On the disorders of infantile development, and rickets : preceded by observations on the nature, peculiar influence, and modifying agencies of temperaments / by A. Schoepf Merei.

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DISORDERS OF INFANTILE DEVELOPMENT AND RICKETS;

AND ON THE INFLUENCE OF

TEMPERAMENTS, ETC., ETC.

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INFANTILE DEVELOPMENT, AND RICKETS;

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OBSERVATIONS ON THE NATURE, PECULIAR INFLUENCE, AND MODIFYING AGENCIES OF

TEMPERAMENTS.

BY

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PREFACE.

The first part of this work contains the substance of a few lectures on temperaments, which I had the honour of delivering here in the Chatham-street School of Medicine in 1852, amplified subsequently by further observations. The style in which this part is given will be found to bear marks of such origin, which it would have been difficult otherwise to arrange. Having endeavoured to trace the peculiar features and dispositions of temperaments from the early period of life; and indicated the special kinds of diet, which, according to my experience, are required by each of the several types for their healthy physical development, I have availed myself of this opportunity, to state also some facts of practical importance which have attracted my attention, relative to the climatic, pathological, and remedial bearings of temperaments in different countries, and especially in England.

The second part contains the results of a long protracted and careful investigation of the principal developmental disorders of infancy, upon an extended scale.

Far from attempting to treat this important subject in a comprehensive manner, with such literary references as are required in a systematic work, I propose to do little more than furnish facts and illustrations, which I was enabled to derive from a varied and wide-spread sphere of personal

observation. Having been transplanted, by an uncommon concurrence of events and circumstances, from an extensive hospital and general practice in a distant part of the Continent to professional activity in this country, I have been enabled to observe and examine the subjects here treated in a comparative point of view as to their nature, frequency, and the mode in which they appear to be influenced by climatic, dietetic, remedial and other agencies.

I acknowledge with gratitude the kind assistance rendered by several of my professional brethren in furnishing facts illustrative of the etiological conditions of rachitism; and I would fondly hope, that my efforts—however limited and imperfect on the whole their result may be—may contribute in some measure towards the elucidation of certain unsettled questions on the causes and management of an extensive class of infantile diseases.

In conclusion, I must appeal to the reader's indulgence for the many inaccuracies of diction which appear throughout the work—the almost inevitable consequence of difficulties in the English language, not easily mastered by the foreigner.

Manchester, May 1855.

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TEMPERAMENTS, IN THEIR RELATION TO CLIMATE, DIET, DISEASE AND REMEDIAL AGENTS.

ORIGIN AND MODIFYING AGENCIES OF TEMPERAMENTS.

Among the objects of the medical practitioner it is one of no secondary importance to promote the normal development of the human body during the stages of its growth, and to regulate its functions in accordance with the various natural dispositions of the individuals. This purpose, in order to be satisfactorily realised, requires enlightened views and notions on the principal agencies of life not only in the profession but in the public generally.

It must be confessed however, that diet itself, the most important part of human hygiène, is generally regarded in too general a point of view. The light recently thrown upon this subject by the progress of chemistry and physiology, through which we know the nutritious and the non-nutritious, the healthy and the unhealthy, the digestible and the indigestible qualities of every description of food, has supplied us with principles, which have been applied with scientific accuracy to the human system in general; it is well known, however, that the human body, even in a state of health, presents different features of organisation,—different types, known under the names of sanguine, bilious, phlegmatic, and nervous temperaments; and it is a pretty generally received fact also, that each of these temperaments has its peculiar necessities as regards aliments—that one kind of food suitable to one, is mischievous to another. Diet, therefore, to be rendered more efficacious in promoting the physical development and health of individual constitutions, must be studied and inculcated more strictly than has been the custom hitherto as a diet of temperaments.

But it may be asked: in what consist temperaments? and what are the special dietetics suitable for them?—We must confess, that an exact scientific solution of this question is as yet impossible. Chemistry and physiology have not hitherto shewn any notable difference between the fluids and solids of a phlegmatic and a sanguine, or of a bilious and a nervous temperament; nor have they yet sufficiently explained why one

requires for its healthy sustenance a large amount of animal substances, and another a predominance of food derived from the vegetable kingdom; why one may prosper and be healthy upon a large amount of fatty matter, and a proportion of spirituous drinks, while, on the contrary, another requires a certain quantity of green vegetables, of fruits, of acidulated substances, and a large proportion of water. In regard to this part of science theory as yet is imperfect. Our practical observations and enquiries, however, making use of certain established principles of chemistry and physiology, afford us some useful directions, and may promote the better understanding and management of temperaments. I shall endeavour to develope the theory of this subject in a succinct manner, merely to serve as an introduction to ensuing considerations.

From the remotest epoch of medical science, temperaments have been and are still considered as dependent upon the relative development of one or two of the principal organic systems of the body. Whilst the non-medical public are accustomed to view and to name them generally as so many moral dispositions, the medical philosopher considers them as organic types, of which the moral dispositions result as phenomena. There are, the sanguineous, the nervous, the bilious and the lymphatic systems in our bodies, forming the organic basis for the temperaments. These organic systems, although all present in every individual, yet, according to the more prevalent development and functional influence of any one over the others, give origin to several types, and mixtures of types. There are various opinions with regard to these types; I for my part prefer considering them in the following manner.

In the first place I would name the strictly *normal* type, representing the human organisation in its regular development, full harmony of functions, aud greatest latitude of health. As one form of the normal I would regard the *muscular*, representing the type of a body enjoying a strong development of the muscular system, of the internal muscles —the heart, stomach, intestines, as well as of the external ones —the trunk, neck, and limbs. The *sanguine* I would consider also as a normal type. We do not exactly know its special source and basis, but use the term generally to denote a healthy body, with a cheerful and happy frame of mind. A little deviating from the normal, follows the *phlegmatic* or *lymphatic*, considered by ancient writers as representing the predominance of the white humours of the body; then the *nervous*, founded upon the predominant development and influence of the nervous system; and lastly the *bilious*, with an excess of biliary elements and great activity of the biliary functions.

Each of these types in its full development has its peculiar physical features, its functional and moral qualities as well as its special necessities, which I shall take opportunity to mention hereafter. The types, however

do not occur very frequently in striking simplicity, but in double and treble compounds; we may indeed say, in an indefinite variety of mixtures. This cannot be wondered at when we reflect, that every human organism contains all the same organic systems, and that the different temperaments merely suppose certain modifications, or a predominance of some of them.

If we inquire into the origin of the different types, it would appear that climate and aliment may be considered as the principal agencies in their formation. The following considerations at least seem to argue in favour of this assumption.

Where, and under what climatic influences do the bilious and phlegmatic occur, the two most opposed to each other in every respect?—We find the bilious predominant in hot, and the phlegmatic in cold countries. Why? The life-process, though governed by the nervous system, is in its basis a chemical process. One important act of this process is performed by the *oxygen* which with the atmosphere we inhale, upon the carbon of the blood which incessantly arises from the chemical acts of digestion, assimilation, and nutrition. In the course of the chemical process operated between the oxygen and carbon in the lungs animal heat is produced, and carbonic acid formed and eliminated along with the expired vapour. For the regularity of the life-process there must be a certain *proportion* between the oxygen of the atmosphere, and the carbon of the blood. The quantity of the oxygen, however, which we inspire, varies very much according to the temperature of the climate. For instance, in southern latitudes, the atmosphere being rarefied by heat, we inspire in a given volume of air a smaller quantity of oxygen, smaller than is required to subdue (if I may be allowed to say so,) that quantity of carbon in the blood which continually arises form the nutrient process itself; consequently, in hot climates we have always a super-abundance of carbon in our bodies, which must have a constant tendency to cause disorder. Nature, however, has bounteously provided against this danger, by the functions of the liver. The liver secretes bile; bile contains a great amount of carbon; and thus, by means of the bile carbon is extracted from the blood, and eliminated from the body. Now, the greater the quantity of carbon in the system, the greater becomes the activity of the liver, and so, the greater will be the abundance of bile; consequently, the natural disposition to bilious temperaments in warm climates must be obvious.

We have, however, the power of guarding to a certain extent against derangement in this respect, by taking, besides a smaller proportion of nutritious food, a greater proportion of green vegetables, fruit, acid and water, which counteract and prevent the accumulation of bilious elements in the blood (over-carbonisation).

The opposite of this happens in cold climates, where, the atmosphere being in a condensed state, a greater proportion of oxygen is inhaled. This must meet with a proportionately large quantity of carbon, in order to generate the greater amount of heat there required; consequently, it is proper in these regions to eat quantities of those articles which are rich in carbon. The richest of these is fat; and in polar regions quantities of this article are consumed; even pure train oil; the meal being frequently repeated during the day, in order to get the required proportion. But notwithstanding, there is no chance of the liver being over-excited or overwhelmed by bile; because the proportion of oxygen in the atmosphere is too great for this in high latitudes, and always sufficient to neutralise the carbon in the blood, however abundant;—where frost is *incessant*, there is no possibility of over-accumulation of bile, consequently there bilious temperaments cannot exist.

If we duly appreciate the physiological influence of these climates, and different kinds of food peculiar to them, continued through ages, through thousands of years, and take into account also the tendency to transmission of physical dispositions from genitors to offspring: we may readily conceive, how by this continued action certain types of organisation may be established in individuals, nations and races, even so fixedly as to resist for a long time the modifying influence of a climate and system of diet of a totally different character. Thus, from the temperaments established by certain climates and adequate kinds of food, arise the peculiar temperaments of races; which by migrations have been carried into other territories of a character more or less at variance with their type, having thus operated a modification more or less profound in other races and nations. This fact doubtless is of some importance in history.—But, to return to the climatic origin of temperaments. If the facts upon which I found the deduction be right, (though the deduction itself may be very imperfect, and not at all sufficient to resolve all the mysteries of temperaments)—if the facts be right, as I believe they are, then I may continue to say: that a constant and extreme climate favours the development of one general temperament; on the contrary, in temperate climates with a great variation between heat and cold, moisture and dryness, positive and negative electricity, and accordingly miscellaneous kind of food—in such a climate we find conditions for a great variety of temperaments. Again, in those countries where the summers are hot and the winters intensely *cold*, we find the conditions for both the extreme types, for the bilious and the phlegmatic; and in fact so it happens, for instance in Austria, in Hungary, and the German States. But in these countries we also meet with a great proportion of the sanguine and nervous, of which it is difficult to deduce the origin, though I shall try to do so hereafter.

According to the above statements, therefore, it would appear, that, above all, climates and their adequate food, then, crossing of races, are apt to establish or modify in general the national temperaments. But, besides these, there are other powers apt to work a change; for instance, age. We observe change in the temperament of the same individual, in different periods of life. Infancy presents a great proportion of the nervous;—childhood and youth of the sanguine;—mature age of the bilious;—old age of the phlegmatic temperament. Then, we find in the female sex by far a greater proportion than in the male, of the nervous temperament; and ladies are not the less interesting on that account, though we regret that they are more subject, owing to this quality, to overpowering sensations, to pain, and nervous disorders. Then, civilization, in its different stages and forms, must exert a great influence. A lower degree of civilization favours the robust, the muscular temperament; on the contrary, higher stages of it, by the influence of scientific pursuits upon the brain, must necessarily favour a greater development of the nervous. And thus it may happen, that a nation, after a long and active history, and when proud of a long list of glorious achievements and lofty intellectual creations, may reach a limit, when it will experience a loss in its muscular power and connected energy of mind; or, mind and muscles becoming disproportional, disorder may arise between thought and strength, between ideas and practical execution. Thus at least sometimes a physician feels inclined to consider the grand and proud matters of history. Different professions, prolonged moral influences and passions, and above all, the continued influence of education, have power to modify temperaments of individuals and nations.

But, I believe, all these agencies only possess much power under the influence of temperate climates. In fact (from this point of view) countries with winter and summer, and infinite varieties of temperature through the year, but having on the whole a temperate climate, decidedly dispose, and lead to a higher degree of civilization, than others, which are uniform in extremes, or constantly mild and genial. Moderate and varied climate is the physical source of a variety of products, and effects a physiological necessity (as we have shewn above) for a variety of food; both which agencies lay the foundation for a variety of temperaments; and these again are nothing less than a proportionally multiplied and varied stock of impressions and ideas, and of a more lively and productive action and re-action between individuals of that country or part of the globe. From this consideration of facts, which are indisputable, it becomes clear, that India and Egypt, those ancient seats of civilization, did what they could to a certain limit; but it is also evident, that (abstracting even from the necessary exhaustion and decay of races in the course of ages,) there

never could in those climates have arisen a civilization similar to that which sprang up, and has been matured in Europe, or that which may in future ages perhaps be developed and matured in the moderate regions of America. But, returning from this digression to my purpose, I shall look over the different articles of food.

PRINCIPLES OF DIET REFERABLE TO TEMPERAMENTS.

This review will be very short. I have to speak here on the chemistry of food only so far as the diet of temperaments is concerned. For a beginning, it will be enough for me to say, that all nutritious constituents which have been discovered in different kinds of food, are characterised by, and must necessarily contain an element, which we call *nitrogen* (azote). *Only nitrogenous substances are nutritious.* This element appears in different articles in different proportions and forms; by which, besides their common nutritious property, they acquire different relations in regard to our organism, interesting for our purpose—namely, the diet of temperaments. Many substances, moreover, are used as food, not strictly nitrogenous and nutritious, and still they are remarkable and useful under circumstances, by reason of their action upon certain organs and functions, upon the blood and nerves. Cookery, of course, by mixing and modifying in different ways the nutritious and non-nutritious elements, has no little influence. Boiling or roasting makes a great difference; so the addition also of butter and eggs to vegetables or farinaceous dishes; or salt, sugar, and spices.

Now, in all the civilized countries of Europe, the food, generally speaking, is the same. It consists of a variety of animal and vegetable substances; and, besides, almost everywhere some sort of spirituous liquors are used.

Amongst the animal substances, the flesh of *hot-blooded animals* stands paramount. These animals are pretty generally known, and with regard to the qualities of their flesh, chemically considered, there is no important difference between one species and another. Still, however, there is a difference even between individual animals of the same species, according to their different ages, countries from which they are taken, different manner of feeding them, &c. These differences, though not perceptible in general, become so in different temperaments.—The nutritious principles of flesh consist in *fibrine and albumen;* these at least are the principal. Besides these, there are other constituents, also supposed to be but modified albuminous matters—as, for example, *gluten;* but I will not here enter too far into specialities. Fibrine, albumen, and other constituents of the flesh of animals, are the same principles which our own flesh and blood contain; con-

sequently we find in it a direct supply of those elements which our bodies require. Flesh, consequently, must be the most restoring, the most strengthening element of all the organic world. We obtain from flesh, by acting upon it with water, a certain compound extractive substance, called *osmazome*. This possesses the flavour or aroma of the flesh, more perceptible and stronger in game than in domestic animals, which I may be allowed to call the stimulating element of flesh. Besides the strictly nutritious constituents, flesh contains more or less of fat. Fat is but little nutritious; it is rich in carbon and increases the secretion of bile. Now, fibrine, albumen, and osmazome—the strengthening and invigorating principles—are present in the largest proportion in the flesh of grown animals, as, for instance, in beef. But these animals contain in their muscles a fibre much developed and hard; this makes their flesh less easily digestible for some delicate stomachs; consequently, the flesh of younger animals, though a little less invigorating, as it contains a more tender fibre, may be digested in greater quantities, and is, therefore, under some circumstances more suitable for those delicate constitutions, which require not to be strongly acted upon by means of their food. Nervous temperaments are frequently of that kind. Thus, when we want a strongly invigorating food for strong constitutions, beef is to be preferred; flesh of young animals, particularly fowls, suits the delicate; and bilious constitutions must avoid fatty substances. Again, it is worthy of notice, that the beef consumed in England is by far the most nutritious, succulent, and digestible, of all similar kind; and the mode in which it is roasted, makes it still more so; too much so for some delicate constitutions amongst the natives, and more frequently for foreigners. Boiling meat, and eating both the broth and flesh separately, as used on the Continent, makes of it certainly a less strong or stimulating nutriment, than when eaten roasted.

Milk owes its nutritious qualities to *caseine;* besides which it contains butyrine, sugar of milk, and many salts, dissolved in a large quantity of water. It is sufficient for the development of the tender organism, till a certain period, for instance, till six months, sometimes even longer—twelve months; but it cannot be made use of, with a view to develop or restore muscular strength at a more advanced period of life; it has nothing stimulating or heating for the blood, and is therefore a mild food, suitable for delicate constitutions; by its proportion of butter and fatty matter, however, particularly in cream, it does not agree well with the bilious; and this disposition shows itself sometimes in infancy.

Butter is a fatty substance, of which the principal element is *butyrine*, which is little nutritious; but butter contains also caseine (the most nutritious element of milk) in small proportions. It increases likewise the secretion of bile.

Cheese consists principally of caseine; it is, therefore, nutritious; but as it contains the caseine in a hard state, commingled with different proportions of free acids, it does not agree well with delicate constitutions.

Eggs consist mainly of albumen. I have observed that some delicate persons, nervous or bilious, by taking two to four eggs during several days or weeks, feel not only a constipative, but a heating effect; probably because they are too nitrogenous.

The *flesh of fish*, chemically considered, is similar to that of hot-blooded animals with regard to fibrine and albumen: but both these are certainly less animalized than in the latter. There is a phosphorous oil and a good deal of fatty matter in it. I have, observed that the flesh of fish does not well suit a great many delicate and, in particular, bilious constitutions.

Isinglass is very nutritious; a little of it dissolved in water and mixed with milk, makes an invigorating food for delicate children.

With regard to *farincea and vegetables*; the former owe their nutritious quality also to albuminous elements, in different forms, of which gluten is one of the best. The richest in these constituents is wheat flour; then comes barley, rye, oats; rice is less nutritious,—it contains a large amount of starch; potatoes are nearly the same. Beans and peas, on the contrary, are very rich in nutritious, nitrogenous elements, but not easy of digestion. Now these and similar grains and seeds are nutritious, but they contain not so directly strengthening and invigorating principles, and as there is no fat in them, they do not, therefore, act upon the secretion of bile. They are mild nutriment and less invigorating. Arrowroot and tapioca are rich in starch, and but slightly invigorating They are used at present all over Europe, too generally, as a food for children, to the detriment of some of them. There are certain vegetables,—greens, succulent roots, and fruits, which are very moderately nutritious, and owing to the considerable quantities of water and salts, which they contain, they possess a rather cooling quality, and, according to experience, counteract the secretion of bile. By cooking these articles and mixing them with different animal substances—for instance butter and eggs, they acquire more nutritious qualities, but, on the whole, not great. The most cooling certainly is salad, as it is taken in Italy.

Coffee and tea are scarcely nutritious, in consequence of an aromatic principle, which they possess, they have a stimulating effect on the nerves and blood, I have paid very much attention to this subject, but have not been able to determine whether they act *directly* on the one or the other, whether more upon the nerves, or more upon the blood. It would seem to me, however, that in the majority of cases, coffee is a more powerful stimulant for the nerves, and tea for the blood. In fact, coffee is more used in hot countries. An officer of the African army told me of its beneficial

effects in exhausting marches, under the burning sun. Tea is more used in colder climates. Neither the one nor the other is well suited for stronlgy developed nervous or bilious constitutions.

As to *spirituous liquids;* alcohol has a heating effect upon all constitutions in general. Being rich in carbon, it increases the secretion of bile; consequently brandy, rum, whiskey, and similar liquors, replete with alcohol, are the greatest enemies to delicate, nervous, and bilious temperaments. Beer, ale, and porter contain different proportions of alcohol; besides also a malt extract. This latter gives them a nutritious property; the former, on the contrary, (according to the greater or less proportion of it), renders them heating, and increases the secretion of bile.

Wines contain alcohol, and in addition different proportions of sugar, salts, and free vegetable acids. Alcohol and saccharine matter are predominant in the strong wines: Sherry, Madeira, Port, &c. On the contrary in France, Germany, Hungary, and other continental countries, there are wines, in which the proportion of acids, salts, and water, is so great, that they possess almost a cooling quality; so much so, that even some irritable temperaments can bear them to a certain limit. Experience gives the preference to Claret (Bordeaux) over all the rest.

Water has a very important share in the animal economy; but for our purpose here it will be sufficient to say, that our blood contains about 74 per cent. of it; the greater the quantity of water in the blood, the less the proportion of fibrine, and of the other strengthening, invigorating elements. The quantity of animal heat decreases in the reverse ratio with water in the blood; consequently, in the diet of temperaments water appears as a cooling element, quite opposite in its effects to spirituous liquors, fat, and partly even to an extensive use of flesh meat. Phlegmatic temperaments, therefore, need less water, whilst they bear well fat, flesh meat, and spirits. On the contrary, the bilious constitution will bear a great deal of water, whilst it is injured by the use of spirits, and by fatty substances. Moreover, the necessity for it varies in different climates and seasons; for instance, in summer we require more water, because by perspiration we lose more; in winter, on the contrary, for the converse reason, much less; and in humid atmospheres, as in England, for instance, still less of it is required; because we inspire more moisture with the atmosphere.

Now, as to the application: the specific diet of the types of temperaments consists of mixtures in different proportions of the above-mentioned variety of substances. Any one of the nutritious principles taken alone, would be unable to maintain the human organism in good health. For instance, albumen (eggs) and gluten, are purely nutritious principles; but if a man should eat only one of these exclusively, he would soon get deranged

in health, and not live long under such diet. Not only so; a pure animal nutriment, although more compound, as for instance, flesh, butter, or cheese, without a due admixture of bread or vegetables, is altogether unwholesome. Pure farinaceous diet, however, particularly in warm climates, has not the like evil effect. There must be, in general, a mixture of articles derived from both kingdoms, animal and vegetable.

The general principles of diet for the different temperaments are the same everywhere, and the modifications necessary for the particular climate, are easily conceived, and almost instinctively adopted. They are, generally, in accordance with the climate and with its prevailing temperament. Thus, the diet in Italy is cooling; in England, on the contrary, it is strengthening and to a certain extent stimulating. The difficulty consists in individualising, in specialising; because every individual in a country does not represent the peculiar temperament of that country; the great majority are of a certain shade, or of a mixed variety of temperaments, in Russia as well as in Spain, in Italy as well as in England.

Though, by inquiry, and assisted by the experience of intelligent self-observers, we are generally able to find out the temperament or the mixture they possess, this discrimination is very difficult to be made in infancy and childhood. It seems, however, that infancy does not possess the different types of temperaments in their distinctive development. I have not been able at least, though I have seen a good deal of them, to determine exactly before the fourth, fifth, or even the sixth month, the temperament of an infant, and not then generally. Nature has designed for all of them at first, one kind of food—the milk of the breast, which will answer all purposes in ordinary cases till the sixth month, frequently longer; but after that age, some light and shade will begin to appear, and gradually form the outlines of the future temperament; and thus it will become more important to regulate the diet of the individual accordingly.

I shall endeavour to sketch the characteristics of the different types from infancy upwards, such as I have observed them—with due allowance for the numerous deviations and exceptions. I can pay attention only to the principal types, not to mixtures; this would lead the enquiry too far.

SKETCHES OF THE PRINCIPAL TEMPERAMENTS, FROM INFANCY TO ADVANCED AGE; THEIR DISPOSITIONS AND DIET.

I will, in the first place, take into consideration the *muscular* temperament; because a strong development of the muscular fibre of the heart, stomach, and chest, must have a strengthening influence on the functions of circulation, digestion, and respiration. Moreover, the mus-

cular power of the limbs imparts to the individual a feeling of strength and independence. This temperament occurs somtimes in children of small dimensions; but more frequently in those of mediocre size, or above it. Their complexion and skin have a vigorous appearance. We generally observe, that a child of such temperament, at about the third or fourth month, if it take hold of one's finger, will grasp it very firmly; we observe its chest to be ample, and wide between the armpits; and about the sixth month, when the abdomen of other children is still very prominent, in the robust muscular it is frequently already flattened. The three processes of development, to which I pay particular attention in judging of a constitution, go on easily and regularly; dentition about the sixth or seventh month; seldom sooner and seldom later. The skull is completely ossified about the eleventh, and about the twelfth month most of them walk freely and fast, with an easy and firm step. I have seen even a case (but this must be of rare occurrence), where the child walked quite freely before the age of ten months. They do not incline to fatness, but their muscular actions are very strong; nor do they present a high degree of sensibility. About the fourth or fifth month, they take a good deal of milk, digest it quickly and are so soon hungry again, that they almost exhaust their nurse. At this period it will be proper to commence with the addition of some semola, biscuit, or boiled white bread, mixed with a little milk or cream, once daily; about the seventh month, they may be given chicken broth, or light beef tea, with sago, rice, or similar articles boiled in it. Weaning causes no particular derangement to them. About the eleventh or twelfth month that diet may again be improved, with a small proportion of the tender flesh of young animals, or fowl.

Nature has assigned flesh to these temperaments. Should they get no animal food till about the eighteenth month, for instance: they will perhaps not be unhealthy on that account, but they will be less vigorous in point of strength, than they might be. They have no particular morbid disposition. When they arrive at mature age, all goes easily and well with them, and they are able to make way for themselves in the world. The muscular temperament is frequent everywhere in *temperate* latitudes; it intermixes with other types; but not much with the nervous. In fact, individuals, whom we may call eminently nervous, seldom present a strong muscular structure. This temperament, therefore, is rarely seen in the female sex. The hair of muscular individuals is seldom very fair or of fine texture.

The *sanguine* also may be considered as a normal and healthy type. We know not its organic ground, and it would be impossible for me to present even an exact physical feature of it. They may be of small stature or the contrary. They enjoy, for the most part, a good harmony of functions, and most probably their cheerful disposition is a result of this

harmony. We know them more by their moral than their organic properties; they are vivacious, always in good spirits, rarely subject to, or capable of lasting grief. They are exceedingly kind and disposed to enthusiasm, but not steady; impetuous, but not violent. They have no particular morbid dispositions. I could not assign to them any striking feature in infancy. Their development generally goes on well. Their diet requires no particular attention or care, even under the influence of new climates and circumstances.

If it were asked, to what we may attribute this temperament? I should be inclined to refer it to particular atmospheric influence; to a great latitude of temperature, but with a light, dry atmosphere; it *must* be warm in summer, and *may* be cold in winter, but neither in the extreme; with a clear sky and a brilliant sun. We find at least a great proportion of this temperament in all those countries, where these conditions prevail: in Germany, Austria, Hungary, Upper Italy, and France. And I have seen in my own country and some parts of Germany, that on some of those beautiful mornings, of which Englishmen (I hope they will excuse my remark) can scarcely form an idea, almost the entire population of towns are put into early movement; starting for the country, in multitudes, early in the day, to enjoy themselves until late in the evening. In this sensible, lively, and innocent enjoyment, and its effects upon the mind, amid the picturesque scenery of nature, with distinct views at great distances, I see the conditions and sympfoms of a sanguine temperament. They inhale with visible eagerness that genial air; their chest expands and their heart too, to carry on an easy circulation; an impulsive locomotive elasticity is felt in the limbs, and lungs and mouth yield aloud, as nature prompts, their cheerful sounds in song or conversation. It is not easy to describe the happiness which these beings feel on such occasions, and I am perfectly sure, that of such an intensity of delight an English temperament can receive no adequate impression, because the native atmosphere does not admit of that expansion. The impression of a clear, dry atmosphere, and an intensely blue sky, such as alluded to, is powerful upon both body and mind, and calculated to work changes in the blood and nervous system, though as yet unknown to us, to which the moral attributes of what we call "sanguine" may correspond. I am strongly convinced, that this good, happy, and enthusiastic, but fickle temperament, has had a great share in some of the historical events of the Continent!

We now come to the *phlegmatic* or *lymphatic* temperament. This has been supposed to arise from the predominance of water, lymph, and phlegm, with a disposition to atonic and lymphatic diseases. But all these original notions of medical antiquity are not the least advanced, as yet, in anatomical or physiological respects. A practical mind is struck by the

truth, which lies in the old construction; although science is not able yet to settle the ground and establish a clear understanding. Thus, until we get a clearer notion of a better theory, the best we can do is, to maintain the old one and throw light upon it, to the best of our power.

Is there any difference between the notions implied in the phlegmatic, and those in the lymphatic temperament? These are too vague to admit of an exact distinction. "Phlegmatic," it would appear, however, implies more the moral and physiological properties, whilst "lmyphatic" indicates more the physical attributes and pathalogical tendencies of the type. In fact, when we say, "phlegmatic temperament," we do not signify anything morbid, whilst "lymphatic" approaches the idea of morbid (I should say strumous) disposition. But these distinctions are too superficial, to be held strictly separate. All that I can say upon the point is this: I have seldom heard it said of a child—"this is a phlegmatic," but frequently—"this is a lymphatic temperament." Further, I have often been struck with the fact, that parents, of whom the one, particularly the father, is of a phlegmatic habit and temperament, and the mother similar, or at least not very much the reverse of it, propagate children with a disposition to vegetative weakness, or to what has been termed a lymphatic disposition. I shall, therefore, for our purpose in general adopt the term "phlegmatic," but notice, for the earlier period of life a certain modification or tendency of it, which comes very near to the adopted notion of the lymphatic.

In spite of the difficulty to trace this temperament to the early period of life, I shall not make perhaps a great mistake in saying: an infant belonging to that class and type has rather an extensive than intensive reproduction. The habit of body during the first months of life is rather full and well-looking, sometimes exceedingly fat. They have light hair and a large face, are quiet and good-tempered, eat and digest well, and may get over childhood without trouble. But betwixt the ninth and twelfth month I have frequently observed in them, more than in other types, a tendency to sink in strength and fall into vegetative weakness. As long as they are at the breast of a healthy mother or nurse, they seem specimens of health, but weaning is a great trial for them, by which digestion and assimilation become deranged, costiveness alternating with diarrhœa; nor is it seldom, that convulsions under the efforts of teething suddenly, or atrophy by a slower process, destroy their life; or they fall victims to *scrofula*. Another form of vegetative weakness, with tendency to rickets, manifests itself later, about the fifteenth or eighteenth month, by weak legs, and the avidity with which such children take bread in quantities, and other kinds of farinaceous food; this symptom is joined, in higher degrees of the disposition, by positive aversion, when we offer

to them animal substances. The latter I have noticed frequently also in pure nervous habits, but without the farinaceous voracity. Those first indications of the forenamed faulty condition parents are frequently not aware of, and the physician finds himself in the disagreeable situation to undeceive them. We are requested, for instance, to attend in a family one of the children, for some disease, when the mother exhibits another, younger, and is happy in showing how plump and healthy it is. This child may be fifteen months old; the mother asks it to walk towards us, and we observe that it does not walk very cleverly; we see it has a very large skull, of a *quadrangular* shape, almost forming corners on both sides, in front and laterally backwards; flat at the top. When we touch the top of the head, we find that the skull is not completely ossified; the anterior fontanalle is not closed as it ought to be at its age. We look at the face: the lips are tumid and the eyelashes long. We lift the dress, and find a large prominent abdomen, with proportionally thin and flabby legs. We lift the dress more, and we find a chest prominent in front and laterally compressed—pigeon-breasted; on further enquiry we learn, that the child has got its first teeth very late; or that after the first four or eight have been cut in time, there is then a long interval in that process of organic development. In a word, these are the first steps to disease of the lymphatic kind, which may assume different forms; for instance, of rickets, or what is worse, atrophy.

This wrong course of development, consequently, coincides more with the term of lymphatic than phlegmatic temperament. If there is any chance of future health, it is at the onset of the first abnormal signs, when we must insist on recommending animal food; commencing by small quantities, even by accustoming them to the taste only at first, and then gradually to increase its use. Small quantities of wine also may be given; but sometimes we are obliged to have recourse to an animal substance, the most efficacious of all, viz., cod liver oil; which most of these children will soon like to take. And by cod liver oil we insure at first their life; then we go to animal food, to broth, flesh meat, and so forth. When they get over the age of infancy, they are comparatively healthy. But dropping the consideration of the lymphatic modification and tendency, in conclusion I may say: phlegmatic temperaments at more advanced periods of life are subject to mucous and catarrhal affections, but not particularly to acute and dangerous diseases. Between the thirtieth and fortieth year of life they are disposed to fatness—to *embonpoint;* and some of them are liable to a chronic enlargement of the liver, which recently has been called the "fatty hypertrophy" of that organ; they incline also to passive dropsy. They can bear to take a good deal of meat, of fat, and also of spirituous drinks, and do not require much water. When we see the dis-

position to fatness, we must recommend abstinence from fatty substances and malt liquor, which have the effect of increasing that tendency.

The phlegmatic temperament in its full type is inactive, physically and morally, and can also bear no great exertions. It is not rare to find it commixed with the sanguine (particularly in Austria, Bohemia, and Hungary); and thus it becomes more or less modified in its attributes, by the addition of cheerfulness, livliness and more feeling. It does not associate the bilious. In Italy there is little of it, nor did I meet with striking examples in France.

The *nervous* temperament is the most delicate of all. It is the opposite, I should say, of the muscular. In its full type, it has a delicate feature in every respect. It is characterized by light or brown hair, white skin, sometimes almost transparent; the organs and parts are well proportioned, and the development regular; but we find, even in earliest infancy, a disposition to excessive sensibility. Then, in childhood we notice an uncommon degree of affection; and the more they advance in age, the more are they subject to excitement and intense feeling; which easily has an overpowering effect upon them. Children of this type are frightened and shaken by any sounds or sights, which are strange or unknown to them, and mothers guarding them in their sleep too anxiously against light and noise, generally make matters worse. They thrive the best and for the longest time on milk, and should the mother or nurse have a productive breast, they may be kept thus nursed till their ninth or tenth month; in general however, about the seventh or eighth month we may add some light, farinaceous article; but it is altogether improper and unsafe to give animal food too soon, at least not in substantial form before the fifteenth, eighteenth month; even then we must proceed with caution. Their nerves are exceedingly delicate. They bear not a strongly animalized blood. Their muscular system is sufficient evidence of this. They have not strongly developed muscles; consequently, their blood must be in accordance with that feature, not too fibrinous, not too strong. And this constitutional property—so frequently disregarded under the superficial notion of "strengthening the system," to the damage of not a few, remains with the nervous type through the age of maturity. The animal part of their diet must be light and scanty. Chicken, lamb, mutton, or boiled beef, generally agree with them, whilst the continued use of roast meat easily causes general derangement of the nervous system, restlessness, headache, disorder of the digestive organs—all that train of symptoms generally included in the term of nervousness. Nor do alcoholic liquids, or any kind of stimulating beverages, and in many cases no medicine, not even that which appears to be the "best indicated," agree with them.

During infancy, they incline to spasms and convulsions; particularly

while the first dentition is going on; and in the female sex this disposition not unfrequently remains up to mature age with them. There exists no temperament, in which a light and suitable kind of diet is of greater consequence. I have known nervous ladies and gentlemen (not a few) on the Continent, who were only healthy when they took a small portion of meat, once or twice during the week. Next in importance to a suitable diet, a mild and dry (but not too heated) atmosphere, is of the most beneficial influence upon them.

The nervous temperament is very common among the female sex; it seems just in the same proportion rarer and less intense in men, as they represent on the whole more the muscular. It is not frequent in England, at least not strongly developed; but exceedingly prevalent and intense in France, Germany, Austria, Italy, and probably other parts of the Continent, with which I am not acquainted. In Germany, I suppose, it is frequently connected with the lymphatic; in France, predominently with the sanguine; and in Italy, with the bilious or sanguine-bilious. We know that it depends upon an excessive activity and irritability of the sensible nervous sphere; but we do not know, from what physical or organic source this development and activity may be derived. We seldom find it in the lower, but very frequently in the higher ranks of life. Social refinement, the influence of scientific and artistic pursuits, and unrestrained passions, further its development. In daily life we meet with many individuals reputed to possess the nervous temperament, merely because they show excessive sensibility and restlessness without perceptible local disease. A frequent source of this state is a quality of blood, too strongly animalized (from the above-mentioned stronger kind of animal food) in proportion to *their* nerves; or continued excitement, or other kind of unsuitable influence upon their brain. In the real nervous type, on the contrary, organisation itself leads primarily to that excessive sensibility.

Education properly managed from early infancy, avoiding a disproportioned action of the brain, and teaching and accustoming such subjects to self-command, is calculated to improve them, though not always.

The *bilious* temperament, the opposite of the phlegmatic, is the most salient of all types. Sometimes even in early infancy we may recognise it, by very dark hair, and a slightly brown hue of the complexion, with some other additional marks in the progress of childhood and youth; yet, in general, it acquires its full developnent only between the thirtieth and fortieth year, when also its moral attributes are the most prominent, characterized by a strong, active and enterprising mind, ambitious, and yielding to outbursts of ire and violent reaction. Again, after the fortieth year it decreases.

During infancy, therefore, it seldom does require a particular diet,

because it is not developed; I have seen, however, some such infants improved by weaning them, and recommending light farinaceous food, with but little milk. As soon as the bilious temperament is developed, the principal regulation of the diet consists in avoiding large quantities of substantial and fat meat—the worst of all being pork; in abstaining from strong wines, alcoholic and malt liquors—in one word, from all those articles, which are rich in carbon, and which consequently augment the principal source of bile. Moderate use of lean meat, or in the case of more morbid tendency, only white flesh (fowl, young veal), boiled, with greens, acidulated substances, and a good deal of water, suit them best. They do not bear at any period of life milk or butter in great proportions.

The bilious temperament is the strongest physical type, and moral influence has less power over it than others. We may succeed in governing or moderating such persons, and may suppress even their outbursts; but this will not always be much the better for them, with regard to their sanitary state, unless we assist the moral management by physical means, in particular by a proper diet.

The bilious temperament, like others, occurs in infinite degrees and mixtures; it combines with almost all the others, except the phlegmatic. Frequently we see it commixed with the nervous, and these are the most unhappy dispositions—exceedingly uncomfortable and restless; the least disorder affects them strongly. Perhaps what are called *melancholic* temperaments, are pretty nearly a mixture of the bilious with the nervous. In these cases we must pay a still greater attention to diet and moral management. The bilious combined with the muscular, on the contrary, is a favourable mixture; because the nerves in this case bear better its influence: and thus passion becomes united with energy. This mixture has been the characteristic of many distinguished men in history,—daring in enterprise, powerful in execution.

When the bilious temperament reaches its fullest developmont (in mature age), it shows a great tendency to bilious or liver complaints. After that age it generally decreases, and its morbid dispositions lessen or disappear. It is by far more frequent and stronger in the male sex. It is very often met with in Southern Europe; in Italy, Spain and Portugal.

It was already mentioned, that these outlines of the temperaments are subject to many exceptions. The difficulty consists in individualising each case, and in estimating the various mixtures and compounds. It would be impossible to point out all those specialities, which present themselves in life and reality, and produce that infinite variety in body and mind, in health and character. The expressed principles of specific diet, therefore, are subject to manifold modifications in their individual application. The idiosyncrasy of a nervous temperament, above all, is unlimited. We can

never know with certainty, what will be the effect of a proposed kind of food upon it, before its use. Nor is it much better with the bilious. Slight and unaccountable differences in the food may affect such persons otherwise, than we had reason to anticipate. Nature and life have unattainable depths. Therefore, I should advise young practitioners, when they recommend a certain kind of diet, to say—"take this; probably it will do you good; it is indicated—but you will see how it acts." We ought not to be too positive in these matters. Apodicticism is convenient for the mathematician and the chemist—they have sciences; we, however, as medical men, have but scientific principles to guide us, and their application is an art, more difficult than most others.

There are great many cases, in which we succeed in improving the temperament with its morbid tendencies of body and mind, by a careful regulation of diet, occupations, and moral agencies; but there are others, which will improve only by a suitable change of climate. The influence of climate is the most powerful of all, if assisted by its appropriate food.

To know one's own temperament with its physical and moral requirements, should be a task recommended to every one. There are a great many, too little acquainted with themselves. Because they feel nervous or bilious, they think they are nervous or bilious temperaments, though nature has formed them otherwise, and what they feel is but functional disorder, from unwholesome influences.

The notions on temperaments, entertained by the public at large, scarcely touch the organic ground of them, but are confined to their moral qualities. From this point of view it might seem strange, to speak of a compound between the sanguine and phlegmatic, as the former signifies in that sense nothing but a lively feeling, hopeful and enthusiastic frame of mind—and the latter quite the reverse. But from the organic point of view, this opposition goes not so far. In Austria and Hungary I have seen frequently the combination of a stout body, with very much of *embonpoint*, with all the quiet and sluggish feature of the phlegmatic, yet endowed with a most lively and cheerful mind. It is otherwise with the bilious and phlegmatic; these seem indeed—as I endeavoured to show in the earlier part of this treatise—to rest upon opposite organic conditions.

Finally, I may mention also the circumstance, that in different countries the same types present modifications, in their organic mixture as well as in their physical feature, which, besides the climate, may depend also upon the different race, or mixture of races. Thus the predominant colour of the hair of pure nervous temperaments in Germany is fair; on the contrary in Italy, and if I am not mistaken, also in France, dark.

DIET MODIFIED BY CLIMATE, SEASONS, STAGES OF CIVILIZATION, AND INDIVIDUAL PURSUITS.

It has been shown already, that different climates require, and enable us to tolerate, different kinds of food and drinks. Taking the subject at large: in cold climates animal food is required, and spirituous drinks are well borne; a warm climate requires chiefly farinaceous aliment, and cooling liquids. The plus and minus of coldness and heat occasion numerous modifications and mixtures of both. In polar regions, it is said, people live exclusively on fish and fat; on the West coast of Africa some populations entirely upon rice boiled in water; in temperate climates, as peculiar to most countries of Europe, the food is mixed in infinite gradations.

It is worthy of notice, however, that, while among African tribes, who live exclusively upon farinaceæ and fruits, there are many robust muscular men (*f. e.*, the so-called "Crew-men," forming part of the crews of some ships, which sail between Liverpool and the West coast of Africa); the Esquimaux of the North, on the contrary, are weakly framed. Some Hindu and Arab tribes live also exclusively upon farinaceæ and fruits, and they are said to bear great muscular exertions. We shall have occasion to mention nearly the same of some Italian populations. In Hungary I am acquainted with districts, where the peasantry live during seven or eight months in the year upon potatoes and coarse rye-bread; and they are healthy and strong looking; but in the cold season they have plenty of pork-meat and bacon, and most of them also wine; in those districts, where in some unfavourable years it happens, that even in winter they are obliged to live upon potatoes and oat-bread only, they suffer from disease. Better kind of bread, however, and farinaceous dishes containing some fat, maintain them sufficiently well even in winter. Potatoes are a very imperfect substitute, at any rate, of wheat flour; this, I believe, has been experienced also in Ireland.

On the whole it is proved, that men may live in good health and vigour upon pure farinaceous food; but I know of no instance with the same effect, of men living upon pure animal diet.

From what was said on climate, it is easy to conceive, that different seasons in the same country require a modification of diet, more or less essential, according to the greater or lesser thermometric difference between its winter and summer. It will be found, that little difference is made in England, where the thermometric difference is scarcely more than 55 or 60° Fht.; and little for the same reason in the South of Italy; in Austria and Hungary, on the contrary, the diet in summer very much differs from that adopted in winter. It is scarcely necessary to remark, that, in principle, summer diet corresponds to that required in the warm, and winter diet to that which is suitable in cold climates.

Different stages of civilization require and adopt also a change of diet in the same climate. A nation, when arrived at a high state of physical and mental refinement, will require a lighter and more delicate ailiment, than in its former periods. To understand this, it is enough to take into consideration the decrease of the muscular, and augmentation of the nervous temperament, in ratio with the increase of scientific and artistic influence, and the multiplied agencies for excitement and passion.

The progress of science also works important changes, by teaching us, for instance, how to counteract the disadvantageous influence of climate, temperature, and other circumstances,—how to supply the natural requirements of different temperaments, and to amend their abnormal tendency, by regulation of diet. The progressive reduction in the use of ardent spirits in the higher and middle ranks of society, during the last twenty-five years, seems to be a fact referable to this point.

Furthermore, as regards the diet of individuals: even those possessing the same type of temperament, and inhabiting the same climate, require a modification of diet according to their different social positions and pursuits. An active life, with vigorous muscular exercise, requires strong animal food; while the scholar at his books, and the artist through the long day at his easel, will find themselves healthier upon a lighter kind of diet, with little animal food.

In conclusion, the diet of individuals, depends upon a number of agencies and circumstances, besides the type of their temperament, which it is necessary, though not always easy, to estimate. And in addition to the above-mentioned, there are others of a more recondite nature, connected with the unattainable depths of our living machine, and included in the obscure term of *idiosyncrasy*,

NATIONAL TEMPERAMENTS OF DIFFERENT COUNTRIES, COMPARATIVELY CONSIDERED.

From what was said in the foregoing pages, it appears clearly enough, that the variety of temperaments is a fact, of which we understand some principal causes, effects and requirements; but, that on the whole, our knowledge of them is still far from scientific accomplishment,

A comparative consideration of the national temperaments of different countries, traced as far as possible, to the nature of their *climates*, *diet*, *endemic pathology*, and *popular medicine*, will probably furnish some additional facts and views on a subject, so interesting in moral as well as physical respects.

I purpose, therefore, giving a brief account of the effect and relation of these agencies to temperaments, in Italy, France, Germany, and England. It will include the results of personal experience,—having passed several

years in some of the principal towns of Austria, Germany, and Italy, mainly in hospital practice, previous to establishing myself in the capital of Hungary; and having spent (after the disastrous events which occurred in summer 1849, and before taking a permanent position in Manchester, where I have again had every opportunity of practical experience,) about a year, partly in Paris, partly in London and other towns of Great Britain—though merely as a visitor.

I mention the towns, where I have had a longer sojourn, merely to show the reader, and enable him to judge of, the grounds, upon which my observations are founded. Owing to the great extent of the countries mentioned, these observations must of necessity be limited and imperfect; and, therefore, to avoid mistakes, I shall be obliged to confine myself to a few principal points, which may be safely regarded as applicable, in general, to a larger space than that comprised within the sphere of my immediate experience. It is necessary to observe also, that under the name of "England" I comprehend Great Britain, with the exclusion of Ireland, of which I have no personal experience,—and that in speaking on Germany, I shall pay particular attention to Austria and Hungary also: as, taking our subject at large, the last named three countries in many respects may be considered together.

CLIMATIC INFLUENCE REFERABLE TO THE TEMPERAMENTS, IN ITALY, FRANCE, GERMANY, AND ENGLAND.

In former pages (see pages 5 and 6) it was indicated, how a climate intensely and constantly hot, seems to promote the bilious, and the opposite extreme of cold, the phlegmatic temperament. None of the countries in question, however, possesses either of these extremes so unchangeably, as to produce the above-named types alone and pure;—all of them present a great variation of temperature: the co-existence, therefore, under such atmospheric conditions, of a variety of temperaments, is a fact, which seems natural enough, however difficult it may be, to render a satisfactory explanation for it in every point.

Be this as it may, if we extend the climatic comparison, we shall find, that in most continental countries the seasons of summer and winter are more distinctly marked, and more highly contrasted, than in England. In fact, with the exception of the south of Europe, where a high degree of heat extends over two-thirds of the year, and the winter is short and mild, as *f. e.*, in the greater part of Italy,—other continental countries, as *f. e.*, the German States, Austria, and Hungary, possess both extremes: great heat in summer, varying from 75° to 105° Fht. at its height—and severe frost in winter, with a temperature from about +25 to Zero Fht.

Of each of these extreme seasons in the same country, the action upon the blood and nervous system of the inhabitants must have an accordingly opposite effect, enhanced by the double kind of diet, which is the natural necessity of that difference of the seasons.

England, on the other hand, is remarkable for its moderate coolness—we scarcely can say mildness—of temperature, and the humidity of its atmosphere, through the whole year. One of the most remarkable phenomena, lately discovered and ascertained, influencing the meteorological condition of this climate, is the so called "Gulf Stream": a certain oceanic current, from the gulf of Mexico, in a direct line to the West coast of England. This current, warmer at its origin (the gulf mentioned) by nine degrees, above the temperature of the surrounding ocean, loses a few degrees in its long course; but still remains warm enough, to cause the sea of the English West coast to be of a higher temperature, than that of the Spanish, or of other Southern countries. It causes in the same time a current of air, remarkably warm, the West wind, which is frequently felt during the greatest part of the year, and which concurs to render the climate milder in winter, than it might be expected from the geographical position of the island.

The contrast of temperature between winter and summer in England is comparatively trifling. The average temperature of winter is 40° Fht., the thermometer seldom falling, even on the coldest nights, below 20°, and that seldom for a duration of several days,—and sometimes in midwinter it will mount up to spring or summer temperature. In summer the average is 60°; frequently the temperature is much lower even in June or July, and seldom exceeding 80°. The extreme thermometric difference, therefore, in England, can not be assumed to exceed 65°, while in Germany or Hungary, it extends at least to 100°. With these climatic conditions, we find the temperaments so far in accordance, that in the above-named countries, which have both extreme seasons strongly marked, both the extreme types, the bilious and phlegmatic, are strongly developed; to which we may add, that besides these, the sanguine and the nervous are met with in a great proportion. In Italy, with a higher temperature and length of summer, the sanguine bilious type is predominant, and the phlegmatic (as it will appear also from pathological characteristics to be mentioned by and by) is very little expressed. How is it in Russia—with the reverse proportion of temperature? with a winter much severer and longer than in Germany, and a short summer, but in many parts for some weeks rather above the temperature of Germany?—Is there the phlegmatic so much predominant, as in Italy the sanguine-bilious? Or how is the latter modified? How are the sanguine and the nervous? I am too little informed on that subject, to hazard an answer to these questions.

The climate of *this* country differs from that of the others, by less extremes of heat and cold; consequently it has an adequate milder and more equable influence upon constitutions, blood, and nervous system, which are the organic basis of temperaments. And with this conclusion again coincides the reality: England has, as we shall see by and by, a less strongly marked variety of types.

In accordance with the above-mentioned greater extremes in winter and summer, the named continental countries have in the seasons of transition—in spring and autumn—more sudden and greater themometric variations; the nights in particular, are comparatively much colder on the Continent, than in England. In Vienna and Pesth I frequently have noticed in one day a difference of about 50°. Such sudden changes are the fertile source of morbid overthrows in our system, of frequent excitement and depression in the body and mind; which again may be of some influence upon the organic mould of temperaments.

Great Britain has the most unsteady weather through the whole year; there are few days without repeated changes; but these changes are of much less difference, just less in a day in proportion to the lesser difference between the extreme seasons of the year. In Manchester, *f. e.*, heat in summer is less than in any continental country; and coldness in winter is less than in Milan. Many people have their chimneys lit through the whole year. The difference of the above-mentioned sudden changes in Manchester is generally only of 10°, 15°, and seldom 20° Fht. in a day. The nights are comparatively very mild, and the *twilight* of England, which is altogether unknown in Italy, and other countries, is worthy of being called a pleasant characteristic of this climate. This phenomena prevails from the month of April to September, in the period comprised between sunset and the moment when total darkness sets in. For several weeks in the middle of summer it continues the entire night—then being no total darkness. This is particularly striking to the foreigner in Scotland. In general, whatever the character of the weather may have been during the day—whether hot, or chilly, or boisterous, or tranquil—this portion of the evening is calm, clear, and of moderate temperature. In the evening the light fades slowly and imperceptibly; the horizon is tinged with a soft grey light, and the "solemn stillness" of the air is delightfully "tranquillizing."—Thus, on the whole, amidst more frequent changes, the English temperature is more moderate and equable; therefore less exciting and trying for the organism, allowing the functions to work in a more steady way; this more quiet run of the life-process, in the blood and nervous system, seems to have its correspondent effect in the national temperament.

Slight barometric changes easily escape the perception of the general

observer. I may safely state, however, that all continental countries have more dryness than England. There it rains sometimes uninteruptedly for many days, more heavily than here; but then follows dry weather continued for some weeks and longer, with a cloudless sky and bright sunshine—exhilarating the mind, vivifying the circulation, and the muscular action of chest and limbs. If anything, this would appear to be one of the ways for the development of sanguine temperaments which in fact; abound in all continental countries. In *this* country, there is but little in the meteorological agencies to excite the circulation, or the nervous system, little to gladden the eye, or elevate the mind. The atmosphere generally is sunless, heavy, and dull. This is not only seen, but felt. An anecdote is recorded of a lady of high rank, having said to an eastern ambassador: "Is it true, your Excellency, that in your country there are worshippers of the sun?" "Yes, my lady," replied the ambassador—"it is perfectly true, and doubtless you would be one also, if you ever saw him!"

Of course, a notable difference exists between the South of England and the North of Scotland; or between the neighbourhood of a manufacturing place, like Manchester, that remarkable city of smoke, and open, agricultural places; but taken on the whole, and on an average, the decided character of British climate is a moderately warm, or moderately cool temperature, with a great proportion of slight rain, mist, or fog—more unpleasant than noxious, more depressing to the elasticity of the muscles, and to the cheerfulness of the mind, than dangerous to the life. In fact the rate of mortality in this country is strikingly favourable,—but this is not pertinent to our present question. The firmament, even when devoid of clouds, and under sunshine, does not allow so clear a view at distances, as on the Continent, its blue being tempered by some whitish hue, from a degree of moisture. The sanguine temperament has little to suit or develop its dispositions (see page 14), and some delicate English constitutions, and still more those, who exhibit the nervous types of Germany and France, complain frequently of a feeling of chilliness, of cold in the legs or in the spine, a degree of headache and restless nights; in the warmer season again they talk of what they term a "close atmosphere." But the latter sensation, it appears, seldom amounts to that oppressive feeling from electric tension, which precedes the heavier showers and thunderstorms, with which the Continent abounds,—and after which, at once the atmosphere acquires a vivifying and charming lightness, combined with an intense *ozone** smell.

The very different hygrometric condition of the English atmosphere, is in

* Ozone, has been termed a recently discovered atmospheric imponderable, thought to be the result of the action of atmospheric electricity upon atmospheric oxygen. On the whole, it is more frequently perceived in winter and spring—at least on the Continent.

itself a proof of a considerable difference also between its electric state and that of the Continent,—which must have no little influence too upon the nervous system and blood, the two chief agencies in the production of temperaments—though I am unable to adduce explanatory facts in support of this theory. This much I can state, however: I have witnessed here many a thunderstorm, (this year, 1853, we have had scarcely one, which can be called a storm, except just now, being in October!) in the open country of several near and distant districts; but I have felt at these times decidedly less of oppression, and less of subsequent lightness, than on the Continent, under like circumstances.

Regarding winds, I feel unable to form either an exact estimate of their comparative frequency and power, or an opinion as regards their particular influence upon constitutions and temperaments.

A fact, merely referrible, I believe, to the nature of the English climate and atmosphere, and by the universality of which I have been struck, is the character of the voice of the natives. The difference between its tone and that of Italians, nay, even of Germans, or French, is remarkable. In the great majority, the voice of the English female sex, even though not unpleasant in tone, or when it sounds as is said "sweet" in singing—is weak, frequently less than weak. Nor is the male voice so sonorous as on the Continent: and when strong, then generally it is less melodious, or even harsh. Fine and full melodious voices are decidedly much rarer here in both sexes than on the Continent.

To what quality of the atmosphere is this owing? To the relaxing influence of moisture upon the fibres of the the larynx and bronchi? Most probably so; though perhaps the joint thermo-electric condition may also contribute to that effect.—The climate of Italy, ranging through nine or ten months in the year between 60° and 105° Fht., with prevalent dryness, is acknowledged as most favourable to the voice. Extreme heat or cold, in spite of dryness, has a contrary effect, as is abundantly evident in the voices of Negroes and Esquimaux.

In connection with the climate it will not be improper to mention some dependent properties of the soil—above all, the well-known beautiful green of the whole surface of England, lasting almost through all seasons—a great proof of the prevalent moisture and coolness of the atmosphere. Nothing equal to this can be seen on the Continent.

Everywhere the English soil shows a luxuriant growth in those vegetables which agree with, or require much moisture. A variety of greens, (cabbages, cauliflowers, cellery, rhubarb, and some others)—but on the whole much less numerous than on the Continent—are luxuriant, and of exquisite tenderness, but much poorer in aroma; and it is just by the last-mentioned defect that some of them, cellery for instance, are by far more

palatable in England. Certain kinds of fruits, such as gooseberries, strawberries, and raspberries, and all sorts of currants, grow to an uncommon size; but they have a watery juice, are scarce in sugar, poor in aroma. But of fruits in general, of which the eastern, southern, central, and western countries of the Continent produce a great variety and excellent qualities, here we have few and poor looking specimens, and these with little or no flavour. They are but little inviting, and would scarcely be much eaten were they produced in ten-fold quantities. The same may be said of the aromatic herbs and flowers; these are beautiful in colours, large in size, but deficient in flavour.

Another property of the English climate is the total absence of some, and the great scarcity of other kinds of flying and creeping insects, which are more or less common in continental Europe, and form in summer in many parts an intolerable scourge to the skin and nerves. Their scarcity in this country, relative to others, is proved also by the scarcity of those birds which live upon them. And this again shows the afore-mentioned difference between England and other countries.

This brief account of climatic properties, obvious and perceptible to every one, leads to the conclusion, that the climates of continental countries are infinitely more pleasant, more animating and vivifying to the circulation, the muscular and nervous systems, and, probably therefore, more favouring the development of sanguine and nervous temperaments—attended with a more intense feeling of health and happiness, but more exposed to disease and distress, than the temperaments of Great Britain. According to the climate of the latter, if the essential character of the phlegmatic temperament suppose the presence of a greater proportion of aqueous elements in the system, then the great prevalence of this type in this island appears but as a natural consequence.

It is a fact, which all those who are well acquainted with the climate of the southern, northern, and central countries of Europe, will have noticed, that not only on a fine summer day in July, but also on a fine day of January, in the North—when the sun's rays cover with brilliancy the unwieldy snow and ice—we feel a vivifying and exhilarating influence, and a kind of impulsive elasticity in the muscles. But there is a degree of heat—of course, different for different constitutions and dispositions of the body, from which, or beyond which, instead of a vivifying, we feel an exhausting influence; and there is a degree of cold also, from which instead of that elasticity in our limbs, we feel overpowering rigidity.

