toms which are the consequences of the rickety diathesis,—the late dentition in rickets being in itself merely a symptom of the general disorder. The rickety deformities may be very trifling, and yet the teeth considerably retarded in their development.

The inorganic constituents of bone—the earthy phosphates—are sometimes found in great excess in the urine, a case being recorded by Mr. Solly where such excess was fourfold. It is perhaps, however, as frequently the case that the deficiency in lime-salts results from non-ingress of these materials, without change in the egress; while a hypothesis founded on the observations of Marchand attributes the absence of the phosphates to their dissolution by lactic acid. This is effected, as inferred, by the lactic acid changing the carbonate and phosphate of lime into the soluble lactate, which in this state is capable of being taken up and carried from the system; or, when not removed in this way, it might be possible for the organic basis of bone to be dissolved by the inflammatory neoplasia with a breaking down of the chalky substance, whose molecules might either be dissolved or carried away.

In rachitis, according to Virchow, the bones are histologically formed, except that the bone-cartilage has no chalky salts,—or, at least, little in proportion to their requirements. Billroth directs attention to the effect of the dyscrasia upon dentition. The treatment he regards as of that general nature which pertains to the building up of the health of the patient. As food, it may not be well to use too freely of bread, potatoes, mush, or flatulent vegetables, but the child is to partake freely of meat, eggs, milk, and all nitrogenous diet. Billroth, in discussing the use of preparations of lime, expresses a doubt as to any benefit that may arise from their employment, deeming it not impossible that rachitis is a disease of digestion in which such preparations may not be absorbed,—which view is indeed a common one among American physicians.

A rachitic child should be daily bathed in salt water, lukewarm or cold, as seems most suitable; the dress is to be adapted to the season; and daily exercise, active or passive, is to be taken in the sunlight and open air. The use of cod-liver oil has the recommendation universally both of European and American practitioners. Vogel asserts that rickets is to be cured by the use of cod-liver oil alone. Rickety children tolerate the oil well, and are usually found to become fond of it. Iron and the vegetable tonics are almost always found useful; while beer or wine in limited quantities, graduated to the age and condition of the patient, is sometimes found to meet the indications most admirably.

Syphilis.—Viewing the relations of this disease with the health of the teeth, we necessarily embrace, or, indeed, perhaps more fully treat of, the association of the mercurial poison than that of syphilis itself, inasmuch as the two are found so constantly combined that it may be esteemed a matter of some doubt if the single relation is ever met with in the hereditary aspect. I use

the term in the fullest sense of heredity, not embracing the cases in which a fœtus receives inoculation in passing over an unhealed vaginal chancre, or where the father, having incipient secondary manifestations, extends such to the impregnating sperm.

That the syphilitic poison impresses of itself the growing teeth is made evident by the very frequent imperfect development of these organs found in association with the disease. Allusion is made to the notching, the pitting, and the small size,—conditions which may fairly be presumed not to have special relation with the second of the poisons, inasmuch as this renders its expression in that general molecular depression which is seen in the lowered vitality of the parts at large, and which has been considered under the head of scrofulosis.

The pittings in the enamel of the teeth, and the irregularities of the cutting faces, represent expressions believed generally to be found only in connection with hereditary syphilis, and which it seems proven may be transmitted to the third generation. These deformities are seen most generally in the second set alone; the first are liable to early decay, but not so much to the malformations. The impressions are confined commonly to the anterior six teeth, and vary from the most marked examples to scarcely perceptible irregularities of the cutting edges, or an occasional depression seen here and there upon the anterior face, or it may be the posterior,—most frequently, however, upon the anterior alone. Observation is found to greatly vary concerning the existence of any constancy in phenomenal expressions of the teeth in this relation.*

* That the notchings found on teeth are not strictly associated with the vice of syphilis will clearly enough discover itself to an observer who takes the trouble to investigate. In one instance three children were exhibited at a clinic of the Oral Hospital dispensary service all having badly notched teeth, traceable unmistakably to attacks of measles occurring during the dentitional period.

