At *Munich*, *Orphan Asylum*, the morning meal on Wednesdays and Thursdays, is milk-soup; other days, water-soup boiled with onions and schmalz. At noon, rice or barley-soup, with boiled beef, twice a-week; dumplings, sourkrout, and water-soup, on other days. The evening meal in winter is, Sundays and Fridays, boiled potatoes and half-a-pint of beer; on the other days, soup with schmalz, and a piece of bread. In summer, it is, Sundays and Fridays, salid and radish; on the other days, soup with schmalz and a piece of bread.

At *Berlin*, *Frederick's Orphan Asylum*, the breakfast is composed of rye-meal soup, and bread; the dinner, of beans, peas, lentils, potatoes, carrots, turnip-tops, cabbage, with ¼ lb. (raw), of cooked meat on Sundays, Mondays, Wednesdays, and Firdays; the little children receive meat daily. For supper, vegetable soup, bread and butter. The larger children have daily ¾ lb. of black rye bread.

At *Vienna*, the *Royal Imperial Orphan House*, the ordinary breakfast is composed of 2½ ounces of bread, and a "seidel"* of soup. The ordinary dinner, beef-tea, boiled beef, vegetables, and 2½ ounces of bread. The four o'clock meal, 2½ ounces of bread. The supper, strong beef tea, and 2½ ounces of bread.

At *Moscow Foundling Hospital*, all the information I have obtained as to diet, is that it is good, but not more vegetable than animal.

At *St. Petersburg*, all the information furnished me by the Director, is that the food is of good quality, consisting of animal food, bread, and vegetables. M. Kohl says that the children have meat daily, with the exception of the fast-days of the Russo-Greek Church, and that on those days they have fish, kapusta, oil, and vegetables.

In *Greece*, the food of the children attending Mr. Hill's schools, was pulse, olives, bread, fruit, fish, cheese; very rarely indeed, meat, "perhaps five times during the year." After leaving the school, the cuttle-fish (sepia) is a good deal eaten.

In *India*, the food of the children is almost entirely vegetable.

* *Seidel*, a pint (German); or, ⅗ of a pint (Rhenish).

In *Philadelphia*, the diet of the Alms House Asylum, consists of milk, coffee, tea, bread, sugar, rice, molasses, potatoes, beef, mutton, ham; and the general diet of the children attending the public school is much the same. Meat, if not eaten once every day, is eaten at least five days out of the seven, and often twice in the day.

Let us now see whether the food of the children bears any evident relation to the prevalence of Scrofula in the Institutions I have named.

At *Lisbon*, of 800 children examined, 279, or 35 per cent. were scrofulous.

At *Munich*, of 300 examined, nearly two-thirds were scrofulous.

At *Vienna*, of 412, coming under medical treatment, 45 were for Scrofula, a proportion four times greater than our own.

At *Amsterdam*, of 495 examined, 209, or 42 per cent were scrofulous.

At *Berlin*, of 230 examined, 129, or 56 per cent. were scrofulous.

At *Paris*, of 132 orphans examined, 56, or 42 per cent. were scrofulous.

At *St. Petersburg*, at the *Imperial Foundling Hospital*, the proportion of scrofulous cases is returned at 249 out of 840, or nearty 30 per cent.; but I am inclined to think, if all cases had been included in which the finger could detect a sensible enlargement, the number would have been much greater, because of the 840 cases, 26, or 3 per cent. are returned as presenting scrofulous ulcers or sinuses, a proportion double that which is found in our own institutions. Five times a week they have animal food. "The Foundling Hospital of St. Petersburgh," says Laurent, "accommodates 18,000 children. Under the Chief Physician, M. Doepp, every thing which is humanly possible is done for the preservation and the education of the children. The ordinary receptions are 5000 annually, the usual number of nurses 800, part of them engaged in suckling the children, others in waiting for new arrivals. These women usually remain five weeks in the establishment, and do not leave it until the children entrusted to them are vaccinated. In spite of all this care, a large number die annually.

