The Disorders attending Dentition
When we consider how wonderful and interesting are all the processes of growth, and the remarkable phenomena which especially characterize the rudimentary condition and growth of the teeth, we are not surprised that some of our most distinguished anatomists have found in the development of these organs an attractive subject of research. Their labours have laid the foundation of our knowledge of what is to be regarded as abnormal in the progress of dentition, and
have guided to a rational explanation of some of the causes which may render it difficult and painful. Independently, however, of such irregularities, there not unfrequently exists during teething an amount of constitutional disturbance — analogous, it may be shown, to what is observed during the establishment of important functions in the female, at a later period of life. Many circumstances indeed are seen directly to concur in marking the time of the first dentition as one in which the infant is peculiarly susceptible of the influence of any exciting cause of disease. The disorders which may justly be referred to dental irritation —
the alleged mortality - their true pathology, and the treatment it suggests, are points the discussion of which might serve to illustrate the progress of medical science, and if I succeed in presenting a brief, yet distinct and connected view of some part of this most important subject, it is all that my limited time and opportunities permits me to attempt.

The increased liability of the infant to disease at the time of teething is recognized by every mother and nurse, while the attention of the medical practitioners is also directed to it. In considering the high rate of mortality, which is seen to prevail during these early years.
On sait combien il pérît d’enfants
des suites de la dentition.

Mémoires de la Société Royale de Médecine
1780-1 p. 11.
impressive does the conclusion which has been drawn as to the danger attending this process appear, that we find, for example, in 1781, La Société Royale de Médecine, upon this ground, offering a prize of 600 livres for the best essay on the following question: “What are the means the most sure de preserve les enfants en nourrice des accidents auxquels la dentition les expose, et d’y remédier lorsqu’ils en sont atteints?” We find Dr. Bell, in his “Essay on Children” stating that above a tenth part of infants die in teething, and some later writers give a still higher proportion. We may believe that there is some exaggeration in these statements, but the more reliable information
afforded by the Reports of the Registrar General for England gives five per cent of all the deaths of children, under one year, as attributable to measles, and seven per cent of the whole mortality within the first three years. I would here notice a point of some significance, while remembering that considerable caution is necessary in putting an interpretation upon the data furnished by statistics. Dentition taking place, as it does, generally speaking, about the same time in all children, we might expect that, by a comparison of the proportion of deaths, decreasing each successive month from birth, the period of its occurrence would be marked by,
at least, a relative increase of the mortality. We find, however, that it decreases in ratios which do not vary so as to represent this element in the account. Thus, from Mr. Auletelet's tables it appears that of 100,000 infants born, there remain alive at the end of the

<table>
<thead>
<tr>
<th>1st month</th>
<th>90,396 or 9604 die during 1st month</th>
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<tbody>
<tr>
<td>2nd</td>
<td>87,936 × 2.600</td>
</tr>
<tr>
<td>3rd</td>
<td>86,175 × 1.761</td>
</tr>
<tr>
<td>4th</td>
<td>84,270 × 1.455</td>
</tr>
<tr>
<td>5th</td>
<td>83,571 × 1.149</td>
</tr>
<tr>
<td>6th</td>
<td>82,526 × 1.045</td>
</tr>
<tr>
<td>12th</td>
<td>77,528 × 0.998 before 12th</td>
</tr>
</tbody>
</table>