The alterations of teeth here considered are atrophic in nature, and are recognized as of different origin by close observers. Hutchison's syphilitic teeth pertain chiefly to pitted central incisors, the pits, breaks or sulci, disfiguring the cutting edge or closely adjoining parts. This observer has established a relation between these atrophies and chronic inflammation of the cornea.

Atrophic change is most common to the six-year molars, and is here least traceable to any specific cause; the defect showing in general imperfection of the enamel and irregularity of faces, particularly the grinding surface. Color too is abnormal, yellow points and streaks intermingling with white of varying shade. The cusps of these teeth are too often found of foreign expression, resembling at times portions of a hard variety of yellow sandstone. That such atrophic condition relates itself with the bicuspidati is practically known to every practising dentist, these teeth being recognized proverbially as least resistive of aggression.

Forms of atrophy related with the oral teeth are known as cup-shaped, sulciform, pitted, notched, and grooved.

Cup-shaped atrophy is commonly met with in the labial faces of the incisors, although it is not peculiar to these; generally a number of pits exist, the bottoms of which may or may not be enamel-covered: carious evolution finds here most frequent start-points; the teeth are never of natural translucency, the color varying from a dead yellow to a dirty white.

Sulciform atrophy is simply a variety of the cup-shaped; it consists in furrows, one or

The diagnostic signs and conditions of acquired syphilis, it is to be taken for granted, are known to the reader. With these we have nothing to do, inasmuch as the influences here considered are those impressed in utero.

The assumption will be borne out that it is only in earliest infancy that syphilis expresses itself with that distinctness which, outside of a history, renders its diagnosis reliable; and, further, that parents afflicted with the advanced tertiary stage of the disease do not transmit the disease with diagnostic individuality, but rather that in the term scrofulosis lies its expression, that the condition of the syphilides is the state in which the transmission retains specificity,—the tertiary stage expressing the exhaustion of the disease in the molecular degeneration induced of it,—and that when transmitted in such secondary stage, its continuous course in the child is apt to be the same as that in the parent.

As a syphilitic impression has been made on the fœtus, with the condition of the parent or parents most closely allied to the first of the secondary manifestations, so will the child exhibit rashes, or the graver expressions of inflammation of mucous surfaces. Thus, without perhaps proper attention to such data, it has become common to write of the confounding of the secondary with tertiary manifestations,—a confusion that does, however, without doubt, occasionally exist, owing to the general slighter resistive force of particular infants, just, indeed, as the same confounding of conditions is not infrequently met with in the adult.

The expressions of the transmission of uncomplicated syphilis show themselves commonly by the third week; although instances enough occur where the child is born with such evidences; or the little patient may live for a year without any sign of the disease exhibiting itself,—seldom longer, however.

Hereditary syphilis differs of course from the acquired in having no primary stage. As the author's observations are concerned, the most common manifestation of the condition is found in that morbid congestive state of the Schneiderian mucous membrane, which, as in a common cold, yields what the parents call snuffles, being universally attributed to the child's having a cold. Unfortunately, however, such colds do not tend to self-cure, but in very many instances, perhaps in a majority, produce changes in the nasal relations which result in a flatness of the bridge of the organ, bearing the sign throughout life, and which is justly to be esteemed as markedly diagnostic of the hereditary association.

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more running across the faces of teeth, commonly central and lateral incisors, occasionally the cuspidati. The separation of these sulci, of which there are often three, more commonly two, infrequently four, is by means of what looks like a ridge of pathological enamel. Instances occur where the sulci pursue a wavy course, or one that is oblique or vertical.

The pitted, notched, and grooved varieties described by authors will be recognized as nothing different from expressions of forms described above.

Objection is repeated to the fixing of heredity in syphilis out of the signs of the teeth. Any condition interfering with evolution at the dentitional period affords alike with syphilis acceptable explanation.

A child afflicted with this disease may, without doubt, be born plump and apparently vigorous; but such vigor proves evanescent. After a few days, or weeks, or, it may be, months, it begins to emaciate, the skin wrinkles from absorption of the underlying fat, the face shows discolorations, and a peculiar expression of premature age comes on: this expression of age is so marked and persistent that it will be found to characterize every child, young or old, afflicted with transmitted syphilis. The writer has this moment in memory the faces of a number of little girls who are in the habit of occasionally presenting themselves at his clinic, and, although the eldest is not over thirteen, they have, all, the demure expression of years quite in advance of them. Yet such expression, it is to be remarked, seems influenced by the stage of their affection, those afflicted with bone-troubles being usually older-looking (in proportion to their years) than others presenting alone the skin-manifestations.

