SCIENCE.

FRIDAY, SEPTEMBER 21, 1883.

THE U. S. SIGNAL SERVICE.

II.

IT must be said that the annual report would be vastly improved by being made either one thing or the other, or, better, two separate things. At present it is at once a *résumé* of meteorological work done during the year, and a government blue-book. As the former, it falls far short, not of the ideal, but of the possible: it is probably equally deficient considered as the latter. It is certainly desirable that the summarized results of such great labor, comprehending so vast a field, should be published annually in such a form as to be useful to those who are engaged in meteorological study and research, and it ought to be done with reasonable promptness.

The size of the volume might be reduced to at least one-half of what it is at present, and that without material loss. The report proper of the chief signal officer ought to be rewritten; and it does not seem too much to ask that it be prepared afresh every year, and that it should be confined to a statement and discussion of the actual progress made during the year. Expensive reprinting is a luxury that only government offices can afford to indulge in, and it is sometimes carried to an extent that is not only wasteful, but positively objectionable. A large portion of this annual report is made up of a republication of the monthly weather-reviews for the year. These have already been printed and circulated among those to whom they would be useful. Another large part consists of material already printed and circulated as 'Instructions to observers,' and might well be dispensed with here. The 'annual meteorological summary,' occupying about one-fourth of the volume, is susceptible of considerable condensation without loss of value to the student of meteorology. Many of the appendices are made up entirely of matter which is, of itself, not without value, and which may well be kept on file and accessible at the central office, but which is entirely without interest or value to the majority of those into whose hands this report is intended to fall. A much smaller volume, embodying the real meteorological work of the year, with such discussions thereof as could be given, as everybody knows, by persons in the employ of the government at the central office, would be welcomed everywhere, and would be a real boon to students. As at present issued, the report is unmanageable, uninviting, and unsatisfactory.

As already intimated, the report for 1881 contains evidence of some important changes in the organization of the central office, and in the general policy of the service. It seems now to be recognized, that meteorology is, or will be, a *science*, and that it is wisdom on the part of the government to secure the cooperation of scientific men in the work which it has undertaken, as well as to employ an important portion of its own staff in the investigation of meteorological problems, and the carrying-on of special researches. This is a step which, although tardy, will be highly appreciated.

Among the most tangible results thus far may be mentioned the permanent establishment of a 'scientific and study division.' The wisdom of placing this entirely under the control of Professor Abbé, and of permitting him to select his own assistants, cannot be too highly commended. His selection of Messrs. Upton, Hazen, and Waldo for this important service has been justified by the numerous valuable contributions which they have already made under his direction. The transfer of Professor Ferrel from the coast survey to the meteorological bureau is another step in the same direction, which is likely to materially increase the strength of the division. In many other directions, the chief signal officer has shown his appreciation of the 'eternal fitness of things.' He has sought and obtained the cooperation of the National academy, in the

appointment of a permanent committee of that body to which he may refer such questions concerning meteorological science as may seem desirable. He has inaugurated the custom of consulting specialists upon various matters pertaining to the service, and has shown a disposition to aid scientific research in all matters related to meteorology, as instanced in Professor Langley's expedition to Mount Whitney, in the offer to the coast-survey of cooperation in the making of pendulum-observations, and in the interest shown in polar research. The publication of professional papers by members of the staff; the work undertaken in the way of a revision and definitive establishment of standards of pressure and temperature; a promise that after a while something will be attempted in the way of a study of atmospheric electricity; and the proposition to offer prizes for essays upon various meteorological problems, competition to be open to the world, — are all straws that show which way the wind is blowing.

At the same time, the general observation work has been much extended by the wise and hearty interest which the chief signal officer has shown in the establishment of state weather services, which have rapidly increased in number through his encouragement and material aid. This is particularly fortunate just now, when the general service has unfortunately been crippled by the failure on the part of congress to make sufficient appropriations. In short, it is only just to Gen. Hazen, to say that he has greatly enlarged the scope of the service, and that he has materially strengthened it by a broader recognition of the relations which ought to exist between it and the science of the country.

