Diseases OF SPECIAL OCCUPATIONS.

No. I.

THE SHEFFIELD GRINDERS.

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IN commencing the first of a series of papers for the BRITISH MEDICAL JOURNAL, on the Diseases of Artisans, I shall endeavour, whilst treating of the peculiar disease induced in Sheffield by the calling of a *Grinder*, to give a general description of the habits of these men, the numbers employed in the various branches of grinding, the average ages of those now living, and other particulars of general interest with regard to the town of Sheffield and its geological position; for I quite agree with the editor of this JOURNAL, that these articles will derive no little portion of their interest from containing faithful sketches of the various peculiarities found in the towns which form the homes of those industrious workers in the hives of British enterprise, together with an account of the social and industrial conditions which lead to the diseases of artisans. Of course the Sheffield grinders are liable to various affections, like other men; and to the depressing influences on the animal economy which exist in all large towns; but, when speaking of the diseases of the Sheffield artisans,* I intend to treat only of those which arise in consequence of the occupations in which they are engaged. Our investigations will, I think, be facilitated by directing attention to—

- The Town of Sheffield, and the Manufactures carried on in it.
- The Sheffield Grinders, and the Nature of their Occupation.
- The Grinders' Disease.

A. THE TOWN OF SHEFFIELD, AND THE MANUFACTURES CARRIED ON IN IT.

Sheffield is the principal seat of cutlery and other hardware manufacture, and the capital of the parish which bears its name, as well as of the ancient but not very clearly defined liberty of Hallamshire. It covers for a considerable extent the abrupt declivities and hills near the conflux of the rivers Sheaf and Don. Its canal opens a communication with the river Don, and other navigable rivers and canals; and its various railways afford a transit for passengers and goods to all parts of the kingdom. "Where now", says the historian of Hallamshire (the Rev. Joseph Hunter, F.R.S.), "is collected a numerous and active population, was anciently a deep solitude, the silence of which was broken only by our rivers pouring their waters in natural cascades through the woodland scenery. Who was the first to raise the axe amongst the forests of Hallamshire, or who first established himself and his family in one of its romantic valleys, it is now vain to attempt to discover."

The parish of Sheffield was unknown as one of the ecclesiastical subdivisions of the diocese of York before the time of the Norman conquest: it now comprises three entire Saxon manors, and a considerable portion of a fourth.

Few places in England present a more wonderful contrast between what they were and what they now are, than the town of Sheffield. Wide indeed is the difference now, when compared with that memorable period (from 1570 to 1584) when the unhappy Mary Queen of Scots was for so many years a prisoner, in the custody of the Earl of Shrewsbury, at Sheffield Castle; or when the Governor of Sheffield, Major Beaumont, surrendered this strong fortress to the Parliamentary forces under General Crawford, after a gallant resistance, on the 11th of August, 1644.

The parish of Sheffield is of considerable extent; it is more than ten miles in length, and its average breadth is about three miles, with an area of rather more than 22,000 acres. It contains many populous villages and hamlets, in the centre of which stands the large town of Sheffield, from which the parish derives its name. The following table will at a glance show how the town has increased. In 1615, the population was only 2,207; and, in 1736, the township of Sheffield consisted of 2,152 houses, with a population of 9,695.

TABLE I.

Townships.		Population in A.D.						No. of Acres.	Houses in 1851.
		1801.	1811.	1821.	1831.	1841.	1851.		
SHEFFIELD.	Sheffield	31,314	35,840	42,157	50,011	67,967	83,447	3436	16,943
	Ecclesall	5,362	6,569	9,113	14,279	20,003	24,552	4180	5,194
	Brightside	4,030	6,899	6,615	8,968	10,089	12,042	2680	2,517
	Attercliffe	2,281	2,673	3,172	3,741	4,156	4,873	1336	1,001
	Nether Hallam	1,974	2,384	3,200	4,658	7,275	8,897	1902	1,689
	Upper Hallam.....	764	866	1,018	1,035	1,396	1,499	8836	304
Total		45,755	53,231	65,275	91,692	110,891	135,310	22,370	27,658

1856.—Houses occupied	32,472
„ unoccupied	1,568
„ building	989
Total houses	35,029

In 1856, the total population of Sheffield was 161,000. Since then there have been erected 1,307 houses; so that the exact number of houses in the six townships of Sheffield at this time is 36,366, and the population 164,000. The rateable value of the property in the borough of Sheffield is £366,394:15:8. The expenditure of the Sheffield Union, which includes the townships of Sheffield, Brightside, and Attercliffe, last year was £32,000; and of the Ecclesall Union, which includes Ecclesall, Upper Hallam, and Nether Hallam, £9,853:6.

