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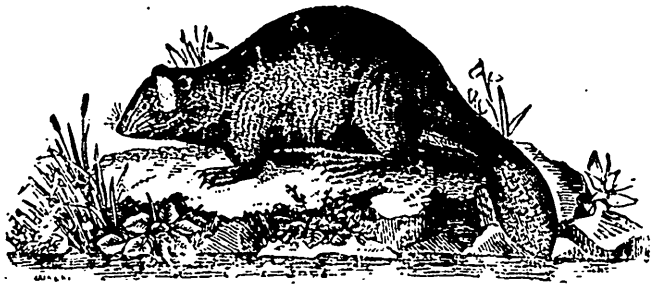

THE BEAVER *(Castor Canadensis*, Kuhl*)*.

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FOOD AND ALIMENTATION.

BY L. COTEUX PREVOST, M D.

(Continued from page 60.)

Personally, I do not know whether these lovely drinks really have a pernicious influence upon the "*eye*" of *oysters*, but all I can say, is that everytime I perchance witnessed any indigestion brought on by this association of wines and oysters, it was that the quantity of liquids ingulfed had been totally out of proportion with the laws of sobriety, required by any reasonable stomach.

Mussels (*Mytilus edulis*) are not generally known in Canada, at least in restaurants. In France they delight those who are really fond of delicious eatables. But if ever your good fate takes you to Paris, beware of what they call there : " Moules a la Marinière."

If you should forget this wise advise you might pay dearly the satisfaction of your legitimate curiosity. I saw some of my friends twisted by the most excruciating colics, accompanied with an abundant rash of urticaria, owing to their having eaten but a few mussels. In Ireland, these shells seem to be less poisonous. In 1874, I had just arrived in Dublin, where I entered the Rotunda Hospital as resident pupil. One evening towards 10 or 11 o'clock, I was leaning on the window sill of my room thinking of my absent native land, when I heard a strolling dealer bawling out his goods, contained in a basket suspended to his arm. Impossible to understand what he was offering from door to door. " What is he saying ?" I asked my room companion. " This is the Cockle dealer " he answered. These Cockles are mussels which delight the people in Dublin. Every night they constitute the family revel, every body eats them with a glass of sherry wine and I never heard that they had the reputation of being hard to digest.

While we are under water, gentlemen, we must not get out without saying a word about fish.

As far as digestibility is concerned, fishes may be divided in 3 groups : those with white flesh such as trout, haddock, etc., they are the most digestible, but the least nutritious ; those with yellow flesh, such as salmon are of a slower digestion but contain more nutritious principles ; thirdly those with fat flesh such as eel, very nutritious but hard to

digest. It has been contended that exclusive fish alimentation might have some inconvenience, namely that of producing cutaneous diseases —do not believe it; still it is absolutely necessary that fish should be eaten perfectly fresh. Of all animals fish is the one which most quickly putrifies. Twenty-four hours after death, there takes place in their tissues a development of enormous quantities of toxic substances the adsorption of which may give rise to the most serious disorde. in the digestive tube.

I have very little to say concerning fowl and game. Game, however, offers special conditions to which Gubler has called our attention. You are aware that some kinds of game are very often brought on the table in a state of incipient decomposition. This condition is a sort of fermentation which has a certain analogy with the fermentation that takes place in the stomach, and owing to this fact, according to Gubler, assists the work of digestion. But that putrification must not be too far advanced or else it will introduce in the system toxic alkaloids, as will fish, and these cadaveric substances may then cause fatal results. Bronardel, for instance, has cited cases of people dying after having eaten tainted game pie. At any rate, as far as I am concerned, I vote for fresh things—and the duck as well as the partridge that I ordered on our bill of fare are of an irreproachable freshness. Taste them without fear and sprinkled with a glass of good Chambertin I promise you ineffable pleasure. For it is with game that Burgundy wine must be drunk.

With regard to fowl, let us speak of eggs, that precious and complete food above all others. I say complete food, that is containing associated all the substances necessary to the nutrition of our tissues. Eggs contain nitrogenous compounds, such as albumen (vitelline); fatty substances (margarine, oleine) and salts. Should we compare the quantity of nitrogen, carbon, fat and water contained in eggs and milk, we shall find that an egg weighing for instance 50 grammes is equivalent to 100 grammes of cow's milk.