Again, moisture in the atmosphere combined with different degrees of temperature, alters very much the effects of heat or cold upon our system. It is certain, *f. e.* that a temperature of some degrees above the freezing point in the moist atmosphere of England has a very depressing effect; whilst

a temperature many degrees below that point, with a clear sky, acts upon us in an exactly opposite way. In this action and reaction probably electricity plays an important part. Even animals, horses, when brought into the open air on severe but clear winter days, show by their lively and bounding movements the above-mentioned vivifying influence of a German winter. Man and beast experience that influence alike.

Thus also that degree of heat which we have sometimes in summer in this country, has not the same effect as it has at Pesth, Berlin, or Naples. I have remarked, and ascertained by numerous enquiries amongst Englishmen and foreigners, that at a thermometric stand between + 60 and 70° Fht.,—an elevation so moderate in its effects in Italy, or Austria, that people feel elastic and light—here at that temperature the phrase is in every one's mouth: "it is very close to-day!" This happens not always even at + 70°, but sometimes—as *f. e.* in September last—I remarked the same condition even below + 60°, which certainly does not happen on the Continent. It is at such periods, which are not unfrequent throughout the greater part of the year, that bilious disorders are afloat, of which I shall make mention in another place. It seems, that while in Italy, Germany, or Hungary, a temperature of about + 70°, associated with dryness of the atmosphere, constantly increases the activity of the skin: here in England, at certain periods, a similar thermometric stand abates the cutaneous functions, and thus antagonistically the liver is brought into greater decarbonising activity, *i. e.* production of bile. The reason of such an effect, of so moderate a thermometric elevation, may be found, I believe, in its connection with the peculiar hygrometric and electric condition of the English atmosphere.

But, of course, were it in Italy for months as hot, as it is for days or weeks in July; or were it in Warsaw or Petersburgh for months as cold, as it is for some shorter periods, of weeks or days, in December and January—the comparison with England would lead to a different result.

It would be interesting and useful, to obtain on this subject comparative facts and observations more extensive and exact, than I am able to bring forth.

With regard to dress—every body knows, or may conceive, the great difference between summer and winter clothing in central and northern Europe. In Italy the difference is much less; but nowhere have I found so little distinction made by the *masses* of people between winter and summer dress, as in this country. Fur dresses are not required in winter, and the male sex entirely dispenses with them. Flannel on the contrary, is much more constantly used than anywhere else. Remarkable is the circumstance, that many females, particularly of those who belong to the middle and lower classes, dress exactly alike in August as in January, and may be seen on the finest days of which this climate is capable, with a long

fur wound round the neck. This coincides with the almost constant use of the chimney flame—it shows the little difference of the seasons, and the great apprehension even in summer of "catching cold;" although it would seem, that to wear articles of fur constantly, is not a secure plan to prevent it, and only commendable, with certain precautions, to very delicate constitutions, or real invalids. The wealthier ranks generally dress much lighter in summer than in winter. For the purpose of comparison, however, the interesting point is this; that the English summer *admits* the use of fur, and the comforts of the fireside; and the English winter does not necessarily require fur.—The considerably lesser activity of the skin in this country is an obvious fact. A high degree of perspiration seldom shows itself even in the summer. If I am not greatly mistaken, however, foreigners, except those of very nervous or bilious habits, are more liable to perspiration here than the natives, though, of course, not so much as on the Continent.

Another remarkable peculiarity of British custom is the little use of *warm baths*. A large town like Manchester has but a few, very small and uncomfortable bathing establishments; and it has not seldom happened to me to hear even persons of the wealthy classes say, that they have never yet made use of warm baths, but only of sponging. The fact is, that in no country I am familiar with, so exceedingly little use is made of warm baths, either for hygienic or therapeutic purposes; and this fact, though perhaps followed to excess, is evidently in connection with the climate and temperament. The dynamic reaction after a bath in a cool and moist atmosphere, where there is less determination to the skin, as mentioned above, cannot be in general so pleasant and efficient as in a dry atmosphere; and the native temperaments of this country do not so generally, (and in many instances not at all,) agree with baths, as do the more sanguine, nervous, or bilious of the Continent. Cold sponging of a few minutes with efficient friction afterwards seems to suit well here great many individuals. There cannot be the slightest doubt however, that a more general use of warm baths than the present, at + 90° to 98° Fht., of ten to fifteen minutes duration, followed by dry friction, would be a considerable improvement to the English popular hygiène.

NATIONAL DIET, IN CONNECTION WITH CLIMATE AND TEMPERAMENT, IN ITALY, FRANCE, GERMANY, AND ENGLAND.

The general character of diet adopted in a country may be regarded as the physiological necessity of its climate, and may properly be called *climatic* diet,—the principal tendency of which must be, to keep up the necessary

quantity of carbon in the blood, proportional to the quantity of oxygen in the atmosphere (see pages 5 and 6). Climate and diet acting conjointly through successive generations, are the principal sources and agencies of what may be considered the national temperament. Climate being unchangeable, is the higher power of the two; diet the subordinate, being changeable to a certain extent. As a general rule we may say: the prevailing character of the diet of a people indicates the *predominant* temperament of that people, and at the same time shows, in what manner the unwholesome tendencies of climate and temperaments may be counteracted by food and beverage, in different nations.

What a variety of usages and customs, however, in eating and drinking, present themselves in different districts of the same country, and even in individuals of the same district or town! The following details are intended to express the impression I have received on the subject at large, in the countries which have been already named.

The diet of Italy, the preponderant warm temperature of which and its sanguine-bilious temperament, nobody ignores, consists in a large proportion of green vegetables, fruits, acidulated and iced beverages, and plenty of water, almost throughout the year; a great deal of light wines and of strong coffee (see on coffee, pages 10 and 11). The Italians use bread and farinaceous dishes (maccaroni especially) in great quantities, and much rice. These, with a large amount of salad and acidulated drinks, will account perhaps for their not being deranged, in spite of the warm temperature, by fish—which, of course, is very much eaten in and about seaports. Of flesh meat they make moderate use, more boiled than roasted, and in the latter form commonly veal and fowl. Of pork, ham, or bacon, they eat very sparingly; sausages in the cooler season, fumigated, not fat, and moderately spiced. Spices are otherwise little used in cookery.

Their whole living is eminently frugal, plain, cooling and temperate. Drunkenness is so rarely seen, and held in such detestation, that an occasional exhibition of it, when perceived in the streets, is treated by the populace with manifestations of abhorrence and insult.

Wealthy families in Naples frequently content themselves with one substantial dish at dinner, and the rest of their meals are barely nutritious. The population of entire districts live exclusively upon a sort of bread (fogaccia), made of flour and oil; some others on other kinds of pastry, with greens and fruits. There are lazzaroni at Naples, who live throughout the year upon maccaroni and fruits. During summer it is not rare, even in Upper Italy, to see people eat for days or weeks nothing but salad made up with oil and vinegar, and dry bread.

In spite of this light and scarcely nutritious diet, it is remarkable to see among them numbers of tall, muscular looking men.

The diet which suits the majority of Italians in Italy, would be comparatively innutritious, if not absolutely injurious, to the majority of Germans or Englishmen in their respective countries; but, no doubt, it must be considered in principle, not only as convenient for, but also at the same time counteractive of, the unwholesome influence of summer, and the morbid dispositions of the sanguine bilious temperament everywhere, with appropriate modifications.

In *France*, people live generally on a cooling diet, though less so than in Italy. They eat a greater proportion and variety of animal food, partly boiled, partly roasted; seldom however roast-beef,—this would be too stimulating and too drying, as a general diet. I have seen there, both in hotels and families, many people, particularly females, eat exceedingly sparingly of animal food, and that of the lightest kind. This probably arises from the frequent occurrence of the nervous temperament. The household kitchen is generally more refined and complicated than in Italy; but on the whole it consists of light dishes. The French very generally use coffee, though in lesser quantities than in Italy; their usual beverage is the light wine of the country, with very little of liquors. Drunkenness is scarcely less rare, or less abhorred, than in Italy.

In *central Europe*, in most of the German states where I have been, in Austria and Hungary, they use an abundance of fruit during summer and autumn; greens and other vegetables through the whole year, in great variety; but in many places these are prepared in a more substantial way than in Italy and France—with the addition, namely, of flour, and butter or fat. Though diet for the past twenty-five years has undergone material changes in Vienna and Pesth, with considerable improvements, both for the healthy individual and the invalid; still, one fault is not yet sufficiently amended in the household kitchen of both these capitals: their cooking is too rich and too fat, and by virtue of this property disadvantageous for a great many individuals.

They drink a great deal of water; to take from six to ten glasses in a day, is very common in summer time; quantities of light wine are consumed in localities where this is produced; in other districts they use a kind of beer, generally light, but rather in abundance. On the whole, strong spirituous beverages are much more used than in Italy or France; and, as a natural consequence, drunkenness is more frequently met with. In fact, considering the comparative frequency of drunkenness in different countries, it will be found to prevail in direct ratio with the cooler atmosphere, and with the greater frequency of the phlegmatic or lymphatic element in the national temperament. They use coffee more than tea; but less than the Italians. Bread and farinaceous dishes they eat in much greater variety, and much more of sweet cookery than in Italy.

Respecting soups (bouillon) and meat, their use little differs from that of France; I should think, however, more is eaten of the latter, and decidedly a greater proportion of pork, in different forms.

Like the climate, which is hot in summer and intensely cold in winter, the diet of these countries has a distinctly two-fold character. In winter the population of Germany, Austria, and Hungary, eat considerably more meat, pork, and fresh sausages, which are very fat, and drink more spirits; in summer, on the contrary, they use a greater proportion of those cooling articles, we noticed in the diet of Italy. It may be well to mention in passing what on a former page was already observed, that in these countries we find not unfrequently, and rather strongly developed, both the opposite temperaments—the bilious and phlegmatic—as well as the other types, with all their modifications.

The *diet of the people of England* differs widely from all those before mentioned, in the following particulars: they use much more animal food, and this of a more succulent, invigorating quality,—above all, beef and mutton—than any people on the Continent. The one or the other, with plenty of boiled potatoes, and very little bread, form most generally the dinner amongst the lower ranks of the vast middle class. A little higher up in society, besides beef or mutton, some kind of fish may be on the table; potatoes forming a constant part of every dinner. Fish, beef, or mutton, is commonly also added to coffee or tea for breakfast. Butter—partly in the form of "bread and butter," partly with toast, or otherwise, forms part of every breakfast, lunch, and tea. Ham and bacon is not seldom met with at breakfast or lunch, even in summer.

It is worthy of notice, that beef is principally—we might say, almost exclusively—prepared by roasting; mutton is not unfrequently also boiled. Never, before coming to England, had I an adequate idea of so nutritious, so strong a kind of aliment, as the English roast beef. It well deserves the reputation it possesses, of being the national dish; and I could scarcely have believed, had I not been practically convinced, what an amount of difference it makes, to eat roast beef regularly for a time—prepared by the sudden action of intense heat, by which a superficial crust of coagulated albumen is formed on the outer surface, and thus the evaporation from the interior of the piece effectually prevented; or to eat boiled beef, and the broth of it (bouillon) separately and successively. Although it would seem, that in the latter case nothing of the nitrogenous constituents is lost; still, it cannot be denied, that by boiling, the flavour and consequently the stimulating principle becomes diminished both in the broth and the meat; nor is it indifferent, to eat fibre and albumen penetrated and soaked with water, and to eat them unmixed, in the English way:

moreover, it must have a different effect, to let all the constituents of the meat (as they are contained in the roasted), act conjointly and at once upon the stomach, or to bring them separately and consecutively into contact with its nervous, muscular, and chemical powers.

Regarding the different effects of beef—eaten as roast meat, or as boiled and in form of broth—I have made during the last two years many careful experiments, partly upon patients, partly upon healthy but delicate individuals, German and English ladies and gentlemen, of nervous, sanguine-nervous, and bilious temperaments,—of whom about ten have carried out the experiment with the utmost patience and perseverance, using for an equal number of weeks or months, one after the other, both forms under otherwise equal circumstances.

The general result of the experiment is this: that in those who for a length of time had made daily use of roast beef, when afterwards they lived for a week or two upon boiled meat and broth made of the same piece, the alvine evacuations became easier, more frequent, and of lighter colour, the pulse less frequent, and the nerves more at rest.

Veal is much seldomer eaten in England than on the Continent, and has the reputation of being difficult of digestion. It is, in fact, less digestible than that used on the Continent, owing to the custom with English butchers, of abstracting as much as possible of the blood of the animal, before killing it, in order to give the flesh a white appearance. There is certainly no other objectionable quality in it, except the greater dryness of the muscular fibre, by which, in case that the veal be a little advanced in age, its flesh becomes a little less digestible. It would be desirable at any rate, to abolish that procedure. I must observe, however, that the English veal as it is, without the blood, gives a broth exceedingly suitable for some invalids and delicate temperaments, forming a light and cooling kind of animal nutriment, of which I avail myself frequently with decided advantage, in the dietetic treatment of chronic diseases, so frequent in this country. And even the flesh, if the animal be sufficiently younng, is tender and very digestible. This I have ascertained by numerous experiments.

Wealthy English people use, of course, all kinds of flesh meat, but roast beef and mutton occupy generally the first, and among the lower ranks the only place on the table. Farinaceous dishes are less used than in Germany; greens and fruits still seldomer. The quantity of bread which they consume, is extremely small in comparison with continental nations; potatoes, on the contrary, are eaten more plentifully than in any country of the Continent. It is enough to say on this point, that in Italy, one scarcely sees potatoes at any meal; and in Hungary—a country enjoying the reputation on the Continent, for its abundance and great consumption of

potatoes—even in Hungary, in several towns well known to me, scarcely a sixth of that article is used in comparison of the quantity I see consumed in Manchester. Coffee is less generally used here than on the Continent, and is much weaker; but, if I am not mistaken, there is more tea consumed in England, than in Italy, France, Germany, Austria, and Hungary together.

Ices and acidulated beverages are scarcely ever seen in public establishments, the nature of the climate not requiring them.

But nothing is more remarkable and significant, than the small quantity of water consumed in its natural simplicity. I shall scarcely be wrong in saying, that if we assume that on the Continent people on the average during the year drink from about three to eight glasses of cold water daily; the average in this country probably is somewhere between nothing and three. Counting tea however as a substitute for water, we may arrive perhaps at an average of three glasses of liquid per day; but everybody must be aware of the difference between cold water and a warm aromatic drink, such as tea.

Probably, the quantity of water used in different countries, is in direct ratio with the quantity of bread eaten. On the Continent an abundance of both articles is placed upon the table and consumed at each meal; whilst in England there is plenty of bread only at breakfast, and with tea in the evening; but comparatively little of it at dinner—with the exception, however, of the lower orders,—and simple cold water is placed generally in small quantities on an English dinner-table, sometimes it is entirely wanting, and only supplied on demand.

The small quantity of water used as drink in England is in connection, of course, with the coldness and moisture of the atmosphere, and the "phlegma" of the national temperament. But to the latter there are many exceptions; and as the nature of this climate is abundantly counteracted by substantial dishes and a proportionally greater quantity of strong wines, malt liquors and spirits, so here also for many individual temperaments a free supply of water is desirable. The use of malt liquors and spirits is also more frequently carried to excess and to hurtful consequences here, than in those parts of Germany with which I am acquainted, not to speak of Italy or France. There is no doubt, (and this I know from personal experience) that port, sherry, and spirits, are more naturally liked and better supported in the damp climate of England, than on the Continent; but I feel strongly convinced that the English temperament in the majority of instances would be much better—especially from June till October—with claret, pure or mixed with water; and this is so generally understood in the present day, that so soon as the importation duty shall be reduced, I am sure the use of lighter wines will spread to the partial exclusion of the beverages now in vogue, and to the great benefit of the English population

at large, as regards both their moral and sanitary condition. There are however temperaments met with on the Continent, and still more of them in this country, which are decidedly benefited by the use of strong wines, such as port and sherry.

The English household kitchen, speaking in general terms, is plainer, but its products are more substantial and less easily soluble in the stomach, than those of other countries ; the digestion of such strong animal viands, as are used, must of necessity require greater muscular power on the part of the stomach, and the more so, as more cold meat is eaten by the English than by other nations. It is said, that scarcely thirty years ago great simplicity prevailed at dinner tables, even when a party of friends were assembled ; the host and hostess performing the kind offices of carving and distributing. In the wealthier of the middle classes, however, by the rapid increase of riches, that simplicity of living seems to have yielded more and more to the luxury of an overloaded table, which is more frequently displayed here than on the Continent, and offers a truly Lucullian cornucopy, even on what may be called "friendly" occasions. Moreover, the old English custom of assisting and serving each other at table being not seldom practised amidst a most overwhelming array of dishes, lively conversation is rendered almost impossible—which is the constant "assaisonnement" of such meals on the Continent; nor can it be denied that lively and mirthful conversation not only prevents us from eating too hastily and overloading the stomach at once ; but it forms a real "auxilium digestionis", which was well understood in olden times—

> "The feast is ready; bid the fool prepare
> With piquant gibe our laggard souls to chide,
> And help digestion on." *Old play.*

Nothing is more true, than, that whilst Italy is the representative of frugality ; the English climate, and national temperament, its wealth and customs, give occasion more naturally to a "surplus" of nutriment, by which more frequently than in other countries the blood undergoes that slow and insidious chemical alteration, which results in the gouty dyscrasy.

My remarks concerning national diet refer principally to the wealthier classes. Poor people live everywhere just as well as their means will admit of, and their temperaments and diet do not appear in the same strongly marked varieties as they do in the higher ranks.

The masses of the population of warmer climates, or at least of countries with longer and warmer summers, have decided advantages as regards dress and food over those of Britain. Statistics have been issued to the effect,

that in England proportionally more meat is consumed than in any other country. This I believe, is a fact; but we must not forget, that the diet of a warm country, as of Italy, is based upon the principle of counteracting the production of carbon in the blood, by light food and abstinence; that of Britain on the contrary, on the principle of supplying a larger amount of carbon, consequently requiring in general a more substantial kind of food.

The poor of Italy, therefore, are easily able to satisfy the wants of nature; whilst the poor of this wealthy island are in a much more difficult position.

The Italian peasant may subsist well on rice or Indian corn; but I scarcely believe the British country people could maintain themselves in a satisfactory physical and moral condition upon mere bread or potatoes.

The condition of the English working classes seems to me, however,—at least since I have lived here—better than it has been described by some philanthropists. From what I have observed in this world-renowned emporium of industry, with its immense wealth and hundreds of thousands of artisans—I scarcely believe, that equivalent masses could live in the present day anywhere much better than they live, under ordinary circumstances, here. From this simple statement of what I have observed, however, I wish not to draw the conclusion, that the population of exclusively manufacturing and trading towns and districts are, or ever will be secure against sudden checks, or become models of human happiness!

Infantile diet—considered in relation to different climates and national temperaments—would be a subject highly interesting and instructive. I must however confess, that my personal experience in this respect merely extends to Pesth, Vienna, and Manchester. Years ago, when I was in Italy and Berlin, I had but few opportunities of observing diseases of children, or their management in health; nor did I on the occasion of my last sojourn in Paris find sufficient opportunities to make myself acquainted with the details of infantile diet, in French families.

It is physiologically interesting to notice the fact: that while the diet of adults so much varies, and is dependent upon the difference of climate and temperament: the aliment for the first six months of life—milk, is everywhere the same. There must be in all probability a physiological difference between the milk of an Italian, a German, or English mother; but of this we have no appreciable evidence.

After the sixth month, in general, a more striking variety begins, and augments from month to month, in the aliment of children—and mischief increases in the same proportion. I cannot refrain from stating: that the obvious fault of using too soon and too freely farináceous substances for infants of tender age, and the propensity to overfeed them, I find to be the same in Manchester (and I guess in other parts of the kingdom), if not more, than in those places of the Continent, of which I have

personal knowledge. The *indiscriminate* and too general use of starchy articles (arrowroot, tapioca, &c.), against which I had to contend at Pesth, I meet with also and in a higher degree in Manchester. And nowhere as yet is sufficient attention paid to establish about the second or third year, when some children already evince a decided type of temperament, a specific diet suitable for them. Thus, I frequently see children of a nervous habit, fed at too early a period, or with too substantial a kind of animal food; and on the other hand, the phlegmatic or lymphatic, with a rickety disposition or taint—which is so frequent in Manchester—who ought to have meat in preference, to be kept in want of it much longer than is desirable. (See pages 13, 16, 17.)

The influence of scientific instructions in the hygiène of children upon the public at large, is certainly nowhere greater than in Vienna; it began with the immortal Goelis, and is kept alive and augmenting by the activity of my able colleagues (directors of the children's hospitals), D. D. Mauthner and Hügel, and many other clever representatives of this branch,—which in Britain, in spite of its striking importance and extent, has been, in comparasion with other countries, less efficiently promoted hitherto. May the efforts of my distinguished friend, Dr. Charles West, of London, now chief physician of a newly founded hospital for children,—and of the learned and experienced Dr. Churchill, of Dublin, the merits of whom are acknowledged by the profession throughout Europe, be crowned by an increasing interest for the branch they so laudably represent. Doubtless, children's hospitals are giving a great impulse in this respect.

NATIONAL PATHOLOGY, AND POPULAR MEDICINE, IN ITALY, FRANCE, GERMANY, AND ENGLAND.

Climate and diet, considered as to their sanitary influence, undoubtedly occupy the chief position among the agencies which regulate the physical condition of the human system. But the diseases engendered by the unsuitableness of the one, or the erroneous employment of the other, are in strict relation with, and are modified by the quality of temperaments of those submitted to their influence. I shall have occasion to show hereafter, that the same kind of disease occurring in the same climate and under like circumstances, differs materially in its character, and requires a particular modification as to treatment, in the native and the foreigner; proving the important relation which subsists between national pathology and national temperament: and hence the importance of a correct knowledge of the one to the due appreciation of the other. A comparative appreciation of drugs popularly used—the tolerance or intolerance, namely,

of certain remedies which act upon the blood, upon the nervous system, or upon both, will materially assist us in judging of the respective temperaments.

With a view to this end, it is not of so much importance to acquaint ourselves with the epidemics liable to visit a certain country or district, or with the diseases which are endemical to it, as to observe in what degree the prevailing diseases are disposed to assume the acute or chronic, the inflammatory or asthenic, the bilious, the nervous, or the lymphatic character. These and certain other pathological characteristics become more appreciable in their bearing upon temperaments.

There can be no necessity on the present occasion for making minute inquiries on a subject so vast and difficult; and as I wish to give only the remarks of a practical physician, confined in that quality, as is usually the case, to one locality; so must I limit myself to such observations as I think may be applicable on a larger scale.

In what measure the inflammatory or the asthenic character of disease may predominate in one country or another: how far the bilious, the nervous, or the lymphatic type of malady may prevail—will form a principal subject for future consideration.

In the first place then, as regards *Italy*, it may be stated, that during the discharge of my duties in the General Hospital of Pavia, I had for the space of two years ample opportunity of acquainting myself with the prevailing diseases of the country and their treatment, and I am now able to institute a comparison between the maladies of that ardent climate and those of England—based upon facts, the result of personal experience. I witnessed many hundreds of cases of inflammatory disease, where in the space of a fortnight the patient was bled from the arm ten to fifteen times. Professor Francis Hildenbrand, then superintendent of the Pavia Infirmary and clinical school, though animated with aversion for the system of Rasori, frequently acknowledged in my presence that the great majority of those cases recovered under that treatment speedily and completely. Now, setting aside the injury not seldom inflicted by such measures carried to excess, to say nothing of the erroneous general tendency of the Rasorian system, now fallen into well-merited disrepute in Italy, it is pretty certain, that in Pesth few people could bear the loss of even half so much blood without serious injury; and here in Manchester, amongst all the patients I have seen in the space of three years—there has not been one case of so violent a character, as would have induced an Italian physician of those times (1830-2) to practise his theory to any considerable extent. In Pavia I knew a lady of high rank, thirty-two years of age, exceedingly pale and thin, but lively, and very fond of society. She was said to suffer from chronic metritis, with frequent acute attacks, and had been bled in the course of fifteen

years about one hundred and fifty times. In the hospital of Parma I saw a young female, Rosa Cellini, (I should think about twenty-four years of age), suffering, as it was stated on the bed-board, from traumatic hepatitis (from a fall). She had been bled from the arm about one hundred times in two years. When I saw her, she was walking about the ward, and though not looking well, her appearance did not betray such an enormous loss of blood. But a case still more extraordinary than the preceding occurred during my sojourn in Italy, in the clinical practice of Professor Del Ch * * * *, of Pavia, one of the most sanguinarian contrastimulists of that day. He had a patient in hospital, a young girl suffering from chlorosis (watery blood)—a disease at that time considered, strangely enough, by the Rasorian school, as inflammation of the ateries!—whom he bled not less than seven times in a fortnight! Headache, palpitation of the heart, and similar symptoms of anæmia, were to him indications for bleeding; and as by the loss of blood these symptoms increased in severity, instead of abating, the same barbarous measure was repeated again and again; yet, the poor girl did not die! Now, this practice would have been equal to killing in Pesth, Vienna, or Manchester. I cannot exactly remember what symptom or circumstance eventually put a stop to that treatment. These facts, no doubt, are sufficient to show the influence of climate upon the temperament, and of temperament upon treatment—although a fully satisfying physiological explanation of them, in the present stage of our knowledge, might be difficult to render.

To these facts others might be added, tending to show in what manner national temperaments, when once established by the lapse of ages, maintain their peculiarity to a certain extent against the modifying influences of other climates. In the hospitals of Pavia we had many Hungarian soldiers, (of the regiment Bakonyi, who were quartered in that town,) suffering from accute pneumonia, a common complaint in winter and spring in Lombardy. In spite of their robust constitutions, the most daring Italian physicians of the above mentioned school durst not take half the usual quantity of blood from them, and I remember more than one case of collapse, even from a less proportion. A similar fact in proof of the alleged inherent nature of temperament, in spite of the difference of climate, I had an opportunity of noticing afterwards, when established at Pesth. In that town during fifteen years I had to treat a considerable number of Italian captains of the Danubian steam navigation service, and I had frequent opportunities of observing, how inflammations in these men ran a much more violent course, and required more energetic modes of treatment than in my own countrymen, in Hungary.

But, to return to the national pathological character of Italy, I may allude to the frequent occurrence also of acute bilious fever, but seldom

without more or less of inflammatory action and localisation in the liver—so much so in fact, that these cases generally passed under the denomination of the last named malady. The acute bilious dyscrasy (bilious fever) not seldom causes dysentery (colitis), or pneumonia, &c.—and I scarcely remember to have seen primary bilious fevers pass into such a chemical alteration of the blood as to cause death; the acute bilious dyscrasy of Italy disposes to inflammation and not to a septic phasis of fever.

Low fever, collapse in the course of acute diseases, are decidedly rarer in Italy than in Austria and Hungary.

Inflammations of every description are frequent and severe.

Of the two important chronic dyscrasies—the hemorrhoidal and the gouty—referrible to temperaments, climate and diet—the former is more frequent than the latter, with a congestive and inflammatory tendency, especially to the liver and rectum. Lymphatic diseases, in the form of scrofula and rickets, are considerably less obvious than in Germany, Austria, and England.

Pure nervous diseases, as far as I remember, are less frequent than in Germany or France. Vascular reaction soon associates itself with spasm or pain.

The other kinds or modifications of diseases peculiar to Italy, with which I am acquainted, have little bearing upon the subject under consideration.

With the above mentioned pathological attributes and dispositions we find the physiological stamp of the body and mind to harmonise: the Italian constitution is liable to sudden, powerful, and lasting vascular reaction, and to violent and lasting passions. This appears to be the characteristic of the Italian race.

In accordance with the national pathology, and the before-mentioned light and cooling diet, is also their popular and domestic medicine. "Mi sento un riscaldamento"—I feel heated (in the throat, head, chest, &c.): this is the popular expression, corresponding to the English "I have got a cold." And to "abate heat" is the general purpose of their popular pharmacy. This consists mainly of cream of tartar, cassia, tamarinds, and castor oil; of which the former in many parts of the country are as much in daily use, if not more so, as in England soda water, stimulating purgatives, and tonics for the stomach, which Italians use seldom and in small proportions; rhubarb and aloës are looked upon as "very heating" drugs.

In acute diseases, besides the great frequency of bleeding—mentioned above—the Italian physicians of that day (1830-2), made frequent use of *tartar emetic*, as it is known to the profession, in enormous doses. I have seen in some cases twenty, thirty, or more grains administered in a day; which generally was well borne by the patients; and when Professor

Francis Hildenbrand, returning from Pavia to the University of Vienna, employed in that town the same method in pneumonia, he was obliged to be more moderate in its use. About eighteen years ago, in Pesth, I arrived myself to the same conclusion, having noticed several threatening cases of collapse consequent upon such doses.

Is that striking endurance of tartar emetic in Italy owing to the bilious element in the national temperament? I feel not sufficiently confident, to answer in the affirmative. But another fact is worth mentioning in this place, the intolerance of, and reaction after the use of opium. The primary action of this drug in Italians is frequently so stimulating and exciting, that the secondary soothing effects can scarcely be obtained without unpleasant concommitant symptoms. In fact, all Italian schools have classed opium amongst the principal stimulant remedies.

Is that peculiarity owing to the bilious or nervous element in the Italians? Or to both? A fact, which seems to have some bearing upon that question, is, that also in warm eastern climates, as in Turkey, the stimulating effect of opium is far more striking than the narcotic.

The nervous and phlegmatic temperaments among the Italians—at least as unmixed types—are little indicated by their pathology, nor much more by their popular remedies. I have said, their predominant temperament was sanguine-bilious. But, in what way sanguine? What is the respective character of their blood? Or, of what kind, in what degree, or mixture obtains in them the bilious element? What degree or average of heat, dryness, or other less known properties of climate and soil are especially productive of that mixture, which forms a temperament with that measure of vascular reaction and power? These questions I am unable to answer. A careful practitioner cannot have failed to witness, that decided bilious temperaments in any country or climate bear emetics well generally, but not equally well opiates; this coincides with what I stated in respect of Italy; but vascular reaction and power, and tolerance of bloodletting—these are certainly not characteristics of strongly marked bilious habits.

In South America (as I have been informed by credible authorities), in New Orleans, and some other of the southern regions, all forms of the bilious dyscrasy (over carbonisation of the blood) are much more endemical, more frequent, acute, and disposed to pass into septic fevers, than in Italy, (as the yellow fever for example): whilst, on the other hand, bloodletting is not so frequently required, nor so easily borne. I have had as a patient a native of the Caraccas (of Spanish origin), and am now attending two families, who formerly were established there,—all of whom concur in extolling its delicious climate. It is neither too hot nor too chilly, but remarkably equable, having a standard temperature about equal to the summer of Naples, and free from severe epidemics. But nevertheless the

native temperaments of this genial clime seem very different from those of Milan, as they do not bear so well the loss of blood. Again, to complete the difficulties, Constantinople, where I resided during the latter months of the year 1849, and found the climate, as regards its temperature, analogous to that of Upper Italy—presents many a striking difference between the physiological and pathological dispositions of its native inhabitants (Turks, Armenians, Greeks, and Italians), and those of Lombardy. The endemic bilious dyscrasy (il male del Lavante) in form of a low, chronic bilious disorder, accompanied with an irritable eruption on the skin—a complaint which in one or another form most foreigners after settling there have to encounter—seems very much at variance with the endemic character of disease in Italy. In spite of every appearance of salubrity in the situation of Pera, out of about sixty Hungarians, who went thither at that time, certainly more than thirty suffered from bilious derangement; some in the form of jaundice, with its depressing influence upon body and mind. Much is left in these matters to future enquiries.

France shows much less of the bilious character than Italy, and less also of the inflammatory. Local congestion, spasms and convulsions, enter largely into the character of French pathology, and the general line of treatment seems to indicate the same. In Italy the lancet is frequently called into requisition; in France depletion is more practised by means of leeches. In the French constitution congestion, spasm, and pain, commonly associate themselves with each other, and cease more rapidly than in others. It seems, that the ebullition of the blood is less violent and lasting than in Italy. This at least is the result of what I saw in French hospitals, heard from distinguished practitioners in Paris, and witnessed in private circles. In Paris I saw numerous individuals of strikingly nervous habits, endowed with such exquisite sensibility, that in no other nation have I witnessed any near approach to it. A French lady, the picture of health and cheerfulness, may by impressions, which others would call trifles, at once fall into fits. Migraine, partial convulsions and nervous trembling, have also struck me by their frequency; and I have met in shops and other public places ladies, apparently beyond the prime of life, affected with a degree of St. Vittus's dance,—an affection which I regard as very rare after the age of puberty. Indeed in all my practice at Pesth, which was certainly of considerable extent, and very much amongst females of the higher classes, I am positive that I met with but a very few such cases in patients upwards of twenty years of age; nor must I omit here to notice the circumstance, that in the hospital under my care, during the space of ten years there occured near 150 cases; which shows that the desease is at least not rare at Pesth.

There are many other points of French national pathology, with which I should like to be better acquainted, in order to avail myself of them for my present purpose. I was in Paris however merely as a visitor, and my mind was not at all disposed at that time to carry on enquiries of this kind. The above-mentioned pathological dispositions of the body very much coincide with the well-known excessive sensibility and mobility of the national mind, and a disposition, we might say, to moral convulsion. With a high degree of the nervous temperament, they combine a great proportion of the sanguine, to which the great liveliness, cheerfulness and enthusiasm of the French people may be referred. It is difficult to say, I think, which of these dispositions is most prominent in them. The bilious certainly enters much less into their national temperament than into that of the Italians, and the phlegmatic is scarcely met with (at least in Paris), either in its physical or moral attributes, to any striking extent.

The French popular diet, as already intimated, comprises a great many articles of a cooling nature, and their domestic medicine consists of a quantity of cooling powders, soothing and anti-spasmodic herbs. After all that I have seen and heard, emetics seem considerably less used in France than anywhere else; and opium, I should think, is as seldom given as in Italy: indeed, several of my medical friends, distinguished practitioners of Paris, spoke frequently of idiosynacrasies met with, which could not bear this drug at all.

The reason of the restricted use of both emetics and opiates may be perhaps the small proportion of the bilious, and the large proportion of the nervous element in the prevailing temperaments. Opium, according to my experience, has ill agreed with decidedly nervous hypererethism, and still worse with the bilious habit. Moreover, according to the information I have obtained, which coincides with my personal experience—there is no people in Europe amongst whom the physician so frequently meets with decided aversion to, and intolerance of medicine, as amongst the French. This intolerance seems to be a general property of the nervous temperament, in whatever clime occurring.

With the *German* national pathology I shall connect that of Austria and Hungary, a vast extent of inland country, and exhibiting great variety in the character of the population. However, considered in the aggregate, from a comparative point of view, I am certainly correct in stating, that on the whole the last named countries present less the character of inflammation than Italy, and less I should think the character of congestion and spasmodic disorder than France.

It would appear, that in accordance with the greater extremes of temperature in each of those countries, there exists a greater discrepancy and variety as regards their pathological character.

In winter and the commencement of spring the hospitals of Vienna and Pesth, and, as far as I remember, those of Berlin also, offer many severe specimens of inflammation, though far less in number and intensity than I have witnessed in Paris or Milan. On the other hand, asthenic fevers (typhoid) and collapse, or an asthenic phasis of acute diseases, seems to be more frequent in Germany and Austria, than in Italy and France. And this would indicate a less degree of reaction and resisting power, which seems to be more peculiar to the lymphatic or phlegmatic, than to other temperaments,

The acute bilious character, as it occurs during the summer months, is less inflammatory than in Italy, and I should think also, than in France. Cases of the same kind, which in Italy are characterized by more local reaction, and called "hepatitis," in the countries in question are more strikingly febrile, and accordingly called "bilious fever."

Lymphatic diseases—if I am right in using that name for the glandular and strumous forms, rickets and impetiginous deposits on the scalp and face of children, are decidedly more frequent in those parts of Austria, Hungary, and Germany, where I have been, than in the districts known to me of Italy and France.

Fatty degeneration of the liver (well understood and excellently described by the pathologists of Vienna,) and passive dropsy of the abdomen—morbid dispositions of the phlegmatic temperement, are not unfrequent in Austria and Hungary, and apparently also in Germany.

Chronic nervous disorders of all descriptions are common in each of these countries (everywhere of course most frequent in the female sex), though less common and less convulsive in their character, it appears to me, than in France.

The domestic or family pharmacopœa of Germany, Austria, and Hungary, contains a considerable stock of aromatic and nervine flowers and herbs; especially I may name the "chamomilla vulgaris," which is a household article of every German and Hungarian family, and in consequence of the dryer and warmer summer, infinitely more aromatic than that of England. Amongst cooling remedies cream of tartar is in general use; then come magnesia and rhubarb, and several bitter remedies, on the whole more stimulating and active than those of the preceding nations, though considerably milder than those used in England. Loss of blood is not so much resisted as in Italy. Emetics and opiates are much more used than in France, and the latter in higher doses and more easily borne, though neither in the same measure as in England.

I shall not attempt to bring the mixture and proportion of temperaments into exact accordance with the premised statements: thus much however seems to follow from them, that the countries in question have not much

of that reactive character of the sanguine-bilious temperament, which is peculiar to Italy, nor that high degree of the sanguine-nervous which we meet with in France; but the phlegmatic or lymphatic more frequent, and more highly developed in its purity; which temperament it seems to me forms a very frequent compound with the nervous and sanguine. The sensible and mild moral dispositions of the German people seem to coincide with this.

The *pathological character of England* differs very much from that of the before-mentioned countries. According to what I see in Manchester, a smoky town, with an immense population of workmen (consequently in that respect not favoured at all in a sanitary point of view), confirmed too by what I have seen, though more superficially, in other British towns, and by what I have read and heard from brother practitioners, I have no hesitation in stating, that in Manchester with its neighbourhood, and I may safely say, generally in Great Britain, acute fevers are rarer, run milder courses, and seldomer present either that inflammatory tendency peculiar to Italy, or that low and asthenic (typhoid) character, which so frequently rages in Vienna (more than in any other town so far as I know), also in Pesth, Paris, and, I dare say, in many German towns. Typhus in severer and more epidemical forms has been imported sometimes into Manchester by Irish immigrants, amongst whom want of proper food and clothing are not unfrequent agencies of disease. Ague is extremely rare except in the fenny districts of Lincolnshire and adjoining counties.

Though these and similar fevers have not any direct relation to our present purpose (temperaments), still I think the fact worthy of notice, with the addition of another—the reverse of the former—which is the great frequency and more dangerous course of eruptive fevers. Of this I am convinced by a sufficiently large field of practice in this town, and by what I have been told by my friends, established in other towns. Small-pox, measles, and scarlet fever, are exceedingly liable to take an irregular course, and to become destructive to life by secondary inflammations of, and deposits in, internal organs. I have attended with my distinguished colleagues Dr. Whitehead and Dr. Noble, some striking cases of the kind, supervening upon measles and scarlatina.

After the last named disease, I saw with each of these gentlemen, in children of different English families, what I have distinguished at Pesth by the name of "hydropic hydrocephalus." I have constantly mentioned it in my clinical lectures as being marked by severe convulsions with concomitant drowsiness, or even coma, two or three weeks after scarlatina had run through its course more or less irregularly, and left behind the dropsical dyscrasy. One of the above mentioned cases (with Dr. Noble) recovered speedily by the use of iodide of potassium only; the other died in spite of the application of more energetic means. According to what I saw of the

disease, I cannot regard it as inflammatory. At Pesth, moreover, I was successful in some cases treated with blisters and iodide of potassium, a remedy which I found decidedly disadvantageous in inflammatory exudations. To enter here into disquisition as regards the albuminous character of the urine, and its pathological signification, would lead too far away from my present purpose. The eminent Dr. Rilliet, (of Geneva,) in an article recently published in Dr. Behrend's "Journal für Kinderkrankheiten" (Berlin), speaks explicitly on the same disease, under the name of "Encephalopathia Albuminurica," and states it to be of rare occurrence. In fifteen years practice amongst children at Pesth, as far as I can remember, I saw only six or seven cases, out of nearly 17,000 sick children of the hospital, and perhaps an equal number in private practice.

Small pox is another disease which I consider to be less favourable in its course here than at Pesth. There are, of course, in this country also sometimes milder eruptive epidemics.

I think it proper to mention these circumstances concerning the eruptive fevers in this country, because they seem to show the noxious influence of a moist atmosphere in this class of diseases, or, in other words, of a lessened activity of the skin; both conditions being almost peculiar to England.

The mortality of children from eruptive fevers or their consequences is decidedly greater here, according to my experience, than in other countries.

But leaving that subject as a mere digression, and directing the readers attention to inflammatory diseases of a primary character, as more characteristic of the nature of temperaments, it appears to me, that some forms—for instance catarrhal and rheumatic, are more frequent, but less so the very acute and plastic forms; and that deaths are not so frequently caused by them here as in Hungary, and still less so than in Italy. Children being much more subject to, and affected by, diseases generally than grown-up people, show the difference in certain respects more strikingly For the purpose of enabling myself to speak with more confidence on this point, I made a list of all the children and their diseases of twenty families of Pesth, belonging to the higher and middle classes, whom I attended regularly, and of whom I have so lively a recollection, that I am able to write down every acute case, and every death which happened in the space of *two years*. The same I have done here with twenty families, who are as much as possible equal as respects the comforts of life and education, to the former, and of whom I am partly the regular attendant, partly consulted on important occasions. The twenty families of Pesth numbered together forty-eight children; the same number of families here have sixty-six; amongst the former, during two years, occurred about fourteen or fifteen severe acute cases, with three deaths, of which one was from meningitis, one from double pleurisy, and one

from trismus; amongst the latter (comprising English, German, and French families of Manchester), were eight acute cases, with two deaths, both scrofulous infants; the one died of scarlet fever, the other of hydrocephalus.

The same favourable proportion obtains in my practice with adults in Manchester, though this city is described as the most unpleasant, smoky, foggy, and rainy place in the kingdom!

The above figures are not to be regarded, of course, as a general rule or criterion. In my practice of three years in Manchester I have seen also some severe and dangerous primary inflammations of the chest, particularly amongst children. In fact, I find that the atmosphere here from October to April is infinitely more productive of catarrhal inflammations than at Pesth, particularly in the unhardened mucous membrane of infants and children of tender age. I have seen altogether thirteen cases of capillary bronchitis, two of which reached the height of general catarrhal pneumonia of extreme gravity, in consultation with Mr. Melland, and two similar and equally dangerous cases with Mr. Mellor, surgeons, of this town. All recovered however, and the danger in these cases did not arise from the vehemence of inflammatory reaction, but from what I may properly term the "*mucous engorgement* of the bronchi," a condition frequently dangerous to children under two or three years of age, who are unable to make voluntary efforts to cough more profoundly, and to throw out the phlegm; and for the opposite reason much less dangerous at a more advanced age.

To that treacherous stage of the disease in infants I paid particular attention in Pesth. I found also there, that as soon as abundant catarrhal secretion follows after the first inflammatory stage—which frequently has no threatening appearance, and during which the infant may at times be playful, and have but a slight and moist cough—that the sudden accession of catarrhal secretion in a few hours may overwhelm the lungs. Then at once dispnœa sets in, decarbonisation of the blood is prevented, and the little patient, pale, or slightly livid, and collapsed in his countenance, with stertorous tracheal rattling, low temperature of the skin, sweat on the forehead, and a pulse between 160 and uncountable frequency, presents the picture of agony. Percussion gives downwards on the back a slightly dull resonance, while no respiratory sound is audible except in the upper third of the chest, from the larger bronchial tubes and trachea. Now, though this form of disease is perfectly the same in Manchester and in Pesth, I am convinced that comparatively the catarrhal engorgement takes place more treacherously, suddenly, and abundantly here than in Pesth,—in which latter place, on the contrary, the first stage is more frequently expressed by higher inflammatory symptoms. Since I happened to mention that important stage of capillary

bronchitis in infancy—although it is not in direct connection with the subject of temperaments, I may add, that in Pesth, in spite of the vicinity of the school of Skoda and the presence of many a distinguished representative of the physical mode of examination, I frequently observed that those who were not well versed in the use of auscultation in infants, or not skilled in diseases of that age, have either overlooked, or not valued sufficiently that slight subcrepitant râle, generalised or scattered amidst rough respiratory sounds, the characteristic of the first stage, with a pulse varying from 110 to about 130, and a moderately elevated temperature of the skin. And instead of being then ordered at once the emetic and leeches, or hot bath, and mustard poultice if required, and a dose of Dover's powder—during the first twenty-four hours,—I have seen leeches applied and the emetic, when already the "mucous engorgement" was fully established, and thus the exhaustion of the vital powers, caused by deficient aëration of the blood, aggravated by those retarded means. The essential and exclusive characteristic of this disease in infants and young children consists in this: first, that infants and young children are exceedingly liable to abundant mucous secretion; secondly, that mucous obstruction takes place, because they are unable to throw out the mucousity by their own efforts; and, thirdly, that in ratio with the approach of an asphyctic condition, the inflammatory reaction necessarily ceases. Nature effects the cure in favourable cases, when life seems nearly extinct, by gradual absorption, and consecutive climination of the mucousity by mucous diarrhœa, assisted by the functions of the kidneys, and ultimately also by the skin, under the increase of heat, and moderate perspiration. The best medical assistance, I find, consists in blisters and poultices, and, besides gentle aperients, in the use of muriate of ammonia and camphor. Of the former I prescribe from ten to fifteen grains to an ounce of water; a teaspoonful to be given every two hours. Of camphor gr. ss to gr. jj per dose; to be given according to the degree of reaction. This treatment has answered extremely well in Manchester not less than in Pesth. The emetic *may* be applied repeatedly, but only in cases where the little patient shows sufficient strength. Otherwise hyper-catharsis might follow and become dangerous to life.

Now, if I am not mistaken, the catarrhal process in races and climates reigns in the reverse ratio with the severe forms of pneumonia. When I compare Italy with England, this becomes particularly evident. In Pesth I had sometimes great numbers of catarrhal cases in very moist seasons. This coincides in pathogenetic respects with the above-mentioned facts concerning England.

At any rate, I believe that the whole host of catarrhal affections, slight and severe, is considerably more frequent at all ages, and more obstinate here than on the Continent. The continuous though slight changes of

weather, and the frequently damp and rough character of the atmosphere, account for this, and the phlegmatic temperament, as represented in England, seems more liable to it than the sanguine-bilious or nervous of the Continent.

The same may be said of rheumatism. I find this astonishingly frequent here in all its forms. This present autumn I have had so many cases of a similar appearance of rheumatic angina, that I have been struck by it, as if it were quite an epidemic. Commonly it is confounded with catarrhal angina, though its characters are different: it is marked by much severer pain, with intense circumscribed redness, and proportionally little swelling; whilst in the catarrhal form the reverse degree and proportion of the same symptoms takes place. Though in little children, on account of the difficulty of inspecting their throat, the diagnosis is not so easy to be established, the appearance of great pain and impeded deglution, with a fuller sound of the cries, and little swelling of the tonsils perceptible outwardly on the throat, speak clearly enough in favour of the rheumatic form.

I noticed formerly at Pesth, though not frequently, the same form of angina, of which so far as I know no special description is given in the works on children's diseases. I do not remember to have seen the like in Italy, where inflammatory angina (riscaldamento della gola) is not unfrequent. It has no tendency to suppuration or hypertrophy of the tonsils, and requires more the warm and sudorific treatment than the other form,—under which, recovery generally soon takes place. I have been told by several medical gentlemen here, that in their practice this kind of angina frequently occurred at the same time (November 1853), and also lumbago almost epidemically, of which I myself have had several cases. It is remarkable that just at this time, although we have had an uncommonly tranquil atmosphere, yet many of my patients have been affected with rheumatism without exposure to open air or draught.

There are also almost constantly numerous cases of pleurodynia, of which I find only a small minority passes into pleurisy. But I have seen during the last three years several cases of the latter in children, with sudden exudation treacherously taking place, with little vascular reaction preceding it, and frequently unperceived by those who are not well acquainted with auscultation and percussion. In all these cases, both catarrhal and rheumatic, there is on an average more visible constitutional reaction on the Continent.

Articular rheumatism, which in the great majority is little or not at all inflammatory, and yielding to quinine, or iodine—is here one of the most frequent forms of disease. In Vienna, Pesth, and Paris, on the contrary, I believe I observed a proportionally greater frequency of

acute arthritis. Again, gouty rheumatisim, *i. e.* rheumatism in subjects with a gouty disposition, or chronic rheumatism in general in all its forms, is here certainly much more frequent and severe than on the Continent. While at Pesth—and of course still more in Pavia—under the influence of summer, a great many radical cures are effected with facility; here on the contrary I am struck by the obstinacy of the complaint throughout the year. Acute arthritis, pleurisy, and pleuro-pneumonia of rheumatic origin, however, in this country as in others are more prevalent in autumn, winter, and early spring; and all forms of rheumatism in general are more frequent in the eastern and northern parts of the country than in its southern and western districts.

Respecting children, I may notice in this place the frequency of croup, with a still greater frequency of pseudo-croup, or catarrhal laryngitis. The English profession have prudently and generally adopted the energetic use of the emetic and hot bath in similar cases, whichsoever they may be. Respecting real croup, when fully established, it is as fatal a disease in Manchester as in Pesth or other places, and I am unable to mention it without expressing my strong conviction of the inefficiency of mercurial and almost all other remedies at this stage, except two: cauterisation of the larynx, and tracheotomy. My experience regarding cauterisation entirely coincides with the statements and recommendations of D. D. Rilliet and Barthez, in their invaluable work on diseases of children, on that important subject. During these latter years of my practice, as soon as laryngeal dyspnœa and wheezing gave evidence of the presence of exudation, I hastened to apply a solution of nitrate of silver (from 120 to 150 grains to the ounce of water), by means of a long sponge-holder provided with a small piece of sponge. The mouth of the child being kept widely open by means of a piece of cork pushed firmly between its jaws, the base of the tongue must be pressed down and by traction brought forwards with a suitable spatula or the handle of a middle-sized spoon, while the operator with his other hand carries the instrument over the base of the tongue, bringing for an instant the slightly soaked sponge under the epiglottis, or at least on its lateral margins, that some drops of the solution may penetrate into the rima glottidis. Great prudence is required to avoid choking from the first effects of the caustic; and therefore the indication for this procedure ceases at a stage, when tracheotomy begins to be indicated, *i. e.* when a higher degree of suffocative dyspnœa supervenes, under which condition the caustic might easly cause suffocation. I have seen in my practice some cases saved by this means; and it will be well, in support of its usefulness, to mention a recent instance I had with Mr. Mellor, in a child thirteen months old, suffering from primary laryngeal croup, with a rapid increase of dangerous symptoms in spite of the energetic use of the emetic, leeches,

and blister. The cauterisation of the larynx, performed four times between the third and fifth day of the disease, was followed by a speedy recovery.

Though this subject leads me a little away from my present undertaking, I will here make a few additional remarks concerning the limit which obtains between the indication for the caustic, and that for tracheotomy. In my opinion cauterisation should be applied before the passage of the glottis becomes so much narrowed by the accumulation of pseudo-membranous formations, as to make the child unable to resist that degree of choking constriction, which necessarily must at first follow the contact of even a few drops of the remedy with the rima glottidis. This constriction, under which the little patient, with its highly flushed or livid countenance, with the expression of extreme anxiety, accompanied with convulsive movements of its limbs, presents for a time an alarming aspect—will, almost in every case, last half a minute, or longer, and cease by degrees under the salutary efforts of throwing off from the throat a quantity of mucus, and, may be perhaps, some pseudo-membranous fragments; in one word, cauterisation is in my opinion urgently called for, and should not be delayed at all, so soon as there is evidence, however slight, of exudation. Tracheotomy, on the other hand, must be resorted to as soon as in spite of the previous abstraction of blood, and the use of efficient emetics, and the caustic, dyspnoea begins to exhibit a degree of continued asphyxia. To perform laryngeal cauterisation at a stage when the child has to contend against a high degree of dyspnœa, is a difficult, not to say a dangerous undertaking. Tracheotomy, on the contrary, when employed at such a stage, but before the appearance of asphyxia, will in all probability effect an immediate improvement of the state of the child, so far as to admit the use and advantageous effect of efficient cauterisation. And, again, there is a limit beyond which the operation of tracheotomy should not be delayed, because according to general experience it affords but little hope for the life of the child, when asphyxia and carbonisation of the blood have already become fully established.

To the latter circumstance I am obliged to ascribe the want of success in my own tracheotomic operations in the children's hospital of Pesth. In fact, it appears that lately this operation has been employed in Paris at an earlier stage of croup, and for this reason with more favourable results than used to be the case formerly.

As regards the operation itself, the method adopted by Professor Trousseau of Paris, seems to be the most safe. (See Rilliet and Barthez, "Traité clinique et pratique," etc., Vol. I, Laryngite.) He has proposed and described it in detail, as well as the consecutive treatment, with that precision, which characterises in general the works of that eminent

physician. The practice in children's hospitals, where they exist, will by and by familiarise the public with the operation, so that probably at no distant period its application will become adopted also in private practice, and at an earlier stage of the disease than at that of hopeless despair. With respect to its execution, however, I may observe, that although it is comparatively easy and safe in children from two years upwards, with a thin and long shaped throat, and suffering only from a moderate degree of suffocative dyspnœa—I remember two cases in the children's hospital of Pesth, with the reverse conditions, in which the operation presented great difficulties. One of these patients, a very young child, whose age I do not exactly recollect, on whom I performed the operation (under the clever assistance of D. D. Metzner and Olàh, then physician assistants to the establishment, and two other assistants), in spite of the able co-operation of so many hands, and of every care, died almost immediately, in consequence of the delay occasioned by the extraordinary shortness and fatness of its throat, by which the proceedings lasted considerably longer than is desirable in such cases.

It needs scarcely to be added, that by cauterisation as well as tracheotomy an efficient means of relief or of cure will be found in cases of croup limited to the larynx; but less so where the disease extends down to the bronchi, or when pneumonia forms a complication with laryngeal croup.

I hope to be excused for this digression in favour of a subject of great importance, and on which I have taken on this occasion the opportunity of expressing for the first time before the profession my opinions and experience.

A question however, regarding croup, which falls within the limits of the purpose of this treatise, seems to be this: is any instructive conclusion—considering the obscure nature of this disease—to be drawn, by comparing the character and the course it presents in Manchester, with the same phenomena observed at Pesth? Is its inflammatory or non-inflammatory nature more strikingly apparent in the one or the other of these places? Personal observation and comparison of the disease in climates so different, lead me to assert that, at variance in this respect with some other diseases, croup appears exactly in the same form and runs the same course in the one climate as in the other. In both places I have seen it amongst the higher ranks of life as well as amongst the poor, as a primary as well as a secondary affection, conjointly with diphthrite and without it. Most frequently it attacks children between the first and the fifth year of life, seldom above the sixth; and robust or healthy looking children are especially its victims. In both places its onset is insidious, and I think it impossible to discern the future croup from simple catarrhal

laryngitis, before the exudation takes place. Moreover, all its variations, in form and complication, so exactly described by D. D. Rilliet and Barthez, and the success or non-success of the curative means employed, obtain precisely in the same proportion to the disease here as in those countries and races where I formerly observed it. Its greater frequency in this town coincides with the greater frequency of catarrhal affections (of which mention has been already made); and this relation seems to be in favour of the assumption, that croup is, ab origine, an affection of the mucous membrane, though it implicates, in severe cases, the sub-mucous tissues in the morbid process; the perfect identity, however, of the croupy process itself, here and in other climates so very different from that of England, would point at the probability of some specific element in its nature.

In conclusion, croup appears to assume the same form and to run the same course in different countries, of which in the one the climate and national temperament in general dispose to a higher inflammatory character of disease, whilst in the other both climate and temperament appear much less favourable to inflammation.

Croup, however, is generally considered as a plastic inflammation; and as in a former page it has been stated, that acute and plastic inflammations are less frequent and intense here than I have seen them on the Continent; it would seem, that the relative frequency and vehemence of croup in this town, is either in contradiction to the latter statement, or at least that it forms an exception to the general rule. Here I may be allowed to remark, that that kind of plastic inflammation, which by Rokitansky was first called "croupy," and which was generalised as one genus of the inflammatory process, peculiar to the whole mucous tract, has been subdivided anatomically into different species, and differently considered by different pathologists (Engel, Henle, Bock, and others); all of them, however, agree in considering the croupy product as liable to "purulent liquation." At any rate, the practitioner not less than the anatomist, will find a higher inflammatory character associated with the plastic inflammation of the serous membranes, or in that of the parenchyma of organs, than in the croupy inflammation of mucous membranes in general.

Regarding the relatively less frequency and less intensity of serous inflammations in the chest in Manchester than at Pesth, the result of my personal observation has been already noticed in a former place; with respect to acute lobar pneumonia—the chief representative perhaps of the inflammatory genus of a country—this I find to be still less frequent and intense in this town. Dr. Watts, physician to the Manchester Infirmary, an acute observer and competent judge, has told me that what he has seen of pneumonic inflammation is principally partial pleuro-pneumonia;

extensive lobar pneumonia being exceedingly rare. Other professional gentlemen have furnished nearly the same information; and I feel convinced also from my own practice, that primary acute pneumonia, in its lobar form, is considerably seldomer met with here than in Pavia, Vienna, or Pesth. This statement I regard as correct in its application to all ages.

