EARLY SCOTTISH ESSAYS IN INDUSTRIAL HEALTH*

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Long before the Industrial Revolution and the coming of the machine age, Scottish craftsmen, like their colleagues south of the Border, had their Guilds and Incorporations to safeguard their interests in professional matters and to look after the welfare of their decayed brethren. The Common Chests of the Incorporations were sustained in several ways, partly by entrance fees, partly by membership dues, partly by charitable contributions, and partly by fines imposed on members for breaches of the Incorporation code.

The Pynours

One of the many interesting crafts was that of the pynours, an ancient Aberdeen body later known as the Shore Porters' Society and first mentioned in the Burgh Records in 1498. Up to 1636, admission to the Society was easy and unrestricted; but that year candidates for admission had first to undergo a professional trial before being accepted as fully and privileged members. Such professional trials were by no means uncommon in other crafts, but the special interest of the test to be undergone by budding pynours lay in the fact that it was a test of strength, to which the candidate was subjected under the supervision of the Water Bailie; and only candidates who passed the test were licensed by the Magistrate. It is believed that this test of strength lay in ability to carry without resting a back lift of one hundredweight from the Block House at the harbour mouth to the Braid Gutter up in the heart of the town. The test was primitive but severe when the distance, a long mile, and the elevation were taken into account: and it must rank as one of the earliest Scottish examples of a test of physical capacity for work to be undertaken. No class of the community had more need to provide for old age and infirmity than the pynours, for each man's stock in trade was his physical strength, and when that failed he was dependent on others.

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The Water Caddies

There were many quaint trades in Scotland in the seventeenth and eighteenth centuries and many colourful personalities. Among them must be mentioned the water caddies, a turbulent crew, who in these days, made a living by selling water to the lieges of Edinburgh and other Scottish towns at a penny per stoup. They were to be seen bearing their staffs and wearing their leather aprons, their little barrels on their backs, negotiating the tenement stairs, ready to curse and brawl on the slightest provocation, a sore trial to the Magistrates.

The Coming of the Industrial Age

But the industrial age was at hand. Sir John Sinclair's analysis of the occupations of the people of Scotland at the end of the eighteenth century showed that while the largest individual group of occupations was still that associated with agriculture, a considerable number were already employed in manufactures of various kinds and in building: and that already over 13,000 families were dependent for a livelihood on work in mines and quarries. This growth of industry was viewed with concern by observers of the times. Sinclair himself saw obvious ill effects of the growth of manufactures on health: generally people went "too early to work"; in addition to which, "eager application, scanty food, and want of proper exercise enfeebles the constitution, produces nervous disorders, and brings in various infirmities which render their lives uncomfortable and hurry them on to premature old age." Lord Cockburn, in a celebrated letter to the Lord Provost of Edinburgh on the best ways of spoiling the City, wrote that mercifully Edinburgh had almost no manufactures, with their legacy of tall brick chimneys, black smoke, a population precariously fed, pauperism, disease, and crime, all in excess. John Galt, referring in his *Annals of the Parish* to the condition of workers in a small cotton town in his beloved Ayrshire, wrote that they

had "a strong cast of unhappy melancholy," and that it cut him to the heart to see so many young men, in the rising prime of life, already in the arms of a late consumption.

Nor were complaints of the increasing tempo of life confined to industrial districts. James Cameron, surgeon in Tain, wrote that the period of daily labour there extended from five o'clock in the morning to six o'clock at night, and that among adults amusements and games of every kind had almost disappeared. "Doubtless they (the people) have of late greatly improved as to enterprise and habits of steady industry; but while they have lost much of that laziness and waywardness imputed to the unmodified Highlander, I fear they have lost also much of his free and serenely joyous spirit." And who will say that Cameron was wrong?

The Mills at New Lanark

There was as yet little interest in the welfare of workers, and the conditions under which they laboured were often very bad, but forces were stirring and things were already on the move. The mills at New Lanark were among the first in Britain to set new standards, far in advance of those generally prevailing, and these standards did not altogether commend themselves to the owners of textile factories in England. Mr. Bayley of Manchester addressed a series of queries to Dale about working conditions in his New Lanark factory and his questions, with Dale's replies are preserved in the files of the London Monthly Magazine for July, 1796.

