off; but, in spite of her efforts, it kept coming back. Finally she drew it to the bank. Three days afterward she had a vision, in which she heard a human voice complaining, and demanding to be released from the trunk of a tree in which it was enclosed. The woman told her husband of her dream, and they concluded that the dream must refer to the tree which the woman had drawn to the bank. They brought it to the house, and cut it open, and found within a puppet similar to that of the Wajang Kalitik, which they named Kjaï Gandroung. Several days after, in a dream, the woman again heard a voice saying, "I am the wife of Kjaï Gandroung, and I desire passionately to be re-united to him." The woman asked her where she was, and was told that she was enclosed in one of the two trees before the house. On cutting off a branch of one of the trees a very pretty puppet of the Wajang Kalitik was found. It was placed beside the other, and given the name of Njaï Gandroung. The man put them in a box, and then made a number of similar puppets after these two models. This box descended from father to son, and is at present in the possession of a Dalang of Pagoung, regent of Kediri. The two puppets are said to be in the same state as when found, and many poor people come to make them offerings in order to obtain the fulfilment of their wishes. When an extraordinary representation is desired, Dalang of Pagoung is invited to come with his chest containing the puppets.

Besides the performances where puppets only are on the stage, there is another kind of Wajang where the parts are taken almost altogether by women. It is called the Wajang Wong, or Ringgit Tijang; and the actors are dressed and painted to resemble the persons whom they are meant to represent. But they do not speak: the Dalang always recites their parts, while they only dance and sing.

THE RECENT TORNADOES.

THE recent tornadoes, which the newspapers still persist in calling 'cyclones,' in Pennsylvania and adjacent states, seem to have had all the peculiarities of the typical storms of the west. The whirling funnel, or conical cloud, and the excessive destruction that accompanies its rapid passage along a narrow path, are clearly made out: the occurrence of several whirls near one another in south-eastern Pennsylvania on the afternoon of Aug. 3 is equally characteristic of this class of storms. The tornado in Philadelphia was well developed; and, by reason of passing over a thickly populated district, it proved especially destructive. A letter from Mr. S. E. Paschall of the Bucks county (Penn.) *Intelligencer*, describes the passage of three tornadoes in his neighborhood on the same day, one of which he regards as a continuation of the Philadelphia storm: when it reached the town of Churchville, it wrecked nineteen large and twenty-eight small buildings; it struck a cemetery, and scattered the tombstones, and even tore the bark from trees. Its course was a little east of north: the other two storms travelled north 35° east. It is with regret that one notes the absence of discriminate observation concerning the immediate mechanism of the tornado among the many newspaper columns given to the description of its general appearance and destructive action. Few observers who speak of the rotation of the conical cloud mention the direction of its turning: no one seems to have watched the downward extension of the cloud sharply enough to say whether its 'plunging' toward the ground was real or apparent, although it is probable that this important point might be directly determined by looking closely to see if the wisps or fibres of cloud at the base of the cloud rose into it or descended from it. It can hardly be doubted that the 'plunging' is only an optical effect of the growth of the cloud-forming space downward, faster than the cloud particles are carried upward; for heavy objects are carried high aloft in the centre of the whirl, and this could hardly be if the wind descended there. The circulation of the upper winds should also be determined by noting the motion of the clouds overhead at different times during the tornado's passage; for it is probable that much of the working of the storm is well above the ground, and that we feel only its most violent central action; and, if an observer be found, with presence of mind equal to doing all this while the tornado is roaring past, it would be well to notice whether the clouds above him are forming or dissolving. A tornado is an elaborate experiment, and very critical observation will be needed to follow all its action.

W. M. D.

THE BACILLI OF CHOLERA ASIATICA AND CHOLERA NOSTRAS.

WE have received within a few days a copy of Finkler and Prior's latest work upon the curved bacilli of cholera nostras, and of cholera asiatica. (*Ergänzungshefte zum centralblatt für allgemeine gesundheitspflege*, 1885.) It will be remembered that these observers found in the discharges of patients, in an epidemic of cholera nostras, bacilli which they at first considered to be identical with the organisms found by Koch in cholera asiatica. Various slight differences in the behavior of the two organisms under cultivation were observed, and the paper before us contains the results of a great deal of work undertaken to prove the exact nature of the relationship between the two organisms. It contains chapters upon the morphology and behavior under cultivation of each bacterium. The differences between the two are well considered; and a full account is given of the inoculation experiments undertaken with intestinal dejecta, and pure cultures of the two bacilli.

The conclusions of the authors are given in the following *résumé*:—

1°. We have established the occurrence of Koch's comma bacillus in the intestinal contents, and dejections of cases of cholera asiatica in the epidemic of 1884, at Genoa.