According to Dr. West, however, lobar pneumonia would seem to be a freqnent form of disease in children in the metropolis. He disagrees with French writers on this subject, who assert the contrary (Barrier, Fauvel, and others), and believes that the theory of the prevailing *lobular* pneumonia in children, has been carried too far. This is the opinion of one who is rightly considered as an authority on subjects of infantile pathology. Myself, I have expressed the opinion in my lectures at the medical school of Manchester as well as formerly in my clinical courses at Pesth, that from capillary bronchitis to catarrhal, and to lobular pneumonia, and from this to lobar pneumonia, there is a gradual transition, formed by the intermedium of what French authors have termed "the generalised lobular pneumonia;" viz. that there are occasionally met with phases of this form, in which so many contiguous lobuli are closely hepatised into one solid mass, that the attempt of vindicating for such a condition the term of generalised lobular pneumonia, instead of calling it plainly lobar pneumonia, amounts almost to scientific exaggeration. Indeed, I believe that the distinction which we may properly establish between these two forms clinically, is scarcely more than this: that lobular pneumonia is preceded and accompanied with bronchitis of the larger or mediocre tubes, whilst primary lobar pneumonia at once commences in the inmost capillary tubes of the parenchyma of the lungs. But there are instances of lobar pneumonia also, which originate from broncho-pneumonia, or lobular pneumonia.

Now, as to primary lobar pneumonia, I am able to say, that I have met with it at Pesth more frequently in adults than in children, and amongst children much more frequently in those of the poor classes than those of the wealthy; and here in Manchester I have seen severe cases only of pleuro-pneumonia, and broncho-pneumonia; but, as yet, not one case of extensive primary lobar pneumonia, either in adults or in children, has come under my notice. From this I wish not to conclude that this form does not appear at all in the pathological register of this town, only that its occurrence is rare.

The figures in the work of Dr. West, upon which he founds his statement, seem to be derived from his hospital practice, and it may be, that the foggy atmosphere of London, along perhaps with the neglect which prevails amongst children of the poorer classes, afford some reason for the alleged frequency.

Be this as it may, judging from my personal observation in this town, I

find the climate to be a fertile source for catarrhal and rheumatic affections in the chest, of which the one occasionally passes into broncho-pneumonia, the other into pleuro-pneumonia. Of the latter some severe instances have occurred in my practice during the last three years, with less outward appearance of inflammatory reaction, pain, or cough, than usually is the case in primary pneumonic inflammation. I have been on different occasions struck with this circumstance, and could quote several interesting cases of the "pneumonia latens" of ancient writers, which have become patent by aid of the stethoscope. Amongst several which I remember, one case occurred to me last year in an infant, the child of a brother practitioner in this town, nine months old. No cough was heard, no pneumonic sign was outwardly apparent, when upon percussion and auscultation we verified the complete impermeability of the whole right lung, with certainty of a large pleuritic exudation, and probability of partial solidification of the lung in addition to pleurisy.

I have been surprised on several occasions by the existence of serious acute disease, the countenance the while being tranquil and the pulse quiet. In English patients, under such deceptive appearances, sometimes large exudations, or sudden and extensive structural changes may take place, which on the Continent are generally announced and accompanied by more prominent symptoms. Thus it has happened in a recent case of mine, which my friend Dr. Whitehead visited with me, a robust English lady, twenty-one years of age, in whom profuse exudation was discovered and ascertained to exist in both lungs up to the upper third; this happened but a few days before our examination; the pulse being between 80 and 95, with a cheerful unaltered countenance! It may be added, that the slowness of absorption, and the deposits in the urine, and afterwards pleuritic adhesions, proved clearly, that the exuded fluid must have been fibro-purulent, consequently a decidedly inflammatory product. Now in all my practice in Hungary, and also with foreign patients residing in Manchester, I have never met with an instance like this. I had occasion six weeks ago to attend a young gentleman, a foreigner, with simple bronchitis; and the heat of the skin, the rapidity of the pulse (numbering above 120), pain and restlessness, were greater than in any case of pleurisy or partial pleuro-pneumonia I have as yet seen among English patients. This I mention as one instance amongst many, proving the inherent peculiarity of temperament, even though located under the influence of a foreign climate.

The celebrated Dr. Tomassini of the University of Pisa used thus to express himself relative to certain forms of disease, as modified by the nervous temperament of the individual—"molta malattia e poco fondo"—violent symptoms and little disease. This pregnant expression certainly is

most frequently applicable to French patients, and more to females than men—owing to the greater sensibility of the former. For England the phrase might well be reversed—"poca malattia e molto fondo."

The bilious character of disease manifests itself more frequently and extensively here, than at first sight might be supposed in a climate which never presents a considerable and lasting degree of thermometric elevation. The disorder develops itself generally in a slower way than on the Continent, but it not seldom runs a protracted course. A professional friend, when looking over these remarks before their being printed, observed, that according to his opinion, from the disorder in question the principal sufferers are those who indulge in a too generous kind of diet. This statement may be true; but as the complaint of "being bilious" is avowedly most frequent at certain periods, I feel justified in bringing its occurrence into relation with those climatic conditions with which that frequency generally coincides. According to my knowledge, here in Manchester, if we except the space of time between December and March, a degree of biliousness is complained of by many persons at frequent periods throughout the year; whilst in Pavia, Vienna, or Pesth—and I dare say in other continental towns—the same disorder is very little noticed by the public and profession, except in the middle or end of summer. To this may be added that the form of biliousness, which between July and October frequently presents itself with an epidemic character on the Continent, is less extensive and severe here; and the form which has come so frequently under my notice in this town, is comparatively rarer on the Continent.

In fact, the acute and epidemical bilious dyscrasy, of which I have seen many instances on the Continent, presents itself, when after a comparatively cool tempearture in July or August—say 65° to 80° Fht., a high degree of dry heat, from 80° to 100°, suddenly sets in, and lasts for days or weeks. Then are observed extremely violent bilious affections, in form of bilious fever, with or without hepatitis, summer cholera, and bilious dysentery, epidemically. Under this atmospheric condition, there is profuse perspiration and scanty urine, and the liver is scarcely able to discharge its functions sufficiently for abstracting from the blood that abundance of biliary elements, which arise from the great scarcity of oxygen in the rarefied air. As the source of this biliousness is directly a high degree of heat, it is but natural to expect that this form will occur less frequently, and with less intensity in England, than in countries having a warmer summer.

The biliousness, which is commonly complained of in this country, generally appears under calm but moist weather, or under the influence of south or south-west winds, not seldom at a thermometric stand scarcely

higher than from 60° to 70° Fht.—an atmospheric condition which, with the exception of the short winter season, may happen at certain periods throughout the year. If the temperature be above 70°, the moisture being the same, then it occurs more frequently, and with symptoms more severe. Generally, however, "being bilious" indicates in the popular language only an uneasy condition of the system, with impaired appetite, tense epigastrium, bitter or otherwise unpleasant taste in the mouth, giddiness or headache, and low or irritable spirits. If with this group of symptoms, or with some of them, costiveness or insufficient evacuations be combined, then we may suppose an increasing accumulation of bile in the liver and gall bladder; in this case also the urine becomes more scanty and of a higher colour; but the onset of this form of biliousness, unlike that we noticed above, is not ab origine marked with scanty and highly coloured urine. Its principal source seems to be a lessened activity of the skin, as consequent upon the dampness of the atmosphere; and in the ratio that the skin is less active, the kidneys act more freely, and the liver receives an antagonistic impulse, to co-operate more efficiently in the function of decarbonisation.

Now, as long as the discharge of bile is in due proportion with its augmented secretion, far from feeling deranged and uneasy, people experience an increase in their appetite, digestive power, health, and strength. And this, indeed, happens more strikingly with foreigners, who come to to England from countries having a dryer atmosphere. I feel justified in advancing this statement, after the strict and numerous enquiries which I have made on the subject amongst a number of foreigners, shortly after their arrival in this town.

As soon however, as the elimination of bile falls below the amount of its secretion, then of course the liver becomes overwhelmed with that humour, and the above-mentioned form of biliousness, together with the group of symptoms already noticed, appears; the urine at the same time assuming the character common to all kinds of bilious disorder, being scanty and high coloured.

Towards the latter end of summer, along with the disorder in question, we frequently hear mentioned the "bowel complaint," which term commonly refers to a moderate degree of diarrhœa or dysentery, frequently of a bilious character. But the hyper-acute bilious fever—which I have frequently observed at Pesth in a dangerous degree, and liable to pass into the typhoid form—and acute hepatitis, which is more vehement in Italy, are certainly of rare occurrence in England. I think it worthy of notice in this place, that here during the last three years I have seen only a few cases of decided jaundice. A slight degree of yellowish tint on the conjunctiva and on the skin of the face is not at all rare; but that intense, I may say

shocking yellowness, which we frequently see (sometimes even epidemically) in Italy, Austria, and Hungary—this I have never noticed as yet in England, and according to the information I have obtained on the subject, it is decidedly of rare occurrence. Physiologically considered, this fact seems in accordance with the climate, which is not so hot as to produce a sudden and vehement overcarbonisation of the blood; and it seems that the great activity of the liver is sufficient to prevent its outbreak into the form of jaundice.

Now, setting aside the question, as to how far the biliousness peculiar to this country may be promoted, as I believe it is, by a too substantial kind of food relative to that frequently recurrent "chologenetic" phasis of the climate,—or how far it may be prevented, counteracted, or tempered in many individuals by a suitable modification of the regimen at such times: the facts above exposed seem to prove, that in spite of the moderate temperature of Britain, there is great activity in the biliary functions, of which not only the tendency to bilious derangement appears as a natural consequence, but we may conjecture also with some show of reason, that the blood itself in the native English may frequently possess a certain amount of cholo-genetic elements. Experience seems to indicate that this proportion or quality of bile as it exists in the English system, must be at variance with that which is prevalent in the Italians; as the former is so much less disposed to acute inflammation than the latter; but it may have a certain influence, perhaps that of modifying the otherwise predominantly phlegmatic basis of the national temperament. Setting aside theoretical inductions, the fact cannot be denied, that that phlegmatic temperament which we find common with Englishmen, has its own peculiar character, and is at variance with the continental phlegmatic; the former having less tendency to excessive fatness, and a more active and energetic disposition of the mind, than the latter.

It may not be uninteresting to consider in this place the *nervous character of disease* in this conntry. Having said in a former page, that pure nervous tempraments are much less frequent here than on the Continent, but that the climate and general character of the national diet are little favourable to nervous and delicate habits, we may anticipate some peculiarities in the course and relative prevalence of some of the nervous affections.

Of nervous diseases in infancy I have seen frequent instances. *Fits* during dentition, and at other periods, are of daily occurrence and are fully as fatal as in other countries. I have been struck also by the frequency, severity, and obstinacy of *laryngeal spasm* ("the crowing disease"). In consultation with Mr. Rogers and Mr. Renshaw, I saw at Sale Moor, near Manchester, a rare instance of what may be called "*continued laryngism*"—consisting in a degree of continued spasmodic constriction of

the larynx, with only slight remissions from time to time. I shall have occasion to mention in another page the frequency in this town and its neighbourhood of vegetative weakness, with retarded cranial ossification and a rickety taint. This pathological condition of the vegetative process I have found here as well as at Pesth to be almost a constant attribute of those who suffered from laryngeal spasm; and, as a general rule, this vegetative disorder must be amended by hygienic and therapeutic means, in order to subdue the spasm. Unless the habit of the infant who suffers from it be radically improved, a slight indigestion or cold may bring it on. In the case at Sale Moor, in which the child presented during two days an almost constant state of threatening asphyxia, in all probability an abdominal disorder gave rise to the attack; and our first thought was to improve the abdominal functions; but it was by cod liver oil and sponging with cold water and brandy, that the spasm was radically removed.

This case was the second of the only two I ever saw in the space of eighteen years' parctice amongst children—i. e. the second of *this* description in which I was able to ascertain during life, by a concurrence of signs and circumstances, and to corroborate by the mode and progress of recovery, that there was no catarrhal nor croupy laryngitis connected with it, but that tonic spasm of the glottis was the only cause and character of the continued dyspnœa. It must be regarded as a fortunate circumstance that this form of laryngeal spasm is of rare occurrence, because the diagnosis between it and croup presents such great difficulties, that frequent and injurious mistakes might easily happen in the treatment.

I am not aware that any writer on diseases of children has given a description of this peculiar, severe, and deceptive feature, and I should regard it as premature to base any conclusions respecting it upon two cases only, did I not regard it as extremely rare. Both these cases (the first of which I saw at Pesth some four or five years ago,) were children between one and two years of age, of a decided rachitic habit, having that deformed state of the thorax which is denominated "pigeon-breast," with considerable lateral compression. The child at Pesth had previously had some slight attacks of the pure intermittent laryngeal spasm, which is commonly known by the name of crowing disease; and when the laryngeal constriction had become steady for nearly two days, then I erroneously considered the case for a time to be inflammatory. In the second case (at Sale Moor) no crowing had ever been before observed. In both cases the air-passage was so constricted at the time, that breathing required the greatest efforts, causing a dry wheezing sound, at periods a little louder, more audible, and more moist; the head was constantly thrown backwards as in the last stage of croup, and the lips and cheeks were of a livid appearance. By auscultation, only over the trachea and the largest bronchial tubes a slight respiratory murmur was per-

ceptible; percussion yielded a clear sound over the upper two thirds, and less clear over the lower third of the chest backwardly (probably from passive congestion). In both cases there was a considerable degree of oppressive drowsiness, alternating with an expression of intense anxiety in the face. Deglutition of liquids was less difficult than would have been anticipated, and in both cases I remember there was a kind of convulsive movement of the mouth, and some degree of empty swallowing, almost similar to what we observe in those hysteric attacks, accompanied with "globus hystericus." In the case at Sale Moor all these symptoms, after they had lasted for two days, gradually disappeared in one day, without cough, nor leaving behind them any degree of laryngitis. The child took nothing but cod liver oil, and we had reason to admire (Mr. Renshaw and myself) the incredibly sudden impulse that the remedy effected in the vegetation and strength of the child. In some instances of simple laryngeal spasm, with prominent weakness of the spinal innervation, I have found great advantage from quinine. But not seldom in Manchester the disease is dangerous and unyielding; when the only resource is to be found in change of air, particularly to the southern or western sea coast.

Hooping cough I find to be uncommonly frequent here, and it would seem much more severe and dangerous than on the Continent. In the reports of London as well as of Manchester, frequent deaths from this affection are mentioned. Though not seldom complicated with bronchitis or pneumonia, in itself it is rightly classed among the nervous affections of infancy and childhood. When I came to this town, and (after a pause in my professional pursuits from depressing events) again began to feel interested in medical activity, hooping cough was one of the first objects to attract my attention. At Pesth it appeared from time to time as a distinct epidemic, constantly with or after epidemics of measles; sometimes for many months not a single case; here during the last three years it has never been totally absent, not even at periods when of measles no trace was to be seen. In Manchester as in Pesth, in many instances after a short bronchitic stage it presents its pure nervous character; but on the whole broncho-pneumonic complications are more frequent *here*, and more dangerous; and to obviate or subdue these is decidedly a better plan, than to contend against the convulsive attacks with either of the remedies recommended for this purpose. Blisters are also disadvantageous in young and delicate children.

The cold and damp atmosphere, which is peculiar to this country, seems particularly unfavourable to delicate children of lymphatic and nervous temperaments suffering from this disease. The beneficial effects of a dry pure atmosphere, on the contrary, in mitigating and shortening the nervous vous stage, which I have noticed at Pesth, become at times evident also

here. The disease has in different climates and temperaments so constant and specific a character, that a specific remedy may probably one day be discovered for it. I shall not detain the reader with further comparative considerations on nervous affections of children.

Respecting adults, I am struck by the rare occurrence of *hysterical convulsions* in females, comparatively with the Continent.

Not unlike that slow and low form of bilious derangement, which was noticed above, there is a degree of nervousness very common, long lasting, difficult of cure, and almost a constant complaint of some females of the wealthier ranks; but very seldom arriving at such a degree of severity as to produce fits. They feel uneasy and are restless beyond control, and cannot bear any exciting impressions; they feel sometimes cold in the spine and legs, or have pain in the spine or some peripheric part, without exhibiting in their physical features the decided nervous habit. In fact, I am convinced, that this condition in many instances arises not directly from the nervous centres, but rather indirectly from the blood, in consequence of a diet too substantial for them, rendering the blood too animalised, or over much carbonised, and thus irritating for the nervous system. Indeed it is easy to conceive, that the same chemical condition of the blood, according to the different susceptibilities of the nervous system which it meets in different temperaments, may be normal for one, too weak for another, and too strong for a third. A certain equilibrium between the power (animalisation) of the blood and the power of the nervous system, is an essential condition for the maintainence of the harmony of health. The idea of strengthening weak and delicate individuals, endowed with an exquisite degree of nervous sensibility, with animal diet and malt liquor, is unscientific and hurtful.

Both the atmosphere and the national diet of England seem to be unfavourable to many female constitutions of a delicate frame; their nervous system is upset, but there is a great resisting power in them naturally, preventing outbreaks into fits.

I could adduce many cases of high and continued nervousness, which I have had opportunity of observing in females in Manchester, in which general convulsions never did occur; and only four cases have come under my notice with severe hysteric fits. The practitioner finds more opportunities in England than on the Continent, of noticing the deranging effects of a too strong kind of animal diet upon delicate habits—namely, of the frequent use of roast meat with a relatively small proportion of farinacious articles and greens, a kind of diet which instead of strengthening such individuals, as it is expected to do, and recommended for the purpose, causes them restless nights, nervousness, and debility. This happens the more certainly by the additional use of large quantities of tea, or the

use, however moderate, of malt liquor or wine. And it is just owing to the small minority of nervous temperaments in this country, that they are less considered in dietetic respects than on the Continent, and more easily drawn into the general line of national diet, which is certainly less suitable to them than that of continental countries and races. (See pages 17, 34, &c.) The nervousness, then, alluded to, is generally of a secondary character.

In support of the above remark, namely, that most cases of nervous hyper-erethism (of which I have had opportunity of observing instances in English females), do not arise directly from a highly nervous temperament, but indirectly from a relatively overanimalised or overheated state of the blood, I might allege the good effects which have been obtained in these cases by an essential change in their diet. This statement is still more applicable to the male sex. Indeed, when men say, as it happens sometimes, "I feel nervous"—it might be generally more properly said, "I feel bilious;" as commonly the source of their nervousness is not the brain, but the abdomen or blood.

Personal comparison makes it evident, that primary nervous disorders, in form of spasm or convulsion, are considerably more frequent in Pesth than in Manchester, though Pesth has fewer of them than Vienna, and Vienna certainly fewer than Paris. The cause of this seems to be attributable both to peculiar qualities of climate and of national temperaments. The nervous system of the female sex in England seems to be of a much stronger mould than that of other nations, and that of the male sex not less so in proportion; they bear a degree of irritation in their nervous system without the issue of fits, which in other races is not so easily tolerated.

Neuralgia, however, if I am not mistaken, is much more frequent, and at any rate more severe and obstinate here than on the Continent, in all its forms, and in both sexes. The reason of this frequency may be found in the circumstance, that the causes productive of neuralgic affections seem to be less inherent to the nervous temperament (which was said to be relatively rare in England), but to be dependent, to a great extent, upon extraneous and accidental agencies, as for instance, atmospheric influence, alterations of the blood, abdominal disorders, &c. I have met with several interesting cases of *spinal neuralgia* in females, a disease rather imperfectly represented, or totally overlooked in many otherwise excellent treatises on practical medicine. Generally it is included in the vague term of "spinal irritation,"—a step in modern pathology which is far from having arrived at a satisfactory diagnostical and therapeutical solution. I have seen the disease in question, in spite of the relative minority of pure nervous temperaments in England, more frequently and more

obstinate here than at Pesth, in the form of a fixed pain, sometimes merely numbness, in a circumscribed part of the spine, commonly in the lumbar region, with more or less weakness, or even a degree of paresis of the lower extremities, and remarkably cold feet. There are cases which present exactly the appearance of lumbar meningitis, by a sensation of constriction around the abdomen, commencing at the affected part of the spine, and extending across the stomach, intestines, or uterus, with more or less disordered functions of these organs,—amenorrhœa for instance, or dysmenorrhœa, or a certain degree of metrorrhagia. The last mentioned symptoms are not less striking and apt to mislead to an erroneous diagnosis than the numbness, or paresis, and coldness of the legs. The faults which I have principally to object to in the treatment of the subject by authors in medical works is, that the designation and the idea which commonly attach to the expression "irritation," naturally lead, and have led, to the recommendation of blisters or other counterirritants, as may be found in French, German, and English works; or, as congestion is supposed to be a usual associate of irritation, leeches and other antiphlogistic means are recommended. Both these kinds of measures, however, I have found constantly to aggravate the evil; nay, I may confidently state, that in the great majority of cases, all kinds of external applications of a decided nature—as cold or warm embrocation, or douches, or leeches, blisters, stimulants, or narcotic inunctions, galvanism, and gymnastic exercise; and all kinds of internal remedies, tonics or stimulants, quinine or steel, equally aggravate instead of alleviating them. The only exception which I know, in this respect, is the chlorotic complication, in which case mild preparations of iron will be found advantageous. This is not frequently the case however. I am in attendance upon a young married lady, twenty-two years old, a native of Germany, and now living in this town, who suffered last year very severely from spinal neuralgia, so much so that she could scarcely walk. In her thirteenth year, in Germany, she suffered first from the same complaint, in which all kinds of treatment were applied, calculated to subdue chronic inflammation or congestion of that portion of the spinal cord; under which, however, the complaint constantly grew worse, so that at last the patient was obliged to lie on the sofa for several months; when in despair of obtaining medical relief, she was taken to a country place, where very speedily an improvement was perceptible, and ended in the course of a few weeks in complete recovery. There was, however, a great deal of nervousness left behind, manifesting itself during the five following years in one form or another, most frequently in that of spasmodic dyspnœa in the morning,—when, again, with the entire disappearance of these disorders, weakness was felt in the back, gradually increasing to spinal pain in the lumbar region.

Three of the spinous processes, and the surrounding skin and subjacent tissues became tender, the uterine functions deranged, with abnormally prolonged menstruation, and impairment of the power of walking. I tried every means which seemed indicated for the case, nervine and roborant remedies, but in vain. Upon my recommendation the patient went at first to a country place, rather elevated in situation, with a bracing atmosphere; but with no good result: when ultimately a sojourn of four weeks on the west coast (Southport), gradually, but entirely dispelled the disorder.

I remember about twelve cases of the complaint in question, having occurred in my practice in females; of whom the youngest, in Hungary, was twelve years old, the eldest, in this town, twenty-four. I have heard and read of some patients of more advanced age. All those whom I have had occasion to attend here were, on an average, about two years older than those in Hungary.

In some of these cases the affection developed itself in the course of a week or two, to a high pitch; in others it began slowly, and lasted in a moderate degree during several months; and one case, which I am now attending, has already continued in a slight degree, with occasional remission, two years and a half. In three cases there was a striking variability of symptoms perceptible. Within a few hours space pain or numbness in the spine disappeared, giving rise to neuralgic pain in the head or heart; and with the disappearance of the latter, neuralgic paralysis, or pain in the spine, re-appeared. In one of my cases (a girl, about nineteen years of age), the complaint consisted of periodical weakness in the lumbar region, with pain in the ankles and wrists, just as it happens sometimes in meningitis. Leeches and cold shower-bath caused in this case a most severe aggravation of the symptoms.

All the cases of which I know have improved, or completely disappeared. The improvement presented, however, the same variance as the symptoms; in a few cases the complaint has disappeared suddenly in a few days, without known reason; in others slowly.

I have been puzzled more than once with the diagnosis of spinal neuralgia in young females, until I came to recognise it in its real nature; and more than once my medicinal treatment was unsuccessful, until I desisted from all interference, and recommended country air. Many of my patients presented the physical features and moral attributes of the nervous temperament, which circumstance rendered diagnosis easier; but some others, young girls under the process of female development, had not at all such an appearance; and still greater was the difficulty of unmasking the nature of the complaint in two of them, in whom the lumbar vertebrae presented a slight lateral deviation—an occurrence

not rare in the fair sex—but which in that case had nothing to do with the spinal nevrosis, though I erroneously attributed this to it for a time.

The disorder in question has occurred in my practice in a few instances also in young men, from juvenile disorder of the worst kind, in the sexual sphere, its seat having been the sacral portion of the spine, and the disordered innervation manifested in the corresponding organs, partly in the form of hypererethism, partly in the reverse of this, and simulating tabes dorsalis.

I have spoken thus largely on this subject, because I happen to have had opportunity of observing a relatively not insignificant number of interesting cases of this kind, in climates and races which in many respects differ from each other; and because I wished to give the young practitioner some useful hints on the subject: these cases belonging to the most deceptive, most difficult, and the least pleasant in practice. I have heard some experienced English practitioners use for the same affection the popular designation of "hysteric spine." Under the name of hysteric paralysis, or hysteric paraplegia, we find also here and there either the same form, or at least the same kind of disease as above mentioned; but, as I said before, the descriptions with which we meet in systematic works under the name of spinal irritation, are such as to lead to erroneous or mischievous therapeutical attempts, instead of cautioning the young practioner in this respect.

Many a patient of this description, after long and varied and unsuccessful therapeutic trials, ultimately recovered by country air; which ought to be mild and dry for this purpose, and recommended the sooner the better for both the patient and her medical attendant.

One of the cases mentioned above, a young English lady, seventeen years of age, after having suffered from lumbar neuralgia during two years, went last summer with her parents to the sea-side in Wales; and after two months she returned completely free from pain. Being the regular attendant of this family, I have noticed since October last the renewed symptoms of the same affection, and since then have endeavoured to check it by hygienic and therapeutic means—but with little result. Six weeks ago I received a note from the mother of this young lady, in which I am asked: "If I think it advisable, and not injurious, to try Mesmerism?" I answered: that, if any, this case would seem a fit one for such treatment, and recommended certain precautions; as really in one of my former cases procedures of this kind increased very much the nervous excitement of the individual. The patient in question, however, was of a quiet and not at all excitable disposition. She manifested *great faith* in mesmeric treatment—another reason why I thought it proper to consent

to the experiment. This was done by a practitioner of Manchester, with a very favourable, and *unequivocal* result. Immediately after the second operation the effect was visible, and in three weeks she was free from pain, and left with her parents for Paris. Under the manipulations of the operator, this young female constantly fell into a deep sleep. Besides this I have known another case benefited in the same way. I would here observe, that medical man alluded to, known to the profession as an author on the subject, is a gentleman not to be confounded with the common set of "ex professo" magnétiseurs.

Be the patient male or female, after all I have seen of this obscure disease, I think it well to bear in mind: that inflammatory or congestive affections of the cord do not present themselves limited to so small an extent of the spine, and the tenderness is by far not so superficial as in neuralgia. In fact, one of the best diagnostic signs is exquisite tenderness, not only in the corresponding spinous processes, but also in the skin, not bearing even — though not invariably — moderate pressure. Gentle sponging with salt water of a medium temperature, between 75° and 85° Fht., is among local applications the only one, which I have found useful in some cases, and never hurtful. On the whole, spinal neuralgia is a "noli me tangere" as regards the use of local remedies, and not much more tolerant of internal medicine—with the exception, of course, of homœopathic globules, or some tincture—of imaginary potency!

Prosopalgia and other peripheric neuralgic pains, and nervous *headache*—complaints in which it is not always easy to determine, if they are of primary and pure nervous origin, or arising from rheumatism, or from an abnormal chemism of the blood, or the disturbed equilibrium between the power of the blood and the sensibility of the nervous system (see page 62)—I find also to be much more frequent and unmanageable here than at Pesth. Whatever their origin be, the English climate seems to exert an unfavourable influence upon all neuralgic forms. At Pesth, and I dare say in other countries with a warmer and dryer summer, these complaints either entirely disappear during the milder seasons, or they are intermittent at long intervals; here, however, cases of idiopathic nervous headache have come under my notice, distressingly severe, and scarcely remittent even in summer for more than a few days or weeks. A distinguished clergyman and theological writer of Scotland, who not long ago was under my treatment, suffers in this way in a measure almost unparalleled in my experience. His son, an esteemed friend of mine and brother practitioner, presents an instance of hereditary transmission of this complaint in himself, but in the intermittent form (migraine, sick headache), which also on the Continent is frequently met with, forming periodical attacks, relieved by spontaneous bilious vomiting.

Respecting the relation of different temperaments to the different kinds and forms of nervous affections, a comparison between Pesth and Manchester might offer some interest; but I am sorry to say, I have not so exact a recollection of such patients in the former place, as to enable me to institute a strict comparison. Thus much, however, I feel enabled to state: that migraine is in both places a morbid attribute of nervous temperaments in both sexes, most commonly between twenty and forty years of age; the severest forms of periodical migraine which have come under my notice, were in patients above thirty, and have been frequently observed in those individuals who, besides the nervous type, present some marks of hæmorrhoidal, not to say, bilious admixture; spinal neuralgia occurs in young females of nervous and nervous-lymphatic temperaments, very seldom above twenty-four years of age, and in young men; and laryngeal spasm attacks almost exclusively young children, under two years of age, of a lymphatic or rickety habit. Most forms of neuralgia occur in both localities promiscuously in different temperaments, with the exception of one—the pure phlegmatic type; this I believe is pretty nearly exempt in all climates from general convulsive as well as from local spasmodic or neuralgic forms. Again, idiopathic and essentially hysteric spasms and convulsions are here as well as on the Continent peculiar to the nervous temperament.

It appears, that both the temperature and atmosphere of England are much less productive of nervous temperaments, than these agencies on the Continent; and it is perhaps for the same reason, that general convulsions in adult females are less frequent here: because undoubtedly these fits in the great majority occur in nervous temperaments.

It may be perhaps, that the greater dryness of the continental atmosphere is one of the causes of the greater frequency of nervous hypererethism and convulsions there. Indeed, it is not improbable, that a dry atmosphere being a less powerful conductor, the accumulation of electricity in the human body, or of the nervous fluid itself, is more favoured in it than in the moist atmosphere of England. Neuralgia on the contrary, which is not so much dependent upon the nervous type, and not seldom the secondary effect of various internal and external agencies, is more frequent and severe in this country: probably owing in a great measure to the cold dampness of its climate, and to some extent also to an overheated condition of the blood, which it would seem is more obvious in this country than in others.

An observation which I have made at Pesth I find confirmed in Manchester, viz.: that general nervous hypererethism, and convulsive and spasmodic forms of this disorder, become aggravated under what is generally called a "close atmosphere,"—warm, cloudy, heavy, and quiet,—a condition under which also some degree of biliousness is commonly

prevalent; neuralgic forms, on the contrary, primary and secondary, increase in cold, damp, and windy weather, contemporaneously with rheumatism. A warm temperature, again, between 75° and 90°, with a pure and cloudless atmosphere (which is rare in England) suits best both the convulsive and neuralgic forms.

In the case of nervous diseases the English profession generally place the greatest confidence in change of air, and carry out measures to this effect with great energy; and the patients are more generally disposed to act upon such recommendations here than on the Continent,—in which respect certainly they are right.

The ingenious and enlightening enquiries in neuro-pathology of Marshall Hall, and the careful and extensive trials with a number of active remedies of English practitioners are generally acknowledged; but by the unfavourable influence of the climate the treatment of these affections meets with still greater difficulties in this country than on the Continent. Sacharo-carbonate of iron and quinine appear to be in the present day here as well as on the Continent the principal remedies for neuralgia, both in the highest possible doses. The effects of both, however, are very much dependent upon the temperament and other conditions of the individual. The energetic employment of the carbonate of iron, if I am not mistaken, was first introduced in this country, by Hutchinson, and made its way through Europe with many good results. It has the best effect upon individuals of whom the carotids manifest the anæmic murmur. Quinine I have found to suit best those neuralgic patients who are subject to rheumatism, who have a feeble and frequent pulse, and principally when they suffer from intermittent or periodical neuralgia. Professor Francis Hildenbrand has obtained some striking results in prosopalgia from mercurial treatment (inunctions with large doses of the strong ointment to the production of fever and crisis), employed according to the powerful method of Louvrier. I myself have found also this treatment perfectly satisfactory in two similar cases of extreme severity at Pesth. Both patients were men of a moderately strong constitution, without the slightest suspicion of syphilitic complication.

After what I have seen of prosopalgia in different forms, and treated in different ways—and all these forms and ways are very much the same here as in Vienna, or Pesth, or Pavia—I have been more and more led to believe, that in most cases rheumatism or an abnormal condition of the blood may give rise to that nervous affection. The effects of the mercurial "metasyncrisis" in subduing it, is also only intelligible through the medium of the blood.

St. Vitus's dance is frequent in Manchester, and, if I am not mistaken, more obstinate than at Pesth. Here not less than there it

affects in preference young girls, commonly between seven and fourteen years of age, of a nervous habit, and when rapidly growing. In spite of the frequency of rheumatism in this town, I have met only in one case out of seven with the clear evidence of rheumatic complication; this patient, a girl seven years' old, had pain in the muscles of one shoulder, remittent febrile alterations, and profuse sweats, with the characteristic lateritious sediment in the urine, and twice an attack of endocarditis with the blowing murmur. In Pesth this complication was proportionally scarcely more frequent in my practice: so that my experience in this respect is at variance with that of several modern writers of incontestable merit, according to whom rheumatism is a common complication of chorea. It is true, pain in one or another joint, and abnormal murmurs of the heart, were present in many of my cases; but as the former generally appeared only in higher degrees of chorea, I considered them as coherent with it, and of nervous origin, unless the urine, skin, and pulse spoke in favour of rheumatism; and as in my cases the blowing murmur of the heart was accompanied by the same phoenomenon in the carotids, and an anæmic appearance in the habit of the patients, so I attributed these symptoms to anæmia. In fact it was in cases of that description that the addition of iron to a solution of ammonio-sulphat of copper produced beneficial effects. Of nearly one hundred and fifty cases, with the exception of a small minority all recovered under the use of the last named remedy *only*. Of about one hundred of these patients exact records exist in the case books of the children's hospital of Pesth. The formule is this: R. Aqu. menth. piper. unc. jv., ammonio-sulfatis cupri gr. jv-vj, tinct. opii gr. vj-viij, syr. simpl. dr. ij. To be given from one to four teaspoonsful four or six times every day. In this form high doses of the remedy are well supported for weeks and longer, with occasional short interruptions. The patients, with the exception of a small minority of boys, were girls between seven and twelve years of age, at which age articular rheumatism is undoubtedly a rare affection; nor seems the satisfactory effect of the above named remedy (in some cases conjointly with iron) to admit the assumption of rheumatism. In several cases with evident rheumatic complication, I first acted against this with quinine.

I remember a case of chorea at Pesth in a young girl, which my distinguished friend and colleague Prof. Sauer attributed to spinal rheumatism, because of a fixed pain and tenderness in a portion of the spine. I have seen several such instances. But unless the water be high coloured, or form a lateritious sediment, I should feel inclined to suspect the presence of spinal neuralgia.

Of *hæmorrhoidal* and *gouty* affections, according to my recollection, the former is in Italy much more prevalent than the latter; this again is

more frequent at Pesth and I believe in other towns of Austria and Germany than in Italy, but less frequent than the hæmorrhoidal dyscrasy in the same places; here, on the contrary, if I am not greatly mistaken, gouty disorders are not less, if not more obvious than the hæmorrhoidal, and at any rate considerably above the rate of other places of which I have any personal experience.

Having used in this statement the term of "hæmorrhoidal dyscrasy." it is well understood, that I include in it a certain group of symptoms in the abdomen, head, chest, and spine, generally attributed by practical observers to that dyscrasy—although we ignore as yet the chemical character of it—while hæmorrhoids strictly so called, or piles, or other diseases of a similar nature in the rectum, may be slight, inconstant, or entirely absent in many individuals who are under the deranging influence of the dyscrasy in question.

Hæmorrhoidal complaints of the last named parts are not rare also here; but taking the whole group of phœnomena attributable to that dyscrasy, I may correctly say they are less in number and intensity in this town, than the practitioner observes them in Pesth or Vienna, and I dare say in general in Germany. I believe indeed, that scarcely a day passes there in a physician's practice without bringing the complaint under his notice in one or another form; and hæmorrhoidal powders (having constantly for their basis cream of tartar, frequently with a small proportion of sulphur), are as common in daily life there, as in this country the black draught or aperient pills.

I have been struck, on the contrary, in Manchester by the relative frequency of gout. I do not refer, of course, to severe or fully declared cases merely, which fortunately are not very frequent, but to all phases, forms, and degrees of the dyscrasy, those slight symptoms not excluded, which in daily life are not seldom regarded as simply gastric or kidney disorders in one case, and as rheumatic in another.

It is my impression that in modern times, which are so fertile in every direction of anatomical, patho-chemical, and microscopical inquiry, the clinical and practical knowledge of the two diseases in question has been comparatively little advanced. From the modern medical literature of Italy and France it would appear, as if hæmorrhoids and gout were but little noticed as constitutional disorders. In Germany the former (as a constitutional dyscrasy) has been paid more attention to; in England, as is well known, since the graphic description of gout by the English Hippocrates, two centuries ago, from time to time some observers have devoted no common mental power to the study of it. The treatises of Scudamore, Wilson, Copland (in his comprehensive Dictionary), Todd, Budd, Bence Jones, and other English writers, are of great merit; but there is still a great

deal of obscurity left to be dispelled by further enquiries.

Both the hæmorrhoidal and gouty dyscrasies are certainly of great importance in practice; the former for its great frequency especially on the Continent; the latter for the same reason more in England.

Are they both of the same origin? representatives—as has been stated by Schoenlein and other German authors—of an analogous patho-chemical process in the blood? Is there any notable difference to be observed in different countries as regards their causes, relation to temperaments, climate, and other circumstances?

It strikes me more in this country than it did ever before, that though in a general point of view the same kind of diet seems to promote hæmorrhoids in one, and gout in another individual, still there is a considerable difference in many essential points between them. Even the fact, of which every practical man having had my opportunities of instituting a comparison, would be convinced as well as I am—of the great frequency and intensity of hæmorrhoidal complaints in one country, with a lesser proportion of gout, and the reverse relation of both affections in the other, seems to speak in favour of their different origin and nature.

My comparative observations between England, Hungary, and Italy (Manchester, Pesth, and Pavia), lead to the following conclusions:

In the production of both hæmorrhoids and gout, climate as well as the mode of living (food and drinks and individual pursuits) are of great influence. In the warm and dry climates of Europe hæmorrhoidal symptoms are more frequent than gouty; whilst the outbreak or attacks of the latter are evidently promoted by cold dampness, as we have the best opportunity of noticing this circumstance in England.

Both complaints, as is generally known, occur in the great majority in the wealthy classes and in individuals addicted to a generous and stimulating diet, and taking insufficient bodily exercise; but the development of the hæmorrhoidal disease requires these conditions much less than gout.

Both occur in the great majority in mature age; but hæmorrhoidal symptoms not seldom manifest themselves in youth, and commonly about the thirtieth year; gout on the contrary seldom before the fortieth.

Both are preceded by abdominal disorders, which in the beginning are not always easily diagnosed; but the hæmorrhoidal prodroma, and the abdominal symptoms of this disease, are considerably more troublesome and more liable to act upon the brain and mind, than the abdominal disorders preceding gout. Persons of gouty habit have generally a good appetite, feel easy in their head, and have cheerful spirits up to the outbreak or attack; while hæmorrhoidal subjects present the reverse conditions.

The abdominal symptoms of hæmorrhoidal subjects have their seat in the brain, lungs, liver, rectum, bladder and uterus, with painful congestions in these organs; while those of the gouty most commonly manifest themselves in the kidneys, with a sensation in the back of tension, fullness, or weakness, —as patients express themselves—and with much less pain; and their dysuria, if present, is seldom of congestive origin.

The urine in hæmorrhoidal complaints is not so acid as that of gouty subjects;—it is frequently of a reddish, sometimes even a bloody appearance, and forms a mucous deposit; whilst in the gouty urine red gravel, lithates and other concretions, are perceived.

Those who suffer from hæmorrhoids feel decidedly worse in warm and better in cold seasons; gouty persons experience exactly the reverse influence of temperature. And this double relation seems to me the principal reason of the relatively greater frequency of hæmorrhoidal symptoms in Italy and Hungary, and of the greater frequency of gouty disorders here.

Gout disposes to, and is frequently connected with, rheumatism; which disposition does not prevail in hæmorrhoidal subjects more than in others.

The hæmorrhoidal disposition frequently manifests itself in spare tall persons, with a degree of bilious temperament; gout, on the contrary, commonly attacks persons of mediocre size with a degree of embonpoint, and phlegmatic temperament, with sanguine admixture.

Both hæmorrhoidal and gouty subjects, in order to improve their condition, require here as well as on the Continent principally a light kind of food, with modifications for the individual, but in general no strong animal food or fat, nor spirits or malt liquors; but while the medical treatment of hæmorrhoids ought to consist of bland aperients having a cooling action upon the blood—principally cream of tartar,—gouty subjects require and bear drastic aperients, and other kinds of active remedies, calculated to give a powerful impulse to the secretory functions of the liver, intestines, and kidneys. In my opinion, in modern times the treatment of gout on the Continent has undergone partly a favourable, partly an unfavourable change. Bland and inefficacious remedies have been to a great extent substituted for the active drugs of the old schools; this change has gained ground in ratio as the dietetic and hygienic treatment has been more efficiently and more generally adopted. In fact, in Vienna, or Pesth, and I dare say in almost all other continental towns, which, according to their position or importance, have been influenced by the great modern movements in medicine, the energetic treatment of gout has almost been abandoned by many practitioners, who make scarcely a difference between the remedies they prescribe in hæmorrhoidal and gouty

disorders. In England, on the contrary, there is rather the disposition to rely more upon active remedies and relatively less upon diet than on the Continent. As to gout it may be confidently stated however, that here as well as on the Continent its successful treatment requires generally both active remedies and long continued low diet.

If I compare my observations concerning hæmorrhoids and gout in this town with the recollections of a former experience at Pesth, I find, that both forms fully developed very seldom occur combined in the same individual. A moderate degree of hæmorrhoidal dyscrasy, however, occasionally complicates gout, and vice versa. In such cases here as well as on the Continent I have found, that skilled practitioners endeavour to abate first by bland cooling means (neutral salts for instance), and prolonged dietetic treatment, the hæmorrhaidal complication. As long as the latter condition continues to prevail, a strong and active treatment directed against the gouty symptoms only increases the sufferings of the individual.

The complication of rheumatism with gout is much more frequent here than I have before seen it. I have been fully satisfied in this town, that although rheumatism is a disease quite different from gout, the latter eminently disposes to the former, and that the same well-known atmospheric conditions are unfavourable to both complaints. Rheumatism, which on a former page was said to be considerably more frequent here than on the Continent, however, is in both climates and in all dispositions the effect of either sudden atmospheric change, from warm to cold, more especially with north or north-east winds, or of prolonged cold with dampness; whilst gout is decidedly the effect of an anomaly in the nutritive process deranging the chemism of the blood. Cold damp weather, however, without causing a rheumatic complication to the gouty individual, increases also the gouty symptoms, evidently by reason of the lessened activity of the skin.

When rheumatism supervenes upon gout, it becomes modified by the latter dyscrasy. In fact, rheumatism, as is well known, has a tendency to inflammation; when it is acute and febrile, it produces what has been called the "fibrinous crasis" of the blood, with tendency to plastic exudations in serous or fibrous membranes. It happens otherwise when rheumatism attacks gouty subjects; in this case acute inflammation comparatively seldom supervenes, or at least seldom to the degree of causing pleurisy and pleuritic exudation; on the contrary, the supervening rheumatism becomes in such subjects more liable to a chronic course, and the inflammations produced by it have generally their seat in the knee, and very seldom in the pleura.

The efficient and successful treatment of gout I find to be in principle

the same here as on the Continent; the only difference is this, that it must be modified more frequently on account of the more frequent complication of hæmorrhoidal disorders there, and of rheumatism here.

We find in many works the same specific remedies recommended for both gout and chronic rheumatism; colchicum for instance, or antimonials. Comparative observation, however, by which I have had opportunities during the past three years of forming an estimate, confirms the conviction I have long entertained, viz.: that the two diseases improve under the use of quite different remedies. Quinine, for instance, in high doses, an invaluable remedy in simple rheumatism (without inflammation), is decidedly hurtful in a case with gouty complication; and iodide of potassium, another excellent remedy in noninflammatory rheumatism, will remove this complication, if present, but not the gouty symptoms. The vinum colchici I have used extensively at Pesth in rheumatism, but have obtained only very doubtful results; during the last three years in this town, I have had adequate opportunities to warrant a decided conclusion, according to which it is not rheumatism but gout, in which this remedy is frequently useful to cut short, or mitigate, and abbreviate the attacks. To produce this effect, the remedy must be given in high doses, between gtt. 35 and 50 p. d., to cause a deep revulsion in the system, with nausea, vomiting, and diarrhœa; to be repeated in that measure if required; afterwards in more moderate doses, as a diuretic and bland aperient. A combination of iodide of potassium with vinum colchici, in such proportion that the patient may take between ten and twenty grains of the former with from twenty-five to forty minims of the latter twice daily, so that moderate iodism be maintained for several weeks or longer, will be found frequently very useful in cases of gout complicated with rheumatism; but only after the abdominal organs have been acted upon by the emetic or strong aperients, or, in severe cases, by full doses of colchicum. The decoction of *Zittmann*, (consisting of guajacum, sarsaparilla, senna and antimony, with stomachic aromatics), I find also to be worthy the confidence of practitioners. Conjointly with the starving diet as proposed by the originator Dr. Zittmann, this compound remedy has effected, not only in severe cases of gout, but also of chronic rheumatism in robust and full habits, the most happy results in the practice of several distinguished colleagues at Pesth and Vienna, and I have found it to answer very well also in this town. This is a plan of treatment which, on the Continent, is adopted in many different chronic affections.

From what has been already said, it appears clearly enough, that owing to the different pathological nature, but frequent complication of rheumatism and gout, it is important to discern exactly the rheumatic pain, be it primary or engrafted upon gout, from gouty pain; but this is not always easy to accomplish when the rheumatism is not acute or inflam-

matory, or the gout not fully developed. In the heart for instance, and in the knees, both diseases appear sometimes nearly in the same form; but this localisation, however equivocal it may be, seldom occurs alone and without other more characteristic symptoms, either rheumatic or gouty. It scarcely needs to be remarked, that acute articular rheumatism, which has an especial tendency to engender inflammations and exudations in the pericardium, endocardium, and valves, is sufficiently characteristic in its symptoms to be recognised and distinguished from gout. As to chronic rheumatism, it attacks in the majority of cases the muscles or large joints; gout, on the contrary, does not affect muscles, but in preference, and in the incipient stage almost constantly, small joints, not seldom with a sensation of weakness and numbness throughout that limb of which one or several toes or fingers may be affected. This numbness, when it happens in one of the arms, generally causes inquietude to the patient from the apprehension of a stroke, or progressive nervous paralysis. There is a sensation in the tips of the fingers, for which we have the very graphic English expression of "pins and needles," which generally characterises *gouty* numbness and weakness, the more clearly so when at the same time some of the fingers become stiff and swollen. An English lady advanced in years, whom I attended in this town, and who was formerly under the care of Mr. Duplex of London, presented that symptom in a considerable measure, with temporary remission, during nine years. The apprehension of paralysis in these patients is frequently augmented by the sensation of almost a paralytic weakness proceeding from the lumbar part of the spine, which causes cold feet, difficulty in walking, and of bending the body forward, or rising from a chair. I have had to attend several such cases in this town, all occurring in persons of a sanguine phlegmatic habit, with more or less of embonpoint. Their paralysis or weakness improves as far as possible under the continued use of colchicum and other active (evacuant) remedies, conjointly with the lightest diet; and most of them run great risk under a tonic treatment. The above-mentioned lady, though above sixty years of age, and all her life accustomed to a generous diet and the use of wine, submitted at last to such a rigorous change, as to abstain for several weeks from every kind of animal food, and for months afterwards from roast beef and other strong viands, with so signal a benefit (as I am informed from London, where she lives at present), that she is able now to run up and down stairs, better than she could do for many years past. The old method of treatment in gout—of adopting at an early stage the use of tonics and stimulants and a generous diet, after a short employment of aperients during the attack, suits the wishes of most of the patients, but leads to imperfect results here as well as in other countries.

Indeed, not a few cases have come under my notice, in Hungary as well as here, of this disguised (gouty) numbness, which arises from the abnormal condition of the blood peculiar to gout, and not at all from a supposed weakness of the nervous system. We may feel fully justified in considering such state of the blood as being both too rich and thick (be it from superabundance of globules, or from overcarbonisation) for easy circulation; and too little invigorating and stimulating for the spinal sphere of the nervous system: hence those sensations of checked innervation. Now, if such individuals, who have not been much in the habit of taking wine, brandy, ammonia, and the like, be recommended to make use of those articles, and also of a more generous, tonic kind of diet, it is not seldom that we hear them rejoice at the change they experience,—the numbness is gone, and they feel stronger—a deceptive and dangerous improvement indeed! Because it may happen sooner or later, that the stimulated spinal cord is no more able to carry on such a degree of vasomotor innervation, as is necessary to propel that dense kind of blood, and the suppressed symptoms will certainly break out with redoubled vehemence and danger.

Comparing the individual habits and temperaments in whom I have observed the disease here, with those I recollect at Pesth and other towns, it appears that they were almost all of the same physical and moral type—having the phlegmatic temperament, but not to excess, with an admixture of the sanguine; they were fond of a dainty table, and were generally of a cheerful disposition.

Many experienced practitioners are of Budd's opinion, according to whom malt liquors are more liable to promote the gouty dyscrasy, than wines. On this opinion I have only to remark, that English malt liquors (beer, ale, and porter), are considerably more alcoholic than similar beverages on the Continent. The same relation prevails between British wines (sherry, port, and the like), and those of France and Germany; the former being decidedly more noxious in gout than the latter, amongst which I consider claret the least injurious of all. But as regards the progress of the complaint, according to my experience, here as well as on the Continent, both wine and beer of every description undoubtedly promote it, more or less.

As the phlegmatic temperament conjointly with gout has come in question, and being comparatively a more prevalent type in this country, although seldom to that degree of excessive fatness which we see in some continental countries, it would be interesting to inquire into other pathological dispositions connected with, and illustrative of, its nature; but my experience does not furnish me with facts sufficient for such a purpose. On the Continent I have had frequent opportunities of observing *over-fatness* to the degree of disease, with *fatty hypertrophy*

of the liver, and connected portal disorders, and dropsy. Undoubtedly, no other temperament is so much liable to abnormal production of fat as the phlegmatic, and the last named complaints occur also in England; but I am unable to speak on this subject comparatively from personal experience, nor have I been able to collect information satisfactory on this matter.

It is difficult to determine, as to how far *retarded and disordered vegetation in children* so frequently met with in this town, in one of the most characteristic forms, viz., *rickets*, may be attributed to the prevalence of the phlegmatic or lymphatic temperament, or to peculiarities of climate. *Chlorosis*, also, in all forms, in children and females, is exceedingly frequent here.

In a former page, national temperaments have been represented in general as the combined result of climate and diet—agencies which exert their influence upon the constitution (temperament) of children partly through the blood of their progenitors, partly in a direct way upon the children themselves. But besides these there are many other direct and powerful agents affecting the vegetative system of the infantile organism, which are dependent on national habits and peculiar circumstances—different in different countries and races—and which may promote or counteract in various degrees the disorder in question.

Having paid particular attention to lymphatic and vegetative diseases of children in Pesth, and having found in this town an ample field of observation on the same subject, which I regard as worthy of special consideration, I shall speak of it in another place more in detail.

Tubecular disease is certainly considerably rarer in Manchester than in Pesth, although it was a general belief in Pesth, and not without foundation, that Vienna presented a still higher rate of it. It would appear that Liverpool has by far a greater proportion of cases of this destructive malady than Manchester, although these two large towns are so nearly alike in geographical position. Districts and towns differ of course, in this respect from each other, both in this as well as in other countries. To investigate rigorously this part of the subject is beyond my means, as well as foreign to my present purpose; but I cannot pass over one point of importance—the great difference, namely, in the *course* of tuberculosis of the lungs, as it occurs in this country and in Italy. This difference rests upon the varying degrees of reaction and inflammation consequent upon the tubercular deposits: these in Italy are generally more acute, or over-acute, while here, on the contrary, they are lower and milder. Unmistakable personal impressions entitle me to hazard this statement. In the hospital of Pavia I saw tuberculosis very frequently in the form of acute pneumonia or plurisy, and retain many similar cases in my memory which

I had opportunity of noticing there in private circles. Here there is by far a more favorable chance for tuberculous individuals than in Pesth. Nor is it to be wondered at that in Italy abstraction of blood is more freely practised for the purpose of soothing the vehement reaction than here, where the reaction is quieter, sometimes even almost imperceptible.

Had those Italian physicians who considered tuberculosis as a mere product of inflammation observed the disease in this country, at least in Manchester, perhaps they would not have fallen into that error. Climatic agencies—namely, moisture or dryness, coldness, heat or moderate temperature, and national temperaments, effect a great difference in determining the *course* of the same disease.

It needs scarcely to be observed, that many of the statements in the preceding pages, concerning the character of various kinds of disease, are not intended to be strictly applicable to all regions or places of this Island. Pathology is sujbect to considerable local variations and modifications everywhere; and the declared intention of this treatise is not that of describing topographical pathology, but merely calculated to communicate those personal impressions, which the writer has received in different countries, with certain reflections and remarks thereupon, the result of his individual experience.

On one important pathological subject—inflammation, I may venture to express the conviction, that, although the inflammatory disposition, or inflammation when it exists, is augmented by the use of animal food and spirituous liquors,—the inflammatory disposition itself, and more particularly the acute character of inflammation, is not so much the result of an overnutritious or heating kind of diet, as of climate and temperament. This becomes especially clear, when we compare Italy with England (Pavia for instance with Manchester). There we have the Italian with his frugal and cooling diet, subject to the most violent inflammations; here we have the Englishman with his substantial and stimulating diet—calculated to increase the amount of fibrine in the blood—yet, far less subject to acute parenchymatous inflammations; but to a host of catarrhal, rheumatic and gouty affections, with tendency to run a chronic course.

On the mode of action and influence by which some warm climates, as for instance that of Italy, dispose to a higher degree of the inflammatory *crasis*, our notions as yet are very imperfect; whilst it seems easier to account for the opposite effect under the influence of a moist atmosphere like that of England.

Also primary and purely nervous diseases do not arise from the effect of diet, but from the organic character of temperaments—although diet may excite, increase, or soothe them in different ways and in

varying degrees.

Popular medicine in England, not less than in other large countries, is subject to manifold variations according to different districts and towns; and this applies not only to self-drugging without medical advice, but also to remedies enjoying a paramount credit among the generality of medical practitioners. For the purpose of comparison, however, with what has been said in former pages on the same subject in continental countries, it will be sufficient to consider only a few principal points, obvious in daily life, in the druggists shops and medical practice.

According to personal observation it would appear, that self-drugging is more extensively in vogue in England, than in continental countries of which some accounts have been given already,—with a considerable proportion and variety of *antigastric* articles, with an almost entire exclusion of those light aromatic flowers and herbs, which have been mentioned as household articles in general in the central and northern countries of Europe, and in France. The same may be said of the light and diffusible kinds of nervine preparations, as the spirit of melissa for instance, which is popularly prevalent as a remedy throughout France, Germany and Austria,—and cherry laurel water, which, besides its frequent employment in these countries, is very much used also in Upper Italy.

Pure nervine remedies, so far as my observation goes, corroborated by the information that I have received, are scarcely met with in domestic life, and not frequently used in practice, in England. The stimulants of this country are of a more heating and tonic charater, acting more through the medium of the blood. A very popular remedy in cases of faintness or spasmodic attacks, so far as I know, is *brandy*, taken in small quantities with water. *Ammonia* is professionally very frequently recommended; sometimes the tincture of castoreum, and less frequently and only in some places, as I am told, the liquor Hoffmanni—a nervine remedy most extensively used in Austria and Germany. This difference, with respect to nervine remedies undoubtedly points at a less excitable and hypererethistic nervous system in the English race—a circumstance significative as regards the English national temperament.

The general blood-cooling panacea of the whole Continent—*cream of tartar*—is very little used here, and decidedly less required for Englishmen than for others; the same may be said of the numerous and varied kinds of acid and other cooling drinks, so obviously indicated in continental countries, of which there is very much less use made here.

Amongst the antigastric remedies, it is interesting to notice, that in the general and popular use of *castor oil* England coincides with Italy. And as this is one of the most extensively used aperients also over the central parts of the Continent, and, owing to the medical influence of Germany,

probably in the East and North: so we are led to regard castor oil as the most important and serviceable aperient of this part of the Globe.

The main body however of the domestic remedies in this country consists of a variety of patent pills and medicines. Similar articles are in favour in Germany and France and other countries, but in a proportion not to be compared with that of England. There they are partly legally interdicted, partly silently admitted; but *in England patent medicines afford a revenue to Government.* The medical profession make frequent use, however, of drastic pills, and certainly there is no nation in Europe requiring and better tolerating strong aperients than the English. Magnesia and rhubarb, and senna with Epsom or other salts (in form of the "black draught") are very generally resorted to both popularly and professionally; but with regard to these articles, Germany and Austria are scarcely much at variance with England.

In the extensive use of *carbonates of soda* and of *potash*, again, this country differs from the Continent. To "act upon the kidneys" is among the most obvious indications of English practice. The reason of this may be found in the national diet and frequency of gouty symptoms—not seldom regarded by the patients as disorders of the stomach, and intestines, liver or kidneys, until an "attack" dispels or changes such flattering and mistaken views of the gouty sufferer.

The antihæmorrhoidal compounds, so very extensively used in Germany and Austria, are scarcely represented here. In fact the hæmorrhoidal dyscrasy, as has been mentioned in a preceding page, seems to be much less diffused and severe here, owing to the coolness of the climate, than in those countries. Among the foreign population of this town, however, many suffer from it, in spite of the cold average temperature during at least 2-3rds of the year.

Abstraction of blood, by bleeding and cupping, frequently recommended by the profession, is also not seldom resorted to without advice. Not often in the form of venesection, however.

