

## LESSON VII.

### DIVISION OF LABOR, AND ITS EFFECTS.

1. OF THE NATURAL AND NECESSARY DIVISION OF LABOR.—In the nature of the case, it is impossible for each man to perform every kind of labor, and produce all the articles which he needs. And, besides the want of ability in man, there is an equal want of means and capabilities for all kinds of production in every place. If every man were capable of being at the same time a farmer, a mechanic, a trader, a manufacturer, a chemist, etc., yet the means of exercising these various callings do not exist in all places. As a man could not be a farmer on the coasts of Greenland, where there is no soil, so he could not be a manufacturer where there is neither water-power nor fuel. Much less could one produce all varieties of articles on the same soil and in the same

climate. Hence some division of labor is a matter of necessity. Besides, even in the same country and climate, men differ so in their capacities and aptitudes, that they naturally incline to different kinds of labor. Accordingly we find everywhere doctors, lawyers, farmers, mechanics, traders, and all the varieties of producers and laborers required by the wants of the community.

2. OF THE ARTIFICIAL DIVISION OF LABOR.—The division of labor, thus far described, is adopted without much thought, and in part as a matter of necessity. But experience and reflection lead to a further division. Seeing that men succeed best by pursuing some one kind of business, or producing some one article, the inquiry naturally arises, whether the process of division can not profitably be carried further. Almost every process of production can be divided into parts. A stock example is that of pin-making, which may be divided into wire-drawing, wire-straightening, heading, pointing, tinning, etc. Now, as the man is confessedly more successful who follows some one

employment, than the man who follows many, it would seem to be implied, that the laborer who devotes himself wholly to a single part of some process would be more successful than the one who goes through the whole process. And this is found to be the fact. Such a division, being the result of calculation, and being resorted to for its economic results, is the only division of labor known to Political Economy.

3. THE ECONOMIC ADVANTAGES OF DIVISION OF LABOR.—When the process is divided and each laborer devotes himself to a single part, there is a great saving in several respects. In the first place, there is a large saving of time in learning the business, since a portion of a process is more easily and quickly learned than the whole; as, for instance, putting on the bottoms of boots, than the whole process of cutting, crimping, and making generally. And as the time required to learn one's trade is less, the waste of material from unskilfulness while learning it is also less. In the second place, there is a great gain in skill arising from

the attention being exclusively confined to a single operation. Skill is acquired in any thing by its frequent repetition. The mind and the muscles both become adapted to that which we do constantly. And the simpler the repeated process is, the more complete the adaptation, and the more perfect the skill. But where the process to be performed consists of several parts to be gone through with successively, several habits really have to be learned, each of which unfits the laborer for the other; since a habit of one thing, while it gives one skill in that particular thing, tends just so far to unfit him for any other thing. Thus, the process of preparing wood for the fire consists of sawing and splitting. If, now, one man gives himself wholly to sawing and another to splitting, they will each in time acquire the greatest skill and power of endurance in his business of which he is capable. On the contrary, if each carries on successively the double process, the habit of sawing not only does not avail him in splitting, but actually tends to disqualify him for it. And so in other cases.

And especially is this so where, in passing

from one part of a process to another, not only the habits have to be changed or re-adjusted, but the tools also with which one works. In working up wood for the fire, the exchanging the saw for the axe with every stick is as great a hindrance as the re-adjusting of our habits to the different processes. Another advantage arising from the division of labor is, that it enables one to employ cheap labor for the simple and easy parts of the process, while if each operator had to perform the whole process, it would be necessary in each case that he should be competent to the most difficult parts. And not only is the expense greatly diminished by such an arrangement, but women and children, and often feeble old men, are furnished with employment. The saving from these sources, spread over every department of industry, is in the aggregate very great, and to the same extent reduces the cost of products.

4. EFFECTS OF THE DIVISION OF LABOR ON INVENTIONS.—As labor is divided, the portion which each operative has to perform becomes less, and

hence more simple. His whole attention is thus directed to a single operation, and his whole study is to see how this can be performed the most easily and effectually. By the repeated performance of the operation and long attention to it, improvements in the tools for performing it naturally suggest themselves to him. And improved tools being made by the operatives in the different parts of the process, these are at length combined in one or several machines, by which the whole process is performed almost without the aid of man. This is notoriously the history of nearly or quite all complicated machines. They have gradually grown up from separate improvements in the tools required in the various portions of the process, which they now perform as a whole. And while the separate improvements have generally been made by the common operatives, these have usually been combined into machines by head workmen, overseers, or other men possessed of more than ordinary mechanical genius and knowledge, who have been able to supply the principles by which the detached parts

could be linked together. Thus knowledge and practice go hand in hand with each other in making improvements, and neither is complete without the other. Without practice, knowledge is vague and theoretic; and without knowledge, practice is detached and fragmentary.