Sheffield of late years has rapidly increased in size and importance, and recent enterprise has greatly added to the wealth of many of our merchants and manufacturers; although, as a rule, the large fortunes are not made in Sheffield that we hear of in Manchester and other towns. Many of our local trades can also be carried on with a very small amount of capital, and

hence the very large number of what are called "little masters" in Sheffield. The wages of many of the artisans are also much higher than in other towns.

The neighbourhood of Sheffield abounds in the three mineral productions which are most important to man; namely, *iron*, *coal*, and *stone*. The iron ore is found in many parts of the district, at a depth of from fifty to sixty feet; and, although it was most unquestionably the presence of the "raw material" which first led the inhabitants of the town of Sheffield to manufactures of iron, these mines are comparatively, in this our day, of little importance to the staple branches of their trade. Steel is what is principally required; and the native iron of the district is not adapted for conversion into steel, like the iron of other countries. About 32,000 tons of Swedish iron are annually imported into Sheffield, for the purpose of being converted into steel; and every year from ten to fifteen thousand tons of English iron are made into railway springs, etc. The iron obtained from the ore of the district is either used for castings or made into "rails", "merchants' bar", etc. What may be the effect of the recent process that has been patented by Mr. Bessemer, time alone can show; but we have evidence that foreign iron has been used in Sheffield for the last three centuries; and, in the accounts of the Church Burgesses of Sheffield for the year 1557, are the particulars of a payment to

* After I have finished the diseases of grinders, I intend to communicate a paper on the diseases of file cutters, etc.

Robert Moore "for one stone and quarter of Danske iron", and for "a lib. of Spanysch iron".

Below the iron lies the bed of coal, one principal seam of which runs under a portion of the town. The mean depth of the coal is about 120 yards, and the thickness of the bed from three to five feet. This bed is a principal source of that large supply of fuel which the manufactures of Sheffield require, and has been so for many years. The existence of railways of late years has of course extended the sources whence the supply is obtained. Previous to the employment of coke, charcoal was used in the smelting of the iron ore, and doubtless led to the destruction of many of our ancient forests. Evelyn has remarked, that "Nature has thought fit to produce this wasting ore more plentifully in woodlands than in any other ground, and to enrich our forests to their own destruction."

A magnesian lime-stone, similar to that of which the Houses of Parliament are built, and which was obtained from the quarries at Anston, is found in the neighbourhood of Conisborough and Roche Abbey. Sheffield is built principally of red bricks, the clay for making which is found in almost every part of the parish. In every direction around Sheffield are quarries of freestone, of various quality, which supply grind and mill-stones, flag-stones, and common roofing slate. Of the stones used for grinding, the greater part come from the neighbourhood of Wickersby and Dalton, about nine miles from Sheffield. These stones vary in size from twelve inches to the very large stones of seven feet diameter used in grinding saws. The "whitening" stones, used for smoothing articles before glazing, are brought from Brincliffe Edge Quarries, about a mile from the town.

In the early years of its history, the only extensive concerns connected with the trades of Sheffield were the furnaces and forges in which the iron was prepared for the use of the manufacturer; and the beautiful Park of Sheffield, in the midst of which stood the prison which so long held the Scottish queen, within the memory of man, was dotted with iron-stone "pit-hills". This land now is used for agricultural purposes, and hardly a trace of the mining operations remains visible. Sheffield did not enjoy in those times that almost entire monopoly it possesses at the present of the staple article of its manufactures—the *knife*. This country had an import trade in knives till the reign of Queen Elizabeth; and in the articles enumerated in the Custom-House books of the reign of Henry VIII (*British Bibliographer*), are *knives of Almayne, knyves of France, and knyves of Colloynne*. Stowe informs us that, in the fifth year of her reign, Queen Elizabeth laid some restrictions on this import trade, in order to encourage the London manufactures; London being at that time the principal mart for the finer species of cutlery. Now it is notorious that a very large portion of what is sold as "fine London cutlery" in the metropolis, both scissors, knives, and razors, are

"Sheffield made,
Both haft and blade;"

the name of the London house being stamped upon them here.

