

SCIENCE.

FRIDAY, DECEMBER 18, 1885.

COMMENT AND CRITICISM.

THERE IS A POPULAR BELIEF that demand begets supply. If this be true, it would appear that the demand for good maps and atlases of this country, on small scales, is very limited. In respect to culture, the published maps are fairly good, although in detail they are not what they should be, even in this respect. In their representation of natural features, however, they are, as a class, subject to severe criticism. It is not too sweeping an assertion to say that there is scarcely an atlas of this country which is abreast of our geographical knowledge, or even within several years of it. Indeed, in atlases dated '1884,' there are to be seen maps of the western states and territories, in which all geographical work, executed subsequent to the Pacific railroad explorations, has been ignored. The charitable might assume that the compilers were not aware of the existence of later and better material, were it not for the fact that in many atlases the same area is represented a second time by maps compiled from material of much more recent date. One must conclude that the same old plates have been made to do duty these many years, and that, while the culture has been revised from time to time, the natural features have not been considered of sufficient importance to warrant revision. On the most recent maps one still meets with the old familiar errors. The mouth of the Rio Dolores, in eastern Utah, is still frequently represented thirty miles out of place. The mythical island in Green River, in the Green River basin, is occasionally seen; and Sevier Lake, Utah, is sometimes accompanied by its double, the so-called 'Preuss Lake.'

But it is not in this respect alone that our maps and atlases are subject to criticism. As a rule, the representation of the relief is a dismal failure. There is scarcely a map published by private parties which gives even a fairly good picture of the orographic features of the country. No attempt is made, by means of contours, at a quantitative

representation of relief, but hachures and crayon, or brush-work alone, are employed. In most cases the expression is in the highest degree conventional, a double line of hachures representing a range, and an asterisk a peak. When an attempt is made to represent properly the forms of relief, it is seldom successful. Through the ignorance of the compiler, the great ranges are belittled, while minor ridges take on an importance altogether disproportionate to their size. Every divide between drainage systems is represented as a mountain range. Plateaus appear as ranges, and ranges as plateaus. Another feature to be condemned is the raw and glaring colors by which the states, counties, etc., are distinguished from one another. If colors must be used, let them be subdued tints, which will not offend the eye, or render the map illegible. Many American maps and still more foreign maps are rendered almost illegible from the quantity of material which they contain. The names are so numerous as to obscure all other features, while the lettering is often so fine that it can be read only with a microscope. A map should be as legible as print. There is certainly room for improvement in the compilation and publication of maps.

IN THE INAUGURAL ADDRESS of President Adams of Cornell, reference is made to the need for the establishment of regular courses of instruction in the history and science of education at that university. According to the census of 1880, there are in the United States 64,137 lawyers, 64,698 clergymen, 85,671 physicians, and 277,710 teachers. For each of the first three professions we demand a more or less special training. Sometimes we ask much, sometimes little; but we always require something, and in the more cultured sections of the country that something is a great deal. With our teachers the case is, or it may be more just to say has been, radically and incomprehensively different. Any person who chose could start a school, and various influences aside from special training served to secure responsible positions in institutions of learning. Teaching may, and perhaps does, require what we are used to hearing called a knack. But on what principle is it that teachers are not required to possess a scientific knowledge of their

profession? That profession is not a fungus, but a gradual development. It has a history, it has a literature, and it has a profound philosophy. How many of our two hundred and seventy-seven thousand teachers know any thing of these? We are forced to believe that this number can be counted by hundreds, perhaps even by scores. Our great universities are the places where reform in this matter should be brought about. Let us see established in each of them courses of instruction in the history, theory, and practice of teaching. Let us hear something about the educational systems in other countries. Cambridge, Edinburgh, St. Andrew's, and other British universities have taken this step, and it has proved a successful one. It is no new thing in France; and such lectures are to be heard in almost every university in Germany. Paulsen in Berlin finds from two to three hundred hearers for his lectures on *pädagogik*, which occupy four hours per week throughout the semester. Our college presidents recognize our need in this respect, but the governing boards do not seem to carry out their recommendations. How much must be said and written on this subject before the authorities understand what is needed to round out this scheme of university education? It is safe to say that not more than three of our leading colleges now offer any scientific instruction in pedagogics.

THE GOVERNMENT AND ITS SCIENTIFIC BUREAUS.

THOSE who anticipated that the President, in his annual message to congress, would enunciate some radical views in respect to the relations of the government to its scientific work, have been disappointed. Those who know how sincerely desirous he is to uphold the efficiency of the public service have been gratified. Considering the length of his message and the obvious care which has been bestowed upon many questions,—the coinage of silver and the civil-service reform, for example,—it is noteworthy that all he has to say upon science is contained in a few short paragraphs. Two suggestions which he makes are, however, of very great importance, and deserve the most judicious consideration,—the separation of the signal service from the war department, and the transfer of the coast survey to the navy department. It is remarkable that these recommendations so opposed to one another should be included in one message, and it is by no means obvious

why better administration can be secured in the one case by separating a large corps from the army, and in the other by placing a large corps under the administration of the navy. There are strong reasons for believing that both those bureaus—the signal service and the coast survey—will do better work if allowed to stand as independent corps,—that is, detached from the army and navy. The reasons for such a belief will doubtless be made known to the congressional commission which has been instituted for the investigation of this and allied subjects.

This commission, in continuation of the prolonged inquiries which it carried on several months ago, resumed its work, unless we are misinformed, within the first week of the session. It is earnestly to be hoped that all the matters which come within its view will be soon taken up, and such a report prepared as will enlighten the administration, congress, the men of science in the government service, and the public at large, upon the principles which should govern the various scientific bureaus established in Washington. These principles seem to us very clear, and we hope to see them so definitely announced during the present winter that subsequent legislation will be simplified, and future superintendence made more efficient than ever before.

It is already evident that the alarms which were sounded by some over-zealous correspondents during the last summer and early autumn were exaggerations. One important case of mal-administration was undoubtedly brought to light; but the more thoroughly that case is understood, the more obvious it is that the chief officer upon whom reproaches were cast has been long a sufferer from such serious physical infirmities, and that right-minded men should rather incline to charity than to censure in their estimate of the close of his official career. The full and frank explanations which were promptly made by other chiefs of scientific bureaus have removed the imputations which were cast upon their official conduct. It is not unlikely that congress will institute such inquiries as will reveal the exact situation, and we have not the least doubt that the utmost scrutiny will be encouraged by those whose work has been publicly impugned.

Out of all this discussion there will doubtless proceed further legislation in respect to the scientific work of the government, and probably better methods of administration will be devised than those which have hitherto prevailed. The dangers