has been appointed instructor in chemistry in the University of Montana, in place of Mr. J. W. Hill, who has resigned.

DR. MADISON BENTLEY, assistant professor of psychology in Cornell University, has been called to the chair of psychology in the University of Illinois. Dr. H. P. Weld, of Clark University, becomes assistant professor of psychology at Cornell.

DR. W. F. BOOK, of the University of Montana, has accepted an appointment as professor of education in the University of Indiana.

THE department of physics of the University of Illinois has added two new assistants to its teaching staff for the present year, Mr. W. H. Bair, for some time a teacher of science in the high schools of Illinois, and Mr. Earle H. Warner, assistant for several years in the department of physics of the University of Denver. Both men are to serve as half time assistants.

DR. ALVIN R. PEEBLES, formerly professor of the theory and practise of medicine in the University of Colorado, has been appointed head of the department of preventive and experimental medicine, which has been established by the regents.

DR. THOMAS CLACHAR BROWN, a graduate of Amherst, who received his doctorate from Columbia in 1909 and who has since filled the positions of assistant professor of geology at Middlebury College and assistant professor of geology at the School of Mines, Pennsylvania State College, has been appointed associate in geology at Bryn Mawr College.

MISS MARY D. MACKENZIE, professor of biology at Western College, Oxford, Ohio, has been appointed head of the biology department of the Margaret Morrison School for Women of the Carnegie Institute, Pittsburgh.

PROFESSOR J. LORRAIN SMITH, F.R.S., professor of pathology and pathological anatomy in the University of Manchester, has been appointed to the chair of pathology in the University of Edinburgh, in succession to Professor W. S. Greenfield.

DR. J. STILLE, of the Technical Institute at Hanover, has been appointed professor of geology and paleontology at the University of Leipzig.

DISCUSSION AND CORRESPONDENCE

THE POLICY OF THE GEOLOGICAL SURVEY

TO THE EDITOR OF SCIENCE: In his paper on "A National University," printed in the issue of SCIENCE of August 16, President Van Hise takes occasion to comment on the neglect of science by the scientific bureaus. He states that the United States Geological Survey "is almost exclusively a department of practical geology" and "is not contributing in any large way to the advancement of science."

President Van Hise seems to be comparing the Geological Survey in the first decade or so following its organization with the larger service of to-day. As I am in part responsible for the Survey's present policy, I may perhaps be permitted to present this matter in its other phases. The question whether his statement is justified is not easily debatable, for the premises on which any argument should rest are not of a kind readily agreed upon. In fact, President Van Hise and other geologists might disagree as to what constitutes "advancement of science," and as to what is "practical geology." This unavoidable confusion of definition prevents any adequate comparison of past and present contributions or even of an earlier and the present personnel.

With this inherent difficulty in discussing generalities, it becomes especially a matter of regret that President Van Hise contented himself with reiteration of the charge, without definition of his terms or mention of any supporting facts. The question therefore resolves itself into a consideration of the degree of truth or justice in President Van Hise's two dicta: the Survey is "almost exclusively a department of practical geology," and "it is not contributing in any large way to the advancement of science." These deserve to be considered separately, because I can not admit that the one is a corollary of the other.

Geologic research as conducted under government auspices should, in my opinion, be largely practical. The purposes for which the United States Geological Survey was organized, both as specified by Congress and as recommended by a committee of the National Academy of Sciences, are practical, and the administrator who would venture to disregard the plain intent of that legislation would not contribute to the ultimate advancement of science. The Survey began on very practical lines, Director King arranging the initial work in districts offering "examples of instructive geological structure and great bullion yield," and even that classic work of science planned as the first monograph of the new survey, "Lake Bonneville," had its practical side, the hope having been expressed by Mr. Gilbert himself in a report of progress "that a critical investigation of the secular oscillations of climate in the past will help to solve the problem of secular change which is of such vital importance to the agriculture of an arid domain."

The most recent index of the trend of the Survey's work is afforded by the schedule of manuscripts being edited August 15, which affords some basis for judging of the character of the publications now in hand. The publications issued each year are known to the public, although I might mention as noteworthy in this connection two contributions that are just coming from the press: Monograph LI., "Cambrian Brachiopoda," by Walcott, and Professional Paper 71, "Index to North American Stratigraphy," by Willis. Of the 41 reports now being edited 5 are engineering bulletins, embodying data incidentally collected in the course of topographic surveys, and therefore not chargeable to scientific appropriations; 8 relate to Alaska and represent work done under an appropriation made specifically "for the investigation of mineral resources" and therefore not to any large extent available for theoretical investigations, though the results of the work in Alaska are a splendid contribution to our knowledge of the geology of the globe; 8 are water-supply papers contributed from the work under another specific appropriation; 6 relate to economic geology; and the remainder, 14, may fairly be described as outside the "department of practical geology." This group of 14 includes 6 paleontologic reports, 3 descriptions of areas having no special economic importance, and one report under each of the following subjects —glaciers, Pleistocene geology, petrography, stratigraphy and mineralogy.