The appearance of pemphigus soon after birth, associated with the ordinary early symptoms, is deemed by experienced observers very diagnostic. Interstitial keratitis with inter-laminar lymph-effusions is associated alone with the hereditary form of syphilis,—iritis being an expression of the acquired form. In hereditary syphilis the manifestations are symmetrical; in the acquired form they are rarely so. The manifestations of the hereditary form run one into the other; those of the acquired tend to remain distinct.

From consideration of hereditary vices we pass to that aspect of the subject which treats of the relation of developing teeth with nutritional instrumentalities.

In viewing, from a systemic stand-point, the composition of the teeth, we have primarily to remark that the component parts are formed from and preserved by the chemico-vital relationship existing between blood and parts to be nourished. We recognize, and know, that in the fluid which we denominate blood resides the element of nutrition, and that as this material is well or ill adapted to meet the requirements of the different tissues, so are these tissues found to be in varying states of health. We infer that blood, rich in the elements of tooth-structure, is capable of yielding good teeth, provided the process of assimilation resides to a proper extent in the part to be built up and nourished; so that the study of caries, from the constitutional stand-point, consists in looking at the condition of the blood and the amount of vital force residing in the teeth themselves.

A tooth in its composition is made up of cementum, dentine, enamel, and pulp substance. Excluding the pulp substance, we find, with some variation, the relative proportions of organic and inorganic matter to be as follows:

	Cementum.	Dentine.	Enamel.
Organic matter	29.27	28.70	3.59
Inorganic matter	70.73	71.30	96.41

The character of this inorganic material we find, by a more complete analysis, to be as follows: phosphate of lime, fluorate of lime, carbonate of lime, phosphate of magnesia, salts.

The composition of healthy blood yields the following analysis:

Water	780.15
Fibrin	2.10
Albumen	65.09
Coloring matter	133.00
Crystallizable fat	2.43
Fluid fat	1.31
Extractive matter	1.79
Albumen, in combination with soda	1.26
Chlorides of sodium and potassium; carbonates, phosphates, and sulphates of potash and soda	8.37
Carbonates of lime and magnesia; phosphates of lime, magnesia, and iron; peroxide of iron	4.50
	1000.00

In a healthy and normal condition of the human system we find always the existence of a relationship between the requirements and material of supply which should, and which does, afford proper tissue; where, then, such conditions exist, the teeth, cæteris paribus, are perfectly formed, and, as constitutional relations are concerned, are healthily preserved.

In the study of the pathological conditions of these organs, we are to discover, if possible, wherein the harmony of demand and supply is or has been interfered with; and that we may look at the subject from the most comprehensive stand-point, we must study not only hereditary complications which may exist, but are to understand as well the direct relations of the developing organs. This brings us to the subject of nutrition proper; a matter which refers the student to his works on Physiology.*

* Prophylaxis is assuredly preferable to cure. It is the intention of this foot-note to call attention to nutrients and conditions out of which healthful dental organisms arise, and in which they preserve their resistive power.

Alluding to American women and their early decay, James Paul, M.D., in the best paper on the subject ever met with by the author, laments the fact that even the progeny of other continents coming to this show expressions of degradation, as the teeth are concerned, even in the very first generation.

Admitting the too evident fact of the degradation as comparison is held with European and other races, the subject of cause presents itself with a relevancy not admitting of being passed over.

The refusal of Europeans to drink of iced water is a matter familiar to the writer from personal observation, and not less common is knowledge of the inference drawn by that people that if Americans indulged less in iced refreshments their teeth would be proportionably better. That dental caries has not its existence, however, in cracking of enamel arising out of violent alterations in temperature needs but very little observation to decide. Caries, may, and assuredly does, show itself in sulci and fissures, but it is so frequently met with under the reverse circumstances as to declare the former not a necessity to its appearance. That alternations of extremes in cold and heat are after other manner injurious to the health of teeth is as truly and plainly evident as that the general health is thereby affected.

