

Andrew Ure Describes a Modern Cotton Spinning Factory, 1835

(Andrew Ure was much impressed with the new factories. Here he describes Orrell's cotton factory at Stockport, *The Philosophy of Manufactures*, 1835, pp. 109-12; in J. T. Ward, ed., *The Factory System, Vol. I, Birth and Growth* (New York: Barnes & Noble, 1970), pp. 181-82.)

The building consists of a main body, and two lateral wings; the former being three hundred feet long, and fifty feet wide; the latter projecting fifty-eight feet in front of the body. There are seven stories, including the attics. The moving power consists of two eighty-horse steam-engines, working rectangularly together, which are mounted with their great gearing-wheels on the ground floor, at the end of the body opposite the spectator's right hand, and are separated by a strong wall from the rest of the building....

The boilers for supplying steam to the engines, and to the warming-pipes of the building, are erected in an exterior building at the right-hand end of the mill; and transmit the smoke of their furnaces through a subterraneous tunnel to the monumental-looking chimney on the picturesque knoll, shown in the drawing. By this means, a powerful furnace draught is obtained, corresponding to a height of fully three hundred feet.

As this mill spins warp yarn by throstles, weft yarn by mules, and weaves up both by power-looms, it exhibits in the collocation of its members an instructive specimen of the *philosophy of manufactures*. Both systems of spinning, namely, the continuous or by throstles, and the discontinuous or by mules, require the cotton to be prepared on the same system of machines; and therefore they must be both arranged subordinately to the *preparation rooms*. This arrangement has been considered in the true spirit of manufacturing economy by the engineer.

As the looms require the utmost stability, and an atmosphere rather humid than dry, they are placed on the ground-floor of the body of the building, as also in a shed behind it, to the number of about one thousand. The throstle-frames occupy the first and second stories of the main building; the mules, the fourth and fifth stories; each of these four apartments forming a noble gallery, three hundred feet long by fifty wide, and twelve feet high. The third story is the preparation gallery, intermediate between the throstles and mules, as it is destined to supply both with materials. Towards one end of this floor are distributed the carding-engines; towards the middle, the drawing-machines for arranging the cotton fibres in parallel lines, and forming them into uniform slivers, or soft narrow ribands; and towards the other end, the bobbin and fly-frames, or roving-machines, for converting the said slivers into slender porous cords, called rovings. These rovings are carried downstairs to be spun into warp-yarn on the throstles, and upstairs to be spun into weft (or sometimes warp) yarn on the mules.

The engine occupies an elevation of three stories at the right hand end of the mill. The stories immediately over it are devoted to the cleaning and lapping the cotton for the cards. Here are, 1. the willows for winnowing out the coarser impurities; 2. the blowing-machine for thoroughly opening out the cotton into clean individual fibres; and 3. the lapping machine, for

converting these fibres into a broad soft fleece like wadding, and coiling the fleece into cylindrical rolls. These laps are carried to the continuous carding-engines, and applied to their feed-aprons. The winding-machines, and a few mules, occupy the remaining apartments in the right wing. The attic story of the main building is appropriated to the machines for warping and dressing the yarn for the power-looms. The other wing of the mill is occupied with the counting-house, storerooms, and apartments for winding the cotton on the large bobbins used for the warping-frame.

A staircase is placed in the corner of each wing, which has a horse-shoe shape, in order to furnish, in its interior, the tunnel space of the teagle or hoist apparatus, for raising and lowering the work-people and the goods from one floor to another.