Thesis

On the effect that the trade and mode of living have upon the health and physique of the Lancashire working People

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The effect that the trade and mode of living have upon the health and physique of the Lancashire Working People.

In writing upon this subject, I have chosen a portion of the north east division of the county, as an illustration, particularly the borough of Bacup, a good sample of the numerous towns & boroughs villages which have sprung up within the last 20 or 30 years. In referring to facts which may have happened from 20 to 40 years ago, I state them on the authority of my father, who has practised in this district for nearly fifty years. With regard to statistics, I am sorry not to be able to produce official ones, firstly, because accidents & causes of death are tabulated in such a slovenly manner, that in trying to unravel such a heterogeneous mass, one would get involved in difficulties requiring almost superhuman patience to overcome, and secondly, because the tables are so scanty that they would give no accurate information.

The Statistics given are thrown from notes made by myself during the last seven years, & from information derived from other residents. I intend to describe the trades carried on in this district, how they affect the people generally, then more minutely, how they affect adults and children, and also the mode of living. These two subjects are so interwoven, that I think I can best illustrate my subject by taking the two things together. The great trade of Lancashire is the manufacture of cotton cloth, and upon it I shall chiefly dwell, but there are others, such as dyeing, printing, & the manufacture of woollen cloth which are factors in the trade of the county, & and have more or less effect on the health of the people.
Some fifty years ago both the cotton & woollen trades were in a decidedly rudimentary state. At that time the weaving was all done in the cottages, and from the following account from an old patient now eighty, of the sort of life they led. They rose at 5 A.M. and worked continuously until 8 or 10 P.M., their diet was porridge & skimmed milk, and their wages were fifteen a day. The cotton & wool were carded in small factories turned by water, it was then brought home, & spun on the spinning jacks

or in some places on the then newly invented jennys. the warp, after it had been spun, was sized before it could be woven, & in order to do this, they had large pans filled with the sizing mixture (flour & water). After it had been sufficiently steeped, the warp was carried out by the women & children to be dried in the fields, or else by the help of a red hot-iron. On enquiring at what age the children began to work, I was informed "as soon as they were able", and one old woman told me that when she was a child, she was indulged by her parents, and had only to work from 8 a.m. to 8 P.M., and she was at the ripe age of five. On being asked about their health, the general answer given is, "Why we never ailed aught and had no need for you doctors"; & when one compares the hale old men & women, with their fresh colour and good teeth, with the present generation, white, puny, and with bad teeth, one is inclined to think that the mode of living in the past, when they worked hard in their cottages, brewed their own ale, and were content to live on porridge & milk was much more beneficial to the race, than the mode of living at this present time, with its compulsory in Schools, crowding in factories, high living, and all its concomitant train of ills, notwithstanding even the advantages of the Factory Acts.

There is no doubt that the pure air & simple food had

a great deal to do with prolonging peoples' lives. their occupation also was healthier, being, in those days, they dozed with pure flour, and were not living, as at present, in an atmosphere impregnated with china clay, into which steam is constantly poured. Unfortunately I am not able to classify the deaths which took place in those times, as there were no records, but I have searched the register of the Bacup Parish Church, the chief place of burial for the surrounding districts, from 1813 to 1852, during which time hand loom weaving was in full swing. The numbers of deaths were 24.00, & of children up to the age of five years 49 per cent died; from 6-20 years 9 p.c.; from 20-50 years 13-5 p.c.; from 50 to 70 years 14-5 p.c. and above 70 years 14 p.c.. The end of the first period marks the time at which the children began to work, the second includes the time in which they became adults and married, the third period the prime of life and child bearing time, the last two being the time when they were slowly declining. The proportion of deaths is in the following ratio

	Males.	Females
In the first period	77	78
In the second period	30	33
In the third —	24	45
In the fourth —	26	23
In the fifth	14 —	20

We have found that with the exception of the first period, the numbers follow the general rule, & the only way in which I can account for the high rate of infant mortality, is that the children were not properly taken care of, and that the mothers worked during the whole period of their pregnancy. In looking over the register, I find only 3 cases where the mother & child died on the same day, or a few days after, and from what I can gather, there was very little abnormal midwifery. The practice was entirely carried on by midwives, the patient kneeling on her knees, the operator pressing on the abdomen with a jacket towel with her arms in the patient's back. I have been told, it was quite the exception for the doctor to be sent for as the women were well made, which is not now the case.