It is difficult, however, to review the past without indulging in speculations concerning the future. It must be admitted, that the work of the meteorological bureau falls far short of the standard which many of its friends have set for it. Many, indeed, believe that it will continue so as long as it remains a military rather than a civil service. Each successive report of the chief signal officer has contained long arguments in defence of its military organization; and, unintentionally no doubt, the same reports have furnished strong arguments against such organization. In order to improve the character of the observing corps, considerable efforts have been made, for two or three years past, to induce well-educated and well-trained men to enlist in the service. Under the present organization, it does not seem that the work could have any great attraction for a college-bred man. In the first place, he must enlist as a private in the army for a period of five years. It is true that the service is special, and that his chance for promotion up to a certain point is fair; but before beginning his work as an observer, he is obliged to go through months of military drill, study, and discipline, the relation of which, to the duties which afterward devolve upon him, it is difficult to see. Proficiency in the 'manual of sabres' or the 'manual of the kit' will not greatly facilitate his making a barometric reduction or a dew-point determination. Even after the service is fairly entered, objections to the military system are not less strong. Permanency of position is very desirable in any occupation, and it goes farther than most other things in securing the best attainable results; but it must be a permanency very different from that which obtains in a military service.

The difference is best seen by a comparison of the relations existing between the service and the two divisions of the staff of the chief signal officer, the civil and the military. The young civilians who have recently become *attachés* of the central office have been led to do so, it is almost certain, by their own fondness and predilection for the study of meteorology. They bring to their work a vigor and enthusiasm resulting from a thorough collegiate training, followed by post-graduate work in which observation and research have played the most important part. The permanency of their positions, and their advancement to more responsible places, will, or at least should, depend solely on the value of their services. With the laudable ambition to establish a reputation among scientific men, they have every incentive to hard work, that success may be achieved, and failure, which would be to them disastrous, avoided.

But by far the greater portion of the work at the central office, and that which is doubtless the most immediately effective, is done by commissioned officers of the army. While it is true that many of them have fairly earned distinction through their conscientious labors in the weather bureau, it cannot be claimed that the relation which they sustain to it, and which is no fault of theirs, is that which would be for the best interests of all concerned. Except the very few who have been promoted from observer sergeants, they have been ordered to the service from other occupations and other branches of the army. As a special training to fit them for the work, they have the year at Fort Meyer, during which the study of meteorology is not allowed to interfere materially with other occupations. They enter the central office at the close of this year, having had an experience of eight days in practical meteorology. When, after further study and practice, they become really useful, they are likely to be transferred to some other post and duty for which this training has in no way fitted them; for the policy of the army seems to be in the direction of frequent changes of location of its officers. But by far the worst feature of the case is that there is no particular incentive to induce them to devote themselves earnestly to the work. If, through interest and industry, one succeeds, he is probably retained in the office longer than he otherwise would be: if, through indifference and neglect, another fails, he is likely to be transferred to some other branch of the general service without loss of rank or reputation. It is also true that the meteorological work of the signal service is looked upon with disfavor by many army officers, as not being a legitimate addition to their duties. Under such conditions, and for many other reasons not necessary to mention, it does not seem possible for the weather service to reach that high degree of efficiency which is believed to be possible under a different organization; and it will require weightier arguments than those annually reprinted in the report of the chief signal officer to prove the contrary.

THE FRENCH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

ROUEN MEETING, AUG. 16-23, 1883.

THIS association has just held its twelfth annual session at Rouen, the ancient capital of Normandy, situated on the Seine, between Paris and Havre. It is, I believe, the youngest association of its kind, but is not, for that reason, the less worthy of study. Perhaps, to an American, its most striking feature is its resemblance, in its organization and proceedings, to its sister across the water. It has its permanent secretary to organize its business and give information to members, its daily programmes, its general meetings, its sectional meetings, and its excursions, all fulfilling the same objects as with us. It has even gone through the same process of evolution, and reached the same stage of development, in becoming a representative of popular and applied, rather than of very 'high,' science. Its members already complain, that, when one is elected a member of the Academy of sciences, he no longer affiliates with the association. I have recognized but two academicians at the meeting, and doubt if there are more. But it must not be inferred from this, that the members and their papers are unimportant: on the contrary, the number of eminent teachers, authors, and investigators, who read papers and take part in the proceedings, is decidedly greater than in the American association. If there are fewer academicians than with us, there are also fewer circle-squarers, essayists, and propounders of school-boy problems. On the list of papers presented, there is not one upon atoms, ether, the nebular hypothesis, or the origin of the present form of the universe.

The range and treatment of subjects are much wider than with us, and one is especially struck with the prominence assumed by social science and engineering. It would seem as if the blind passions, which are so apt to stir the laboring population of France and to lead them toward a policy of general social disintegration, had led the thinking and wealthy classes to give especial attention to the question of the welfare and pacification of the workingman. Not only is political economy one of the most prominent subjects, but discussions of plans for improving the condition of the laboring-class form a leading feature of the proceedings. The plan which seems to have met with most success is that of making the workmen in large establishments sharers in the profits. One speaker described, at length, the working of this plan in a great dyeing-establishment,