According to what has been already said on this point in preceding pages—when we compare both the temperament and character of acute disease peculiar to England with that of Italy, we find some explanation why *Brownism could* originate here, and *Rasorism* in the Peninsula—both alike excessive exaggerations; but in spite of differences in its frequency and intensity, the *nature* of inflammation appears in both countries the same, and its essential remedy the same. The unprejudiced and experienced English practitioner as well as the Italian finds those theories and experiments which tend to demonstrate the uselessness or hurtfulness of bleeding in primary inflammations, to be deplorable aberrations of the human mind—and striking, not to say shocking proofs of the difficulties

truth has to contend with in medicine!

Tartar emetic is frequently used in English practise, and well borne.

The tolerance of *opium* is undoubtedly greater in England than in continental nations. Idiosyncrasies to such an extent, that a sixth or eighth of a grain causes long.lasting uneasiness and nervous excitement—an occurrence obvious in the fair sex on the Continent, most particularly in French females—seems not to constitute one of the every day difficulties in English practice. About one grain of opium, or a little more or less, is a usual dose for English patients, and commonly produces not exciting, but soothing effects. It happens, however, in some severe cases that enormous doses administered, are well supported by, and beneficial to the patients. We may say that between fifteen and twenty-five drops of the tincture for a dose, constitute nearly the maximum in German or French practice, with the exception perhaps of delirium tremens, or some excessively painful affections, the individual being accustomed to the use of opiates. Here, during the last three years, several cases have come under my notice, in which much larger doses have been given without causing any unpleasant symptoms. Two of these were painful neuralgic affections, three diarrhœa, and two uterine hœmorrhage, of the severest character; the success in the last named cases was the most striking. One of these seems worthy of being recorded in this place:

One of my colleagues of the Chatham-street school delivered last year an English lady, and a few hours afterwards she was seized with severe uterine hæmorrhage. He ordered in the evening two drachms of laudanum, to be taken at once. As the hæmorrhage continued in a measure to threaten immediate death, in about a quarter of an hour after the first two drachms the lady was advised to take another similar dose—which makes half an ounce within a quarter of an hour. The effect was the most satisfactory. The hæmorrhage ceased almost entirely, and from a state of extreme debility, which she experienced before taking the remedy, her vital powers showed a striking improvement. But, having had to attend at that time a child in the same family, in the night I was called to to see the lady; because some ten or twelve hours after the hæmorrhage had first subsided, another attack of the same character came on. My advice was the same; she took again two drachms of the tincture of opium; and the symptom, accompanied with threatening depression and the stamp of collapse on the face, soon gave way, and did not recur. No narcotism was observed, and the recovery was comparatively speedy. It must be expressly remarked, that this lady is of a delicate constitution, and was never accustomed to take opium before.

In similar cases (of hæmorrhage or acute and exhausting diarrhœa) it is

interesting to see that the depressed, and almost vanishing powers of the nervous system, instead of narcotism, derive from opium an invigorating effect, whilst the hypererethism of the vascular system subsides. With due allowance for the difference of temperament and susceptibility in continental females, I strongly believe, that, as a *decided* indication on the side of disease counterbalances more or less the contraindication (intolerance), if there be any, in the temperament—the use of opium in cases of passive uterine hæmorrhage might be beneficially carried also on the Continent to more powerful doses, than those usually administered there.

On the whole and on an average, I feel convinced by daily observation, that opium is much better supported by natives of this country, than by those of Germany, Italy, and France. Having made from the earliest period of my practice extensive use of this great remedy, I have had frequent conversations on its effects with physicians of Vienna, and of different parts of Germany. Many look upon it with some distrust. My friend Dr. Borchardt, at present established in this town, but having had formerly an extensive practice in Prussia, speaks of its employment there in similar terms. But the question now arises: is it the English climate, national diet, or race—either separately or conjointly—on which this greater tolerance depends?

The climate in its immediate influence, certainly not; nor diet alone, nor both combined. This I am entitled to assert; because from the many opportunities I have had of giving the remedy a full trial amongst foreign residents in this town, it results, that intolerance of it is occasionally met with in the same measure among them here, as abroad. It must be, therefore, due to some peculiarities of the English race, of the English temperament; true, this also is the result of climate and diet, but effected gradually and established organically in the blood, after the lapse of ages, and of a long series of generations.

My experience with numerous English patients at *Pesth* (which was a favourite place of resort of English travellers and residents during a series of years preceding 1848), tends to the same conclusion. In the year 1840 a married English lady, about thirty years of age, was the first instance of the kind that came under my notice. She suffered from periodical pain in the abdomen, and took, under my own inspection, a large tablespoonful of tinct. opii, (i. e. half an ounce) as her usual dose of the remedy under such occurrences. Among English gentlemen whom I saw in Pesth, I have met also with some who have supported uncommonly large doses of morphia.

Which are then the temperaments with which opium agrees best?—Not the pure nervous type, nor the sanguine nervous; as these, instead of being soothed, become restless and sleepless from it, and high doses produce a

narcotic sleep interrupted with convulsive starts, and long-lasting secondary derangement of the system. With the same temperaments also among the English, opium does not agree; only that these are of rarer occurrence here—at least in a full and pure development. A practitioner being transplanted from Manchester to Paris, Vienna, Berlin—not to say to any of the other large towns of the Continent—would find a great difference in this respect, particularly in the female sex.

The following relation between opium and *cherry laurel water* seems worthy of consideration. In my practice I have found very generally that cases of *pure nervous hypererethisia* do not tolerate opium, and are favourably affected by cherry-laurel water. And it is most probably owing to the very great frequency of nervous hypererethisia in connection with the prevalence of pure nervous temperaments, that such extensive use is made of this remedy in Germany, Austria, Hungary, Italy, and so far as I know also in France. *) But cherry laurel water and other hydrocyanic preparations scarcely soothe pain, or only indirectly, when the pain arises from nervous hypererethisia.

The more general tolerance of opium in this country is probably due to the prevalence of the phlegmatic element in the national temperament, with less of the nervous and nervous-bilious.

Mercury is another of the powerful remedies frequently employed by English practitioners, and in a certain measure also by the public, namely in children's slight disorders; in which mothers not seldom administer *grey powder*, or calomel, according to their own judgment. *Blue pill* is another form frequently used without medical advice, as a purgative.

In practice, besides its decided indications—as a *specific*, and as a remedy for *stimulating the functions of the liver and duodenum*—mercury is frequently used under the somewhat ambiguous titles of an "alterative, or "corrector of the abdominal secretions," as an "absorbent," and, finally, as an "antiphlogistic" remedy. All these summed together, however, are not an equivalent for the indications in children's practice—as regards both their multiplicity and obscurity. In this fact there is, however, nothing new

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*) For many years I have been much dissatisfied with the effects of the *aqua laurocerasi*, which formerly in the best pharmaceutic establishments of Vienna and Pesth, and I dare say in other places, was so inconstant in strength, that I arrived occasionally at 100 drops and more for a dose, without any visible result from it. At present this inconvenience can be totally removed, by applying to it the test of *Jodine* for hydrocyanic acid as recommended by Messrs Fordos and Gélis. By this means the strength of the preparation can be regulated, so that a dose of from 20 to 30 drops, will be found efficacious in suitable cases. This I can state from two years experience with a similarly regulated preparation of Mr. *Roberton*, pharmaceutic chemist of this town.

or particular. Some time ago these views prevailed largely over the Continent, with the exception of Italy and France. I have been not only told, but have witnessed myself, some twenty years ago, the very same indications generally followed in practice at Vienna and Pesth; since then, however, this custom (we can scarcely call it conviction) has greatly diminished, and the use of this remedy has gradually become restricted to more special and fewer indications. Also in this country I know some, and there may be many, practitioners, who entertain the same opinion. Undoubtedly, the great popularity of mercury in children's practice was, and partly is still, founded upon the obscurity of their diseases, well matched by the very obscurity of some of the effects attributed to this remedy, and the facility with which children take it and comparatively and apparently bear it. But these are certainly not reasons sufficient for using a remedy which evidently has a powerful effect upon the blood, for purposes attainable by more simple means. Nor are there any grounds either in the English climate, its temperaments, or its diseases, why mercury should enjoy a greater privilege in *this* than in other countries. The climate (moist and cool) seems rather less advantageous for its use than that of continental countries.

For several years past a strong conviction has induced me to dissuade others from any unnecessary prodigality in the use of mercury, and I cannot withhold the expression also on this occasion of my belief, that it ought to be restricted to two purposes: the treatment, namely, of diseases of specific nature, and that of stimulating the functions of the liver and duodenum. And with respect to the latter, at the present, although as yet incipient stage of hæmato-pathology, we must be aware, that in many cases—perhaps in most cases!—when the biliary secretion is deranged, this is but an effect secondary to some change in the chemism of the blood, which in vain we endeavour to remove by mercury. It will require, however, the loud and irresistible voice of a vast, and strict, and well digested experience, to operate this desirable change in children's practice more efficiently and generally. Nothing is more deceptive and more arduous to settle than medical experience. Hence the difficulty of getting over old customs and the employment of favourite remedies.

From the year 1840 to 1849 calomel was subjected by myself to a fair trial as an antiphlogistic (antiplastic), derivative and absorbent remedy in children's diseases, in the hospital of Pesth. I am unable to state at present even an approximate of the number of those cases, but certainly they were at least 1,000. The assistant-physicians Drs. Metzner and Oláh paid a particular, I may say an intense attention to the material and functional changes which took place under the use of calomel—the time and other circumstances affecting these changes—particularly in the following diseases: meningitis, acute and chronic hydrocephalus, pharyngitis

and laryngitis, simple and croupy, fits under the process of dentition, and other disorders. Even so early as 1843 we began occasionally to substitute for calomel, as a purgative in cephalic affections and other acute inflammatory and exudative processes, the infusion of senna with neutral salts; and from 1844 to 1849 this we did most frequently. And upon strict comparison we found: that while the purgative effects of calomel—although given in full doses—appeared on an average between six and twelve hours after the first dose, and sometimes much later with insufficient results, the liquid aperient produced more abundant serous evacuations in between two and four hours on the average. As to the speediness, therefore, of obtaining an efficient derivative effect, certainly calomel merits no preference; with respect to its antiphlogistitic, antiplastic, and other surmised actions, upon strict comparison between cases treated in the one and in the other way, we were unable to make out satisfactory proof in favour of calomel. During several years, the same comparative experiments gave constantly the same results.

But this is not the place to enter into strict and comprehensive enquiries on this subject; it may suffice to say: that in a pretty extensive infantile practice I have never seen any acute hydrocephalic, or inflammatory attack of the brain or throat, checked by those supposed obscure and ambiguous properties, but evidently by the purgative effects of calomel, with the above-mentioned exceptions (when it acted too slowly); nor has it a preferable action as a derivative in difficult dentition, or as a purgative for common cases of abdominal derangement. It is only in some instances of obstinate torpor of the biliary functions, that it proves to be of decided advantage when given conjointly with rhubarb, or jalap.

Thus much, I believe, will one day be proved to evidence—namely, the non-necessity or non-preferability of mercury for most of the above-mentioned indications. With respect to its unfavourable influence upon the system, I willingly grant, that in the majority of cases they are not evident, and in general in children seldom very striking. Yet, the careful observer will not fail to notice in many of those to whom small or mediocre doses have been given frequently, a weak, irritable, and disordered condition of the stomach and intestines, langour, liability to cold, and an otherwise unsteady condition of their health.

I believe that every unprejudiced practitioner, after having given up with perseverance for a year or two the use of mercury in the above-mentioned obscure indications, will arrive at the conviction that there are but few cases in children's practice, in which mercurial preparations might be preferable to other remedies. And as on the other hand it is proved that mercury—although apparently well borne by children—enters into the

blood, and is liable to remain in the system a considerable time,—this possibility along with the non-necessity alluded to, should be sufficient reasons for the restriction of its use to the strictly specified and clear indications, and for cautioning the public against the employment of mercurial preparations for common purposes, and without medical advice.

Cod liver oil has lately become (so far as I am able to judge) very popular in this country; at least in Manchester it is pretty nearly a domestic medicine. Nor is this to be wondered at; because, as will be shown hereafter, feeble and retarded vegetation of children, in which the effects of codliver oil are invaluable, is uncommonly frequent in this town.

After a trial in thousands of cases in my former hospital and private practice at Pesth, and a pretty extensive application of it in my practice in Manchester during the last three years, I feel fully justified in giving decidedly the preference to the *English cod liver* oil over the *brown* and *yellow* kinds commonly used on the Continent. The latter are prepared in Norway, by subjecting the livers to a degree of putrefactive fermentation. The oil thus obtained has an unpleasant smell and an almost rancid taste; and not seldom it irritates the bowels so far as to produce diarrhoea. The English, on the contrary, is obtained simply by exposing the chopped livers of fresh caught cods to vapour (up to 140° Fht.), by which the oil separates from the other organic parts; it is then strained and sold for use. This oil has scarcely any smell, it is light coloured, slightly greenish or even white like pure castor oil; is far less unpleasant to the taste, nor is it irritating to the bowels as the other; and the essential effect—a powerful impulse to the vegetative and nutritive processes—is in both the English and Norwegian perfectly the same. Bilious individuals are unsuited for either kind. As regards the active therapeutic principles of this drug, on which subject so much has been said, I may here state my belief that it is certainly not to *iodine* that the *vegetative impulse* derived from cod liver oil is due. Cod liver oil augments, while iodine reduces, the bulk of the tissues.

I cannot omit mentioning in this place the great popularity which *change of air* enjoys in England, both as a restorative and curative agency. Its beneficial influence is acknowledged everywhere, but nowhere to such a practical extent as in Britain. To leave town for the country once or twice or more frequently every year, constitutes almost one of the standard rules of English life; and especially so in cases of impaired health.

Including in this periodical migration, besides the simple country sojourn, that of visiting *watering places*, and the *sea coast*—certainly, England may be called rich in the hygienic powers of nature. Most

of the efficient springs have both picturesque scenery and a healthy situation. But on the whole, the bountiful gifts of nature in mineral wells, hot and cold saline, sulfurous, chalybeate and others, so richly interspersed over some of the German and Austrian states, are unequalled in any other country. Nor can it be denied, that the more constant, warm and dry summer of the Continent materially assists the beneficial effects of medicinal wells like those of Marienbad, or Carlsbad and others, in abdominal and gouty complaints; and still more that of hot bathing wells in rheumatic and cutaneous affections. *)

But Neptune having on all sides girded this his favoured land, the people of England find in its seas an ample indemnification for the lesser share in the volcanic qualities of springs.

"Going to the sea side"—is eagerly resorted to by the public, upon medical advice, or on their own faith and inclination; too prematurely in some ailments sometimes, at other times for those for which it is less suitably adapted—as everywhere happens indeed in similar curative appliances; but on the whole the effects which I have seen to result from the English sea air, with or without sea bathing, in a host of chronic complaints and their consequences; or in debility founded in a weak condition of the blood or nervous system; in chronic diseases of the lungs; and above all in vegetative weakness of children—is satisfactory to a high degree.

So extensive a coast as that which this great island possesses, presents, of course, great varieties of climate, by which numerous special and individual indications of thearpeutics can be fulfilled.

To enter into detail on this subject exceeds my ability and the purpose of these pages. The *Isle of Wight* possesses a very mild climate; this perhaps, if any place on the English coast, comes near in its effects on tubercular phthisis to the south coast of Italy—I say, *perhaps*, without being enabled to institute a well founded comparison; but as to the abovementioned invigorating influence in a vast number of disorders, I believe, that nothing better can be found than the English sea side at large, with its comparatively cool atmosphere. And this invigorating influence has generally also a soothing effect upon the nervous system.

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*) The importation of the water of some of the *cold* German springs, both natural and artificial (Struve's), so pleasant to the taste and beneficial to the abdominal organs, is increasing every year; moreover a manufactory for this purpose at Brighton produces and distributes annually large quantities of these waters.

SOME OF THE MORAL PROPERTIES CONNECTED WITH TEMPERAMENTS IN RACES, COMPARATIVELY CONSIDERED.

The influence of climate on temperaments, considered upon a large scale, has been indicated in preceding pages. Allusion has been made also to other agencies capable of modifying them, both in individuals and in races. All influences affecting directly or indirectly the brain—through the channels of the intellect and the will, sensibility and feeling—have the power of modifying to a certain extent the moral dispositions and tendencies connected with the physical foundation of temperaments; and it is not paradoxical to suppose, that by long continued exciting or coercing agencies, exercising their influence upon the former, the latter may undergo a corresponding change. To effect such changes where they are required, and to bring the temperament under the control of the will, is among the principal purposes of a good education, and of great importance in health and disease.

The study of individuals, with respect to causes and modifying agencies of temperaments, forms a vast field for investigation, within the compass of every enquirer; the study of nations, as representatives of certain types and modifications of types, furnishes facts not less interesting, although a more arduous task to accomplish.

When we compare with each other the national temperaments alluded to in preceding pages, in respect to their moral properties, it would appear, that in the same way that the English climate (see p. 25) is more at variance with that of Germany, France, and Italy, than the climates of either of the last-named countries are with each other: so the English national temperament offers fewer points of similarity to those of the nations named, than they do each to each respectively. The Englishman, for instance, represents the very contrast to the Italian as regards their relative degrees of passion—referrible to the bilious, nervous-bilious and sanguine-bilious temperaments; and the very reverse of the French as regards their relative amount of sensibility and enthusiasm, referrible to the nervous and sanguine. Both the Italian and French are especially subject to the overpowering influence, the one of passion, the other of nervous excitement; while the Englishman represents the model of self-control. The

German, again, in unison with his vast amount of moral feeling, is endowed with the most expansive nature, whilst the nature of the Englishman is the most concentrated; and, accordingly, when we pursue the same line of argument in regard to properties less directly connected with the general notion of temperaments, we find the German foremost in cosmopolitism, the Englishman in patriotism; in the German we witness the strongest tendency towards a manifestation of the ideal, in the English towards the real.

Among the German nation we meet with the greatest variety, indeed we may say with the universality of temperaments, and with mixtures of all the types; this is a fact of which those who have had the opportunity of personal observation and comparison, will feel convinced, without being able satisfactorily to account for it. The temperament of the Anglo-Saxon race, on the contrary, is apparently the most uniform and simple—yet, there are many contrasts in it, puzzling to the superficial observer.

The phlegmatic element for instance, seems to pervade more generally this nation than others; yet this "phlegma" is sui generis in its type, and peculiarly modified by the admixture of other elements, difficult to define. There is a great deal of active energy under its quiet movements; a great amount of kindly feeling and love under the outward cover of indifference; and more cheerfulness than might be anticipated from the stern and serious countenance, and placid demeanor. This much, however, is certain, that these and any other sentiments, kind, noble, cheerful—have a more lively character in continental nations than here, and the individuals—German, French, Italian, etc.—under like impressions, are evidently more affected by them. Their nervous system is more under the influence of exciting mental agencies, and their bodies more subject to impressions operating upon the nervous system. When we consider these matters on a broad basis, there is no doubt, and we may safely say, that the integrity and harmony of the physical and moral functions of the English is very much less shaken, and less impaired by the same causes than that of continental nations.

Our knowledge of the human system, and of the mode of action of the uncountable external agencies on it, goes not so far as to allow even a probable explanation of the source and causes of many moral dispositions which are directly or indirectly connected with temperaments. To derive from climate and diet, or any external influence the scientific and idealistic tendencies in the one, the love of glory and enthusiasm in the other, or the practical spirit in the third—this it would be in vain to expect. Although there seem to be some probable grounds in the respective climates and the relative brilliance of the sky for the prevalence of excitement and passion on the side of continental nations, and of a cool

and quiet temper in the British; yet, the general existence of energy and self-command in the latter, and the frequency of overpowering nervous hypererethisia among the former, are conditions scarcely satisfactorily explained by these agencies alone, though powerful they be.

Undoubtedly, we must attribute a great part in the origin of national properties to race, age and vicissitudes of races, and to national institutions and customs. With respect to the history of the races in question, philological investigation has not as yet sufficiently enlightened us as to their origin and earliest condition; this much, however, we may say: that the Italian, German, and French, are older and longer settled races than the Anglo-Saxon; the latter being the product of the thorough crossings of different conquering tribes, the last of which has been accomplished scarcely seven centuries ago—a circumstance which, with some show of reason, may be considered as one of the sources of some of its energetic qualities.

On the other hand, the Italian, German, and French, being older as unmixed races, and their cerebral faculties having been operated upon through a longer series of ages without the accession of new blood, there may be some reason from this circumstance, in accounting for the greater prevalence among these nations of excessive nervous sensibility.

A celebrated German historian of the present day ascribes the tendency of his nation towards what he calls the romantic and supernatural, to the primitive life of their forefathers amidst the majestic oak-forests of ancient Germany, impressing their imagination and mind with wonder and admiration. More easily than this we can understand the influence of a dryer climate and brighter sky, in producing in some races more than in others livelier sensations, more excitement in the blood and brain (see p. 14-26), more melodious and powerful voices, to reecho and intensify the feelings, and thus to give rise to excessive sensibility.

National customs, however, may considerably augment the action and effects of such natural dispositions. Song and music, for instance, have received in the above-named countries so extensive an application in public and private life, that we may regard them in the present day as exercising a powerful influence upon their temperaments. Much less extensive is the natural disposition for, and the application and influence of, these accomplishments in English life. For drawing and painting on the contrary, the English nation seems to possess a distinguished disposition and taste; which, although far from being represented, cultivated, and spread among the masses, by so many and so liberal public institutions as exist in some continental states, yet are very much encouraged in the present day by the higher and middle classes of England, who have adopted most extensively the products of this noble art as necessary ornaments of their dwellings. The influence of this art, however, is far less powerful in its

effects upon the feelings than music and song.

Setting aside other kinds of exciting agencies, as influencing the imagination and feelings, and thus increasing the sensibility of the central cerebral organs: when we consider the comparative extent of scientific education, and scientific life, we meet in France with a great number of great and splendidly endowed institutions, which spread their activity and spirit over the whole country. If not equally splendid in its institutions as France, Germany possesses comparatively the largest number of scientific establishments and schools; not centralized, but diffused and flourishing in all parts of the country. And we find in Germany the mode and amount of scientific training carried to an extent unparalleled in history. There is no nation in which science is pursued and loved and cultivated merely for its being science—regardless of its utilitarian relations—to the same extent as in the German; nor are anywhere else the masses of the people, including the fair sex, to such an extent influenced by it. To embrace with eagerness all branches of abstract learning, with the most universalistic tendency, forms almost a distinctive national disposition of the German nation. The latter kind of learning undoubtedly implies the greatest exertion for the higher order of the cerebral faculties.

In spite of great improvements in the mode of teaching the arts and sciences, which in modern times has taken place, it cannot be denied that the central nervous sphere of children and youths in the active course of physical development, are commonly very much exerted in Germany and France, and not seldom over-exerted. Undoubtedly, the sciences and the arts are the greatest glory of mankind; but the medical philosopher may well put the question: whether one and the same race or races may be able to carry such pursuits beyond a certain limit, and over a contrabalancing proportion, of material and practical activities, without producing a too great preponderance of the higher nervous centres over the physical powers, and the energy of mind?

Very different at any rate is the condition of the English nation in this respect. We have noticed in the course of these remarks a greater firmness of the nervous system on its side—a calm and equable temperament and steady vital actions. Besides its native climate, and its more recent origin as a settled race, the character of the national institutions and customs of the English nation must contribute no little to the same result.

The English national life is eminently practical and active. There is in this country little excitement for the mind, imagination, and senses, in comparison with the Continent. Artistic, literary, and scientific institutions are fewer in number, and these branches of education being considerably expensive here, this circumstance is certainly one of the causes of their being limited within a narrower compass. Scientific professions in

Britain receive comparatively little support or encouragement, and seldom reward from the state; and their public position is altogether not nearly so attractive as in Germany and France. To this general rule the medical profession, in spite of its practical importance to humanity, forms no exception.

Those men who have rendered themselves conspicuous and useful to humanity in the various branches of science in this country, have realized this position by opposing great firmness of purpose and tenacity of resolution to existing difficulties, without the assistance of public emoluments and honours, such as are the supports of study, and awards of scientific merit on the Continent. This proves no common disposition for the cultivation of serious sciences in this nation; but it renders a sufficient reason at the same time for the lesser extent of scientific pursuits, whilst the flourishing condition of a vast industry and trade attracts and splendidly rewards the activity of immense numbers of all classes. The scientific activity of London, of Edinburgh—a town celebrated for its literary spirit—and of some other towns of a scientific character, is very much restrained in its influence upon the national life by the materially productive activity and spirit of London and Manchester, Liverpool and Glasgow, and the vast number of minor emporiums of industry and commerce.

On the one hand the decidedly positive and serious character of Calvinism; on the other the political and social institutions of this country—the firmly established individual freedom, the respectful relation of the salaried agents of Government, of the judge, the soldier, and the policeman, towards every individual of every rank—seem to contribute also to the firmness, manly self-consciousness and self-controling energy of the British character. This the physician has opportunity of witnessing in the most trying emergencies of family life, and to notice not seldom its beneficial effects upon both body and mind; where less command over the temperament generally doubles the sufferings and augments the difficulties of treatment.

If therefore, in conclusion, the nervous hypererethisia of temperaments forms in the present condition of European nations a material element in the sphere of disordered functions and impaired health, there is an incontestable advantage in the quiet, energetic mould of temperament, and self-command, as represented in the English nation. This is but a just compensation for the absence of advantages which other nations enjoy. Because, undoubtedly, the climate of this country, the public institutions and customs altogether, dispose less to lively temperaments and conditions of a high pitch of enjoyment and happiness; but there is in compensation less chance for overpowering depression and misery, disturbing the harmony of the moral and physical functions.

All these remarks, as was already mentioned, refer mainly to those social ranks, among which numerous conditions are at work, capable of developing and modifying temperaments. In the lower ranks of society of all nations the temperament is more uniform, more in the natural channel of its origin as determined by climate and race. A comparison also in this respect between the continental races mentioned and the English, leads to the conclusion: that there are more lively feelings, nervous excitability, and bilious outbursts among the former, and a more decided appearance of the phlegmatic temperament with energy and self-control among the latter. The "turnout" movements which lately have occurred among the working classes of this country, have testified to the prevalence of these qualities in an admirable degree. Among the dispositions and excesses of sanguine, sanguine-nervous, and sanguine-bilious temperaments, the most salient are those of sensuality, with intense feelings of love and hatred; among the propensities of the phlegmatic temperament on the contrary that for the use of ardent spirits undoubtedly stands preeminent. The difference between the English and continental populace, more particularly between the French and English, in this respect is most striking; and I feel fully persuaded from personal comparison, that all the excesses in sensuality with which the continental masses are chargeable, are far from producing that amount of physical and moral dilapidation, disorder, destruction of family happiness, and criminal excesses, that intoxication does among the lower ranks of the British. There is also this difference, that the sensual propensities alluded to decrease with the progress of age, whilst the passion for spirits generally increases. Trustworthy observers have noticed, however, a progressive improvement in England in this respect; which may rightly be attributed to the gradual influence of education and refinement in the lower classes of this nation; but this influence is far from having reached as yet so far as to satisfy the wishes of those who devote their attention to the improvement of the moral condition of the lower ranks. To this accedes the great want of exhilarating and animating amusements, by which the dull and stupefying pleasure of intoxicating drinks might be counteracted. Indeed, physiologically and psychologically considered, no class of men seem more in want of such kinds of amusements than the factory-workmen; the hard and utterly monotonous nature of their employment does certainly point at such a necessity. Certain it is, that although they are much better paid than their continental fellow-labourers, their aspect makes a less favourable impression; the quiet and serious national temperament having assumed in this class frequently a somewhat dull or gloomy complexion.

Still more than in the uneducated ranks of nations, the original type of temperament, as referrible to climate and race, presents itself in the age of

infancy. To judge rightly of this it is necessary to observe infants principally of the tenderest age—say under two years of age; because as soon as their intellect begins to develope itself, the example and educational influence of their parents acquire more or less of an assimilating power over their minds and actions. I have had opportunities enough of strictly observing English infants and children in health and disease, and of comparing their temperaments with those of foreign children. It is certain, that in the earliest periods of life the difference between the temperaments of the races in question is not so salient as at a more advanced age. I have seen many English infants as lively and passionate in their infantile pursuits as continental children; yet, in the majority they are more quiet, and when they arrive beyond the first years of childhood, they not seldom support the pains and sufferings arising from disease with admirable fortitude and composure. A little later in life, the quietness of their temperament becomes more conspicuous, and exceeds very much that of children of other races, with some exceptions, of course. In many of them—in Manchester at least—during the first two years of life the processes of organic development are somewhat behind the normal mark; above the fourth or fifth year, however, English children commonly have more the appearance of a strong and firm constitution, I believe, than most others; but a less degree of quickness and of muscular agility then becomes gradually more perceptible in them.

On the whole, there is very little appearante in English children of the physical and moral marks of the bilious temperament, which as early as at the age of two years are not seldom distinctly observed in children on the Continent. There is more appearance among them, sometimes at the earliest stage of infancy, of the nervous temperament. This indeed may increase here as well as in other nations in the course of generations; yet, it is probable that as long as the present active character of English life shall continue to prevail, there will be less occasion for its excessive development, than on the Continent. It must be observed also, that, the English system of education, being far less strict in discipline than that of continental countries, it is already in the school and nursery that the English boy, less strictly controlled by his superiors, is led to govern and control himself, in preparation for his future manly independence and energy of character. When we compare with this system the French, where in private as well as public educational establishments—all of them being under strict governmental influence—children and youths are kept in a sort of military dependence and discipline, the difference is most striking. This physiological and moral advantage of the English school system does not exclude, of course, the desirability of great improvements in matters of scientific and artistic public instruction. There is so much already accom-

plished and in course of being done in this country towards the improvement of material interests and activities; and so much, on the other hand, for religious observance, which undoubtedly forms the great ground-work of English life and character; there is so seldom cheerfulness in the native sky, and so much serious monotony in the spirit peculiar to British industrial towns: that it would scarcely be possible to do too much for the recreation of the senses, exhilaration of the imaginative powers, and the encouragement of artistic and scientific tendencies of the mind.

Every nation, however, adopts its own course, the one in one, the other in another direction in preference, and individual voices may scarcely be able to alter that course. To parents however the physician may conveniently recommend everywhere the importance of such a course of education, by which the higher faculties of the brain—intellect and feeling—may not be led into too early development. Not a few parents yield to such tendencies when they exist in their children, and feel proud of their precocious effects, unaware of the frequent consequences of them—nervous hypererethisia, namely, with impoverishment and impaired power of the blood. And these faults and consequences are very much prevalent on the Continent.

The robust or muscular, the sanguine and phlegmatic types, are undoubtedly the least subject to loss of balance deeply affecting the system, be it from moral or physical causes. The bilious and nervous, on the contrary, have the reverse tendency; and it would be difficult to say which of these in preference to the other. The influence of climate in the production and increase of the bilious temperament is evident; it is promoted by heat. The material representative of this temperament, namely, the preponderating activity of the liver and biliary functions—is more tangible than that of others. The bilious temperament causes most violent and dangerous material disorders, and most vehement moral outbursts, which it is difficult to manage by mere moral influence; yielding, however, to a certain extent under the employment of appropriate physical measures. The origin of the nervous temperament on the contrary, is not clearly explicable by climatic influence; its principal sources are agencies of an immaterial kind, acting upon the nervous system; it causes no dangerous material disease, but vehement and not seldom dangerous immaterial disorders—immaterial at least in our present limited state of knowledge. When highly developed it is very unmanageable by physical means, and not easily yielding to moral influences. The full type of the bilious not seldom, and of the nervous most frequently, are the sources of great difficulties in continental practice, which in England certainly are not felt to the same extent.

It is not likely that the bilious type will ever spread and increase to a

great intensity in Britain; the climate of this country is not hot enough for that; and by increasing dietetic care those moderate degrees of the bilious tendency which are actually observed here, may even become reduced within narrower limits, (see p. 57-59); the progress and spread, on the contrary, of the nervous temperament is to a great extent dependent upon those conditions and changes in national and individual life, which may augment here as well as in other countries.

When we consider the manifold influences of all the agencies mentioned in preceding pages upon the mould of temperaments—climate and diet stand paramount in imparting the primitive type of race, or in modifying it by consecutive migrations and vicissitudes in new countries; next in importance is the educational influence at large, effected by institutions and customs which vary according to different stages of civilization and national circumstances.

Considering the multiplicity of modifying agencies upon the temperament of races, it is no wonder that we find a difference between one race and another, although they live under the same climate: thus the Scotch people seem to possess those qualities which distinguish the British from continental nations, in the highest degree; whilst the Irish, perhaps by reason of their type as a race, and probably also because of their proper religious institutions and historical course, are found to be at some variance with the rest of the British population, as regards their temperament. According to information I have received from several foreigners, who have repeatedly visited Ireland, the sensibility, liveliness, and quickness of the Irish, and their national customs, though far from being of the same degree and form as in the continental nations mentioned, yet present a contradistinctive feature when compared with the English or Scotch. My friend Dr. Noble, in one of his clever lectures on psychology recently delivered at the Chatham Street School of Medicine in this town, says: "Certain nations are characterized more than others by emotional sensibility—the Irish, for example, more than the Scotch."

The Hungarian nation, deriving originally from the North of Asia—from whence many a gallant and noble tribe, perhaps the Scandinavian and Teutonic themselves, seem to have immigrated in this part of the Globe—indebted to a great extent for its progress in sciences and industry to the literary and civilizing influence of Germany, but being divided as regards religious institutions between Romanism, Lutheran and Calvinist Protestantism, presents characteristic differences between one district or community and another, according to the prevalence of the one or the other form of religion, so far as to appear almost endowed with different temperaments. All who know the country agree in this: that the populations of Calvinist towns and villages present a salient mark of a stern,

serious, and self-commanding character, in contradistinction to others.

Yet the Hungarian Calvinist has a much livelier temperament than the English, his blood being more liable to ebullition and inflammation; and this certainly results from the sky of Hungary being brighter than that of England. And the stern and serious character, and quiet temperament of the Anglo-saxon race, transplanted to the United States, will scarcely escape from the modifying influence of the American sun and atmosphere, increasing who knows to what extent with the lapse of ages.

THE SANITARY CONDITION OF FOREIGNERS IN ENGLAND.

It is generally admitted that foreigners sojourning in a strange country are more liable to disease, and are more severely affected by it, than those who have been born and brought up under the influence of its climate, diet, and social customs. Their complaints, also, not seldom assume peculiar modifications and forms resulting from their proper national temperament. Both the frequency and peculiarity of disease obtains in a higher measure in ratio of the greater difference which exists between one country and another as regards climate, diet, customs, and national temperaments. This I have had ample opportunity of noticing in Hungary; I shall not occupy myself, however, in recounting the particulars of those observations, but shall limit my remarks to some salient points relating to the sanitary condition of the foreigner in England, the result of actual observation in Manchester—a town containing an immense foreign population, having a most active intercourse with foreign residents of other towns of this Empire, and attracting visitors from all parts of the Continent.

Manchester, although differing as regards its climate and sanitary condition in some measure from most other English towns—representing, in this respect neither the best condition as compared with agricultural towns, nor yet the worst, as compared with those of a purely manufacturing character—when considered relatively to the Continent, is perhaps as well if not better adapted than any other for establishing comparative observations on the subject in question.

The general characteristics of the English climate and diet have been briefly exposed in preceding pages, The continental traveller, when he reaches this great island, finds himself placed under the operation of agencies, both physical and moral, in many respects more at variance with those of his native country than any which he has or could have experienced in most parts of the Continent. In the first place, Britain has a more limited range between its extremes of heat and cold, more constant moisture, and a more gloomy sky, than any of the continental countries

mentioned; then, its general diet is more substantial and stimulating; its national customs of a more serious and matter-of-fact character.

In any country where a foreigner may sojourn, he is exposed of course to the influence of all these varying agencies. The first impression he experiences, however, is generally that produced by climatic influences—the condition of the atmosphere and sky, which impress at once his senses and imagination—his bodily and mental faculties. The brilliancy or obscurity of the sun and sky, the dry or damp atmosphere, have their corresponding reflex action on the physical and moral temperament of the individual; thence generally arises in him a certain predisposition, which variously reacts upon the consecutive influence of other agencies.

The influence of a climate, however, in its twofold tendency—upon mental and physical systems—is far from being so conditioned, as to promote or deteriorate the health of the latter in the same measure in which it affects pleasantly or unpleasantly the former. On the contrary, it would appear, that on the one hand, in many continental countries we have the most agreeable climatic impressions upon the eyes, the brain, the mind, coupled with more serious effects upon the blood and organs; and on the other hand, in England we have the most unpleasant climatic impressions upon the central nervous organs, with a much safer condition for the body. The different effects of different kinds of soil—sandy or clayish, dry or marshy—though of high importance in sanitary respects, are less distinctly felt than the properties of the atmosphere. To enter into details on this subject, however, would far exceed the limits of our present purpose.

Should I avail myself of my recollections relative to Englishmen whom I had occasion to meet with and to prescribe for at Pesth during sixteen years of practise in that city—partly temporary residents in that place, partly migratory visitors, many of whom had previously experienced the effects of a sojourn of longer or shorter duration in various towns of the Continent—and were I to compare the result of those recollections with my present experience among the numerous foreigners in Manchester, partly residents in this town, partly visitors, and such as are established in various parts of this Kingdom, I should not hesitate to assert: that the sanitary condition of the foreigner in England, as regards dangerous forms of acute disease, as for instance ague, typhus, dysentery, etc., is very much better than that of the English on the Continent. From this general statement must be excepted some individual dispositions and certain morbid tendencies. But the relation is the reverse in chronic affections: for, many English patients labouring under severe forms of rheumatism, diseases of the bronchi and lungs, or disorders of the nervous system, are relieved by a journey or sojourn on the Continent; and again-

many foreigners with a feeble skin, debility in the chest or abdomen, or a decidedly delicate nervous habit, suffer from the climate or diet of England, who have been in good health on the Continent. But, bearing in mind the fact alluded to in preceeding pages, that many fevers and inflammations have a more vehement and dangerous character in continental countries than *here*, we are led to notice a remarkable contrast, which is this: that while the Englishman on the Continent, generally satisfied and not seldom very much pleased with the climate, is notwithstanding exposed to more acute and serious disorders than at home, the continental visitor in England is frequently heard to complain of the climate, although experience proves, that he has a more favourable chance as regards serious diseases in this island, than he had in his native country. This does not apply, however to chronic complaints, and those of minor importance.

There is some difference to be noticed, as regards derangement of health, between those foreigners who only pay short visits to this country, and those who stay here for long periods, or are established as permanent residents.

With respect to the former, when we examine the complaints which are most generally met with in *foreign visitors* in England, we find that generally they are of a more unpleasant than dangerous nature. Some such complaints may be regarded as merely the moral reflex of the gloomy sky, or damp and foggy atmosphere—according to the season—when such weather lasts for some time, affecting through the visual organs their imaginative and mental faculties rather, than affecting through the channel of their skin the condition of internal organs. Numbers of foreign visitors in this country with whom I have conversed on this subject have had the idea that this climate *must* be very unhealthy, evidently only because it *looks* unpleasant and frequently feels so.

In many instances, however, they are under the impression of protracted chilliness, or lassitude, both arising from dampness; the former sensation at a lower, the latter at a higher temperature—sensations seldom leading to decided disease, but frequently enhanced and aggravated by the mind of the individual. Of this kind of half-physical and half-moral complaint I happen to have seen several striking instances in highly sensible individuals. It is observed also in delicate English constitutions, but not to the same extent as in foreigners. Among these, again, there is some difference according to different races.

Italians are not very numerous in this country. Of those with whom I have been in contact in London and Manchester (some thirty) many have complained in the abovementioned way; but more in a moral than physical sense.

The number of the French with whom I happen to have had some

intercourse in London and in this town, scarcely exceeds that of the Italians. Two young French females have to suffer very much from the physico-moral impression alluded to; one gentleman and his wife have left the country after a short sojourn in consequence of having constantly suffered, the former from headache, the latter from an indescribable unpleasant sensation in the whole system—a form of nervous disorder, of which some further mention shall be made hereafter. On the whole I should say, the French are more intolerant and complaining of the English atmosphere than others; but no serious forms of disease have come under my notice among them.

The number of German visitors, on the contrary, here, in London, and some other towns, is very considerable. And I dare venture to say, they are comparatively less affected in the abovementioned way, than the natives of other countries; at least fewer of them, proportionally to their number, complain. It would appear, as though the patient and philosophical nature of the German assists him in overcoming those impressions and influences, physical and moral, more easily than others do.

We must bear in mind, however, that those foreigners who visit this country are generally of a vigorous age, of healthy, energetic and enterprising dispositions, having their mind intensely engaged in business; under opposite circumstances, that is to say, if large numbers of Germans, French or Italians, of all ranks and conditions promiscuously were obliged to remain here without active occupation, the case might be different: that moral influence as well as the physical agency of the climate and sky would probably show itself then more saliently and frequently. Indeed, the English climate and atmosphere may well be called a test for foreigners as regards the powers of their body and mind. The Englishman has become hardened and strong by these agencies through the lapse of generations, and experiences much less their influence. He feels however cheered and animated when his native sky assumes—as it happened this year (in April 1854) in an uncommon measure—a pure and bright aspect; which is a sufficient proof, that if such impressions were more frequent and lasting, his temperament might undergo a change, and become more susceptible of the reverse condition.

With regard to diseases of a more decided character, to which the foreign visitor may be considered as being more especially liable, according to my personal observation in this town the rheumatic, bilious and catarrhal are the most common; the first named affection generally with little or no fever; the bilious, in the form of costiveness with giddiness or headache, or in the form of diarrhœa with or without gastric fever, seldomer to the degree of severe dysentery.

Generally both morbid processes, the rheumatic and bilious, in the form under which I have had the opportunity of observing them, are slow, and

easily admit of redress, or of being checked. The first begins with the abovementioned constant sensation of chilliness throughout the system, with or without local symptoms; and were such individuals to remain for a day or two in bed, they would soon be well again; and covering the whole body with a good flannel dress, they might again expose themselves to the weather with little or no danger. Biliousness, when it arises from damp weather at a temperature of from 55 to 70 Fht., characterised with an increase of biliary secretion, at its first symptoms scarcely requires other measures than the before-mentioned, with some castor oil and a more rigorous diet. I have seen only a few cases where the emetic was requisite.

In spite of my numerous connections with the foreign public of Manchester, and of the considerable number of foreign visitors from all parts of the world with whom this greatest emporium of industry constantly abounds, in three years and a half of practise I have been consulted only by thirty-seven *travellers* of different nations, living during their short sojourn in hotels. The complaints of these patients, with a few exceptions, belong to the abovementioned forms of disease; among which only seven cases were so severe as to require several days confinement in bed, of which three were rheumatic fever, and four acute bilious affections, three of which having occurred between August and October in 1852 and 1853, during a damp and close condition of the atmosphere. The remainder were slighter degrees of the same complaints; but in some individuals so obstinate, namely rheumatism, that it was only possible to mitigate its symptoms, but not to root it out entirely as long as these individuals remained in this country. Bronchial affections were also very troublesome in some of them.

With respect to the bilious disorders alluded to, it must be observed, that some cases were undoubtedly of atmospheric origin, namely the result of lessened or suppressed activity of the skin (see p. p. 57, 58); in others, perhaps in the larger number, the bilions symptoms probably arose from, or were aggravated at least by, erroneous diet; the quality of English diet having been too substantial or too stimulating for such individual temperaments. And in others again, similar symptoms were caused merely by a kind of diet to which they had been unaccustomed, and which proved to be unsuitable for them. It is certain, that the foreign traveller finds some difficulty in obtaining that light kind of food to which he may have been previously accustomed, and which to some is indeed a constitutional necessity; whilst in the hotels of any continental country it is easily obtained. It must be remarked too, that whilst the English traveller on the Continent generally endeavours to realize as much as possible his customary dietetic habits, the continental visitor in England more readily

submits to the general custom of English hotels.

Of bronchial inflammations I remember having seen two severe cases in young gentlemen, who assured me that they had never suffered from this affection before. In some others, who had been occasionally subject to bronchitis on the Continent, the disease was sure to reappear as soon as they arrived in England; the more certainly so in those having a tuberculous and consumptive tendency of the lungs. Such subjects, when they happen to come to this country during the damp and foggy months of autumn, bronchial irritation and cough, and a sense of oppression in the chest, acquire a degree of severity which they have never before experienced. I do not remember to have seen, as yet, in foreign visitors in this town inflammatory and rapidly destructive outbursts of tuberculosis, of so over-acute and vehement course as are frequently observed in Italy, France, Germany, and as I have seen myself numerous cases at Vienna and Pesth—of the "galopping" phthisis—in some instances destructive to life a fortnight after its onset.

The *foreign resident* is in a position different from that of the visitor. He has become acclimatised; is more familiar with the habits and customs of the country, and has learnt to accomodate their influence to his mental and bodily requirements; he is able to realize, should it be necessary, to a great extent his former habits, and, in case of illness, to check its progress by the comforts of domestic life. This, undoubtedly, is an advantage he has over the migratory visitor; but, on the other hand, if his temperament disagree with the climate of the country, he becomes afflicted (by its protracted influence) with some forms and degrees of chronic disorder, from which visitors, owing to the shortness of their sojourn, necessarily remain free.

Among the foreign residents in this and other towns of which I have some knowledge, the Italians, French and Greeks, and some others, constitute altogether but an insignificant minority in comparison with the German. Besides numbers of single men employed in commercial establishments, there are hundreds of families of Germans residing in Manchester, and not a few in other English towns. These German families generally speaking hold a distinguished social position, and are in possession of such wealth as enables them to adopt a mode of diet in accordance with their previous habits or temperaments, if they like; or to follow the English plan, which most of them do, with various modifications; or in many instances without modification at all; and the great majority enjoy excellent health.

So far as I am able to institute a comparison it would appear, that the foreign residents in this town—and, according to the smaller extent of my experience and information received, in the metropolis and other towns—

are not more subject to serious diseases than the natives of England; and as the English climate is less productive of this kind of ailments than the climate of most continental countries, it is but natural to suppose, that the generality of them are even less subject to similar dangers here than they might be in their own countries. Indeed, I cannot refrain from expressing my astonishment at the extremely rare occurrence of dangerous and fatal acute cases, of atmospheric origin, among the foreign population in Manchester, although we may estimate it at present at not less than three to four thousand. With the exclusion of children, there have been to my knowledge only five such cases (fevers and inflammations) during the last three years. Among these the one was genuine cerebral typhus, carrying off an esteemed friend of mine—an uncommonly rare form of fever among the natives in this town; nor have I ever heard during the last three years of a similar instance among the foreign population.

The forms of disease to which the foreign residents in England are more subject than they would be in their native countries, are partly those which have been mentioned in a preceding page as affecting foreign visitors (migratory travellers), namely rheumatic, bilious, and bronchitic-catarrhal affections—diseases to which the natives of this country are also very much exposed. The obstinacy of rheumatism has been repeatedly mentioned. It frequently fixes itself in the larynx or bronchi, in the diaphragm or stomach, and by a protracted sojourn in the country becomes an almost constant companion of many a foreign resident—unless a long continental summer frees him from it. Besides these there are some other complaints, to which the resident is liable only after a longer sojourn in this country. Among these I may name *abdominal and gouty complaints*, and *nervous disorders* principally.

Many a foreigner after indulging awhile in the substantial English diet, experiences a slow and irregular action of his bowels, which may be followed in the lapse of time by some unpleasant sensation in the head, or biliary irritation. If, instead of a suitable change in his diet, he resorts, as frequently happens, to the use of pills, such an assistance may soon become an essential and increasing necessity to him, without the desired improvement of his functions. It needs scarcely to be observed, that those who have a tendency to gout, are almost sure to be afflicted with its symptoms earlier and more severely here than they might have been on the Continent.

There are also certain forms of nervousness which do not afflict the migratory visitor, because their development requires an exposure of longer duration; nor do they occur in any striking manner in the natives, because the nervous temperament is not so highly developed among them. These forms of nervous disorder may for the most part be traced to the influence of the English climate and atmosphere.

Foreigners of highly impressionable nervous habits living here constantly, are undoubtedly in a twofold unfavourable condition as regards their usual complaints of chilliness, headache and languor; because, while stronger habits under the influence of this climate feel inclined to take more stimulants, and are indeed often benefited by their use—individuals with a delicate constitution have generally little to expect from a strong and stimulating diet, except an increase of their disorder. Nor is their successful treatment an easy task to accomplish for the physician, inasmuch as these temperaments are more than any others intolerant of drugs.

I have in my recollection about ten cases of this description, which were more severe and obstinate than others, and were characterized, in males as well as in females, in the following way. They complained of general uneasiness throughout the system, with great languor, particularly in the morning, when they rose from bed; in some females this amounted to a degree of faintness, or slight trembling of the hands, with tendency to palpitation. All complained of giddiness or some similar sensation in the head, or of occasional constriction around the forehead, without decided pain. The skin in most of these subjects was a little dryer than usual, the hand frequently, and the feet almost constantly, were cold, with the exception of short periods when the weather was warm and dry. The pulse was very little altered, nor the appetite much impaired, and a moderate and light dinner was generally well digested; the bowels were rather slow; the urine was abundant and light coloured. The spirits were considerably depressed; all attributed their illness to the influence of the English climate. Some of them felt better in the afternoon and evening, or they felt well altogether for days and weeks; but others complained more or less constantly. In the most delicate of these constitutions, namely, in two young females, towards evening slight shivering was perceptible, with a nervous pulse and abundant pale urine, not followed by febrile reaction. Neuralgia was an occasional complication.

Such patients came generally under my notice in autumn and spring, during cold damp weather, under which conditions the symptoms exhibited their severest form—and this would admit of some explanation; but in the present year I have been consulted by a lady residing in a neighbouring town, and by a gentleman of this town, in both of whom the complaint has been considerably aggravated by the dry eastwinds of March and April as well as it was by the dampness of November. It is therefore difficult to distinguish exactly *what* property or properties of the English climate disagreed with these temperaments; but that really it *is* the atmosphere which causes such disorders, cannot be doubted; because most of these individuals had been while they were suffering in that way repeatedly on the Continent, where constantly and very speedily the com-

plaint disappeared; and again, when they returned to England, in some of them in a few weeks, in others only after a longer sojourn gradually and slowly, the complaint reappeared.

Numbers of foreigners of both sexes when they are affected in any similar way, but in a more moderate degree, are benefited by change of air in England; and the same may be said of certain anologous forms of nervousness, when developed in Englishmen; but among the abovementioned ten cases there are four ladies and three gentlemen, who have tried this plan repeatedly, but in vain.

This form of nervous disorder, therefore, although it does not present any new or peculiar symptom of which we could strictly state that it is not observed in other countries, or among the natives of England; yet, when considered in its totality, its relative degree, and obstinacy, is of some interest, so far as it represents a nervous affection caused by the English climate in, and considerably aggravated by, the oversensible nervous temperaments of foreign races.

At the present stage of knowledge it is difficult to say if such complaints consist in overexcitement or depression, in general or local accumulation or deficiency, of the nervous power. Nor are we able to illustrate this question by remedial experience, inasmuch as with such patients decided tonics and stimulants as well as debilitants and sedatives generally disagree; some of them are relieved only by the lightest kind of aromatic vegetable preparations; others, on the contrary, by the lightest vegetable sedatives—the aqua laurocerasi for instance (see p. 84). Some similar complaints, but modified in certain respects by a rheumatic complication, with periodical accessions of neuralgia, have been benefited by efficient doses of quinine. There are some gentlemen as well as ladies in Manchester and in another English town, who by frequent recourse to this remedy have made their sojourn in this country, if not pleasant, at least tolerable, which formerly was distressingly inconvenient.

If great care be taken in reference to diet, with special regard to the function of the liver, and the individual be free from the marks of the bilious temperament, such a plan may be pursued for years with benefit in some such constitutions, while others—we may say most of them—do not support the slightest attempt of the kind. Others again, with an anæmic condition of the blood, have derived benefit from an aromatic solution of iron. Another modification of nervousness is that, in which by the continued use of too strong a kind of food and drink the blood becomes overstimulated for the individual temperament—superinducing a morbidly nervous condition of a secondary kind; or the nervous disorder may have its origin in some sort of bilious irritation. In both instances a methodical change of diet generally relieves or entirely removes the complaint.

But such cases as the preceding, complicated with rheumatism, anæmia, or other forms of disease, do not represent in its purity that highly-pronounced nervous disorder described above, and, of which the sufferers can scarcely be entirely freed by medicinal treatment alone —absence for a time from the country being generally found necessary to accomplish a complete cure.

The question therefore arises: what quality of climate and of atmosphere is that by which the nervous system of foreigners in this country becomes so utterly deranged? In Pesth I have observed complaints of a similar description in nervous females during the moist seasons of autumn and spring; but never so protracted or so severe, and the least so in males. In this country also, damp weather most conspicuously afflicts such constitutions; but, as was already mentioned, there are cases of nervousness among the foreign residents, observed in both sexes, which only abate periodically, but scarcely cease entirely, throughout the year. The pure nervous nature of such complaints becomes evinced by their long duration, without engendering material or organic affections. I strongly believe, that besides the distinctive moisture of the English atmosphere, it must possess a peculiar electric condition, very much at variance with that of continental countries; and there must be a difference too in the relation (action and reaction) between the internal electricity of the human body and the electricity of the atmosphere, in this country and the Continent. It has been observed already in a preceding page (p. 27), that thunder-storms in England are not preceded by so great an amount of electric tension as on the Continent; nor is the outburst of a thunder-storm so severe and lasting, nor followed by so striking a sensation of lightness in the nervous system, as on the Continent. Is it the prevailing moisture of the English atmosphere, which prevents great accumulations of electricity? It is now nearly four years, since my personal observation and experience have been brought to bear on the climate of this country, and during this length of time there has occurred but one thunder-storm (in the summer of 1852), which approached in intensity that which is commonly noticed in this phenomenon in continental countries. On the other hand it happens (as for instance in January, February, March and April of the present year), that thunder-weather occurs even in winter and spring—but so short and slight and peculiar in sound, and at so low a temperature, as to be peculiar, I should suppose, to this island, inasmuch as I have never before witnessed a like phenomenon in any European country where I have at any time sojourned. On the Continent, only in summer and for short periods there is an accumulation of electricity, which concentrates itself to an overpowering degree, then explodes vehemently, and an enlivening lightness of the atmosphere soon follows; here throughout the year there are long periods of close atmosphere, and there seldom occur so

decided explosions, by which a high and lasting degree of lightness is produced. To my knowledge, this difference alluded to has not been sufficiently noticed by travellers, or those who could have instituted a comparison, although certainly it must have an important influence upon the human system, namely, upon the nervous centres, and the biliary functions.

All things well considered, it is certain that among the temperaments of foreigners, the oversensitive nervous is not well suited for this country; and the least so if it be connected with a tender and delicate skin. Some individuals endowed with the bilious temperament are also easily deranged by the English climate, as well as diet; others of the same type, on the contrary, are decidedly benefited by this very climate, if an appropriate diet be carefully selected and rigidly adhered to. In explanation of this statement it may be well to remember, that under the name of "biliousness" we comprise in practice two different conditions; in one of these there is what may be called "overcarbonisation" of the blood, consequently accumulation of biliary elements, but insufficient secretion and excretion of bile; in another set there is a too abundant secretion and excretion of this liquid going on. In the former the habit of the foreigner generally becomes benefited by the English climate; the function of the liver, and with this the appetite, digestion and evacuations are improved, in ratio, as it would appear, to the lessened activity of the skin. This improvement of health and strength (owing to an increased activity of the liver) I have had opportunities of noticing in many continental gentlemen, and in some Americans of the northern states of the Union, who, before their sojourn in England, suffered much from costiveness, want of appetite and irritable temper. Those habits, on the contrary, in which there is a natural tendency to abundant biliary secretion, are liable in this country to undue accumulation of bile, which they must try to counteract by flannel dress and suitable mode of diet.

Among morbid dispositions, as has been mentioned, the rheumatic and gouty are both for climatic and dietetic reasons more liable to outbreaks of disease here, than on the Continent. Moreover, as there is abundant cause in this climate for bronchial irritation, those who have such a predisposition, or who have latent tubercles in the lungs, are troubled with cough or bronchitis almost throughout all seasons, whilst in their native country they may have had longer free intervals, say from May to October. Such subjects should clothe their feet much warmer, and wear flannel, immediately on their arrival, and leave it off as soon as convenient after their removal. The difference between the course of tuberculosis in foreigners and natives, in Manchester, is very remarkable. I must say, however, I have met only with a few tuberculous subjects among foreigners.

With the exception of one of them, the disease, materially considered, as regards the amount of tuberculous deposits, seemed to be of a slight degree; but, by continually renewed bronchial irritation in this atmosphere, the cough was distressingly severe, so much so that these individuals felt the necessity of leaving the country.

The slow and mild progress, and not unfrequent tendency towards recovery of this destructive disease among the English population of this town, has been mentioned already in another place, and I can merely add, that during the last half year two additional cases have come under my notice, with a most favourable issue. One of these cases occurred in a young lady about twenty-five years of age, the other in a gentleman above thirty. I have had opportunities of frequently examining the chest of both individuals in former years, when in each of the patients, auscultation as well as the nature of the sputa, with hectic fever and emaciation, shewed that there were caverns present in one of the lungs, and scattered tuberculous deposits most probably in both. At present their recovery seems to be quite perfect. I know myself of several other instances of the kind, and have been informed of many others by my colleagues.—How is it then, it may be asked, that in foreigners the same disease runs a less favourable course than in natives in the same climate? The reason, I believe, is the difference of their respective temperaments. The English climate, although the probable source of the quiet and less inflammatory temperament of the natives, cannot alter at once the inflammatory tendency in some foreign habits, nor the greater irritability in their system, owing to which they suffer more severely in case of bronchial irritation than the natives do: consequently the infiltrated tissue of the lungs of the latter is more disturbed, and more liable to inflammation and suppuration, than if the same morbid alteration existed in an Englishman.

