

time, so rough in its appearance, that those very rich would be ashamed of using it. The article we mean is a pin."

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"Needles are not so cheap as pins, because the material of which they are made is more expensive, and the processes cannot be executed so completely by machinery. But without machinery how could that most beautiful article, a *fine* needle, be sold at the rate of six for a penny? As in the case of pins, machinery is at work at the first formation of the material. Without the tilt-hammer, which beats out the bar of steel, first at the rate of ten strokes a minute, and lastly at that of 500, how could that bar be prepared for needle-making at any thing like a reasonable price? In all the processes of needle-making, labour is saved by contrivance and machinery. What human touch would be exquisite enough to make the eye of the finest needle, through which the most delicate silk is with difficulty passed? Needles are made in such large quantities, that it is even important to save the time of the child who lays them all one way when they are completed. Mr. Babbage, who is equally distinguished for his profound science, and his mechanical ingenuity, has described this process as an example of one of the simplest contrivances which can come under the denomination of a tool."

On the Effects of different Arts and Trades on Health and Longevity; abstracted from a work on that subject, relating particularly to the Manufactories of Leeds, in England, written by C. TURNER THACKRAH.

AFTER a series of interesting remarks and calculations, founded on authentic data, Mr. Thackrah says--

"Taking, then, the mortality at Pickering Lythe as the natural one, there was an excess of 321 deaths in the borough of Leeds during the year 1821. And allowing for the increase of population since that period, we may fairly say that at least 450 persons die annually in the borough of Leeds, from the injurious effects of manufactures, the crowded state of population, and the consequent bad habits of life. We may say that every day of the year is carried to the grave the corpse of an individual whom nature would have long preserved in health and vigour;—every day we see sacrificed to the artificial state of society, one, and sometimes two victims, whom the destinies of nature would have spared. The destruction of 450 persons year by year in the borough of Leeds cannot be considered by any benevolent mind as an insignificant affair. Still less can the impaired health, the lingering ailments, the premature decay, mental and corporeal, of nine-tenths of the survivors, be a subject of indifference. Assuredly an examination into the state of our manufactures has long been demanded, alike by humanity and by science. The object of this paper is to excite public attention to the subject. Myself and my pupils have personally and carefully inspected the

state of the artisans in most kinds of manufacture, examined the agencies believed to be injurious, conversed on the subject with masters, overlookers, and the more intelligent workmen, and obtained many tables illustrating the character of the disorders prevalent in the several kinds of employ. From these sources collectively, I have drawn up statements, which, though avowedly imperfect, must, I conceive, approach to the truth."

Mr. Thackrah then goes into his striking details, dividing, for that purpose, the population into four great classes of operatives, dealers, master-manufacturers and merchants, and professional men; and examining "the atmosphere they breathe—the muscular exercise they take—the posture of the body they maintain—the variations of temperature and humidity to which they are exposed—their diet and habits of life; and finally, in some classes, their state of mind." We will display some of the results in almost a tabular form.

OUT OF DOORS.

"*Butchers*, and the slaughtermen, their wives and their errand-boys, almost all eat fresh-cooked meat at least twice a-day. They are plump and rosy. They are generally, also, cheerful and good-natured. Neither does their bloody occupation, nor their beef-eating, render them savage, as some theorists pretend, and even as the English law presumes. They are not subject to such anxieties as the fluctuations of other trades produce—for meat is always in request; and butchers live comfortably in times as well of general distress as of general prosperity. They are subject to few ailments, and these the result of plethora." Though more free from diseases than other trades, they, however, do not enjoy greater longevity; on the contrary, Mr. T. thinks their lives shorter than those of other men who spend much time in the open air.*

Cattle and horse dealers are generally healthy, except when their habits are intemperate.

* *Butchers*, (he says,) in fact live too highly—not too highly for temporary health, but too highly for long life. Is every man gifted at birth with a portion of the pabulum of life, which he cannot increase, but which he may prematurely consume;—in other words, does nature endow us with a vital patrimony, which we may exhaust, not only by profligate indulgence, but even by regular draughts too frequently repeated? Or rather, does not high living, (for I speak not at present of excess or intemperance,)—does not high living produce that plethoric state which gradually leads to disease? I believe the latter. Congestion of blood, affecting chiefly the vessels of the abdomen and head, shortens the lives of numbers who are plump, rosy, and apparently strong. My very intelligent friend, Dr. Murray, of Scarborough," he adds, "concurs in the statement relative to butchers. 'The high living of butchers assuredly leads to plethora and premature dissolution.' He adds—'Thus coal-meters, &c. of London, rarely, if every, attain the age of forty, though men remarkable for muscular bulk and strength. They work most laboriously, perspire immensely, and supply such waste by extraordinary and almost incredible potations of porter, which ultimately, without much positive and actual intemperance, brings on irregularities of the digestive system, structural changes, and death.'"