The year 1742 is memorable in the history of Sheffield for the introduction of a new manufacture. Mr. Thomas Bolsover, an ingenious mechanic, when employed to repair the handle of a knife which was composed partly of silver and partly of copper, was struck with the possibility of uniting the two metals so as to form a cheap substitute, which should present the external appearance of silver, and therefore capable of being used in the manufacture of articles in which silver only had previously been employed. He confined himself to the manufacture of buttons and snuff-boxes, etc.; but Mr. Joseph Hancock, one of the Cutlers' Company, very soon showed that, by this new method, the finest and most elaborately embossed plate could be imitated. Birmingham very soon obtained a share in the new manufacture; but to the town of Sheffield belongs the honour of the invention, and the "Sheffield plate" is still highly prized for its elegance and durability.

The manufactures of Sheffield in cutlery—knives, scissors, razors; in files, edge tools, joiners' tools, scythes, sickles, shears, saws, circular saws, steel, railway springs, anvils, vices, stove-grates, fenders, fire-irons; silver, plated, and Britannia metal goods,—are celebrated throughout the world. At the great Exhibition of all Nations, held in the Crystal Palace, London, 1851, 12,000 square feet were covered with articles manufactured in Sheffield; and to the town, five council medals, and fifty-five prize medals, were awarded. At the great Exhibition held in Paris, Sheffield fully maintained its world-wide reputation for its manufactured articles in cutlery, edge tools, files, saws, etc.; and, in addition to numerous medals, a grand

medal of honour was presented by the Emperor of the French, to the town of Sheffield, "for the superiority of its steel and hardware".

The town of Sheffield is supplied with water by a company, the total area of whose present reservoirs is 173½ acres, and which contain, when full, 898,000,000 of gallons. These reservoirs are situated at Redmires and Rivelin. Very extensive reservoirs are also in process of construction near Bradford, which, when completed, will afford to the town of Sheffield a supply of 10,000,000 of gallons of water daily. The principal store reservoirs at present belonging to the company are at Redmires, seven miles from the town. These are placed at an elevation of 1,200 feet above the level of the sea, and are filled from springs, and from the surface drainage of the land. The quantity of rain water at such an elevation is always considerable. The water is brought along an open stone conduit to the other reservoirs of the company, which are placed about a mile from the town, and they are at an elevation of 460 feet above the lower streets; so that the water, which is conveyed in iron pipes to the town, can be easily taken to the upper rooms of the house of any inhabitant who may require it.

The water is very pure; and an imperial gallon does not contain more than four grains of mineral and organic matters. About a grain of these is in a state of suspension, and can easily be separated by filtration; and about three grains of saline, earthy, and organic matters, are held in solution. The taste is agreeable; and few towns have purer or better water than Sheffield. In addition to private houses, the company supply many steam-engines, breweries, and other manufactories.

The supply of all the necessities of life is abundant and cheap. Milk is brought into the town in barrels, in carts, and on ponies and asses, by the small Derbyshire farmers around Sheffield.

Two causes, in the first instance, mainly contributed to raise Sheffield into an important town; viz., the possession of vast mineral riches; and water power, by which, before the introduction of steam, grinding was carried on. The first steam-grinding was erected in 1786, when grinding became a separate branch of trade.