From 1822 to 1831, a period of ten years, out of 39,114 admissions, there were 31,779 deaths; and, it is said, the proportion of deaths among new-born children of the poor in the same district is greater, when cared for by the parent. For the district of Moscow the mortality under 5 is 854 out of 1000. In St. Petersburg it is 816*. Those who survive are maintained in the Institution until they are twenty, when they are discharged, well educated, and knowing some profession. Whatever talents they manifest are cultivated; music, painting, dancing, &c." The severity of the climate of St. Petersburg appears to be very inimical to infant life, and it is evident, that a large number of weakly children who might, in other countries, continue to live and bear about them the marks of Scrofula, are here speedily cut off. This, of itself, would lead us to expect that scrofulous children, after six years of age, should be less commonly seen there than if the infant mortality were less severe.

The mortality in the Foundling Hospital at St. Petersburg appears very large, and so it was at one time; in our own Foundling Hospital, when in consequence of a resolution of the House of Commons, in 1756, the admission was indiscriminate for a time; but although it only lasted for three years and ten months it is said, the consequences of this general admission, "were indeed lamentable." The Governors having neglected to provide themselves with proper means of rearing so many children during the most critcal period of human life, by far the greater number of the infants admitted under the new system, died. Of 14,934 children received during the three years and ten months, no less than 10,389 perished in early infancy.

At *Moscow*, of 15,515 children examined, 1294 had marks of Scrofula, obvious on simple inspection. The fact certainly is, that at Moscow, with a mean temperature of 3° 6′ Reumer, the proportion of scrofulous cases is less than at Lisbon, with a mean temperature of 66, at Munich, or Berlin, in India, or even in some parts of our own country.

In the schools of *Philadelphia*, 2998 children were examined, of whom 13, or less than ½ per cent. had marks of Scrofula.

In *Greece*, according to Mr. Kayes' examination, of children in

* Herrmann, Ann. d'Hygiene, T. xiv.

the district of Athens, 26 per cent were scrofulous;—according to the notions of the Greek surgeons, 19 out of every 20 are so. Indeed, so satisfied are the natives of Greece of the prevalence among them, of the disposition of this disease; and so great is their dread of its effects, that, according to Mr. Kaye, as soon as a child attains his eighth or ninth month, they scarify the back, parallel to the spine, with a razor, making from twenty to thirty incisions on either side, "to let out the bad blood."

In *India*, Dr. Spry examined a school of 509 native children, of whom 300 had marks of Scrofula.

The *London Orphan Asylum* I cannot compare with similar establishments of the other countries of Europe, because the authorities of that Institution declined to allow me to examine the children. Without presuming to find fault with such a decision, I may mention that it is the only Institution in Europe or America, in which, upon a similar application, to make the necessary investigation, permission was withheld.

I think the evidence now adduced must produce a belief, that whether children are brought up in town or country, whether their accommodations as to space be ample or confined, whether born of healthy or unhealthy parents, the influence of food in the production of Scrofula is most important, and that the extent to which it prevails, has a very evident relation to the diet of the child.

INFLUENCE OF PARTICULAR KINDS OF FOOD IN THE PRODUCTION OF SCROFULA.

An opinion has been expressed, that a tendency to Scrofula is less frequently produced by coarse and inappropriate, or insufficient food generally, than by the use, for food, of particular substances. Indeed there is scarcely an article of food in common use which has not been charged with inducing Scrofula. Bordeu conceived that even milk produced the disease; whilst Wiseman believed it to be an excellent anti-scrofulous agent.

Haller mentions it as the common opinion in his time, that the people of Gottingen owed the prevalence of Scrofula to the extensive use of potatoes. Although the proof may not be complete, that the use of potatoes, as the staple article of food, tends

to produce Scrofula, it has been made extremely probable that they afford insufficient nourishment; and it is certain that in Ireland, where they are largely and exclusively used, Scrofula is more prevalent, and the value of life less than in England. Reference has been made by some authors to the Bussorah porters and the Boatmen of the Bosphorus, whose diet consists of vegetable matter, and who are capable of great exertion, but whatever may be the truth of the statements made on this subject, and to whatever degree those men can endure fatigue and support labour, without the stimulus which animal diet affords, we must remember how different is the climate they inhabit from that of our own country, and how far removed is their social condition from that of our own labouring poor.

