stantly in the habit, during a polar winter, for some months, of undergoing a change of from 80° to 100°, and in several instances 120° of temperature, in less than one minute, not a single inflammatory complaint (beyond a slight cold, which was cured by common care in a day or two) occurred during this particular period.

Alison, relating the effects of the cold on the French soldiers during the retreat of the army from Moscow, notices specially the bumbling of the mental faculties, the state of fatigue or idiocy, and ague attacks supposed for some time previous, during which never alrides to any occurrence of catarrh. It seems reasonable to conclude that there could not have been any prominent disorder of this kind.

A recent authoress, speaking of Lower Canada, where the winter lasts from December to April, and the thermometer is, in January, 35° below the freezing point, says that she has seen a wonderful effect produced, in the early stages of pulmonary consumption quoted as catarrh, defluxions, and feverish colds in the Russian capital.

There are, seriously speaking, so few diseases of the chest, that a cold is seldom to be heard of in St. Petersburgh.

Of this kind.

Dr. Granville writes: "It is a fact which will startle my readers, that 'a cold' is seldom to be heard of in St. Petersburgh. There are, seriously speaking, so few diseases of the chest, catarrhs, defluxions, and feverish colds in the Russian capital, that I was quite surprised on hearing consumption quoted as catarrh.

The untoning, relaxing influence of heat on the nervous system seems to me the more essential of the agencies concerned in the benumbing of the mental faculties, the state of fatuity or idiocy, and ague attacks supposed for some time previous, during which never alrides to any occurrence of catarrh. It seems reasonable to conclude that there could not have been any prominent disorder of this kind.

From these testimonies, it seems difficult not to conclude, that a considerable degree of cold, sufficient to check very materially the cutaneous circulation, does not exert any perceptible influence in promoting the occurrence of catarrh. Its tendency seems rather to be the reverse.

From questions which I put to some of my out-patients who were much exposed to the weather, it appeared, on the whole, that they did not suffer from catarrh unless they were much in the way of heat as well as of cold. The untoning, relaxing influence of heat on the nervous system seems to me the more essential of the agencies concerned in originating catarrh. When a system in this condition receives a sudden coup of cold, and does not react, the shivery feelings which ensue are an indication that the nervous system has received a depressing shock, and this may issue in some local affection or one more general. The reproduction of ague attacks, in those who have suffered from cold, is a result, not of exposure to cold, is quite an analogous case. Dr. Copland notices the converse as a not uncommon occurrence, catarrh being induced by "coming into an over-heated apartment out of a cold and moist atmosphere. I have met with more than one instance of catarrhal affections being either originated or aggravated by the supervision of thaw upon a frost. In others, again, cold has interrupted improvement. This difference must be referred, I think, to the peculiar states of the patients—in the one, the cold doing good by toning the vaso-motor nerves; in the others, harm, by irritating the tissue. It seems to me very possible, that various causes operating after the manner of depressing poisons upon the nervous system, may give rise to the phenomena of catarrh. The principal, however, in all the more severe cases, is without doubt the presence of some malarious miasm, which, when general and potent, occasions an epidemic of influenza, but which in minor amount affects only the predisposed.

(To be concluded.)

ON THE ADULTERATION OF BREAD AS A CAUSE OF RICKETS.

BY JOHN SNOW, M.D.

On commencing, in the year 1839, to see a considerable amount of practice amongst the poor of London, chiefly the out-patients of a public hospital, I was very much struck with the great number of cases of rickets. The complaint was shown more particularly in the bones of the leg, causing an outward curvature of the tibia and fibula; in children in their second and third year, it seemed almost the rule, and might be observed in the streets and the parks, as well as amongst children brought for advice. The complaint, moreover, was not by any means confined to the poor, but affected the children of the middle and upper classes, as well as of the wealthy.

The usual causes to which rickets are attributed are of a somewhat general nature, such as vitiated air, want of exercise and nourishing food, and a scrofulous taint. These explanations, however, do not satisfy those who have previously seen a good deal of practice in some of the towns in the north of England, where the over-crowding and the other evils above mentioned were as great as in London, whilst the distortion of the legs in young children was hardly present; moreover, I found that the manner in which the children often suffered most from curvature of the bones of the legs, owing to their greater weight; and I afterwards found that this complaint was quite common in the villages around London as well as in the metropolis itself.