Eggs are generally very well borne by the stomach, they are easily digested. But we must remark the considerable influence of cooking upon this kind of food. A fresh egg, boiled only a few minutes is rpaidly peptonized, being completely digested within 1½ or 2 hours, as

showed by Dr. Beaumont, whereas a hard egg has hardly undergone this process at the end of three hours and a half. Must I add that it is of the greatest importance that eggs should be perfectly fresh? For choice, look through the egg, fresh eggs are more transparent in the centre, old ones at the top. Dissolve one ounce of salt in ten of water, good eggs sink, indifferent swim, bad eggs will float even in pure water.

Amongst the preparations having eggs for base I want to particularly point out what is called "American Cream." It consists in beating two yolks together, in adding some powdered sugar and then flavouring with rum or sherry. This mixture is very easily digested and exceedingly nutritious. You may conceive how precious it is for sick persons as well as for weak stomachs which require a strengthening food under a small volume. This mixture constitutes also the first meal recommended by Coats in training pugilists. I regret, gentlemen, that time and the limits of this paper do not permit my saying a few words upon this marvellous method employed by sportsmen in their training for competitions.

I heard, in Paris, Professor Bouchardat speak most emphatically of the excellence of alimentary diet, united to exercise, used by these athletes to obtain that perfect ponderation of muscular powers which permit their going everywhere and disputing prizes in races, on foot or horseback, rowing, fencing and boxing. He contended that these trainers knew and applied better than anybody the laws of hygiene the observance of which is the *sine qua non* condition of perfect health.

Here we are now, gentlemen, at the solid joints of our bill of fare, that is the meats of mammifers, such as beef, mutton, pork and veal. Those are the aliments to which is entrusted the repairing of our tissues, owing to the large proportion of azote they contain. According to Beaumont, the most digestible meat is that of mutton, then beef and lastly pork. But the age of the animal bears a considerable influence upon digestibility: for example veal is more digestible than beef, lamb more than mutton. I mean, of course, the digestibility and not the nutritive value of these nutrients, or else the order would have to be changed. In fact adult animals are those that give the most nutritious meats. According to Payen, the composition of roast beef cut up in slices three centimeters thick, is as following:

Water	69.89	Fatty substances	5.19
Albuminates	22.93	Mineral matters	1.05

Muscular flesh contains, besides free lactic acid and sulphur united to the nitrogenous organic compounds, mineral matters constituted by salts formed out of the bases, potash, soda, lime and magnesia united to the phosphoric, lactic and muriatic acids.

Roast meat is far preferable to boiled, not only on account of the preservation of the nutritive qualities of the meat, but also, owing to the development during cooking of certain odoriferous nitrogenous principles such as osmazone, which render these meats palatable.

Since I mentioned boiled meat, it is impossible not to say something of broth, a preparation which has given rise to rather interesting discussions; certain physicians praising, others denying its nutritive properties. Schiff's experiments, however, permit our deciding this question. This physiologist has demonstrated that the secretion of gastric juice is not indefinite and that it suffices to give a dog, with an empty stomach, a considerable quantity of meat to see, under the influence of this exaggerated alimentary mass, the secretion of gastric juice dry up. Food, then, acts as a real foreign body and is consequently thrown up. This state is known under the name of indigestion *a crapulâ*. But, and here is a very interesting remark of Schiff, it suffices to introduce into the circulation certain substances to immediately cause the gastric juice to be secreted anew, at the surface of the gastric mucous membrane. Among these substances, dextrin appears to possess this property to the utmost, and on animals thus crammed with food and in whose stomach gastric juice is no more secreted, it suffices to introduce a dextrin solution, either in a vein or in the rectum, to promote the immediate digestion of that excess of alimentation. To those peculiar substances, Schiff has given the name of "peptogenes," that is, substances promoting the secretion of gastric juice and therefore the conversion of albuminoids into peptones. Well, gentlemen, broth precisely contains almost exclusively these peptogenous compounds, and the secular tradition of eating soup before meals, receives in the discoveries of modern physiology a resplendent confirmation. Not very nutritious by itself, since it contains a very feeble

quantity of organic matter, hardly 16 p. 1000, and an enormous proportion of water, 985 p. 1000, broth helps the digestion of food in rapidly penetrating into the circulation and bringing back the materials necessary to the secretion of gastric juice.