That those who live almost exclusively on vegetable food in this country are less robust, and exhibit a greater tendency to Scrofula, than those who subsist on an ad-mixture of animal and vegetable food, is, I think, true. Our own rural population, as well as that of Scotland and Ireland, bear out the assertion. But, although it has been shown, that insufficient and improper food, however associated, may lay a foundation for that disease, we have in truth, no conclusive proof that any particular article of food directly tends to the production of Scrofula.

INFLUENCE OF A CONTAMINATED ATMOSPHERE IN THE DEVELOPMENT OF SCROFULA.

Before I proceed to estimate the extent to which Scrofula is developed by impure air and insufficient ventilation, I will shortly consider the influence, which those agents exercise upon the general mortality; and should it be thought that I have given to this preliminary inquiry more prominence, than the general question ought to assume, in a work professedly treating of a single disease, my excuse will be found, first, in the fact, that the general mortality bears a very direct relation to that from scrofula, (inasmuch as where the one is large the other is small), and next, in the practical importance of correct views of the nature and extent of atmospheric influence on human life, more especially at the present moment. The overcrowding of our densely peopled districts is said

to be a fruitful agent of disease, and estimates have been made to show that many thousand deaths occur every year from this cause alone. Public attention is thus strongly directed to the subject, and the Report of a Royal Commission, by whom the question has been investigated, must soon be considered by the legislature. Believing, though I do, that exaggerated views are entertained of the extent to which disease is generated by what is called overcrowding, as well as of the efficiency and value of any measures for the amelioration of that evil which can be ensured by legislation, I would approach the consideration of the subject, in no controversial temper, but with a sincere desire by calm and patient investigation, to promote the best interests of humanity, (as those interests ever must be promoted) by the discovery of truth.

When it was shown that the mortality of towns, is much larger than that of Rural Districts (the ratio of such mortality being represented by the respective numbers, 2.733 and 1.906), inquiry was naturally directed to the discovery of some malignant agent, to which the town population was peculiarly subject; and as it was evident that there was crowding in towns, it was assumed that crowding implied the existence of an impure atmosphere, "because human beings must corrupt the air they respire." That condition was, therefore, assigned as the exclusive cause of the larger mortality of towns; although, if the question had been sifted with more care, that excessive mortality would be found either not to be real, or to result from the combined influence of many causes rather than the exclusive agency of one.

If we adopt the selection made by Mr. Farr to show the comparative mortality in Towns and Rural Districts, we find the question stated thus: of twenty-five towns, excluding the metropolis, and having a population of 1,883,693 souls, the deaths amount to 2.733 per cent.; whilst in Rural Districts, having a population of 3,440,501, the deaths amount to 1.906 per cent.

The result of the comparison made by Mr. Farr is this, namely, that in contrasting certain town populations, with certain Rural Districts, the mortality of those towns exceeds, by nearly 50 per cent., that of the country districts with which they were com-

pared. But overcrowding cannot be assigned as the exclusive cause of that excessive mortality, unless it be found to operate uniformly, and to act in a direct ratio to the density of the population. Now whilst the population of the Metropolis in each square mile is greater than that of Bristol or Leeds, the mortality of those towns is greater in proportion to the population than that of the Metropolis.* And the proportion which the deaths, under five years of age, bears to the whole population, is less in the Metropolis, than in Sheffield, Leeds, or Exeter; is less in Manchester than in Sheffield, Leeds, or Exeter; and is less in Liverpool than in Sheffield, although the Metropolis, Manchester, and Liverpool, are more densely peopled than the towns with which they are respectively compared.† And if we compare certain districts of the Metropolis with each other, we find, that in the Unions of East and West London, St. James's Westminister, St. Martin's-in-the-Fields, St. Giles's, Holborn, and the Strand, there is the least space and most crowding, and the mean mortality is 2.6 per cent., the highest mortality being 2.95. On the other hand, there are sub-districts, less crowded, where the mortality averages 3.2 and in one case amounts to 3.6 per cent.; whilst in Bethnal Green, to which attention is usually called as the most unhealthy portion of the Metropolis, the

* Metropolis, 1838–42		2.563	per cent.
Bath	(seven years' average)	2.435	,,
Leeds	,,	2.591	,,
Bristol	,,	2.911	,,
Manchester	,,	3.273	,,
Liverpool	,,	3.368	,,