We now pass from the period of handloom weaving, and come to the time when the people began to be crowded together in factories, and this may be subdivided into the time before the American war, and the time after the American war, when china clay superceded flour & water. The first factory legislation which we meet in regard to the restriction of the hours of labour of young persons was in 1833, when an act was passed wherein it was provided,

that no young person under the age of 18, should be employed in any factory at any description of work, for more than 12 hrs a day, or 69 hours in one week. We next pass on to the act of 1844 which was most wise and beneficial, as it not only confirmed the previous act, but included women in the same category as young persons. By this act the appointment of factory inspectors and certifying surgeons was made. all the children up to 13 years of age having to pass under his hands, to see if they were fit for work, the age for half timers being 8 years, for young persons 13 years; it also provides for children working alternate days & for school attendance for 3 hours per diem, if working every day, or 6 hours, if every alternate one & that no children should be employed more than 6½ hrs in one day. The factory surgeon had large discretionary powers; if he thought a child was fit to work, he could pass it, even if it were slightly under age, or, if on the other hand he thought the child were delicate and unfit for work, he might refuse it; it is the opinion of old certifying surgeons, that this discretionary power has acted better than in any of the late acts where the passing is wholly done by birth & school certificates.
The certificates for passing the children, kept in the Office of the Mills, were as follows. "I — of — duly appointed certifying surgeon do hereby certify that — son (or daughter) of — & — residing in — has been personally examined

"this — day — that the said child has the ordinary
"strength and appearance of a child of, at least eight
"years of age, and that I believe the age of the child
"to be eight years, and that the said child is not
"incapacitated from disease or bodily infirmity, from
"working in the above named factory, for the time
"allowed by the act". The certificate for the young
person was materially the same, only "young person"
and thirteen years of age" were substituted for "child" and
"eight years of age" —

The act then provides for the cleansing of the mills, and
orders the interior of the factories to be lime washed at
least every fourteen months; it forbids children or
young persons to be employed in cleaning the machinery
while in motion; it orders all dangerous machinery
to be fenced in, and all accidents to be reported to
the Surgeon, who is to examine the accident, the
place where it happened, and to report the same to
the inspector. There is one bad point in the act; it
allows of the recovery of lost time, i.e. if the factory
had been stopped through some failure of the machinery
the young persons (which includes women) and children
were allowed to make up for lost time, except on
Saturdays when work had to cease at 4.30 P.M.
There are also regulations for meal times which

allow an hour and a half for meals in the course of the day, and the act also forbids any young person or child working above five hours without a meal. The next act of any importance was passed in 1847 & 48, in which the hours of labour for women and young persons are shortened from 12 hours a day to 10 hours, and to 63 hours a week instead of 69 hours. Then comes the act of 1863, in which it is enacted that no child a young person can be employed in a factory before 6 a.m. or after 6 p.m. except to recover time, and the time for overwork shall not exceed one hour before 6 a.m. or after 6 p.m.; also no child a young person may work on Saturday after 2 p.m. for any purpose whatever. The Act of 1867 is called the Factories' Extension Act. In this act a large number of trades are included, such as those of iron, copper, paper, glass, dyeing, printing, bookbinding, baking, &c. and the act defines, "Manufacturing" to mean "any manual labour, exercised by way "of trade, or for purposes of gain, in, or incidental to the making of "any article, or part of any article, or in, or incidental, to the "altering, repairing, ornamenting, finishing, or otherwise "adapting for sale, any article." This extension of the act includes many trades for which legislation was pretty much needed, and and in some measure remedied the overcrowding and overworking of apprentices and young persons in tailors' & milliners' shops &c. The act of 1874 now

comes under consideration; in it the time for children & young persons to work is between 6 a.m. & 6 p.m.; or between 7 a.m & 7 p.m; they are not allowed to work continuously more than 4½ hours without half an hour for meals; two hours per diem are allowed for meals. On Saturday, if one hour is allowed, the works close at 1 p.m.; if less than an hour, at 12.30 p.m. Children are to be employed every alternate day or half day, and are not to be employed on consecutive Saturdays. The meals are required to be at the same hour every day, and during those times all employment is forbidden. The most important feature is the abolition of that clause of the Act which allows over work to recover lost time. The age at which the children and young persons are allowed to begin work is raised; being for children 9 years, if they have passed the 2nd Standard, & 14 for young persons, unless they have passed the 4th.
The elementary education act of 1876 further raises the standard of age for children beginning work to 10 years, & under certain penalties enforces the duty of parents to educate their children. It also regulates the school grants, which are paid to the school according to the efficiency of the scholars in passing their standards -
I have now given a brief statement of all the factory legislation and there is no doubt, taking it all in all, that it has done a great amount of good in improving