Therefore, if I am allowed to offer you here a practical advice as a conclusion of what I have just said, I will give you the following: If ever it is your misfortune to suffer some day from bad digestion, before exposing yourselves to be stuffed up by all the drugs invented of late to cure dyspepsia, try a cup of good broth before or after meals; others have often derived much benefit from this practice and the experiment is inoffensive and certainly worth trying.

In spite of the nutritive value of the aliments we have just examined, they cannot exclusively compose the food destined to repair the waste of the organism. If meats possess the advantage of containing a large proportion of nitrogen (albuminoids) on the other hand, they are deprived of starch and carbohydrates which we are compelled to ask of the vegetable foods, characterized by low albuminoids and high carbo-hydrates. The vegetable kingdom will supply us with flour, bread, vegetables and fruits, and if you want to form an idea of the nutritive value of these nutrients, allow me to place before you the composition of some of them. For example, wheat flour contains:

Water	14.0	per cent.
Fatty Matters	1.2	"
Nitrogenous substance insoluble in water (gluten)	12.8	"
" " soluble in water (albumen)	1.8	"
Non-Nitrogenous substances (dextrin)	7.2	"
Starch	59.7	"
Cellulose	1.7	"
Salts	1.6	"

Oatmeal, out of which porridge is made, contains 63 parts of starch, and 12 per cent. of nitrogenous substance, that is, almost as much as muscular flesh of animals. Peas contain 22 per cent. of proteic compounds, and 53 per cent. of starch.

Among usual alimentary compounds, the most important is without doubt bread. The whitest is the most nutritious, and the crust

has a more considerable nutritive value than the pith, as you may judge by the following table :

Water	Crust	=	17.15	pith =	44.45
Insoluble nitrogenous subst	"	=	7.30	" =	0.92
Soluble " "	"	=	5.70	" =	0 75
Soluble non-nitrogenous "	"	=	3.88	" =	3.79
Starch	"	=	62.58	" =	43.55
Fatty substances	"	=	1.18	" =	0.70
Salts	"	=	1.21	" =	0.84

Potatoes for 100 parts contain 2 parts of nitrogenous substances and 21 of carbo-hydrates. Rice has 5 parts of albuminoids and 83 carbo-hydrates.

Among the fats I shall mention butter, which contains 91 per cent. of fatty substances ; cheese, which contains 24 per cent. of fat, besides 33 per cent of nitrogenous substances.

My intention is not to dwell at any length on fruits, wishing only to remind you that they introduce into our economy salts of sodium and potassium, useful to nutrition, and since I am speaking of salts, I wish to point out the importance of common salt, and of all mineral matters in alimentation. These substances are just as necessary as the reparative and respiratory aliments. Forster has given pigeons, mice and dogs a food very poor in mineral matters, and he has observed that mice lived 21 to 30 days only, pigeons 13 to 29 days, and dogs 26 to 36 days.

According to Barbier, man must take daily within 24 hours, 12 to 20 grammes of salts, either pure or mingled with food. When for one reason or another man cannot take the necessary quantity of salts, the same accident happens as with other animals, he falls into a state of weakness and languor, offering, after a while, all the symptoms of anemia, owing to the dimunition of albumen and blood corpuscles.

With regard to the importance of salts in alimentation, I cannot resist the desire of saying a few words about " scurvy," a disease I particularly studied within the last few years. This disease, which formerly was the terror of navigators, exists nowhere, so to speak, except in Canada, where it pretty severely treats, almost every year, the raftsmen who spend the winter in the midst of our forests. You have all heard of that disease called " blackleg " by our " voyageurs," which 20

or 25 years ago was a regular plague, as it would strike down 25 or 30 men in a shanty composed of 40 individuals.

Nowadays, we meet almost every spring with a certain number of cases, but it has become a good deal less common, and shows a tendency to disappear. What is the cause of this consoling diminution? Formerly, our forests, so rich in wood, were poor in settlers. Food intended for the shantymen was exclusively bought in cities, and consisted of salt pork and beans. As clearings allowed settlers to establish themselves, farms were created on almost every limit. On these farms, vegetables are being cultivated, especially potatoes, with which the shantymen can easily be supplied for their alimentation. Those who are to-day the victims of scurvy are those who winter in the remotest parts, away from established settlements. Do you know to what treatment we subject these unfortunate patients suffering from black-leg? We actually stuff them with potatoes and other fresh vegetables, and in a few weeks they are perfectly cured.

