When once these rules are put in force, we can rest assured that the southwestern scientist in good standing will be courageously doing fine work, regardless of all sorts of prejudices. He will not be maliciously criticizing his colleagues nor will he have stolen their mental offspring or their means of subsistence. In fact he will be wholly respectable, scientifically speaking. His pay will be adequate and he will enjoy administrative authority of a sort. His publications will be prompt but not too prompt and the public will be in his confidence, for he will have learned that the public pays the bills. He will be conversant with politics, religion and economics, but it will be useless to approach him on literature, history or philosophy, for these have been left to the charlatans as unworthy of ethical scientists.

With all this careful charting of the course of the true scientist the rules committee unfortunately neglected the all-important matter of a distinctive name and appropriate insignia for these new paragons of scientific virtue.

As any realtor could have told them, rules are all right as far as they go, but the important thing is for the paying public to be able to discriminate between those who have a framed copy of the rules and those who have not. The southwestern scientists, having aped the realtors to the extent of adopting a code of ethics, should go the rest of the way and grasp the substance of reform by choosing a name.

The writer, ever anxious to encourage and aid in the salvation of southwestern science suggests "Scientor"[2] as a designation for those very earnest-minded practitioners seeking a way out of the wilderness—or what have you?

J. H. KEMPTON

BUREAU OF PLANT INDUSTRY

A DAYLIGHT METEOR

I READ with great interest the note of William L. Bryant, entitled "A Daylight Meteor," which appeared in the issue of SCIENCE of July 22, 1927. Several years ago, about four o'clock in the afternoon of a beautiful October day, while walking in the open country just north of the city of Stamford, Conn., I chanced to see at an elevation of about 30° above the horizon a veritable "ball of fire" moving in a northerly direction with an exceedingly high velocity. The brilliance of the moving body, which I immediately assumed to be a daylight meteor, was fairly dazzling notwithstanding the fact that the sun was shining brightly in the western sky. During the brief interval that the meteor was visible its trajectory appeared to be nearly horizontal. Unlike the luminous body observed by Mr. Bryant, the daylight meteor which I chanced to see did not leave a train of sparks in its wake. Unfortunately, I was alone at the time when this phenomenon occurred and hence was unable to compare my observations with those of an independent observer.

FREDERICK H. GETMAN

[2] Lest I be accused of transgressing Rule 10 of the southwestern code I hasten to admit having read a series of letters, appearing in *Nature* a year or so ago, in which the question of a proper designation for men of science was discussed. Although I am not conscious that Scientor was among the suggested appellations, it may well have been, and ethically I can claim credit only for appreciating its appropriateness for the group of men in question.

QUOTATIONS

SCIENCE FOR CITIZENSHIP

OF the importance of science in any modern system of education there can here be no question: but there is danger of a certain confusion of thought. The value of the practical application of science was fully brought out during the war; it has been apparent in many of the problems which have arisen since the war; while scientific men have repeatedly and justifiably urged upon the public and the government the fundamental importance of the promotion of scientific research for all departments of the administration and life of the community and the British Empire. This insistence upon the value of science, aided by a confusion between instruction in science and a technical training, has obscured its true function as an element in the training of the average individual in preparation for his duties as a member of the community. Now that science enters so widely and so intimately into every department of life, especially in all questions relating to health and well-being, it is essential that both the individual who ultimately through the vote will control policy, as well as those by whom that policy will be framed and carried out, should have a general knowledge of the scope and aims of science, as well as of scientific method and the mode in which science envisages and attacks its problems. It is, however, beyond question that it should be a general knowledge on broad lines: a specialized training in some highly technical branch of science is neither needed, nor indeed is it desirable. The educationist need feel no alarm.