the lot of the operatives, in preventing overwork; in minimising the number of accidents, occurring through the unprotected state of the machinery; and in keeping the factories and workshops as clean and healthy as possible. I am not sure that the last act was an unmitigated blessing, as some people would have us believe, and I certainly do not stand alone in that opinion.

I shall now in a couple way describe the process of manufacture.

The cotton used is of three sorts, American; which is the best & cleanest, Egyptian; and Surat which is worst. The first process is mixing the cotton; i.e. taking a certain amount out of the different sorts mixing them together, in order to get a cotton to make a fair cloth; this is generally done by elderly people, & it is very easy work as they can do it in a sitting posture. There is a good deal of dust flying from the cotton which causes a certain amount of phthisis, but not more than one would expect from any dusty occupation. But before the American war the great supply came from America and the occupation in those days consisted in mixing the different kinds of American together, which was not nearly so dusty a process as it is now. I have heard from several persons that it was an occupation sought after by people of advanced years, but now [illegible] those

the work is not hard, it is never taken unless by persons unable to do anything else. The next process in the manufacture is the breaking up of the cotton which is done by the willow. This machine consists of a number of knives placed in rows on a drum, to break up the cotton. In the old time this was not properly boxed in and was a great source of accidents, but now it is covered up and the cotton passes up a kind of flue. During the last seven years I have only had one accident, and that was through the man's stupidity in attempting to pick some cotton from the knives, which were making one thousand five hundred revolutions per minute. He got his hand & forearm in, & I had to amputate below the elbow.
The next processes are the scutching & carding, by which the cotton is cleaned & brought into laps. In the old style of machinery the dirt flew about the room, & this was one of the most prolific sources of phthisis. Now, since the improvement of machinery, a shaft has been attached to the engine, by which all the dust and waste of the cotton are blown into a room called the dust hole. This product is sold as cotton waste to make shoddy, and in that way the expense is compensated.
We meet with a large number of accidents in the carding & scutching rooms, and in 99 cases out of a 100 they are caused by pure carelessness, very often by children

lifting up the cover to the machinery working, or by people attempting to pick off cotton while the machinery is in motion — Both my father and I found that in this district of which he was certifying surgeon, and which contains a population of over 25,000 and 96 factories, of the accidents, which averaged from 90-100 per year, considerably over 50 per cent are caused in the carding or scutching rooms, and that these accidents are always of a bad type, as the bent wire brushes of which the card is made cause a great amount of lacerating of the hands.

The cotton is then carried on to the slubbing, drawing & roving frames. The temperature of these rooms is very high, Carding & Scutching rooms 83 Fahr, of the Slubbing & Spinning rooms being 87 Fahr. The chief part of the work is done by women who, especially in the slubbing department, have to carry large tins containing the cotton in the process of manufacture after these processes the cotton is taken on to the throstle-spindles for warp yarn and the mule-spindles for weft. The mule which is used for making the weft is a complicated machine, furnished with a movable frame or carriage running upon iron rails; this carriage moves backwards & forwards drawing & twisting the thread as it does so. The men who look after these machines are obliged to follow the carriage on its way

backwards & forwards brow footed, and the constant walking up and down on the hard floor causes a great many cases of flat-foot; in fact nearly all the cases of flat foot that we get in this neighbourhood are in mule spinners - This disease I am sorry to say gives great play for bone-setters, because as the treatment for flat-foot is rather a tedious one the patients generally get tired of their own medical attendant & drift into the hands of those quacks who assure them that a bone is out of its place & after wrenching the foot inform them the bone is replaced which I am afraid they do not find to be the case. —

