

Field (C.C.)

STATISTICS OF COMB-MAKING

IN

LEOMINSTER.



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1852.



By CALEB C. FIELD, M. D.

WITH AN INTRODUCTION,

By SAMUEL A. GREEN, M. D.



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THE following account of Dr. Field's article on Comb-making at Leominster is given in order to show why it is here reprinted. His paper, prepared originally for the American Statistical Association, was to have appeared in the second volume of their Collections, which was in part printed, but never published. Unfortunately the sheets of the volume, so far as struck off, with the exception of two or three copies belonging to some of the officers of the Association, were burned at the time of the Great Fire in Boston, which broke out in the evening of November 9, 1872. Two file copies of the volume, more or less complete, then in the hands of the Recording Secretary, the Rev. Joseph B. Felt, D. D.,—but both containing Dr. Field's paper,—were saved, and afterward given respectively to the Massachusetts Historical Society and the Boston Athenæum; and a third copy of this paper alone was presented to the Boston Public Library by Dr. Edward Jarvis. It is believed that these printed copies of Dr. Field's article on Comb-making are the only ones now extant.

For a more detailed account of the various papers in the missing volume of the Collections of the American Statistical Association, see the "Publications" (I. 328-330) of that society for September, 1889.

CALEB CLESSON FIELD, the writer of the article, was a son of George and Phila (Holton) Field, and was born at

Northfield, on May 27, 1810. He received his preparatory education at the academies in New Salem, Massachusetts, and Chesterfield, New Hampshire, and in Amherst, Massachusetts; and he graduated at Amherst College in the Class of 1833. Besides attending a course of lectures at the Harvard Medical School in the winter of 1836-37, he pursued his professional studies under the guidance of Dr. James Deane, of Greenfield, and Dr. Amos Twitchell, of Keene, New Hampshire, and took the degree of M. D. at the Dartmouth Medical School in 1837. Immediately afterward he settled as a physician in Leominster, where he continued to reside until his death, which took place on May 6, 1881. For more than forty years Dr. Field was a member of the School Board in that town, and for two years a representative to the General Court. He filled many positions of trust and responsibility in the neighborhood, and in his death the community sustained a great loss.

On May 27, 1839, Dr. Field was married to Hannah Crosby, youngest child of Timothy and Bridget (Blanchard) Danforth, of Amherst, New Hampshire, who died on May 14, 1857, aged 36 years, 6 months, and 3 days; secondly, on January 7, 1858, to Mrs. Ann Sophia (Warren) Carter, daughter of Ephraim and Nancy (Moors) Warren, of Lunenburg, and widow of William Sawyer Carter, of Leominster, who died on January 16, 1860, aged 34 years, 7 months, and 26 days; and, thirdly, on March 28, 1861, to Martha, daughter of Luke and Sally (Beaman) Joslin, of Leominster, who died on October 9, 1882, aged 68 years, 2 months, and 15 days.

S. A. G.

*** The paging of the original article is indicated by the broad-faced type enclosed within brackets.

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ITS HISTORY.

THE manufacture of Combs from Horns was begun in Leominster about the year 1770, by *Obadiah Hills*, who went to that place from the town of Newbury. His descendants are now, and ever have been, engaged in the same business. Silas Hills, a younger brother of the said Obadiah, and now living at the advanced age of 92 years, together with *John Chase*, *Joseph Tenney* and *Edward Low*, all of whom came from Newbury, were also early engaged in Comb-making.

The business was then pursued on a small scale, compared with the present operations. With a cash capital of \$100, each man employed could make about \$500 worth of Combs in a year. Almost the only Combs made then were the old-fashioned kind, with coarse teeth on one side and fine teeth on the other. No *Fancy Combs* were manufactured until the commencement of the present century. The tools used by the workmen were few and simple, and were worked by hand and not by machinery. The Wooden-wedge Press, so called, had not been supplanted by the more perfect machine of the present time. In this press, the pieces of horn, when taken from hot water in which they were softened, were placed between cold iron plates, and pressed by driving with force a large wooden wedge. About thirty years ago, in 1822, the Iron Screw Press was introduced from Rhode Island,

by Jabez B. Low, the son of the above-mentioned Edward Low. In this press, heat was applied, to the iron plates, to aid the process of pressing. [1]

In preparing the horns in their rough state, almost the only tool then used was the hatchet; while their division into sections was accomplished in a tedious manner by the hand-saw. The horns were softened and clarified by hot water instead of oil, as the latter article was too expensive for general use. All the various processes in the manufacture of Combs were slow and imperfect; and all the implements used were ill-adapted to their purposes, except the grail, which was then, as now, a perfect finishing-tool for the Comb. It is said that previous to the use of the "cold press," the horns, when softened by hot water, were stamped upon by the feet on the floor, and then placed under a heavy, flat stone, to be pressed.