"Thus", writes the classical historian of Hallamshire, "has Nature been bountiful to the parish of Sheffield: not by bestowing upon it the most delicious fruits, double harvests, or perpetual summer; but the means and materials of durable and substantial comforts, so placed that they may serve as stimulants to labour. And, accordingly, her sons are an active, acute, and hardy race; patient of toil, unwillingly submitting to unnecessary restraints, aware of the advantages of their situation, proud of the reputation they have obtained for her, attached to their birthplace; and, wherever they go, remembering with more than common affection the tall graceful spire that surmounts the town, the woodland heights around it, and the streams which glitter along its devious valleys. Even the very sound of its waters poured over their broken weirs, or the slow moving wheel, the hiss of the grinding stone, and the noise of the forge, are grateful in recollection on the ear of the genuine son of what is fondly called 'old Sheffield'."

In Sheffield, the artisans have generally a house for themselves, and those who live in the suburbs frequently a garden. In times of good trade, at least, it is unusual to find two families under the same roof; and there is hardly an instance of an uninhabited cellar in the town. The average number of inmates to each house is rather more than five; and many of these dwellings either front the street or open into moderate sized yards. It cannot fail to have been noticed, in reading what has already been written, that, at certain periods, numerous houses are returned as uninhabited in Sheffield. During a period of active trade, the demand for cottage houses is very great, and speculators are induced to run them up as slightly and rapidly as possible, in the hope of obtaining, for a time at least, an enormous percentage; and hence, when a reaction takes place in the trade of the town, the speculative builders, who have paid but little attention to what are really the legitimate wants of a population, find to their cost that the cottage accommodation that has been created is far beyond what is required.

I have already stated that there is probably less of the confined alley and narrow *cul-de-sac* in Sheffield than in many other manufacturing towns, and that a good deal has been done of late years to improve the sewers and surface drains of the town; but still much more is required to render perfect the sanitary condition of the inhabitants; and the working classes appear but little aware that all measures for effecting improvements in the drainage of the streets, the supply of water, and ventilation, may be rendered nearly inoperative for the obvi-

ating of the causes of disease, if a nidus of morbid effluvia be permitted to remain in almost every part of the confined court where the artisan opens his window in the hope of purifying his small habitation with the breeze of summer, but gets instead a mixture of gases from dunghills, ashpits, etc., or, what is even worse, because more insidious, from a soil which has become impregnated with organic matters imbibed long before, and now, though perhaps to all appearance dry and clean, emitting the poisonous vapour in its most pernicious state.

The importance of a plentiful supply of pure air and water, as well as of selecting a home that can constantly be cheered and lighted by the sunbeams, appears but little understood by many of the artisans of this country; a home in a dark back court being often selected on account of its cheapness. Some medical writers of no little authority have gone so far as to assert that impure air and want of light are the only real causes of scrofula; and, although other adverse influences may doubtless have a tendency to promote the mischief, impure air and want of light are often, at any rate, essential to its establishment. The scrofulous children of the artisans of Sheffield, admitted under my care at the Sheffield Public Dispensary, are most frequently brought from such abodes. In a very sensibly written essay, M. Baudelocque contends that, even if a child be fed on a sufficient quantity of good and nutritious food, if living in a house so placed that the sun's rays do not reach it, or the fresh air cannot be supplied in sufficient quantities, the strumous diathesis will in all probability be induced. "If," says he, "the house be small, dark, low, and badly aired, scrofulous disease will inevitably intervene;" and it is very certain that, in the houses inhabited by the artisans in the larger manufacturing towns, even when a sufficient supply of food is given, such food cannot properly be assimilated in the absence of light and pure air. What must inevitably be the result of keeping an infant in a close, dark, badly ventilated room? The external lymphatic glands, more especially those of the neck, enlarge; the hue of health will be exchanged for a pallor which gradually creeps over the countenance; the muscles become soft, the abdomen enlarged; and, in a very short time, the tuberculous constitution may be established, and this too in a child whose parents are perfectly healthy, and whose brothers and sisters have never exhibited any symptoms of phthisis. These evils of course exist in degree; and, even supposing a child brought up in such an abode to escape for a time, what must soon or late be the fate of such a one, first reared in a home placed amid the tainted air of some dark narrow back street of a large town like Sheffield, and then, at the age of eight, ten, or twelve, set to labour at the trade of a fork-grinder?