5. EFFECTS OF THE DIVISION OF LABOR UPON THE LABORER AND OTHERS.—Division of labor, like every thing else which facilitates and increases production, makes products cheaper, and hence benefits consumers, and of course the laborer, with others. At the same time, however, it must be confessed that division of labor, by confining the attention exclusively to single operations, requires less general intelligence in the laborer, and tends to render him little more than an automatic machine for performing one simple process. If the operatives in factories, where labor is minutely divided, be compared with farmers and ordinary mechanics, who are accustomed to perform a variety of operations, the difference in general intelligence and breadth of views is at once apparent. The man who per-

forms the several processes (although, it may be, less polished and sharpened on particular points by contact with others) embraces in himself nearly the same intelligence as the several individuals who perform them singly. Thus, division of labor reduces, as it were, several men to one, but this very fact tends to harmonize the interests of the different classes of laborers, since it makes them more dependent upon each other, like the members of the same body. And, in like manner, the distribution of the labor of producing different articles among different nations, from the necessities of climate, soil, etc., renders the nations of the earth more dependent upon each other, and thus tends to the harmony of the world.

6. LIMITATIONS OF THE DIVISION OF LABOR.—Division of labor, by distributing the operation to be performed into many parts, requires a large concentration of machinery and other forms of capital. This may be profitably done to the extent of one's ability to superintend and give harmony to the whole; beyond this it should not be carried. On

the contrary, some employments, for instance agricultural pursuits, do not admit of sufficient concentration either in time or place to allow of any considerable division of labor. And in all employments, no advantage can arise from attempting to divide the labor beyond the simple, ultimate parts of the process.

## LESSON VIII.

## AID TO PRODUCTION FROM NATURAL AGENTS.

1. NATURAL AGENTS DEFINED.—In the most general sense, natural agents include all the varied agencies and powers of nature. In reality, how little does man, of himself, do in production! He is but the experimenter in nature's laboratory. He learns the conditions under which nature works, and sees that these conditions are fulfilled; but nature really does the work. This is as true in the simplest processes of agriculture as in the highest operations of the mechanic arts. The farmer places the seed in the ground, but it springs up by its own laws and forces. He moves the soil and manure around the plant, but this being done, he can do no more; the plant extracts its own nutriment from these and other sources without his aid. Indeed, as already stated, man cre-

ates nothing in production; he simply avails himself of the materials and principles of action furnished by nature. Without the natural properties of wood, iron, and other forms of matter, he could neither make nor use the lever, the inclined plane, the screw, the wheel and axle, the pulley, or the wedge. And without these there could be no such thing as machines, since all machinery is but the combination of some or all of these mechanical powers under various forms. But while all the natural properties of objects are, strictly speaking, natural agents, the great mechanical forces employed in producing *momentum*, such as steam, wind, water, electricity, etc., are more commonly understood as embraced under this term.

2. OF THE NATURAL AGENTS EMPLOYED IN PRODUCING MOMENTUM.—Man, of himself, can exert a certain force. By the use of his various organs and limbs he can move not only himself, but many other objects also. After he has reached the extent of his own power he can call to his aid the strength of the lower orders of animals,

which were made for his use, and constitute a part of the dominion over which he is placed. Some of these, being keener scented, he employs in capturing other animals which he can not catch himself; some of them being fleet, he uses to increase his velocity, and some of them being stronger, to increase his strength. But even with their aid, there are many things which he can not do. His next step is, therefore, to call to his assistance the great inanimate natural agents, whose power is almost unlimited. The rock, which he can neither split nor move by his own power nor by that of other animals, he rends in pieces by introducing into it a charge of gunpowder. The vessel, which he can not propel by any animate force at his command, he moves by placing in it a steam-engine, or spreading sails upon its spars to catch the wind. So, too, he turns the ponderous wheel, which neither man nor beast could stir, by directing upon it the precipitous stream, and sends along the telegraphic wire, by the power of electricity, the message which neither the reindeer nor the carrier-pigeon is fleet enough to bear.

