

Andrew Ure - *The Philosophy of the Manufacturers* (1835)

Andrew Ure (1778-1857), a professor at the University of Glasgow, was an enthusiast for the new manufacturing system. Here he represents the views of a new class: the manufacturers whose wealth derived from ownership of factories.

This island is pre-eminent among civilized nations for the prodigious development of its factory wealth, and has been therefore long viewed with a jealous admiration by foreign powers. This very pre-eminence, however, has been contemplated in a very different light by many influential members of our own community, and has been even denounced by them as the certain origin of innumerable evils to the people, and of revolutionary convulsions to the state. If the affairs of the kingdom be wisely administered, I believe such allegations and fears will prove to be groundless, and to proceed more from the envy of one ancient and powerful order of the commonwealth, towards another suddenly grown into political importance, than from the nature of things....

The blessings which physio-mechanical science has bestowed on society, and the means it has still in store for ameliorating the lot of mankind, have been too little dwelt upon; while, on the other hand, it has been accused of lending itself to the rich capitalists as an instrument for harassing the poor, and of exacting from the operative an accelerated rate of work. It has been said, for example, that the steam engine now drives the power-looms with such velocity as to urge on their attendant weavers at the same rapid pace; but that the hand-weaver, not being subjected to this restless agent, can throw his shuttle and move his treddles at his convenience. There is, however, this difference in the two cases, that in the factory, every member of the loom is so adjusted, that the driving force leaves the attendant nearly nothing at all to do, certainly no muscular fatigue to sustain, while it procures for him good., unfailing wages, besides a healthy workshop *gratis*: whereas the non-factory weaver, having everything to execute by muscular exertion, finds the labour irksome, makes in consequence innumerable short pauses, separately of little account, but great when added together; earns therefore proportionally low wages, while he loses his health by poor diet and the dampness of his hovel.

The constant aim and effect of scientific improvement in manufactures are philanthropic, as they tend to relieve the workmen either from niceties of adjustment which exhaust his mind and fatigue his eyes, or from painful repetition of efforts which distort or wear out his frame. At every step of each manufacturing process described in this volume the humanity of science will be manifest....

In its precise acceptation, the Factory system is of recent origin, and may claim England for its birthplace. The mills for throwing silk, or making organzine, which were mounted centuries ago in several of the Italian states, and furtively transferred to this country by Sir Thomas Lombe in 1718, contained indeed certain elements of a factory, and probably suggested some hints of those grander and more complex combinations of self-acting machines, which were first embodied half a century later in our cotton manufacture by Richard Arkwright, assisted by gentlemen of Derby, well acquainted with its celebrated silk establishment. But the spinning of an entangled flock of fibres into a smooth thread, which constitutes the main operation with cotton, is in silk

superfluous; being already performed by the unerring instinct of a worm, which leaves to human art the simple task of doubling and twisting its regular filaments. The apparatus requisite for this purpose is more elementary, and calls for few of those gradations of machinery which are needed in the carding, drawing, roving, and spinning processes of a cotton mill.

When the first water frames for spinning cotton were erected at Cromford in the romantic valley of the Derwent, about sixty years ago, mankind were little aware of the mighty revolution which the new system of labour was destined by Providence to achieve, not only in the structure of British society, but in the fortunes of the world at large. Arkwright alone had the sagacity to discern, and the boldness to predict in glowing language, how vastly productive human industry would become, when no longer proportioned in its results to muscular effort, which is by its nature fitful and capricious, but when made to consist in the task of guiding the work of mechanical fingers and arms, regularly impelled with great velocity by some indefatigable physical power. What his judgment so clearly led him to perceive, his energy of will enabled him to realize with such rapidity and success, as would have done honour to the most influential individuals, but were truly wonderful in that obscure and indigent artisan....

The principle of the factory system then is, to substitute mechanical science for hand skill, and the partition of a process into its essential constituents, for the division or graduation of labour among artisans. On the handicraft plan, labour more or less skilled was usually the most expensive element of production.... but on the automatic plan, skilled labour gets progressively supersede~ and will, eventually, be replaced by mere overlookers of machines.

