# SCIENCE.

FRIDAY, AUGUST 24, 1883.

## *THE LESSONS OF THE MEETING.*

THE question as to the distance from the eastern seaboard to which the American association for the advancement of science can carry its annual assemblages is partly solved by the meeting at Minneapolis. That has registered about three hundred members in attendance; a small number, indeed, as compared with the Boston and Montreal meetings, but larger than was at first anticipated. One-third came from the Atlantic and New-England states. Astronomy and physics are fairly represented in the list; geology, as was expected, claimed the largest proportion; of botanists, there were over twenty-five — this was a surprise; the ethnologists were in considerable force; in all other branches of science, the attendance was somewhat meagre.

This, therefore, has not been one of the large meetings. Its addresses and papers have not contained any very striking feature that appealed to the interest of the general public. On the other hand, all that was presented, with few exceptions, though not brilliant, was above mediocrity. Looking over the list of papers, we find fewer than usual of the kind that brings sorrow to the hearts of scientific students; that provokes the question, How did such things ever pass the standing and sectional committees?

The merits and the disadvantages of the present system of conducting these meetings have been placed in very sharp light. Excellent addresses were delivered by most of the presidents of sections; in fact, these productions this year are a credit to the association. But the strain of obtaining such representative addresses from so many sections will soon be apparent: it may prove difficult to find the men to deliver them, within a very few years, especially if the number of sections continues to increase. The delivery of two or more of these addresses simultaneously, and the completion of the delivery of all of them in one afternoon, was felt to be a matter of grave injustice, both to speakers and hearers. To our readers we shall offer the only remedy now possible for this injustice, by printing the addresses in full, and by detachments.

Local committees, in cities to which the association will hereafter be invited, may learn some valuable lessons from the experience at Minneapolis. There was no lack of hospitable intention: the hearty courtesies of a western community were liberally extended. But the generous intentions were not carried out in the minor details that are essential to comfort if not to success. The meetings were held at a distance from the city, at the extreme end of a one-horse car route. Consequently the conveyances were overcrowded, much time was lost in going and coming, and — worse than all — few of the citizens of Minneapolis attended the sessions. We do not remember a meeting of the association at which the local interest, so far as audiences indicate it, was so deficient. The hotel selected for headquarters was not agreeable, because not exactly suitable. Members scattered to distant points, finding delicious havens of rest and recreation at summer-hotels on the lakes, but having to take yet longer time to attend the daily sessions. Free railroad transportation was provided to these distant resorts, but there was a confusing uncertainty about late trains that caused many embarrassments. These things may be trifles, but they are apt to be remembered when the lavishness of entertainment is forgotten.

As was anticipated, the association has chosen Philadelphia for its next session, where we may look again for the great numbers which attended the Boston and Montreal meetings. The exact date for holding it has been wisely left in the hands of the executive board,

pending the choice of time by the British association for their Montreal meeting. A preference, however, has been indicated for the week beginning Sept. 3, — a date earlier than usual, but welcome to all who know how warm Philadelphia can be in August.

W. C. W.

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## *RELIABILITY OF THE EVIDENCE OBTAINED IN THE STUDY OF CONTAGIA.*

There is certainly a disposition, among some of our scientific men, to doubt the possibility of making direct and satisfactory demonstrations of the *rôle* played by the schizophytes, or microbia, in the production of disease, and that which they may be compelled to take in its prevention. Recent publications by accepted authorities have tended rather to confirm these doubts than to remove them, and we are frequently asked if our results are not founded on probabilities rather than on definite and conclusive facts. While this uncertainty is still felt, it is well to occasionally review the connection between the facts established and the conclusions drawn from them.

Though the schizophytes are the smallest of living organisms, that is not an insurmountable obstacle to their careful study, as is proved by the well-known investigations of the Bacillus anthracis by Koch. His demonstration that this exists in two forms (a vegetating filament and a spore), and that the latter survives unfavorable conditions which destroy the former, enabled him to trace a connection between the activity of the virus and the life of the parasite, which other investigators had failed to establish. Thus, the blood of anthrax victims, which contained only Bacillus rods, lost its power to reproduce the disease after a few days' putrefaction; while that which contained spores remained virulent an indefinite time. A certain degree of cold, and also an insufficient supply of oxygen, prevent the formation of spores; and, the filaments being short-lived, the organism loses its vitality in a few days under such conditions. If spores had formed before the liquid was exposed to these conditions, however, they were unaffected, and were capable of germination after weeks or months. Again: if a virulent liquid was largely diluted, the filaments were destroyed, but the spores survived. In all these cases the activity of the virus disappeared with the death of the organism, and was retained whenever the formation of spores had enabled this to resist the unfavorable conditions.

Here was a proof of the pathogenic character of the schizophyte much more satisfactory than the mere demonstration of its presence in all cases of the disease, or the additional evidence that it might be passed through a certain number of cultivation-flasks; the liquid in the last being as virulent as in the first.

Since Koch's paper was published, Pasteur has added observations of an equally convincing character. The liquid part of the virus may be freed from the organism either by filtering through plaster or by decanting after it has stood in a constant temperature for a few days to allow the germs to gravitate to the bottom of the flask. In either case the liquid is harmless, and the separated germs still produce the disease. Again: compressed oxygen destroys the filaments, but does not affect the spores; and a virus containing only the former loses its activity when treated with this agent, while one in which spores have formed retains its virulence.

We are able to say, therefore, that, in the disease known by the French as charbon and by the English as anthrax, no liquid is virulent unless it contains the living Bacillus anthracis, and that the death of this organism always coincides with the destruction of the virulence.

This demonstration of the pathogenic action of the Bacillus cannot but be regarded as equally satisfactory with what is obtained by investigations in other departments of biological science. If the observations of these gentlemen are accurate, and they have been confirmed too often to be doubted, then there is no escaping the conclusion that the Bacillus anthracis is the essential and only cause of anthrax.

It is not to be denied, however, that the size of the parasite in anthrax, and the fact of its existence under two forms having such unequal resistance to unfavorable conditions, were characters which greatly facilitated the demonstration of its pathogenic relation to the disease. Is it possible to obtain equally satisfactory evidence in regard to the smallest of the schizophytes, and one which only exists in the vegetating condition?

The micrococcus of chicken-cholera is of this kind, and it is consequently very interesting to see just what progress we have made in demonstrating its identity with the virulent principle. We know from Pasteur's investigations that it is always present in this disease; that it may be cultivated, and passed from flask to flask for many times, without losing its virulence. The filtered liquid loses its activity; that from which the germs are