Here, of 83,571 alive at the fifth month, 1045 or nearly 80 die during the sixth month. While of 82,526 alive at the sixth
mouth, those die before one year
1998, or nearly 50% in the next
six months. Similar results
are obtained from the abstracts
occasionally given in the Returns
of the Registrar General, but I
bring forward this table merely
to show the nature of the evidence
that has been adduced in
support of the view that the
disorders occasioned by teething
have but an inconsiderable
influence in the production
of fatal effects. It is
argued that since the
process of dentition takes place,
and does so within a limited
time, were its effects of the
unfavourable character
generally represented, they
would scarcely avoid displaying
themselves in a more obvious
manner. I do not think
this agreement carries any proof, for it is easy to suppose that the rapid decrease in the mortality, which is so marked in the earliest months of infancy, is in the later months still sufficient to conceal the influence which such causes exert, towards increasing its amount. This seems the more reasonable, since an examination of the very table of M. Quetelet, from which the extract has been taken, shows that, where the value of life rises by smaller increments, a peculiar liability to disease, such as that which occurs in another epoch of development, can be most readily distinguished. I refer to that period of constitutional change in the
female, by which she is advanced to womanhood. The mortality of this sex, which is considerably less than that of the male in infancy, and scarcely more than equals it, for any of the years of childhood, rises so conspicuously between the fourteenth and eighteenth years of age as to exceed by one fourth the number of male deaths—sinking again, in the succeeding four years, by a more than equal diminution. This fact, apart from the purpose which has led me to introduce it here, has its own value in sustaining the analogy I have supposed to exist between these processes of development in relation disease. I may
hereafter use some of the points
of correspondence to aid me
in the exposition of my views.

It has been too much
the custom to regard diarrhoea
as the origin of most of the
diseases of infants, when no
other cause could be assigned.
The difficulty of diagnosis
in observing the maladies of
these tender beings, and the
comparatively small amount
of positive information as yet
derived from pathological
research, are probably among
the causes of the uncertainty
in which this subject is in-

olved. It may be hoped that
the hospitals for sick children,
which are becoming established
in most of our principal cities,
may afford better facilities
for the study of a class of
disorders that have not hitherto received so much attention as their importance deserves. Disease, manifested under the peculiar conditions, natural or artificial, which this period of life presents, offers problems which such institutions alone can enable us to solve. By affording the opportunity of comparison, cases may be classified according to their resemblances in the more impalpable particulars of their history and aspect. Generalizations are in this way obtained which indicate the prevailing causes of disease, in such a manner as often to greatly modify pre-existing ideas. While they furnish a clue, which, in practice, we should neither
undervalue nor abuse. Modern writers have, for the most part, been contented with noticing this careless and indiscriminate association of various disorders with toothache, and endeavouring to correct it by showing what are the affection to which dental irritation most frequently gives rise. There remains, however, the question, which must often have been suggested — why dentition, which is a natural process, should be, in so many instances, attended with suffering and danger to life. We know that it is otherwise in the case of the lower animals, though exceptions may be found even here. Inquiry in this direction may, I think, lead to a view of the whole
subject that will, at least, impress more strongly certain principles regarding the nature and treatment of these affections.

The fact that many children suffer not at all, or, if in any degree, but slightly, in cutting their teeth, while it is admitted that in others this process is laborious and attended with serious and even fatal disorders, shows that it is only in certain conditions that such accidents occur. Just as the various affections connected with the retardation or imperfect performance of the menstrual function, the intelligent physician knows that they have, in nearly every case, a constitutional origin, and adapts his treatment
Accordingly.

It is essential to remember that the growth of the body comprises a series of evolutions whereby different organs are developed at epochs corresponding to the order in which Nature has designed that their appropriate functions should be exercised. The various portions of the organism which combine to sustain the life and well-being of the individual, have, in this sense, relations to one another so intimate that any inherent weakness, or irregularity of growth, will be signified in a more or less general disturbance of order and power.
in the whole. The fact too that certain structures are allied in sympathy more direct is one that enables us often to trace the connexion between an irregularity in any of these traces of growth and a special determining cause, as also to know where first we may expect its influence to be felt.