Excessive dissipation, no doubt, has a tendency to diminish the duration of life amongst many of the Sheffield grinders, although I am most happy to bear my willing testimony to the great improvement which of late years has taken place in the habits of these men. The early age at which so many of them commence their calling prevents, in many instances, even the imparting of the rudiments of education. Ignorance, improvidence, intemperance, and crime, are but too often congenial and inseparable companions; and those who have no resources within themselves but too often seek recreation in intoxicating drinks, and in pursuits which are little creditable to the civilisation of the nineteenth century. Still, as I have already stated, the social condition of the grinders has much improved. In my visits to various wheels, it has not been an uncommon circumstance to find the Sunday-school teacher employed in shaping a razor; and some of the most active and intelligent of the Committee of the People's College and the Mechanics' Institution working by their side. The fact is becoming more and more apparent to these men, and it must be made still more so, that the appliances of science can and will lessen the high rate of mortality which at present exists; and that recklessness which only contemplated, in years that are past, "a short life and a merry one," will, I trust, ere long become an exception rather than a rule. My experience as a Director of the Savings Bank in Sheffield also induces me to conclude, from the increased number of depositors, that some of these men are beginning to think more generally of to-morrow, and that habits of economy and prudence are on the increase. It may be added, that many of the grinders are now members of freehold land societies.

There is yet in Sheffield another very lamentable source of dissipation and wretchedness amongst its artisans: I allude to early marriages. How to support a wife never appears for one moment to enter into the calculations of the boys who get married. Many of the grinders select their "partners for life" from girls who, from a very early age, have been employed

in warehouses, or from hair-seating weavers and spoon and comb buffers, and who are altogether ignorant of household affairs. What is the inevitable consequence? The wages of the husband are not employed to the best advantage. To waste, as a matter of course, succeeds want; home is made miserable; and, in the excitement of company at the public house, and in intoxicating drinks, the husband seeks that happiness which he has not at home. The evils produced by these early and thoughtless marriages, I honestly believe, cannot possibly be exaggerated.

In my next communication I shall endeavour to explain the nature of the occupation carried on by a grinder; to describe the wheels in which they work; wet and dry grinding, etc. I shall also show the number of men and boys at present employed; the average age of the men now working in the different branches of the trade; the ages, so far as they can be ascertained from the books at some of the principal wheels, at which, for some years past, the grinders have died; the effects of grinding on the animal economy; and, lastly, the means which appear best calculated to improve the physical and social condition of these artisans.

Surrey House, Sheffield, March 3rd, 1857.

British Medical Journal.

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THE NECESSITY OF A MEDICAL COUNCIL FOR THE ARMY MEDICAL DEPARTMENT.

IN our last impression, we gave our reasons for believing, with Mr. Martin, that for the shifting necessities of war, and for the startling emergencies which continually arise in the field, the medical department of the army should be governed by a medical officer or field inspector, who should be always in advance with the commissary-general, and should be capable, by his skill and forethought, of anticipating the immediate wants of the troops. It must be clear that this great and important office cannot be performed by an authority acting, perhaps, thousands of miles from the scene of action. Instead of being vastly behind the necessities of an army, as metropolitan directors must be in some cases, measured by the time necessary for transferring his orders, he should be always beforehand and forearmed. The deliberative portion of the machinery necessary for the due conserving of a well trained and expensive army—the power which has to deal with problems of a general nature, which can be considered better at headquarters, should, however, be of a very different nature. The medical affairs of the army, and we may say perhaps of the united services, cannot possibly be ordered properly by one man. We have an able medical director-general of our military force as it is, who, we believe, did his duty actively and well in the late campaign, but who was overwhelmed with obloquy by the public press, and burthened with responsibilities for duties which should not have been put upon him. The medical miscarriages of our army were attributed to Dr. Andrew Smith, at the same time that he was only allowed to interpret "regulations," and delegated with the power of a commissary of medical stores! It is clear that the medical department of our army cannot be starved in its authority in this manner; it is equally clear to all thinking men that so important a branch of the public service cannot be delegated to any one man, for the simple reason that no one man can possibly be found who comprises in his own person the necessary qualifications for the office. It is