HEINRICH RIES, PH.D. (Columbia), has been appointed instructor in economic geology in Cornell University.

PROFESSOR J. H. WELLS has been appointed professor of mechanical engineering in the University of Montana.

DISCUSSION AND CORRESPONDENCE.

A 'CENTURY OF GEOGRAPHY IN THE UNITED STATES.'

TO THE EDITOR OF SCIENCE: In the preamble to his address entitled a 'Century of Geography in the United States' (this JOURNAL, April 22, 1898) Mr. Marcus Baker states that he proposes to give 'a general review of the century's progress in the diffusion of geographic knowledge in and as to the United States.' For his material he looks 'not to the repulsive black volumes that have for years been poured out over the country from the government printing office,' which represent the *increase*, but 'to text-books, to public addresses in Congress and out, to newspaper and magazine articles, and to public lectures,' which represent the *diffusion* of geographic knowledge.

While it would thus appear that Mr. Baker had intended his address to be of a popular rather than of a scientific nature, yet this does not justify him in making misleading or incorrect statements in regard to the sources from which his geographic knowledge is derived. Such statements are even more liable to do harm in popular addresses than in scientific ones, for the reason that his hearers are less likely to verify them by reference to the original sources of information.

I beg to call the attention of your readers, therefore, to certain of these inaccuracies and misleading statements that have attracted my notice.

1. Powell's first voyage through the canyons of the Colorado was not made in the same year that Alaska was purchased, but two years after, or in 1869.

2. The statement that, at the time the U. S. Geological Survey undertook the gigantic task of making a topographical map of the entire United States, 'topographic maps did not exist,' except of 'a fringe of lake and seacoast,' is not only misleading, but does injustice to the work of the earlier organizations, without essentially enhancing that of the present, to which Mr. Baker is now attached. The earlier topographical work which Mr. Baker ignores includes nearly 90,000 square miles in a belt extending entirely across the Cordilleran system mapped both topographically and geologically by the 40th parallel survey and an area of about 70,000 square miles in Colorado and adjoining States mapped in like manner by the Hayden survey. While these maps are on a smaller scale, and hence give less detail than those made by the present organization, they have been proved by long test to possess a substantial accuracy commensurate with their scale, and are not surpassed or even equalled by corresponding maps in any part of the world.

3. Finally, while enumerating in considerable detail all the other organizations which have contributed to our knowledge of the geography of the country, Mr. Baker has studiously avoided all mention of the Fortieth Parallel Survey, the first to introduce modern methods of topographic surveying into American cartography and to whose pioneer work all the subsequent organizations have been more or less indebted, as I showed in my address on the 'Geology of Government Explorations,' published in this JOURNAL in January, 1897.

S. F. EMMONS.

COLOR VISION.

MY thanks are due Professor Titchener for his appreciative criticism and reply to my recent paper on Color Vision. He confirms some of my most important points in showing that the number of competitors for the credit of new color hypotheses is even greater than I had supposed. It is reassuring to be told that "The psychologist must know them in the sense that he must know his literature at large. He is no more disturbed by them, however, than is the biologist by the thousand and one theories of heredity and transmission that have been formulated since the days of pangenesis."

I am quite willing to be corrected by so competent a psychologist if I was mistaken in thinking that Wundt's hypothesis has a good follow-

ing among psychologists; and, also, if I ascribed to physicists generally some knowledge of the Hering hypothesis. It would, perhaps, have been a more nearly accurate statement to say that most, if not all, of the physicists who are acquainted with Hering's hypothesis reject it. My own acquaintance with the outlines of this hypothesis began sixteen years ago; but Professor Titchener is entirely correct in the conclusion that I have not 'followed up the Hering theory in its meanderings through a large number of scattered journals, some of which are now not at all easy to procure.' I do not consider this remark at all 'blunt,' nor is there anything in Professor Titchener's paper that calls for excuse. I may, however, regretfully remark that, in common with others of my profession, I shall hardly have the opportunity to look up these journals. When a psychologist of recognized authority informs me that 'there are now only two discussable theories of color vision, those of Helmholtz and of Hering,' I am willing and glad to accept his judgment, and to let the rest go with but little attention.

The conflict between these two hypotheses will, therefore, be watched in future years with the calm interest of an outsider, rather than that of a partisan. In teaching that portion of optics which relates to color I shall carefully limit myself to the physical facts; and if Hering's hypothesis should win its spurs, and thus be changed into Hering's theory, the physicists will doubtless forget their ancient hardness of heart and will welcome the settlement of a long vexed question.

Apart from Professor Titchener's discussion, several private communications have brought the assurance that my criticism of the color hypothesis which has for many years held a place in my regular course of instruction has had more than one sympathetic reader. The good spirit which has characterized the reception of my paper is a source of gratification.

W. Le Conte Stevens.

THE GEOLOGICAL AND BIOLOGICAL SURVEYS OF ALABAMA.

To the Editor of Science: In his Presidential address, published in Science, April 29th, Professor V. M. Spalding credits the Biological Survey of Alabama with the botanical work of Dr. Charles Mohr, of Mobile. That Survey is doing most excellent work, but Dr. Mohr has for many years been engaged, under the auspices of the *State Geological Survey*, in the investigation of the Botany of Alabama. As one of the results of this work we have now going through the press a complete flora of the State, and this will be followed by a companion volume in which the useful and noxious plants will be treated in a very thorough manner, as all who know the character of the work of Dr. Mohr will be ready to believe.

The Geological Survey began this work many years before the Biological Survey was inaugurated.

Eugene A. Smith.

University of Alabama, May 6, 1898.

SCIENTIFIC LITERATURE.

An Elementary Course of Infinitesimal Calculus. By Horace Lamb, M.A., F.R.S., Professor of Mathematics in the Owens College, Victoria University, Manchester; formerly Fellow of Trinity College, Cambridge. Cambridge, University Press. 1897. Crown 8vo. Pp. xx + 616.

The English text-books on the Infinitesimal Calculus in common use afford a formal treatment of the calculus that is all that can be desired. A student who has worked all the examples under important topics in one of these books has been through a course of shop-work that prepares him adequately for the manipulation of calculus formulas—and for the tripos examination. But he has done only shop-work. He has learned to differentiate explicit functions and to integrate (some) explicit functions, and to prove all sorts of things by Taylor's Series. He has *not* been trained to examine carefully the reasoning he employs or to consider even the broadest limitations in the statement of theorems. Teachers of elementary calculus are only too prone to leave the consideration of all such matters to the indefinite future; but a wise system of instruction will strive not to hide from the student, but to point out to him those difficulties that are inherent in the fundamental