The yarn from the bobbins is taken to the weavers who prepare it for the sizers - This process of sizing the warps causes the period I made in the diseases of the cotton trade. The strain on the warp during the process of weaving is very great and from the earliest times weavers have prepared & dyed the warp threads with some preparation before weaving with a view to strengthen them. The material used by ancient oriental nations was rice-water. The method first adopted in Lancashire was simply to pass the threads through some adhesive substance such as flour paste & to dry them This saw the epoch

strength required for the warp to pass through the loom but it made the cloth produced feel harsh. Tallow or oil was then boiled with the flour or starch paste to give it the desired softness, and this mixture gives all that could be desired for the simple manufacture of the fabric. This was practically the process before the American War. On enquiring of some of the elderly weavers about here I find that the average amount of size put on the warps was 7-20, i.e. 7 pounds of size to 20 of warp — and from the statistics I shall give, gathered from an inspection of the Registers of births of this district, I shall prove that the weavers of that time were much less liable to phthisis than they are now. The reason of that is this — At that time there was a large amount of capital invested in the cotton trade, but it was chiefly in private hands & the competition was not nearly so great. But after the American war numbers of people flocked into the trade, immense cooperative mills were run up, & very large profits were made. Then a large amount of competition arose & it was found that the large profits were dwindling down, & the cloth had to be manufactured more cheaply. This was done by adulteration. It was observed that different kinds of size & modes of mixing & applying it to the threads of the

warp gave to them properties which made the fabric when woven appear fuller & better; and now to so great a state of perfection has this been carried that there are many in Lancashire who profess that they can tell how much cotton a cloth contains by simply feeling it.

I will now give the substances employed in making size mixtures, but it is difficult to ascertain the exact proportions as sizers are very chary in imparting information about what they consider a secret of the trade. We may divide the substances used into the following:—

I For giving adhesive properties to the size—
Wheat flour, sago ~~flour~~ maize, starch, farina, rice, dextrine, Irish moss;

II To give weight & body to the size & yarn—
China clay, Sulphates of soda, lime, magnesia & soda, Silicates of magnesia & soda, & Chloride of barium;

III Oily & greasy matters to soften the size or yarn—
Tallow, bleached palm, cocoanut, castor, olive & other oils, Shea butter, paraffin, & Japan wax;

IV Other substances used for giving weight & body to the size & yarn—
Chlorides of magnesium & calcium, glycerine & different kinds of grape sugar;

E For preserving the size from mildew—
Chloride of zinc, carbolic, cresylic & salicylic acids,
thymol, & salts of arsenic.
The substance which we have principally to deal is the china clay. This is an almost pure hydrated silicate of alumina which in this country is chiefly derived from deposits in Devonshire & Cornwall.
The following is the analysis of the china clay generally used by dyers

Alumina	40.03
Silica	46.47
Oxide of Iron	.38
Lime & magnesia	a trace
Potash & Soda Salts	1.24
Water fluorine & Organic Matter	11.88
	100.00

The clay is boiled in water before being mixed with the other ingredients of the sizing mixture. The warps are then drawn through this, and after saturation are dried on hot cylinders and then sent to the weaving shed. The amount of size put on to the cloth has immensely increased of late years, very much to the detriment of the weavers. In some of the mills in this district from 150 to 200 per cent is

just on, especially on what are called grey cloths; and, on taxing the manufacturers with this adulteration, they say that in the state of the market they are obliged to do so, the cloth being principally exported to China, India and Egypt where the natives will only give a small price for it because they throw it away when they have used it for turbans & loin cloths, never washing it, but simply turning it on the other side. This cloth would not stand washing because the size is so lightly held in the meshes that, after one washing it, it is a net work of visible holes

The following is a mixture for heavy sizing

Flour (2 sacks)	= 560 lbs	= 37.66 p ct	
Clay (3 bags)	= 762 lbs	= 45.19	"
Tallow	120 lbs	= 8.07	"
Chloride of Magnesium	= 75 lbs	5.5	"
		100	"

The only disease common to sizers is eczema of the arms & legs, very much like grocers or bakers itch. We next turn to the process of weaving. It is well known that the condition of the atmosphere has a great influence on the weaving of cloth, the temperature and the amount of humidity making a great difference; & further that the locality & surroundings of the shed have much

to do with it.