CONDITION 2. *On the shape of the teeth, their relation with each other, and their self-cleansing features.*—On examining the two arches, Figs. 70

Dental deterioration is accepted in these pages as being more commonly associated with constitutional weakness than with any of the various local causes, and the agreement of the writer with Dr. Paul is absolute as to this weakness having its existence in a deficiency of the inorganic or earthy constituents being taken into the system, most particularly in early life. Accepting such conclusion, the oral surgeon, as well as the general physician, necessarily agree that correction of the condition rests with such understanding of subjects involved as permits of reconciliation between demand and supply.

Referring to the analyses, given in the text, of teeth and blood, Dr. Paul directs attention to the very great proportion of certain earths that enter into the structure of the teeth and the bones of man, the chief being the phosphate of lime; that in proportion as the definite earths are properly distributed so is the health both of bones and teeth.

To be distributed a material must not only exist, but it must be in a channel of distribution. The teeth require lime. The channel by which such requirement is supplied is the blood. It is necessary that the blood possess a proper quota of lime, that vessels of relation with the teeth exist, and that the teeth are able to appropriate to the full satisfaction of a want.

It is seen, as will be recognized, that if we take away from the blood the proportion of water, amounting to 780 parts, and the coloring matter, amounting to 133, we have left scarcely 90 parts of organic and earthy matter, the salts and earths forming upwards of a 10th,—the salts being in proportion to the earths as 4 to 1. It is here the subject opens from the stand-point of the derivations by the blood of the elements needed by the teeth.

Having then shown the constituent portions of the bones and teeth to be in the blood, the next consideration is, whence are these constituent portions derived?

Out of deference for the industrious compiler and worker, and with a view of keeping the memory of a man in the minds of people his investigations benefit, Dr. Paul's analyses and conclusions are here appended precisely as they were presented in a paper read before the Medical Society of Mercer, N. J.

Before entering on this subject further, wrote the lamented author, let us for a moment take a broader and more comprehensive view of what must be most interesting to mothers, and of great consequence to the well-being of the infant generation, in a short time, in a very few years, to become in their turn the mothers and fathers of another generation.

The question then presents itself, what is the nourishment or food best adapted and necessary to the wants of an infant, that the foundation may be laid for a strong frame and vigorous constitution? For here, we must recollect, is the starting-point in by far the majority of instances. We know that in some cases disease is hereditary,—that the offspring unfortunately inherits from the parents constitutional defects; but we also know that more misery, suffering, and constitutional derangement are entailed on children by want of care and improper food in the first years of life, by which their hopes of health are blasted, and they are doomed to struggle through a weary life, to be hurried at last into a premature grave.

Now, that the frame—that is, the bones, muscles, and other portions—of the infant may be fully developed, it is necessary that it should be supplied with nourishment containing all the constituents required for this important undertaking. And this nourishment, by the all-wise ordering of Providence, is contained in the milk secreted from the mother's bosom.

The infant is entirely dependent on the nourishment derived from its mother, and nature has wisely ordained that the secretion from the mother is its very best food; for we find in

and 71, the observer will instantly be struck with the decided difference presented. In the first is represented a denture which, mechanically speaking,

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the composition of milk—that is, healthy milk, derived from healthy blood—all those ingredients we have hitherto traced as requisite in the formation of the bones and teeth, and not only these, but every constituent required for the life and growth of the individual; milk containing the albuminous, saccharine, oleaginous, saline, and earthy compounds requisite and necessary for the health, strength, and development of the infant child.

An analysis of cow's milk gives the following proportions of the various constituents; that of human milk is not so elaborate, but contains the average of observations taken at fourteen different times from the same individual, by Simon.

COW'S MILK, BY M. HAIDLEN.

Water	873.00	Phosphate of iron	.07
Butter	30.00	Chloride of potassium	1.44
Casein	48.20	Chloride of sodium	.24
Milk sugar	43.90	Soda in connection with casein	.42
Phosphate of lime	2.31		1000.
Phosphate of magnesia	.42		

WOMAN'S MILK, BY SIMON.