It appears that the spinning rooms were from 120 to 150 feet long and from 26 to 30 feet wide, with 9-foot ceilings: that each contained about 2,000 spindles and that the number of work-people per room varied from 50 to 75. The hours of labour were eleven and a half each day—from 6 a.m. to 7 p.m., with half an hour off at nine o'clock for breakfast and an hour at two for dinner. Seven was the hour for supper; and in half an hour after that the teaching commenced, continuing till nine o'clock. There were fully 500 scholars, and 16 teachers were employed. On Sundays those children who could not be accommodated in Church were kept busy at school, and on Sunday evenings after Public Worship there was more religious instruction. Education, except for the provision of books, was free of expense to the scholar. The supply of labourers for the mills was recruited either from the native inhabitants, from families who had been attracted to the district from other parts of the country or from Edinburgh or Glasgow, "by the number of destitute children these places constantly afford." Those who agreed to serve for a stipulated

weekly wage were commonly engaged for four years; while those children who were received from city workhouses were generally bound until they had completed their fifteenth year.

The average number of children in the boarding house serving the factory during the four years 1792-95 inclusive was 310, and the number of deaths over the period totalled nine. In the boarding house were six sleeping apartments and three children were allowed to each bed. The children slept on wooden-bottomed beds, on bed ticks filled with straw which was changed once a month. For a few months in summer the children went without shoes and stockings. Their food consisted of oatmeal porridge for breakfast and supper, with milk in season or, in winter, swats—a composition of molasses, fermented with some new beer. For dinner there was every day barley broth made from fresh beef. The beef itself was divided among one half of the children, about seven ounces to each; the other children received about five ounces of English cheese; with now and then a dinner of herrings in winter or fresh butter in summer. To the beef and cheese was added a plentiful allowance of potatoes or barley bread, of which last they also received an allowance every morning before going to work.

Dale reported that the workers, when too big for spinning, were as stout and robust as other young people and fit for any trade. Many of the boys subsequently became weavers; most of the girls left the mills to take up private family service when about sixteen years of age.

The Mill at Catrine, Ayrshire

But New Lanark, though perhaps the best known, was not the only Scottish cotton mill that tried to give heed to the welfare of its workers in these early days. In the mill at Catrine in Ayrshire, which employed nearly a thousand persons, the work-rooms were well ventilated and carefully kept and the workers' houses were well built; the workers were encouraged to become the proprietors of a house and garden. The village had a piped water supply long before its time. The good health of the work-people was something of a byword, "as unlike as possible to the pale languid-looking females too frequently to be found in similar works in great cities." Crime was almost completely absent. Child workers, especially, were looked after with some care: all lived with their parents or with friends, for Claude Alexander of Ballochmyle, the owner of the mills, was no friend of the overseers, and *Oliver Twists* were not invited to Catrine. Evening education followed the same lines as at New Lanark. Alexander anticipated

legislation by a century when he ruled that all workers injured in the course of their employment should receive full wages and free medical treatment until they were recovered.

The Adelphi Cotton Mills in Perthshire

The Adelphi Cotton Mills at Deanston, near Doune in Perthshire, were erected about 1786 and employed about 700 work-people. Sir John Sinclair reports that early experiences in the factory were unhappy, though wages were high. "The confinement of so many people in one house rendered the air they breathed very impure: the heat necessary in preparing the cotton kept the workmen constantly in a sweat, and extracted the nourishing juices; the noise of the machinery rendered them soon deaf; and the flying particles of cotton, and constant labour of the eye in watching the texture of the threads weakened and destroyed the sight."

Improving Conditions

By the time of the Second Statistical Account of Scotland (1845) conditions had apparently improved. The mills employed then about eleven hundred persons, young and old, and were said to contain the most perfect machinery in the kingdom. The bobbins, driven "at the amazing velocity of 8,000 revolutions per minute" were attended by children, chiefly little girls, and the work was said to form an excellent school for training the young to habits of attention and industry: "These little girls follow the employment with spirit and cheerfulness, from eight to twelve hours a day." It was added that all the workers had the privilege of leaving at any moment they chose without previous warning and without fine or punishment.

The New Factory at Deanston

The new factory at Deanston was structurally an improvement on the old. Its ventilation was better, the belts and shafting were guarded, and the solid base of stone floor had a thin covering of wood. "The floor so arranged affords the solidity of a stone floor, and the advantages of the wooden surface to the workers are a diminution of swelled ankles and rheumatic affections of the joints, often produced by working bare-footed on stone floors." By all accounts the health of the work-people was better in the new factory than in the old, and part of the improvement was attributed to improvement that had taken place in the housing of the workers. In particular, cases of rheumatism and of lung disease were said to be less prevalent among the mill workers than among agricultural labourers in the surrounding countryside.