The bones owe their hardness to phosphate of lime, which exists ready formed in many articles of food, and only requires to be assimilated, whilst in rickets the phosphate of lime in the bones is known to be deficient; and therefore it seemed extremely probable that the want of this earthy salt in the food of the infants of this metropolis was the chief cause of the soft state of the bones. My attention was naturally directed to milk, which contains one chief supply of phosphate of lime, whilst it is sometimes said that milk contains no quality in London; but I immediately recollected that in some of the mining and manufacturing districts in the northern counties of England milk was scarcely used at all in the families of the operatives, and yet I had hardly seen a case of curvature of the legs from rickets in those districts. However, there seemed to be something which might explain the prevalence of this complaint in London. In the northern counties, where cows are cheap, it was the universal custom for every family to bake their own bread, and I believe still remains so; whilst in the south of England it is as much the custom to buy bread from the baker. Now, the bakers, so far as I have examined, all put alum in their bread, whilst this is never done in domestic practice, and the flour dealers rarely use it. This relative absence of alum is liable to a heavy penalty for adulterating flour, but the law is never enforced against the bakers. I have never examined a specimen of flour which contained alum, or a specimen of baker's bread which did not contain it.

When my attention was first turned to the subject of rickets, I thought it likely that the sulphuric acid of the alum would decompose the phosphate of lime of the wheat, and form sulphate of lime, which would not be available as nourishment for the bones; and there might be an influence both chemically and statistically; but this intention was long postponed, on account of other engagements and inquiries. In the meantime, and without any regard to the question of alum, Liebig has inquired into the action of alum in bread, and has shown that alum is decomposed by the action of the yeast on the flour, and is thus liable to be injurious to the health of those who eat bread containing alum. His researches are far more important than any inquiry of mine. He says, "Since phosphoric acid forms with aluminia a compound hardly decomposable by alkalies or acids, this may perhaps explain the indigestibility of the London bakers' bread, which strikes all foreigners."

It is evident from the above passage that Liebig has ascertained that alum decomposes the phosphate of lime of wheat, and it is not likely that the bones were able to nourish the deposit of lime which did not contain phosphoric acid. But I was able to direct the attention of the profession to the question both chemically and statistically; but this intention was long postponed, on account of other engagements and inquiries. In the meantime, and without any regard to the question of rickets, Liebig has inquired into the action of alum in bread, and has shown that alum is decomposed by the action of the yeast on the flour, and is thus liable to be injurious to the health of those who eat bread containing alum. His researches are far more important than any inquiry of mine. He says, "Since phosphoric acid forms with aluminia a compound hardly decomposable by alkalies or acids, this may perhaps explain the indigestibility of the London bakers' bread, which strikes all foreigners."

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where home-made bread is chiefly used; and I was lately told, few miles off, where bakers’ bread is consumed, the complaint of their own bread, this complaint is almost absent; whilst in a town a colloquial nature, I hesitate to mention places and persons. If it cannot be denied that the number of pickets of rickets in the children under four years, as compared with the whole number, which are brought to the dispensaries, in towns where respectively the people buy chiefly flour or ready-made bread, help to answer this question.

It does not follow, if my conclusions are correct, that every child eating bread adulterated with alum ought to have rickets, or that every child fed with good bread ought to be free from the complaint; or, on the one hand, the other articles of food must be eaten in the same time without the bread, and, on the other hand, derangement of the digestive and urinary functions may prevent the phosphate of lime being assimilated when present. What we might expect, however, would be precisely what we observe—that rickets would be much more common in the children of the working classes fed almost entirely on bread than in those who have a greater variety of food. It can also be explained how the bones ultimately become hard from the gradual accumulation of the calcareous deposit, the result of the metabolic activity of the bones, unless prevented by certain remedial measures. The bones would be more common in the children of the working classes than the cheap bread sold in many of the poorer districts. I have met with alum, not only in the ordinary practice of bakers to adulterate bread, but also in captains’ biscuits, and in the so-called farm-house bread; and I was somewhat surprised to find that the high-priced bread, sold in the fashionable neighbour-hoods of the city, contained as much alum as the cheap bread sold in many of the poorer districts. I found that the bread supplied to me last autumn contained 10.13 grains of alum in 500 grains—i.e., 561 grains, or more than an ounce and a quarter in the 4 lb. loaf; whilst some bread obtained from a very noted baker contained 11.37 grains in the 500 grains, or nearly an ounce and a half in the 4 lb. loaf. The following is a brief account of the analysis of the latter bread:—500 grains, bing carefully dried at the temperature of 100° Fahr., lost 120.67 grains of water, or more than one-fourth. Being carefully incinerated in a crucible, the ashes weighed 55.85 grains. The ashes yielded alumina, which, being washed, dried, and ignited, weighed 1.2 grains, representing 11.37 grains of crystallized alum; with chloride of baryta, washed, dried, and ignited, weighed 1.4 grains of sulphate of baryta, and with the nitrate of silver, 6.7 grains of chlorid of that metal, representing 2.8 grains of common salt.