The late Dr. S. Schoepf-Meri, whose large experience, and scientific method of investigation give a value to his opinions, observed that all the serious consequences of dental irritations were both more frequent and more dangerous, in infants presenting a notable retardation in the eruption of their teeth. The reason
of this, he remarks, is obvious. It is because the protracted duration of these effects and proof of their sedate development power, with impaired and disordered spinal innervation - a condition of the system sufficient of itself to cause these affections without the presence of dental irritation, and augmenting their intensity when they arose from the last named source. Much valuable information would be derived from a systematic observation of the developmental processes of infancy, taking in the circumstances and history of the cases in which they are seen to be disordered. The eruption of the teeth, the closure of
the fontanelles in the cranium and the attachment of the faculty of walking are stages of development, which stand out conspicuously as signs of the vital power of the child, and the times at which they usually appear, in the healthy infant, may be taken as the standard of comparison. It will be found that difficult or retarded dentition, no less than Rachitism, may be traced to some inherited weakness or to some unfavourable hygienic conditions, as impure air, unwholesome properties of the milk of the breast, too early weaning, improper feeding, or, in short, some source of imperfect or faulty nutrition.
In the third Report of the Manchester Clinical Hospital for Children, Dr. Whitehead gives the result of his observations of the influence of a good or bad state of development upon the process of teething. Under these terms he describes two classes of patients, which he thus defines. Those marked as being of good development were children brought under observation for disorders of local or acute character, of climatic, erysipelas or adhesive origin, not of inherited or constitutional tendencies to disease, in whom the process of development had not previously been interfered with. Their bodily health was, as a general
rile, fearless, and whose parents were healthy. Those were considered as of bad development whose health had been deranged by inherited weakness or tendency to disease, by want of a due supply of breast milk, by faulty diet, poverty, unhealthy locality, or neglect. We excluded from the comparison those who, in any of these respects, could not be ranged with either class. It would perhaps too much encumber these pages to insert his tables, interesting as they are, and I am content to embody an analysis that will suffice to bring out the conclusions bearing most directly upon the argument in hand.
was seen that in the great majority of children of good development, namely in 603 out of 763, or 79 per cent, the teething process had fairly commenced before the eighth month was past, and in only 21 per cent. After the eighth month—namely in 81 of them at eight to nine months—in 64 from the ninth to the twelfth month—and in none was it delayed till after the fourteenth month. In children of bad development, only 161 out of 435, or 37 per cent, cut their first teeth before the completion of the eighth month, and in 63 per cent. (in contrast with 21 per cent. of the former group) it commenced after the
eighth months—namely, in 63 at nine months—in 167 at ten to twelve months, and in 104 after twelve months.

At the age of twelve to thirteen months, 83 patients of good, and 72 of bad development presented themselves. Of the good only one had no teeth—of the bad 24 had no teeth, and the contrast was equally great, as to number, as to respective ages, in all the rest.

After age of ten years, of those of good development 88.6 per cent. had all their teeth, while of those of bad development, only 21.8 per cent. had accomplished the process. Of the former
group, only one had as few as twelve teeth at two years, but among the second group 25 had no more than twelve at that age.

Of 76 children of good development it was observed that 62 accomplished their teething process earlier than the age of two years — namely, one at the early age of twelve months, two at fourteen months, three at fifteen months, and in 47 before the end of the twenty-first month. In 53 children of bad development, 20 only completed their teething before two years of age — one at twenty months, and one at twenty-one months — while in 51 it was delayed beyond the twenty-seventh month.
These comparisons show plainly to what large an extent disorderly dentition is the result of morbid influences, early affecting the constitution of the child.

The nature of these agencies I have already indicated in general terms, and I now propose to fill up, in part, this outline, by showing how one of the causes named is seen to operate, taking that which I believe to be the most injurious in its effects.

Infancy is emphatically the period of growth. The remarkable rapidity with which the young child increases in size and stature implies a corresponding...
activity in the nutritive functions, and such as no other period of life exhibits or requires. The influence of a good or faulty alimentation therefore, comes to be considered as one to which the greatest importance should be attached. If we regard the alimentary canal in the infant, we find that it presents, as indeed in the young of most animal peculiarities of form and arrangement differing in many respects from its structure and powers when fully developed. More simple in all its elements, it is not however the less perfect in its adaptation. The digestive and assimilative
processes in the babe are
effected with a rapidity
commensurate with its
exalted capacities for
nutrition and growth.
And now the food required
being such that while it
yields a sustenance ade-
quate for these purposes,
it may be easily digested.
Nature has not left it to
the chances of an arbitrary
selection, but has provided
the milk of the mother-
in this way fulfilling also
many parts of a beneficent
design.