In 1834 twenty children had been sent by the Guardians of St. Martin's Parish, London, to work in the mills at Deanston, and three years later seventeen of them were still employed there, the other three having returned to London, two to the care of relatives, the other, described as incorrigible, having been returned to the Guardians. The Guardians later wrote again to ask whether Mr. Smith, the proprietor, had openings for any more children, and the reply was in the negative: "Our own population grows so fast upon us that we have a plentiful supply of excellent children, who give us no trouble in the training, whilst those we have had from St. Martin's Parish have given us a great deal and they require constant care and looking after." Mr. Smith found, however, that, given such care, and placed not more than two in families where there were other children, the London incomers did begin to show a desire to emulate their associates in attending to their work and education. As evidence of the satisfactory health of these London children employed at Deanston there was produced a certificate issued by Andrew McAnsh, surgeon, Royal Navy, "appointed by Her Majesty's Inspector of Factories for Scotland to issue Certificates relating to the age, strength, and general appearance of children employed at Deanston Cotton Works."

Appointment of a Factory Doctor

Mr. Smith was satisfied that the improved health of his work-people "was attended by more energy and better labour; by less of lassitude and waste from relaxed attention; by fewer interruptions from sickness, and fewer spare hands to ensure the completion of work." So satisfied was he about the influence of health on industrial output that he retained, as early as 1829, apparently at a salary of £53 per annum, the services of a medical gentleman "to inspect the work-people from time to time, to give them timely advice, and, so far as possible, to prevent disease."

The medical gentleman was Mr. John Fraser, Surgeon, resident in Doune, and there is still preserved a book recording sickness absence at Deanston for the years 1829-1832. In this book was entered the name and age of every worker losing time through sickness with the duration of absence, and, in most cases, the diagnosis; and from pencil notes here and there throughout the book it is easy to deduce that Dr. Fraser experienced most of the petty annoyances and some of the misgivings about alleged sickness incapacity that beset the industrial medical officer in later days.

Sickness Absence

It is believed that at that time there were approximately 700 workers in the factory, but nothing is known about the distribution of these workers by age and sex, though there is some reason to believe that young girls formed a large proportion of the labour force. The extent of sickness absence was probably not very unlike that prevailing in our own time (Tables 1 and 2). The total number of incapacities lasting more than three days was very nearly 700 over the three-year period—approximately one incapacity per worker employed.

The conditions most frequently responsible for absence from work were influenza and upper respiratory catarrhs (544), headache (475), sepsis (142), accidents (140), dyspepsia (87), diarrhoea and dysentery (79), rheumatism (73), and eye conditions (52). Among other diseases not common nowadays were typhus (12), hysteria (9), and cholera (3). (The year 1832 saw the first great visitation of Scotland by cholera.)

Ship Builders of Greenock

Not all employers were so enlightened as Smith of Deanston but even the tough ship-builders of Greenock—where there were eight yards each employing 60 to 120 apprentices—each retained a medical man to attend to his apprentices during illness. Perhaps their high accident rate prompted this course, for, in the year ending May 1, 1841, 74 of the 790 cases treated in Greenock Infirmary were injuries, mostly the result of accidents in the yards: incidentally, 583 of the 790 admissions were cases of typhus fever.

Coal Miners and Iron Workers

For a long time the chest troubles of coal miners and iron workers were a great source of interest to Scottish doctors. In 1831 Dr. Gregory reported the case of a collier from Dalkeith whose lungs showed a peculiar black infiltration throughout, and this first report was followed by a series of papers on the same subject. Dr. Hamilton of

TABLE 1

SICKNESS ABSENCE AMONG MALE WORKERS AT DEANSTON MILL, 1829-32: APPROXIMATE NUMBER OF WORKERS OF BOTH SEXES, 700

Age	Total days lost*	No. of absences	Duration of incapacity in days							
			1	2	3	4—	10—	20—	30—	Not stated
10—	847	241	120	47	22	35	8	4	2	3
20—	503	93	34	17	9	18	5	5	2	3
30—	200	31	16	5	1	3	1	2	2	1
40—	121	17	5	4	2	3	1	—	2	—
50—	337	11	3	1	—	3	2	—	1	1
Not stated	6	4	—	1	—	1	—	—	—	2
Total ..	1,914	397	178	75	34	63	17	11	9	10

* Apart from days attributable to the 10 cases of unstated duration.