Then, as the Combs were made without machinery, the labor was performed by each Comb-maker in an apartment of his dwelling-house, or in a small shop attached to the same; but now, the work is done mostly in large factories, by the aid of steam or water power. In one factory, 50 or 60 persons are employed, and in five or six others, 20 or 30 labor together.

GROWTH.

In regard to the *growth* of the business, but little information can be found. In Whitney's History of the County of Worcester, published in 1793, under the head of History of Leominster, may be found the following:—"And, besides, the manufacturing of Combs is here established in two or three places, and the work is carried on to great perfection and profit. About twenty persons work more or less at this trade. About ten persons are constantly employed, and they manufacture about six thousand dozen a year. Among them is one Nathaniel Low, who makes ivory combs equally good, perhaps, as any imported from any country."

After the introduction of the Iron Screw Press in 1822, the manufacture increased more rapidly; so that, in 1845, the "Returns of the Assessors" to the Secretary of the State, showed the following to be its amount:—

No. of shops or factories,	24
“ “ persons employed,	146
Value of Combs made,	\$77,400
Capital employed,	22,000 [2]

Undoubtedly the value of Combs is returned too low ; at least, that is the opinion of our best and most extensive manufacturers. It would naturally result, that the least probable amount should be given in to the Assessors. Probably, at that time, not less than \$100,000 worth of Combs were made annually. Corroborative of this opinion may be mentioned the fact, that, according to the same returns in 1845, while in the town of West Newbury, with only 86 persons employed, \$70,700 worth of Combs were made in a year ; in Leominster, with 146 persons employed, only \$77,400 was the value of the yearly manufacture. From the same source it also appears that, in 1845, more than one-third of the Comb-making in the whole State was carried on in the town of Leominster.

From the same published returns in 1845, it is found that the aggregate amount of the manufacture in the whole State, and the extent of the same in each town, where the business was pursued at all, was as follows :—

The aggregate amount in the State—

No. of shops,	71
Persons employed,	340
Value of Combs made,	\$198,965
Capital employed,	73,100

The amount in each town may be seen by the following table :—

Towns.	No. of Shops.	No. Employed.	Value.	Capital.
Leominster,	24	146	\$77,400	\$22,000
West Newbury,	25	86	70,700	22,575
Lancaster,	5	32	16,200	9,000
Northborough,	3	26	15,000	6,700
Holliston,	1	20	10,000	8,000
Bolton,	1	3	1,200	700
Haverhill,	3	12	3,760	550
Boston,	1	2	1,500	1,050
Tyringham,	2	4	1,000	900
Pittsfield,	1	1	83	25
Amesbury,	1	1	300	100
Conway,	1	3	800	400
Salisbury,	1	2	522	300
Attleborough,	2	2	500	
14 towns,	71	340	\$198,965	\$73,100

From the above table it seems probable the Assessors in [3] most of the towns did not return real estate, machinery, tools, &c., as capital.

PRESENT AMOUNT.

Since 1845, the business has increased more rapidly than at any former period. The following table will show the extent of the manufacture in 1852. For information, personal application was made to all the Comb-makers, and the estimate may be relied on as nearly correct:—

No. of shops or factories,	28
“ “ firms or companies,	28
Individual head Comb-makers,	44
Persons employed, males 264, females 50,	314
“ engaged in the business,	358
Value of Combs made annually,	\$270,000
Capital employed,	85,000
Real estate, machinery, tools, &c.,	55,000

The cash or credit necessary to carry on the business, after the shops, machinery, tools, &c., are in readiness, is alone reckoned capital. The value of real estate, fixtures, &c., makes a separate item.

More persons are now employed in Leominster alone, and a third more value of Combs is made annually, than in the whole State in 1845.

KIND OF ARTICLE, WAGES, &C.

Fancy Combs, of all kinds, constitute the chief part of the manufacture. They are made from Horns, and are called "Side, Tuck and Pocket Combs." Raw-horn Pocket Combs are made, to some extent; and, within the past year, the manufacture of Shell Combs has been commenced.

The South American Horns are mostly used, and are purchased chiefly in New York.

New York City is the chief market for Combs, though some are sold in Boston and Philadelphia.

Males are paid on an average \$1,00 per day, reckoning ten hours for a day; but some expert hands, laboring twelve or [4] fifteen hours a day, and receiving pay by the dozen, often earn nearly or quite double that sum. *Females* are paid \$3,00 per week. Both males and females board themselves out of their wages; and the price of board for males is \$2,25, and for females \$1,50 per week.