Dr. Haswell and some other authors have very properly pointed out that the only safe way to seek for alum in is to examine the bread, and examine the ashes; but many writers go on repeating the statement that alum may be found by digesting the bread in distilled water, filtering, and applying zinc to the water. In this way seldom more than a trace of alumina can be detected, even when the bread contains a large quantity; but it is probable that many persons take this short and easy method of examining it, and it is probably in a great measure owing to this circumstance that the bakers continue to use alum with so much impunity. An instance came under my notice not many months ago where a baker expected, with the utmost confidence, to have a satisfactory certificate to lay before the committee of a club-house respecting his bread, that it was free from any quantity of alum.

A probable way to break through what seems the universal practice of bakers to adulterate bread, would be for the committees of the public hospitals and the guardians of the poor to oblige the bakers who contract to supply their respective districts to submit an unadulterated sample of bread, and that alum is either nutritious or wholesome; and if the cates without alum should cost a little more, owing to their carrying less water, no one can doubt that as much nourishment would be obtained for a given sum as under the present system.

Buck-site, June, 1857.

OBSERVATIONS ON THE ARCUS SENILIS, OR FATTY DEGENERATION OF THE CORNEA.

By EDWIN CANTON, Esq., F.R.C.S., Surgeon to the Charing-Cross Hospital; consulting-surgeon to the Kenton Ophthalmic Hospital, Maidstone.

"Disease anticipates the ravages of time, and there is no more interesting part of our subject on which that which refers to wide relations to those various times which impede the progress of the eye, and cause it to become old as to structure."—W. F. Barlow: On Fatty Degeneration, p. 6. London: 1833.

PART IX.

Of the co-existence of the Arcus Senilis with Phthisis.—On the 9th of June, 1855, a male patient, aged forty-five, affected with phthisis, was admitted into the Charing-cross Hospital, and died from this disease on the 11th of August ensuing. He stated that his complaint had commenced two years previously. His eyes were of a bluish colour, somewhat prominent, and the corneas of each presented a well-marked circle of fatty degeneration.

At the autopsy, I found a very large cavity occupying the upper lobe of the right lung, and several smaller excavations existed in the lower one. The left lung was densely studded with tubercles in various stages of varied, and the heart was of the average size, but pale, flabby, and friable. Dr. R. Quain in kindly reporting to me on its histological conditions, observed: "There is no doubt whatever as to its structure being in a state of fatty degeneration. I examined both venous and arterial tributaries, and found each to be in a like degenerated state."

The arch of the aorta presented several atheromatous patches of varying size and consistence, and many similar ones existed along the course of this vessel and in the primitive iliac arteries. The liver and kidneys were examined by Dr. Hyde Salter, who stated with respect to them:—"The liver was, I think, the most fatty I ever saw; its structure was almost entirely supplanted by free oil-globules. The liver-cells, in most cases, were broken down and fragmentary; some few were perfect, but all were full of air-globules. The kidneys—"


"The average or mean duration of consumption has been computed to be about two years. This is a different thing, you will be pleased to observe, from its ordinary duration."—T. Watson, M.D.: Lectures on the Principles and Practice of Physic, third edition, vol. ii. London: 1843.

"It was the opinion of some physicians of former days, that persons with blue eyes enjoyed an immunity from consumption. I am at a loss to understand how such an opinion could have originated. The colour of the eyes of patients is amongst the particulars recorded at the Consumption Hospital; and, in my opinion, when it shall be shewn that blue eyes are more common in those cases by which phthisis is caused rather than is its cause, we may perhaps be able to form an idea of the truth."

Dr. Clenning has stated that the eye is amongst the organs which exist in the lower one. The left lung was densely studded with tubercles in various stages of variety, and the heart was of the average size, but pale, flabby, and friable. Dr. R. Quain in kindly reporting to me on its histological conditions, observed: "There is no doubt whatever as to its structure being in a state of fatty degeneration. I examined both venous and arterial tributaries, and found each to be in a like degenerated state."

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