TABLE 2

SICKNESS ABSENCE AMONG FEMALE WORKERS AT DEANSTON MILL, 1829-32: APPROXIMATE NUMBER OF WORKERS OF BOTH SEXES, 700

Age	Total days lost*	No. of absences	Duration of incapacity in days							
			1	2	3	4—	10—	20—	30—	Not stated
10—	5,500	1,399	610	282	138	250	67	15	21	15
20—	3,804	745	318	145	67	149	29	17	15	5
30—	239	74	30	12	11	18	1	2	—	—
40—	41	9	2	1	—	4	1	—	—	1
50—	187	7	2	—	—	1	1	2	1	—
Not stated	1	1	1	—	—	—	—	—	—	—
Total ..	9,772	2,235	963	441	216	422	99	36	37	21

* Apart from days attributable to the 21 cases of unstated duration.

Falkirk described a similar case in 1833, his patient being a man who had been employed for forty years by the Carron Company as a moulder, "in which occupation the workmen are continually exposed to the inhalation of a fine powder, composed in great part of very finely ground charcoal." Dr. Girdwood of Falkirk had two other moulder patients similarly affected. Dr. Graham of Glasgow described a similar condition in a collier from Polmadie, as did other doctors in the West of Scotland. Dr. Thomson of Perth, who had formerly worked in Tillicoultry, described a similar case that he had seen in mining practice there; and Dr. Archibald Makellar dealt with conditions as he saw them in the coalfield of East Lothian. "The collier," he wrote, "at last unavoidably falls a victim to lesions within the cavity of the chest, arising from the nature of his employment." He found that the ventilation of the mines in East Lothian was very much neglected, that for a generation coarse linseed oil had been burned in the miners' lamps instead of whale oil, with greatly increased production of smoke, and that from blasting operations the men inhaled much gunpowder smoke.

Dr. Stevenson of Musselburgh wrote in 1840 of the colliers there that "Almost every one is affected more or less with dyspepsia; they are also very subject to diseases of the lungs (I would say that one in three are affected with asthma); but the nature of their work I should consider as often producing these, more especially as they are frequently accompanied by a kind of spit, only known I believe among colliers—I mean what is called the black spit, produced I should suppose by their inhaling small particles of coal along with the air in the pits. I was at the dissection of a young man, a collier, last winter, who died of enlargement of the heart, and on examining the lungs we found them completely gorged with fluid, which, when squeezed out with the hand, had just the appearance of ink: this young man had not been at the pits for some weeks previous to his death." Dr. Stevenson advocated the provision of improved air in collieries, with, if necessary, the use of respirators, as well as control of colliery accidents and of the employment of children in collieries; he thought that mines should be under similar control to factories. A neighbouring practitioner, Dr. Allison of Tranent, also knew well

that mining was an unhealthy trade. From statistical survey of thirty-five colliers' families he found the average age for each male head of the family to be 34 years, whereas the average age of thirty-five heads of farmer families in Tranent was over 51 years. Many of the miners were in bad health, suffering from "difficulty of breathing, cough, with expectoration of a black colour resembling ink, and are affected with greater or less emaciation." In the thirty-five families studied, taken without any selection, Dr. Allison found that there were ten widows.

A little later, in 1851, Professor Bennett tried to sum up experience of lung disease among miners as it occurred in Scotland. He found that the disease was common in colliers, as in moulders of iron and copper: "yet it is curious that whilst it is common among the workmen of some coalpits it is unknown among these employed in others. For instance, it exists to a great extent among the colliers of Fife, Haddingtonshire, and Midlothian, but is unknown at Newcastle, Paisley or Alloa, although the dust and powder is as finely levigated in one place as in another." Bennett found that miners doing stone work in the pits were particularly liable to the condition.

Then and Now

These were the early gropings of a hundred years ago; they showed among the physicians and industrialists of their day an interest in industrial health. We may ask, how do we stand now? By comparison, I fear, not too well. We have still some enlightened employers; we have, generally speaking, a level of social conscience among our people which we are unwilling to regard as falling short of that south of the Border; we have still doctors interested in industrial health. But the traditional heavy industry of Scotland—and especially of Clydeside—is apt to be spartan in its outlook: employers and work-people alike have been bred in a hard school. It would be idle to pretend that Clydeside is accustomed to regard industrial health as a high priority; and we welcome this visit, partly from its opportunity for professional counsel, partly as a stimulus to efforts worthy of our Scottish heritage.