Some little time ago a number of experiments were made by Wm Thompson of Manchester on the influence that water had upon cotton threads. This point was tested by taking nine small hanks of the same yarn. These were accurately weighed separately and each placed in a stoppered glass tube. Three of them were put in a steam bath, dried, and replaced in the tubes; three were placed over some water contained in a plate which was slightly warmed, and moved with a large bellows to allow them to absorb as much water as possible and then put back in their stoppered tubes; whilst the remaining three were left in the original tubes, thus representing the yarn in its unaltered condition. All these hanks were broken by means of a yarn tester, ~~of~~ each weighed, dried thoroughly, then weighed again, and the following average results of each obtained —

	Original weight of yarn	Condition	Percentage of moisture	Breaking Strain
~~1~~ 1	33·21 grains	Natural	3·93	64 lbs
2	33·33 —	Moistened	17·39	69·2 lbs
3	33·85	Dried	2·85	39·9 lbs

These results show how weaving depends upon the atmosphere, and the position of the shed; that a shed situated in a valley near a stream would be

capable of producing much better cloth than one situated on a hill. In order to make provision for the changes in the weather the manufacturer has to produce artificial moisture that, especially in frosty weather when the air is cold & dry. This is done by the blowing of steam into the weaving shed by means of pipes just a little above the heads of the weavers, & in these pipes are a number of jets through which the steam is blown. When one thinks of a shed in which such large numbers of people are congregated, the air being filled with particles of china clay moistened by the steam, & these the clay falling on the people till they are whiter than millers, flying into every aperture it can find, mouth, nose, eyes & ears, one is not surprised at the large mortality caused by phthisis amongst the weavers, but rather that any of them escape. In the new mills there is an improved system of ventilation with fans; but as the operatives, accustomed to a temperature of at least 80° Fahr., say they cannot bear the cold air & close the ventilators as soon as the overlookers back is turned, this improvement is not so beneficial as it might be. I have been in patients houses when they have come from their

work when them shakes from their clothes such a shower of dust that one might imagine a sack of flour had been thrown over them.

The two chief causes of the accidents in the weaving shed are —

First — The flying out of the shuttle.

The shuttle is made of boxwood, tapered at both ends & pointed with steel, about ten inches & a half in diameter at its centre and about 12 inches long. Unfortunately in the present state of the machinery it is very apt to fly out of the shuttle race & often strikes the weaver; very frequently in the eye, destroying the sight. I have had a great many cases of this sort, & from the great velocity at which the shuttle flies there is as a rule very little chance of saving the eye; happily as the injury is done by direct violence no sympathetic inflammation is in most cases set up in the other eye & the case does well.

There are large numbers of people who still follow their employment fitted up with glass eyes to hide their deformity.

Secondly. The accidents caused by the picking stick or the stick that hits the shuttle to send it on its course.

The stick is attached to the loom by a strap and

constantly moves backwards and forwards striking the pickers. In swinging backwards it projects into the alley between the looms, & careful walking is necessary to avoid the blows of the sticks which are in motion on both sides (especially in old factories where the alleys are rather narrow); but, as familiarity breeds contempt, the people forget about the sticks & the result is that they very often get severe blows; in fact in several cases I have had fractures of the hand & arm.

I have now stated the different processes of the cotton manufacture and have to a certain extent mentioned the injuries and some of the diseases to which the workers are liable. I shall now give the effects on the health of the people generally & then in regard to the other trades I shall mention a few special points that affect the people in a different manner from the cotton trade.

If a stranger were coming into these districts for the first time and were to see the people coming out of a cotton factory the first thing that would strike him would be the general paleness of the people, most of them looking quite happy and well off but yet with a sort of half blookless look. He would notice the majority of the

of the men to be under the average height, & though perhaps broad, yet with a stunted appearance. The women are well developed, many being decidedly good looking, & having in a great many cases large quantities of hair, but still with no colour in their cheeks. This paleness is especially observed in weavers, so much so that I think a person with a little experience could tell in most cases whether an individual is a weaver or not. One thing particularly noticeable about the young weavers is the fine shape of their hands, the possession of which is due to the kind of work on which they are employed, whilst it is also of great advantage as leading to increased dexterity in their operations. The people, the men especially, seem to become prematurely old. The women in many cases leave their work after they have borne two or three children, become stout, regain their colour, & are very often a little gross.