By the infirmity of human nature it happens, that the more skilful the workman, the more self-willed and intractable he is apt to become, and, of course, the less fit a component of a mechanical system, in which, by occasional irregularities, he may do great damage to the whole. The grand object therefore of the modern manufacturer is, through the union of capital and science, to reduce the task of his work-people to the exercise of vigilance and dexterity, - faculties, when concentrated [sic] to one process, speedily brought to perfection in the young. In the infancy of mechanical engineering, a machine factory displayed the division of labour in manifold gradations -the file, the drill, the lathe, having each its different workmen in the order of skill: but the dextrous hands of the filer and driller are now superseded by the planing, the key groove cutting, and the drilling-machines; and those of the iron and brass turners, by the self-acting slide-lathe....

It is, in fact, the constant aim and tendency of every improvement in machinery to supersede human labour altogether, or to diminish its cost, by substituting the industry of women and children for that of men; or that of ordinary labourers for trained artisans. In most of the water-twist, or throstle cotton mills, the spinning is entirely managed by females of sixteen years and upwards. The effect of substituting the self-acting mule for the common mule, is to discharge the greater part of the men spinners, and to retain adolescents and children. The proprietor of a factory near Stockport states, in evidence to the commissioners, that, by such substitution, he would save 50l. a week in wages in consequence of dispensing with nearly forty male spinners, at about 25s. of wages each....

Steam-engines furnish the means not only of their support but of their multiplication. They create a vast demand for fuel; and, while they lend their powerful arms to drain the pits and to raise the coals, they call into employment multitudes of miners, engineers, shipbuilders, and sailors, and cause the construction of canals and railways. Thus therefore, in enabling these rich fields of industry to be cultivated to the utmost, they leave thousands of fine arable fields: free for the production of food to man, which must have been otherwise allotted to the food of horses. Steam-engines moreover, by the cheapness and steadiness of their action, fabricate cheap goods, and procure in their exchange a liberal supply of the necessaries and comforts of life produced in foreign lands.

Improvements in the machinery have a three-fold bearing:

- 1st. They make it possible to fabricate some articles which, but for them, could not be fabricated at all.
- 2nd. They enable an operative to turn out a greater quantity of work than he could before, - time, labour, and quality of work remaining constant.
- 3rd. They effect a substitution of labour comparatively unskilled, for that which is more skilled.

Benjamin Disraeli- *Sybil: or the Two Nations* (1845)

Nineteenth-century novels contain some of the most effective descriptions of industrial life. In addition to providing such description, Sybil, or the Two Nations (1845), written by Benjamin Disraeli (1804-1881), a novelist and politician who also served as prime minister of England (1867-1868, 1874-1880), illustrates the thinking of a group of reforming Tory aristocrats, sometimes referred to as Young England. They hoped to gain working-class support against their political competitors, the Whigs. In the following selection from this novel, Disraeli describes Marney, a rural mining town.

Consider: The physical consequences of industrialization for the land and the town; the worst aspects of industrial labor; according to Disraeli; how this description compares with Engels' views in the following excerpt; who, if anyone, Disraeli would blame for all this.

The last rays of the sun contending with clouds of smoke that drifted across the country, partially illumined a peculiar landscape, Far as the eye could reach, and the region was level, except where a range of limestone hills formed its distant limit, a wilderness of cottages, or tenements that were hardly entitled to a higher name, were scattered for many miles over the land; some detached, some connected in little rows, some clustering in groups, yet rarely forming continuous streets, but interspersed with blazing furnaces, heaps of burning coal and piles of smouldering ironstone; while forges and engine chimneys roared and puffed in all directions, and indicated the frequent presence of the mouth of the mine, and the bank of the coal pit. Notwithstanding the whole country might be compared to a vast rabbit warren, it was nevertheless intersected with canals. crossing each other at various levels; and though the subterranean operations were prosecuted with so much avidity that it was not uncommon to observe whole rows of houses awry, from the shifting and hollow nature of the land, still, intermingled with heaps of mineral refuse, or of metallic dross, patches of the surface might here and there be recognised, covered, as if in mockery, with grass and corn, looking very much like those gentlemen's sons that we

used to read of in our youth, stolen by the chimneysweeps, and giving some intimations of their breeding beneath their grimy livery. But a tree or a shrub, such an existence was unknown in this dingy rather than dreary region.

It was the twilight hour; the hour at which in southern climes the peasant keels before the sunset image of the blessed Hebrew maiden; when caravans halt in their long course over vast deserts, and the turbaned traveller, bending in the sand, pays his homage to the sacred stone and the sacred city; the hour, not less holy, that announces the cessation of English toil, and sends forth the miner and the collier to breathe the air of earth, and gaze on the light of heaven.