In conclusion, although not a few foreigners have to apprehend the climate and diet of this country in some troublesome disorders, in compensation they have very little to fear from acute and serious affections; and numbers of them feel stronger and healthier since living here.

The cautions which the foreigner of a delicate constitution should not neglect in this country to observe are principally twofold: in the first place, he should at once adopt the flannel dress, woollen stockings, and warm shoes and boots;—secondly, he ought not to adopt indiscriminately for a protracted period that kind of food and drink which may be offered to him in hotels; but endeavour to procure what his system requires, and avoid what experience taught him he must avoid. Strong constitutions, and what we might call neutral temperaments, or robust sanguine, may safely adopt everywhere the diet they find in use. So they may do at least in the different countries of this part of the Globe, with the exception

perhaps of its extreme regions. *Decidedly* nervous and bilious temperaments, on the contrary, require their peculiar habits almost equally in all the countries mentioned—in Vienna as in Paris, in Manchester as in Milan.

In preceding pages (p. 33-36) the distinctive characteristics of the English diet have been sufficiently pointed out. The animal food is considerably more succulent and stimulant than on the Continent—namely, the English roast beef possesses both in the quality of the meat and the mode of roasting, such digestive and invigorating properties as are without parallel in other countries, and affect too strongly the blood of delicate individuals The same may be said of the English malt liquors, spirits and wines. On the other hand, among the negative distinctives of the English mode of living, the relative scarcity of greens and fruits stands paramount; but those who constitutionally *require* such articles, and *insist* upon having them, will generally be able to obtain some of the kind. It would be a great mistake also to think, that the mode of living which we meet with in this country is altogether a necessary consequence of its climate, and to overlook those tendencies and customs of life which to a great extent are but the result of the wealth spread over this island, and the taste of its opulent inhabitants.

The *children* of foreign families, so far as I am able to judge, at a very early age are perhaps less advantageously situated here, than their grown compatriots, inasmuch as they are subject in the same degree as the English to those acute diseases of infancy, which have been mentioned in preceding pages as being frequent and severe; so at least they have been for some years past with short intermissions, in *this* town. They are liable in about the same measure as native children to severe eruptive epidemics, croup, bronchitis and broncho-pneumonia; and they are subject also very much to retarded and disordered development with rachitic tendency, and the various connected secondary affections. This morbid disposition, however, namely rickets, applies very particularly to Manchester; for in this town it is observed in striking frequency also in wealthy families; while in others, so far as my information goes, it is either absent, or only prevalent among the poor. Indeed, the developmental disorders alluded to—according to some accounts to be given in a further place—seem to be more frequent in many continental countries than in Britain generally. These disorders, on account of their importance and practical interest, will form in another place the subject of special and careful consideration.

On the whole however, and in particular when we except the tenderest age, the children seem to enjoy excellent health and many have come under my notice who have become healthier and stronger here, than they have been in their native countries.

Before concluding the present argument I cannot pass over in silence some facts relative to *intermittent fever*, which came under my notice in Manchester, and which in some respects present scientific interest. Genuine intermittent fever, as has been mentioned already, does not occur in this town, unless occasionally imported, among poor Irish immigrants; nor is intermittent in general an English disease, its appearance being restricted within the narrow limits of a few districts (the fenny districts of Lincolnshire; see p. 46). I have constantly observed in Hungary—where ague is a common disease— that when patients who were for many years subject to continuous relapses, have been sent to some high and dry districts, where no trace of the disease was to be found, in such situations they rapidly recovered, and suffered no relapses so long as they remained there. In opposition to this, I shall now relate two cases of genuine intermittent, which in two foreigners broke out in Manchester, soon after their arrival, after they had been free from it for a long while.

On the 22nd of September, 1851, I was called to see a Swiss gentleman, who visited this town on mercantile business, and lived in the Albion Hotel. Being the possessor of a large establishment in Naples, he had for several years lived there and been subject to repeated attacks of intermittent in different forms, commonly in that of *tertiana*, from which he was easily relieved by quinine. He was subject to it also once in Germany, and more recently in Holland; but he has been quite free from it and healthy during the last two months. He arrived three weeks ago in England, stayed in London for some days in good health, and in Manchester four days, before he was taken ill. Without having committed errors of any kind, the day before I saw him he felt a sudden attack of severe shivering with headache; went to bed, where after an hour of unremittent cold, intense dry heat broke out; and after seven hours duration of this hot stage, profuse perspiration set in, lasting for five hours more. When I saw him he felt quite well again. I examined the abdomen: there was nothing to be discovered except a very slight swelling of the spleen. On the 23rd, after I had seen him, at the same hour as the day before he had another paroxysm. I cured him with quinine, and recommended a garment of flannel over the body, and moderate use of wine. He was free from the complaint during the few days he remained afterwards in Manchester.

The 2nd of February, 1852, the weather being cold and damp, without frost, I was called to see a gentleman at the Queen's Hotel, a young German merchant of distinguished qualities—whose sudden death not long since, while on his way to Belgium, has caused profound sorrow among his numerous friends. He had arrived the day before in Manchester in good health, but in the afternoon was suddenly seized with headache, shivering,

followed by intense heat, and profuse perspiration. In short, it was a regular *intermittens tertiana*. The abdominal organs presented no abnormal condition at that time, and the fever was speedily subdued by the use of quinine. Scarcely a fortnight afterwards he had a relapse without any appreciable cause. The disease again yielded to the same remedy, combined with a convenient solvent and roborant management of the bowels; and on this occasion I thought it advisable to continue awhile the use of quinine, administered, as to dose and frequency, in the manner usually adopted in fever districts, to prevent relapses. After a fortnight the recovery seemed to be very satisfactory, the strength and functions having considerably improved. But in spite of that, towards the end of March I had occasion to witness another relapse, though slighter than the preceding one. This yielded soon, but left behind considerable debility; from which however he gradually recovered by change of air, and had no more attacks of the same disease.

This gentleman, in the course of a journey during the preceding year to the East, on his return through Greece—which, as is well known, abounds with ague—for the first time in his life suffered in that country from the tertiana; and in passing through Vienna, he was detained for some time in that town by a severe attack of the fever, described by him as of the *intermittent* type with typhoid character. From this however he comparatively recovered, and during the interval (of a few months, I believe) between his stay at Vienna and arrival in this country, he had no febrile symptoms at all.

With the exception of these two cases I have never seen, nor heard mentioned an instance of genuine ague in this town. From which it does not follow, that there have never been here cases of this complaint, but certainly that it must be extremely rare in our days in the town and districts around Manchester, and scarcely ever having its origin here.

I content myself with having mentioned the above facts, which I regard as interesting in pathogenetic respects, leaving it to the reader, to draw conclusions with respect to the nature of ague—this most obscure and remarkable of febrile diseases.

The *rate of mortality in Manchester* is, when compared with continental towns, certainly very favourable; according to most credible statistics (see Dr. Carpenter's Quart. Rev. Jan. 1854, p. 9) the average life in the wealthy classes is 38 years, among the poor 21. Undoubtedly, an average term of life of 38 years will appear highly satisfactory to every continental reader, (in Rutlandshire it is stated to be 52 years); 21 years for the

labouring classes, on the contrary, is a very low term of life. It is necessary to observe, however, that according to the Manchester registers, the immense mortality occurring in the lower ranks of this town has reference in an appalling proportion to *children under five years of age*. It has been mentioned in a preceding page, that this climate is rather unfavourable to children of tender age; and, no doubt, domestic neglect of poor children, ignorant management of their disease, and the power of infantile epidemics in overcrowded poor districts, are agencies well calculated to destroy scores of lives!

Hooping cough, however, is making a long pause just now; it ceased in the summer of the year 1852, and has not reappeared to this day (15th of August, 1854).

Among the grown members of the wealthier ranks—besides the scarcity and mildness of fevers—encephalitis, entero-peritonitis and acute lobar pneumonia are rarities in comparison with their occurrence in Milan, Paris, Pesth, Vienna, and I dare say most parts of Germany. Not one foreigner, to my knowledge, has died from any such inflammation in this town during the last two years. Bilious diarrhœa and dysentry are more frequent than the abovenamed inflammations, and liable also to assume the typhoid character, or to degenerate into sporadic cholera; but such an issue undoubtedly much seldomer happens here than in most continental countries.

Asiatic cholera, each time that it has visited Manchester (in 1835-49-50), was astonishingly mild, and not a single case of it was observed in many quarters of the town, or in most of the villages and townships in immediate connection with Manchester.

The scourge of this climate undoubtedly is rheumatism in all forms and degrees, seldom dangerous, but obstinate and liable to relapses—like ague in the marshy plains of Italy or Hungary.

The *sanitary arrangements* of Manchester in many respects are excellent, and by most laudable efforts of the local *Sanitary Association*—originated and supported only by that selfgoverning spirit, which is the pride of this nation—they are improving every year. Many members of the clerical and medical professions have devoted themselves actively to humane and enlightened efforts in this respect.

DISORDERS OF INFANTILE DEVELOPMENT, AND RICKETS.

RETARDED AND DISORDERED DEVELOPMENTAL VEGETATION.

It is neither in accordance with the plan of these pages, nor am I adequately prepared, to treat the whole extent of this subject in a systematic manner; I shall merely call attention to some points, and endeavour to contribute to the illustration of the nature and causes of that anomaly of infantile vegetation, which is manifested by the retardation of certain developmental stages—namely, of the eruption of the first, or of some of the subsequent groups of teeth, the closure of the anterior fontanelle, and free walking—of which rickets is a frequent consequence.

Such a disordered course of vegetation is frequently connected with an appearance outwardly of good health; but as under this flattering aspect many a germ of fatal disease may lie concealed—the disorder on this account is only the more dangerous.

There is a great difference in different countries, and even in different localities of the same country, as regards the vigorous as well as the slow progress of infantile development; and the rate and degree of rachitism are also equally varying. In this country for instance, in some districts and towns, and very generally in Scotland, rickets is scarcely known; yet, from the majority of the accounts with which I have been favouredby professional brethren it results, that even in some places possessing this privilege, the protracted irruption of the teeth, late ossification of the fontanelles, and retarded walking, are phœnomena not seldom observed, and that such children are more liable than others to fits and other morbid tendencies.

These considerations have induced me to pay to this subject special attention, and to communicate the results of certain personal observations thereupon, gathered in my former station, and brought to further development in this country.

It is my firm belief, that it would be of great utility, if every systematic work on the diseases of children were to contain elaborate information on the developmental processes of infancy, and their disorders, inclusive of rickets, of a clinical and practical nature.

It would be desirable, at any rate, to avail ourselves of every opportunity to examine carefully infants, both in health and disease, as regards the regular or irregular (retarded and interrupted) progress of the first dentition; the period at which the closure of the anterior fontanelle is accomplished, and that at which the child begins to walk; to investigate the relation between these developmental stages and the constitutional features and dispositions of the child, with due attention to the local and domestic conditions, dwellings, alimentary and other circumstances, under which the child was brought up.

The healthy infant cuts its teeth at a certain age; its fontanelles are found to be closed at a further period; and shortly afterwards its long bones and joints have acquired that degree of solidity, the muscles of locomotion that amount of contractility, which enable the child to sustain the weight of its body upon its legs, and to perform certain voluntary movements.

These developmental changes, then, are perceptible to every observer, and form stages, according to the regular and irregular progress of which the vital power of the child can be valued more accurately than by any other—we may say innumerable and incessant, but less palpable, changes, which take place in the course of developmental vegetation.

The stages mentioned, in their physiological regularity, fall within the first thirteen or at most fifteen months. A child that has cut its first teeth at the age of seven months, that has the anterior fontanelle closed at twelve months, and begins to walk at thirteen, has commonly a good constitutional foundation; the more these stages are retarded beyond these periods, the more questionable becomes the vital power of the child.

THE FIRST DENTITION, ITS DISORDERED PROGRESS, AND PATHOLOGICAL BEARINGS.

We are not in possession as yet of any strict and comprehensive accounts relating to the commencement and progress of dentition in different countries and localities, connected with medico-topographical considerations, and the appreciation of those circumstances which are acknowledged to have a favourable or unfavourable influence upon the infantile health and development.

From those accounts of which I have knowledge, and from some personal experience, it would appear, that in France, England, Germany, Austria and Hungary, very generally the first teeth are cut rather after than before the end of the seventh month. The experience of Dr. *West* coincides with this statement. Dr. *Churchill* (in his work on the diseases

of children) says, that "about the seventh month" we find the first teeth appear; according to *Alb. Meckel* the first incisors pierce through the gums at the end of the seventh or the beginning of the eighth ; *Jahn* in his work on diseases of children names the seventh month ; *Rau* the seventh or eighth ; *Hanmann's* statement in his monograph on dentition (Rostock 1845) is a little at variance with the premised observations, as he assigns for the irruption of the first incisors the end of the sixth or commencemeut of the seventh month, consequently a period one month earlier than that observed by the previously named physicians. According to the statements of other observers the first incisors appear even earlier than at the sixth month ; on the other hand the celebrated physiologist Valentin names the ninth and tenth month as the usual period of commencing dentition. It must be observed, however, that such statements in opposition with the general experience, not being supported by exact and comprehensive statistics, do not merit our confidence, however illustrious the name of the author be.

A distinguished friend, Dr. Alexander of Altona says, that in that town, and very probably in Hamburgh, 8 children out of 12 are supposed to cut their first teeth at the seventh or the commencement of the eighth month.

In all these statements, as the reader will percieve, no distinction is made between children of a normal, and of a feeble or impaired constitutional development.

From my own experience at Pesth, corroborated by that of other physicians in Hungary, and of some professional friends of Vienna, I feel strongly convinced, that the great majority of infants of a strong constitution, cut their first teeth in the last named places before the commencement of the eighth month.

As to the further progress of dentition, the abovementioned A. Meckel says, that about the commencement of the 2nd year (13th or 14th month) appear the first anterior molar teeth ; about the eighteenth month the canine, and towards the end of the 2nd year the posterior molar teeth.

The generality of writers (though without supporting their statements by extensive statistics) state the end of the dentition to take place in the course of the 3rd year.

Dr. West says, that the interval between the irruption of the lower central incisors and that of the upper is generally of six or eight weeks, which then are quickly followed by the lower lateral incisors ; after these, according to this distinguished author, frequently a pause of 3 or 4 months is observed before the irruption of the first molar teeth ; another interval of equal length before the appearance of the canine ; and then another still longer before the posterior molar teeth.

In Manchester, according to what I have observed myself and heard from other practitioners, the great majority of children cut their first teeth after the seventh month; but, if I am not greatly mistaken, also here the majority of children with a strong constitution cut their first incisors before the seventh month is over.

If we calculate the periods and intervals indicated, it would appear that in the estimate of Dr. West the whole process of dentition extends beyond the end of the second year.

The well known German medical Journal *Schmidt's Jahrbücher* (1853 No. 12) gives an extract from Dr. *Eichman's* observations on dentition, extending over 27 years of practice, and comprising the cases of 400 children. According to the statements of this physician, which in essential points very much coincide with those of Trousseau, the twenty deciduous teeth make their appearance in *five groups*, at five distinct periods, and in the great majority of cases in the following order: Group 1st. consists of the two middle incisors of the lower jaw, which generally appear between the 28th and 33rd week. In 3 only out of 400 children the first incisor of the lower jaw broke through as early as the 20th week; which tooth, however, was not followed by the next in succession before the 31st week. Dr. E. remarks that the eruption of the first teeth takes place more frequently after than before the above-named age; but only in 5 cases out of 100 was this protracted beyond the 48th week.

Group the 2nd. consists of the four upper incisors, of which one or the other of the central teeth is the first to appear, in most cases after an interval of 6 to 7 weeks after the eruption of both the lower central incisors. In 24 cases the interval between both groups was not longer than 3 weeks, and in 32 cases it was 10 weeks. The eruption of these 4 teeth (constituting the 2nd. group), is generally accomplished in 3 to 4 weeks.

Group the 3rd. After a pause of 10 to 12, seldom of 7 or 14 weeks, follows the eruption of the anterior molars and of the 2 lateral lower incisors. (According to Dr. West the 2 lower lateral incisors precede the anterior molars; an order which I have observed very frequently). The extrusion of this group generally takes 15 weeks, seldom so short a period as 12, still more seldom so long as 17 weeks.

Group the 4th. The four canine teeth in the great majority of cases appeared successively within 7 to 8 weeks; in 7 children only the process of their complete eruption occupied 5 weeks; and in 29 children as long as 29 weeks. At the age of nineteen months the four canine teeth were seldom through, at 21 months frequently, and at 24 most generally. Before and during the eruption of this group (canine) the infants are

subject according to Dr. E. to the most numerous and dangerous diseases. After this group there is the longest pause, most commonly of from 16 to 17 weeks; seldom so long as 20 to 24 weeks; still more seldom of only 14.

Group 5th. The eruption of the 4 posterior molar teeth lasts from 12 to 18 weeks; and in no case were they all through before the end of the 2nd year; most generally their number was complete about the 26 or 27th month; frequently at the 30th; in very few instances at the 34th; and in 2 children only their successive eruption lasted beyond the end of the 3rd year.

Considering the periods of irruption of the five groups as assigned by Dr. Eichmann in unison with the statements of other observers, such as coincide also with the result of my own experience, I shall scarcely make a misstatement in saying, that, in the *majority of instances* the first dentition goes on as follows:

the lower central incisors appear about the 28th to 32nd week;
the central upper incisors about the 36th to 40th week;
the first anterior molars about the 48 to 54th week;
the first canine between the 16th and 18th month;
the first posterior molars between the 22nd and 24th month;
the whole number of twenty teeth is accomplished between the 27th and 30th month.

These periods, then, being observed to correspond with what occurs in the majority of instances, may be considered as the average of the normal progress of dentition in healthy infants. But there are numerous deviations recorded in Dr. Eichmann's accounts, showing a more or less considerable anticipation or retardation of each group; and most practitioners will have observed the same.

The *anticipated* eruption of the first teeth, however, presents scarcely a signification. I have seen in children of strong as well as feeble constitution, the first incisors appear at four or five months; after which generally follows a long pause. In Dr. Churchill's work we find mentioned the cases of *Louis* the XIV, King of France, and *Richard* the III, King of England, who both were born with teeth, and the distinguished author himself has noticed the same occurrence in a newly born child at Dublin. My colleague and friend Dr. Whitehead saw an infant, who had the two lower lateral incisors of the lower jaw perfectly protruded at birth. He told me, that when he saw this child at the age of three weeks, these teeth were at least two lines above the level of the gums, and had inflicted a deep wound on the under surface of its tongue, by pressure upon this part when sucking. Dr. W. removed these teeth at once with a pair of forceps, upon which the wound healed, and the child ceased to

suffer while sucking. *Corresponding teeth* (i. e. two incisors) *came up in these places about the time of the appearance of the canine.* This I believe is a very interesting case of this kind. Lately with Mr. Grant I have seen a child belonging to a family of Patricroft, which at three months had cut its first tooth, and at eleven months had fourteen teeth.

On the whole the anticipated eruption of the teeth appears as a mere "lusus naturæ" without pathological bearings; on the contrary, there is a pathological and practical interest in those cases in which the first incisors, or further groups of teeth, made their appearance considerably later than happens in the regular course of development; because this retardation generally arises from a disordered condition of the developmental vegetation; and such cases are of frequent occurrence.

It is not said, however, that a mere anomaly without morbid signification does not occasionally take place also in the way of retarded dentition. I have under my notice at present a child who has cut its first teeth as late as eleven months, although at that age its fontanelle was completely closed; and at present, being fifty-four weeks old, this child has only six teeth, yet it is strong and walks with a facility surpassing its age. Such cases do present themselves now and then in practice; yet, in a general point of view, the question arises: how far may the first dentition be retarded in a state of health? and what are the circumstances under which this protraction signifies, or may be suspected to be, a morbid impairment of the infantile developmental vegetation? This is the question which involves a pathological and practical signification.

Among the 400 cases of Dr. Eichmann, the protracted extrusion in some children extended to the 22nd month; Dr. Churchill mentions the case of Lanzoni—a child who cut its first teeth in its seventh year. In my own practise at Pesth, in 1841, I saw a child brought from the country to the children's hospital of that town, who at the beginning of the sixth year had not a single tooth.

Similar accounts however, without further comments, have merely the interest of rarity; whilst it cannot be denied that even statistics so comprehensive and elaborate as those communicated by Dr. Eichmann would convey more instruction, if we were told about the constitutional health of those infants who have cut their first incisors beyond the eighth or ninth month, or later; or in whom the appearance of some subsequent groups was considerably retarded. It would be useful, if besides the constitutional state of such children, we could know certain *medico-topographic* conditions of the locality whence those accounts are derived, conjointly with other circumstances concerning those children, apt to

exert an influence upon their developmental vegetation; as for instance, in what way they were nursed; at what age weaned; if they belonged to parents enjoying the necessary comforts of life; or if they were children of poor people, and subject to the influence of unwholesome dwellings and improper alimentation. Furthermore, it would be interesting to be informed about the progress of other developmental stages in the same children, namely: how the cranial ossification appeared to be advancing; to what degree their muscular power was developed; and, if there was a tendency to rachitism.

Undoubtedly, the difficulties which we encounter in the arrangement of statistics of this descrption on a large scale, are many and not easy to surmount. This I know from experience derived from investigations of a similar kind carried to some extent at Pesth (the records of which, I am sorry to say, have been lost). Parents are seldom able to give exact accounts of the periods of all the developmental stages of their children; and unless we have had opportunities of observing the successive progress of these stages ourselves, from the fifth or sixth month up to the end of the third year, and taken records of what happened under our own eyes, the results of such a labour will scarcely be so exact as would be desirable.

Some points relative to this subject which I have been able to establish in this town will be mentioned in the course of these communications; it may here suffice to observe, that in my experience in Manchester as well as at Pesth, in some children the protracted eruption of the first or second group of teeth, in others that of the molars, less frequently that of the canine, was accompanied by an evident check in the whole process of developmental vegetation; and in many instances by the appearance of indications of a rachitic tendency.

In the child abovementioned, which in its sixth year (when we saw it in the children's hospital) had no teeth, this circumstance is the more remarkable inasmuch as the anterior fontanelle was firmly ossified (according to the accounts of its mother) since the age of four years. This child was monstrously rachitic; every bone fearfully distorted; the skull large, flat and quadrangular; it had never been able to walk; the chest was extremely compressed; the eyes in constant convulsive movement; instead of speaking it uttered unpleasant inarticulate sounds. It was said, that the appetite and abdominal functions were in a satisfactory condition. We had no opportunities of examining the urine of this little patient, the parents having taken it back with them to the country after that single call. According to my recollection the circumference of its skull must have been not less than 27 inches, whilst its body scarcely equalled in size that of a child two years old. The relatives of this fearful specimen

of rachitis—people of the poorest condition, most probably living in a low and damp hut—stated that the child was feeble, but otherwise healthy until about the third month, when it was weaned, and fed upon maize-porridge and coarse bread.

In this case, then, dentition was about two years behind the cranial ossification.

In considering the pathological bearings of retarded dentition, we must distinguish between the case when local irritation is connected with retarded dentition—seated in, and spreading from, the gums—and retarded dentition as a mere sign and effect of disordered developmental vegetation. Both these conditions, the local as well as the constitutional, either separately, or conjointly, form one of the great sources of infantile mortality. According to Dr. West in this country five per cent of all deaths of children under one year are attributed to dentition; and seven per cent of the whole mortality within the first three years.

Dental irritation, as local disease—manifesting itself either by painful inflammatory swelling, or by mere nervous irritation of the gums; causing, through the medium of the brain and spinal cord, reflex symptoms in some parts or in the whole system—has the same appearance and produces the same effects in the case of retarded dentition as when this process is normally advanced. The most common of these effects are: abdominal derangement, especially diarrhœa, general nervous hypererethisia, with a febrile pulse, spasms, fits, and hydrocephalus. But even these affections it is not always easy to trace to the cause mentioned, i. e. to irritation of the nervous centres, *arising and spreading* from the gums. Other disorders, of the accounts of which superficiality and empyricism are so prodigal, are still less clearly traceable to it. It is stated in credible works that inflammations of the respiratory organs, namely bronchitis, and pneumonia, are also prevalent during dentition. I must confess, however, that with the exception of a kind of convulsive cough, like that in hysteria, I have never been able clearly to make out a connection between respiratory affections and dental irritation.

Now, it is certain, that all the abovementioned serious consequences of dental irritation of the gums, are both more frequent and more dangerous in infants presenting a notable retardation in the eruption of their teeth. The reason of this is obvious—it is, because the protracted dentition is the effect and proof of a feeble condition of their developmental vegetation, with impaired and disordered spinal innervation, a condition of the system sufficient of itself to cause those affections without the presence of dental irritation, and augmenting their intensity when they arise from the lastnamed source.

Indeed, it must be confessed, in case of fits at this age there is a great

dispostition in practice to direct every attention to the gums, and too little to other irritating causes, or to the impaired constitutional state alluded to. It happens but too frequently that the gums of an infant suffering from fits in its fifth or sixth month are lanced; and instead of the teeth, after a pause of weeks or months the fits appear again; and the gums are lanced and lanced again for the same occurrence—until at last at the ninth or tenth month, or later, the anticipated teeth will make their appearance. That such practice is nothing but empyricism, requires no demonstration.

Besides this constutional origin of convulsion, there are many others of a local character, among which abdominal disorders are by far the most frequent.

The question, however, of lancing the gums in cases of convulsion at the period of dentition, is an important one, and merits the serious study of every practitioner.

My experience and views on this point of practice fully coincide with the clear and decisive reasoning and advice of Dr. West in his well known work. The impropriety of lancing the gums is strikingly evident, unless there are local symptoms present, indicating irritation of these parts. In absence of these symptoms it is much wiser to spare the child the painful cuts, and in the case of fits preceded by heat and heaviness of the head, to abstract blood from the temples or mastoid processes, and use a smart purgative; or in a feeble nervous child have recourse to chloroform, and apply afterwards an appropriate constitutional treatment.

Salivation is not at all a trustworthy sign of the impending eruption of the first teeth; the salivary glands not seldom commence to secrete their liquid abundantly three or four months before the first tooth makes its appearance.

Slight swelling with redness, a white ridge along the enlarged upper surface of the respective gums, the eager tendency of the child to bite any object put into its mouth, which indicates nervous irritation— or, in other instances the contrary tendency, i. e. abhorrence of any attempt to touch its gums—which is the sign of inflammatory irritation: these are the phœnomena peculiar to dental irritation.

If such local symptoms be well pronounced in the gums, lancing is decidedly indicated; and, assisted by aperient and cooling remedies, it may answer all purposes in a child with normal condition of its developmental vegetation. Under the reverse circumstances however, namely, when besides the dental irritation of the gum, the dentition is retarded, and the whole constitutional development below the normal mark—it is not enough to lance the irritated gum, but is necessary to improve the vegetation. As the most efficient means in such cases the following

may be mentioned: suitable regulation of the nourishment, free exposure to pure and fresh air, cold sponging, and codliver oil.

It is an undeniable and most unpleasant fact, that laryngeal spasm and fits frequently arise very suddenly from the immediate influence of dentition without prodroma, and without appreciable cause; sometimes all that has or could have been observed is, that the child was less cheerful, restless and peevish, a few hours or days before the attack; or it had startings during its sleep. And it is particularly in fits of this primary appearance, when they are severe, that I have found *chloroformisation* not only the best remedy to check them when present, but to soothe down the nervous system, so as to prevent their recurrence, and afford an opportunity for those more efficacious and lasting preventive measures, which have been mentioned above, and among which I have found nothing so beneficial as change of air. At Pesth I recommended such children to be taken to some dry and moderately elevated country place; in Manchester I prefer the sea shore. Though both kinds of sojourn have proved beneficial, yet, according to comparative experience I must decidedly give the preference to the influence of marine air above that of the finest inland-country situations. This influence is especially beneficial to infants feeble and retarded in their development.

Codliver oil is also a sovereign remedy to prevent dental fits, when the child presents the symptoms of atrophic and developmental debility.

It is a remarkable fact, that in some families there is an evident hereditary disposition to dental fits. Many such families have come under my notice in Hungary, nor are they rare here. About a year and a half since, I was called to see a child in this town with Mr. Mellor, surgeon; the little patient two years old was in convulsions—the pulse uncountable—and expired shortly after our first call. Four months after this occurrence we met again under similar circumstances, to see a younger child of the same parents, scarcely nine months old, with no trace of dentition, and the fontanelle very much behind the normal degree of ossification. The fits came on suddenly and unexpectedly; and after having resisted during seven hours every curative attempt, we succeeded in checking them perfectly by a free chloroformisation. Six months after this attack, came on a second exactly under the appearance of the first incisors, which was checked in the same way—and two months later again a slight fit appeared under the eruption of the upper incisors. On this last occasion I was told by the mother of this child, that in a letter she had received from her own mother, it was mentioned that she and her sister (aunt of the mother of the little patient in question) were dangerously ill from dental convulsions in infancy, and that all the sisters and brothers of the mother of the child had suffered in the same manner.

I must expressly remark: that although I believe, that dental convulsions are as frequent in infants of a nervous temperament, otherwise well developed, as in lymphatic children with a signal retardation in their development: yet, I feel convinced they are less dangerous in the former, and hydrocephalus arises decidedly more frequently in the latter.

Diarrhœa, though not so dangerous as convulsion, is by far the most frequent of affections during dentition, and gives rise to the same kind of error and misrepresentation as convulsion. Between the fifth and twelfth month of life there are many and various influences capable of producing diarrhœa. The action of these agencies is partly local, namely irritating and deranging the abdominal functions; partly constitutional, partly both conjointly. These causes of infantile diarrhœa are generally known, but nevertheless too little distinguished in practice; so much so, that perhaps nine out of ten cases of this kind at the age in question are directly attributable to dentition.

There is amongst the many causes of diarrhœa, however, one internal and constitutional, which has been mentioned already as a frequent cause of fits: this is feeble and disordered spinal innervation—a condition almost constant in all those children in whom the process of dentition is retarded. Diarrhœa arising from this source never sets in suddenly; the evacuated liquid is generally of a dark brown or otherwise dirty colour, with a most offensive smell, alternating with claylike stools, and it is connected with tumefaction of the abdomen. Spasmodic pains may or may not associate themselves with it; the pulse may be febrile or normal. This kind of diarrhœa, then, is of constitutional origin—probably from an imperfect condition of the blood, the cause of disordered spinal innervation. It is generally obstinate and only yields to means which improve the constitution of the child; or, more precisely speaking, its developmental vegetation.

In contradistinction to this form of diarrhœa—which we may call constitutional—there is another of a local origin, from dental irritation of the gums, which may be properly called *dental diarrhœa*. The real occurrence of this form cannot be called in question; the common error consists in its too vague and general assumption, with considerable disregard of the many other causes liable to produce the same derangement, as was mentioned above.

The question arises, then: what are the characteristics of dental diarrhœa? There are some circumstances and symptoms, which must be present to justify its assumption, which are the following.

In the first place, the child must present the uneqivocal signs of dental irritation—tumid or irritable gums (see p. 122).

Before the outbreak of the diarrhœa such children are restless, with

increased heat of the forehead; and in this case the evacuations come forth with a certain impetuosity, are copious and liquid, and the child seems to be, at least temporarily, relieved by them.

In other instances, there is little or no disturbance in the head, and in this case the evacuations are smaller, come out easily; and in many such cases it would appear as though they arose from a nervous irritation of the gums in conjunction with profuse salivation, and admixture of a large proportion of this liquid in the milk, or other food, which the child is taking.

Again, in other cases there is a degree of tenesmus connected with the motions, and dysuria. This happens chiefly in children with an impaired developmental vegetation, or even a degree of rachitic tendency.

In all cases of dental diarrhœa—as a reflex-action of the irritated gums—the abdomen is soft, no pain present when we press it. Whenever there are signs indicating an inflammatory condition of the intestines, it is in my opinion a mistake to attribute such to dental irritation. Indeed, I happen to have dissected children dead of convulsion or other causes, whose symptoms had been complicated with profuse dental diarrhœa, and there was no trace of intestinal inflammation discoverable.

Moderate diarrhœa under the evident irruption of the teeth, should not be checked by treatment, when the child feels otherwise well. Under different circumstances, the same indications may present themselves, and require lancing of the gums, or leeches to the head, or constitutionally invigorating remedies, as was mentioned in a preceding page against dental fits. Opiates require great circumspection; but I have derived invaluable benefit from Dover's powder in instances when, along with great restlessness (hypererethisia) day and night, the diarrhœa was profuse, connected with some spasmodic pain, without heaviness of the head or other symptoms of cerebral congestion.

THE RETARDED CLOSURE OF THE ANTERIOR FONTANELLE, AND ITS PATHOLOGICAL RELATIONS.

The progress of ossification in the child obtains proportionately to the power and impulse of its general developmental vegetation. This process is the most tangible and appreciable in the advancement of the ossification, and consequent closure, of the fontanelles. It is especially the anterior fontanelle which merits our attention; because the closure of this, in the natural order of developmental progress, takes place after that of the posterior, and at an age when children are especially liable to a check in

their developmental vegetation, and to various affections arising from this source.

Anatomists generally assign the third year as the period when the ossification of the anterior fontanelle becomes completed. This statement is correct; nor does the term of "closure" imply the fully achieved ossification of this part of the skull, but merely such a degree of the process, at which the fontanelle ceases to be soft and yielding under the moderate pressure of the finger, and at which the cerebral pulsations can be no longer felt. For our present considerations we assume this, though imperfect degree of ossification of this region, as an easily perceptible mark of the general standard of vegetation.

There are as yet no published records sufficiently exact to shew the average measurement of the anterior fontanelle in well developed newly born infants, and of the various mensural relations of this aperture at different periods of the first year of life.

According to my observations, in small and feeble as well as in large sized and strong infants, as a general rule, the extent of the anterior fontanelle a few weeks after birth varies from about half a square inch to one inch; I have seen, however, several infants of a small and weakly formed body, in whom the anterior fontanelle at the first or second month was scarcely open to the size of one third of an inch; and some others of a strong appearance, in whom at the same age the fontanelle was much larger than a square inch.

In many instances the anterior fontanelle seems to remain stationary during the first four or five months of life, or its extent augments evenly with the skull. If I am not mistaken, however, in healthy children after the sixth or seventh month a more or less rapid contraction of it takes place; and the closure is completed most generally within the twelfth or thirteenth month.

Among 20 of those children in this town, whom I have had opportunity of seeing frequently from their earliest age up to the second or third year, and whom I have reason to consider as strong, or at least healthy, in 10 the closure of the fontanelle took place between the eleventh and twelfth month; in 5 at the thirteenth; in 2 at the fourteenth; in 2 at the tenth, and in one at the fifteenth month. In 14 of these children the first teeth had appeared between the sixth and eighth month; in 4 of them during the eighth or ninth, and in two before the sixth month. The interval between the first cut tooth and the closure of the fontanelle varied from four to seven months.

Among 8 other children, of whom I had equally the opportunity of watching the developmental progress from their tenderest age, but who are of rather delicate habits, or actually suffer, or have periodically suffered

from some disease, in 6 the closure was accomplished between the eleventh and thirteenth month; in 2 during the thirteenth and fourteenth. In 7 of these children the first tooth preceded the closure of the fontanelle (as in the abovementioned 20 cases) from four to seven months In one of them the first incisors appeared as late as during the thirteenth month, almost simultaneously with the closure of the fontanelle. None of them manifested thus far any mark of rachitis.

Of 8 other children, who evidently are rachitic, in 3 the fontanelle was closed before the end of the thirteenth month, and rachitis developed itself after that period, in a slight degree; in 3 the fontanelle closed at sixteen and nineteen months, under the amendment of rachitis; and in 2 it continues as yet, at eighteen and twenty-five months, the rachitic symptoms having made their appearance before the eleventh month, and being still severe. In the first mentioned 3 cases (of the 8) the first and second group of teeth appeared at due periods, but the molars and canine were very much retarded; in the next 3 cases the first teeth appeared after the twelfth month, and were rapidly followed by others; of the lastmentioned 2 infants one has cut the first two groups regularly, but even now at eighteen months, has only eight teeth; the other, now twenty-five months old, has not a single tooth.

Other observations on this subject which I might adduce are less complete, but coincide very much with those aforementioned.

The retarded ossification of the fontanelle, speaking in general terms, is pathologically more significative than retarded dentition; it acquires more importance when connected with an abnormally large size and angular shape of the skull. It may not be out of place therefore to say a few words on the lastnamed condition.

In the majorlty of cases according to my experieuce, I may say, small skulls are sooner completely ossified than large ones; but there are numerous exceptions to this rule.

In estimating the size of the skull, we must, of course, consider it in relation to the child's age, the size of the body, and especially to the circumference of the chest.

For several years I have been accustomed to measure in children—in the healthy as well as the unhealthy ones—the largest circumference of the skull, in a horizontal circular line crossing the occipital and frontal protuberances; and that of the chest by a horizontal line, which runs anteriorly a little below the nipples around the chest. The reason for choosing this precise region is, because in case of rachitic compression of the chest, the indicated circular line will run over the most compressed lateral regions of it. (For effecting these measurements the commonly used tape-measure is a convenient pocket-instrument.)

Now, in regularly developed middle sized infants, at the age of about six months, the circumference of the skull generally averages between 15 and 16½ inches, or a little more or less; and the indicated circumference of the chest at this age is commonly a little—say, from 4 to 6 lines—less than that of the skull; in case of much fatness of the chest, however, its circumference may exceed a little that of the skull. In equally constituted children of about 15 months the circumference of the skull will be between 16 and 17½ inches, and the chest on an average of about the same dimension; at the age of two years the skull averages between 17 and 18½ inches, and the chest very frequently exceeds by some lines, or even by more than half an inch, the circumference of the skull. At a more advanced age it is still more frequent to find the circumference of the chest larger than that of the skull.

These average measurements vary very much in their relation to the ages mentioned as well as to each other (between the skull and chest) without exactly implying a pathological condition of the developmental vegetation. I have daily under my eyes a middle sized infant about seventeen months old, evidently healthy and strong, in whom the circumference of the skull exceeds 19 inches, and that of the chest is near 20, because of its being very fat; and I saw a few days ago a boy three years old having a skull of 19 inches in circumfereuce, and the chest only 17½. This boy is of an exquisitely nervous temperament, uncommonly lively and intellectually advanced, with an unusually meagre chest, but otherwise in perfect health.

In both the last-named instances however, the dentition and cranial ossification progressed with regularity. Indeed, as was already mentioned, the absolute circumference of the skull as well as the relative to the circumference of the chest, in order to serve as signs of the normal or abnormal condition of the developmental vegetation, must be considered in connection with the course the dentition has taken, and with the condition of the fontanelle.

Furthermore, in addition to these points, the *shape* of the skull is also of some importance; namely, when a child with retarded dentition and closure of the fontanelle has a flat skull, with a perpendicularly rising forehead and two considerably protruding frontal protuberances, and similarly prominent parietal bones, imparting to the skull a quadrangular shape— this circumstance increases the pathological signification. This is very frequently the case in children with a rachitic tendency.

According to my impressions, I should think that the cranial ossification as well as the first dentition in the children of Manchester are on an average a little later, compared with the same processes in the children of Pesth.

It needs scarcely mentioning, that the retarded ossification of the

fontanelle can be judged relatively to the age of the child and in connection with other physical features mentioned, at an age much anterior to that at which the fontanelle ought to be closed. An infant for instance eight months old, in whom the fontanelle is of the size of a square inch or more, will seldom have it entirely closed at thirteen months, and, therefore, may be considered as being in retardation in this developmental process.

The morbid dispositions connected with the retarded closure of the anterior fontanelle—especially when this is connected with the abnormal circumference and shape of the skull—are the same in both towns mentioned, and, I dare say, everywhere. Such infants are peculiarly liable to laryngeal spasm, in some cases through many months, until either the cranial ossification takes a more satisfactory course, or supervening convulsions put an end to life. They are not seldom voracious and presenting the symptoms of irregular abdominal functions—liquid evacuations alternating with claylike ones; the abdomen is bloated; the urine is frequently overacid, forming a sediment, sometimes with a large proportion of phosphate of lime, before or without the appearance of rachitic symptoms in the joints.

Head sweats during sleep are an important symptom in such children; and whenever these are present in a notable degree in infants with a large skull and widely open fontanelle, experience has taught me to consider this as a sign of the rachitic disposition.

Acute or subacute hydrocephalus is another affection to which children with the abovementioned condition of the skull are very much liable. It is to be apprehended, or is commencing already, when such children under the disappearance of both the head sweats and bloatedness of the abdomen, become irritable, or drowsy and sick. I have seen this fatal issue in children several times here, and frequently at Pesth, where I have dissected a number of them, who died of this affection under the morbid developmental phœnomena in question.

In many of these cases there was no trace of tubercles in the body, and with respect to the "meningeal granulations" I take the opportunity of expressing frankly my belief: that, though these little coagulated corpuscles (which are frequently seen in dead bodies of children, in whom there is some serous accumulation at the basis and in the ventricles of the brain) have given rise to the assumption of hydrocephalus being nothing but a tuberculous meningitis, I could never satisfy myself to regard them as tubercles. Nor have we seen in the children's hospital of Pesth unequivocal signs of "meningitis" in such cases; but the serosity appeared to be the result of a secretorial disorder, similar to that constituting dental diarrhœa (hyperdiacrisis), without signs of inflammation.

The *causes* of, and the means of improving the condition of children

who present the abnormal features of the fontanelle and skull described, being identical with those influences which affect the process of developmental vegetation in general, shall be mentioned hereafter.

The retarded ossification of the fontanelle acquires further pathological signification, when, in addition to the aggravating concomitant phœnomena mentioned above, there is a retardation in the muscular development of the limbs.

WEAKNESS OF THE LOCOMOTIVE MUSCLES—RETARDATION OF THE FACULTY OF WALKING.

The power of the locomotive muscles is the most conspicuous and appreciable in the legs; and by the gradual and relative progress of this active phœnomenon we are enabled to make an estimate of the power of the spinal innervation—one of the essential groundworks of the developmental vegetation.

Upon accurate observation and investigation of the external muscles in general, we may be able to judge of the standard of spinal innervation at any age of the infants; but as a most perceptible mark of this power we may consider the relative strength of the muscles of the lower extremities, by their fitness for walking.

There is undoubtedly truth in the assertion, that fat and heavy children are later in walking than others, although their muscles may not be less strong for this reason; yet, I believe, this assumption is generally carried too far. Indeed, large sized children, when they are of a strong constitution, have generally also muscles proportionately strong; it is, however, but too frequently the case, that full and plump looking children are liable to a check in their developmental vegetation about the fifteenth or eighteenth month, and their walking is for this reason retarded.

Among the 36 children alluded to (see page 126), the 20 strong and healthy ones commenced walking at the following periods: 10 during the thirteenth month, 6 during the fourteenth, 2 at the commencement of the fifteenth, and 2 before the end of the twelfth month.

Of the 8 weakly children, 5 commenced walking during the thirteenth month, and 8 during the fifteenth.

Among the 8 rachitic subjects, 3 commenced walking before the end of the fourteenth month, but ceased afterwards to perform this function, when about the seventeenth and eighteenth month rachitic symptoms shewed themselves; 3 others commenced walking between the eighteenth and twentieth month, when their rachitic symptoms were gradually impro-

ving; and 2, (the one eighteen the other twenty-five months old) being severely affected with rickets, have never yet been able to walk.—Some additional relations between rachitism and the progress of developmental stages will be mentioned in another place.

In the large majority of healthy children the commencement of dentition precedes the closure of the fontanelle, and the faculty of walking follows the closure of the fontanelle by an interval varying from a few weeks to two months.

I am not able to recollect more than a few cases in which the fontanelle was closed before the appearance of the first incisors; but it is not so unusual to meet with children in which the third or fourth group of teeth (see p 127) is retarded beyond the closure of the fontanelle; this ordinarily is the case in those in whom rachitism develops itself during the second year.

Furthermore, I do not recollect many instances, in which the faculty of walking considerably preceded the closure of the fontanelle. An interesting example of this kind presents itself in the child of a family in this town, at present nineteen months old, and of whom mention has been already made as regards its liability to convulsions (see p. 123). The fontanelle in this child is open still to the extent of about half an inch; it commenced walking at fifteen months—a month before the first incisor pierced the gum. In this case, therefore, the faculty of walking, instead of being the last of the three developmental stages, was the first—an uncommonly rare occurrence indeed. This child is extremely lively and endowed with excessive nervous sensibility; it presents no trace of the rachitic taint.

In estimating the pathological relations of the retarded faculty of walking, we must set aside, of course, every debilitating disease which may affect a child near or during that period of life at which, in the regular course of development, it ought to commence walking; because whilst the dentition and the closure of the fontanelle frequently take place at due periods even under the influence of serious disease, the muscular innervation is at once lessened or checked by every debilitating influence.

The muscles of children who are late in walking are generally flabby, however full and plump may be the appearance of the body and limbs. It is rather a rare occurrence to find children in whom though dentition and cranial ossification have made normal progress, yet the faculty of walking is considerably retarded. If such be the case, the child almost invariably presents signs of anæmia; it will be found pale and languid with a feeble and slow pulse, easily increasing, however, to great frequency under slight exertion. I have at present under my notice a case of the kind. It occurs in a child sixteen months old, who has cut its teeth regularly, and has the fontanelle duly ossified. When this child is for some time kept in a quie-

scent position the pulse is between 68 and 75; and when it is led (as it cannot yet walk alone) from one part of the room to another, the pulse soon rises to 120 and more; the heart beats as in chlorotic subjects, and there is a very audible chloro-anæmic murmur on both sides of the neck.

I have noticed many similar instances in my practise in Pesth as well as in Manchester. Anæmia is a most frequent pathological condition of feeble and considerably retarded muscular development, frequently, though not invariably, marked by the chloro-anæmic murmur.

The "proxima causa" of an impaired and retarded progress of the muscular development and strength of infants, is undoubtedly spinal innervation; but this direct and proximate cause, according to my observation is almost constantly derived from imperfect hæmatosis.

The feeble condition of the locomotory muscles, when existing in children in whom the dentition and the closure of the fontanelle present a notable retardation, increases the pathological signification of both named disorders with respect to the rachitic tendency. Without this combination the retarded muscular development in itself involves no special morbid tendencies. It is a sign of either nervous or anæmic debility, and nothing else. In both conditions children have generally a poor appetite, but are not necessarily subject to noticeable abdominal disorders. In the case, however, of the connection of retarded muscular development with retardation of both the stages mentioned, the child may have more than common appetite, or even manifest farinaceous voracity; this is not seldom the case in children with a rachitic disposition.

It is a singularly remarkable fact, that almost all children in whom the three developmental stages in question, namely dentition, cranial ossification, and walking, are considerably retarded, present a decided tendency to rachitism. And in the case where this complaint develops itself beyond the fifteenth or eighteenth month, the first symptom announcing it is most frequently a retrogradation in the strength of the muscles of locomotion.

INFANTILE MARASMUS, PÆDATROPHIA, RETARDED SUBSIDENCE (INVOLUTION) OF THE THYMUS, SWELLING OF THE THYROID GLAND, AND OF THE TONSILS — IN THEIR RELATION TO DISORDERED DEVELOPMENTAL VEGETATION.

Infantile marasmus, a disease of the earliest period of infancy, noticed and described under this denomination by the celebrated Schoenlein, seems in essential points to coincide with Marshall Hall's "hydrocephaloid disease". In both descriptions the prominent feature of the disease

consists in exhaustion, collapse, with the difference, that the firstnamed physician considered the disease as it occurs during the tenderest age, when the slighter, and less protracted influences of a debilitating character are sufficient to impair the vital powers and actions of the delicate organisation ; whilst the illustrious physician of London has considered the same disease upon a broader basis, and as a consequence of agencies more decidedly exhausting (profuse diarrhœa, for instance). In infantile marasmus the abdomen is generally retracted, from want of spinal innervation.—This then is simply debility, exhaustion, collapse — not to be classed among disorders of *developmental* vegetation.

Pædatrophia, synonymous with *tabes mesenterica*, or *scrofula abdominalis*, is atrophy consequent upon dyscrasic deposits in, and obstructions of, the mesenteric glands. It is a form of scrofula which is not seldom observed in children with retarded dentition and cranial ossification; but this connection is not at all essential. Indeed we meet with numerous instances of pædatrophia without retardation of the developmental stages from this cause.

Of *acute rachitis* mention will be made hereafter. It is a febrile disorder, and consequently more than a simple check or derangement of the developmental efforts.

The *retarded subsidence* (involution) *of the thymus gland*, on the contrary, is essentially a developmental disorder. In the regular progress of developmental vegetation, every organ of the extra-uterine life increases in size and activity, while others—the inheritance of foetal life—more or less speedily decay. Strictly speaking, the thymus gland seems to be an organ destined to perform some special function during the earliest period of infancy; because it rapidly increases immediately after birth (see Carpenter's Manual of Physiology). But after a few weeks this increase becomes slower, and entirely ceases towards the end of the second year; after which period it emaciates and soon becomes almost entirely transformed into a fatty mass. When the developmental vegetation, however, is impaired, then the thymus gland in some habits continues to grow proportionately with the body, beyond the first or second year, or longer. And as such children—namely those having an abnormally large fontanelle — are peculiarly liable to laryngeal spasm, Dr. Kopp has been misled by this circumstance to consider this affection as the result of pressure caused by the thymus gland.

In the dissecting room at Pesth I have met with numerous instances of an abnormal size of this organ; I have seen the gland, in children from two to three years old, equalling in circumference that of a full sized pigeon's egg, sometimes larger. All these children, without exception, presented the marks of retarded cranial ossification. The oldest subject

in which I have seen this gland abnormally large (I may say swollen and somewhat of a spongy appearance) was five years old, having a large skull, and both the thyroid gland and tonsils were considerably enlarged.

For the present purpose, however, the retarded decay of the thymus gland presents less interest than disorder of the other developmental features ; inasmuch as we have no means of ascertaining such an abnormal condition in the living child.

Swelling of the thyroid gland not seldom takes place in children bearing marks of the rachitic tendency, and almost constantly in connection with enlarged tonsils. This is at least the result of my observations in Pesth as well as in Manchester.

In Dr. Behrend's excellent journal of diseases of children, there is an interesting article on "asthma thyroideum", by Dr. Betz of Heilbrunnen. This physician says, that in the newly born infant the lateral flaps of this gland frequently turn around and meet each other at the posterior part of the larynx, pushing themselves between this organ and the pharynx, and thus by pressure giving rise to a severe form of dyspnoic spasm at that tender age. I must confess, that I have not at command such facts derived from observation on this subject as would entitle me either to confirm or oppose the statement of Dr. Betz ; but the fact alluded to at any rate merits the attention of the profession. (Journ. f. Kinderkrankh. Berlin, 1853, p. 162).

While in normally developed children the thyroid gland is scarcely palpable to the digital touch, it happens that in some habits during the second or third year this gland increases so far as to become outwardly conspicuous, without attaining, however, any considerable size, and without ever being the source of inconvenience to the child. In some instances this swelling disappears after the short period of a few months, in others it remains stationary through a few years, and disappears gradually.

The enlarged condition of the thyroid gland in infancy is of importance only in as much as it is connected with a more or less notable degree of developmental disorder. If I am not greatly mistaken it is more frequently met with in Manchester than at Pesth. I have at present under my observation five children from two to four years old, who have that anomaly in the usually moderate degree ; one of them presents no notable disorder in its development ; four were late in the process of cranial ossification and in walking, and have enlarged tonsils ; and three of them show more or less of rachitic disorder.

Swelling of the tonsils, of which I am speaking here, arises without the slightest pain, without any sign announcing it, until its presence becomes manifest by a change in the voice and snoring during sleep. I feel fully satisfied that this enlargement has nothing in common

with any inflammatory action, although eminent authors consider it as chronic tonsillitis. According to my observations in the living and dead subject, I feel not even intitled to call it a hypertrophy in the accepted sense, of the term. Some such glands which I macerated in water and carefully examined, appeared to me to consist chiefly of enlarged bloodvessels, without any exudation. I feel strongly convinced that this swelling takes place in the same way as that of the thyroid gland, and depends upon an altered chemism of the blood which is not in the least degree inflammatory, or over-fibrinized.

Like the enlarged thyroid gland I find an analogous condition of the tonsils more prevaling in children in *this* town than at Pesth. It is very frequently met with without any degree of thyroideal swelling, but in my experience the majority of children who exhibit the last named anomaly have also swollen tonsils. Both disorders exist conjointly in several children of some families of this town whom I have under my observation; these children have more or less the rachitic features, and have been slow in their developmental progress.

In most cases, however, the atonic swelling of the tonsils takes place later than has been mentioned above, generally between the third and seventh year. Again, chronic as well as acute tonsillitis in the plurality of cases develops itself *after* the seventh year; and this is, at least in the beginning, accompanied with pain, with or without fever; and the enlargement of such origin presents a degree of induration, which in the atonic swelling (in question) is not the case.

Children affected with swollen tonsils of the atouic kind conjointly with an enlarged condition of the thyroid gland, have in my experience frequently manifested the phœnomena of anæmia; but there may be at the same time another alteration of the blood at work, of which as yet we do not know the specific nature.

It is impossible to remove this species of tonsillar swelling by any antiphlogistic or astringent means, or scarifications. Only constitutional treatment—suitable diet, codliver oil or iron according to circumstances, cold sponging and a change of air, namely to the seashore, are capable of gradually and slowly reducing it. I may observe, however, that in some cases it becomes a measure of urgency to remove this obstacle to the circulation and respiration by partial excision of the enlarged glands.

It is a remarkable phœnomenon, that most of those children who are affected with considerable enlargement of both tonsils (of the atonic kind), when asleep, not only show a distressing difficulty in breathing, but also great irregularity of pulse. The beats are now frequent, now slow, and at short intervals intermittent. In a family of this town, of which all the children present symptoms of rachitism in a mediocre

degree, some years ago a boy *four years* old, considered by the parents as healthy, but afflicted with difficulty of breathing and snoring when asleep to a distressing degree, one evening, an hour after he had left playing and gone to bed, was found dead.

Upon post mortem examination (as is stated), nothing but a degree of congestion was found in the brain; but besides the tonsils and the thyroid, the thymus gland also was enlarged.

Such an issue as this is certainly rare *at that age*. I myself have witnessed only one instance of it at Pesth, in a child about three years and a half old. The brother of the abovementioned boy, at present seven years old, has been troubled when asleep with the same symptoms (snoring, apnoea, irregular and intermittent pulse) since his fourth year, and has been the object of no little anxiety to myself as well as to the parents; but happily the unpleasant symptoms are gradually diminishing.

Neither in this case, nor in many others of this description which have come under my notice, has the size of the tonsils been so large as to prevent respiration. Such an impediment is not perceptible in the slightest degree when such children are awake—only the nasal sound of voice indicates a degree of obstruction at the choanae; but it appears that in these subjects the Schneiderian membrane, nay the whole mucous tract of the fauces and pharynx, is in a relaxed condition, and besides the tonsils from all these parts together seems to arise an obstacle to the circulation.

In cases where the tonsils are so much enlarged as to oppose a constant impediment to respiration, the consequence is an impaired condition of their sanguification and vegetation. Some years ago my late colleague at the University of Pesth, Prof. Balassa, brought a child from slowly progressive atrophy in a strikingly speedy manner to full health, by extirpating the enlarged tonsils.

INFLUENCES LEADING TO RETARDED AND DISORDERED DEVELOPMENTAL VEGETATION.

As there are no such causes known by which the eruption of the first teeth suffers a retardation, or others by which more especially cranial ossification, or again others by which the development of muscular power become directly checked, we are only entitled to speak of agencies and influences by which the developmental vegetation in general is impaired—the common and unique source of the retardation of each of these special processes.

Of such influences the following are undoubtedly the most common and

unequivocal as to their noxious effect: unwholesome properties of the milk of the breast, too early weaning, unsuitable kinds of food and overfeeding, impure air, certain conditions of climate, some kinds of disease, and hereditary predisposition.

Most of these causes are pretty generally acknowledged; their mode of action and their effects, however, seem to be allied to certain organic conditions peculiar to a certain age. It is a fact, that in the earliest months of life their hurtful influence becomes conspicuous by notable functional derangement, emaciation and decay, (marasmus), without noticeable retardation of the first teeth, or of the progress of ossification in general; moreover, rachitism, the most marked morbid feature and conseqnence of disordered developmental vegetation, seldom appears at that tender age.

As regards the *milk of the breast*, it happens not unfrequently, that infants, whose development has made a regular progress till the fourth or fifth month or longer, do not thrive beyond that age, though no notable change has taken place in the health of the mother, nor in the supply of her milk. Without diarrhœa or other debilitating disturbance they become languid, their muscles are flabby and weak, and ere long the progress of ossiffcation becomes checked.

In those infants, however, who are weaned as early as about the fifth or sixth month, this unfavourable change happens more frequently. Not that weaning and dry nursing ought not to be preferred to nursing by the the breast, so soon as the performance of this maternal duty ceases to benefit both the child and the mother; but because dry nursing is generally a source of numerous dietetic mistakes, and because the natural necessity of an infant of tender age is the milk of the breast of a healthy quality. And it would appear, that in similar instances occurring in the children of the wealthy, the developmental disorder consequent upon early weaning is not so much caused by innutritious or otherwise improper food, as by *overfeeding*. This was my impression at Pesth, and it has been fully corroborated in Manchester. Among the 36 children mentioned in preceding pages there are 13 in whom the closure of the fontanelle has been more or less retarded; 10 of this number since their seventh, eighth, or ninth month, have taken daily three or four substantial meals, consisting of milk mixed with other farinaceous articles, good in quality but too abundant.

Regularity of meals along with encouragement to eat, wonderfully develope the appetites of children, and many of them are plump and healthy looking until the eleventh or twelfth month, when a check is perceived in the developmental process.

Heavy, unfermented, starchy kinds of food, given in large quantites, have still more frequently this effect. From a too exclusive, abundant

and prolonged use of arrowroot I have but too often noticed this in Pesth as well as in *this* town. Delicate children, however, endowed with the nervous temperament form an exception to this rule.