† In Herefordshire the proportion which the deaths under five bear to the living is		3.8	
,, Devon	,, ,,	4.3	
,, Suffolk	,, ,,	5.2	
,, Bethnal Green	,, ,,	7.9	
,, Metropolis	,, ,,	8.8	
,, Manchester	,, ,,	9.2	
,, Exeter	,, ,,	9.3	
,, Leeds	,, ,,	9.9	
,, Liverpool	,, ,,	11.2	
,, Sheffield	,, ,,	11.8	
,, Dublin	,, ,,	12.54	

mortality in the several divisions varies from 2.7 to 2.2 per cent. only; so that if the mortality of a sub-district be adopted as a test, the salubrity of Bethnal Green is equal to that of the most favoured parts of the Metropolis.

The *arrondissement* in Paris, in which, with one exception, the population is the most crowded, is the second, and the mortality is there the least, being 1 in 71. The quarter in which, with a single exception, the population is least crowded, is the eighth, and with one exception, the mortality is there the largest, being 1 in 46. Thus, the quarters in which the mortality is the largest are amongst those where the streets, gardens, and public places are the most spacious and airy, and *vice versâ*. Again, the eighth arrondissement, the district where with a single exception, the crowding is least, the space for each person is $46\frac{51}{100}$ square mètres, and there, as has been already stated, the mortality is, with one exception, the largest. The densest crowding is to be found in the fourth, where the space for each person is $6\frac{56}{100}$ square metres, and, with three exceptions, the mortality is there the least, being 1 in 62. From 1822 to 1826, the annual mortality of the six arrondissements where the population has most space, was 1 in 57; and in the six where they had the least, 1 in $59\frac{1}{2}$.*

The arrondissements of Paris in which the payment of impost is the least, in proportion to the population, and therefore where poverty is the greatest, are the eighth and the twelfth, and there we find the mortality the greatest; and this result is obtained wherever we can apply the test of destitution.

In the second arrondissement, the proportion of untaxed houses is 0.07, and the deaths, 1 in 62. In the twelfth, the proportion is 0.38, the mortality, 1 in 43. It is, unfortunately, not always easy to apply this statistical test satisfactorily, because the population in two given districts, though comprising all classes, may have those classes in different proportions; there may be much poverty, but there may be also much comfort or wealth, and the data with which we are furnished, apply to all the persons indiscriminately in each district, but do not represent any single class.

Manchester, for example, is an unhealthy town, the mortality

* Villerme, Annales d'Hygiene, tom. III..

being 1 in 29. Now, supposing we select, for comparison, a densely peopled and confined part of that town, in the vicinity of a large factory, in which employment is constant and the earnings moderate so that the people are in comfortable circumstances; whilst in another part of the town, less densely peopled and less confined, where the bulk of the people have no constant work, where their earnings are small, and they can scarcely procure the bare necessaries of life. In the former, the mortality will probably be less, the general health better. And yet, in so far as the influence of a contaminated atmosphere would operate, the condition of the latter was the best. I put this case, not as a proof that insufficient food is the cause of increased mortality, but to illustrate the difficulty of the investigation in which we are engaged.

But our observations must not be confined to the comparison of one town with another, and their more or less crowded populations, nor to the contrast of the straggling population of Rural Districts, with the dense masses of Towns; we will therefore refer to extensive districts which present, in so far as crowding is concerned, fair materials for comparison.

Thus, the South Midland district comprises the agricultural part of Middlesex, Hertfordshire, Buckinghamshire, Oxfordshire, Northamptonshire, Huntingdonshire, Bedfordshire, and Cambridgeshire. In this district there are few factories, and no great crowding; the people are principally employed in agriculture, the population is 1,152,000, the mortality is 2.076 per cent. The South Eastern district comprises a part of Surrey, Kent, (excluding Greenwich), Sussex, Hampshire, Berkshire; the population is 1,542,000, the mortality is 1.877 per cent. The South Western district, which in so far as crowding is concerned, is less favourably situated, comprises Wiltshire, Dorset, Devon, Somerset, and Cornwall; the population is 1,740,000, the mortality is 1.872 per cent.

The results obtained by comparing the general mortality with the population in different localities may be thus generally stated: Over-crowding exercises no such direct agency upon health and life, as that we can determine its actual influence in any given district, with relation to the density of the population, and whatever may be the amount of such agency, it represents one only of many

combined elements, acting upon our town population, some one of which, in its separate influence, is greater than that of over-crowding.