PROFIT.—EFFECT ON MORALS.

The business of Comb-making has always been very fluctuating, sometimes yielding ample profit, and at other times carried on with loss. To those who have been engaged in the manufacture for a series of years, and who manage the business carefully and shrewdly, the average profit has been between ten and twenty per cent, probably about fifteen per cent. Comb-making, besides having been profitable on the whole, to those engaged in it, has been a source of much wealth and prosperity to the town.

I am not aware that the business of Comb-making has any injurious influence on the moral character of this people. For industry, thrift, temperance and general intelligence, Leominster has ever ranked high; in fact, in these respects, it has been called the "model town" of Worcester County. Perhaps during the past few years, the influx of laborers from other places, on account of

the great increase of business, may have, in some degree, lowered the high tone of morality before maintained by the native-born citizens; nevertheless, the good character of the town remains essentially unimpaired.

EFFECT ON HEALTH.

An accurate or very satisfactory estimate of the influence of Comb-making on the *health* of those engaged in it, cannot, perhaps, be made; still, there is evidence sufficient for forming an opinion, that may have a tolerable approximation to the truth. I have no Registry of Diseases sufficiently full and extensive to make a perfect comparison of the amount of sickness among Comb-makers, with the general average of disease of the whole population. But from an intimate acquaintance with all classes of Comb-makers and their families for the past fifteen years, and from my limited and imperfect Registry [5] of Diseases, I have no satisfactory evidence that the general health of the *adult* laborers among them is perceptibly less than that of other mechanic laborers. As this is an inference from general observation, it is subject, of course, to all the qualification of probability. But I have long been satisfied, from the same general observation, that the *children* of Comb-makers are sick more, and die younger than other children, on an average; and thus the average length of life of Comb-makers must be less than that of the whole people. This is more susceptible of demonstration than the opinion in regard to the health of the adult portion.

To obtain as correct a result as possible, I have carefully examined the Registry of Deaths, (both my own and the town's,) for the years 1839 to 1851, inclusive—a period of 13 years.

The following table shows the result:—

	Whole town.		Families of Comb-makers.		All other Families.	
	No. of Deaths.	Average Length of Life.	No. of Deaths.	Average Length of Life.	No. of Deaths.	Average Length of Life.
In 13 years, } 1839-51. }	600	33	100	16 1-2	500	36 1-5
In 7 years, } 1839-45. }	252	37	35	16 3-4	217	40
In 6 years, } 1846-51. }	348	29 1-3	65	16 1-3	283	32 2-3

From this it appears, that the average length of life of the members of the families of the Comb-makers, for the past 13 years, has been only $16\frac{1}{2}$ years—just half the general average of the town for the same time. As the Comb-making business increased much subsequent to 1845, and Comb-makers constituted a rapidly increasing portion of the whole population, we will suppose the 13 years to be divided into two periods, one of 7 years (1839-45), the other of 6 years (1846-51); still we find the average length of life of Comb-makers and their families about the same, namely: $16\frac{3}{4}$ for the first period, and $16\frac{1}{2}$ for the latter, only a fraction of a unit from the general average for Comb-makers for the whole time. The diminution of the general average length of life from 37 to 33 years, is caused by the increased proportion of mechanics and young families among the people; for the manufacture both of paper and of piano-fortes has also largely increased during the same period. [6]

The comparative mortality among children under 5 years of age, may be seen by examining the following table:—

Children that died under Five Years.

	Whole town.		Comb-maker's Families.		All other Families.	
	Deaths of Children.	Proportion to total deaths.	Deaths of Children.	Proportion to total deaths.	Deaths of Children.	Proportion to total deaths.
In 13 yrs. } 1839-51. }	175	$\frac{175}{600} = \frac{7}{24}$	48	$\frac{48}{96} = \frac{1}{2}$	127	$\frac{127}{500} = \frac{1}{4}$
In 7 yrs. } 1839-45. }	62	$\frac{62}{252} = \frac{1}{4}$	17	$\frac{17}{35} = \frac{1}{2}$	45	$\frac{45}{217} = \frac{1}{5}$
In 6 yrs. } 1846-51. }	113	$\frac{113}{348} = \frac{1}{3}$	31	$\frac{31}{63} = \frac{1}{2}$	82	$\frac{82}{283} = \frac{2}{7}$

From this it seems that the proportion of deaths of children under 5 years, to the whole number of deaths was $\frac{7}{24}$ in the town, $\frac{1}{4}$ for the first period, and $\frac{1}{3}$ for the last; but among Comb-makers the proportion was $\frac{1}{2}$ for the whole time, and for each period; while among all others only $\frac{1}{4}$ of the deaths were of children under 5 years of age. Now unless a part of this difference of mortality among Comb-makers can be attributed to a different composition of their families, as it may be that there are among them a larger proportion of families of young children, then, it would seem, that the inference might be fairly drawn, that

the average length of life of Comb-makers is only about one-half as much as that of the whole population, and that about one-half of their children die before reaching the age of 5 years, while of the remainder of the population, only one-quarter die thus early.