That the United States Geological Survey concerns itself with the practical side is true now as it has always been in the past; whether its work is more or less devoted to practical geology than formerly can be decided according to one's taste or prejudices; but that it is almost exclusively a department of practical geology must be denied.

Besides making general investigations in geology and highly specialized researches in paleontology, petrography, mineralogy, geophysics and geochemistry, which it will be generally agreed contribute to the advancement of science, the Survey is making other investigations whose theoretic results are so closely combined with the results of practical geology that their scientific value may be overlooked by some readers. In some cases the "purely scientific" conclusions reached are incidental to the practical investigation, but in many instances are essential to it. To-day, as in the past, the study of ore deposits by the Geological Survey continues to yield a large measure of scientific results of the highest grade, and the five manuscripts on economic geology mentioned above are no exception to this rule. Most of these are not detailed descriptions of mining camps, but deal to a great extent with the areal geology and physiography of the hitherto blank spaces on the geologic map of the United States. The broader studies are not neglected—a fact illustrated by a manuscript just received from Professor W. H. Emmons on "Secondary Sulphide Enrichment," which represents results gained in the course of economic work in several mining districts during the past twelve years. That the answers to the problems of chemistry and physics here discussed possess a practical present value to the mining engineer

in nowise detracts from their permanent value to the broad science of geology.

An example of work on a broad problem that concerns a number of states is afforded by the general and detailed study of the Atlantic and Gulf Coastal Plain which for five years has been prosecuted under the direction of T. W. Vaughan with the cooperation of several state and federal geologists. Similarly, the mapping of the San Juan region by Whitman Cross serves as a notable example of a general investigation of broad scientific interest, covering two decades. A third illustration is to be found in the geologic work of Messrs. Campbell and Alden in the new Glacier National Park. It is conceivable that the publications resulting from such geologic investigations will stand as large contributions to science, and when this literature has been illumined by the added glamor of the years, the Geological Survey of to-day may be cited as again "the center of the world for the advancement of the science of geology."

More than this, the application of geology to economic problems has a reflex effect upon the science. The association of the scientist with the engineer is beneficial to both. The geology that is applied to big problems, whether of engineering or of governmental policy, must be not only qualitatively true, but also quantitatively exact. So the entrance of the Geological Survey into the administration of the public lands has modified field methods and established standards of accuracy not before demanded. The result is that the geologist who works in terms of forty-acre tracts observes details that were overlooked by his predecessor who looked the country over by the square mile.

The recognition of the applicability of geologic data collected by government scientists to the administration of the public lands is in itself, I believe, a large contribution to the advancement of science. The field of science is broadened and the standing of science is dignified. The remark of the geologist whose experience had been gained largely in the east but who is now working in a western mining camp illustrates this: "It is a satisfaction to be looked upon as a worker and not have to make apologetic explanations as to what geology means."

Another illustration is afforded in the work of the Geological Survey in connection with the proposed forest reservations in the east. For years the geologists and hydrographers of the Survey had taken interest in the question of the relation of forest cover to stream flow and as opportunity afforded had made observations bearing on the question. The results, however, were at best only qualitative and to some extent confusing. The Weeks Act, however, specifically laid upon the Survey the burden of making an affirmative showing of the regulative effect of the forest upon stream flow, before land could be purchased, and then an investigation was planned with the purpose of obtaining conclusive results. That the Survey withstood popular clamor until its investigation was concluded and reported only on observed facts may of itself have been a possible aid in advancing science. As an intensive study, the hydrometric survey of selected areas in the White Mountains is believed to be without parallel in the world, and it has yielded quantitative results which, when thoroughly digested and compiled, will be published as an important contribution to science. This opportunity to apply science to an administrative problem came to the Geological Survey because its work was believed to be both practical and scientific; and I may add my opinion that whenever this bureau becomes exclusively "practical" or exclusively "scientific" it will cease to deserve either recognition or support. This idea has been best expressed by Brooks: "Applied geology can maintain its present high position of usefulness only by continuing the researches which advance the knowledge of basic principles."

GEO. OTIS SMITH

SCHOOL GRADES—TO WHAT TYPE OF DISTRIBUTION SHALL THEY CONFORM?

THOSE administrators who have given the subject of scholarship marks or school grades considerable attention, will appreciate President Wm. T. Foster's article, "The Scientific