The children soon lose their freshness in the mills, & the girls develope rather prematurely, the period of puberty generally being from 13-14 though in a good many cases I have found it to begin at ~~[illegible]~~ 11 or 12. The boys remain hobbledehoys for a considerable time and often one is astonished

in shaping to one to find he may be married and the father of a small family. The physique of the people has changed very much even in my life. I can remember, some three or four & twenty years ago, when the whole of the Sunday morning in Priory was taken up with bleeding people who came year after year; and on examining the arms of elderly people I often come across the scars of the lancet. In the present state of the race I think transfusion would be more likely to answer than phlebotomy —

The Elementary Education Acts of 74 & 76 are no doubt in themselves very good, but, as in most cases of new legislation, it takes a considerable time to get them into working order, and at the present there are several abuses which will have to be remedied. There is no doubt that the raising of the age at which the children are allowed to begin work is an extremely good thing and will in time greatly benefit the race, but at present I am afraid this is more than counteracted by the over pressure of work in the schools. This over pressure question has been laughed at; and it has been said that it is only a fad of a few people who are always finding some new evil or other; but I think that if an impartial enquiry were made it would be found to be a fact and some

of the first to acknowledge it would be the school-masters themselves. The great evil of the act is the payment by results, and the schoolmasters, who are elected by the board, are obliged to make as many of their scholars efficient as possible, because if one school in a place passes less children than another the managers are dissatisfied & the stipend of the teacher falls short. I speak rather strongly upon this subject because I have had several deaths in children from acute meningitis which could be referred to nothing else but overpressure, and they have all occurred in children of a nervous temperament & immediately before an examination.

Take the following case:- that of a man with a large family of small children & no workers saving himself. The children are packed off to school when they are four years of age. The mother glad enough to get rid of them. They are kept at school the greater part of the day, & have home lessons at night with very little time for play. As the parents wages are small the children's food is generally of poor quality, chiefly consisting of tea bread & butter & pastry & very little milk. The parents are very anxious that their children should

pass in their Standards in order to work on the mile; and the result is that overworked & underfed the children tend to develope into a puny delicate race or succumb before they reach the age at which they are allowed to work, & in this way the benefits of the education acts are lost to them.

The inspector of factories for this district is very much interested in this subject, and as he was a schoolmaster before he obtained his present post I think he is well qualified to study. To a great extend our opinions coincide. The remedies he proposes are these,- 1st That the appointment of certifying Surgeon & Medical Officer of health be combined & that he should visit the Schools at various times & examine the children;

2nd That all home lessons should be abolished the preparation of the next days lessons being done in School;- 3rd Stoppage of payment by results;

4th A series of cheap dinners, for the children who are not able to be well provided for at home.

I for my own part certainly think that until something of this sort is done we shall have continual heartburnings & trouble about

overpressure.

The people, constantly at work in the overheated rooms, come out tired and exhausted. Their appetite becomes capricious and there is a constant desire for stimulants, which they usually take in the form of tea; and I am certainly within the mark when I say that the average amount that a person will drink per diem is three or four pints. The tea is generally strong black & very often well stewed. Pastry of the heaviest description & rich meats are very favourite articles of diet, & altogether the food is not such as to render digestion easy.

The amount of hot tea swallowed destroys the enamel of the teeth, & then the dust from their work & the amount of sweets that they eat soon causes the teeth to decay; and it is quite a rarity to see a person of 20 years of age with sound teeth. A dentist in this neighbourhood told me a little time ago that, although he only charges fifpence for extracting a tooth, his income from that source & the making of artificial teeth amounts to £1500. He makes on an average 84 complete sets and 165 partial sets per year.

As one unjust effect from their mode of

living the people suffer very greatly from dyspepsia, and I am sure that about one half of the cases one has to treat are of this nature. I was speaking with a man who was parish surgeon at the time of the cotton famine and was surprised to hear from him that the rate of sickness during that time was not nearly so great as one would have believed. He accounted for this by the people having had to fall back upon their old diet of porridge & milk.

Next turn to the amount of phthisis we have. There is no doubt that this disease especially attacks the cotton weavers. I have here a table of the percentage of deaths from phthisis which have happened since the year 1852, taken from an examination of the Registers of deaths

Date	1852 – 60	1862-65	1875 – 84
Percentage of total deaths due to phthisis	9	13	9
Percentage of weavers on the deaths from phthisis	30	40	60
Percentage of card room hands in the deaths from phthisis	23		10

These figures fully bear out my statement about the increasing & increasing mortality amongst weavers, & incidentally show the immense improvement effected by the boxing in of the card room machinery.

