THE AMERICAN SOCIETY OF MICROSCOPISTS.

The third annual meeting of the American Society of Microscopists, the largest representative body of miscroscopists in America, will begin at Detroit, Mich., the 17th day of this month (August), and will continue four days.

The circular of the Society announces that the headquarters will be at the Detroit Female Seminary, No. 82 Fort Street West. Ample arrangements are being made by the (local) Griffith Club of Miscroscopy for the comfort and convenience of its guests. Free accommodations are to be furnished the members and delegates of the American Society at private residences, and the noted hospitality of the citizens of Detroit will undoubtedly be freely dispensed to the visiting Society.

The forthcoming meeting of the Society promises to be the most successful yet held. Several valuable papers will be presented, and new and original mechanism in the construction of stands will be shown and described. Also in the preparation of microscopic objects several valuable and much needed improvements will be presented.

The circular issued by the Society extends an invitation to microscopists who are not yet members to be present, also to join the Society, and participate in its business, both scientific and executive.

The last meeting of the American Society was held at Buffalo, N. Y., one year ago, and the results, both in the attendance and character of the papers read at that meeting, were highly encouraging to the lovers of miscroscopic work throughout the country. The influence exerted by these meetings has been productive of a great amount of good. Microscopic societies have been, and are, forming throughout the country. In Pennsylvania, New York, New Jersey, Michigan and other States good working societies have lately been formed, and a corresponding interest in scientific enquiry has been aroused. This cannot but be valuable to the communities in which these societies exist. This work must not be allowed to cease, and therefore we trust the National Society may have a long lease of life.

Not only in stirring up an interest in scientific work is the American Society valuable, but in original research it will yet make its name known, as even now among its members may be found many of the leading scientific workers with the microscope in this country. The officers of the Society, and of the Detroit meeting are as follows:

President,—Prof. Hamilton L. Smith, LL.D., of Geneva, N.Y.

Vice-Presidents, { Dr. W. Webster Butterfield, of Indianapolis, Ind., and / Mr. C. C. Merriman, of Rochester, N. Y.

Secretary,—Prof. Albert H. Tuttle, of Columbus, Chio.

Treasurer,—George E. Fell, C. E., of Buffalo, N. Y.

Executive Committee, { Dr. W. B. Rezner, of Cleveland, Ohio, / Dr. Carl Seiler, of Philadelphia, Pa., and / Dr. W. C. Barrett, of Buffalo, N. Y.

THE TAY BRIDGE DISASTER.

The report of the Court of Inquiry appointed to investigate the circumstances of the fall of the Tay Bridge last December, which was fatal to so many hundred lives, has been made public, and the result is thus summarized and commented upon by *Nature*:

There appears to be some difference of opinion amongst the members of the court respecting the scope of the inquiry and the duties placed upon them by the Board of Trade, in consequence of which two separate reports appear together, one by Col. Yolland, Chief Government Inspector of Railways, and Mr. Barlow, President of the Institute of Civil Engineers, and the other by Mr. Rothery, the Wreck Commissioner. The former report describes in detail the design and method of erection adopted in the bridge, giving also a description of the various alterations in the plan which were rendered necessary as the work progressed.

The bridge was 3,465 yards in total length, divided into 86 spans, and it was the central portion, of 3,149 feet in length, which fell on the evening of December 28. As originally designed, this central position was to consist of lattice girders of 200 feet span, carried by brickwork piers somewhat over 80 feet in height from high-water level, but as the river bottom turned out to be different from what was expected from the borings, and the difficulty of obtaining a secure foundation greater, eleven spans of 245 feet and two of 227 feet were substituted, and braced iron piers were adopted in the place of brickwork, as imposing a less weight on the foundations. It is these piers which at the inquiry chiefly received attention, as there can be little doubt that they were the immediate cause of the catastrophe. The process of floating out and sinking the caissons for these piers has already been described in these columns, and so successfully was this—certainly the most difficult and hazardous part of the undertaking—accomplished, that no suggestion of insufficient strength has been made, and in the Report it is stated that there is nothing to indicate any movement or settlement in the foundations of the piers which fell.

The caissons were lined with brickwork and filled with concrete, on which was built a hexagonal pier of masonry carried up to 5 feet above high-water mark. Upon this pier was built up six cast-iron columns secured by holding-down bolts to the masonry at the angles of the hexagon. The columns were made up of lengths united by flanges and bolts, and connected with each other by horizontal struts and diagonal ties. The up-stream and down-stream columns were each 18 inches in diameter, the remaining four, 15 inches; all were inclined 12 inches inwards at the top. The piers thus formed were from 81 to 83 feet in height from the top of the masonry to the under-side of the girders. The diagonal bracing consisted of flat bars attached to the columns by means of "lugs" cast on them, being secured at one extremity by a screw-bolt passing through the lugs and bar, and at the other by a strap provided with a gib and cotter for tightening up. The horizontal struts consisted of two channel-bars bolted back to back to a single lug on each column.

It will thus be seen that all vertical load must be borne entirely by the columns, and with the exception of the small transverse resistance of the latter the whole of any lateral pressure must be transmitted by the bracing.

Whether as designed the bridge would have been strong enough for its work if the materials and workmanship had been good throughout is very doubtful, but, as carried out, the evidence shows distinctly that it was not sufficiently substantial for the heavy traffic and severe gales to which it was exposed. When everything was tight and in good order the bridge, at the time of its inspection by General Hutchinson in February, 1878, showed great rigidity under the tests imposed by him, but by October of the same year so much slackness had made its appearance in the bracing that, besides the ordinary keying-up by driving the cotters, more than 100 packing-pieces about three-eighths of an inch thick had to be introduced in different parts.

Respecting the immediate cause of the accident the Court states—"In our opinion the weight of evidence points out the cross bracing and its fastening by lugs as the first part to yield." This we believe the calculations of Dr. Pole and Mr. Stewart, taken in connection with the experiments of Mr. Kirkaldy, are quite sufficient to establish. With a wind pressure of 30 lbs. to the square foot on the windward girder and train, and half this amount on the leeward girder, the stress on the tie-bar most severely strained, would be 16·8 tons, or 10·18 tons per square inch; again, with a wind pressure of 40 lbs. to the square foot the stress on the tie-bar would be 22·4 tons. Now, as Mr. Kirkaldy's experiments, made by order of the court on some of the tie-bars removed from the bridge, showed that they broke with a load of from 19 to 23 tons, and the corresponding lugs with a load of 23 to 25 tons, it is pretty certain that the ultimate strength of this part of the structure would be reached by a wind pressure of 40 lbs. to the square foot.