The general opinion to-day is that scurvy proceeds from the privation of vegetables, and that these vegetables posess anti-scorbutic properties, owing to the salts of potassium they contain. Here it is curious enough to remark, that these salts of potassium exist in vegetables in a special chemical state which causes all their efficacy. In fact, mutton contains by ounce 0.846 of salts of potash, and besides, you are aware that the pork destined to shantymen is generally salted with nitrate of potash. Still, in spite of this alimentation, scurvy soon appears. What can be the reason of this apparent contradiction?

Here it is: Salts of potash in food, as all the mineral salts, must be introduced on determinate chemical forms in order that these principles may be fixed in sufficient quantity by the functions of assimilation. Thus, phosphate, nitrate of potash, and chloride of potassium traverse the whole system, and are expelled almost entire through the excretions and secretions of the body. These salts are stable. On the contrary, in a combination of potassium with an organic acid, such as the citrates, nitrates and tartrates, the organic acid is decomposed, giving up carbonic acid, and the economy finding itself in possession of a salt of little stability, nutrition takes up and utilizes its base. Fresh green vegetables contain potash combined with organic acids, which

are thus decomposed. Meats, on the contrary, contain phosphate or nitrate of potash, which are are stable salts. These facts explain why mutton, although containing a certain amount of potash, is unable to prevent scurvy, whereas lime-juice, for instance, with an equal quantity of this base, but in the state of super-citrate, acts as a true specific in the prevention of this disease.

One word now, with your permission, about milk and wines; because however succulent may be all the dishes we have spoken of so far, it seems to me that the subject is rather dry, it wants liquids. Milk, like eggs, is what we call a complete food. It contains albuminous substances; casein and lacto-protein and albumen; fatty matter the butter; a sugared substance, lactose; saline principles, phosphates, and chlorides, and lastly water. Its digestion is most rapid, it is the food most quickly absorbed, requiring in the mean time the least digestive work possible. We must add that it is the nitrogenous compound which contains the smallest quantity of toxic alkaloids.

Its nutritive value is certain. Unique aliment of the child during the first months that follow its birth, milk supplies it with all the materials necessary for a rapid growth. Even with adults, milk employed alone suffices for their alimentation, and we often observe that certain patients fed on strict milky diet obtain by it a sufficient nutrition. Lastly, it is an admirable therapeutic agent in some diseases of the stomach. In ulceration of that organ, for instance, milk given exclusive of all other food and even without any drugs whatever, acts in a truly specific manner

I have, in the course of this paper repeatedly spoken of toxic alkaloids, products formed during digestion in the stomach. I think it proper to dwell a moment upon these curious phenomena which, although within the province of pathology, still have a proximate relation to alimentation and the functions of the digestive tube. You have all heard of microbes, and bacteria; micro-organisms, the discovery of which has had such an influence upon medical doctrines in general and the theory of infectious diseases in particular.

It is to Pasteur that we owe the wonderful discovery of the role played in our planet by a whole world of infinitely small beings which, everywhere invisible and present, constitute by the manifestation of their

incessant activity, one of the greatest forces which govern matter and determine its transformations. In applying all the faculties of his deeply investigating mind to the study of these infinitely small beings, much more powerful than the antediluvian monsters and often much more dangerous, M. Pasteur has succeeded in watching them at work in catching the play of their functions and in establishing their relations to the phenomena of fermentation of which they are necessary agents.

These micro-organisms swarm by millions in the atmosphere. They lie everywhere; our clothes, our furniture, our books, the walls, the hangings of our houses are covered with them. The water we use for our ablutions, the water which purifies, as we fancy, the things it washes, the water we drink, how many microbes does it not contain and nourish? Miguel has demonstrated that a single glass of Seine water contained 300,000 microbes. Evidently, all these micro-organisms are not malefactors: many of them are, on the contrary, for us very useful auxiliaries, others are quite harmless or indifferent. But mixed with these indifferent germs, there exists around us an immense quantity of them which are formidable. Such are the germs of infectious and contagious diseases, especially during epidemics.

These ferments, introduced with food into our stomach, feed themselves upon what we have prepared for our own nutrition; they are our guests, our parasites, and live upon the portion of our aliments which we do not consume, clients who eat the leavings of the table. A great number of them are immediately killed by the chlorhydric acid of the gastric juice; among those remaining some work for us, playing an important role in the digestive transformation of alimentary substances, but more often they openly work against us.

