

been filled with in 1820, for example? And what an interesting thing would it not be if it were possible to establish a department in the Exhibition in which the steam engines, machines, tools, and general mechanical appliances of that time could be shown by way of contrast with the present magnificent display! Then, again, if a road wagon, a stage-coach, and a locomotive, were placed side by side, how eloquently would they not speak of progress and improvement! It is, perhaps, a misfortune as regards the International Exhibition, that none of these startling comparisons were tangibly instituted. They are more instructive to young minds than any other mode of inculcating knowledge. If Stephenson's "Rocket" were placed beside the locomotive of Sharp, Stewart & Co., or that of the North Western Railway Company, or of Sir William Armstrong, how unmistakably would it tell of what thirty odd years of railways have done for us, in a mechanical sense! Such were some of the reflections which passed through our mind while going through the "fine perspective arcades" of Mr. Hunt, and gazing on the mechanical treasures stored within them. It is possible that some day the suggestions we venture to throw out with regard to *Comparative Exhibitions of Mechanical Science*, may be realised. When this season shall have passed away, and the vast building which has challenged and obtained so much hostile criticism shall remain as a casket whence the jewels have been abstracted, it may come to be a consideration as to how it may thereafter be employed, and then may comparative schools be opened therein.

"Occupying a very small space in the Western Annexe are some machines which are the precursors of a revolution in one extensive branch of tool manufacturing, and these are the file-cutting machines of the Manchester File Making Company. It has been maintained obstinately for many years past that the manufacture of files was beyond the machinist's art. Hand labour alone could produce them, it was said, and in Sheffield it was stoutly declared that hand labour alone should produce files. At length the problem seems to be solved—the delusion dissipated; and from what we see of the file-cutting machines in the Exhibition, and know of their performances in Manchester, we are bold to say that the days of hand file-cutting are numbered. The importance of this change can scarcely be over-estimated, as the price of files will be reduced enormously by it. The Sheffield workers will have to succumb to the giant might of automatic machinery, as other classes of workers have been compelled to do, and the sooner they accept the alteration of system the better will it be for themselves.

"We have left ourselves little space to touch a hundred other topics which crowd upon our attention and claim notices at our hands. It is embarrassing thus to find so rich a mine of mechanical wealth as the Exhibition affords, and not be able to work it at once more effectually; but again and again shall we return to the task, nor leave it until justice has been done to those who have created it."

The largest steam whistle in the world is said to be the one at the Rolling Mills, Toronto. The bell of the whistle is 14 in. diameter.—*Artizan*.

## PROGRESS OF GEOLOGY.

(Continued from page 103.)

*Geological Survey and Government School of Mines, Mineral Statistics and Colonial Surveys.*—As I preside for the first time over this Section since I was placed at the head of the Geological Survey of Britain, I may be excused for making an allusion to that national establishment, by stating that the public now take a lively interest in it, as proved by a largely increased demand for our maps and their illustrations—a demand which will, I doubt not, be much augmented by the translation at an early day of many of our field-surveyors from the southeastern and central parts of England, where they are now chiefly employed, to those northern districts where they will be instrumental in developing the superior mineral wealth of the region.

The Government School of Mines, an off-shoot of the Geological Survey, is primarily intended to furnish miners, metallurgists, and geological surveyors with the scientific training necessary for the successful pursuit and progressive advancement of the callings which they respectively pursue: but at the same time, the lectures and the laboratories are open to all those who seek instruction in physical science for its own sake, by reason of its important application to manufactures and the arts. The experience of ten years has led the Professors to introduce various modifications into their original programme—with the views adapting the school as closely as possible to the wants of those two classes of students; and at present, while a definite curriculum, with special rewards for excellence is provided for those who desire to become mining, metallurgical and geological associates of the school, every student who attends a *single course of lectures* may by the new rules compete, in the final examination, for the prizes which attach to it only.

Throughout the whole period of the existence of the school, the Professors have, as a part of their regular duty, given annual courses of evening lectures to working-men, which are always fully attended; and during the past year several of them have delivered voluntarily courses of evening lectures, at a fee so small as to put them within the reach of working men, teachers and schoolmasters of primary schools. The Professors thus hope to support to the utmost the great impulse towards the diffusion of a knowledge of physical science through all classes of the community, which has been given through the Department of Science and Art by the Minute of the Committee of Privy Council of the 2nd June, 1859. \* \* \*

As I can trace no record of the teachings of the Government School of Mines in the volumes of the British Association, and as I am convinced that the establishment only requires to be more widely known, in order to extend sound physical knowledge not merely to miners and geologists, but also to chemists, metallurgists, and naturalists, I have only to remind my audience that this School of Mines which, owing its origin to Sir Henry De la Beche, has furnished our Colonies with some of the most accomplished geological and mining surveyors, and many a manufacturer at home with good chemists and metallurgists, has now for its