SCIENCE.

FRIDAY, DECEMBER 5, 1884.

COMMENT AND CRITICISM.

SEVERAL QUESTIONS of importance, affecting the scientific work of the government, will come before congress during the session just opened. First among these will be the organization of the two great surveys and of the signal-service. Our readers have already been informed through this journal, as well as through the newspapers, that the question of the management of these bureaus was referred to a congressional commission, composed of three senators and three representatives, who are required by law to report their conclusions, by bill or otherwise, on or before the third Monday in December. This commission invoked the aid of the National academy of sciences, and a report from a committee of this body is already in the hands of the commission. The conclusions of this report have not been authoritatively made public; but, according to a newspaper account, it recommends nothing more radical than the concentration of the bureaus in question under a single department of the government, and the appointment of a commission to control the policy both of the coast and geological surveys.

It was naturally expected that the commission would itself enter upon a thorough and minute investigation of the subject, — a view which was strengthened by the fact that a meeting was called for Nov. 11; but, up to the present time, there are no indications that the commission is going to enter upon any very serious labors. Only one week will remain to it when these lines reach our readers, and we have not been able to learn that it has done any thing but postpone its meetings. In this it only reflects the natural tendency of the congress whose term is about to expire. A short session is, under any circumstances, unfavorable for new legislation, and the house would naturally be inclined to await the views of the incoming administration before adopting any measures which might hamper it. We must also remember that it is much easier to stop a bill than to pass it, and that we can hardly expect a measure to be devised which will command the unanimous approval of all concerned. The establishment of a bureau of electrical standards, as proposed by the electrical congress at Philadelphia, must take its chances with the measures for re-organization of the surveys. There is no likelihood of an independent measure for such a bureau being successful.

Other matters which may be expected to arise are international in character; namely, the legalization of the conclusions of the Paris electrical conference and of our own meridian conference. In both these matters we can only hope that congress will make haste very slowly. There is no apparent pressing reason for speedy action on either subject, since both might very well take care of themselves without legislation; and there is a chance of much harm being done by too hastily adopting conclusions which may soon be found to need revision. The standard of light of the Paris conference has not been shown to be realizable in practice, and the accuracy of its ohm is already being called in question. In the case of the meridian conference, so far as its conclusions define the counting of longitudes from Greenwich, they merely authorize our universal practice, and there is hardly more need of our legislating upon the subject than there is of enacting that people shall eat their dinners. If its universal day is found convenient, it will come into use of itself; if not, congress ought not to legalize it. Altogether, we do not see much prospect of very good measures being devised between now and the 4th of March; and we may as well, therefore, reconcile our-

selves to the prospect of nothing being done beyond the passage of the regular appropriation bills.

THE RAPID increase of an organic species in a new and favorable habitat has been illustrated by Darwin's description of the cardoon, that so quickly spread over the Argentine pampas. A more recent example of similar success on the part of a colonizer is seen in the English sparrows that have become so numerous around our eastern cities; but the most peculiar illustration of the effect of better opportunity on an old form is found in the rapid development of seismometric instruments in Japan. The instrumental observation of earthquakes has had but moderate advance in Europe of late years: earthquakes are too rare there to give the study sufficient nourishment for development much beyond its present stand. But the English and German professors imported a few years ago, by the Japanese government, to build up the University at Tokio, found the numerous light shocks in that country to be just the stimulant needed for the rapid multiplication of seismometers; and as a result the European stock planted there has sprung up in such number, variety, and perfection, as to leave its relatives elsewhere in the world far behind.

We dwellers in a land of relatively few earthquakes may profit by the studies made in Japan, as reviewed in another column, instead of waiting for the slow development of seismometry among ourselves. Even a brief examination of Professor Ewing's memoir and of the transactions of the Seismological society of Japan will show how many of Mallet's theorems need revision in the light of these newer and more practical studies, and how great is the need of systematic and co-ordinated observation in the search for the seat and cause of seismic disturbances. The study is regenerated since Mallet's time. The newly opened opportunity for its cultivation in this country is described in our notes.

AT THE FOOT of the titlepage of Professor Ewing's recent work on earthquakes, printed by the Japanese government, the date is given as '2543 (Japanese era). 1883 A.D.' In a matter of chronology, where, to avoid confusion in dates, a uniform system among all nations is the great desideratum, it would seem almost superfluous to suggest the advisability of dropping from the works which the Japanese publish in foreign languages the use of an era which has never been employed in either business or official correspondence or records by the Japanese themselves, which was invented and officially adopted only twelve years ago, and which, though claiming to reckon from the time of the accession to the throne of the first Japanese emperor, has no reliable historical basis whatever, for at least the first twelve or thirteen hundred years, perhaps more, of its claimed antiquity.