Fishmongers, though much exposed to the weather, are hardy, temperate, healthy, and long lived.

Cart-drivers, if sufficiently fed and temperate, the same.

Labourers in husbandry, &c. suffer from a deficiency of nourishment.

Brickmakers, with full muscular exercise in the open air, though exposed to vicissitudes of cold and wet, avoid rheumatism and inflammatory diseases, and attain good old age.

Chaise-drivers, postilions, coachmen, guards, &c. from the position of the two former on the saddle, irregular living, &c. and from the want of muscular exercise in the two latter, are subject to gastric disorders, and, finally, apoplexy and palsy, which shorten their lives."

Carpenters, Coopers, Wheelwrights, &c. healthy and long lived.

Smiths, often intemperate, and die comparatively young.

Rope makers and gardeners suffer from their stooping postures.

Paviors, subject to complaints in the loins, increasing with age, but they live long.

IN-DOOR OCCUPATIONS.

Tailors,* notwithstanding their confined atmosphere and bad posture, are not liable to acute diseases, but give way to stomach complaints and consumption. "It is apparent, even from observing only the expression of countenance, the complexion, and the gait, that the functions of the stomach and the heart are greatly impaired, even in those who consider themselves well. We see no plump and rosy tailors; none of fine form and strong muscle. The spine is generally curved: the reduction in the circumference of the chest is not so much as we might expect; the average of our measurements presented 33 to 34 inches, while that of other artisans is about 36. The capacity of the lungs, as evinced by measuring the air thrown out at an expiration, is not less than common: the average of six individuals was $7\frac{2}{3}$ pints. The prejudicial influence of their employ is more insidious than urgent—it undermines rather than destroys life. * * * Of twenty-two of the workmen employed in Leeds, not one had attained the age of sixty; two had passed fifty; and of the rest not more than two had reached forty. We heard of an instance or two of great age; but the individuals had lived chiefly in the country."

Staymakers have their health impaired, but live to a good average.

Milliners, dress-makers, and straw-bonnet-makers, are unhealthy and short lived.

Spinners, cloth-dressers, weavers, &c. &c. are more or less healthy

* On the bent postures, which Mr. T. considers so injurious, we may remark, that a French physiologist has just published a memoir, in proof that the spinal marrow has, properly speaking, no special action upon the circulation distinct from the general action of nervous centres, and that it is not in it that the essential principle, still less the exclusive principle of the circulation resides.

as they have exercise and air. Those exposed to inhale imperceptible particles of dressings, &c., such as frizers, suffer from disease, and are soonest cut off.

Shoemakers are placed in a bad posture:—"Digestion and circulation are so much impaired, that the countenance would mark a shoemaker almost as well as a tailor. We suppose that, from the reduction of perspiration and other evacuations, in this and similar employments, the blood is impure, and consequently the complexion darkened. The secretion of bile is generally unhealthy, and bowel complaints are frequent. The capacity of the lungs, in the individuals examined, we found to average six and one-third, and the circumference of the chest thirty-five inches. In the few shoemakers who live to old age, there is always a remarkable hollow at the base of the breast bone, occasioned by the pressure of the last."

Curriers and leather dressers are very healthy and live to old age.

Saddlers lean much forward and suffer accordingly from headach and indigestion.

Printers, (our worthy co-operators,) "are kept in a confined atmosphere, and generally want exercise. Pressmen, however, have good and varied labour. Compositors are often subject to injury from the types. These, a compound of lead and antimony, emit, when heated, a fume which affects respiration, and are said also to produce partial palsy of the hands. Among the printers, however, of whom we have inquired, care is generally taken to avoid composing till the types are cold, and thus no injury is sustained. The constant application of the eyes to minute objects gradually enfeebles these organs. The standing posture long maintained here, as well as in other occupations, tends to injure the digestive organs. Some printers complain of disorder of the stomach and head; and few appear to enjoy full health. Consumption is frequent. We can scarcely find or hear of any compositor above the age of fifty. In many towns printers are intemperate."

Bookbinders—a healthy employment.

Carvers and gilders look pale and weakly, but their lives are not abbreviated in a marked degree.

Clockmakers, generally healthy and long lived.

Watchmakers, the reverse.

House-servants, in large, smoky towns, unhealthy.

Colliers and well-sinkers, a class by themselves, seldom reach the age of fifty.

EMPLOYMENTS PRODUCING DUST, ODOUR, OR GASEOUS EXHALATIONS.

If from animal substances not injurious; nor from the vapours of wine or spirits.

Tobacco manufacturers do not appear to suffer from the floating poison in their atmosphere.