Impure air, according to my observations, is a more noxious agency in checking the developmental process, than unsuitable kinds of food. This becomes evident by comparison between the children of the poor population of large towns and those of agricultural and open country places. In a further part of these communications destined to etiological investigation of rachitism, the preeminently injurious influence of impure air will be rendered more conspicuous by a considerable number of relative facts.

When we consider and compare with each other the two following cases—one of a child fed upon coarse and heavy farinaceous articles, but enjoying the benefit of constant aëration of the blood in a pure atmosphere,—and the other, of a child fed upon highly nutritious aliment, but exposed to the inspiration of impure air, overcarbonized from animal exhalation: it is obvious, that the former of the two has the better chance of enjoying a normal sanguification. And again, in a third case—in that of a child overfed with food however good, it is easy to conceive that even the purest air of which either the interior or neighbourhood of a large town is capable, may be insufficient to answer the purposes of a healthy respiratory chemism. Experience fully confirms these theoretical conclusions; inasmuch as in and about large towns developmental disorders and rickets are by far more frequently observed in all classes, than in the open country, although it is more than probable that all kinds of errors in infantile diet obtain in the village as well as in the town.

Humid soil together with damp atmosphere, two circumstances peculiar to many parts of Manchester, seems also to exert a great influence in checking infantile vegetation; the more so, when such localities are densely surrounded by trees.

After all that I happen to have observed, investigated and compared, as regards the relative effects of the various influences of which mention has been hitherto made, I feel strongly convinced that a child fed upon innutritious kinds of food, but living in a dry, open, and well aërated situation, although it may grow spare and smaller than it ought to grow, it will remain healthy; a child, on the contrary, abundantly fed upon nutritious articles, but living under unfavourable circumstances as regards soil, atmosphere, and the air of dwellings,will most likely become impaired and disordered in its vegetation, in spite of its full and plump appearance.

With respect to the *influence of disease*—it is a remarkable fact, that many infants suffering from severe and protracted acute disease do not experience any notable check in their developmental progress. Acute

inflammations, for instance, of important organs, not seldom afflict tender nurslings, exhaust visibly their strength, emaciate their body to the condition of a living skeleton; and yet, amidst such serious sufferings, or upon recovery from them, their teeth appear at the normal period, their cranium becomes duly ossified, and they begin to walk without retardation, as if nothing serious had happened to them. Similar instances, more or less striking, have come under my notice in great numbers. The child of a friend of mine, some years ago, when three months old, had a severe pleuro-pneumonic attack; a large exudation took place; for more than three months the child was in a most critical condition; the absorption proceeded very slowly, and there was every evidence afterwards of partial hepatisation in both lungs. Both emaciation and debility were extreme, and complete recovery was not accomplished before its sixteenth month. Yet, this child cut the first incisors at the commencement of its seventh month, had eight teeth at the age of fourteen months, the fontanelles were perfectly ossified at twelve months, and at fourteen months, before convalescence was fully established, it walked freely.

Another case I remember with a most severe and tedious peritonitic exudation, lasting for many months, while the dentition and cranial ossification proceeded regularly, and at the age of fourteen months the child was able to walk, scarcely two months after it had left the bed of the children's hospital, where it was confined for the long period of seven months.

The influence of eruptive fevers appears however to be different; inasmuch as after measles especially, and not seldom after scarlatina, we notice a check and retardation of the developmental stages, and the rachitic tendency; small pox, I believe, has the same effect, although my recollections are less clear in this respect.

Without entering into minute investigation of the cause to which this difference between the effects of the one kind of acute disease and the other, upon the process of developmental vegetation, may be attributed—it will be proper to advert to the different "crasis" of the blood in acute inflammation and in eruptive fever; the crasis of the one represents what has been called the *hyperinosis*—overfibrinization, whilst in the eruptive dyscrasy there is an evident tendency to the contrary condition—to *hypinosis*. Furthermore, the crasis of the blood in eruptive fevers, from the beginning or onset of the specific process, produces spmptoms indicative of a severe disturbance of the spinal innervation—vomiting, spasmodic pain, convulsions, vehement diarrhœa—which is much less, or not at all observed in inflammations. These circumstances seem worthy of mention with respect to the pathogenetic relations between both classes of acute disease and the disturbance of the developmental process.

Chronic diseases of a topical character, although they may have a debilitating influence upon the system,—even diarrhœa arising from local abdominal affection, or considerable loss of blood, in otherwise good constitutions, have not proved in my experience to be evidently the cause of a check in the process of developmental vegetation. The same may be said of several forms of the vast and undetermined class of scrofulous dyscrasy, with the exception, however, of eczema, impetigo or achor of the scalp. At Pesth at least, and at Vienna, I have found that most of those infants, who suffered from this affection in the first year of age, were retarded in the ossification of the fontanelle. Tuberculous children, on the contrary, are frequently in advance with their teeth and cranial ossification.

To the foregoing observations I have to add: that some years ago, in the children's hospital at Pesth, I had the opportunity of examining several infants of that age which corresponds to the developmental stages in question—children which were for months under the influence of what we may call starvation, and yet in which, to the astonishment of those who saw them with me, the process of ossification was not disturbed in the least.

PATHOLOGICAL CONDITION, DISPOSITION, AND TREATMENT OF DISORDERED DEVELOPMENTAL VEGETATION.

Although, considering the agencies mentioned, under the influence of which the developmental progress of infants becomes checked, and observing the features and functions of such children, we might feel entitled to surmise constitutional debility as the proximate cause of the disorder; yet, as it is also observed in children who have not been under the influence of directly debilitating agencies; and as, on the other hand, many children though weakened and emaciated from acute inflammation or other causes, do not suffer any notable retardation in the developmental stages: the assumption of simple debility does not appear to give sufficient explanation of the disorder in question. The consideration also of some functional disorders—namely, an abnormal character of the stools (see p. 124,129) head-sweats, and sediment in the urine—commonly observed in instances where the cranial ossification is considerably retarded, leads to the supposition of some *specific* condition. An additional argument in favour of this view we find in the circumstance that a large proportion of such habits present some degree of the rachitic taint—and that every case of rachitism which declares itself about the twelfth or fifteenth month is constantly preceded by a check or retardation of the developmental stages. Rachitism, however, is certainly a specific morbid process.

We are led, therefore, to assume either a specific chemical alteration of the blood, or a peculiar disorder in the nervous system, as the proximate cause and pathological condition of the retarded and disordered developmental vegetation. Of these assumptions the former seems to be the more satisfactory, which is corroborated also by the circumstance, that the principal agencies capable of causing and curing the disorder in question (as for instance the bad or good qualities of air) affect evidently the blood primarily; of which the next consequence seems to be a feeble and disordered spinal innervation.

The diseases to which such children are especially liable have been mentioned in preceding pages; most of them arise from cerebro-spinal innervation, but have otherwise nothing in themselves to characterize the general pathological condition of the system, from which they arise.

In many instances a degree of anæmia is evident, manifested even, though not invariably, by the anæmic murmur. The muscles are flabby, and have in the dead bodies a pale aspect. The large abdominal veins and vessels of the liver contain a dark fluid blood, but the tissue itself of the liver looks pale. The brain is frequently large, not seldom softer than in other subjects; the spinal cord, on the contrary, is almost constantly thinner and softer, particularly downwards, than in children well developed.

Swelling of the mesenteric glands has been met with most frequently in dead bodies of such patients in the children's hospital at Pesth; occasionally these glands contain scrofulous deposits (pædatrophia); but if this be the case in a high degree, then atrophy will be the predominant morbid feature, and not developmental disorder.

Disposition. There is no one among the agencies and influences mentioned, which by itself would be sufficient to check the developmental vegetation, nor several of them combined together, in every case. This proves, that many infants have not the slightest disposition to become disordered in this way. And on the other hand, there is evidently a peculiar disposition in some infants, which even under the best hygienic and alimentary conditions leads to a retardation or check in the developmental vegetation; but it is impossible, I believe, to say precisely in what this disposition consists.

It is certain, that infants born with a large head and emaciated limbs are more liable than others to the disorder in question.

The children of aged parents, or of those of a phlegmatic temperament, having considerable embonpoint—especially when the mother has these attributes—present very commonly the same disposition.

Children of the lymphatic habit (see p. 15) having a fair, flax-like hair, have the same tendency.

On the contrary, children of a nervous temperament and habit (see

p. 18) are very seldom liable to this disorder, however delicate they may be.

There is every reason to believe that in some places, particularly in large towns, there is more tendency to a retarded and disordered progress of developmental vegetation, than in others. Such is the case in a great measure, I feel strongly convinced, in Manchester. And most probably the relative proportions of this tendency coincide with the relative rates of rachitism in different localities; but this statement is not brought as yet to decisive evidence by exact statistical accounts.

The *means of improving the impaired vegetative development* have been already mentioned in preceding pages—namely, a suitable kind of food; pure air—above all, marine air; sponging with cold water containing chloride of sodium in solution; codliver oil, iron, and quinine. These constitutional agencies and remedies will be more strictly considered and estimated in connection with rachitism in another place. The treatment which I have found to answer best in some secondary affections arising from the disordered developmental process, has been mentioned. I shall therefore limit myself here to a few remarks concerning the management of the *atonic diarrhœa*—a frequent derangement of children in whom cranial ossification and muscular development are considerably retarded—and of the *swelling of the mesenteric glands*, a morbid condition as frequently supposed in practice to exist in similar habits as its existence is seldom demonstrable in the living child.

The diarrhœa in question, which has been repeatedly alluded to in preceding pages, is very frequently misunderstood and treated upon erroneous principles. It most commonly occurs in children between the ages of eighteen and thirty months, having a large skull with the fontanelle either as yet widely open, or not duly closed; the majority of them are fat and plump looking, but late, and relative to their age not very clever, in walking; their muscles are flabby; the abdomen is bloated; the pelvis, namely the hip-bones, in many of these habits are rather small, and the spinous processes in the lumbar and sacral regions also small in size; the eyes generally have the expression of langour, and a blueish circle over the infraorbital margin. With these features there is little or nothing of harm connected; such children generally are quiet but in good spirits; during sleep many of them are liable to head-sweats. They eat a great deal, some of them of every kind of food, but commonly they show a predilection for bread and potatoes, and not a few manifest an unconquerable aversion to meat, and a degree of voracity for farinaceous articles and potatoes. At Pesth and Vienna I have found they prefer the coarse brown bread to every other article; in Manchester, where a similar kind of bread is seldom used in families, potatoes are the favourite food of children of such habits

The evacuations, as has been mentioned above (p. 124), consist of large quantities of a pultaceous, seldom very thin liquid, twice, thrice, or four times every day. The smell of these evacuations is exceedingly offensive, ammoniacal; the colour is dark-brown or reddish-brown, occasionally quite dark, but on the whole variable. Stools of this description occasionally alternate with smaller quantities of more consistent masses of a clayish appearance—with utter want of bile. Neither the one nor the other kind is usually preceded by pain or great uneasiness. The evacuations generally take place between evening and morning, in some instances at regular periods. Some of these children during their sleep pass urine and stools unconsciously.

The quality of the urine is variable; generally it is overacid; sometimes it forms a whitish mucous sediment; at other times, or in other cases of the kind, red gravel, or earthy phosphates, are deposited. The last named deposit, when it happens repeatedly and to some extent, not seldom indicates the existence of the rachitic diathesis. Generally, however, that changeable character of the urine affords no pathological indication except that of a disordered condition of the nutritive and assimilative processes. Nor are we enabled to derive better information from the properties of the stools. It appears not improbable, that the dark coloured masses passed by these habits are the result of a passive congestion in, and excretion of overcarbonized blood from, the hepatic and intestinal veins; and, again, that a higher degree of venous stagnation, without excretion or exudation of blood, produces the clayish stools.

On the whole, my observations speak to the effect that the atonic diarrhœa described above occurs more frequently in children whose developmental disorder is caused by overfeeding, consequently more frequently among the wealthy, than in children born and living under the reverse conditions (see p. 137). Indeed, I have not seen many such cases in the children's hospital of Pesth, but numbers of them in children of the opulent ranks of society in Pesth as well as in Manchester. It is striking to notice to what extent the habit, features, and circumstances connected with this diarrhœa, are identical in both these towns.

In regard to the *treatment* of diarrhœa, I have frequently seen used, and formerly made use myself of, the following remedies: hydr. cum creta, or magnesia with rhubarb, colombo or other vegetable tonics, each of these remedies alone, or combined with an opiate. The results obtained by these local indications and means are generally unsatisfactory, and an actual amendment of the digestion, secretions, and evacuations, can only be effected in these cases by suitable constitutional agencies, calculated to improve the blood and spinal innervation—in one word, the developmental vegetation.

In overfed and voracious children the large quantities of farinaceous articles, which they are commonly accustomed to eat, must be generally reduced; and the animal food which may be administered, must be adapted in form, quality, and quantity to their digestive powers—which are feeble and generally unfit to perfectly digest the muscular fibre of grown animals.

Codliver oil is undoubtedly the remedy best adapted for those cases, where besides the developmental retardation there is a notable degree of atrophy. Should the diarrhœa, instead of diminishing, at first be increased by it, this inconvenience is generally obviated by Dover's powder. But this will seldom be requisite when the oil is given after breakfast and an hour or two before the principal meal.

Sulphate of quinine, on the contrary, suits them best when administered in the evening, in small quantities, from gr. ss, to gr. jss. according to the age, continued for weeks or months. Not seldom after a few doses the evacuations improve, and the little patient will be seen to move about with more ease, and the pulse become fuller—all signs of an improved condition of the spinal innervation.

The *saccharo-carbonate of iron* is particularly beneficial in case of chloro-anæmic symptoms, not at all rare in those habits. In this case, the evacuations, instead of being large and dark coloured, are usually less in quantity and of a clayish appearance. I have frequently prescribed under such circumstances from gr. jjj to v of this preparation together with the above dose of quinine, once every evening.

It scarcely needs mentioning that cold sponging, a suitable change of air, and every hygienic influence capable of improving the process of developmental vegetation, are powerful remedies in this diarrhœa.

Swelling of the mesenteric glands is a local affection which, owing to the circumstance that children suffering from retarded developmental vegetation have almost invariably a bloated abdomen, is most frequently supposed by the practitioner to exist in such habits. If such be really the case—an assumption difficult to demonstrate, but rendered probable in many instances by a conspicuous degree of atrophy of the limbs, in contrast to the largely expanded abdomen—it is only by constitutional treatment that this local affection can be removed. Codliver oil is the sovereign remedy in this complication, assisted by strong saltbaths of a medium temperature. All the so called solvent remedies are unsuitable in children with impaired developmental vegetation; they do not support iodine; and calomel, besides being inefficacious upon the swollen glands, is certainly not a remedy favourably affecting their blood and system generally.

RICKETS.

The treatment of this subject is facilitated by the preceding observations on developmental disorders, inasmuch as the appearance of rickets is most generally preceded by some of the symptoms mentioned.

There are several reasons, however, which induce me to consider rickets with more than ordinary interest. In the first place, the extensive diffusion of the disorder in some districts and towns, at least in its slighter degrees, and its total absence in others; its vast pathological bearings where it exists; the obscurity of its etiology and nature; its origin, as at one time believed, and still *supposed* great frequency, in this island; its having been first noticed and described by English physicians—whence the German designation of "English disease"; and, finally, the circumstance of my being enabled to consider it, as regards its frequency, course, and causes, comparatively between Manchester and Pesth, two towns so differently situated and at the same time so different in character from each other, yet both having a comparatively high rate of rachitism in *all* classes.

In accordance with the modern tendency in medical science some observers have devoted their enquiries, and not without success, to the pathology of rachitic bones; but the *clinical* study of rachitism has not been much advanced in modern times. Indeed, comprehensive systematic works on diseases of children, lately published, contain no information on this disorder; other special treatises take too narrow views of its nature.

Rachitis is by many physicians of merit regarded as a form of scrofula. This position does not rest upon solid grounds; and at any rate "scrofulosis" has as yet so extensive and vague a signification, that it will lead only to erroneous or vague conclusions, unless we enquire into, and enable ourselves to understand those special forms—we might say *species*—of which that comprehensive *genus* is supposed by some authors to consist.

The following pages, however, far from supplying these defects, are merely destined to enquire into some important points of this disease, and to contribute by a comparative consideration of accumulated facts, to the illustration of its causes and nature, its preventive and curative means.

The importance of rachitism, its extensively noxious influence upon health and life, when considered upon the broad basis of a developmental and constitutional disease, must be evident to everybody. Indeed, here as well as in Hungary, according to my experience, a large proportion of children who at a period ranging between twelve and thirty months suffered from laryngeal spasm, idiopathic ecclampsia, or hydrocephalus, presented some marks of retarded development, and more or less of the rickety feature of the joints and ribs.

When in addition to the disorder in the joints and legs the chest as well has assumed a notable degree of rachitic deformity—the well known pigeon-breast with lateral compression, even though without curvature of the spine,—then any slight bronchial affection is sufficient to form a serious complaint, on account of its being attended more than in other subjects with laborious respiration and impeded circulation, with a tendency to passive congestion and carnification in the pulmonic parenchyma, venous hyperemia of the brain and spinal cord, diminished innervation to the heart, cardiospasmus—sudden death. Enlargement of the liver, constantly met with since the age of Glisson in the dead bodies of children with rachitic deformities of the chest is another, we may say natural consequence of the impeded circulation and imperfect decarbonisation of the blood in the lungs, and a cause of chemical and functional disorders in the digestive and assimilative functions. And although the curvature of the legs frequently disappears about the third or fourth year, this is not so generally the case with the rachitic feature of the chest; which not seldom deprives such subjects throughout life of the invigorating influence of an ample aëration of the blood, and consequently from enjoying that measure of health and strength, which they might have enjoyed otherwise. In a word, though few children die of rachitism as an immediate cause, many dangers and deaths arise indirectly and in different ways from the rachitic diathesis and deformity.

From some facts which I shall adduce it will become evident, that as yet we know very little of the real nature of rachitism; it will appear too, that the development of the disorder is connected on the one hand with some *internal* cause or disposition, the precise nature of which we do not comprehend; but that on the other hand its development frequently depends upon the influence of *external* agencies which it is possible to know and demonstrate. Where the former is in existence, there the disorder generally makes its appearance in spite of the most favourable hygienic conditions which may be furnished to the child; these cases however are not numerous. But even where no specific disposition can be discovered, by the operation of *certain* unfavourable external agencies the disorder will nevertheless come forth and spread over the

infantile population; whilst by correcting these faulty conditions, and subjecting the infantile organism to influences of a different character, the disorder may be prevented, or be kept down, improved, or even completely eradicated. These conditions undoubtedly merit our serious attention.

The term *rachitism* may be applied to the whole morbid process in question, before and without, or after and with the appearance of rickets, from the organic disposition and incipient stage up to the fully developed disease.

But before entering into further detail it will not be without interest to throw a glance on

THE EARLY HISTORY OF RICKETS.

Rickets, in popular German "Doppelglieder", double joints, is more commonly called (over all German and Austrian states) "die Englische Krankheit", the English disease. Is rickets really an eminently English disease? This question excited my attention, so soon as my practice in this town enabled me to institute a comparison between the frequency, causes, and features of the disorder as it exists here and in other countries.

The supposed origin and great frequency of rickets in this island, are assumptions of which the invalidity will be shewn hereafter; but most probably the term "English disease" arose from the circumstance, that Whistler (in 1645), Booth, and Glisson (soon afterwards), three English physicians, gave contemporaneously the first description of it, comprising the symptoms in coherent groups and their characteristic order of succession; whilst of spinal affections and gibbosity as mentioned by ancient writers anterior to that period, it is difficult to say, if those affections were really of rachitic origin, or consequent upon scrofulous deposits in the vertebræ. To this we must add that *Glisson*, a great medical authority of his day, in accordance with his contemporaries expresses the opinion, that the disease had originated in England about thirty years before he published the first edition of his work, therefore in the first half of the seventeenth century. Floyer mentioned its existence as early as 1620.

Those, however, who have paid attention to the causes and circumstances under which in our day the rachitic disposition arises and progresses towards full development of its characteristic features, must feel inclined to believe, that it existed, and perhaps very extensively, long before that time. Indeed, its most appreciable *external* causes, namely, improper modes of nursing and bringing up children, unhealthy conditions of the dwelling houses, and of the soil (for want of drainage), and—if we wish to trace farther the origin—unwholesome habits in dietetics, and

other vices of the progenitors: these causes are so intimately connected with national life, that they could scarcely have arisen at once, any more than they could have ceased at once. And comparing the present condition of these causes, with what we know of them in past ages, we should rather suspect a greater frequency and intensity of the disease in ratio of retrospective history and a more barbarous stage of nations, than the reverse. In fact—as we shall see by and by—some statements made by Glisson himself seem to speak in favour of this assumption.—It is not at all paradoxical to suppose that the disposition to, and incipient stage of, rachitism may have been overlooked, and consequently the deformities of the spine and of the bones looked upon in a different light, before these English physicians noticed it. When we consider how frequently even in our day no importance is accorded to the condition of a child, who has no teeth at the age of eight or nine months, who has the anterior fontanelle open, and is unable to walk, at the age of fifteen or sixteen months—provided it eats with a good appetite and presents no salient complaint: we may easily imagine, that some centuries ago, in times less enlightened, the slighter symptoms of the rachitic group have not been noticed at all—the less so perhaps when they were more general than in the present age—and less understood in their bearings. How many diseases have not been described first in our day! and nobody argues for this reason only that they did not exist in past ages.

Although there may have been some grounds, therefore, formerly, to consider rickets as eminently an English disease on account of its great frequency having been noticed by Glisson, and because *possibly* it *may* have been more frequent in ages past, owing to want of drainage and other conditions then prevalent: the theory of its having originated *here* in the first half of the seventeenth century, and thence increased and spread, rests on no valid grounds, and may be deservedly abandoned.

Nor is the opinion better founded, which has been entertained by some writers, by whom the origin and the diffusion of the disorder has been brought in connection with the importation of the potatoe to England (1586), and its extensive use so early as the first half of the seventeenth century. Undoubtedly, potatoes when freely used in the diet of young children, promote (according to our actual observation) the rachitic disposition where this exists; but, as we shall show in another place, there is no plausible reason for considering this vegetable as a specific and extensively noxious agent to which great effects could be attributed. To my knowledge no English author of the seventeenth century ascribes to potatoes or other special article of food the origin of rickets, and in Ireland (as shall be shewn hereafter), in spite of the extensive use of this vegetable by the poor classes, no such effect of it is observed.

Glisson considers as the internal cause of this affection principally the "*intemperies frigida et humida*", equivalents of our present still very imperfect notions of the phlegmatic and lymphatic temperament,—besides which he derives it from "*spirituum inopia et torpore*", i.e. vital debility, defective innervation. And among external causes he adduces first of all the *coldness* and *moisture* of the atmosphere; to which he ascribes the great frequency of the disease in this island, so far so that he considers it himself as an eminently English disease—"*morbum Anglis vernaculum*". (But Glisson had probably no opportunity of ascertaining its frequency in other countries.) Besides these general properties of the English climate, the eminent professor of Cambridge inculpates a number of vapours, mineral and narcotic for instance, and others, which at present are not admitted at all in the etiology of this disease; whilst experience every day proves that the most noxious influence upon the vegetation of children must be attributed to impure air, charged with animal exhalations.

Among improper kinds of food, which he mentions as causes of rickets, many such articles are included, to which our present experience could only accord a general disordering influence upon the system; or such ones as are scarcely used at present as food for children: salt fish, smoked meat, cheese, and the like. He mentions *overfeeding*, in a general sense; but lays no stress on the too early feeding and overfeeding with farinaceous articles, which we rightly class among the principal and most extensive *dietetic* causes of the disorder in question.

The reader will excuse my reviving some of the passages of this imperishable work, taken from its *third* Edition. (Glisson de Rachitide, 1671).

"Innotuit autem primum hic morbus (*quantum quidem ex aliorum relatione diligenti facto examine colligere potuimus*) in occidentalibus Angliae tractibus, in Comitatu *Dorset* et *Somerset*, triginta circcter retro ab hinc annis. Ab eo tempore paulatim eius *notitia* ad alia quoque loca *derivata est*, Londinum puta, Cantabrigiam, Oxoniam, immo omnes pene australes et occidentales Angliae partes: in septentrionalibus autem comitatibus multo rarius hic morbus occurrit, et vixdum vulgo communiter innotuit".

The first difficulty which Glisson encounters in respect of the above statements, is with the vulgar name "rickets",—the origin of which, as he says, nobody knows, nor is *he* able to find it out; but he guesses it must be a corruption of the scientific word ῥαχιτις. Admitted, that this improbable etimology be correct—yet, the obscurity of its date, and the general spread of the denomination, speak rather against the recent origin of the disease. According to *Mason Good's* clear deduction the term "rickets" is the diminutive of the Anglo-Saxon ꝛıcꝯ, ricg, or rick, a heap, or hump, figur. also back, and identical with the German "Rücke": A

humpback", signifies a rickety back. This deduction, I believe, points to the great antiquity of rickets!

The second and greater difficulty he has to deal with is the fact of the disease (as he says himself) being more frequent in the western and southern counties than towards the North of England, or in Scotland in general. Having established the "intemperiés (humorum) frigida and humida" as the internal cause of the disease, he finds it congruent "morbum hunc esse Anglis vernaculum", i. e. that rickets is an eminently English disease; because the cold and moist character of the climate imparts to its inhabitants the same qualities of temperament. But he rightly observes, according to this assumption the northern counties and Scotland should present a greater frequency of rickets, whilst in reality the reverse of this obtains. This difficulty Glisson endeavours to remove by saying, that the "cold and humid" temparament, as well as similar properties of the climate, are general, but not exclusive, nor sufficient causes of the disease; that he has reason to believe it prevails also very extensively in the Northern counties and in Scotland, but in a slighter degree, scarcely noticed by the public; and that the reason of its being milder in those parts of the Empire and more severe in the West, is to be found in the great wealth that flows hither in preference to other parts, and causes a less active and more effeminate, voluptuous, and exhausting mode of life, at variance with the more hardy customs of northern and Scotch populations. He says that the origin *(eruptio)* of the disease in the West of England has been preceded by long peace and security, and consequent wealth, with its effeminating influence. And in the course of these considerations Glisson adduces a statement which in the present day we find generally contradicted by facts, viz. that the disease prevailed *principally* among the wealthy classes, among whom also it first originated. Their vital energies—he says—becoming gradually exhausted by luxury, their children are liable to rickets; and for the same reason, many noble English families, according to him, have died out.

This remarkable argumentation runs in the following words:
—"dicimus frequentiam hujus morbi in Anglia multum fuisse promotam a diuturna ac secura pace regionis primam eius eruptionem precedente. Per hanc enim *ditiores familiæ, quas primas hic morbus infestavit, et adhuc præ aliis infestat*, otio ac delicatiori molliorique vitæ generi se addixerant",—"adeoque liberos huic morbo facile obnoxios procrearant". Glisson, de rhachitide, Edit. 3tia. 1671, page 248). And a little farther he says: "causam esse affluentiam omnium bonorum in australibus hisce et occidentalibus Angliæ partibus. Est enim hæc pars Angliæ multo florentissima, opulentissima, feracissima, voluptatis omnimode illecebris instructissima. Haud mirum ergo si hic primo hominum vivendi genus

mollescere, vires labescere, corporis robur et tonus exsolvi coeperit".—"Henrici Octavi linea forse extincta est ob similem causam".

It is now exactly two centuries since these statements were first published, and as regards the non-universality of rachitism in this Empire, and its lesser frequency and intensity in the northern parts, especially in Scotland, I shall take opportunity hereafter of mentioning some facts, which clearly prove that no change has taken place in this respect after so long a series of years. But as regards another assertion, namely, the prevalence of the disease in the wealthy classes, undoubtedly in the present day in Hungary as well as in England and everywhere else, we may say, where the disease exists, it is not among the wealthy but among the poor classes that we find it in preponderating proportion.

Is there any plausible reason to account for this at present reversed proportion of frequency?—It is certain, since the epoch of Glisson great changes have taken place in the mode of living of both classes of this Kingdom. The gross luxury and disordered habits of which historians accuse the higher ranks of the seventeenth century, have gradually disappeared—so much so, that the wealthy English families of the present day—nobility as well as trading classes—in general may serve as examples for regular and decent life. This change may be considered as *one*, but certainly not sufficient, reason to account for the diminished frequency and intensity of rickets among the wealthy classes; better drainage of the country, as we have it at present, and, above all, a better mode of building and ventilating houses: these are probably more efficient causes of the decrease of this disorder. But this applies to the poor as well as to the wealthy. Indeed, it is not so easy to find an explanation for a supposed increase of the same disorder among the poor. It is true, the working classes who at present live crowded together by thousands in the narrow quarters of large towns, and breathe during ten or twelve hours each day the close air of industrial establishments—among the children of whom in this town and others of the same character a great prevalence of rickets is observed—lived two centuries ago under different circumstances, so that they themselves and their children in all probability at that period enjoyed much more the benefits of fresh air, and more healthful occupations. But as regards the interior of their dwellings, and nursing, feeding and management of their children: in this respect it is reasonable to think, that their condition has become improved; consequently, unless we assume—although without proofs in support of the assumption—that the practice and observations of the illustrious author just quoted did not extend to the lower classes (as is the case with many practitioners in the present day), we are at a loss how to explain satisfactorily his statement of the greater frequency of the disease among the wealthy than among the poor.

In the works of medical writers of all nations, until within a short period of the present day, we not unfrequently meet with the opinion, that the wealthy are more subject to disease than the poor—a belief, which in modern times has been limited almost exclusively to gout, hæmorrhoids and nervous complaints. The etiology and pathogeny of rachitism, as exposed in the treatise of Glisson, is very much in accordance with the view alluded to, and at variance with our present notions, according to which we find many more causes at work in the production of the rachitic dyscrasy among the poor classes, than among the wealthy.

Setting aside similar imperfections, the monograph of Glisson will ever remain a groundwork of invaluable merit; of which—as there exist only very few copies in England, and perhaps not more on the Continent—it would be well desirable, I am sure, to have a new edition. When perusing it, it cannot fail to make upon us the impression of genuine and rigid observation as regards the symptoms and severity of rachitism as observed by the author at his age. His pathological anatomy of the disease, as far as the knife and the eye, unassisted by the microscope and organic chemistry, could reach, approaches very much the present state of knowledge.

Besides the large volume and somewhat soft condition of the brain, swelling of the liver and of the mesenteric glands, and other alterations of a still more secondary nature—the like as are observed by ourselves in dead bodies of rachitic children—Glisson mentions an anatomical alteration in some of the blood-vessels (as having been observed by one of his contemporaries, and which observation he believes to be correct), namely: that the veins and arteries which run to the "first affected" parts (joints and bones) are uncommonly small, whilst the carotids and jugular veins are disproportionately enlarged. His words run thus: "Denique observavit e nobis aliquis in hoc ipso affectu, se aliquoties deprehendisse in dissectis post mortem, venas ac arterias ad partes quidem primo affectas tendentes graciliores debito; verum arterias carotides et venas jugulares improportionate ampliatas; et credibile est, hoc perpetuo observari potuisse. si in mentem dissecantium hoc ipsum attentius contemplari venisset." (Glisson, p. 97).

So far as I know this anatomical condition of the blood-vessels has not been noticed in our day; it has escaped at least, I must confess, entirely my attention in the dissecting room.

The diseases, to which Glisson found rachitic children to be subject, he distinguishes in accidental complications, and in essential connections and consequences of rachitism; among the latter he names hydrocephalus, of which he says: "magnam obtinet cum hoc morbo affinitatem" (p. 266).

His *pathology* is partly *dynamistic* (referrible to vitiated innervation), partly *humoral*, surmising an imperfect condition of the blood. The local disorders of the bones he considers as secondary effects and as having no

essential importance in the pathogenetic process—"ea non pertinere ad essentiam morbi primariam" (p. 59).

He declares the blood not to be sufficiently vitalized—"sangvis hicce imperfectis spiritibus imbutus" (p. 95).

Defective spinal innervation, as proximate cause of the disease, is expressed by the illustrious author in the following words: "quamvis ergo *cerebrum* in hoc morbo *debitum forte influxum* ex parte sua præbeat, vix tamen, et ne vix quidem fieri potest, ut sufficienti gradu tensitatem suam spinali medullæ extra calvariam, nervisque inde ortis, etc, ob intemperiem (frigidam), torporem et inopiam spirituum insitorum—communicet". And, in accordance with this assumption, he notices *muscular languor* and *imperfect walking* as an earliest symptom of the disease. "Etenim pueri hoc morbo afflicti ab ipso eius principio minus robuste se movent".

It appears that the learned professor of Cambridge must have seen a great number of very severe cases, and dissected many bodies of children dead of that disease; whilst at present, in spite of the infinitely more extensive medical observation, high stages of the disease, and fatal cases directly from this cause, seem to be a comparatively rare occurrence. They are rare even in this town, where the disposition and slight symptoms of it prevail to a great extent—extremely rare at least in the wealthier classes; and according to trustworthy information which I have received, the same may be said of other towns of England, Cambridge not excepted. We cannot doubt therefore, that the disease, which has decreased among the wealthy, will for similar reasons gradually diminish also among the children of the poor, viz. by improvements in their dwelling-houses, by correcter notions on diet and hygiene of children, and ampler means to carry them into effect.

I am sorry that I have not at command such literary means as would enable me to compare the *continental history* of rickets, with that of England. So far as I know, no continental author of notoriety wrote on the subject during the seventeenth century. *Büchner's* work on rachitis appeared in the earliest part of the eighteenth century, followed by that of *Leidenfrost* and some others; towards the end of the eighteenth century several treatises were published in Italy and France as well as in Germany; but nothing exists, to my knowledge, of so early a period, as to serve the purpose of comparison in the history of rickets at the same age, or soon after that of the first English authors.

I shall not therefore, longer detain the reader with historical remarks, but will proceed to direct attention to the actual condition of the disorder, so far as my experience and received information will allow.

MODERN NOTIONS ON RACHITISM.

The anatomical and chemical patholoy of rickets has derived con-

siderable advances from the modern spirit and means of physical investigation. The origin, however, of the chemical and anatomical disorder of the bones, has not been traced as yet to its roots in the life process. To promote this purpose it is desirable, that *clinical observation* —which in modern times has rather been neglected in this disease as in many others—may render assistance to the enquiries carried on by means of the knife, microscope, and chemical analysis.

Some German physicians have noticed an *acute form of rachitis*, which, it would appear, has been first observed and described by the illustrious *J. P. Frank* in his "Discursus de rhachitide acuta" (Opuscula medici argumenti, Lipsiæ, 1790); he says, at least himself: "a nemine quod sciam hucusque descripta."

I am not aware that this form has been described by any English physician, and it is not probable that in general it is a frequent occurrence. I have not heard it mentioned in Manchester, nor have I been struck by its existence—though it may occur—at Pesth.

Lately *Dr. Stiebel sen.*, a distinguished physician of Frankfort, has given a concise description of it, in which he says: the first symptoms are indigestion, and abundant urine with a sediment of phosphate of lime; the pulse rises above 140; an almost constant symptom is profuse perspiration of the head; the rest of the body being hot and dry. The countenance of the child soon collapses and takes a senile appearance; rapid emaciation takes place, whilst the abdomen becomes puffed up. The little sufferer is restless and miserable, frequently creating moaning and plaintive sounds.

This is the *first stage* of the disease, which may last for weeks or months, ending in death from anæmia and exhaustion; or passing slowly into convalescence; or increasing to a more advanced stage.

The characteristic symptom of the *second stage* is the *straight stretched posture* of the little patient, its limbs being constantly extended, and painful to any touch or movement. During this stage the symptoms mentioned increase, and death ensues from the same cause; or recovery takes place slowly, under the gradual disappearance of the symptoms. During these two stages commonly there is no appearance of rickets in the joints and long bones.

Sometimes however a rapid swelling and softening of the epiphyses is observed, with simultaneous curvature of the diaphyses. This symptom represents the *third stage* of this disease, followed more frequently by death than by recovery.

According to the above named author acute rachitis is only met with in children of poor people that are nursed without the breast, as early as three or four weeks after birth.

I must confess that, although in the children's hospital at Pesth there have been cases presenting a group of symptoms to a great extent analogous to those described, yet, the phosphate of lime sediment, and in general the last mentioned stage with rachitic alteration in the bones, were not observed in them. I clearly remember, that I have looked upon such cases as were marked only by the symptoms above described, and representing the two first stages of acute rachitis, as a kind of acute infantile atrophy. I yield willingly to the belief however, that, besides those named, other observers may have seen this disease in its fully developed rachitic features. It is not improbable also, that influences and circumstances capable of producing it may exist in some places, and be totally absent in others; and therefore the disease may not be observable everywhere.

As the same agencies are mentioned as causes of acute rachitis which give rise to the usual chronic form, the difference between them, as regards their symptoms and course, may therefore merely depend upon the difference of the respective ages. It is remarkable indeed, that the occurrence of acute rachitis is decidedly limited to the first few weeks or months of life—an age at which the chronic form is scarcely ever seen.

The treatment according to Dr. Stiebel must be such as are calculated to improve digestion and assimilation, and to counteract superabundant acidity; these indications he fulfills by the administration of small doses of carbonate of lime. Iron is also recommended by this author, whilst codliver oil he found seldom to agree with such patients.

The *chronic form of rachitis* is that which most generally has been observed and described ever since the time of Glisson.

This is a disorder so characteristic and so well known in its features, that it would be surperfluous for our present purpose to give a minute description of it.

It is generally admitted, that lymphatic children—considered as such according to the imperfect notions we possess as yet on temperaments (see p. 15), are the most liable to rachitis, those namely who have a large, flat, and angular skull, with retarded ossification.

In the immense majority of instances the age at which rachitism shows its first symptoms, in my experience ranges between the first *nine and eighteen months;* and the children afflicted with it are almost invariably such as are late in their dentition, closure of the fontanelle, and walking—so much so, that all the phoenomena and disorders (mentioned in preceding pages) peculiar to children with retarded developmental vegetation, belong essentially to the pathology of rachitism.

In the case however, where rickets develops itself after the fontanelle has become closed, and after walking has been already performed, this

function generally retrogrades, and muscular languor announces the approach of the disease. There is also commonly a check given to the further progress of dentition noticed at this time. The digestive functions of such children almost invariably present some disturbance.

Pondering the prondroma—the symptoms namely, which partly consist in a disordered state of the abdominal funtions, partly in a degree of languor referrible to some defect in the hæmatosis, and which constantly persist through the whole course of the disease—we cannot hesitate to define rachitism as a feeble, slow, and disordered process of developmental vegetation, with the *visible* results of retarded and imperfect ossification, swelling and curvature of bones, and the less salient, but not less important results of imperfect hæmatosis, namely: thin and flabby muscles, and feebleness of spinal innervation, with its consequences upon the locomotive, digestive, and vegetative functions of the individual.

The actual course of this disease seldom protracts itself beyond the age of two to three years, in most cases improvement commences before one year of its duration has expired, or even much sooner than that. Death is seldom caused directly by rachitic deformity, but frequently by secondary or accidental affections.

The anatomical investigation of the dead bodies of rachitic children has not led as yet to the discovery of any such morbid alteration as might tend to a better understanding of the nature of this disease. I have had myself numerous opportunities of dissecting children who have died at an early stage of rachitism of convulsion, hydrocephalus, or some other accidental disease; in which, however, there was no striking morbid appearance of the blood, or internal organs. And again, the pathological alterations which are observed in those who die at an advanced stage of rachitism—namely, the anæmic aspect of the muscles and internal organs, a dark, over-carbonized appearance of the blood, and enlargement of the liver—these alterations appear but as the immediate and necessary effects of the compressed state of the chest, and the impeded respiration and pulmonary circulation thereupon consequent—in short, these are mere *effects* of mechanical compression, and devoid of other signification.

There is one post mortem appearance however, which I think worthy of notice. During a period of about three years in the children's hospital of Pesth and in private practice, I directed particular attention to the conditions of the brain and spinal marrow in rachitic children. The number of post mortem inspections of such subjects (the immediate causes of death having been various), amounted during that short period, so far as I am able to recollect, to about forty or forty-five; and the results as regards the brain and spinal marrow were these: the great majority—I am not mistaken in saying, seven or eight out of each ten of them—had a more

or less considerably enlarged brain; in some of them this organ appeared strikingly anæmic and soft, in those namely who died of long protracted disease; but in many of them the consistence and appearance of the cerebral substance was normal. In all those, however, having an enlarged brain, with, as well as without abnormal softening, the spinal cord appeared to be abnormally thin, more so particularly in its lower parts, and most commonly softer than in the normal state, not seldom approaching a pultaceous consistence. The spinous processes of the vertebræ, and the hips themselves were small-sized in these children.

Researches into the *pathological anatomy of rachitic* bones have, in modern times, been so successfully prosecuted that little seems to be left for the labours of future inquirers. *Guêrin*, who was the first to investigate this subject with scientific precision, has furnished the following results: from the first stage of rachitis a process of softening takes place in the epiphyses and diaphyses of the bones, in the spongy structure of which parts a dark red blood becomes effused. This at first is considerably fluid, but afterwards it assumes a gelatinous character, and gives rise to the formation of capillary vessels. At the second stage of the disease, a new formation of a "spongioid" structure is observed, consisting of minute "areolæ" which are more or less condensed in different parts. The periosteum swells and becomes vascular. At a still further stage, the areolar tissue changes into a mass of unequal and irregular cells, containing an oily fluid, and the bone undergoes a process of "consumption." This theory of rachitic—we may say, *specific softening*, has undergone a very essential change by the microscopic anatomical investigations of rachitic bones by some German pathologists, among whom *Virchow* has arrived at the most decisive results.

According to this acute and indefatigable observer, all the same vegetative changes are going on in the rachitic bone which in the normally conditioned bone prepare the growth, with this exception only: that in the former no phosphate of lime is deposited. He distinguishes in the growing bone *four strata*: 1st, the spongy, consisting of bars (Balken) of normal bone structure; 2nd, the yellowish spongioid stratum, with groups of large cartilage cells; 3rd, the blueish stratum, with large celled cartilage growth; and 4th, the common cartilage.

Now, in the normally growing bone an *endogenous* formation of cells takes place in the cartilage stratum; medullary spaces (Mark-Räume), and bone corpuscles are formed; and all these preparatory processes are observed also in the rachitic bone, but without subsequent deposition, or with insufficient deposition, of phosphate of lime, therefore, without ossification of these structures.

To complete this theory we may safely add the remark, that, in bone as in other organic structures a continuous vital movement obtains

between the functions of absorption and deposition: so it is obvious, that at a high stage of rachitism the already deposited phosphate of lime becomes dissolved and absorbed without an adequate new supply of this crystalizable salt.

To explain more fully the pathological anatomy of the rachitic bone, a *chemical theory* has been advanced, of which the leading idea was conceived long since by the illustrious *Fourcroy*. It was he who first stated that by the presence in the system of a free acid the phosphate of lime is dissolved and carried off by the urine.

In modern times *G. W. Weatherhead* has endeavoured to show, that this free and superabundant acid in rachitic children is the phosphoric.

Marchand, on the contrary, argues that it is lactic acid; for the superabundant formation of which there is so much liability in the food and digestive functions of infants.

Certain it is, that phosphate of lime cannot occur in the blood as such, from its being an insoluble salt, but only as a super-phosphate, which is soluble; or else some other free acid must serve the same purpose.

The tenour of these theories then is: that some superabundant acid prevents the deposition of the uncrystallizable (neutral) phosphate of lime in the bone-celles, and is the cause at the same time of its being carried out of the body along with the urine.

But the question which bears especially upon the *nature of rachitism* is this: whence arises, and in what anomaly of the life process is founded, that disordered chemism peculiar to rickets? This has not been satisfactorily answered as yet.

As *causes of rachitism* the following agencies and circumstances are generally adduced: a specific disposition in some children, inherited from old, weakly or sick parents; early weaning; improper food; uncleanliness of the skin; impure air; and a northern climate.

Among these agencies improper food is that which is regarded as being the most extensively noxious in producing rickets; and it is particularly to the use of heavy farinacious and starchy articles that such an effect is attributed. The prevailing chemical notions on the nature of the disease in question seem to direct general attention more especially towards the improper kind and mode of nourishment, than to other causes.

Formerly I myself was of the opinion that the too early use of heavy farinaceous or starchy food is the most frequent cause of rickets. Further investigations, however, on this subject, and a comparative consideration of the noxious agencies as observed in *this* country with what I have observed of their influence on the Continent, especially at Pesth, have produced a change in my etiological views.

I firmly believe at present, that the unwholesome nature of the inspired air, is a more powerful cause of rickets than any other agency.

And from this belief follows another, namely: that from an improved mode of building the towns, with spacious streets, having good drainage, ventilation and cleansing of dwellings, etc., much may be effected towards preventing or lessening the rachitic tendency of children. This statement does not exclude, of course, the importance of a suitable infantile diet. Next to the impure air of overcrowded quarters, and paramount among dietetic causes of rachitism, stands overfeeding with farinaceous and starchy food.

Nothing is more certain, in fine, than that the chemical indication of counteracting and correcting the surmised superabundant acidity in rachitic children, by alcaline remedies—magnesia, lime water, or carbonate of lime—leads to no successful results.

I shall now proceed to adduce such facts, as I have been able to gather, relative to the frequency of the disorder in question under various hygienic influences, upon an extended basis.

RELATIVE FREQUENCY OF RACHITISM UNDER DIFFERENT CLIMATIC, LOCAL, AND SOCIAL CONDITIONS.

The same "desideratum", which in former pages was mentioned regarding topographical statistics on disordered vegetation, in different countries, climates, and races, and under different national and social conditions, and habits—applies with equal force to rickets, in connection with the impaired progress of infantile development.

With respect to *climatic influence*, in the production as well as prevention of this disease, this is demonstrable to evidence by facts; but in reference to the question, as to what are the healthy or unhealthy properties of climate in respect to it, our notions seem to be as yet imperfect and unsatisfactory.

From the important part which the lungs and skin have to perform in the animal chemism, it is easy to conceive, that a difference must arise in the blood and vegetation from a plus or minus of inspired oxygen with a greater or less quantity of moisture,—or from varying conjoint conditions of heat, electricity, and moisture. It is not improbable, that from the different relation and mutual influence between qualities of the soil and qualities of the surrounding atmosphere, agencies may result affecting animal vegetation, of which we are as yet unable to comprehend the real nature. May be, perhaps, that even in Manchester, as well as other places, the prevalence of retarded and disordered vegetation and of rickets is partly dependent upon such circumstances.

Very remarkable, and impossible as yet to explain, is the fact, noticed as early as in the days of Glisson, and persisting unvaried in the present

age, that in the North of this Empire, namely in Scotland, very little is to be found of rachitism. This is an unquestionable proof of climatic influence upon developmental vegetation. Besides this great enigma of climatic or cosmo-telluric influence at large, there is no little obscurity left as regards causal agencies—atmospheric, telluric, and social—of a more limited extent, to the presence or absence of which a great share may be attributed in the frequency or absence of rachitism in various districts of the same country, or localities of the same district.

It is probable that one day such agents will be known, and duly estimated. Meanwhile it is highly desirable, that those who take an interest in infantile physiology and pathology, should exert themselves in their respective countries and localities, in establishing statistical inquiries concerning rachitism in connection with *such* local circumstances as may be available in the present stage of medical observation, and communicate them through the medium of the medical press.

I am not in possession myself of observations statistically arranged on this disorder from continental countries; some results, however, of personal observation, with information received from others in Austria and Hungary, I shall briefly expose hearafter in this treatise.

I will venture however to offer in this place a condensed extract of some communications with which I have been favoured from practitioners in various parts of Britain, containing facts which speak very intelligibly on some important etiological points of the disease in question.

It would appear from these communications that rachitism is frequent in some English towns, but by no means generally, and the least so in agricultural districts; in Scotland it is generally of rare occurrence, or observed only in a slight degree—as was mentioned already in a quotation from Glisson. Altogether it might be difficult to prove, and I dare say is not even probable, that the "English disease" is in the present age more frequent in England than in many countries of central and northern Europe, and according to some reports from children's hospitals, and remarks to be found in several medical journals and published works, confirmed by my personal impressions and recollections, it seems to be even less frequent here, at least in the wealthier ranks of society, than in many continental countries; this I am sure is certainly the case in comparison with Austria and Hungary.

The notion therefore. entertained and expressed by writers: that rachitism is more frequent in northern than in southern countries, is contradicted by the reverse circumstance, so far as regards Scotland. In Norway, Sweden, and Denmark, the case may be different, although it has not been proved by stringent facts.

If we speak, however, of the large and strictly manufacturing towns of

England, with their crowded operative population, the rate of rachitism most probably is above that of continental towns; but we must not overlook the circumstance, that there are no towns in other countries of such an extensive and strictly manufacturing character as these.

Glisson mentions the origin and peculiar prevalence of rickets in the South and West of England; he especially names Oxford, Cambridge, and London, and assigns the greatest frequency of it to the wealthy classes.

Now, with respect to *Cambridge*, my information derived from two sources speaks to the effect, that in our day the disease is seldom observed in the wealthy classes of that town, and among the poor only in *some* quarters, in no striking frequency.

Mr. *G. Humphry*, surgeon to the Addenbrook hospital—a gentleman who, following the example of his immortal predecessor, has devoted no little attention to the subject of rickets, and who has delivered at Cambridge an interesting course of lectures on the diseases of bones—says in a note kindly directed to me: "I do not think the disorder is very frequently observed in Cambridge and the neighbourhood. Comparing what I have seen in Cambridge with what I saw during three years attendance at the Norwich hospital, and three years attendance at St. Bartholomew's in London, I should say that it is not more frequently observed in Cambridge than in the other two localities, if so frequently."

Mr. Humphry continues to say "that the cases of infantile rickets which he has seen, have been *almost exclusively among the poor classes.*" He seldom sees a case in private practice.

Here then is, we may safely say, a much altered condition of this disease, as regards its frequency in Cambridge in general; and it is perfectly the reverse of what was observed by Glisson with respect to its relative prevalence among the wealthy rather than the poor (see p. 150).

Mr. H. however, well aware of this change, observes: "It must be borne in mind, that the sanitary condition of this district has undergone great changes since the days of Glisson by drainage and other improvements."

London, owing to its vast territory, and the great variation in the condition of its several quarters, opposes great difficulties to the gathering in a short space of time, and by the limited means which single practitioners possess, any valuable accounts on the relative frequency of rickets in that gigantic city; this much, however, I am able to state from two credible authorities, that the disorder prevails to any considerable extent in London *only in some of the poorest districts*, and is of rare occurrence among the wealthy ranks.

From the information kindly forwarded to me from a gentleman having had twenty-five years extensive practice in *Bristol*, it appears, that very little

of it is observed in that town, even among the poor. Bristol however is situated west from London; a manufacturing town with about 140,000 inhabitants. The poor quarters are said to be in a better condition than those of London; and besides this important circumstance we must perhaps attribute some degree of favourable influence to the *marine atmosphere*. of which Bristol may be said in some measure to partake.

In *Norwich*, also a manufacturing town, north north-east from London, an inland city, with a number of narrow streets and many of them badly paved, the disorder is not common; it does occur, but not frequently, among the poor and ill fed.

Again, in *Bath*, south-west of London, and near Bristol, but totally different from it in its character, being a splendid and celebrated watering resort for wealthy people, and in a most healthy situation—the poor offer a high proportion of rachitism, and an appalling mortality; whilst the wealthy classes present a most favourable sanitary state. According to Dr. Tunstall (author of a work on the climate of Bath), who has favoured a colleague of mine with details on the subject, the cause of the prevalence of impaired vegetation and rachitism among the poor of Bath is evidently found in their faulty localities and dwellings, and in the improper nourishment of their children; they are almost totally deprived of animal food, and feed infants of the tenderest age upon gruel and other farinaceous articles, and a great proportion of bread and sugar; to the effect of which that gentlemen distinctly attributes the retardation of ossification—evidently in a chemical point of view.

Equally striking, but in the very reverse sense of this, is the condition of *Thirsk*—a small agricultural town, with an inland situation, north from London, standing at a medium elevation above the sea level, within an amphitheatre of a somewhat distant range of hills, not over-crowded, and enjoying the benefits of good sanitary arrangements. A professional gentleman having an extensive town and country practice there, states rachitism to be of exceedingly rare occurence, *notwithstanding the great poverty among the agricultural labourers*. We are told that many large families residing in that neighbourhood do not take butchers meat oftener than once or twice a year, and yet their children are active and healthy. In the town of Thirsk there are about 350 births per annum (lately more than this number); yet the gentleman alluded to thinks he scarcely sees more than one or two cases of rickets in a year, and all that he has seen of this disorder he could distinctly trace to heriditary predisposition, or otherwise unhealthy, or dissipated habits of the parents or ancestors. Frequent, on the contrary, are diseases of the heads of the long bones, and spinal curvature of adults (the last named affection indeed is often of the same nature as the caries of joints—tubercular), a circumstance not without

interest, which I shall have occasion to mention also in the accounts from Scotland analogous to those received from Thirsk: while Manchester, with a great proportion of rachitism, presents comparatively but a slight proportion of scrofulous and tubercular affections.

According to numerous accounts I have received, the disorder seems to be scarcely anywhere so prevalent as in *Manchester*. It is true the poor classes also of *Birmingham*, *Stockport*, and some other manufacturing towns are said to furnish a great proportion of these cases; but not perhaps to the same extent as in Manchester, where the disorder is not only freqent among the poor, but also among other ranks of society.

Manchester, however, being the scene of my actual observation, and offering so ample a field for enquiry into the subject, I shall consider its condition with respect to rachitism more minutely hereafter, and merely mention at present: that whilst in this town the disorder prevails to so great an extent, comparatively in *Liverpool*, which is only thirty miles distant from Manchester, and nearly as populous, with less satisfactory sanitary arrangements, a considerably higher rate of mortality generally, and especially from tubercular consumption—the rachitic disposition is not very prevalent. Scarcely at all is it seen in the wealthy classes of that town, and among the poor only in some very bad quarters, and principally among the Irish. This statement almost verbally coincides with the observations of two practitioners of that town, both competent judges. One of these gentlemen, who happens to have been some years ago connected with the Manchester Infirmary, says: "I saw more cases of the disorder in one week in the out-patient room of the Manchester Infirmary, than in a whole year in the Liverpool Dispensary; although the number of children brought to the latter establishment is at least equal to that of the out-patient room of the Manchester Hospital". He notices particularly the neighbourhood of Vauxhall-road (Liverpool) as the most prolific in rachitism; the dwellings of its poor Irish population being situated near the banks of the canal, a locality very defective in its sanitary arrangements. These people feed their children almost exclusively upon potatoes.

Undoubtedly, as regards the character of the population of both these large towns, Liverpool very much differs from Manchester; the latter being quite of a manufacturing character, the former a trading seaport, certainly the largest town of this kind in the world. But although this makes a difference with respect to the mode of life and habits of the poor classes, and may have a different influence in the vegetative disorders of their children—yet, it is not sufficient to account for the prevalence of these disorders in Manchester among *wealthy* families; this being a circumstance as it would appear almost peculiar to this town. But one powerful advantage, I believe, as regards developmental vegetation of

children, which wherever we meet with it proves to be of great importance as regards the vigorous progress of the vegetative functions and stages of development, is on the side of Liverpool—this circumstance is, that it enjoys the marine atmosphere.

Southport affords a striking instance in corroboration of this statement. According to accounts with which a friend has favoured me, there is no trace of the disorder in question in any degree amongst the natives of that town. The place is situated only about thirty miles from Manchester, and scarcely twenty from Liverpool, on the west coast close to the shore, entirely on a dry sandy soil, by which it is also surrounded to a great distance—a place very much frequented by the public of Manchester. The same may be said of *Blackpool*, which is situated a little more northward, on the same coast; both being strictly sea bathing places. In both these towns rachitism is of rare occurrence; and the same immunity has been stated in a letter of a friend with regard to *Scarborough*, a splendid marine town, and fashionable sea bathing place, on the east coast of England.

This information together with some besides (but of a less explicit character), which I have received respecting the sanitary condition of children in other sea side places of this island, seem to encourage the belief, that the sea-atmosphere very much favours infantile development, and possesses a most efficient curative power for the whole group of diseases arising from retarded and disordered infantile vegetation. It would be highly interesting, however, to be in possession of accurate accounts of this kind from sea-places of other countries and climates; because climate may make a difference.

I can scarcely refrain from mentioning the striking impulse which the vegetative functions of children receive, for whom either Southport or Blackpool is recommended for the sake of atmosphere change; their improvement becomes visible in a few days. On the other hand, the gentleman (a practitioner in the former of these places) whose accounts have been mentioned above—says: that those rachitic cases which he has seen, are imported ones in children of strumous parents who have come to Southport as invalids to improve their health, and have married and settled there. This fact, again, is interesting so far as it proves the power of hereditary influence in the production of this disease—a power which of itself is sufficient to call the disease into existence even under the influence of conditions the most favourable to infantile vegetation. The poor population of Southport live through the greatest part of the year upon very limited means. Their children are generally suckled till the 12th or 16th month; but earlier than at this age they receive regularly potatoes and buttermilk; sometimes also bread and milk, and only occasionally a little bacon. They possess two advantages however, which are of the greatest importance towards healthy development: marine air and good ventilation; the doors of the houses

being almost constantly open, and no narrow streets existing to interfere with the freedom of atmospheric circulation.

The same may be said of Blackpool, which has a higher sea-beach and more bracing atmosphere, and is therefore in some individual cases in the warmer season preferable to Southport. In both places I have had opportunities of noticing the easier progress of dentition, and general improvement of children with retarded vegetation. In some children however, endowed with a delicate nervous system, or some inexplicible disposition, I have noticed an intolerance of the sea-air in general. Fellow practitioners having had long and extensive experience in this respect, have arrived at the same favourable result in the generality of cases.