They come forth: the mine delivers its gang and the pit its bondsmen; the forge is silent and the engine is still. The plain is covered with the swarming multitude: bands of stalwart men, broad-chested and muscular, wet with toil, and black as the children of the tropics; troops of youth. alas! Of both sexes, though neither their raiment nor their language indicates the difference; all are clad in *male* attire; and oaths that men might shudder at issue from lips born to breathe words of sweetness. Yet these are to be, some are, the mothers of England! But can we wonder at the hideous coarseness of their language, when we remember the savage rudeness of their lives? Naked to the waist, an iron chain fastened to a belt of leather runs between their legs clad in canvas trousers, while on hands and feet an English girl, for twelve. sometimes for sixteen hours a day, hauls and hurries tubs of coals up subterranean roads, dark, precipitous, and plashy; circumstances that seem to have escaped the notice of the Society for the Abolition of Negro Slavery. Those worthy gentlemen, too, appear to have been singularly unconscious of the sufferings of the little trappers, which was remarkable, as many of them were in their own employ. See, too, these emerge from the bowels of the earth! Infants of four and five years of age, many of them girls, pretty and still soft and timid; entrusted with the fulfilment of responsible duties, the very nature of which entails on them the necessity of being the earliest to enter the mine and the latest to leave it. Their labour indeed is not severe, for that would be impossible, but it is passed in darkness and in solitude. They endure that punishment which philosophical philanthropy has invented for the direst criminals, and which those criminals deem more terrible than the death for which it is substituted. Hour after hour elapses, and all that reminds the infant trappers of the world they have quitted, and that which they have joined, is the passage of the coal-waggons for which they open the air-doors of the galleries, and on keeping which doors constantly closed, except at this moment of passage, the safety of the mine and the lives of the persons employed in it entirely depend.

Friedrich Engels- *The Condition of the Working Class in England* (1845)

To many contemporaries, child labor in factories and mines under harsh conditions was the most shocking change in working conditions brought on by industrialization. However; several investigators documented a whole range of problems facing England's industrial working class. One of the most famous of these investigators was Friedrich Engels (1820-1895), the son of a German textile manufacturer. Engels moved to England in the 1840s, where in addition to learning about business he traveled through cities visiting working-class areas and interviewing people. He would soon become a collaborator with his friend, Karl Marx, and one of the

founders of modern socialism. The following excerpt is from the book that arose from his studies, The Condition of the Working Class in England, first published in 1845. Here Engels focuses on worker's living environment in England's industrial cities.

Consider: What Engels considers the worst health conditions facing the poor; Engels' analysis of how the environment affects the poor mentally as well as physically.

The way in which the vast mass of the poor are treated by modern society is truly scandalous. They are herded into great cities where they breathe a fouler air than in the countryside which they have left. They are housed in the worst ventilated districts of the *towns*; they are deprived of all means of keeping clean. They are deprived of water because this is only brought to their houses if someone is prepared to defray the cost of laying the pipes. River water is so dirty as to be useless for cleansing purposes. The poor are forced to throw into the streets all their sweepings, garbage, dirty water, and frequently even disgusting filth and excrement. The poor are deprived of all proper means of refuse disposal and so they are forced to pollute the very districts they inhabit. And this is by no means all. There is no end to the sufferings which are heaped on the heads of the poor. It is notorious that general overcrowding is a characteristic feature of the great towns, but in the working-class quarters people are packed together in an exceptionally small area. Not satisfied with permitting the pollution of the air in the streets, society crams as many as a dozen workers into a single room, so that at night the air becomes so foul that they are nearly suffocated. The workers have to live in damp dwellings. When they live in cellars the water seeps through the floor and when they live in attics the rain comes through the roof. The workers' houses are so badly built that the foul air cannot escape from them. The workers have to wear poor and ragged garments and they have to eat food which is bad, indigestible and adulterated. Their mental state is threatened by being subjected alternately to extremes of hope and fear. They are goaded like wild beasts and never have a chance of enjoying a quiet life. They are deprived of all pleasures except sexual indulgence and intoxicating liquors. Every day they have to work until they are physically and mentally exhausted. This forces them to excessive indulgence in the only two pleasures remaining to them. If the workers manage to survive this sort of treatment it is only to fall victims to starvation when a slump occurs and they are deprived of the little that they once had.

How is it possible that the poorer classes can remain healthy and have a reasonable expectation of life under such conditions? What can one expect but that they should suffer from continual outbreaks of epidemics and an excessively low expectation of life? The physical condition of the workers shows a progressive deterioration.