separated by gravitation is equally harmless. Taking up the study here, I have proved that the exact degree of heat which, in a given time, kills the micrococcus (132° F. for 15 minutes), destroys the virulence at precisely the same point; also that the proportion of carbolic acid, of sulphuric acid, and of a solution of chlorides (Platt's), which destroys the virulence in from two to four hours, corresponds with the proportion which is required to kill the organism in the same time.

The effect of heat and of these disinfectants on the virus was determined by inoculation experiments. The point at which the micrococcus is killed was learned by placing a drop or two of virus in the sterilized liquid of a cultivation-tube after the proper proportion of disinfectant had been added. In a given time a drop was taken from this tube, and placed in a second one which contained a favorable medium for the growth of the germs. If the schizophytes had been destroyed by the disinfectant, there would be no multiplication; while, if they had resisted it, they would certainly reveal the fact by developing in their usual manner. The exact correspondence which exists between the results of the two series of experiments in every case, is also an evidence of the reliability of the method.

While it might be conceived, that, even though the virulent agent consisted of something entirely different from the micrococcus, both might be destroyed by the same degree of heat in the same time, it is not conceivable that this would also occur from the effect of three different chemical agents. If it were necessary, this line of evidence could probably be increased indefinitely; but it is already equal to what is usually considered necessary to demonstrate a point in other departments of science.

It is possible, then, by present methods of research, to determine satisfactorily whether a given organism is the cause of a certain disease, or whether it is an epi-phenomenon; and, if there is still much doubt in regard to some of these, it would seem to be owing to the fact that observers have relied too implicitly upon the microscope, and neglected the cultivation and inoculation experiments, that are essential to definite and reliable conclusions.

D. E. SALMON.

SPONGE-CULTURE IN FLORIDA.

THE U. S. national museum has lately received from Messrs. McKesson and Robbins, sponge-importers of New York, an interesting contribution representing the first successful attempts at sponge-cultivation on the American coast. It consists of only four specimens, all of the finest or sheep's-wool variety, which were raised from cuttings at Key West, Fla., by the agent of the above-named firm. The localities in which the sponges were planted were not the most favorable for sponge-development, and their growth was therefore less rapid and perfect than might otherwise have been the case. They were fastened to the bottom, in a depth of two feet and a half, by means of wires or sticks running through them, and allowed to remain down a period of about six months before they were taken up. Fully four months elapsed before they recovered from the injury done them in the cutting, which removes the outer 'skin' along the edges of the section; and the actual growth exhibited was for about two months only. The original height of each of the cuttings was about two inches and a half. One was planted in a cove or bight where there was little or no current, and its increase in size was very slight. The other specimens were placed in tide-ways, and have grown to from four to six times their former bulk, which certainly promises well for the future of sponge-propagation. Two hundred and sixteen specimens in all were planted at the same date, and, at the last accounts, those which remained were doing finely.

The chief obstacle to the artificial cultivation of sponges at Key West arises from the fact that the sponge-fishermen infest every part of the region where sponges are likely to grow, and there is no legal protection for the would-be culturist against intruders. The enactment of judicious laws bearing upon this subject by the state of Florida, or the granting of special privileges conferring the right to occupy certain prescribed areas for sponge-propagation, would undoubtedly tend to increase the annual production of this important fishery, which has remained at a standstill for several years past, mainly because of the partial exhaustion of several of the most extensive sponging-areas.

Accompanying these artificial growths was a collection of over a hundred specimens of the various grades of Florida sponges of different sizes, each labelled with its supposed age, based upon estimates of the average rate of growth, by the sponge-collectors. This entire collection now forms a part of the American exhibit at the great London fisheries exhibition.

R. RATHBUN.