Now, is this conclusion materially modified by comparing the rate of mortality and value of life between the different sexes and classes of society?

And first, as to the sexes, woman is more exposed than man to the agency of confined rooms, and to the influence of an impure atmosphere, and yet female life has been usually considered of superior value to that of man.

And next, as to the comparison which has been made between the different classes of society, the result of which seems to me of a very high value, because the very highest and the middle classes of society in this country are either altogether removed from the unfavourable influences which imperfect sewerage, ill-ventilated and filthy courts and alleys, and confined and over-crowded rooms exercise on respirable air, or are subjected to those influences in a very slight degree only. And yet it has been already shown, that at the age of thirty, the expectation of life is in the Peerage 30.9; amongst the Gentry, 31.2; amongst Professional men, 33.9; and for the general population of England and Wales, 34.1; completely reversing, therefore, a very favourite doctrine.

The results of Mr. Neison's examination of the data supplied by Friendly Societies towards determining the value of life amongst their members, have a yet more important bearing upon the question now under consideration, because those societies are composed of the more provident of the labouring population, whether agricultural, mining, or manufacturing, and whether found in overcrowded towns or in rural villages. The extremes of society, whether as represented by the very destitute or the elevated, are wholly, and the middle classes are generally excluded; and we have thus the hard-toiling artisan of our towns, and the industrious peasant of our fields, whose necessities are moderately supplied, and who are protected by provident habits against the vicissitudes and alternations, which exercise so baneful an influence on the health and life of the reckless and improvident amongst our town population; and the results may be thus stated.

The expectation of life is greater in those classes of our indus-

trial population who cultivate provident habits, than in any other class of society in Great Britain.

And by employing the data furnished by the Returns of Friendly Societies, this further result is obtained, that if we exclude agricultural labourers, and divide the remaining members into two classes, those who are engaged in out-door occupations on the one side, and those who are engaged in in-door occupation on the other, the value of life at 40 is 3½ years greater amongst the class which is confined by its employment within-doors; and this although it must be obvious that the in-door labourer is most exposed to the influence of bad air.

The subject is so important, that I may be pardoned for introducing here lengthened extracts from Mr. Neison's very able paper.

"The circumstances in which the humble and working population of the country is placed, have generally been thought adverse to a prolonged duration of life: but the healthiest Life Tables hitherto formed, have not shown any thing so favourable as the present results, deduced from the operations of Friendly Societies, even among what are generally considered the select classes of society :—

"It may be well to be understood here, that the persons composing Friendly Societies, are almost exclusively the hardworking members of the community, chiefly occupied in the drudgeries and toils of the mechanic arts, and consequently exposed to the inclemencies of seasons, excesses of temperature, impure atmospheres, constrained postures, and other conditions, usually thought objectionable. Their incomes are very limited, affording but the scantiest and simplest means of support. Their habitations are of an inferior order, being of the cheapest kind, and consequently in the worst streets. The members of Friendly Societies are therefore generally placed in those circumstances which persons habituated to the luxuries of the upper ranks of society would regard as unfavourable to health and to a superior duration of life. In making these remarks, however, it is necessary, as will hereafter be seen, to make a distinction between them and the great bulk of the poorer classes of the country. For an individual to remain a member of a Friendly Society, it is required that he should make

his weekly or monthly contribution to its funds; and although a few pence is all that is needed, it presumes a certain amount of frugality and industrial habit, sufficient to separate him from the reckless and improvident person, who is more openly exposed to the vicissitudes—poverty, distress, destitution, and disease—incidental to the fluctuations in the demand for labour.

"The superior value of life among the members of Friendly Societies is a very remarkable and important feature in this inquiry, and is a result that generally would not have been anticipated; and the question which naturally follows is: From what source or class does the excess of mortality, which makes up the general average of the community arise?

"Those persons having transactions with Assurance Companies belong, with a few exceptions, to the middle or higher ranks of society; and if the value of life, as deduced from observations in those companies, be admitted as a correct measure for such classes, it will be found that their duration of life is not only less than among the members of Friendly Societies, but also less than in the country generally.