3. ADVANTAGES OF INANIMATE OVER ANIMATE NATURAL AGENTS.—As we have seen, the powers which man calls to his aid in producing momentum are partly animate and partly inanimate. The use of animate agents is of great service to him, but the use of inanimate agents is of still greater service. Besides the greater power and velocity attained by their use, there are certain other advantages which deserve notice. In the first place, inanimate agents can be made to work in a far smaller space than animate agents. The steam which is equal in force to the power of a hundred horses can be made to work in an engine which occupies but a few square feet; whereas, a hundred horses would occupy the whole boat. Again, inanimate natural agents work continuously, and with great regularity and precision, while animals must have intervals of rest, often become restive under the hand of their driver, and flag in the performance of their task. In traveling by cars and steamboats, much time is saved not only by the increased speed attained, but also by the greater regularity and precision in their trips. It

is true, the loss of life is very considerable by these modes of travel, yet it is probably less than would result from the same amount of travel by horse-power. And although the original expense of engines and the expense of maintaining them is great, still it is much smaller than that of purchasing and maintaining the number of animals adequate to perform the same work. These are some of the economic advantages of inanimate over animate natural agents. The question which of the inanimate agents it will be the most economical to employ in any particular case, will depend wholly upon the circumstances. A good water-power convenient to market will generally be found cheaper than steam, for mill purposes, while wind for ordinary transportation and long voyages will be less expensive than steam.

4. RESULTS ACCOMPLISHED BY MACHINERY MOVED BY NATURAL AGENTS.—The object of machinery is to modify, regulate, and apply the power to just such a point and in just such a manner as we wish. Machinery is a sort of organism through

which the natural agent works. It is the feet by which it moves, the arms by which it reaches, the fingers by which it picks up, and the hands by which it clasps. By means of it we may give to the motion produced by the agent a perpendicular, a horizontal, or a rotary direction, as is seen in the trip-hammer, the railroad locomotive, and the steamboat. Or we may exert all the power upon a single point, as in forging anchors, or rolling iron; or else we may distribute it over a wide space and among a variety of operations, as is done in a cotton factory, where carding, spinning, weaving, and various other operations are carried on in different parts of the building,—all as the result of the power exerted upon a single wheel by the natural agent, and transmitted through a succession of mechanical contrivances, till it reaches the separate operations to be performed. And as machinery has no nerves, and moves with perfect regularity and precision, it can be made to perform, without faltering, operations too delicate for the human hand, such as the spinning and weaving of the finest and most delicate

fabrics. And finally, we may by machinery accumulate power for a sudden stroke, as in the pile-driver, or for a gradual and regular evolution through a longer or shorter period, as in the clock or watch.

5. EFFECTS OF THESE AIDS TO PRODUCTION ON HUMAN HAPPINESS.—As labor-saving machinery performs to some extent the labor of the hand, to the same extent it dispenses with human labor, and tends to turn men out of employment. But at the same time, it greatly diminishes the cost of articles, and hence increases the demand for them, and consequently for the labor required in producing them; since the number of purchasers of any article of common use increases rapidly as it comes within the reach of those of small means, who are always vastly more numerous than those of large means. Besides, when articles are cheap they are put to new uses. Thus, cotton cloth, which during the war was scarce and dear, and hence used only for the most necessary purposes, but a few years ago, when it was cheap,



was used largely for hay-caps, and other similar purposes. And not only so, but, with the increased productiveness of labor, capital increases, and hence new wants spring up which have to be supplied by new products. From these and the like causes the demand for labor is kept good, so that, notwithstanding the astonishing increase in the use of labor-saving machinery, the demand for labor was probably never greater than at present. Labor, indeed, under improved processes and means, is more effective than formerly, and hence the laborer can devote more hours to social and self improvement, and less to toil. But these diminished hours are better remunerated as production and capital increase. Hence, the use of labor-saving machinery is a blessing to all classes.

## LESSON IX.

### STIMULANTS TO LABOR.

1. THE NATURAL DISPOSITION OF MAN TOWARD LABOR.—Man has been styled a “lazy animal,” and with reason. Labor is irksome to him; if it were not, he would value it at nothing, and hence set no price upon its exertion or results. There is, it is true, a certain restlessness and love of activity in man, varying with the temperament, but not a love of continuous and systematic labor, such as is required in all production. Without some regular employment, indeed, man is uneasy and wretched; but yet he will not generally work if he has the means of living without it. He will spend his time in hunting, fishing, traveling, and possibly in speculating, but not in regular labor. And yet we were evidently made for labor. We have all the powers both of body and mind which are requisite