Water	883.6	Fixed salts	2.3
Butter	25.3		1000.
Casein	34.3		
Milk, sugar, and extractive matter	48.2		

	Maximum of 14 observations.	Minimum of 14 observations.
Butter	54.0	8.0
Casein	45.2	10.0
Sugar and extractive matter	62.4	39.2
Salts	2.7	1.6

Now, although these amounts will no doubt vary, under every variety of circumstances, according to the *health*, *exercise*, *passions*, and *food* of the mother, yet they show that healthy milk contains all the requisites for the nourishment of the infant; but then it must be *healthy* milk, secreted from healthy blood, and that blood must derive these ingredients from the *food* consumed.

Cow's milk differs from that of woman in the proportions of some of the constituents: it abounds more in butter, but particularly in casein, or cheese; and, on the other hand, human milk abounds more in the saccharine principle, or sugar of milk. Now, this points out a circumstance from which great benefit may be derived. It is of very frequent occurrence that infants are deprived of the natural nourishment of the mother, and diverse opinions are given relative to the food of infants by persons who really know very little about the matter; one recommends a milk diet, another that the infant must be fed on starch and sugar.

Now, to enable the infant to receive a nourishment in every respect similar to the mother, the knowledge of the various proportions which we obtain by chemical analysis enables us to rectify and produce milk very analogous to human milk from that of the cow, by diluting it with water in the proportion of about half as much again; that is, to a pint of milk should be added half a pint of water that has been boiled, which will reduce the cheese principle to the proper proportion; add a small portion of cream to restore the proportion of butter, and then add sugar until the whole is distinctly sweetened, and we have a compound in every respect similar to the milk from the human breast.

To understand the subject of nutrition, let us remember that food should, or must, embody two great principles: one to nourish, the other to give heat to the body. And food, when consumed, is applied to one or the other of these purposes. Now, in the proccess of digestion, the constituents of the food are separated, and arranged in three classes:

1st. All that portion derived from animal food, eggs, the curd of milk, the gluten or adhesive portion of wheat and other grain, and whatever in animal or vegetable food can be rendered into *albumen*—of which the best example that can be offered in illustration is

may be pronounced physiological, every tooth having a harmonious relation with its fellow, and each individual tooth being perfect in itself.

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the *white of egg*, which is in reality nearly pure albumen—and the principle is therefore called *albuminous*.

2d. All that portion of the food derived from vegetables, starch, sugar, etc., that can be converted into *sugar* in the process of digestion. This principle is therefore called *saccharine*.

3d. All the fat, butter, oil, etc., which, when deprived of the other substances, is left in the state of *oil*, and therefore called *oleaginous*.

Now, of these three the *albuminous* is the *nutrient*, and the *saccharine* and *oleaginous* are the *calorifacient*, or heat-giving; and chemical analysis shows that they vary in composition.

	ALBUMINOUS.		OLEAGINOUS.
	Eggs.	Wheat.	Mutton fat.
Carbon	55.000	55.01	78.996
Hydrogen	7.073	7.23	11.700
Nitrogen	15.920	15.92	
Oxygen, Sulphur, Phosphorus	22.007	21.84	9.304

	SACCHARINE.			
	Starch, arrow-root.	Sugar from starch.	Sugar of milk.	Cane sugar.
Carbon	44.40	37.29	40.00	42.301
Hydrogen	6.18	6.84	6.61	6.384
Oxygen	49.42	55.87	52.93	51.315

It will be observed that the albuminous or nutrient differs from the saccharine and oleaginous, in containing nitrogen, and sulphur and phosphorus, with carbon, hydrogen, and oxygen, while the latter contains only carbon, hydrogen, and oxygen,—nitrogen being required in those compounds which give strength and formation to the frame.

Now, the albuminous or nutritive, being that portion which affords nourishment to the body, contains those constituents required in the first place for the formation and giving strength to the different portions of the body, and, when fully developed, of repairing the general waste continually going on in the system, whether from the usual wear and tear, fractured bones, or the ravages of disease. And the saccharine and oleaginous—the calorifacient or heat-making—to keep up a continual supply of fuel, as it were, that the body may be kept of a regular and proper temperature; for all are no doubt aware that there is a continual supply of carbon, or, in more simple language, of charcoal, required to keep up the natural temperature of the body; and what is not required for immediate use is stored away in the form of fat, to be called into action as occasion requires.