There is no doubt that the large amount of phthisis amongst the cotton weavers is due in the heavy sizing & I attribute the chief part of the mischief to the china clay. The clay acts in a ~~purely~~ purely mechanical way, for settling on the lungs by its irritation it sets up pneumonia which frequently degenerates into phthisis. I have examined sputa from phthisical cases and certainly think that the clay can be seen in it, though being an amorphous substance it is difficult to demonstrate. I have not been fortunate enough to obtain any post mortems, as the people object; but I am very much inclined to think that the clay would be found deposited in the lungs in the same manner that coal is in coal miners phthisis.

There are two other affections which I think are produced by the dust in the mills

1st A kind of dry eczema of the outer meatus in which there is generally an absence of wax and the drum-head and parts around it become covered with dry scaly epithelium, causing a considerable amount of deafness and irritation.

2ndly Ophthalmia, which very often occurs in the children soon after they begin to work.

Rheumatism is frequently met with, especially

in dry hot weather when steam is forced into the rooms & the floors are watered to moisten the air & lay the dust. The people have often told me that they feel the effects at once.

We also met with many cases of Bright's disease, & generally in those who, coming out of their hot workshops into the cold air, take no care to wrap themselves up.

The general death rate 1853-63 was 25.8 per thousand & from 1873-83, 22.63 per thousand so that though phthisis has certainly increased to a great extent yet the death rate is practically lessened. This is accounted for in a great measure by the decrease in infant mortality

Now intend mentioning a few facts about the health of the women. As I said the menstruation period comes on rather soon & many of the girls are very early developed. As soon as possible they begin full work and are quite as good if not better workers than the men, especially as weavers, and it is not uncommon for a girl of 16 or 18 to run four looms, while is a mans full work. The result of this is that the over-strain in the hot rooms produces a great many cases of chlorosis, in fact it is the chief disease that we meet with in young girls. When times

are good the first thing they think about is getting married, and as a young couple could make from two to three pounds a week they very soon begin housekeeping for themselves. In fact the general complaint of the mothers is that as soon as their children get passed as full timers they think it is time for them to begin "courting."

I must say that the percentage of illegitimacy is not large considering the crowding of the sexes together being only 6.2 per cent; while that of the whole of England 6.4 per cent. This low rate may be accounted for by the fact that most of the early marriages are hastened by previous pregnancy. After marriage the women continue to work in the mills through pregnancy & the result is a large number of abortions which generally occur at the third month. This is so common a thing that many of the women think nothing about it and begin work again in a day or two.

We find a large number of abnormal deliveries. During the last seven years I have attended about 900 cases & find the following Percentage of them abnormal

Instrumental delivery	16 per cent
Breech & foot	2 ———
Version	1.5 ———
Placenta Previa	1 ———
Adherent Placenta	2.5 ———
Puerperal Convulsions	1. ———

In a great many of the cases in which I have applied forceps I have found slight contraction in the antero-posterior diameter both of the brim & outlet; and sometimes approximation of the ischial tuberosities. The result of this is that the head after being disengaged from the brim does not turn in the cavity. The presentation is very often right occipito-anterior. The cause of the contraction of the brim I can understand from the women having to carry such heavy weights when they are children before the bones are completely ossified. The coccyx probably becomes tilted forwards by a slight degree of spinal curvature due to the constant standing and leaning forward over their work. The type of pelvis to a certain extent resembles the funnel-shaped pelvis in the lower part while in the upper part it tends to the richetty one. The conclusions to which I have come in this matter are these,—that the contraction at the brim is caused when they are children, & that the lower deformity is caused by what Play fair describes as the cause of the funnel-shaped pelvis, i.e. an advanced condition of ossification in a pelvis which would otherwise have been infantile, brought about by the development of

of unusual muscularity corresponding to the laborious employment of the individual.
Cases of retained placenta I have not mentioned as abnormal because they are so numerous that one ceases to look upon them in that light. They are generally due to midwives pulling on the cord, which causes hour glass contraction. It follows quite naturally that when there is so much unnatural labour there are a great number of displacements of the uterus the most common of which is prolapse. This occurs generally in women who have had large families & troubles them at the change of life. This is often due to the small amount of care the women take after their confinements, often getting up on the third day —
I should think if a census of all the women from 50 - to 60 were taken a very large proportion would be found to be wearing pessaries of some sort —
As one might expect from the kind of midwifery there is a considerable amount of infantile mortality, but it has decreased considerably from what it was 30 or 40 years ago. The percentage of deaths from convulsions is very much above the average and to a great extent can be accounted for by

the abnormal births, though there are other causes, improper feeding being one of the chief. It is very usual for babies to be fed with tea instead of milk, and tea sops are quite an institution

We get many cases of infantile disease of the ordinary types; a fair proportion of hydrocephalus (I have had to perform craniotomy for tumour) and a large number of cases of curvature of the spine for which during the last seven years I have applied between 30 & 40 Cayes' jackets.