Strictly considered, we find three joint conditions in these sea-coast residences: the marine air, good ventilation, and dry soil. Among these conditions the first, i. e. marine atmosphere—charged with the vapour of salt water—is perhaps the most efficient, in giving an impulse to the chemism and vitalism of the blood; and by means of this to the vitalism of the spinal marrow, in heightening its innervating power.

Had these places extensive poor districts with narrow, crowded streets and dwellings, probably the beneficient effects of atmosphere and soil might be somewhat diminished.

In *Bradford* (Yorkshire), a purely manufacturing town, with about 120,000 inhabitants, according to the extensive experience of my friends Dr. Macturk and Mr. Douglas, presents very few cases of rickets. This town, although thoroughly manufacturing, is situated however upon an uneven surface, consequently well ventilated, and without any such extensive overcrowded quarters as Manchester possesses.

Newcastle-on-Tyne, a town situated considerably above the sea-level, near the frontiers of Scotland—which country has been already mentioned for its healthful condition as regards the infantile disorders now under consideration—about eight miles from the coast, and therefore not beyond the influence of the marine atmosphere—is nevertheless far from being free from rachitic affections. Two professional gentlemen, one of them formerly, the other now in practice there, bear testimony to the frequency of rickets among the poor classes. Why, it may be asked, should it occur so frequently in a place so near the sea coast, and in the North of England? Evidently on account of the unfavourable sanitary condition of the poor population alluded to. Newcastle is a manufacturing town, having a large poor population, crowded together in its imperfectly drained streets, having many narrow, dark, and ill ventilated courts and wynds, stagnant cess-pools and drains, and over-populated houses: it is in these places, we are *expressly* informed, that the rachitic disorder develops itself in numbers of children.

Destitution, inappropriate food (as to its quality) for children, these agencies themselves, provided the atmosphere be healthy and the houses well ventilated, seem evidently to be insufficient to produce rickets. In several of the alleged instances and accounts we meet with facts corroborative of this opinion.

In *Scotland* we find the most striking proofs to the same effect. Dr. Irvine during a long and extensive practice in the town of *Atholl*—including a considerable portion of the *Highlands* and of *Perthshire*—among an agricultural population on the whole very poor, has noticed only a few cases, of mere first stage indicia of rickets; and these arose according to his opinion from dereditary influence.

Mr. S. Lawrence, an able and experienced practitioner in *Montrose*, says in his note: "I am sorry I am unable to furnish you with any information regarding rickets—*the disease according to my experience and as far as my enquiries extend, being unknown in this quarter.* The delay of dentition beyond the 8th month, and of free walking beyond the 15th, is of uncommon occurrence, &c."

A distinguished practitioner of *Inverness*, has scarcely observed in that town and surrounding districts one case in five years with decided symptoms of rachitis. Dentition is seldom retarded beyond the age of from six to eight months; the children of the poor generally walk at the age of twelve months, and enlarged wrists and ankles are uncommon. Although in this report the cranial ossification is not expressly mentioned, yet according to general experience we may suppose, that where the two above-mentioned processes progress favourably, the third also will not be defective.

The accounts from *Aberdeen*, however favourable, after the above related facts, are no longer striking. *Dr. W. Keith*, to whose kindness I am indebted for some interesting details on the subject, says: that in twenty-five years of active practice in that town he has seen only three cases of rickets, two of which were imported, children of Irish parents. Aberdeen has about 70,000 inhabitants, with a large proportion of poor, engaged in all sorts of pursuits, as artizans and day labourers, and only a small number of them employed in large manufactories of cotton, flax, and wool, which exist in that town. In two or three small and isolated districts the houses of the poor are much crowded together, and densely populated. The town stands mostly on a gentle slope upon the river Dee, and another small stream that runs into it, intersecting the town. The town is situated close to the sea and very much exposed to easterly winds; it is said to be colder than Edinburgh, and from its proximity to the sea the climate is very variable. Aberdeen is tolerably well drained, and is plentifully supplied with fresh water.

With respect to the management of children the same gentleman

observes, that after the period of weaning, their diet consists partly of "Scotch broth" (bouillon), made from excellent meat, with barley and vegetables boiled in it, once daily; and as soon as the first teeth are through, they are given "a bone to pick." This reminds one strongly of the mode of infantile diet very commonly adopted in Austria and Hungary, which in the generality of cases I always judged to be well suited. We learn however from the same communications, that scrofulous affections of the glands and joints—the fingers, wrists, elbows, knees, and hip joints—are frequently met with in all classes: a circumstance which we have noticed already in the accounts from Thirsk, and which shows that rachitism and scrofulo-tuberculous forms of disease do not *necessarily* prevail under the influence of the same external agencies.

The accounts from *Edinburgh*, with which my friend *Dr. George Keith*, a distinguished practitioner in that city, has favoured me, are of uncommon importance. Because here we have a large town, densely populated, having 150,000 inhabitants, in some quarters with long and densely crowded rows of houses; a town which, with the exception of its quiet and serious character, reminds the foreign tourist of some continental cities; which scarcely would bear comparison with it, however, as regards the picturesque, the classical and at the same time elegant and cleanly aspect of this interesting seat of science. Indeed, it may be called a model-city.

The situation of Edinburgh is high, near the shore of an extensive bay, exposed to winds from all quarters; and being built upon a number of gently sloping hills, forming an undulating surface, there can be no doubt of its being very well ventilated, and washed by every shower that falls. One district, however, of the town forms an exception to this, being mostly inhabited by the poorer classes. In this district also the ground is very uneven, but the houses are so high and crowded together, that the air is always disagreable to the inhabitants of other quarters; and the occupants being far too numerous, the air in the interior of the houses is still more so.

The drainage on the whole is good; there are scarcely any low damp localities in the city, and there is abundance of water.

The atmosphere, besides its being very much moved by the wind from whatever quarter, is on the whole considered to be bracing and dry; trying in chest complaints, but generally healthy.

The proportion of poor in the population is large. There are but few manufactories, or large works: so that the occupation of the populace is the most miscellaneous possible; a great many of them being employed in artizan's shops, and as day labourers. The very poorest are mostly Irish; many of whom might have a sufficient livelihood; but drunkenness prevails to such an extent among them, that several thousands live in continual misery and wretchedness.

Dr. G. Keith believes that he scarcely sees in his practice above two or three cases of strikingly retarded vegetation and ossification among wealthy families in one year, and thinks also that there are not many such cases among the poor. He mentions the general use of *oatmeal porridge* (in German "Hafer-Brey"), which contains a large proportion of phosphate of lime; without, however, expressely attributing to this quality of diet the favourable progress of infantile vegetation alluded to.

Among about four hundred children belonging to those families with whom he has been lately in professional connection, he is unable to make out more than one case with such a degree of rickets as to present any considerable enlargement of the wrists and ankles, or of bending of the long bones. Children in Edinburgh are generally weaned between eight and ten months, and receive then commonly (besides milk with certain farinaceous articles) once daily broth or soup, also eggs; substantial animal food is seldom given before the second half of the second year. Poor people, however, after weaning, use bread and oatmeal very much, with water and sugar, and commonly potatoes also, when these are cheap. He finds a great want of milk in the diet of poor people's children.

Thus in Edinburgh we have the example of a large town, with a numerous poor population, among whom infantile diet in many respects is defective, yet offering but a slight rate of rachitism. Dr. Keith feels unable to express the proportion numerically.

With regard to scrofulous affections this gentleman says: "I do not recollect one instance of scrofulous affection of the bones during the last two years, nor more than five or six cases of diseased glands under ten years of age, and these all of an acute character. Among the same number of children I remember two cases of severe eczema during the last two years." Tuberculous cases among adults—though not considered as a rare occurrence in Edinburgh—for some years past have not been frequent in his practice.

Finally *Glasgow*, a manufacturing town about as large as Manchester, densely populated, with a considerable poor population—yet, in spite of these conditions, which we have found to be prolific of rickets in English towns of similar character—seems to enjoy on the whole favourable conditions for the development of children, even those of the poor, with the exception of some ill-conditioned quarters peopled by the poorest operatives, This at least seems to result from the limited information I have been favoured with; which, although not containing exact particulars on the subject, convey the impression, that between the rate of rachitism in Glasgow and in Manchester, there is a great difference in favour of the Scotch manufacturing town. There are two atmospheric conditions which merit particular attention, as being different in these two large

cities, viz: the climate of Glasgow is cooler than that of Manchester; and it is situated at a short distance from the sea, whilst Manchester is about thirty miles inland. Besides this, there is a difference I should say in the extent and intensity of industrial life, and the closely concentrated and vast number of the industrial establishments, in which respect—as will be more especially mentioned hereafter—Manchester exceeds every other town of like character.

In *Ireland*, known for the poor condition of a large proportion of its population, and for the extensive use they make of *potatoes* as an article of food—therefore on both accounts liable, as one might anticipate, to a high rate of rachitism—yet, appears to be freer from this disorder than most other countries, and as free from it, if not more so, than Scotland. This at least is the result of inquiries instituted on the subject by some friends of my esteemed colleague Dr. Whitehead, who kindly favoured me with the accounts of these results.

In the county of *Cork*, in an extensive rural district, according to the experience of a distinguished practitioner, there is scarcely any appearance of rickets, with the exception, as he says, of some cases in children brought up in the impure air of the workhouses. In his opinion "rickets has always been a rare disease in the rural districts of Ireland, and in the small towns."

Other accounts refer to the *South and South-West of Ireland* generally, and contain the same negative results.

From these accounts it appears also, that in the present day the potatoe is so expensive that the poor population of Ireland generally have substituted for it the Indian meal and oatmeal. But this change in the food is only of recent date, and the medical gentleman above alluded to expressly says: "neither do I believe, that the use of potatoes has any influence in producing rickets."

Dublin itself however, being a town sufficiently large and thickly populated to be considered on this account as liable to the production of rickets, presents also very little of this disease. A distinguished professor of medicine at Trinity College says in a note, with which I have been favoured by my friend Dr. Whitehead: "I have seen very little of it (rickets), and from the extent of my opportunities, being physician to the largest hospital here, this is alone conclusive as to the rarity of the disease; almost all the cases I have seen were in the upper classes."

Another medical gentleman of that city, occupying a position which enables him to give a credible opinion on this subject, says: "I have the superintendance of a very large number of infants and children in the workhouse of the North Dublin Union, and amongst these *there is not a single case of rickets, although strumous affections abound.* Within the

last seven years I have certainly not met with more than ten. During seven years I spent in Castlerea (Roscommon), and previous to the first potatoe failure, I never met with one single case."

"Dr. D—— (thus runs the statement of the distinguished practitioner alluded to), who has the workhouse of L. told me yesterday, that in his experience the disease is of extreme rarity."

The statements of a third medical gentleman of distinction in Dublin entirely coincide with those quoted above.

Thus we may safely say: in Dublin as well as in Edinburgh, in Ireland as well as in Scotland, rickets is a rare disease.

It is remarkable, that the few cases which occurred in the experience of these practitioners in Ireland, almost all belong to the upper classes, and are attributable to early weaning and improper hygienic influences. Such isolated cases, however, give no sufficient grounds for etiological conclusions.

Finally, it is worth mentioning that in several of the accounts from Ireland, both from Dublin and the rural districts, scrofulous affections are said to be of common occurrence, and in a severe degree.

The climate of Ireland is certainly milder and more humid than that of Scotland; but this difference can in the present state of physiology scarcely be estimated in relation to infantile developmental vegetation and rickets; of other agencies connected with the condition of towns and rural districts, and modes of life in Ireland, I am unable to judge.

RACHITISM IN MANCHESTER; ITS FREQUENCY AMONG ALL CLASSES.

It might be difficult to find, I believe, a field for the study of infantile developmental disorders, more extensive and more abounding in objects, under every variety of circumstances, than this town.

These disorders present themselves very frequently here along with passive enlargement of the tonsils, and not seldom of the thyroid gland (see p. 135); and rachitism, the highest and most characteristic representative of disordered and infantile vegetation, is met with in all ranks of the population.

In preceding pages numerous facts have been adduced, from which it appears, that the impure air of overcrowded town quarters is the most common and extensive cause of rickets—a circumstance which, along with improper infantile diet, seems to account for the prevalence of the disease among the children of the poor. In Manchester, however, we find rickets to be a common complaint even under the best domestic circumstances.

and in the very best houses, situated at a distance from populous quarters.

This will appear from some accounts respecting eighty-six children, belonging to twenty-seven families (including the twenty alluded to at page 47), and which, with respect to the situations where they reside, represent all the principal localities in the immediate neighbourhood of Manchester, at various distances not exceeding four and a half miles from the central quarters. This number of individuals, although small in itself, is still rendered available for conclusions by the circumstance that I have been able to ascertain in these families the various influences, past and present, internal and external, hereditary, and supervenient, which may possibly have affected the progress of their development in infancy; and this purpose it would have been difficult in a larger number to strictly accomplish. Indeed, most of the children of these families I have frequently seen and been enabled strictly to observe during the last two or three years.

Thirty-four of these children are under four years of age; among them, *eight* present the actual evidence of rachitism. Among the other *fifty-two*, being of the age between four and twelve years, according to information I have received from the parents, and to traces I have discovered myself, at least *nine* must have exhibited in their tenderer age the same symptoms—from which results the proportion of 17 in 86. Of this total number 37 children belong to strictly English parents, 43 to foreign families, and 6 to a mixture between English and foreign nationalities. The proportion of the disorder between the children of pure English blood and the others is nearly equal.

These families, with the exception of five, are of the same social rank—they are wealthy, at least sufficiently wealthy to possess the luxuries as well as the comforts of life; they reside in commodious houses, at distances of from one to four and a half miles from the central parts of the town in various parts of the suburbs, many of them in elevated situations, considered to be among the best and most healthful in the neighbourhood. Now, it must be remarked, that among seven families who reside at the greatest distances, the children of six present no trace of the disorder; in the seventh, of five children one has, and another has had, the respective symptoms, but only slightly. Of eight families, on the contrary, living at a distance of from a mile to a mile and half from the centre, on a flat soil, although in excellent detached houses—three of them have children with either actual symptoms of the disorder, or one or other of them has been so affected previously. Among five families living in, or very near, the central city quarters, the children of two of them are all, or have been, rachitic; in one of them there is one rachitic child to four healthy ones, and two others have five children all without marks of rachitism. It appears that here as well as in Pesth numerous

families are entirely exempt from this disorder, whilst in some all the children are affected with it. And although in some instances there appears to be reason sufficient—be it in the constitution of the parents, or in the mode of bringing up their children—for its prevalence in one, and its absence in another family; yet there are also instances of these opposite conditions under apparently equal sanitary conditions.

I know several families in the interior quarters of this town, whose children have not the slightest appearance of rachitism. And there are some populous quarters scarcely half a mile distant from the very centre, through which I frequently pass, and have occasion to notice near the doors of the houses numbers of children all of a healthy appearance. These streets and houses, although inhabited by the lower ranks of the middle classes, have, however, a clean and comfortable aspect. Yet, as a general rule, undoubtedly the disorder is more frequent in families living in or near the city, than in those who live in more open and elevated situations, at a distance from the central parts.

It is not here pretended, that the above proportion of 17 out of 86 represents exactly the general rate of rachitism among the wealthy classes of this town; but my experience, which at present extends far beyond the alleged number, constantly confirms the frequency of the disorder among these classes; and this observation is corroborated by that of several of my professional brethren: so that I firmly believe, the said proportion cannot be much above the real rate when applied to the whole of the wealthy ranks. Most of the cases exhibit, of course, only the slighter phœnomena of rickets.

With respect to the *poor classes* of Manchester, both frequency and intensity seem to be still greater. I feel satisfied on this point by personal observation of numerous poor children partly in the Union Workhouse (where I was for some time a regular visitor, in the years 1851 and 1852), partly by observing—as I usually do—the physical features of children I meet in the streets and other places of Manchester. No observant practitioner of this town can, it is my belief, essentially dissent from the above opinion. A friend of mine connected with one of the dispensaries, where he sees large numbers of children, tells me, that according to his calculation from 20 to 25 per cent of all the *sick* children he sees in that establishment present some rachitic symptoms. It is always understood, that the designation of "rachitic symptoms" in these pages is not limited only to the decided degrees of rickets in the chest, the joints or the bones, but, that retarded ossification of the fontanelle, with feebleness and laxity of the joints and muscles of the extremities, with a large, flat and angular skull, laterally compressed chest, and bloated abdomen—are phœnomena sufficiently characteristic of the rachitic diatheses, with its various dangerous disposi-

tions; and these phœnomena at the period between the ninth and fifteenth month commonly precede the more decided rickety deformities; but the latter *may not* necessarily, and frequently *do not*, follow.

Upon strict examination it will probably be found, that chronic endemics in general, and rachitic disorders *where they exist*, prevail in those poor districts in preference, and under the same unwholesome conditions as regards *dwellings and diet*, which are the most fertile in the propagation and diffusion of acute epidemic disorders, such as cholera, eruptive fevers, &c. This I have noticed at Pesth; and during the last two years I happen to have seen some families with numerous children in some of the old quarters of Manchester, having narrow streets, unclean, thickly populated and badly ventilated houses, where scarlatina has assumed a very destructive character, and where children with rachitic symptoms are so commonly met with as though this were there the natural condition of infancy.

The disorder, as I am informed, is not much observed among the poor families living at a distance from the town in the open country; yet some detached groups of houses, even at a distance of about three miles from the city, in low and damp situations, the houses being over-crowded with poor families of factory operatives, living on low wages, a notable proportion of rachitism is percieved; in some low sites near *Crumpsall* for instance, as I have been told by a gentleman who has an extensive practice in the northern environs of Manchester.

Certain peculiarities in the form and course of this disease, and its relations with other chronic infantile disorders as met with in Manchester, will be mentioned in another place; before entering, however, into inquiries on the topographical etiology of rickets in this town, it may not be out of place to direct attention to the fact, that while this disease is so uncommonly prevalent in this town, scrofulous and tuberculous affections, of the skin, bones, joints and lungs, are on the contrary rather rare occurrences—rare at least, I may say, in a surprising measure, relative to what I have seen in this respect in continental towns.

To what *cause or causes, peculiar to Manchester, may be attributed the frequency of rickets in all classes?* Manchester has this general frequency, in the wealthy as well as in the poor, in common with continental towns;—but as in *this* country, as appears from the preceding accounts, the children of the wealthy are generally free from rickets: so we must needs suppose the existence of some special conditions in this town, from which that exceptional circumstance arises.

The *soil of Manchester*, in the centre of the town—the *old town*—is sandy. It is situated on the red sandstone-rock, being covered in many parts, at variable depths, with red sand and gravel; and in most of these quarters—in spite of the favourable qualities of the soil—rickets is a very frequent

disease. Beyond the boundaries on the east side the soil is essentially clay—where also rickets is of common occurrence. On the south side it is coarse gravel as far as the stream of water which crosses Oxford-street at Wilton-street; beyond this it is clay. On the west side, including all the township of Hulme, it is entirely coarse gravel. On the north side, including Broughton and Cheetham Hill, it is sand and gravel, with a thin layer of clay on the top of the sand, where the land is high. But in many parts this clay has been removed to the surface of the gravel or sand for the purpose of making bricks. Now, in almost all these quarters rickets is (with some partial exceptions) of frequent occurrence; but the nature of the soil—which according to credible opinions is not very much different from other localities of this country—does not account for this frequency.

The *climate* is somewhat peculiar. Manchester is situated on a plain, enclosed at a distance of eight or ten miles by an amphitheatre of hills, running from near the sea-coast on the south side to near the sea-coast on the north. They commence in Cheshire a little above Chester, run in a north-east direction by Macclesfield, Congleton, Mottram, Saddleworth, Blackstone-edge, Standage, Bolton, Rivington, and Preston. This geological arrangement gives Manchester a mild and moist climate. The clouds brought by the south-east, north, north-east and easterly winds, impinge upon the surrounding hills and let fall their moisture before arriving over the plain. Hence these winds are usually dry, comparatively speaking: the west, south-west and north-west winds on the contrary bring with them a warm temperature and frequently moisture; and it must be remembered that these winds are said to prevail here generally nine months out of the twelve every year. The warmth of these winds, especially the west and south-west, may be owing to the elevated temperature of the Gulph-stream over which they pass. From these causes *the climate of Manchester and the neighbourhood is warmer than many districts more southerly situated*, and, according to the general belief, it is *the most rainy part of England*. These two conditions *conjointly* appear to be capable of exerting an unfavourable influence upon infantile vegetation; but as rickets is only prevalent to any considerable degree in the town and its immediate neighbourhood, not more than two or three miles from the central quarters, although the climatic conditions just mentioned extend over a much larger territory, so the climate alone cannot be the cause of the frequency of rickets in Manchester.

Again, *the mode of nursing, the period of weaning, and the feeding* of infants and children, present nothing sufficiently faulty to account for the prevalence of rickets in this town. According to the very competent opinion of Dr. Whitehead on this subject, amongst the poor of Manchester wet nurses and artificial feeding are not required from natural failure of the milk

oftener than one time in twenty; among the middle classes it would be about one in forty or fifty, and amongst the wealthy one in ten or fifteen.

On the average, infants in Manchester are weaned at about nine to eleven months, frequently after the twelfth, and in the lower ranks not seldom much later.

After the sixth month, in addition to the milk of the breast some light farinaceous food is given, which among the lower ranks in most cases is bread and milk simply; or by more careful mothers bread-crumbs simmered to a jelly, of which a portion is mixed with a due quantity of milk before being used as food.

In the wealthier classes, instead of bread different kinds of biscuit, rusks, on the whole of excellent quality, are first simmered in water for an hour and pressed out, then boiled for an hour or two, and strained, so as to form a fine jelly, to which a little good milk or cream is added, with a little sugar; and this according to my belief is one of the best kinds of food for infants from seven months up to a year or longer. If any harm arises, it is from the abundance, or too many meals, and not the quality of this food.

When the child is weaned early, another favourite food is a strong decoction of barley, made by simmering the barley in water about three or four hours, then straining through a sieve, and adding to the strained liquid a little cream or good milk and some sugar. Alternately with this is given bread and milk, oat-meal porridge and milk, arrow-root, sago, tapioca, semolina, &c.; and after the ninth month, or earlier should the child be weakly, chicken or veal soup, sometimes "beef-tea", egg-milk (i. e. milk with yolk of egg suspended in it) &c.

The above-named articles generally serve as food for the infant until fifteen or eighteen months. At this age the morning and evening meals usually consist of bread and milk, or oat-meal porridge and milk, and in the middle of the day when the family dine, the child is given a little mashed potatoe with the gravy of roast beef or mutton, (this is a food for which little children have an inordinate liking), sometimes boiled rice with gravy, and a little finely chopped animal food. But rice, sago, arrow-root, and bread puddings are very much used for children at dinner, as well as puddings, made of a mixture of flour, oat-meal and suet, which are extremely nutricious.

Against this kind of infantile diet, *as to its quality*, there can be no objection; and I dare say, it is decidedly preferable to that used in most parts of the Continent—I should say perhaps, all over the Continent—both as regards its nutritive and digestive properties, and its less liability to the production of free acid.

The faults which, though frequent on the Continent, I believe to be

still more frequently committed *here* among the wealthy classes, are: too early feeding, and over-feeding.

As to the poor classes, it would be difficult to say if the fault of feeding children at too early an age, and with all kinds of heavy farinaceous food—bread and butter, potatoes, and not seldom far more unsuitable articles—is more frequently committed here, or elsewhere.

In Scotland great use is made of oat-meal porridge (which corresponds to the German "Hafer-Brey"), an article rich in phosphate of lime. I have met with its use also in this town; most children beyond the ninth month digest it well, and have their bowels more freely opened than under other farinaceous diet. But I have seen rickets develope itself in children fed upon this article, and do not believe that the rarity of rickets in Scotland can be attributed to any kind of diet adopted in that country.

Dr. Whitehead considers the error of *over-feeding* a frequent cause of that disorder of the assimilative functions and hœmatosis which leads to rickets among the wealthy as well as other classes of this town; and my own opinion in this respect coincides with that of my experienced friend, namely, as regards the wealthy families—among whom it is not an unfrequent occurrence to notice that the digestive and assimilative organs of children are overwhelmed with too many meals, and a too abundant supply of nutritious elements. This error, then, easily gives rise to imperfect sangvification, which under certain circumstances contributes to the development of rickets. But I can scarcely believe, that this fault is less common among the wealthy classes of Scotland, Ireland, or the rural districts of England, where nevertheless rickets is of great rarity.

The principal cause, therefore, of the frequent occurrence of this disorder among all classes of *this* town must be sought for among other agencies, or conjoint circumstances peculiar to it—under the influence of which unsuitable infantile diet leads to, or promotes, the development of the disorder in question.

In the first place, there is good reason for believing that the air of the vast central quarters of Manchester and Salford is over-charged with animal exhalation, and carbon and sulphurous vapours from the smoke. Indeed, both towns together constitute such an extensive mass of closely congregated manufactories and warehouses, many of colossal dimensions, overfilled with men and with materials emitting various effluvia, as does not elsewhere exist. Thus a *vast mass of air* becomes impregnated with unwholesome elements—a mass sufficiently abundant to extend its influence far beyond the central parts of the town. The spread of rickets seems to coincide with this; because, although—as was stated in a preceding page—this disorder occurs in families living at a distance of from one to four miles from the city-quarters, yet, I have been

satisfied of its decreasing frequency proportionately to the greater distances from the central quarters: so much so, that beyond three miles very little is seen of it.

Secondly, the unwholesome properties of the Manchester-atmosphere not only affect the blood of children directly, but in all probability exert an influence upon them by hereditary transmission. There is certainly no city-population to be found, which in such vast numbers is exposed from morning to night to the inhalation of a similar kind of air, as the industrious, overbusy inhabitants of Manchester; this remark applies to the wealthy as well as the poor. It is not paradoxical to say, that the blood of many otherwise strong and healthy individuals, but engaged day after day under the influence of a mill or warehouse-atmosphere, with overtension of the brain, may undergo such chemical changes as may affect unfavourably the blood and lessen the vegetative impulse of their offspring.

I remember having heard sometime ago a circumstance mentioned, which speaks very much to the same effect. My friend Dr. Borchardt, informs me, that in the county of Glatz (Prussia) he found a striking difference between the children of the inhabitants of an open and healthy agricultural district, inasmuch as the children of those (of the same population) who were employed in agricultural pursuits, were strong and healthy, whilst those of parents engaged from morning till evening in manufactories, were in a great proportion affected with rachitic symptoms—although both sets of children lived in the same situation, in dwellings having the same internal arrangement, and were brought up in precisely the same manner. Dr. B. says that in this case there was every evidence, that the rachitic disposition of the children arose from transmitted influences, unfavourably modified by the peculiar character of confined industrial and manufacturing labour.

In conclusion: although the climate of Manchester may possibly co-operate with the unfavourable influences mentioned in the production of rachitism,—and unsuitable infantile diet under these very influences may acquire a more noxious effect than it would exert under reverse circumstances—yet, *the principal cause of the prevalence of rachitism in all classes of this community, appears to be the vast extent of narrow over-crowded quarters, filled with animal exhalations and other noxious vapours, and the intense and protracted exertions therein of its industrial and manufacturing population.*

The sanitary arrangements of Manchester being on the whole excellent, there is little felt of the injurious effects of organic decomposition—as a proof of which statement I may allege the scarcity of maligne fevers, and the slight spread of cholera hitherto. But the unfavourable properties of the Manchester atmosphere as regards infantile development seem to be an evident fact. And there is every reason to believe, that in the ratio that the

manufacturing and industrial quarters extend, the impure air generated in them will not only spread over a larger surrounding territory, but also at greater distances from the town. To obviate or mitigate this evil, in this or any other town of like character, the only means would be the extension of these quarters upon strict hygienic principles, admitting only *large* and *short streets*, intersected at short distances, so as to give an ample passage to the atmospheric currents.

RICKETS IN CONTINENTAL COUNTRIES.

If it were true that a northern and humid climate is the most productive of rachitism—Scotland ought to have a higher rate of it than England, and Britain in general a larger proportion than the inland countries at the South, East, and West of Europe. However, as regards Scotland, the evidence of facts proves the reverse; and, so far as my experience and information reach, I feel strongly convinced, that in continental towns rickets is more frequent than in English towns; nor am I aware that there exist as yet any valid proofs for the assumption, that rachitism is more frequent in the *North of Germany*, in *Denmark*, *Sweden*, *Norway* and *Russia*, than in the *South of Germany*, *Austria*, and *Hungary*.

We are not in possession of any accounts relative to the occurrence of rachitism in Italy; this much however I am able to state from personal observation, that in *Pavia* (Lombardy) it is not rare. In *Constantinople*, in spite of its dry and elevated position, near the sea-shore, I have noticed rickety children in poor as well as in wealthy families with whom I had professional intercourse during my short stay in that city in 1849; and I am informed by a medical friend, that the disease is frequently seen in some of the poor quarters of *Smyrne*, on the Asiatic shore. In South America, namely, in the towns of Brazil, it is not an unfrequent occurrence. Three years since, with Mr. Mellor of this town I saw a rickety child, born in Rio Janeiro of parents both natives of Brazil (of Portugueese descent), who suffered there from this disease in a high degree. When we saw this child, we found the fontanelle open at the age of two years, and it died of convulsions shortly after its arrival in this country.

In *Paris*, *Vienna* and *Pesth*, cases of rickets abound. According to personal experience and information I should say, that in the first named of these cities the disease is much less frequent among the middle and upper classes than in the two others. In *Dresden*, *Munich* and many other towns of Germany, I am informed that it prevails to a great extent. In Dr. Küttner's report of the children's hospital of *Dresden* we find 178 cases of

rachitis out of 1426 sick children. In Dr. Hauner's children's hospital at *Munich*, according to the statement of a friend who has visited that establishment, this disease is of very frequent occurrence; and in one of the reports of this distinguished physician, I find mentioned some cases of death attributed to it (Journ. für Kinderkr. 1854. Heft 9, 10). Besides other noxious agencies which as he says "it would be difficult to remove" (perhaps the impure air of over-crowded quarters ?), Dr. Hauner denounces "the unnatural and unsuitable mode of nourishing infants". In the report mentioned the disease is said to be on the increase in the Bavarian capital.

With respect to figures expressing the prevalence of rickets in children's hospitals it is proper to observe, that these almost exclusively refer to severe cases of this disease, as its slighter or mediocre degrees are not brought by their parents to the hospital unless some other important disease affects such children; in which case frequently the latter only is named in the case book. Nor would it suit the purpose of children's hospitals to encumber the beds with cases so decidedly chronic as generally rickets is. Thus we find in Prof. Mauthner's report (1846) of cases in the clinical hospital for children's diseases under his direction at Vienna, among 556 sick children treated there, only 3 cases mentioned of rachitis; whilst in the report of the ambulatorium (dispensary) connected with that excellent Institution 111 cases are alleged out of 1375 patients. Dr. Hügel, director of another children's dispensary at Vienna, mentions in his general report 440 cases of rickets among 10535 patients; and Dr. Löbish, director of another establishment of this description 53 cases among 1896 patients. In Dr. S. F. Stiebel's report on the children's hospital of Frankfort (1845) we find 3 cases of rickets out of 70 patients treated in that establishment. In the reports of the children's hospital of St. Petersburgh scrofulosis and rickets are classed together; and from the hospitals of Paris—where I have had the opportunity of personally noticing the frequency of this disease—I am unable to adduce at present any figures concerning its proportion among the sick children treated in these celebrated establishments.

All physicians connected with children's hospitals will agree with me, that, owing to the reasons mentioned above, the figures of those reports are far from expressing the rate of this disease among the respective populations, which, indeed, is very high.

In almost all continental towns, where I have had an opportunity of observing the sanitary condition of the children, I have been struck with the frequency of rickets.

In *Switzerland* in some districts it is observed in remarkable abundance and severity, in villages as well as in towns. A medical friend of mine who has lately spent some weeks in the environs of Luzern, Thun, and Interlacken, speaks of the astonishing frequency in these towns and

districts of children with retarded developmental vegetation. In dry situations having an elevation of three to five thousand feet above the sea level, in Switzerland, Tyrol and Savoy, rachitism is not an uncommon disease, and—as is well known—idiotcy and cretinism are of endemic occurrence in these very localities. I am unable, however, to exactly determine the correlation between these two forms of developmental disease; nor has any writer given as yet a satisfactory explanation of the nature of that climatic, or telluric influence, which in those regions is so unfavourable to infantile vegetation.

Having hitherto mentioned in general terms the occurrence of rachitism in continental countries, and the more favourable rate of its occurrence in Britain—at present, in order to form an opinion on the peculiar nature of the agencies to which in an extended point of view the frequency of the disease may be attributed in continental and in English towns, it may be desirable perhaps to bring before the reader my own observations established on this subject at Pesth and Buda.

The most essential difference between the English climate and that of continental countries is certainly this: that the English climate is more temperate, more moist and foggy, with more frequent but less salient or extreme changes, than the climate of any country of the European Continent—so on account of these properties the climate of Hungary is as good a representative of continental countries comparatively with Britain, as any. With respect to other influences affecting the health of children—namely, the character of dwellings and streets, sanitary arrangements, habits and social customs, and the usages adopted in the management of children—in all these respects, in general points of view, Pesth and Buda are also adapted to represent the generality of continental towns in contradistinction to the generality of British towns.

It may be well also to remark, that in some respects these cities differ from each other, Pesth being situated on low and flat ground, whilst the city of Buda stands on a hill, and enjoys therefore a better ventilation; then, the first-named city has a comparatively numerous working class, the latter only a very small proportion of it.

To give an idea of *the frequency of rachitism* at Pesth—although I have not at command exact numeric data, yet, I may mention the circumstance, that some years ago two of the physician assistants to the children's hospital of that town, having examined the records of 10,000 sick children, they found, that in this number about 800, therefore 8:100, may be supposed as affected with some of the symptoms of rachitism. But when we consider, that of those 10,000 children probably less than the half were under four years, i. e. of the age liable to rachitism, then the above rate of 8 per cent falls very much short of the real proportion. Frequently, when a slight degree of this disorder was complicated with some severe affection,

the latter only has been expressed in the inscription in the case books.

Different forms and stages of rachitism occur in these books under the various designations of "rachitis, habitus rachiticus, evolutio retardata, and scrofula abdominalis." The term "rachitis" is only used for the higher—indeed, the highest stages of the disease; and I remember, that among upwards of 16,000 infant patients whom I examined and superintended in that establishment, that term did not occur eighty times; this, consequently, conveys some idea—however imperfect—of the proportion of high stages of this disease at Pesth. I know also, that I dissected the bodies of about twelve children, who died of severe stages of rachitism in the spine and chest; and probably more than one hundred, who died from various accidental complications—with minor degrees of the disease.

Therefore, although I am in want of comparative numeric data, my practise of more than ten years in the children's hospital of the capital of Hungary, and of sixteen years in an extensive private sphere, enables me to state with confidence, that the disorder in question is frequently observed there in all classes, much more frequently however in the poorest.

In some suburbs of that town—the worst conditioned in every respects, having confined, low, and overcrowded houses, and a poor population—the disorder is very common; so far so that I used to assume that every fourth or fifth child in those unwholesome quarters presents more or less of its vestiges; and I have seen not a few of them suffering from the highest stages of the disease, with enormous rachitic gibbosity and curvature of every bone. In most of the poor quarters, however, it was a much rarer occurrence; and with respect to the wealthier classes, I came to the approximative conclusion, that probably every eighth or ninth child offers some symptoms of it; but very seldom the rachitic gibbus.

This proportion compared with that I have met with in my practise in Manchester (17 out of 86 in 27 families), would lead to the assumption of a far greater frequency of this disorder in the last named town than at Pesth. But it must be observed, (as was expressly mentioned in a preceding page), that several of those 17 cases are only characterised by the slightest group of symptoms—namely, retarded dentition, late closure of the fontanelle, and retarded walking, with a large skull, and compressed chest—cases commonly overlooked because of the absence of swollen joints and curved legs; and such slight degrees of the disorder may be very frequent also at Pesth. The figures merely alleged as an approximative expression of frequency in my experience, are not to be considered, of course, as expressive of a strictly correct numerical proportion of the disorder in the localities mentioned; nor is such accuracy of importance in this case.

It may be well to consider, that Pesth is situated on the banks of the

Danube on a ground partly clay, partly sand, low and perfectly level, at the limit of a vast plain which extends towards the North, East and South; it is therefore very much exposed to north-east winds. Westward along the right bank of the river it is bounded by a long range of hills. In some of the suburbs above mentioned the sewerage is very imperfect. The population is comparatively wealthy, having a lively trade; with a great proportion of aristocracy, official and literary classes. There may be some thousands of workmen, and day-labourers. Judging partly from personal experience in, partly from what professionally transpires from, other towns of Austria or Germany, we may consider the proportion of rachitism in Pesth to be a large one, but probably exceeded by that of Vienna and many other towns.

In *Buda* on the contrary, which is situated on a steep hill opposite Pesth, on the right bank of the river, namely, the *fortress* or *city* of this name, which occupies the top of the hill, some four hundred feet higher than Pesth—its soil being entirely volcanic and dry, like that of the rest of this range of hills, and the whole city more exposed to currents of air—according to my experience from abundant practise in that town, vegetative disorders of children are of very much rarer occurrence than at Pesth, although I am unable to express any numerical proportion. A considerable part of the population of the city of Buda consists of aristocratic and official classes, and those directly attached to their service; or trades and workmen providing for their exigencies. Instances of advanced stages of rachitism however are not entirely absent in this city, and have come under my notice also in the highest ranks, even in the venerable palace until lately inhabited by Hungarian Palatines. In many such instances (among the wealthy and highest ranks of Buda) I found reason to attribute the disease to hereditary influence, if not exactly rachitic, at least otherwise debilitating, upon these children.

Different is the case with the wealthy families of Pesth, inasmuch as these live in the centre of the town, and in large houses built closely together in long double, sometimes treble rows, with little free space between, (as usually in continental towns); they enjoy therefore by far less the benefit of efficient ventilation than the inhabitants of Buda.

I have seen the disease to prevail extensively in some villages high up on the *carpathian* range, or situated in valleys, or on the slope of the mountain, surrounded with forest, of which the inhabitants lived in a poor condition, in miserable, low and badly ventilated huts; whilst on the contrary I have had the opportunity of admiring in society of some professional friends the healthful appearance of children in the low and marshy but rich plains of the *Banat*, in several of those large villages, which are specimens as regards the comforts and cleanliness of a rustic population.

The same favourable condition I have noticed in many villages of different counties and districts of Hungary, as regards rickets; although in several of these villages children from about the sixth month upwards are almost exclusively fed upon potatoes and coarse rye-bread. In Austria, and according to my information in Germany also, in villages and rural districts rickets is a rare disease.

I am sorry that I am unable to bring forth more extensive and accurate facts from Hungary: this much however is certain, that the disorder is frequent enough in many towns, which commonly are badly drained, and the rooms of the houses (in small towns) low and crowded. But I have seen very little of rachitism, on the contrary a most satisfactory development of the children, in those noble families who used to live in their well-arranged country mansions; or among the population of several small towns and villages, well built, with comfortable houses.

Consideration of the causes of rickets in continental towns. The facts mentioned are proofs of the analogy of some causes and joint circumstances in the occurrence or absence of rachitism in different countries. The rare occurrence of it in villages and rural districts of the Continent, where the children enjoy the benefit of pure air, having been mentioned, I shall content myself with briefly stating the result of personal observation as regards the condition of some of those great and general agencies in continental towns, the nature and effects of which upon infantile vegetation in British towns have been given in preceding pages.

Infantile diet among the *poor classes* of continental towns—speaking in general terms—seems to me to be in many respects less suitable than that of the same classes in this country. The flour they use is generally of an inferior quality, and this they commonly give boiled (raw as it is) in milk; or browned with butter and boiled afterwards with water to a thick soup. Bread and milk is also very generally used; with regard to broths, soups, and other more substantial dishes, I am unable to state even in general terms whether the children of the poor are nourished more suitably in those continental countries or in England.

The children of the wealthy on the contrary, though some articles of their infantile diet are less suitable in quality than in Britain (in the case namely, when raw flour boiled in milk is given, which happily in England is not customary), receive on the whole a lighter kind of food, and the error of over-feeding with too many substantial and nutritious meals, so frequently observed here, is, so far as my experience goes, by far less generally committed on the Continent. In Vienna and Pesth it is usual also to give after the seventh, eighth, or ninth month, in addition to the breast, or after weaning, "barley coffee" with milk and fine white bread; and once or twice a day chicken-broth or beef-tea with some farinaceous article

boiled in it. The use of the so called barley-coffee is very much diffused in Germany, Austria, and Hungary. It consists of roasted barley coarsely powdered, which, after being boiled for a quarter or half an hour, is strained and mixed with about one third or fourth its quantity of milk, with a little sugar. This the child takes with some fine white bread, and I have found it to be a decidedly good food for infants. For weakly children with atony of the bowels, instead of this acorn-coffee is used, prepared in the same way. (For a comparison of continental modes of feeding with those prevalent in England see p. 175). On the whole I should say, the continental diet of children (in the countries alluded to) includes more frequently such kinds of food as are liable to create acidity and flatulence; the error on the contrary, which, although not rare among the wealthy of the Continent, is still less prevalent than in England, is over-feeding with articles of a too substantial character. It is impossible, however, to state with certainty, which of these faults promotes more extensively the rachitic tendency.

Considering the British population comparatively with what I have seen of continental races, I have no hesitation in stating, that the British are decidedly stronger both in body and mind. But as I have had opportunities in this town of observing, that the children of even strong looking English parents are not unfrequently subject to rachitic symptoms during their second or third year, so I feel not entitled to ascribe to the more frequent occurrence of weakly and dilapidated constitutions in continental towns a greater influence in the production of rachitic children.

That the climate of the Continent in general, does not more, but rather perhaps less effectually than the British climate, prevent the development of rachitism, seems to be proved by the apparently greater frequency of this disease in continental towns. As a fact elicited under my personal observation at Pesth, I feel however only justified in mentioning the wet season of autumn as evidently noxious to developmental vegetation. It is then that I have almost constantly noticed an aggravation of rachitic symptoms, whilst during the dry weather, in winter and summer, they were seen to improve.

Considering in a comparative point of view—as was already done in preceding pages—in what kind of towns, in what quarters, and in what style of dwellings rickets especially prevails in England and on the Continent, both among the poor and the wealthy classes, and particularly with regard to the ventilation of their habitations, I may safely state: that in the generality the streets and districts in which the poor classes of continental towns reside are more open and more efficiently aerated than those of the working people in British manufacturing and trading towns—but that, on the contrary, the wealthy ranks of the Continent during their city-sojourn breathe a decidedly less pure air than their equals in this country.

What has been said of the construction of towns, streets and houses at Pesth (see p. 182), may pretty fairly be applied to the generality of continental towns. The wealthy of the Continent pass the greatest portion of the year, and most of them the whole year, in dense rows of houses in the interior of cities, contrary to the custom of the English wealthy classes, who live in more open quarters in detached houses, remote from the centre of towns, and often in the country; and in general on the Continent there is not that tendency and anxious care for thorough ventilation, which as a most important sanitary custom we observe in this country. We must bear in mind of course, that the cold season in Germany, Austria, Hungary and other continental countries, is far more protracted and intense than in Britain; and in consequence of this the houses are more carefully closed against the external atmosphere, by double doors and windows, and consequently enjoy less ventilation than here. Moreover, the temperature of Britain admits the general use of chimneys instead of stoves, a circumstance which efficiently promotes the ventilation of the dwellings.

In conclusion, accordant with the facts now narrated, rickets is manifestly a disease of rare occurrence in rural districts. In open country places it occurs at least much less frequently than in towns; and it is highly probable that in continental towns impure air has an important share in the production of this disease; to which the wealthy classes of England are exposed only in the vicinity of the vast manufacturing and industrial quarters of some towns.

ETIOLOGICAL CONCLUSIONS.

From the accounts referred to, corroborated by some others I have received of a more general character, it appears, firstly—that rickets is less frequent in English towns than in many of those of the Continent; and altogether of rare occurrence in Scotland and Ireland: consequently the assumption, that the development of this disease is favoured by northern elevation and damp climate is thus invalidated. From the facts alluded to, however, it cannot be inferred, that in those countries and localities where rickets is seldom observed in its well marked stages, also those slighter features of the rachitic tendency along with retarded developmental vegetation which are included in the accounts of Manchester, and which so commonly are overlooked—are of rare occurrence.

Secondly.—Rickets occurs under a great variety of climates, and the medico-statistical data which we possess at present are insufficient to state what precise kind of climate disposes especially to this disease.

Thirdly.—Marine atmosphere is highly favourable to infantile development (see p. 164, 165), and consequently to the prevention of rachitism.

Fourthly.—Rickets, *where it extensively exists*, is everywhere observed in a preponderating proportion among the poor; and it seems to be considerably more frequent among the wealthy on the Continent, than among the corresponding classes in England, with the exception perhaps of a few towns.

Fifthly.—Improper food *alone*, under the influence of a pure atmosphere, is insufficient to produce rachitism, (see p. 164, 168).

Sixthly.—Impure air (an over-carbonized atmosphere) of over-crowded and badly ventilated quarters and dwellings, constitutes the most powerful cause of the disorder both in continental countries as well as in England.

Seventhly.—The influence of unwholesome air is sufficient to cause rickets, in spite of the most wholesome kind of infantile diet: this is proved by the frequency of rickets amongst the educated and wealthy families of continental towns, and to some extent among those of Manchester.

Eighthly.—Hereditary influence is powerful enough to produce rickets under local and social conditions even the most favourable to infantile development, (see p. 164, 166).

THE RACHITIC HABIT; SUCCESSION OF SYMPTOMS; PECULIAR FEATURES.

It is generally admitted, that the disposition to rachitism is the most prevalent in *lymphatic* children; in the course of these communications however it has been repeatedly intimated, how imperfect as yet are our notions respecting the real nature of the lymphatic temperament. The term "rachitic habit" has a more expressive meaning; but in reality, the features constituting this habit signify the actual existence of the disease itself in its incipient stage.

On the whole, the appearances which represent in children the presence of the rachitic habit—its physical and moral features—present themselves identically in Manchester and in Pesth, in spite of the difference of climate and race. In Hungary (and so far as I remember, in Austria also), this habit of body in the majority occurs in children with fair hair; in the town of Manchester most of the cases which have come under my notice have been children with light brown or dark hair; nor do I think, that in this respect any general rule could be established. In Pesth as well as in Manchester, in the generality of rachitic children, I have met with the same intellectual and somewhat senile expression of countenance, with intelligent eyes, protected by long and dense eye-lashes, having a furrow along the infraorbital margin (circled eyes); intellectual faculties and behaviour

more advanced than in healthy children of the same age; with a slow development however, for the most part, of the faculty of speaking. In some of them, on the contrary, there is a degree of imbecility, amounting not unfrequently to idiocy; and these of course are the worst kind of cases. The immense majority of rachitic children according to my experience have large and angular skulls, flat on the top, with a forwardly projecting forehead and prominent frontal protuberances. Among those having disproportionately large heads the faculty of speaking is often retarded, and in a few of them also the intellectual development is defective.

At Pesth, in some such individuals upon postmortem inspection I have found serum in the ventricles, or a striking pultaceous state of the brain. The worst instances, however, of rachitic idiocy that I have met with here as well as at Pesth, instead of a large skull, presented the reverse condition in a high degree, namely, a strikingly small skull, flat behind, defective as though it were in the occiput.

The rachitic habit is generally characterized by a large face, flat nose, large mouth, and large jaw-bones; but there are exceptions in these repects; the bloated abdomen and flabby limbs, on the contrary, are their constant concomitant features, both here as well as on the Continent.

There is a manifest difference between Manchester and Pesth, however, and other continental places within my experience, inasmuch as, in the same measure that the children in this country in general are more strong and healthy looking, I observe also a comparatively more healthful appearance in the complexion of rachitic children here than on the Continent. Many of them, indeed, look plump and rosy, even after the disease has set in; and this contributes not a little to mask the symptoms and mislead the parents as to the importance of the malady already existing, which by their deception and deplorable carelessness not seldom reaches a more serious stage. But this favourable aspect disappears so soon as the disorder attains a high degree.

The severity of the curvatures and other rachitic symptoms in particular cases does not necessarily bear any proportion to its extensive prevalence in the locality where these occur. In Manchester, for instance, rachitism is certainly more extensively prevalent than at Pesth, but severe stages of it, namely, the rachitic gibbus, is as appears to me of rarer occurrence here.

I am sorry I have not at command statistics sufficient to show the precise relation and succession of the rachitic symptoms at Pesth. My inquiries in Manchester in a limited number of cases, in addition to the facts communicated in preceding pages, (see p. 127,130) as regards the relation of retarded dentition, cranial ossification, and walking, to rachitism, have led to the following results:

Besides the 17 rachitic children of the 27 families mentioned above, I have endeavoured to obtain information on the progress of the developmental stages, and of the subsequent rachitic symptoms in an additional number of 22 rachitic children, among poor and wealthy parents promiscuously; thus they amounts altogether to 39. Of this number, in 13 the morbid characteristics of the bones and joints shewed themselves first between the sixth and ninth months, and were preceded by, and associated with, retardation of the developmental stages repeatedly alluded to;—in 19 the disease made its first appearance between the twelfth and eighteenth months, and was preceded in 15 of them by the retarded appearance of the first group, or of the next following groups, of teeth; of the 15 last mentioned, 12 were late also in the closure of the fontanelle, and in walking. In 3 (of the 39) the first rachitic symptoms appeared only between the eighteenth and twenty-fourth months;—in 2 between the thirtieth and thirty-sixth;—and in 2 as early as between the fifth and sixth months.

Among the 39 rachitic cases in question the disease manifested itself in the following parts of the skeleton: in 37 there was more or less enlargement of the wrists and ankles, in 5 of which the tibiæ are considerably incurvated, and in 11 more only slightly or moderately;—in 32 (of the 37) the chest was laterally compressed, but only in 16 of these to the degree of a well marked "pigeon-breast", and in 3 coupled with spinal curvature, 1 of which forming a high degree of deformity;—in 2 of the 39 there is no enlargement of the wrists and ankles, nor curvature of the tibiæ; in *these* rachitism is merely characterized by the large size and angular shape of the skull, the pigeon-breasted chest, retarded cranial ossification and late walking, without other striking symptoms. 26 of the 37 who have enlarged joints, present a large, flat and angular shape of the skull.

Altogether, among the 39 cases there are only 2 which represent high and severe degrees of spinal and tibial rachitism. On the whole, the symptoms as well as the course of the disease in essential points appear to be the same in this town as what I have observed at Pesth, Vienna and other places; but it strikes me, that, as is generally assumed—and my own experience also speaks to this effect—rachitism in the immense majority of instances begins to show itself after the ninth month: in *this* town we very frequently observe children in whom as early as the sixth, seventh or eighth month the fontanelle, wrists, ankles and chest, present unmistakable indicia of the rachitic alteration. This is the case in 13 of the 39 patients alluded to. Moreover, chloro-anæmia is a more frequent morbid condition of rachitic children here than at Pesth; among the above-named number of cases this is strikingly evident in 7 of them, and indicated, though less evidently, in 8. The same may be said of the *passive enlargement of the tonsils* (see p. 135), which takes place as early as between eighteen

and thirty months, and which sometimes is obstinately persistent for some years.

Finally, the *valgus-like relaxation* of the ankle and plantar surface—one of the commonest phœnomena in rachitic children in this town, are very frequently observed at the unusual age (unusual at least in my experience) of from seven years to ten or eleven, or later,—that is to say, it happens that the disorder begins only to manifest itself at so late a period of childhood, and when neglected persists up to the period of female puberty, or even longer, generally shewing an undulation between periodical aggravation and improvement.

Mothers become aware of this kind of deformity when the internal ankle of one or both legs already considerably protrudes internally, so much so, that in the acts of standing or walking the foot turns with its external longitudinal edge a little upwards, towards the peroneal ankle, whilst the internal edge of it supports almost entirely the weight of the body, and the tibial ankle, which is internally protruding, sinks down as if it were to the ground. Upon examination we find, that the internal ankle is more or less enlarged, and the ligaments surrounding it, and the tendons of the tibialis anticus and posticus, and flexors of the toes, are in a relaxed condition; being just the reverse of what they are in the pes varus. In fact, the plantar muscles and aponeuroses are relaxed also: so that the shape and direction of the foot more or less represent the *talipes valgus*, differing, however, as we shall see afterwards, in some essential points from the *congenital valgus*. I am far from assuming, of course, that the appearance of the deformity alluded to at so advanced a period of childhood (i. e. in girls from six to eleven years old) is peculiar to Manchester; my statement merely amounts to this, that the enlarged condition of the tibial malleolus with the connected relaxation of the muscles and ligaments of the ankle-joint, and its consequences in standing and walking—conditions almost constantly observed in rachitic children—in the immense majority of instances disappear towards the third, or to say much, the fourth year, and that the development of this valgus-like disorder beyond this age is altogether a rare occurrence.

In this town seven cases have come under my notice, all in girls, in whom the valgus-like relaxation manifested itself some years after the primary set of rachitic symptoms had entirely disappeared. Two young girls (belonging to the twenty-seven families, see p. 171), in whom the disorder first shewed itself at six years in the one, and at nine in the other, according to the statement of their parents presented no rachitic symptoms during their infancy.

In all these seven cases *both feet* were affected; but, with the exception of two, one foot much worse than the other; in two of them the disorder

is now so slight, that, unless unusual exertion by long walks, or other debilitating influences take place, it is scarcely perceptible.

I have observed, that in some of these cases there is a periodical improvement and aggravation of the valgus, evidently caused by two opposite atmospheric conditions—namely, in damp weather, when it lasts for some time, the ankle-joint becomes more relaxed; in dry weather on the contrary, in standing and walking the ankle shows more firmness. The same fluctuation however is frequently observable also in the ankle-joints of rachitic infants.

The valgus-like disorder in question seems to be peculiar to the female sex; those few cases at least which presented themselves in my practise at Pesth were also all girls, just like those met with in this town.

Without instituting strict investigations regarding the nature of this form of valgus, which developes itself about the second dentition, and is sometimes unconnected with the appearance of other strictly rachitic symptoms, I feel inclined to believe that it belongs to the rachitic diathesis; not only because in almost all cases I have seen infantile rachitism preceded it, but because it presents itself also in the same manner as does the ankle-relaxation of rachitic children. It is more frequent perhaps in this town than in most others, just because the rachitic tendency is more extensively prevalent here.

The difference between the *congenital valgus*, and that in question, which we may call the *rachitic valgus*, consists in this: in the former, although the ankle internally protrudes, yet, its enlargement is more apparent than real, or only consecutively increasing in consequence of the displacemeut of the articular surfaces of the malleolus; and I have seen cases where there is no enlargement at all discoverable; whilst in the rachitic valgus the enlargement is an essential and primary condition. Moreover, in the congenital valgus only the tendons of the flexor muscles, the toes, the tibialis anticus and posticus, as well as the plantar aponeurosis, and ligaments, are in a relaxed condition; the extensors, on the contrary, and the dorsal ligaments, are in a state of permanent contraction: whilst in the rachitic valgus, ab origine at least, there is a general laxity of all the above named structures, the flexors and extensors alike.

The *treatment* of the valgus-like relaxation of rachitic infants, as well as that which occurs at a more advanced age, essentially differs from that which we employ in congenital valgus. In this deformity, as is well known, the forcible extension, or tenotomy performed on the contracted extensors, are the most efficient curative means; the valgus-like relaxation on the contrary generally improves under strengthening constitutional agencies, assisted by similar local means. In these cases generally I recommend sponging over the spine every morning and evening with cold water containing a large proportion of chlorid of sodium in solution, with addition

of a little brandy, and efficient dry friction afterwards; the same measures are to be applied to the legs and feet. This treatment even alone in most cases is followed by visible improvement, and may require but only in very decided degrees of the relaxation some appropriate bandage around the ankle and foot.

It appears to me, that the sudden aggravation or improvement not seldom observed in the valgus-like relaxation throw some light on the *nature* of this disorder. It is certain, on the one hand, that in rachitic children the internal ankle is more or less considerably enlarged, and that consequently the continued forcible extension of the flexor tendons and articular ligiments, resulting from that enlargement, must necessarily cause a relaxation of the structures—yet, on the other hand, a rapid aggravation of the symptoms (sinking of the inner ankle), can scarcely be attributed to an increase of the enlargement of the ankle itself, as this could not happen so rapidly: the symptom must, therefore, result directly from relaxation of the structures; and this it would appear can only arise from deficient spinal innervation.

In this manner, I believe, it is easy to account for this sudden aggravation under the influence of a damp and relaxing atmosphere, or other debilitating agencies; and the speedy improvement again under the reverse condition of weather, or under the use of cold sponging, the administration of cod-liver oil, or other tonic remedies. Is it not possible, that the same impairment of spinal innervation (arising from, or predisposed by, an altered chemism and vitalism of the blood, and aggravated by a relaxing atmosphere, or the impure air of dwellings), which induces that sudden relaxation occasionally observed—may be the cause, also, by its protracted influence, of not only the defective nutrition (flabbiness, atrophy, &c.) of the muscles and ligaments in rachitic children, but even of the imperfect ossification of the respective joints and bones?

EARLY DIAGNOSIS OF RACHITISM; ITS ESSENTIAL, AND CHARACTERISTIC SYMPTOMS.

Rickets, when fully established, admits of no mistake as to diagnosis. No practitioner of ordinary intelligence could fail to recognize in the curved bones and tumid joints in infancy or childhood the true nature of the disease, and give it its proper synoptical designation. It is remarkable enough, however, and deplorable too, to find an anxious mother, paying unremitting attention to any slight cough, to indigestion or some slight rash on her child, quietly looking on, or totally over-looking, a disorder which is so strikingly expressed by external symptoms, and allowing month after month to pass over without seeking medical assistance for the ailment.

Under such occurrences I have frequently been struck by the importance of inculcating and spreading information among the public on the normal as well as the abnormal progress of infantile development.