It has been thoroughly demonstrated by recent investigations, that the pathogruic microbes secrete, by the fact of decomposition produced by their vital action, special toxic substances, real nitrogenous bases similar to the alkaloids extracted from vegetables, such as quinine, morphine, strychnine, which dissolved in the fluids of the organism produce a true poisoning. It is they which incessantly fabricate in the digestive tube compound ammonia, such as indol, leucin, tyrosin, phenol, scatol. Carbonic acid and other gases are set free, such as for example, sulphurated hydrogen, and the products secreted by these

ferments, after their penetration into the economy give rise to the manifestations of a real poisoning. Such is the explanation of the strange phenomena offered by those who suffer of what is commonly called gastric embarrassment, indigestion, biliousness, flatulence, dyspepsia. To prevent this state of things we have a double means at our disposal: destroy the microbes by intestinal antisepsy and expel them from the alimentary canal by purgatives.

Here we shall remark how much the interesting researches in putrid fermentations of the intestines justify the traditional medication of our forefathers, and the physicians rediculed by Moliére were not altogether wrong after all, when they gave so much importance to the reiterated expulsion of atrabiliary humours upon which depended most of the evils that afflicted their clients.

But that is not all; there is something better than to cure an evil when it has been produced; the ideal is to prevent it. Well, it is a known fact that animal food, such as meat and fish, is the aliment that contains the greatest quantity of germs: moreover, we may consider all albuminoid compounds as the most favorable soil for the origin and development of ferments; consequently for the production of these toxic alkaloids.

You may, perhaps think that these considerations upon such a wonderful subject as bacteriology, have altogether made me forget our bill of fare. Not at all, and you will see that the conclusion of what I have just said will naturally bring me back to the starting point of this long digression. In fact, if we ever should find ourselves in presence of these disorders commonly called flatulent dyspepsia our first duty may be the getting rid, by the free administration of purgatives, of the morbid products gathered in the stomach. But this is not everything; we must above all suppress from alimentation all albuminoid food, since it constitutes the *materia prima* of this excess of morbid fermentation.

Still the patient must be fed. Here is where the usefulness of milk comes in, since that aliment is a complete food, as I have already said, since it is the nitrogenous nutrient which contains the smallest quantity of toxic germs. By the administration of this precious liquid food, we shall have suspended all mechanical work from the suffering stomach, which will be then in the position of a broken arm laid at rest

in a splint. Besides, the suppression of albuminoid food will prevent the development of further fermentation and allow the digestive functions to be restored to their normal state. This is what we are doing every day, and we may say that we possess in a milky diet the most powerful and efficacious means of treating and curing that so common disease called dyspepsia.

As far as wines are concerned, you may see that I have given them a large share in the drawing up of my bill of fare. And I believe that I showed proof of extensive artistic knowledge about the choice and distribution of their different kinds. White wines strike up the march and sprinkle the soup and fish; Bordeaux wines accompany the solid joints; Burgundy wines are associated with game, and Champagne with the dessert. All these wines are endowed with particular *bouquets* according to their variety, but the principle base of every one is alcohol, which enters into their composition in the proportion of 7 to 15 per cent. They contain also tannic acid and salts of potash, etc. Absorbed in small quantities during meals, it is a known fact that they possess a salutary action in assisting the secretion of gastric and pancreatic juices. And they contribute to cheerfulness of mind and consequently place the guests in excellent moral disposition, banishing from their brain all cares and preoccupation, which, you will confess, is worth consideration.

We know now, all the ingredients composing our alimentation. Here they are briefly enumerated :—

1.—Albuminoids, especially derived from the animal kingdom and the principal element of which is nitrogen united to carbon, hydrogen and oxygen.

2.—Ternary substances containing only carbon, oxygen and hydrogen without azote, they are represented by sugars and feculents.

3—Fats deprived of oxygen, being consequently composed of carbon alone and hydrogen.

4—Salts, which we meet in food supplied by both the animal and vegetable kingdoms. These are the materials destined to the nutrition of the body.

Now, what is the want of the organism? The human body is a living machine having two different kinds of functions *viz.* the *functions*

of relation, such as intellect, sensation, locomotion and voice and the *organic* or *vegetative functions*, as digestion, absorption, respiration, circulation, secretion, nutrition and calorification. These functions are what we call life. Life means movement, which again is but a transformation of forces contained in nature. These forces are concealed in a latent state in food, and their transformation into movement takes place within the body by means of the digestive functions. Feculents and sugars are consumed and provide animal heat, albuminoids and salts are fixed in our tissues and repair the wastes produced by use. Lastly fats, which have escaped oxidation are stored in the body and kept as a reserve for further and unforeseen wants of the organism.