In spite of all this, infant mortality is not nearly as great as it used to be.

Up to 1852 the infant mortality was 69.5 %
from 1852-60 ——— 40. —
— 1860-65 (Cotton famine) 50.5 —
— 1865-75 40. —
1875-84

Of these deaths the percentage from convulsions is as follows

1852-60 30 %
1860-65 35 —
1865-84 31 —

I have now to mention a few points connected with the other trades of the County.

In the woollen trade the first thing noticeable is a modified form of wool-sorters' disease

which occurs in the teasers of the wool. It begins very like malignant pustule, and if taken in time for opening with the knife and touching with a point of caustic cures it. If not taken in time, it gives rise to a kind of slow blood-poisoning forming multiple abscesses in the hand and arm, though as a rule it is not fatal. As far as I can find, the wool that comes from the east and is dead is the most dangerous; but now the disease is very much milder than the wool-sorters' disease of Yorkshire.
Another point is the immunity of woollen weavers from phthisis. In looking over the Registrar not above 2 percent of the deaths from phthisis were in woollen weavers. The wool contains a large amount of natural grease and in the process of manufacture more oil is poured on. I have had several cases of phthisis in cotton weavers & having advised them to leave the cotton and try the woollen work, I have found their coughs to dry up, and they have put on flesh and felt better in every way. Whether this is due to the removal from the dust or to the action of the oily material amongst which they work I cannot say,

but I think both greatly conduce to the work.
Dr Wood of Wakefield who was Factory Surgeon
for many years, principally in woollen factories,
thinks that the oil has a most beneficial effect
on the people. It has often been children coming
from poor districts and getting insufficient food,
become quite fat and plump after working
for some time amongst the wool.
The next important trade is Turkey Red
dyeing. The diseases I have been most
amongst the dyers are a kind of irritation
eczema & a very considerable amount
of furunculus. The old dyers say it has come
of late years, since the system of dyeing has
been altered. Formerly they dyed the cloth
& used blood and the dung of sheep & pigs as
a mordant for the alizarine. The health in
general was good at that time, & although children
might often be seen eating their dinner in
the midst of all the filth they were never
a bit the worse. Now they dye the threads
before weaving & fix the dye with bicarbonate
& arseniate of soda which I think must be
the cause of irritation —
The last point I have to mention is

The small amount of coal miners' & stone-masons' phthisis. The coal miners' instead of being driven by shafts are run into the sides of the hills; and the mines are very dry & the coal being shaley does not fly about much as dust. There are no accidents from explosions of fire damp, only occasionally we have black damp. (CO_2). The stone got from the quarries, of which there are great numbers is a kind of sand stone or flag work, used for paving; it is a hard damp work & splits in layers producing very little dust; and I am sure that the quarrymen when they work at drunks alone are by far the finest and healthiest men we have in this neighbourhood.

I have now finished my account of the effect that the trades & mode of living have upon the health of the work people, and I think there is no doubt that the cotton trade is the most hurtful. Knowing all these facts one is led to see the necessity of an inquiry into the whole subject that the abuses may be remedied and the health of the people increased.

The measures which I think might do some good are as follows:-
1st The Abolition of heavy fagging & the thorough ventilation of factories;
2nd Increase in the number of Inspectors of Factories so that the laws may be properly carried out; at present they are very much overworked;
3rd The appointment of Factory Surgeon & Medical Officer of Health to be combined; the holder of such an appointment to be debarred from general practice;
4th The establishment of Gymnasiums & public playgrounds for the School children;
5th Teaching a system of domestic economy in the Schools;
6th Cheap public health lectures for women, something like the Gilchrist, or Ambulance lectures, to be held in every town, where by payment of one penny mothers might learn a few of the simple laws of health;
My ideas on the subject may be slightly Utopian, but I am certainly of opinion that if these improvements could be carried out we should find the people regaining not-

their former development perhaps, as they live in towns, but becoming much stronger and more fitted to cope with the duties of their calling.