thousand years ago extended, in certain directions, well into the temperate zones, seem to offer positive evidence that the earth is growing colder. The theoretical (beautifully simple) explanation of the origin, growth and final retreat of the ice, which results from my modification of Manson's hypothesis, is, very briefly stated, as follows:

After the minimum polar-surface-temperature had fallen to 0° C. snow commenced to fall at the two poles during the respective winter months; each year this snow was, for some time, completely melted during the respective warmer seasons of the year; as the earth grew colder, the snow and ice covering became permanent and spread equatorwards with seasonal fluctuations at the ice front; but as the ocean grew colder the amount of evaporation from its surface decreased, so that the available amount of snow to be melted at the ice front continually diminished (while the intensity of the direct solar rays at the surface of the earth was, for a given latitude, continually on the increase);[5] a final retreat of the ice front was, therefore, inevitable. As the snowfall will later on cease altogether, the land ice will continue to retreat and probably disappear at the poles. These results are for ideal sea-level conditions; topographic irregularities, differences of elevation, direction of air and water currents—all act to produce great deviations from the theoretical results here made to depend on latitude and ocean temperature alone; these deviations have, in the past, been so great that evidences of former *local* glaciation should be found throughout nearly the whole series of stratified rocks.

In addition to the theoretical data given on page 415 of the current volume of SCIENCE, I would, in connection with Dr. Barrell's remarks on radiation of heat, call special attention to the fact that, since the publication of my paper demonstrating that Newton's law of radiation is theoretically exact, no less authority than Professor Newcomb has asserted (but not demonstrated) that Stefan's law of radiation has been established; now, as I claim to have demonstrated that "some surprising error in previous methods" has actually developed, Dr. Barrell or some other scientist must show that my demonstrations are erroneous before further intelligent use can be made of laws of radiation established by others and used (to quote from SCIENCE, February 14, 1908, p. 269) as "the formulæ accepted to-day" by scientists.

J. M. SCHAEBERLE

ANN ARBOR, MICH.,
September 29, 1908

[5] Because of this condition of things, it seems extremely probable that formerly, when the arctic climates were less severe, equatorial and temperate regions were for a time actually somewhat colder than they are to-day, for the lowering of the surface temperature resulting from the ever decreasing heat-trapping power of the atmosphere was, for a time, probably more than offset by the increased intensity of the direct solar rays.

CLOUDS OVER A FIRE

TO THE EDITOR OF SCIENCE: In connection with Mr. B. M. Varney's letter on "Clouds over a Fire" in SCIENCE for May 15, 1908, I may say that I have often observed the same phenomenon here. In cutting sugar cane the stalks are stripped of leaves in the field, and when the cutting of a field is finished the leaves are set afire as they lie spread over the field. When the weather is calm there arises a column of dark smoke which is often beautifully capped by a mass of white cloud. I have wondered whether the particles of smoke furnish nuclei for the formation of water drops as the smoke rises to a level of supersaturated air, or whether, as Mr. Varney suggests, the draft carries water vapor to a level of cloud formation.

WM. F. WALLIS

EWA, HAWAII

QUOTATIONS

DANIEL COIT GILMAN

DR. GILMAN was soon called from California to conduct what was, at its inception, a unique undertaking. This was nothing less than the establishment of a university for graduate study, with an equipment and faculty that should make it the rival of the best universities of Europe. On the disap-

pointments and even failures of this enterprise we need not dwell. At one period the Johns Hopkins suffered heavy financial losses, and its resources have always fallen far short of its ideals. But hampered as the university has been by lack of money, of equipment, and of men, it has yet been one of the most potent forces in elevating the intellectual standards of our colleges. The young men who gathered at the Johns Hopkins in the early days under Gildersleeve, Rowland, Remsen, and Sylvester were filled with enthusiasm for exact and extensive learning. There is always, we grant, the danger that vast erudition will not become assimilated and humanized; that it will remain mere pedantry. This peril the graduates of Johns Hopkins incurred; and some of them did not wholly escape it. But in the seventies and eighties our education was less Germanized than now and in an era of slipshod training, Johns Hopkins offered the kind of severe drill that was sorely needed. The graduates carried the gospel of a rigorous scholarship from one end of the country to the other, and made it more and more necessary for teachers, both in college and school, to be masters of their subject. This was perhaps Dr. Gilman's greatest contribution to the cause of education in America. How great it is we can not yet estimate; for the men whom he and his faculty prepared for teaching are yet with us, distinguished in their various callings, and we can not view their labors in proper perspective.

It was Dr. Gilman's fortunate lot also to guide the Carnegie Institution of Washington in its first three years. The conception of foundations for scientific research had made very slight headway in this country. We have had a few laboratories that are endowed, and here and there a university has been willing to maintain a professor—say, in astronomy—who is not expected to teach, but who can devote his energies to extending the limits of our knowledge. But the notion of research, without prospect of return in cash dividends, has not appealed to a utilitarian people. More than that, few colleges, under the pressure of undergraduates demanding instruction, have been able to set aside funds that did not seem immediately productive. The Carnegie Institution, then, like the Johns Hopkins, was established at a moment of need. We can not doubt that in the long run it will do as much, perhaps even more, to raise the standards and the tone of scholarship in America. It was fortunate in receiving its first shaping from the hands of a man of Mr. Gilman's long experience and wide views.—New York *Evening Post.*

SCIENTIFIC BOOKS

The Harvey Lectures. Delivered under the Auspices of The Harvey Society of New York, 1906–7, by Professors A. E. Wright, C. A. Herter, W. T. Porter, J. G. Adami, F. G. Benedict, E. B. Wilson, George S. Huntington, W. T. Councilman, Friedrich Müller and Dr. S. J. Meltzer. Pp. 1–314. Philadelphia and London, J. B. Lippincott Company. 1908.

The appearance of this volume marks the completion of the second year of the Harvey Society. Starting more or less as an experiment based on the assumption that there was a desire on the part of practitioners of medicine to acquire at first hand from men engaged in research more knowledge concerning the scientific problems and principles underlying their profession, the Harvey Society has made for itself a permanent place as a factor in higher medical education. Its usefulness is no longer a matter of doubt, but is now an assured fact. Nor is its sphere a local one, since through the publication of its lectures, these are brought within reach of all.

This paragraph from the preface of the present volume states concisely the position of the Harvey Society. The society was organized in 1905 for the purpose of bringing before medical practitioners the results of important scientific investigation in medical and allied fields. It has a membership of one hundred and seventy-five investigators or practitioners of New York City, and has now held three courses of lectures. Those of the first course were published in 1906, those of the third course are soon to appear, and the present volume includes the ten lectures of the second course. Foreign men of science are represented by two men of distinction: Sir