This, the natural
food of the infant, is shown
by the careful analyses
of M. M. Bermais and
Bequerel to combine all
the elements which are
necessary for its growth, or for the maintenance of its proper temperature, by serving as materials for respiration. In so delicate an organization, we might expect that any departure from Nature's order and prescription, as it respects its nourishment, would be severely felt. Dr. Bell has drawn a graphic picture of the result.

The infant, whose mother refuses to perform towards it a mother's part, or who by accident, disease, or death, is deprived of the food that Nature destined for it, too often languishes and dies. Suck children you may often see, with no fault to give plumpness
to their limbs — no red
particles in their blood
to impart a healthy hue
to their skin — their face
weakening in infancy, the
delineaments of age — their
voice a constant wail —
their whole aspect an
embodiment of woe.
But give to such children
the food that nature de-
stined for them, and if
the remedy do not come
all too late to save them,
the mournful cry will
cease, the face will assume
a look of content, by degrees
the features of infancy will
disclose themselves, the
limbs will grow round,
the skin pure red and
white, and when, at
length we hear the mercy
laugh of babyhood, it seems almost as if the little sufferer of some weeks before must have been a changeling, and thus the real child brought back from fairy-land. This is not an overdrawn picture of the evils that ensue from improper feeding. The proof comes out with startling distinctness in a comparison of the statistics afforded by some of the large foundling hospitals in France. By different systems of bringing up the children followed in these institutions, allow of a comparison being made which shows that the mortality varies to an alarming extent as the nurture and mode
of feeding adopted are
more or less in accordance
with right hygienic prin-
ciples. At Lyons each
infant on its receipt is
placed into the charge of a
wet nurse, and its stay
in the hospice does not
exceed a very few days,
after which it is sent to
be nursed in the country.
At Rheims, the stay of the
infant in the hospice is
equally short, but neither
while there, nor afterwards,
when at nurse in the coun-
ty, is it brought up at the
breast. At Paris the stay
of the children in the hospice
is often very much longer;
but they are usually
nursed by wet nurses.

The mortality of children
under one year admitted into these institutions is

St. Lyons -- 33.7 per cent.

Paris -- 50.3

Rheims -- 63.9

Here, while the notable difference in the mortality in these hospitals, seems, for the most part, to be due to the causes I have assigned, it may be remarked that other circumstances, doubtless, have some share in producing it. This still goes to prove the general statement as to the effect of impure air, and other noxious influences, at this tender age.

The mode of proof I have followed, in showing that infants subject to
these unfavourable conditions, are especially liable to decrease in towns, though necessarily an indirect one, in the absence of any reports upon this subject; is confirmed by the collateral evidence afforded by a comparison of the mortality in town and country, due to disease, chiefly affecting the young, as given in an analysis, by Mr. Farr, of the Registrar General's returns—

Thus,

<table>
<thead>
<tr>
<th>Disease</th>
<th>In the Cities</th>
<th>In the Country districts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typhus Carried off</td>
<td>1411</td>
<td>792</td>
</tr>
<tr>
<td>Hooping Cough</td>
<td>1356</td>
<td>838</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>1257</td>
<td>204</td>
</tr>
<tr>
<td>Convulsions</td>
<td>4337</td>
<td>1816</td>
</tr>
<tr>
<td>Cephalitis</td>
<td>328</td>
<td>200</td>
</tr>
<tr>
<td>Rheumatic</td>
<td>499</td>
<td>222</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>3728</td>
<td>1694</td>
</tr>
</tbody>
</table>
From this table it may be seen that while the mortality in each of these diseases is, in the cities, about twice as great as in the country districts, the deaths referred to teething are in the large proportion of one to one, in respect of this difference of locality.

Having now gone over some of the considerations which seemed to me most worthy of attention in a general view of the nature, origin, and fatality of the disorders occurring at the period of dentition, I think it unnecessary to speak of them in detail. Inasmuch as there is no important difference of opinion as to the treatment to be followed—

Charles H. Francis