would not only obstruct the freedom of the water flow, but also would tend to lower the richness of the middlings and concentrations by being carried beyond the apartment for the tailings. The trouble was remedied by Prof. Richards screwing on to the edge a strip of wood with its upper edge rounding. This worked much more satisfactorily. There is no doubt but that we could have fed on much more ore if this had been put on at the start.

It was our experience, then, that the crushed ore passing through a thirty-mesh sieve cannot be profitably run directly on to the tables. The coarse copper and the coarse sand alike will be rolled over and over and lost in the tailings. This loss may somewhat be due to the fact that our tables have about the same inclination, 13\(\frac{1}{2}\) inches per foot, and revolve at the same rate as those at the Calumet and Hecla, which are nineteen feet in diameter, while ours are but eight feet. It remains to be seen, and Prof. Richards is working in that direction, whether if a finer sieve could be substituted, it might not be done.

The crushed ore at the Calumet and Hecla is first jigged. By this means the coarse is separated from the fine, which, running 1.5 per cent of copper, is the only part of the whole that goes on to the tables. Samples were taken all around the table, and the average yield of the tailings was .45 per cent of copper. G. W. M.

\(\Sigma\) M. E. Excursion.

The establishment of the Wheelock Engine Company, in Worcester, was the first place visited. Among the peculiar features of this shop is the large use of special tools. The machine for boring the cylindrical surfaces of the guides is peculiarly ingenious, as well as the cylinder-boring machine. These are constructed in such a way as to eliminate all possible errors of workmanship. All the different parts of the engine, and their manufacture, were discussed in order. The action of the valves was explained by drawings and models. The high merit of the Wheelock engine is attested by the number of medals which have been awarded it at various exhibitions. One medal—that of the millers' exposition of 1880—is the finest ever won by any engine, and is valued at $500. The students were kindly received, and invited to come again.

Among the places of interest visited was the shop of the Deane Pump Company, at Holyoke. The mechanical engineering department is already indebted to the company for one of their small pumps, which illustrates not only the principles of a direct-acting pump, but especially those of one of the best ever made. The society received the kindly attention and escort of Mr. Deane, and was convinced of the superiority of workmanship and methods of construction in the manufacture of the Deane pump. Of the pumps in process of construction, aside from those for ordinary service, were those for water supply and mining purposes. An engine of the former class was being built for Gardner, Mass., having a capacity of one and a half million gallons per day. The engine of this pump was of the compound order, with one cylinder placed directly in front of the other, the smaller being 16" x 24", and the larger 30" x 24". Of the latter class, a plunger pump attracted attention on account of its peculiar construction. A simple plunger was substituted for the ordinary piston, thus doing away with piston-packing and fitting the pump for service with gritty and dirty water. Many details of construction were of great interest, and showed the care and thought in design that give "The Deane" its good standing among other pumps. The establishment comprises a machine shop, an erecting shop, and a testing room, where every pump is tested before leaving the works. The tool-room was interesting to admirers of good order. All shop drawings are blue copies mounted on heavy card-board. Much can be learned by a visit to such works, and good use was made of the short time allowed. T. B. C.

The mechanical engineers were much interested in the shops of the Worcester Institute, and in the methods used in conducting them. The shops are large, light, and airy, and well