2°. We have found comma bacilli in the dejections

of cases of cholera nostras: we observed them both directly in the intestinal contents, and by cultivation experiments, and studied their characteristics.

3°. Both these comma bacilli are vibrios, which form genuine spirilla. As well in this stage, as in the variations which the form undergoes, are the two vibrios similar.

4°. The behavior under cultivation of the two organisms is almost identical. They vary only under very limited differences of culture media and temperature: and the differences consist not so much in *absolute* as in *relative* variations; i.e., greater energy of growth and vitality of the vibrio of cholera nostras.

5°. Of the physiological properties of the vibrios we have especially remarked — and have clearly determined — their marked resistance to drying, varying temperature, and '*fäulniss*.'

6°. We claim the possibility of a resting stage, and consider it probable that this resting stage is similar to that of other micro-organisms.

7°. Both vibrios are pathogenic.

8°. The pathogenic property of Koch's vibrio is greater than that of the vibrio of Finkler and Prior. There is here also merely a *relative* difference.

9°. The pathogenic property does not exist for all species of animals: much the greater number possess an immunity against both vibrios; they are also pathogenic only under certain conditions. The susceptible animals, and the conditions for producing positive results, are the same for both vibrios.

10°. The symptoms produced in animals by these vibrios have great similarity to those of cholera in man; they are not specific, however, but can also be produced in guinea-pigs by other infectious materials and chemical poisons.

11°. The causal connection between the comma bacillus and cholera asiatica is rendered probable by its constant presence, but is not made certain by the results of inoculation experiments. The causal relationship between the comma bacillus discovered by us and cholera nostras, is rendered probable, first, by the discovery of the micro-organism, and, secondly, by the very great similarity between the symptoms of cholera nostras and asiatica, as well as by the similarity in biological and pathological properties of the two comma bacilli.

12°. The two vibrios can pass into the blood after injection into the intestine, and can be excreted in the urine. The situation of Koch's vibrio in the body so increases its rapidity of development, that a new point of resemblance under cultivation between the two vibrios is furnished.

These conclusions are all supported by the work which is recounted in the text, and which gives evidence of great care and much labor. As will be seen, the claim of identity between the two organisms is abandoned by the discoverers of the later one; and the differences are brought out as well as is possible at the present time. The strong point made by Johne and others of the constant difference in appearance of gelatine-cultures of these two organisms of the same age, is refuted by the authors, and would certainly seem to be completely upset if the figures they give be exact reproductions from nature. At least the differences in appearance between colonies in gelatine of the same age, cannot be taken as *diagnostic*, as some writers upon the subject would have had us believe. There are a number of very fine plates which accompany the book, and give beautiful representations of the microscopic appearances of the two organisms.

The work is very creditable to its authors in every way, and is truly refreshing to read after seeing all the hasty work that has been rushed into print upon the same subject. It cannot be said, of course, that the absolute specific nature of either of the bacilli under consideration has been determined — the positive results of the inoculation experiments were not sufficiently numerous to permit that. It is perfectly true, however, that this work has assisted materially establishing the *probability* of their specific nature; and certainly results of such excellence can but do good in forcing others to attempt the same.

THE COAST-SURVEY AND 'POLITICAL SCIENTISTS.'

THE following letter from the New-York *Evening post* of Sept. 10 is in reply to an article in the same journal for Aug. 13, and reprinted in the *Nation* for Aug. 20. We reprint it here for the interest that it has to scientific men, and desire to call the attention of persons connected with the government to the passage which we have taken the liberty to print in italics.

The article on 'Political scientists' in the *Evening post* of Aug. 13, while it contains many wholesome truths concerning the management of scientific affairs in Washington, reflects with unnecessary severity on the administration of the coast-survey. This article, so far as it concerns the survey, is based upon a report drawn up by a committee of treasury experts, who condemn alike the organization, the methods and the expenditures of the coast-survey. While giving due weight to certain features of their report, we cannot expect that a committee so constituted, however competent to judge of business methods, should know the value of the scientific work upon which, from their point of view, money has been squandered.

Even when their criticism is just, the fact remains that the late superintendent is in no way responsible for the rules which control the general direction of his bureau. He inherited from his predecessors the superintendence of an old and well-trained *personnel*. This has not been materially changed during his administration. Mr. Hilgard did not enlarge the field of operations, but limited himself to the carrying out of plans already formed. In obtaining the appropriations necessary to this end, he relied greatly on the advice of his principal assistants.

In this connection it may be added, that the coast-survey is the only scientific bureau the appropriations for which are distinctly allotted to special objects.