We have seen in the analysis of milk that that fluid contains butter, cheese, and sugar; consequently we can understand how an infant can thrive so well upon it,—the cheese or casein* of the milk containing the nitrogenized or nutrient principle, which, together with the earths and salts contained in the milk, goes to form the bones, muscles, and the different tissues of the body,—the sugar, which, we have seen by the analysis, contains a large quantity of carbon in its composition, going to keep up the temperature of the infant, while the butter, in the nature of fat, is stored away in a healthy infant, filling up every vacant interstice, causing a roundness and plumpness, the pride and joy of the happy parent.

Now, let us mark the difference of the babe that has been denied a milk diet, and is doomed by ignorance to be fed on starch and sugar. We will recollect that these two sub-

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	Analysis of casein from fresh milk.	Albuminous substances found in whey after coagulation with an acid.
*Carbon	54.825	54.96
Hydrogen	7.153	7.15
Nitrogen	15.628	15.89
Oxygen, Sulphur	22.394	21.73, 0.36

In the second of the diagrams the artist has exhibited imperfections which, in truthfulness to nature, have been extended to every individual tooth, even

stances are composed of carbon, hydrogen, and oxygen only. By a process of digestion which I need not here enter into, such food is converted into sugar, the carbon of which becomes the fuel by which the temperature of the body is kept up; there being no principle in the food to give albumen, there is nothing taken into the stomach upon which the gastric fluid can expend its solvent powers; the infant is, therefore, much troubled with acid eructations, and the stomach becomes weak and irritable. The want of the nutritive constituent of the food, and the earths and salts, etc., necessary and essential for the formation of the bones and teeth, show a lamentable deficiency in the child's development; and there being no fatty matter to be laid up, the body is emaciated, the countenance is ghastly, the flesh and integuments hang soft and flabby over the bones; no absolute disease can be detected; the child is ravenous and hungry, and the unfortunate babe descends to the tomb a spectre and an object of the most pitiful description. This is no fancy sketch, but one too often met with in the ordinary walks of professional life. And why is it so? Simply because the composition of the human frame, the component parts of our food requisite to produce that frame, and the process of digestion and nutrition, are so little understood.

We now advance from infancy to childhood; and this is a period when the greatest attention is required in supplying nutriment to aid nature in the great work of developing the body. The child is now deprived of the maternal secretion, and dependent on food prepared for its use by the hand of man,—perhaps living in a city, and deprived of pure and wholesome milk from the cow. And we know there is a vast disproportion in the quality of milk when the cow is country-fed on the natural productions of the farm, and when city-fed on slops and grain, the refuse of the brewery.

It is at this age that the great proportion of bony substances is deposited; those of the extremities are lengthened, become more compact and stronger, and the substance of the teeth is deposited in the cells of gelatinous tissue. How necessary is it, then, that this subject should receive the utmost attention of parents! It has hitherto been too much the custom to leave all this, as belonging entirely to nature, as a thing we had nothing to do with. We have been too much in the habit of considering that nature furnished her own materials, and man had nothing to do with her operation. The potter cannot fashion the bowl without the clay, neither can bone be formed without earth: nature must be supplied with the material, which, although offered in the most incongruous forms, she has the power of decomposing, selecting from, and supplying for the various purposes required: one portion, as we have already stated, to act as fuel in keeping up the temperature; another portion she selects to add to the flesh, the muscle, skin, and different tissues; and the earths which are held in solution she carries away by vessels adapted for that purpose, and deposits them atom by atom, until they are so compressed, so strongly compacted together, as to become what we call *solid bone*,—and all this so wonderfully wrought that, as we have seen, small tubes are left in the hard, stony formations both of the bones and of the teeth, that nourishment may be supplied them, holding in solution the material of which they are composed, that the natural waste and decay may be replaced and injuries repaired.

It is to this nutrition, and to the earthy matter of which the bones and teeth are composed, a deficiency of which is attended with results so deplorable, that I particularly wish to call attention.