I have made some investigations bearing upon this point, with much labor and inquiry. From all the families with which I am well acquainted, and in which I practice throughout the town, I have selected for my examination *all* those which contain *two or more children under 10 years of age, one of which children, at least, is under 5 years*. In fact the examination includes a large part of all the families in town, having the above-mentioned number of children. Perhaps I may have passed over ten or twelve families from want of acquaintance, &c. Of these families I have made a record of all the children under 10 years, and also all the children under 5 — the former class including the latter; all cases of sickness among these children during the last three years (1851-53), and the length of such sickness; also all deaths of children under 5 years of [7] age during the last 5 years (1849-53). The children that have died are reckoned among the *whole* number under 10 and under 5. The means of investigation have been my list of cases, my account books, my long and intimate acquaintance with the families, and much personal inquiry where there was any doubt, either from lack of memory or want of knowledge. In this way I have examined seventy-five families, as follows:

Comb-makers,	. . . . .	32 families.
All others,	. . . . .	43 “

This last class have occupations as follows:—

<i>Farmers,</i>	. . . . .	20	Piano-fortemakers,	. . . . .	2
Carpenters,	. . . . .	4	Capitalists,	. . . . .	2
Basket-makers,	. . . . .	3	Miller,	. . . . .	1
Blacksmiths,	. . . . .	2	Mason,	. . . . .	1
Physicians,	. . . . .	2	Butcher,	. . . . .	1
Traders,	. . . . .	2	Shoemaker,	. . . . .	1
Laborers,	. . . . .	2			

The facts in this record can be more readily seen and compared by examining the following table :—

Employment	Number of Families.	Number of Children Under 10.	Number of Children Under 5.	Number of Deaths Under 5. (1849-53.)	Number of cases of Disease. (1851-53.)	Aggregate length of Disease in Weeks.
Comb-makers,	32	92	55	15	83	163 weeks.
All others,	43	137	80	9	66	113 “

From this table we find that, in the families of Comb-makers, with rather less average number of children to each family than among the others, there has been during the last three years nearly twice as much sickness, and more than double the number of deaths, under 5 years of age, during the last five years.

The relative proportions of sickness and mortality among the children of Comb-makers and others, is shown in the following table :—

	Cases of sickness. Per cent of children under 10 years.	Average length of cases of sickness.	Mortality. Per cent of children under 5 years.
Comb-makers,	90. 2	13. 7 days.	27. 2 days.
All others,	40. 8	11. 9 “	11. 2 “

These facts, as far as they go, tend to corroborate the inference drawn from the Registry of Deaths above, that in Comb-makers' families, the children are sick more and die younger, [8] on an average, than the children of other families in Leominster.

Now, what are the causes of this difference in the average length of life between Comb-makers and others? And why this mortality during infancy? Probably the answer to either question would be the true answer to both.

I have before stated that, from general observation, it was not evident that the present adult laborers were subject to diseases peculiar in kind or amount to their particular trade. Neither do I believe that this mortality in infancy pertains to families of Comb-makers in easy and comfortable circumstances; but is confined mostly to the poorer classes of these laborers, and arises from causes common to many other trades and conditions in life. In a word, universal ignorance and constant violation of the most common laws of life and health, constitute the chief cause of this fearful destruction of life, irrespective of any particularly deleterious influence of the trade itself.

These families, for economical purposes, crowd into small and unventilated tenements, over-heated by cooking or air-tight stoves; from want of dietetic knowledge, as well as from habit and perverted tastes, they live upon gross, heavy and ill-prepared food, and, during all the colder part of the year, at least, the children and female members of the family take no adequate exercise in the open air. His occupation abroad or in the shop affords to the adult male laborer an escape, for a portion of the time, from the impure air of his dwelling; and his more laborious exercise obviates, in a great degree, the injurious effects of bad diet. But, for the mother and the children who breathe continually this hot and vitiated atmosphere, and live constantly upon food unsuited to their exercise and age, neglectful often of many other requisites of healthful being, there is no refuge from disease and debility. They drag out a feeble, imperfect and miserable existence, in constant violation of the laws and nature of their physical constitution, until a premature grave becomes the resting place of an enfeebled and diseased organization.

Respectfully submitted to the American Statistical Association.

C. C. FIELD.