Among substances destined to repair the incessant loss of the animal economy, some are directly absorbed and carried at once into the circulatory torrent; others deposited at the surface of the digestive organs, must undergo the influence of juices which are poured in and are modified so that they may be absorbed. This is the reason why food introduced into the mouth successively travels over the different parts of the digestive tract, being subjected by the way to various mechanical actions, but especially to the action of varied fluids.

Let us take, if you please, the alimentary bole. Follow me, we shall accompany it in its pilgrimmage into the depths of the digestive tube and see what will take place. Let us suppose this alimentary bole composed of albuminoids, feculent and fatty substances. Once introduced into the buccal cavity, it finds itself in presence of a special liquid called saliva. The latter contains a ferment named ptyaline, which, while deprived of all action upon fats and albuminoids, possesses the property of converting feculent substances into dextrin, rendering them, therefore, assimilable. Hence, the necessity of thorough mastication of all starchy and sugared food, in order that these compounds shall be well impregnated with saliva. Hence again the dyspeptic disorders arising with people deprived of suitable teeth, as well as those who eat as if they were pursued, allowing no time for this important function to properly take place.

Arrived in the stomach, the alimentary bole meets with another liquid, the *gastric juice*, which, like saliva, contains a ferment called *pepsin*. The latter's task is to digest albuminoid substances, which it

transforms into peptones, a product eminently assimilable. These peptones still possess some of the chemical characters of albuminoids ; they give, for instance, with nitric acid, a yellow precipitate of xantho-proteic acid, but they have lost the property of coagulating under the influence of heat or acids. Besides, when an albuminoid substance is injected into the veins of an animal, it is found again in the urine, but it is not so with peptones, which are absorbed into the economy, and of which no traces are found in urine, a proof that they have been thoroughly assimilated.

So far, feculent and albuminoid compounds alone have undergone the action of digestion, fats are intact. But when once it has been expelled from the stomach, the alimentary bole, softened, modified, reduced to the state of pulp, meets in the first parts of the small intestines, another juice supplied by a gland called the pancreas. This fluid plays in digestion a considerable role. Its ferment, "the pancreatine," possesses the property of completing the digestive action which began in the buccal and gastric cavities. It modifies not only feculent and albuminoid compounds, which escape the action of saliva and the gastric juice, but it possesses besides the exclusive power of digesting fatty substances. Defresne, who made a careful study of the properties of pancreatic juice, attributes to three distinct ferments the threefold properties I have just mentioned ; *Amylapsine* would have the charge of converting starch into sugar ; *Steapsine* would favour the emulsion of fats ; lastly, *Myapsine* would dissolve albuminoids.

After having undergone the action of pancreatic juice, the aliments start on their way through the small intestines. As they progress, their consistency increases, while in the meantime their mass diminishes, owing to the greater part of them being absorbed by the chyliferous vessels. The excrementitious portion traverses the large intestine to be evacuated *per anum* ; the absorbed portions pass through the mesenteric glands to the thoracic duct, and are finally poured into the left subclavian vein, where they are mixed with the blood. They will hereafter belong to that regenerating fluid, which enters every organ, through the circulation, distributing the nutritive principles to every texture, and becoming the source of every secretion.

Gentlemen, in my quality of physician and hygienist, I do not

want to terminate my lecture without pointing out a common error committed in our alimentation in general, an error just as prejudicial as possible to the health of those who render themselves guilty of it, and they are the greatest number.

You undoubtedly know Count Tolstoi, that remarkable Russian writer, who within the last few years, has astonished the literary world by the originality of his characters and the boldness of his theories in social economy. He seems to have imposed upon himself the task of regenerating society, morally as well as physically, and lately he wrote peculiar articles which everywhere provoked a certain emotion. In fact this celebrated philosopher, falling upon the idols that man worships the most, emitted with his usual daring spirit the three following propositions :

1.—Luxury is bad. 2—Our alimentation is too abundant. 3—We must replace our animal alimentation by a vegetable one.