There are two periods—considering the subject upon a broad basis—at which rachitism develops itself; and corresponding to these two periods of infantile life there are two distinct modes in which the disease manifests its symptoms. In the first of these, the infant becomes rachitic after the age of its fourteenth or fifteenth month; up to this period it may have passed regularly through those developmental stages which were physiologically due thus far,—it may have cut its first two or three groups of teeth, may have accomplished the closure of the fontanelle, and commenced walking, without difficulty or delay. In such instances the first symptoms of incipient rickets are invariably obscure for a time, and not seldom equivocal even for weeks or months of their duration. The devoted child loses its good temper, its liveliness, its freshness, and its vigour of movement; it becomes quiet, or peevish, languid and pale; there is some precariousness in its appetite and abdominal functions, with increasing bloatedness of the abdomen—phœnomena certainly too common to many incipient ailments to be distinctive of rachitism; it walks less firmly and cleverly than before, gets sooner tired, or loses the power of walking altogether. The last-named symptom, undoubtedly, is the most constant and characteristic of all in the earlier stages of such cases.

Upon careful analysis being made of the symptoms and general condition of such a child, and especially should the ankle-joints be found loose and the ligaments relaxed, the muscles of the thighs and legs being at the same time unusually flabby—we are frequently enabled to diagnose rachitism before decided rachitic alterations of the bones and joints have made their appearance; and in adopting appropriate means we may generally succeed in preventing these alterations along with the other symptoms of a more advanced stage of the disease. Should the bones and joints, as not unfrequently happens, at an earlier stage of the disease have assumed the rachitic feature: in this case, of course, the diagnosis is at once clear.

When rickets develops itself at a later period, in the mode alluded to, no wonder that parents entirely overlook its presence for weeks or months. But instances of so late and obscure a commencement form but a small minority of the whole mass of cases. In the great majority rickets sets in before the fifteenth or sixteenth month. In this case the disease is almost invariably announced by the retarded and disordered progress of the developmental stages, as exposed in preceding pages, (see p. 114). Indeed, in the great majority of such children the retarded process of dentition, the peculiar angular shape of the skull with the fontanelle widely open, and considerable weakness of the legs, announce the rachitic disposition

and tendency before any alteration in the bones has taken place; moreover, all the joints and bones at this tender age are more delicate and less firm in structure than at a more advanced age, consequently bending of their shafts takes place more rapidly, and enlargement of their extremities soon gives unequivocal evidence of the disease.

There are, however, numerous instances of children affected with rachitism at the age of nine or ten months, but having otherwise so plump and healthy an appearance, with the bloom of health on their cheeks, that parents regard them as healthy, and continue in such belief up to the eighteenth month or longer, in spite of the lasting retardation in the developmental stages alluded to, and the increasing disorder of the bones.

Because the child looks full and plump, and eats with voracious appetite, it is thought to be healthy. Such erroneous belief is not seldom the source of unwarrantable loss of time, and of no little danger to the child. This is especially the case when the ribs are involved in the morbid process, causing lateral compression of the chest, by which the free action of the thoratic viscera is more or less considerably impeded. This morbid alteration of the skeleton once established to any considerable degree, admits less than any other of this group of complete rachitic changes, of redress by remedial measures. In localities where rickets prevails, instances of such deplorable ignorance and illusion on the part of parents are an every day occurrence.

The careful practitioner, on noticing the phœnomena above-mentioned, not satisfied with the favourable opinion entertained by the parents, on attentive examination will find: that with the retarded ossification of the fontanelle, and the enlarged wrists and ankles, there is combined therewith some other functional derangement; and he will feel it his duty to draw the attention of the parents to the existing morbid tendency, till then unnoticed. Children presenting a degree, however slight, of that condition of the skull and joints above-named, will be found to present the following phœnomena in the aggregate, or some of them: avidity for farinaceous articles, bread and potatoes, immoderate eating without due increase of muscular power; the alvine evacuations irregular, in some instances confined, in others greatly abundant and rather liquid, of an unhealthy, variable appearance, sometimes clay-coloured, sometimes darkbrown and of a most offensive ammoniacal odour; the urine, in some instances having a slightly brownish tint, and acting strongly upon the blue test-paper, and forming after six or more hours (if not sooner) a sediment, either of a red lithic character, or whitish and mucous; the power of walking of these children, if they are able to walk at all, is neither easy nor firm, and the little strength they possess in proportion to the bulk of their body, and incapability of adequate muscular exertion, are proofs of their ailment.

These phœnomena—some or all of them—are certainly discoverable in nine out of every ten cases of the slight, often unnoticed rachitic tendency; yet, in the lower ranks I do not think that once in ten such cases are the parents aware of, or pay any attention to the disorder; and so far as my experience goes, in Manchester as well as in my former position, even among wealthier ranks physiological and hygienic notions—such, as ought to form part of general education, and to be regarded as one of Lord Ashburton's "common things"—are as yet so little diffused, that we but too frequently meet with irreparable consequences of the want of knowledge, as regards essential points on the physical management of children.

Another set of symptoms connected with the above mentioned slight degree of disordered ossification, has direct reference to imperfect hæmatosis, and consists in this: most of these children have a feeble and frequent pulse, and upon auscultation we perceive the chloro-anæmic murmur, particularly on the right side of the neck. These symptoms, however, are less constant than the above-mentioned, and less exclusively characteristic of rachitism.

It would be but a loss of time to dwell in this place on the diagnosis of rickets in its advanced stage, as in this case there can be no mistake. But, after the premised considerations, two questions may properly be advanced for solution: first, what symptom or symptoms are to be regarded as *essential* to the declaration of rachitism from its earliest commencement up to its highest stage?—secondly, what symptom or symptoms are to be considered as *diagnostically characteristic?*

As an answer to the first of these questions I have no hesitation in stating, that weakness of the legs is a symptom never absent in any case of rachitism, and at any stage of it from beginning to end, whether it be that the disease commenced in early infancy, or only after the appearance of the first groups of teeth, after the ossification of the fontanelle was accomplished, and the faculty of locomotion freely acquired. This at least is the invariable result of my own experience; and although I admit that in all probability from the earliest stage of the disease the process of ossification is disturbed, it is undeniable that the weakness of the legs in numerous instances is perceptible, and under certain coincident phœnomena announces the existence of rickets, long before our senses are able to ascertain the disordered process of ossification. To outwardly appearant weakness of the legs (manifested in standing and walking) I may add the flabbiness of the muscles of the thighs and legs, and a certain looseness of the ankle-joint. I believe, therefore, that I am justified in calling this an essential group of symptoms, because it is present always and in all cases of rickets.

But is the symptom in question decisive in the diagnosis of this disease?—certainly not; because we meet with weakness of the legs, flab-

biness of the muscles, and even a degree of looseness of the ankle-joints, in other chronic and exhausting affections of infancy; especially in infantile atrophy from disorder of the mesenteric glands, without any degree of rickets.

Upon strict examination and considering all the symptoms, I think there is not one exclusively peculiar to this disease except chronic enlargement of the ankle and wrist joints; consequently this alone is that which ought to be called in the strict sense of the term "diagnostically characteristic" of rachitism.

RELATION OF RACHITISM TO SCROFULO-TUBERCULOUS AFFECTIONS.

Rickets by the majority of medical writers is classed among the indefinite host of scrofulous affections; the arguments made use of, however, in support of this nosological arrangement are far from being decisive. It would be interesting, and might at the same time contribute to the illustration of this subject, to know in what precise relation rickets, in regard to its frequency of occurrence and combination, stands to scrofulous and tuberculous affections in different climates and localities. As yet we are in want of data to determine this question satisfactorily.

Among the reports given iu preceding pages relating to the occurrence of rachitism, several instances are met with where scrofulous and tuberculous affections of children in some localities are mentioned as abounding, whilst of rickets only rare instances are observed. Such are the accounts for instance from Thirsk, Aberdeen, Dublin, snd some other localities. On the other hand, in Edinburgh, both rickets and scrofulous affections of the skin and glands seem to be not frequent occurrences in practice. Again, in Manchester, where rickets is considerably prevalent, scrofulous affections are neither very frequent nor severe; and tuberculosis, according to the testimony of a friend of mine, physician to the Infirmary, is comparatively a rare affection in that establishment. In many continental towns, on the contrary, both rickets and scrofulo-tuberculous affections have equally an extensive spread.

Indeed, according to my personal observation during the last four years, impetiginous eczema of the face and scalp, impetigo and achor, ulcerated glands and joints, and tubercular phthisis, are very strikingly less frequent in Manchester than at Vienna or Pesth. At Pesth it was usual with me to assume, that one fifth of the children belonging to the wealthy classes of that city exhibited more or less conspicuous scrofulous deposits during the first two or three years of life, with a still greater proportion

among the children of the lower classes; whilst my enquiries regarding the eighty-six children already mentioned, belonging to wealthy families of Manchester, have led to the result, that scarcely ten of them have been, or are actually affected in any remarkable degree, with similar cutaneous diseases. It appears indeed not a little singular, that during four years of practice in this town I have seen only two cases of severe impetiginous eczema of the face and scalp, whilst at Vienna and Pesth it is an every-day occurrence to see children having the face and scalp completely covered with a dense crust of this eruption. This form of dyscrasic deposit I have mentioned more particularly because it is the first to appear in early infancy, and almost as though it were the groundwork of other subsequent scrofulous affections of the eyes, glands, and bones.

In regard to family disposition, both here as well as at Pesth, I have observed rickets in one and scrofulous or tuberculous affections in another child of the same family; with this difference only, that this co-existence of both diseases in the same family is much less frequently met with here, owing to the less frequent occurrence of scrofulosis.

Scrofulous affections of the skin, the glands, and the bones, occasionally also co-exist with rickets in the same subject; but in children affected with severe degrees of rickets, it is rare to observe any severe form of scrofulosis. Here as well as at Pesth, however, I have noticed the following circumstance: when a child affected with rickets recovers from this disease, not seldom eczema impetigo, or achor, breaks out on its skin, although previously there was no trace of such deposits. But this circumstance does not bear upon the identity of scrofula and rachitism; because similar cutaneous eruptions very commonly appear in weakly children at the period when their constitutional condition improves—this being merely a proof that there was some humoral disorder lingering in the system, which under the increased efforts of their improving constitutional power have been thrown out from the blood, and deposited on the surface. I have seen, on the other hand, vast numbers of children recover from high stages of rachitis without the appearance of any notable cutaneous deposits whatever.

From rural districts and villages of Hungary many children have been brought to the children's hospital of Pesth with extensive eczema, impetigo, and achor, of the face and scalp; and during repeated excursions through the country I have had opportunities of convincing myself of the prevalence of these scrofulous affections among the children of the country population, whereas rickets is decidedly a rare complaint among them.

With regard to tuberculosis—which affection is very generally regarded as the highest stage of the scrofulous dyscrasy—I feel confident in stating, that in Manchester where rachitism is frequent, tuberculosis is seldom ob-

served in children—so seldom indeed, that during all the time of my practice in this town I have met with it only in three children under three years of age, namely, in the form of scattered and seldomer as confluent deposits in the lungs, and in the bronchial and mesenteric glands. None of these children presented any considerable rachitic alteration of the bones, or gibbosity with serious lateral compression of the chest. From my experience at Pesth I am able to adduce a more conclusive result; namely, among upwards of five hundred post mortem inspections of children which, either by myself or under my own eyes, were performed in the hospital, comprising a considerable proportion of rachitic subjects (see p. 181), not one instance occurred of tubercular consumption in a child having a high degree of rachitic spine and chest. Enlargement of the mesenteric glands, some of which with a whitish deposit, or with pus in their centres, was the most frequent complication of this kind; the next in frequency was a similar condition of the bronchial glands; and in some cases only, conjointly with these alterations, there were tubercles in the lungs and other organs. But the last named alterations, not frequent in children affected with moderate degrees of rachitism, were never encountered in that hospital in instances of a highly rachitic chest.

The conclusion deducible from these facts would appear to be this: that certain forms and certain degrees of scrofulosis and tuberculosis *may* coexist with rickets; but that a high degree of rachitic compression of the chest, necessarily connected with over-carbonisation of the blood, is a condition adverse to the development of pulmonery tubercles. The assertions therefore of Rokitansky on this subject seem to be correct; and those observers who have expressed a different opinion, may possibly have confounded tubercular caries and angular distortion of the spine with rachitic deformity. On the other hand, however, it remains to be decided, whether the absence of tubercles in subjects with a rachitic chest is to be ascribed to the influence of the rachitic dyscrasy itself, or rather to the over-carbonised condition of the blood resulting in such subjects from mechanical compression of the respiratory organs.

Finally, my conclusion, based upon careful observation of a vast number of cases, is this: that rachitism is a disease which *may* be associated with, but is distinct in its nature from, scrofulosis and tuberculosis.

DISEASES OF RACHITIC CHILDREN.

The diseases to which rachitic children are most frequently liable seem to be the following: laryngeal spasm, fits, hydrocephalus, passive enlargement of the tonsils, of the thymus and thyroid glands, bronchial catarrh, head-ache, chloro-anæmia, and over-carbonisation of the blood.

Laryngeal spasm (crowing disease) and convulsion, I have met with most frequently in those rachitic habits which are characterized by a large flat and angular skull, with the fontanelle widely open; and it is generally between the eighth and eighteenth month, namely, during the efforts of dentition, that these affections are most liable to happen. The occurrence of hydrocephalus generally falls within the same age. Laryngeal spasm is peculiarly pertinaceous in rachitic children, and liable to pass into fits. I have many such cases in my recollection which occurred at Pesth. In Manchester among the 17 rachitic children mentioned (p. 171), one suffered from almost daily attacks of laryngeal spasm, from his seventh to his sixteenth month; another had similar attacks with convulsion under the irruption of the lower as well as the upper central incisors. Both these children recovered under the use of cod-liver oil. A third of them died of fits; and lately another of the same number fell a victim to hydrocephalus.

None of these affections seem to possess in rachitic children the character of inflammation; but the first-named (laryngeal spasm and convulsion) arise, it would appear, simply from disordered innervation; the last-named (hydrocephalus) from disordered circulation of the blood, which abounds in serum.

This pathological condition every practitioner should bear in mind, in order to abstain from bleeding in such habits, unless the spasm be preceded by heaviness of the head and oppressive drowsiness. In my former practice I have been frequently and most decidedly disappointed in these instances by the use of leeches, and post mortem inspection has settled the conviction as above expressed. The treatment ought to be principally constitutional, and calculated to improve developmental vegetation; and symptomatic measures, when required, ought to be modified accordingly.

Laryngeal and bronchial sub-inflammation, and chronic catarrh, are frequent complications in rachitic children; the last-named probably the most frequent of all their supervening ailments. And they suffer in such instances much more severely than other subjects from dyspnœa. Although generally bronchitis settles itself only in the larger tubes, and capillary bronchitis is a rare occurrence in them, there is commonly an abundance of subcrepitant rales, which together with the strikingly loud bronchial respiration not seldom misleads the practitioner to the assumption of pneumonia; percussion however readily rectifies this error, its sound being uncommonly clear—indeed, not seldom this sound is as clear as in cases of emphysema, especially laterally upon the compressed sides of the chest; and this circumstance makes the diagnosis of emphysema—which in reality frequently takes place in children with a rachitic chest—a matter of extreme difficulty. Among the 17 children in question, 7 have been repeatedly affected with chronic bronchitis (bronchial catarrh), and 2 have had repeated attacks of laryngitis

simulating croup, besides their liability to bronchial irritation and catarrh. In order not to overrate these figures howerer it must be observed, that these affections are generally exceedingly frequent in this town.

Catarrhal pneumonia (broncho-pneumonia) is not seldom met with; pleurisy and primary lobar pneumonia, on the contrary, so far as I know are rare diseases in such habits. Indeed, numerous post mortem inspections of rachitic children at Pesth have led me to the conclusion, that, owing to the narrowness of their chest, extensive and severe hyperæmia of the lungs is a frequent occurrence, but that plastic inflammation very seldom develops itself in them. Nothing indeed is more deceptive than the highly exalted bronchial respiration along with mucous obstruction of the smaller bronchial tubes; and hyperæmia of the pulmonary tissue not seldom augments this deception by imparting a degree of dulness to the percussion sound. In fact, if a rachitic child, having considerable lateral compression of the chest, be affected for some time with bronchitis, almost invariably the one or the other of the following cases will take place: either passive hyperæmia, which causes a slight dulness of the percussion-sound; or expansion of the vesicles, causing the reverse phœnomenon on percussion; or the last named condition conjointly with partial "collapse of lungs". Besides these causes dyspnœa in rachitic children arises not merely from the compressed condition of the chest, but is also caused by the rigidity and impeded mobility of the ribs, and weakness of the respiratory muscles.

I have met with some instances of pseudo-membranous adhesion between the costal and pulmonary pleura—which is mentioned in the works of some meritorious authors as a frequent occurrence—but in my cases this morbid condition was either of ancient date, and probably existed prior to the decided stage of rickets; or, when it seemed to be of recent formation, then the rachitic alterations in the dead body were very slight. It would seem strange indeed were it otherwise; because, the slighter degrees of rachitism are frequently connected with some appearance of chloro-anæmia, and the more severe degrees with over-carbonisation of the blood—both conditions almost essentially excluding the possibility of over-fibrinisation of the blood and plastic inflammation. Nothing, in fact, is more unsatisfactory, if not hurtful, than the repeated use of leeches in the bronchial affections of rachitic children, however acute the symptoms may seem to be. An emulsion with nitrate of potash is generally preferable in these cases to tartar emetic, and warm linseed poultices to leeches. This I should say ought to be a general rule, which has but few exceptions. A solution of muriate of ammonia (gr. iii-vi to the ounce of water) with extract of liquorice very commonly soon relieves the bronchial symptoms of rachitic children, to which, in cases of great languor, a few grains of camphor may be added with advantage; and in protracted cases of

this kind not seldom cod-liver oil is the only efficient remedy.

The above pathological views apply also to head-ache; inasmuch as in these infants this complaint is scarcely ever of an *active* congestive or inflammatory nature, but either the direct result of chloro-anæmia, or it consists in *passive* veinous congestion, that is to say, in those having the rachitic chest. In the first case iron is the essential remedy; in the second, cold sponging of the head and the administration of cod-liver oil, but above all free aeration of the blood, will best answer the curative purpose. In either case nothing but mischief is to be expected from the application of leeches.

The frequency in rachitic children of passive swelling of the tonsils, and of the thymus and thyroid glands, has been mentioned in preceding pages (134,135); as well as chloro-anæmia, as a common complication of slight stages of rachitism; and over-carbonisation of the blood, as necessarily present whenever the chest is notably compressed. Nor is it requisite here to mention again, the relation of rachitis to scrofulous and tuberculous affections, which has been dwelt upon extensively in a preceding chapter.

INVESTIGATION OF THE PRINCIPAL CAUSES OF RACHITISM; THEIR MODE OF ACTION.

Rickets, like other constitutional ailments, can only develop itself under a certain organic condition of the individual, sufficiently understood by the term *predisposition*.

The rachitic predisposition as daily experience abundantly proves, is sometimes derived by hereditary transmission from parent to offspring; but it may be extensively engendered in populations by climatic, atmospheric, and other agencies, of some of which we are unable as yet exactly to understand the nature and mode of action.

Judging from such facts as are accessible to our observation, we must needs infer, that some populations and some individuals possess this tendency in a high degree, others less, and others again are entirely exempt from it; and accordingly, in the first of these cases slight errors in diet may lead to the establishment of rickets, whilst where there is no such predisposition—as in Scotland, for instance—even the grossest errors in infantile diet, or other agencies of a still more noxious character, are insufficient to bring about the morbid condition in question.

Although the same influences which give rise to the rachitic predisposition may be sufficient to develop the disease itself, yet, strictly considered, there is a certain difference between these and some other agencies, which we may properly call the *exciting causes* of rickets. Thus, for example, we may instance the lymphatic temperament in children as a cause rather of the rachitic disposition than of rickets itself.

The hereditary transmission of the rachitic predisposition we may consider first in a strict sense—when the parents have had in their infancy, or have still on them, the evidence of rachitism; and in a more general sense—when they are of a lymphatic habit, or phlegmatic in a higher degree, having a good deal of embonpoint. In the first case—of parents who have been or are decidedly rachitic, the children will be almost invariably rachitic. I remember in my practice several such families, and am perfectly convinced that there is no cause of rickets so absolute and powerful as hereditary predisposition in this sense. In the second case—of parents, with simply what we call the lymphatic habit, and those of a full phlegmatic type with a high degree of fatness—a condition much more obvious among the wealthy classes than among the poor—vegetative weakness, and rachitic tendency of their children are a frequent consequence, but not so invariably as in the former case. Both degrees of hereditary influence, however, if only present in one of the parents, are frequently counteracted by the vigorous habit of the other, so that the children present no signs of rachitism.

In my experience infants with a fair, or better to say, flaxen hair, are more disposed to rachitism than others; but I could not state any proportion in this respect either here or in Hungary. But instead of proceeding further in this difficult and profitless line of enquiry, it may be more useful to reconsider carefully some of the more prevalent and direct causes of rickets in their relation to the infantile organism, and their mode of action, of which repeated mention has been made in the course of this treatise.

It must be unhesitatingly admitted, that improper modes and unsuitable kinds of infantile diet, impure air, and uncleanliness, are by far the most frequent causes of disordered developmental vegetation and rickets. Among these the two first-named are the more important and palpable in their effects; it will not be superfluous therefore, to dwell somewhat more largely upon these.

Improper infantile food. It was shown in preceding pages by a number of self-evident facts, that certain qualities of the respired air constitute a more powerful and extensive cause of the disorder in question, than any unsuitable kind of infantile food. It is certain, however, that in countries and localities where climate or atmosphere is not counteractive of the rachitic *predisposition*, errors of diet very frequently promote the development of this, and tend to the decided development of the disease itself.

As artificial nursing from the time of birth or, what amounts more or less to the same thing, too early weaning, represent—especially in the poor ranks of society—the unsuitable kinds of infantile diet (as a necessary consequence), I will mention some data bearing on this subject, which are the result of an approximative calculation instituted in the children's hospi-

tal of Pesth in 1844 and 1845 under the cooperation of D. D. Metzner and Syabadfy, at that time assistant physicians to that establishment. Our joint exertions led us to the conclusion, that out of four hundred sick children under three years of age, of whom it was ascertained, that only a few had been nursed to the natural extent by their mothers; many had received the comforts of the maternal breast only during two or three months after birth; and most of them had been entirely dry-nursed, about three hundred were inscribed in the records of the hospital under the denominations of *atrophy*, *abdominal scrofulosis*, *impaired vegetation*, *retarded development*— of which the two first-named terms certainly included many, and the two last almost exclusively children with the rachitic habit,—and not a few of them under the denomination of *rickets*, denoting the more decided stages of the disorder.

Most of these children had been fed upon a soup of flour (browned with fat and boiled with water), coarse brown bread, potatoes, and partly upon flour boiled in milk. These children, of course, all belonged to the poorest classes.

Early weaning among the wealthy classes is not, for obvious reasons, so injurious in its results as it is found to be among the poor. Yet, in a practice of great extent in my native city, I have met with thousands of instances where the children of wealthy parents, fed too soon or too profusely upon wheat flour, or other farinaceous or starchy articles boiled in milk, were retarded in their developmental vegetation and in a great proportion presented rachitic symptoms. In Manchester I have been able to make out, although upon a smaller scale as regards personal experience, but still sufficiently significant as to its exactness, the following proportion: among 39 rachitic children occurring in families of different social ranks (see p. 188) 18 were fed from the age of their fourth, fifth, or sixth month, either exclusively, or, in addition to an insufficient breast, upon some farinaceous, or starchy article, such as arrow-root or tapioca, mixed with milk or cream; and 21 of them have received animal food either too late (after the 15th or 18th month, or even later), or in a form too substantial, and (as I believe) not easily assimilable for the infantile organs.

When we consider the *nature* of the food upon which those children are fed who do not receive the breast at all, or only a scanty supply of it, and among whom impaired vegetation is followed by rickets (in localities, where this disorder is prevalent), we find, that for infants of tender age they are generally less homogeneous, less digestible and therefore less assimilable and invigorating, than the milk of the breast; besides which most of these articles, when imperfectly digested, yield a large amount of acidity in the stomach, liable to be conveyed in super-abundance into the blood.

We may therefore say, that the *action* of these substances, so frequently

observed as causes of rachitism, is partly debilitating—owing to a relative want of power in the infantile organism to digest and assimilate them perfectly,—partly, and for the same reason, they yield superabundant acid, and thus prevent the solidification of the phosphate of lime, although some of them may contain a considerable amount of this salt. Most of these articles are not deficient, nor even poor in the protein-compounds (albumen and gluten); but these principles of nutrition as contained in the farinaceous articles do not so readily undergo complete assimilation as the protein-compounds of milk, where these as well as phosphate of lime, and the chlorides, are contained in a condition more homogeneous to the animal system, and most appropriate for the tender structure of the infantile organs. The milk of the breast itself, however, not seldom possesses unwholesome properties.

Setting aside the evidence of an unsuitable condition of this fluid obtained by microscopical investigation, or that which is perceptible to the eyes of an experienced practitioner by pouring a few drops of it into pure water—the milk of the breast is generally wholesome when it is abundant, and when the mother feels neither exhaustion nor pain in the chest, nor otherwise inconvenienced by nursing; under the reverse conditions the nursling will become affected with abdominal disorder, or poorness of the blood, or both. If the milk be scanty only, without causing derangement to the infant, then, with an additional supply of a proportion of cow's milk the mother may continue to nurse; otherwise a good nurse ought to be substituted, or if this be impracticable, the child is to be weaned. The plan of improving the quantity and quality of the milk of the breast by encouraging the mother to eat forcibly *beyond her appetite*, or to insist upon the use of ale or porter *in case that these beverages cause headache or other inconvenience*, is altogether unphysiological, and leads to no good result. The use of good and fresh cow's milk, mixed with one third of warm water and a little sugar up to the fourth or fifth month, afterwards the proportion of water being gradually reduced—generally answers well the purpose. The *mode of action* of unwholesome human milk, or cow's milk, in promoting the rachitic tendency, consists partly in impoverishment of the blood, partly in overacidification of the chyme. The last named inconvenience is frequently obviated by the addition to each meal of the infant of a teaspoonful of lime-water, and anise or fennel-water; but, of course, the due amount of nutritious elements in the milk, the "globules", butyrine and casein, are the essential conditions required for healthful infantile development.

Arrow-root, tapioca, potatoes, and other starchy articles, when used with a small proportion of milk, and for children of an age beyond the ninth or tenth month, without other animal substances—besides their being poor in invigorating (nitrogenous) principles, more readily give rise to acidity than the preparations of farinaceous articles.

In the action of the saliva itself, which is so copiously secreted in children, we find an explanation of this fact, insomuch as saliva, in its normal condition (by the action of its principle, *ptyaline*) converts starch into sugar, and sugar into lactic acid; to the super-abundance of which Marchand ascribes the prevented solidification of the phosphate of lime into bony structure. Experience has verified this result in numerous instances of children having been fed mainly upon starchy articles boiled in milk—though I would not say, invariably. In nervous habits for instance, starch will not so readily produce this effect.

As regards potatoes, they are certainly less digestible than arrow-root or tapioca; besides this they are inconstant in their quality, and at all events contain a quantity of raw vegetable juice, which by boiling is less efficiently removed than by roasting them.

Besides the too early use of substantial farinaceous and starchy dishes, there is another error often committed in infantile diet not seldom productive of the same morbid tendency—which is, the omission of the more invigorating animal substances, at an age, and in constitutions, for which farinaceous dishes have become insufficient to supply all the wants of the vegetative processes,—or the use of meat (however hashed) in children whose digestive organs have not adequate power to change sufficiently the solid muscular fibre of meat, and therefore do not supply the blood with those invigorating principles which are contained in meat. This is sometimes the case even at the age of eighteen months and upwards—at which age the same children might be greatly benefited by light soups and tender kinds of white meat. And it requires not seldom a minute examination of the evacuations in order to discover the necessary evidence of the imperfect digestion and assimilation of substantial viands.

Neither the age of the child, nor the appearance of the incisor teeth, are sufficiently trustworthy guides for the introduction of substantial animal dishes in the diet of a child; to avoid mistakes also the constitution and temperament of the child ought to be carefully considered, (see p. 15, 37, 38).

That the with-holding of animal food at a certain period of early life, or the use of animal substances of an unsuitable kind, have the effect of promoting the development of rickets, has appeared evident in numerous instances which have come under my notice; but the mode of action, in which either the omission of such substances, or the relatively too indigestible nature of them in certain habits and at certain ages contribute to establish the *chemical* pathology of rachitism, it is difficult exactly to explain.

It is certainly not a direct hyperacidising influence which the last mentioned errors of diet exert upon the child; but omission as well as improper kind of animal food, may indirectly contribute to that effect—perhaps

by causing a want of stimulus in the blood, and consequent weakness and disorder in the spinal innervation upon, and in the nervous and chemical actions of, the digestive and assimilative organs.

Impure air.—Quite at variance with the "mode of action" of improper food, is the influence of impure air (namely, of over-populated quarters and crowded dwellings) upon the infantile system; and although this agency is one of the most self-evident and extensive causes of rickets here as well as in continental towns, we are even less able at the present stage of knowledge on this subject, to explain exactly its *mode* of action in producing the rachitic dyscrasy, than that of improper infantile diet.

If superabundance of acid is to be considered as the causa proxima of this disorder, then it would appear as though impure air exercised a less *direct* influence towards its production than improper food.

The air of over-crowded and ill-ventilated apartments may possess many heterogeneous admixtures; three properties of it, however, must be considered as eminently noxious: *dampness* from pulmonic and cutaneous exhalation,—*expansion*, from artificial and animal heat, and therefore diminution of the proportion of oxygen in a given volume of air, and copiousness of the *carbonaceous elements*. By the first of these properties the vigorous decarbonising action of the skin becomes checked; by the second, indirectly, and by the third directly, the over-carbonisation of the blood is promoted. In neither of these influences at the actual stage of knowledge are we able to recognize a direct action towards the production of rickets, as regards the chemical anomaly in the bones; but nothing is more surely demonstrable than the effect of all of them combined in preventing a due degree of fibrinization of the blood, and the formation of a due amount of red corpuscles.

Here it may not be improper to digress briefly from the strict etiology and pathogeny of rachitism, for the purpose of noticing the actual symptoms of rachitic children; of which it may be observed, that, although that series of disordered actions, which begins with the over-acidity of the chyme and leads to deficiency of phosphate of lime in the bones, is the most salient condition in the pathology of rachitism,—another series of symptoms which begins with poverty of the blood, and induces a spare and flabby condition of the muscles, and feebleness of the nervous system—is one of no inferior importance. Indeed, in vast numbers of cases, anæmia seems to precede the chemical disorder of ossification.

These cases are numerous in Manchester, and of very frequent occurrence among wealthy families on the Continent—many of whom do every thing they can for their children with the exception of one thing, the most important of all: that is, due care for good aëration. In these children generally the signs of anæmia first of all make their appearance—

paleness, languor, a feeble and easily accelerated pulse, defective spinal innervation towards the locomotor muscles and the skin—and then follows the disordered chemical function relating to the diminished supply of phosphate of lime to the bony structures.

There is no doubt, however, that the immense majority of childen of the poorer classes of large towns are so decidedly exposed to the simultaneous influence of both unsuitable alimentation and impure air, that it would be difficult to examine among them these agencies seperately, and to estimate their relative effects. And in addition to the two agencies abovementioned, a third appears to exercise no little influence—namely,

Uncleanliness—neglected cultivation of the cutaneous function.—Although the importance of this agency in chronic and developmental diseases of children in general is acknowledged by every practitioner, yet it is not easy to demonstrate its noxious relation to rachitism practically, and by facts. The reason of this difficulty is simply this, that wherever we meet with a neglected condition of the skin in children of poor families in towns, most certainly there will be great errors committed also in diet and aëration.

With regard to the "mode of action" of the last-mentioned noxious agent (uncleanliness of the skin) in the production of rickets, enquiry and experimental facts are so far wanted as yet, that it would be too hazardous to propose even a hypothesis—unless some indication were discovered in the circumstance, that the amount of lactic acid which in the healthy state of the skin is carried off from the blood (along with certain salts and other organic matters), owing to the lessened activity of this organ from uncleanliness, remains in the circulating fluid, thus contributing to overacidification of the blood—the alleged source of rickets.

THE NATURE OF RACHITISM; ITS PREVENTIVE AND CURATIVE MEANS.

It has been repeatedly intimated in preceding pages, how imperfect our knowledge is of the nature, the proximate cause and pathological process, of rachitism. If, after a careful survey of facts which have been adduced relative to the etiology and pathological relations of this disease, we now undertake to reconsider more strictly its nature—which, in the spirit of rational and physiological medicine should afford indications for treatment—we scarcely find ourselves much the better for doubts and difficulties.

If we consider the two groups of symptoms—one, directly referable to a chemical disorder, characterised by defective deposition of phosphate of lime in the bony structures, and the abundant elimination of this salt in

An over-acid condition by the urine,—and the other, consisting in muscular atrophy and weakness, referable to defective spinal innervation—we may well ask: which of these two is the more essential, and the most decidedly indicative of the special pathological process?

Considering that disordered nervous action—as has been recently proved in the case of superabundant production of sugar in the liver from injury or disease of the brain—is in itself capable of effecting a change in the chemical processes and their products,—and that at the earliest stage of rickets in many instances the symptoms of defective spinal innervation manifest themselves before any swelling of joints, or curvature of bones, are perceived: there is some show of reason in assuming a disordered condition of spinal innervation as the proximate cause of this disease.

If, then, we go still further, and enqnire: in what consists this nervous disorder of the spinal cord? Although it may be right to state—as was done already—that it consists in defective innervation, yet this statement certainly is far from elucidating the chemical point of the rachitic process. Spinal debility, and want of peripheric innervation, *simply*, cannot be regarded as the essential source of rickets.

Therefore, in argueing a disordered condition of the spinal function to be the "proxima causa morbi," we needs must assume this nervous disorder to be of a *specific* character, otherwise it could not have so specific a disease for its consequence. But at this point again we find ourselves in the midst of doubt. Indeed, we know so little of what the agency of innervation, or the nervous fluid, consists in, that we are at a loss to form a satisfactory idea of any "specific" disorder of its function.

But, it may be confidently stated, that the group of spinal symptoms alluded to, is altogether referable to a disordered condition of the blood; and when we weigh the circumstance—which has been proved to evidence by alleged facts—that impure air, which affects directly and primarily the blood, is the most prolific of all external causes in the production of rachitism, we can scarcely hesitate to refer the proximate internal cause of this disease to the blood. The altered chemism of the blood *must* necessarily derange the chemical functions and products of the digestive and assimilative organs in a direct way,—but it *may* at the same time also co-operate to the same effect indirectly, inasmuch as that ill-conditioned state of the blood does not act upon the spinal cord with the normal stimulus required for a healthy innervation.

Thus far, I presume, our conclusions may be regarded as tenable; but for the knowledge of the nature of a disease so manifestly specific as rachitism is, it would be necessary to exactly define in what the alleged alteration of the blood consists—and this, as yet, we are unable to do.

All we know for certain of the state of the blood in rachitism is, that

very frequently it presents in the living child the signs of chloro-anæmia, (see p. 188), and in general that of hypinosis (subfibrinization), conjecturable from the fact (alluded to p. 199) that such children are but little liable to acute and plastic inflammation. But as this condition of the blood does not account in the least for the specific chemical and organic disorder constituting rachitism, there must be, besides the condition alleged, another and more specific dyscrasy, which we are unable to define. Is it the predominance of lactic acid in the blood ? (see p. 158.206).

Furthermore, careful observation of the living as well as numerous post-mortem inspections have led me to assume, that the disordered state of the blood constituting the rachitic dyscrasy has no tendency to form deposits in the interior or on the surface of the body (in which respects it differs in its nature from other dyscrasies, but coincides with chloro-anæmia); because, as was shown on a previous occasion (p. 197), although scrofulous or tuberculous products are met with in rachitic children, yet this is by no means frequently the case.

In conclusion therefore we may say: *that the proximate cause of the rachitic process seems to be an altered state of the blood, which presents great affinity with chloro-anæmia, but which must have besides this another specific character*—though not proved hitherto by analysis—directly or indirectly affecting the chemism of ossification.

The preventive and curative means of rachitism are partly disclosed by the symptoms of the disease, partly settled by remedial experience. The preventive means, especially, have been indirectly, but nevertheless clearly indicated by the recognition of those agencies under the influence of which the disease generally is seen to arise. To avoid these, and to place the infant under the influence of pure air, suitable nourishment, and cleanliness, by bathing and sponging—this is the surest means of preventing that disordered process of developmental vegetation by which rickets is generally preceded.

The same hygienic measures are of great importance also in the treatment of this disease, when fully declared; and among these—in accordance with unmistakable facts alleged on previous occasions, the most important is

Pure air. Indeed, if in the case of a rachitic infant it were within the convenience of every family to transfer their habitation, or at least the patient, to a more suitable situation, as for instance from the crowded town to a dry and open country place, or still better to the sea shore—this would be a successful means of redressing the morbid process. Unhappily however, parents are not always able to realise so essential a change; but, in the generality of instances, under the cooperation of certain remedial agents presently to be indicated, it will be found sufficient to improve the ventilation of the dwelling, and to take the patient frequently out in the

open air to a distance from the crowded quarters. A rachitic child should have, if possible, a large and well ventilated bedroom, not overfilled with beds for other children or grown persons, and should be kept during the day in a room having similar advantages. These conditions, so necessary to healthful development, are much more frequently disregarded on the Continent even by wealthy families, than in this country; and although domestic circumstances do not always admit of such decided measures as the physician may think desirable, some favourable arrangements in regard to ventilation may be almost generally effected, and these will commonly be followed by a favourable result.

Suitable diet. The regulation of this important agency is more easily realisable by every mother, wealthy or poor—the utterly destitute excepted. Much has been said on this subject already. The errors of infantile diet in general have been mentioned previously; and some instructions relative to special diet as required by the different temperaments at different ages of childhood, have been distinctly specified under their respective heads (see p. 15,17,18). It cannot be too strongly recommended to mothers, that when their milk, besides its being scanty, causes griping to the child and diarrhœa, and emaciation, to abstain from nursing, adopting the directions given in one of the preceding pages.

A circumstance which merits our special attention is this: that most rachitic children, with a voracious appetite for heavy farinaceous articles, bread and potatoes, show little liking, sometimes even decided aversion, for animal food. This in such habits is a sign as well as the result of their morbid tendency, to overcome which not seldom judicious determination on the part of the physician, and intelligence and cleverness on the part of the mother are required. By a reduction of those articles which are voraciously longed for, and by means of prolonged sojourn in the open air, and cold sponging, the appetite of such children must be encouraged to some suitable kind of animal nutriment, in the smallest quantity, to be gradually increased. I am enabled confidently to affirm, that I have succeeded in this way, by patient perseverance, to improve the rachitic tendency in many hundreds of children. There are instances, however, in which such a desirable change in the diet can be accomplished only after the child has taken for a while cod-liver oil, or iron.

For the young practitioner it is not always easy to discern in what cases he ought to insist upon the introduction of animal food, as there are habits, the nervous for instance, in which the aversion for animal food is not at all a morbid sign, but a natural and instinctive manifestation of what disagrees with their constitution. There can scarcely be any mistake in the case of a child, who had previously, when in the enjoyment of health, up to his fifteenth, or eighteenth month taken *some* animal substances, and in whom

then, under the development of rachitism the aversion alluded to gradually established itself. But the question is more difficult of solution when the rachitic tendency, and along with it that aversion to animal food, set in earlier than the fifteenth or twelfth month. In this case, on strict investigation of the habit and temperament of the child, the discovery of the phœnomena of rachitism in however slight a degree must lead us in forming our judgement. It would be a great mistake, indeed, to force upon a child of a nervous temperament dietetic measures which are urgently called for in one of a lymphatic habit. I cannot forbear on this occasion the narrative of a remarkable case, shewing how different the dietetic requirements of the various temperaments are, and how well the nervous may prosper and acquire normal development for years upon a diet, which undoubtedly would be insufficient or detrimental to others.

Not long after my arrival in Manchester, a distinguished practitioner of this town repeatedly consulted me on a rare circumstance concerning one of his own children, a source of great anxiety to him, and sufficiently remarkable to excuse a brief reference to it in this place. The child, a girl, when three years old, had not thus far made use of any kind of food or nutritive substance besides milk—not even in the smallest quantity. As its appearance was somewhat pale and delicate, I thought it advisable to try the introduction into its diet of more substantial articles, to facilitate which purpose, amongst other measures, she was subjected to long walks, and longer intervals between the meals; but all attempts, however prudently practised, to induce the child to take mixed with milk even the smallest morsel of bread, or the least quantity of flour boiled with it—were unsuccessful; she perceived it immediately and threw it out of her mouth as often as it was given, with the utmost disgust. When four years old, egg beaten in milk was given her; but this made her sick, and caused vomiting. At last, at the age of four years and a half she took mixed with milk a proportion of isinglass in quantity imperceptible to her; a little sugar and toffy besides this she ate with pleasure; since her fifth year and a half up to her present age of six years and a half, she takes an imperceptible proportion of flour boiled with the milk. Thus had she taken milk alone till her fourth year; then, milk with the addition of a little isinglass, sugar or toffy (inspissated molasses); and latterly a small quantity of flour, up to the age of six years and a half.

It is remarkable that this child, who, after having been weaned at the age of twelve months was fed upon pure cow's milk during the rest of the period of the first dentition, and for more than a year later, presented no retardation or disorder perceptible in the progress of dentition, general ossification, or of muscular strength for the function of walking. The physical as well as intellectual faculties of this child were and are

well developed; the temperament and whole habit is exquisitely nervous.

In fact, all my experience speaks to the effect, that with children of a nervous temperament milk alone agrees better, and is sufficient nutriment for a longer period, than with others. The case here mentioned however, is certainly one of the rarest, and one which proves the immeasurable influence and power of unknown constitutional conditions, assimilating differently the same aliment. Among the large number of children I have had occasion to attend, I remember not a few who throve well on the breast-milk alone till their fifteenth or eighteenth month; but at this age for the immense majority farinaceous substances and some light kind of animal food become a vital necessity, and the decided aversion for the latter kind of aliment at the age in question is frequently no more than a morbid symptom, which we must try to surmount.

Bathing and Sponging.—These means of treatment are not only prophylactic, but also curative of rickets in its slighter degree.

The promotion of a healthy action of the skin by warm baths, after the ninth or twelfth month once or twice during the week, and cold sponging every morning, will contribute efficaciously to prevent the development of rickets. Should the disease be fully declared, then my experience is very much in favour of sponging every morning and evening with water from 80° Fht. gradually reduced to 75°, 70°, 65°, and even lower (according to the various temperaments, and the constitutional tolerance of cold), and for a period varying from half a minute to 3, 4 or 5 minutes' duration each time; after which, friction is to be applied with dry flannel for several minutes.—In high degrees of the rachitic curvature, and compression of the chest, and under decided symptoms of chloro-anæmia, sponging with cold water is generally not well tolerated, or not supported at all; the water in these cases should not be colder than 80° or 85°, and its application not continued longer than one or two minutes.

Cold sponging of the head is a measure generally useful to infants, more urgently called for in case of a large skull with retarded ossification, and to be practised three or four times every day during the troubles of dentition. If the brain, besides its excessive volume, is much retarded in intellectual development, cold affusions on the head are preferable to simple sponging.

In the children's hospital as well as in private practice at Pesth I have for years applied, first simple warm or tepid baths, then warm baths with large proportions of chloride of sodium in solution; and in numerous instances warm gelatinous baths, aromatized by the infusion of camomile, mint, etc. Of the warm or tepid bath I may say I have seen advantage derived only in the neglected children of the poorer classes, whose skin was

dry and inactive; and unless at the same time other means were resorted to, the warm bath alone very frequently after a lapse of time produced no longer any visible effect.

The warm salt bath, (containing about two pounds of kitchen or bay-salt in solution for an entire bath) of 10 to 15 minutes' duration, has proved to have in far more instances than the simple warm bath an invigorating effect, particularly in cases where, besides rickets, there seemed to be some other dyscrasy latent in the blood with a tendency to deposition on the skin. But in cases where there was a striking degree of muscular flabbiness and spinal weakness, the warm salt-bath—evidently on account of its temperature, and in spite of the presence of the salt—produced a degree of languor in the child; and cold sponging substituted for it, had immediately an excellent invigorating effect.

From the warm gelatinous bath I have seen the same results; in general rather favourable, but not seldom debilitating in its effects, in spite of the intended absorption of the gelatine. This kind of bath was applied in the children's hospital and in the houses of out-patients of the abovenamed establishment in some hundred cases of rachitism complicated with a greater or less degree of atrophy, and frequently proved successful. But from the time when I began to give a more extensive trial to cod-liver oil in rachitism as well as in other chronic ailments connected with defective nutrition, the results of this remedy were such as entirely to supersede the less efficacious gelatinous baths; so that cold sponging was substituted for bathing in general, of from 85 degrees to 60, according to the individual dispositions and temperaments. The water was partly applied in its natural state, partly, and more frequently, mixed with a large proportion of chloride of sodium, and sometimes with the addition of brandy.

With the exception of cod-liver oil I know no remedy so generally and unmistakably useful in rachitism as cold sponging, applied at a temperature and for a duration varying according to the different degrees of tolerance observed. In the present day this is almost the most constantly employed remedy in this disease in my practice. I believe, that the bay-salt (of which I commonly recommend a very strong solution) has a share in the good effects obtained; yet, to prove this by facts appears impossible, so efficacious is the cold water when used alone in its pure state.

Internal remedies.—Remedies calculated to fulfil the chemical indication (to prevent and neutralize acidity) are generally inefficacious in this disorder; and remedies intended to improve one or other of the abdominal functions are seldom of essential use, if not in the long run hurtful. There are instances, of course, in rachitic infants as well as in others, where an accidental and temporary derangement of these functions will be improved by rhubarb and magnesia, or by minute doses of aloes (from gr. ¹⁄₁₂ to ¼ p. d.), or

a brisk aperient; but to insist upon the continued use of mercurials to change in these cases the clayish appearance of the stools into a healthier quality, is an indication ill founded in theory, contradicted by practical experience. Such constitutions as rachitic children possess are certainly not to be subjected to the continued action of mercury; and the condition of the blood as peculiar to these habits will be a constant source of disordered abdominal secretions, until it shall have been improved by constitutional remedies.

The internal remedies—in my opinion the *only* remedies—directly and powerfully beneficial in rickets, are: *cod-liver oil, iron, and quinine.* They have been mentioned already in these pages as being of great value in improving retarded developmental vegetation; in the declared rickets they are imperatively required. The value of *cod-liver oil* is especially acknowledged by credible authorities, among whom Trousseau and Bochut declare it to be the most important remedy in this disease, and almost infallible in its curative effects.

My own experience entirely coincides with the statements of the eminent observers just named, so far so indeed, that I scarcely recollect in my practice a single case of rickets where cod-liver oil did not prove beneficial, provided the patients were able to take and digest it well. In fact, it is generally indicated and well supported in this disease, and instances of invincible repugnance to it, loss of appetite, or diarrhœa after its use, form in the total number of cases but a small minority.

Frequently at first the child takes it with difficulty, but by clever management and perseverance in its administration this aversion gradually vanishes.

In some habits, liable to *mucous* or *bilious* diarrhœa, it excites or promotes these disorders. Mucous diarrhœa is not a decided contraindication, however, of cod-liver oil, inasmuch as in many such instances it can be given with the occasional assistance of an appropriate dose of Dover's powder. The case is different with those liable to bilious diarrhœa and loss of appetite; as by any attempt made to check the bilious evacuations, the disordered digestion and want of appetite will only the more strikingly increase.

There are again other varieties of the rachitic diathesis in which loss of appetite and disordered digestion follow the use of cod-liver oil unaccompanied with diarrhœa; in these cases also its use must be moderated or given up.

In conclusion, I am unable to admit any inducement to abstain from the internal use of cod-liver oil in cases of rachitism, except invincible aversion for it, and increasing and uncontrollable abdominal derangement from its use.

Among children with dark hair and a bilious hue of complexion, the unpleasant effects of cod-liver oil are met with more frequently than among

others; and in summer comparatively less of it is supported than in colder seasons of the year. Here in Manchester I have frequently found reason to suspend its use for a few days or longer in wet weather with a temperature above 60° Fht.

On the whole, *at Pesth*, where I have used for some time the dark brown, and afterwards exclusively the light brown Norway-oil, I have in my practice arrived at the conclusion that in every 100 cases there were 15 to 20 in which some sort of difficulty was experienced in its administration; whilst here, in *Manchester*, among every 100 rachitic infants there have certainly not been 10 such difficult occurrences; and this favourable circumstance, I feel fully satisfied, is dependent upon the more suitable properties of the cod-liver oil we use in *this* country.

It is well known, the light brown cod-liver oil of Norway is much cheaper than the English; and it is notorious also, that large quantities of the former have been imported for sale into England, under most inviting recommendations for its use. Now, if the cheaper kind of this oil answers the same curative purposes, why should it not be preferred to the more expensive? We may ask, therefore, is the light brown kind as efficient in its curative properties as that of Newfoundland, commonly known as English?

This question, in a chemical as well as practical point of view, according to my experience, must be answered affirmatively. If the child take and digest well the light brown cod-liver oil, it will be found quite as useful as the English. But, upon strict observation, that affirmative requires restriction, inasmuch as the light brown oil in question is far less agreeable to take and not so easily digested as the English.

Lately I have on several occasions been struck with astonishment on seeing to what extent commercial men, founding their enterprise upon certificates said to have been obtained from a scientific authority (Dr. de Jongh) and published by several English houses, have succeeded in imposing upon the credulity of the public as regards the pretended superiority of the light brown cod-liver oil above the English. I feel that it would be unpardonable on my part should I hesitate frankly to express my opinion on this subject, founded upon a *comparative* experience with both kinds of oil, both at Pesth and in Manchester, upon a scale most probably larger than most others have had opportunities of enjoying.

I have ordered the dark and the light brown cod-liver oil to several thousand children affected with different chronic ailments in the children's hospital of Pesth, and to several thousands also in private practice in that town; and during the last four years in Manchester, I have prescribed the English variety to more than two hundred children. The result of my experience is this: that the curative effects are obtained by either kind if it is found to agree with the patient's digestive organs,—but,

as was already mentioned, the Norway-oil is less agreeable to the palate and stomach, than the English. And this becomes self-evident upon considering the processes by which they are obtained,—namely, the former being the product of the cod's-liver, after having been left for some time exposed to the air and sun, and thus allowed to undergo a degree of fermentation,—the English (Newfoundland) is directly obtained from the fresh livers of the cod, chopped and enclosed in a bag, and subjected to a vapour-bath not exceeding 140° Fht., to avoid any kind of decomposition.

I have seen it stated, that the *light brown cod-liver oil is four times as active as the English.* Here we may be allowed to ask: what is the active principle of cod-liver oil in the disorders, atrophy, vegetative weakness, and rickets? Nobody has hitherto solved this question satisfactorily. Other oils and fats have not the same effect as cod-liver oil. I feel confident in stating this, from the numerous extensive comparative experiments which I have made with olive-oil, goose-fat, and butter; and to ascribe its curative effects to the minute proportions of iodine contained in it—as some physicians and pharmacologists have done—is a most glaring mistake, since atrophic and rachitic children are never benefited by, and most generally do not bear, even moderate doses of any iodine preparation whatever.

Judging practically, therefore, after a fair trial of both kinds, I can conscienciously state, that on an average no larger doses are required of the English cod-liver oil than of the light-brown, to produce in the same space of time the same result. From two tea-spoonfuls to a large table-spoonful, in rare cases more (according to age, and the nature or severity of the case) as a daily dose, will commonly after a week or two show some good effects, and improve the rachitic as well as the atrophic disposition. Even if it were true, that the identical curative power is more concentrated in the light-brown than in the English oil, the more palatable and mild qualities of the latter would still decide in its favour.

In conclusion—cheapness is the only reason why the light-brown oil may be preferred to the other for those patients who are limited in their means, and in case they are able to take and to digest it well.

With regard to the aversion for, or the nausea caused by the taste of cod-liver oil—which very frequently it is possible to overcome by the addition of a little sugar or salt at the bottom of the vessel holding it, or adding a few drops of an aromatic tincture, essence of orange peel for instance, or (for adult patients) by giving it with coffee, or a little brandy—it is worth observing, that in children in whom nausea pertinaceously persists, seldom any notable advantage results from the continued use of this remedy; and that on the contrary, those with whom it agrees, and in whom the appetite for food increases under its use, are invariably and strikingly benefited by it.

Iron. The most unmistakeable indication for this remedy is, of course, chloro-anæmia, of which the characteristic symptoms (mentioned previously) are frequently observed in rachitic infants, and which—according to credible statements—is one of the most extensively diffused pathological conditions of the present age, on the Continent as well as in England. (I would mention here an interesting article on this subject by Prof. Mauthner of Vienna, which recently came under my notice in Dr. Behrend's distinguished *Journal* of the diseases of children, published at Berlin. Journ. f. Kinderkr. 1854, Heft 7 & 8.) After careful consideration of therapeutical results in different cases from different modes of treatment, I have been decidedly satisfied, that whenever chloro-anæmia is strikingly declared in a rachitic child, the first remedy to be employed is iron, whatever degree of vegetative weakness may be present; and it is a curious fact, that in children with a high degree of chloro-anæmia scarcely ever is such a stage of atrophy combined, which would claim the use of cod-liver oil before any other remedy. To diagnose chloro-anæmia in a child is not always easy. The "bruit de diable" is not perceived in every anæmic case, but when present in any striking degree, in my practice it was always a safe guide for the usefulness of iron in rachitic children; this statement is certainly correct, in spite of an opinion at present entertained by several distinguished observers, according to whom the diagnostic value of that phœnomenon is very much shaken. But cases are not rare, where the symptoms above named are not present, at least not perceptible to the senses and the ordinary means of investigation; and yet, after a certain degree of improvement progressively realized by cod-liver oil, no further benefit is derived from this remedy, but iron is required to accomplish the cure. It is true, that under the vegetative impulse given by cod-liver oil not seldom certain symptoms referrible to chloro-anæmia disappear; but this is not invariably the case. The sluggish action of the bowels with clay-like stools also sometimes yield to cod-liver oil, but far more certainly to iron. And it has been mentioned already as an erroneous, sometimes even a mischievous practice, to attempt in rachitic children the amendment of this abdominal disorder by acting upon the liver and the bowels by means of mercurials and rhubarb—whereas the impoverished condition of the blood is the source of this functional disorder, requiring the administration of iron.

Among the several preparations of this remedy my experience as regards rickets speaks decidedly in favour of the saccharo-carbonate, from gr. jij to v or vj daily.

That the circumstances establishing a temporary contra-indication of iron are far more numerous in rachitic children than those prohibiting the administration of cod-liver oil, is easily understood. Chronic and low inflammations, to which they are liable—bronchial catarrh for instance—

which frequently improve under the use of cod-liver oil, are decidedly adverse to the employment of iron. And, setting aside similar supervening complications, the constitutional condition of rachitic children more generally requires cod-liver oil than iron.

Quinine, the remedy next in importance to iron in rachitism, is however less frequently a "conditio sine qua non," or decidedly useful, in this disorder. I have administered it to hundreds of rachitic children, and carefully watched its effects; and there have been instances in which the strength of the legs and vigour of the whole system speedily and unmistakably increased under its use. In these cases general langour, atony of the bowels, and principally weakness of the locomotor muscles appeared to be the most salient symptoms, more perceptible at least than the alteration in the bones—in short, deficient spinal innervation seems to be the indication for quinine in this disease. This indication, however, is clinically less clear than that of defective vegetation and atrophy for the use of cod-liver oil, or of chloro-anæmia for the use of iron. The dose employed in the cases alluded to varied from gr. ss to gr. j ss, and was seldom well supported longer than two or three weeks at a time. More frequently I gave it conjointly with iron, in which case, of course, the experience concerning quinine is rendered ambiguous by the more striking effects of the other remedy.

It scarcely needs mentioning, that when rachitic children are suffering from dentition, or are affected with fever, the use of quinine as well as of iron must be suspended; the same remedies must be omitted also in case of loss of appetite, or digestive troubles, however slight they may be, arising from their use.

On the other hand, the first and surest sign of the beneficial effects of any remedial agent—whether arising from change of air or the use of medicine—is the increased appetite for food, or the more moderate and regular desire for suitable kinds of food instead of that voracious propensity for heavy farinaceous articles, which so frequently characterizes rachitism. It happens indeed, not seldom, that after a week or two of judicious remedial treatment, a rachitic child, who previously was urged in vain, or even to its detriment, to take animal substances, begins to take and support them well. Another sign of improvement, next in the order of its appearance to that just mentioned, is the increase of firmness in the legs.

In conclusion, the progress of rachitism is almost constantly checked, and the disease gradually eradicated, by the use of one or two of the three last named remedies; particularly when assisted by suitable diet, pure air, and cold sponging; only the high degrees of curvature and pigeon-breasted chest remain stationary, or persist in a certain degree through life. Rachitic children with a severely incurvated spine and compressed chest,

and an overcarbonised state of the blood as a consequence, seldom support iron, and sponging with cold water (say, below 80° or 75° Fht.) has frequently unpleasant effects upon them. In these instances country air is more imperatively required than in others.

It does not belong to my present purpose to speak in detail on the mechanical treatment of rachitis; this much, however, may be positively stated, that slight curvatures in infants disappear under the treatment mentioned without bandages or machines; and that both the morbid condition of the bones and the constitutional state of rachitic children do not admit any notable degree of mechanical compression, or embarrassment of movement caused by steel apparatuses, of which frequent instances are observed to the great detriment of the patients. Light and gently supporting bandages are all that is required, and indeed all that is admissible in cases of curvature of a higher degree.

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