IN A NOTICE of the first annual report of the New-York experiment-station (*Science*, vol. ii. No. 42) we took occasion to point out what appeared to us to be the mistaken view of its director regarding the duties of an experiment-station. It would seem either that our apprehension of his meaning in the preliminary passages of that report was imperfect, or that time and further experience have led to a revision of opinion upon the point in question. On p. 22 of the present report we find the following: "Before much real practical advance can be made in bringing agricultural pursuits within the domain of applied science, much work of a purely scientific character must be accomplished; and unpopular as it may be for the worker, yet that worker who investigates agricultural problems, not from the economic but from the reason stand-point, is doing the best work, and the work which in the end will be found most profitable in its applications." We quote this paragraph because it so well expresses the opinion which we urged in our review of the first report, that an experiment-station is primarily a scientific institution, intended to promote the advancement of the science of agriculture, and capable of the high-

est and most permanent usefulness, only when it fulfils this intention as far as possible.

Whether the words we have quoted, and others of a similar tenor, mark a change of opinion on the part of the director of the New-York station, or are only a clearer expression of convictions previously held, we do not undertake to say. In either case, we are glad to see the weight of this important institution cast in favor of the scientific conception of an experiment-station. The great need of agriculture to-day is not new varieties of plants, or improved breeds of animals; new methods of cultivating the soil, or improved systems of farming. All these, and many other like things, are good; but the two great wants are a better knowledge of principles, and greater intelligence to apply them. For the latter we must look to our agricultural schools: the former we should require from our experiment-stations.

We do not hold that an experiment-station should never undertake to originate or test new varieties of plants and animals or new agricultural methods, — often work of this general character will be demanded of it by the public, and will prove of great public utility, — but, in our view, it should not be allowed to be, or to appear to be, the chief end of the station. The two kinds of work are both important, but we question the advisability of attempting to unite them in one institution and under one management. Each requires facilities and talents peculiar to itself; and it seems doubtful, whether, as a rule, one institution will be able to provide good facilities for both kinds of experimentation, and still more doubtful whether it can find combined in one person the diverse knowledge and training required for their successful prosecution. With the growth of agricultural experimentation there might profitably be, we suspect, in the majority of cases, a subdivision of it into two overlapping yet independent classes. We should have, first, the experiment-station proper, aiming chiefly at a further elucidation of the laws and principles underlying agriculture; and, second, the experimental farm, devoted mainly to carrying out upon a farming scale the principles worked out by the experiment-station.

LETTERS TO THE EDITOR.

**** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

Psychical research.

YOUR issue of Oct. 17 contained two articles which are of good omen for the future of 'psychical research' in America. Of the first, the editorial article, I need say little. It is cordially welcomed by my colleagues and myself for its recognition of the far-reaching importance of an enterprise in the further development of which our society will, we hope, go hand in hand with yours. With the second article, on 'psychic force,' our agreement is less complete; but we still find nothing to complain of in the general attitude of the distinguished writer. He, too, recognizes the legitimacy of the inquiry, while clearly apprehending its difficulties. He describes with entire justice the two opposed classes between which psychical research has to clear a path, — the party of easy credulity, and the party of easy incredulity; and he points out with no more than proper emphasis the rigorous caution which every forward step demands. Fraud and superstition have naturally seized on what science has so systematically neglected; and those who now endeavor to take the subject up from the scientific side must accept the fact and its consequences.

So far, then, we are wholly at one with Professor Newcomb; but we cannot quite so readily follow him in his criticisms of our own doings. He begins by condemning one of our public appeals for information; but his strictures seem to assume that all the information which the appeal brings in will be regarded by us as a safe basis for conclusions. The appeal is, of course, merely a first step, for which it would be difficult to imagine any effective substitute; though I may mention that a very large amount of our information comes to us through private channels. The sifting and treatment of the evidence according to scientific canons must be a subsequent labor, the *rationale* of which could not be set forth, or even suggested, in the terms of a short advertisement. And of this labor no portion is more important than the one which we are glad to find Professor Newcomb so explicitly recognizing, — the application of the doctrine of chances. In all those branches of our inquiry where questions of *coincidence* occur, it is clearly essential to ascertain, as definitely as may be, how far the coincidences may fairly be ascribed to *chance*. We have taken, and are still taking, great pains to obtain this definite information. Very wide inquiries have been made; and the results, though far from complete, may still, I think, claim decidedly more validity, as a basis of computation, than Professor Newcomb's guess at what "any physician will consider quite within the bounds of probability." It would require more space than I can ask for, to comment on Professor Newcomb's numerical argument in detail. But I may remark that he seems to confuse the argument by classing all together what he calls 'dreams, illusions, visions,' etc.; at least, if