"It may be said, in reply to some of the preceding observations, that the superior value of life in the ranks of Friendly Societies, above the general community, is owing to the effects of selection; but a little reflection will show that the difference must be produced by other causes. Every reasonable means is adopted to test the lives admitted into Assurance Companies, and yet they appear to be of less value than the general average of the country; and Friendly Societies are known *not* to exercise the same degree of scrutiny. In both, the interest of the applicant for admission is opposed to that of the Society; and, looking at the results, it is not unlikely that the vigilance of the one may be neutralized by the interests of the other. Another result, brought out by the observations on the lives in Assurance Offices, will show how inadequate the means of selection usually resorted to are, to raise the standard of life above the average of the country. All other inquiries hitherto made on male and female life, have tended to attach a greater value to the latter than to the former; but the results in the Assurance Companies have been reversed, showing that some other causes, beyond the method of selection, must have interfered to

modify the state of health; for if the means of scrutiny had been adequate to determine the actual character and condition of health, the prevailing feature of each sex would have manifested itself, and the anomalous result of male life being of higher absolute value than female life would not have appeared.

"Assurance Companies, it has been stated, are likely to have proposals most freely from among unhealthy persons for sums payable at death; but that proposals for annuities, or sums payable during life, will be made on the lives of the most healthy only; and that the private opinion of the individual being always brought to bear against the Company, the effects of selection, under this aspect, ought to prevent the results of such observations from being regarded as a true exponent of the value of life in the class of society generally to which those persons belong. There exists no published document, so far as Assurance Offices are concerned, to show whether this opinion is well founded: but there is evidence of the same kind—of equal, or perhaps from its greater extent, of higher value, than any to be drawn from the Assurance Companies. The tables calculated by Mr. Finlaison, on the lives among the nominees of the Government Tontines and annuity schemes, are here alluded to. The facts over which his observations extended possessed almost every advantage that could be desired; and, considering the acknowledged skill and care with which his computations were managed, the Government Table must be entitled to the highest confidence, and the expectation of life thence deduced regarded as the true measure of life, in that particular class of society.

From a comparison of these data, then, it follows, that the male lives selected for the Government Annuities, are not only of less duration than those of the male population of the country generally, and also of less value than lives in Assurance Companies, but they are actually of less value than those of the members of Friendly Societies in the City Districts. It is evident from these results, that the presumed power of the individual to judge of his own state of health has not shown the remarkable effects anticipated; there is more reason to believe that the natural inclination with which every person is led to look upon his life as good, will very much influence any power of discrimination on his own chances of

longevity. It is, however, to be kept in view, that persons of decidedly bad health will rarely purchase annuities; and the exclusion of these has, no doubt, some effect in slightly raising the standard of the Table. A similar observation is also to be made with respect to the applicants to Assurance Companies. There is a strong temptation for those in really bad, or at least in indifferent health, to offer themselves for assurance; and if all were admitted, no doubt a lower value would be expressed by the Tables. The known caution, however, usually exercised in these matters, and the medical talent brought to the aid of the offices, is a protection against the very worst lives of that class; about 23 per cent. of the applicants being the average number rejected.

"Friendly Societies, although not equally solicitous, are still not without tests for the admission of members, and they possess one advantage over Assurance Companies; the members, and those likely to be candidates, are generally intimately known in their daily habits and ordinary health to each other; and where evidently bad health exists, admission is refused. A consideration of all that has been advanced will show that the greater vitality among members of Friendly Societies cannot be accounted for by the superior mode of selecting lives; for, if that argument were carried out to its full extent, it would go to prove that the other classes in question had, in that respect, the advantage. The blessing thus bestowed on the frugal and industrious workmen of the country, composing Friendly Societies, in having granted them, as appears by the present inquiry, a prolonged duration of life, must therefore be regarded as a really true and distinctive feature of that class of persons, and is no doubt the result of their simple and uniform habits of life, and the more regular and natural physical exercises to which they are habituated.

"Perhaps no statistical facts are better established, than the duration of life among the middle and upper classes of this country; and if the data brought forward in this paper be received as of sufficient merit to represent the duration of life among the working classes, it will then appear clear that any important change to be hoped for in the value of life, in the Town Districts, must be effected through other means than sanatory regulations.

"Those persons purchasing Government Annuities, and having