As a medium of culture, the history of scientific discovery opens up to the imagination vistas of man's endeavor which place it in the front rank of humanistic studies. Through a general familiarity with the

methods of scientific observation and experiment in the various branches of research may be developed a critical attitude in judgment, a power of observation and a capacity for orderly arrangement; while a knowledge of the questions with which science as a whole is concerned in the past, present and the future, fosters the broad outlook which, in combination with these qualities, is essential in successful dealing with the problems of life. We doubt, however, whether much of the science teaching in schools, either primary or secondary, could be regarded as science for citizenship instead of science for specialists, and we should welcome a movement which would broaden its scope and change its character.—*Nature.*

THE FALL LINE OF THE EASTERN UNITED STATES

THE fall line is one of the most significant physiographic features of the eastern United States, but its origin has long been a mooted question. The fall line is not particularly striking in its physical expression but its east-facing slope gives rise to a remarkable series of falls, rapids or deflections in the streams which flow from the Appalachian province across the Coastal Plain to the Atlantic Ocean.

The fall line, or fall zone as it may more appropriately be called, has been commonly recognized as extending for more than 800 miles, from central Georgia to somewhere in the neighborhood of New York harbor, and following the contact between the crystalline rocks of the Piedmont area and the soft sedimentary formations of the Coastal Plain. All the early geologists and physiographers assumed that the fall line was a natural outcome of streams crossing the line of contact between two areas, one of resistant rocks and the other of relatively non-resistant rocks. This apparently adequate explanation was long given credence and, indeed, to-day many still hold to it. But it must be rejected in the light of the fact that the upper portions of the streams on the Piedmont are as well graded as the lower portions on the Coastal Plain. For if the falls were due to difference in the rate of stream development on areas of unlike rock resistance, the upper courses of the rivers should manifestly be in physiographic youth while their lower courses should be physiographically more mature. This is, however, not the case.

It was soon recognized that the fall line was not explicable solely on the basis of difference in resistance to stream downcutting in two petrographic provinces, so in 1888, W. J. McGee set forth the hypothesis that the fall line was due to monoclinal flexing or faulting. This theory appears to have been accepted by N. H. Darton, N. M. Fenneman, Cleveland Abbe, Jr., Isaiah Bowman and many others. Joseph Barrell, however, clearly showed that while faulting does occur near the fall line in one or two places, there is no evidence of displacement throughout most of its length, particularly in places where some of the most pronounced stream declivities occur.

W. M. Davis in his "Physical Geography" (published in 1898) sets forth a very ingenious hypothesis, which if true is entirely adequate to explain the fall line. On page 127, of this book, Dr. Davis gives in essence the following explanation: Before the Piedmont and Coastal Plain were uplifted the rivers had cut valleys of gentle slope leading to what was then base-level—the shore-line along the outer (eastern) edge of the Piedmont. After emergence, the extended rivers rapidly entrenched their lower courses in the non-resistant sediments of the Coastal Plain, while downcutting proceeded very slowly in the hard rocks of the Piedmont. These new valleys of the lower courses of the streams, worked headward until they encountered the resistant rocks beneath the Coastal Plain sediments near its inner margin, where downcutting was checked. Thus the middle portion of the stream, between the gentle upper reaches on the Piedmont and the gently sloping lower entrenched portion in the Coastal Plain, possesses a relatively steeper slope and hence is marked by falls and rapids.

Davis's explanation is thus based on the assumption that the surface of the Piedmont is continued beneath the sedimentary formations of the Coastal Plain, and this embodies the necessary implication that the gradients of the Piedmont portions of the streams are less than the slope of the upland peneplane surface.

In order to analyze the problem quantitatively, the writer constructed many projected surface profiles across the Piedmont and Coastal Plain at right angles to the fall line, plotting on the profiles the outcrops of the various geological formations together with the depths of well borings in the Coastal Plain to determine the slope of the crystalline basement. Several different vertical exaggerations of scale were used in order that the various elements of the relief might be studied to best advantages.

The profiles show especially well the peneplain nature of the Piedmont upland and the New England upland. These uplands should probably be considered as two sections of the same peneplain (probably Tertiary in age). The slope of this Piedmont-New England peneplain surface varies from 5 feet per mile in Georgia to 18 feet per mile in Maine. The slope of the crystalline basement below the Coastal Plain varies from 36 feet per mile to 85 feet per mile, showing clearly that the Piedmont-New England up-