The Boiler Excursions.

The afternoon of Friday, the 2d, was the occasion of a mechanical excursion to examine the Babcock & Wilcox boiler at the sales-room of the firm on Oliver Street, and see this form of boiler in operation at the Bay State Sugar Refinery. At the first point the various parts of a complete boiler were found, and an hour spent in examination.

By the rapid circulation of water in this boiler, the great extent of heating surface, and the nearly complete exhaustion of heat of the gases before escaping to the chimney, the steam is generated very quickly and economically, and though not superheated is entirely dry. The easy inspection and cleaning of the tubes are matters of considerable importance. The gentlemen at the office kindly answered all questions, and gave us some interesting suggestions in regard to the nature of steam!

At the refinery, opportunity was given to examine the boilers under fire. The gases entering the up-take, with a temperature below three hundred degrees, were passed, before reaching the chimney, through an economizer, by which the feed water was heated.

Permission was given to go through the refinery itself, and the remainder of the afternoon was spent in noting the various processes through which the cane product goes, from the crude state to the pure crystallized sugar of our tables. The amount and appearance of the recovered impurities warned us to beware of the crude article, and gave some anxiety to those who had tasted the latter on entering.

The following Tuesday the boiler works of Messrs. Kendall & Roberts, in Cambridge, were visited. The shops were found to be of good size, though gloomy and ill-lighted. The punching, drilling, and bending of the steel plates all received their share of attention; but the riveting, both by machine and hand, was the most interesting operation to the majority. The powerful steam riveter, of a sort of toggle-bar construction, forced the hot rivets tightly into the holes, forming at the same time a true conical head. A criticism, however, was made on the carelessness of leaving three or four hot rivets to cool in the holes ahead of the machine. The hand riveting was even more interesting, having our own attempts in mind; but the lot of the workman inside the boiler was not particularly envied. Outside the shops a good-sized boiler was being tested by hydraulic pressure, its tightness appearing to our unpractised eyes as rather dubious. A somewhat peculiar vertical engine was next visited in an adjoining shop, which with a cylinder over twenty inches in diameter should have developed some sixty horse-power, while the whole need of the shop was about eight. Probably on this account the lower part of the cylinder, being regarded as superfluous, was covered with dirt and ashes to the height of the valve wheels. In respect to dirt and darkness, we must allow that this engine-room discounted even our own "steam laboratory." A novel method of keeping a belt on a pulley, by leaning a joist against it, was necessitated by the non-centering of a shaft, which, as one of the employees told us, "needed about forty horse-power of the engine to turn it."

On the second floor of the machine shop two hoisting engines of nine horse-power each were being set up, having vertical cylinders bolted to upright boilers. The material and finish were much superior to ordinary engines of this class, and the vertical arrangement makes them very compact. The pattern-making rooms on the third floor contained many hundreds of patterns, but arranged without system. On asking the workman how he found a required pattern, he replied that he hunted till he found it, and then hunted again till he found the core box. The draughtsman, Mr. Dodd, received us very kindly, showed us many drawings, and explained his methods of draughting for ordinary workmen, and the simplicity required.

Our thanks are due Mr. Kendall for a very kind invitation to the mechanical students to visit the works at any time, and be free to ask any questions they may wish. H. S. C.