To what can we attribute the calamity which too often befalls the young? I allude to distorted spines, where the bones composing the spine, instead of forming a column, allowing the body to be erect and dignified, are zigzag in their course, causing one shoulder to bulge out, and the opposite side to bend or double upon itself. This deformity has been long understood to arise from a deficiency of *lime* in the composition of the bones of the vertebræ, allowing them to fall, press upon, and injure each other, destroying the beauty of the fabric and the health and comfort of the individual.

Now let us take a glance at the inhabitants of two countries, natives of which are no strangers on this continent. I take them as examples, because the food of the *common*

to the crowding and wedging of them which are so frequently remarked. Examining the molar teeth, the grinding faces are seen more or less pitted.

people of those countries is well known to be of the most common kind. I allude to natives of Scotland and Ireland,—the principal food of one being *oatmeal*, and of the other *potatoes*. We have heard a great deal of the famishing poor of those countries, and particularly of the latter, of the misery and wretchedness seen in every hovel; and there cannot be a doubt that famine walked through the land when the blight and rot despoiled them of their potato crop, on which for so long a period they depended as the great article of food. Now, allowing all this,—allowing, in the *best seasons*, the chief article of subsistence has been potatoes for breakfast, dinner, and supper;—glad indeed many of them to get a little animal food once a week to dinner, or even far more seldom,—I now ask, what number, in the thousands of emigrants from that country who yearly arrive at our ports, are there that show a constitution weak, fragile, and wanting in physical strength? Many, no doubt, arrive worn down by disease and suffering, and in the last stage of debility; but let them recover from that state, and the robust frame and healthy constitution will be again developed; the bones are strong, the teeth undecayed, and the muscular energy only wanting opportunity to display itself;—in fact, when we wish to denote strength in woman, we use the familiar phrase "strong as an Irishwoman," and all this from being reared on *potatoes*.* But then, if we examine the analysis of the potatoes, we shall find contained in 100 parts of dry potatoes,—

Carbon	41.1	Nitrogen, Oxygen	48.1
Hydrogen	5.8	Ashes	5.0

Here we see that potatoes not only contain the nutrient but the earthy constituents.

But we have a stronger and more healthy race yet, from Scotland and the north of Ireland, who are generally descendants of the Scotch, and continue, in a great measure, the same means in rearing the young. Now, *a* principal—I will not say *the* principal—food of the youth of Scotland, high and low, rich and poor, except in the larger cities, among those who class themselves as more refined and more civilized, but who number few in proportion, consists, for breakfast, at least, of oatmeal,—that is, porridge and milk; and milk, potatoes, and wheaten, oaten, or pease bread, or *bannocks*, at other times of the day. Animal food among the poor is a rarity, a meat dinner on Sunday *only* being common. Even among the youth of the better class, butcher's meat, or animal food, is by no means a principal article of subsistence. And I would particularly remark that *Scotch oatmeal* (the oatmeal generally used throughout Scotland) is coarse, and contains much of the bran which invests the oat,—containing, as it does, a large proportion of the earthy constituents required for the production of bone. Analysis of 100 parts of dried oats gives—

Carbon	5.07	Nitrogen	2.2
Hydrogen	6.4	Ashes	4.0
Oxygen	36.7		

I may here casually remark, that the advantage to be derived from this wholesome food has not escaped the observation of her majesty Queen Victoria, who appears in the multiplicity of her public duties not to lose sight of the equally sacred duties of a mother; and we hear of her son, the heir to the crown of Great Britain, being as fond of his oatmeal porridge as the meanest peasant child in Scotland.

* According to a memorial presented to the French minister, on the proportions of nutriment of the means of living, by Dr. Glaser, we find potatoes taking no mean rank.

NUTRITIVE ELEMENTS.

100 lbs. wheat bread	contains	30 lbs.	
" flesh	"	21 lbs.	
" fresh beans	"	80 lbs.	casein and starch.
" peas	"	83 lbs.	casein and starch.
" lentils	"	94 lbs.	casein and starch.
" potatoes	"	25 lbs.	albumen, starch and sugar.
" carrots	"	14 lbs.	albumen with sugar.
" beets	"	8 lbs.	albumen with sugar.