

carefully taken out every night at the hotel. The next morning before making the observations, if there was no wind stirring, the copper weight was suspended, the arc of vibration bisected and the torsion removed by means of the torsion head; the amount of torsion developed in the single fibre over night and while preparing for the observations was such a trifle that it could be easily removed in this way when it was deemed worth while. If the weather was windy, no further attempt was made to remove the torsion beyond what had been done the night before at the hotel. And so likewise when proceeding from one station in the morning to another station in the afternoon, I generally made no attempt to remove the torsion developed since the morning observation. From a series of experiments made at the base station, extending over a week in all kinds of weather, sunshine and heavy rains, with the magnet suspended by the single fibre all day within the observing tent, I have convinced myself that the method pursued with regard to the torsion did not introduce a larger error than a fraction of a minute.

Sometimes it must be confessed, however, that the single fibre proved disadvantageous in that it would occasionally break—on the average about once for every six stations occupied.¹ In such a case the torsion of the new fibre, previously soaked in glycerine, had to be removed in the field. In this event the other observations, *e. g.*, magnetic inclination, would be proceeded with while the torsion was being taking out. To provide for such emergencies, one part of the work was usually kept in reserve to be carried out in case of accident to the suspension fibre. In times of strong wind, however, it was next to impossible to wholly remove all the torsion from a new fibre. The observations were then proceeded with and on returning to the hotel the amount of torsion in the fibre determined. Such accidents might also occur, to be sure, not so frequently, with two fibres, and in this case the uneliminated torsion would introduce a greater error

¹ It would undoubtedly prove of great advantage to have two glass tubes with a fibre in each. It would be a simple matter to arrange the method of fastening of the tube to the suspension box so that, in case of breakage of a fibre, the tube could be readily replaced by the second tube with a fibre whose torsion had already been largely removed.