Snuff-making is more pernicious.

Men in oil-mills, generally healthy.

Brushmakers live to a very great age.

Grooms and hostlers inspire ammoniacal gas, and are robust, healthy, and long lived.

Glue and size boilers, exposed to the most noxious stench, are fresh looking and robust.

Tallow-chandlers, also exposed to offensive animal odour, attain considerable age.*

Tanners, remarkably strong, and exempt from consumption.

Corn-millers, breathing an atmosphere loaded with flour, are pale and sickly: very rarely attain old age.

Maltsters cannot live long, and must leave the trade in middle life.

Tea-men suffer from the dust, especially of green tees; but the injury is not permanent.

Coffee-roasters become asthmatic, and subject to headach and indigestion.

Paper-makers, when aged, cannot endure the effect of the dust from cutting the rags. The author suggests the use of machinery in this process. In the wet, and wear, and tear of the mills, they are not seriously affected, but live long.

Masons are short lived, dying generally before forty. They inhale particles of sand and dust, lift heavy weights, and are too often intemperate.

Miners die prematurely.†

Machine makers "seem to suffer only from the dust they inhale, and the consequent bronchial irritation. The *filers*, (iron,) are almost all unhealthy men, and remarkably short lived."

Founders, (in brass,) suffer from the inhalation of the volatilized metal. In the founding of *yellow brass*, in particular, the evolution of oxide of zinc is very great." They seldom reach forty years.

Copper-smiths "are considerably affected by the fine scales which rise from the imperfectly volatilized metal, and by the fumes of the 'spelter,' or solder of brass." The men are generally unhealthy, suffering from disorders similar to those of the brass founders.

Tinplate-workers are subjected to fumes from muriate of ammonia, and sulphurous exhalations from the coke which they burn. These exhalations, however, appear to be annoying rather than injurious; as the men are tolerably healthy, and live to a considerable age. *Tinners* also are subject only to temporary inconvenience from the fumes of the soldering.

Plumbers are exposed to the volatilized oxide of lead, which rises during the process of 'casting.'" They are sickly in appearance, and short lived.

House-painters are unhealthy, and do not generally attain full age.

*"During the plague in London it was remarked that this class of men suffered much less than others."

†"Last year there was in the village of Arkendale, (in the heart of the mining district,) not less than thirty widows under thirty years of age. The prevalent maladies appear to be affections of the lungs and bowels. Smelting is considered a most fatal occupation. The appearance of the men is haggard in the extreme."

Chemists and druggists, in laboratories are sickly and consumptive.

Potters, affected through the pores of the skin become paralytic, and are remarkably subject to constipation.

Hatters, grocers, and chimney sweepers, (a droll association,) also suffer through the skin; but though the irritation occasions diseases, they are not, except in the last class, fatal.

Dyers are healthy and long lived.

Brewers are, as a body, far from healthy. "Under a robust and often florid appearance, they conceal chronic diseases of the abdomen, particularly a congested state of the venous system. When these men are accidentally hurt or wounded, they are more liable than other individuals to severe and dangerous effects."*

Cooks and confectioners "are subjected to considerable heat. Our common cooks are more unhealthy than housemaids. Their digestive organs are frequently disordered, they are subject to headaches, and their tempers rendered irritable."

Glass workers are healthy; *glass blowers* often die suddenly.

New Process of Distillation.

WE have occasion to call the attention of our readers to what will probably be deemed one of the most curious discoveries that has been effected in the useful arts during the present century,—that of procuring alcohol, or ardent spirit, from fermented paste, such as is commonly used for making baker's bread; in lieu of making an extract of malt or corn, for the especial purpose of raising a vinous fermentation, as now practised by the corn distillers. This important discovery has been made by Mr. Robert Hicks, a gentleman in the medical profession, who, we understand, has just taken out a patent for the invention.

As nearly all vegetable substances capable of undergoing the vinous fermentation are known to give out a certain portion of aroma, in conjunction with the carbonic acid gas evolved by the process, it might have been inferred, *à priori*, that at least a portion of such vapour contained gaseous alcohol. But the discovery of this fact, obvious as it may appear when once announced, has hitherto been overlooked, notwithstanding the profound discoveries which have been made in almost every department of chemical science during the last thirty years. The only doubt we entertained on the question, on hearing of this discovery, was, as to the practicability of obtaining spirit in any quantity worthy of notice, from the vapour of fermented paste, and sufficiently pure for the purposes of the rectifier. Previous to offering any notice of this important invention, therefore, we took the trouble of investigating its nature, and of tasting a sample of the spirit which had been produced from the

* "The ill health of brewers is, however, evidently attributed to their habitual and unnecessary potation of beer. There is no reason to believe them injured by their employ."