Naturally we have nothing to do with the first part of his thesis, but with regard to the second proposition, I subscribe to it with both hands. Yes, *we eat too much*. Almost everybody eats more than his hunger commands, and how many in presence of a good dinner leave the table only when it is impossible for them to eat any more? The old maxim should never be forgotten that "we must eat to live but not live to eat." And do you know how little one need eat not merely to live but even to live comfortably, and to secure for the body the necessary materials for daily work? If we compared the quantity of food which suffices a poor peasant and the food necessary to the wealthy citizen, we would feel tempted to say that they were beings of different species. The fisherman is satisfied with a piece of bread and cheese and the tourist who accompanies him takes with him a whole kitchen paraphernalia.

The Arabian who guides the excursionist through the desert requires for food but a little bread and a few dates and it is not without a certain expression of contempt, that he considers the baskets of provisions, the cans of preserved meats and other innumerable ingredients that the sportsman thinks necessary to take along with him under fear of starvation.

Sheriff Sweetland, one night at a meeting of the Medico-chirurgical Society, caused no little amazement, in stating that the cost required for feeding a prisoner did not exceed 8 cents a day, that is 3 cents per meal.

He added, that being one day in England, in the course of a conversation with some officers of the London jails, these officers had found the sum exorbitant. They said that each prisoner in London did not cost them, for food, more than 4 cents daily. "If we fed them, they added, at the rate of 8 cents, as you do in your country, our jails would soon become insufficient to receive the mass of those who would rush in solely to be fed in such a luxurious manner."

These examples suffice to demonstrate how few aliments are required to keep life and repair the wastes of the organism. Twenty grammes of nitrogen and 300 grammes of carbon are all that is wanted: or in other terms, physiologists have found that within 24 hours, 125 grammes of meat were sufficient for an adult, associated to 300 grammes of potatoes and 50 grammes of butter and cheese. The food which is taken in excess is not absorbed; it then undergoes chemical changes in the alimentary canal and at last putrifies; and quantities of gas such as carbon-dioxide, carburetted hydrogen and hydrogen sulphide are formed, as I said before, in explaining the fermentation produced during the digestive process. It is then, especially, that dyspepsia arises and that constipation and irritation, causing diarrhoea which does not always empty the bowels, are produced. Some of the putrid substances are absorbed, and then appear signs of evident poverty of the blood, a febrile condition, torpor and heaviness, fetor of the breath and sometimes, possibly, even jaundice.

When excess of albuminates continually passes into the system, if especially a certain amount of exercise is not taken at the same time, there is a want of proportion between the absorbed oxygen and the absorbed albuminoids which leads to imperfect oxidation. Nitrogenous substances, instead of being converted into soluble urea, remain in the state of insoluble uric acid; gouty affections have no other origin. Should excess of starchy food be taken, an excess of fat is produced which accumulates in the tissues, leading to obesity with all its inconveniences.

In conclusion, what can we say of Tolstoi's third proposition, that animal alimentation should be replaced by vegetable diet? You know that there exists a certain class of individuals who contend with Tolstoi that animal alimentation is absolutely useless; they are called vegetarians

Here, we must make a destinction. It is evident that animal food is not absolutely necessary. Herbivores are beings like us, having the same physiological laws of nutrition, heat and respiration and still they do not starve although they consume no meat whatever. The Hindoos, Arabians, Chinese and others are satisfied with rice, dates, flour, vegetables, and fruits. If, to these aliments they join milk, eggs, butter and cheese they then possess a perfectly sufficient alimentation.

Chemists and physiologists agree in saying that in bread, peas and beans, there is enough azote to supply nutrition of the body. Cheese of all others is the alimentary substance which under the smallest volume contains the greatest quantity of nitrogen. Therefore the question is decided; we can live and live comfortably without eating meat. But this proposition by no means involves the consequence that animal alimentation must be given up. It is understood, and accepted that a certain quantity of nitrogen is necessary to the repair of our tissues. Milk, cheese, eggs, flour, fruits and vegetables can fully supply this quantity of nitrogen, but that alimentation has the inconvenience of requiring a large alimentary mass and consequently necessitates a more laborious digestive work than if a small quantity of meat were added to it. 100 grammes of bread contain about 1 gramme of azote, whereas 100 grammes of meat contain 3 grammes of it. Therefore as far as the nutrition in nitrogen is concerned. three times more bread than meat would be required to meet the wants of the organism. Besides, in supplying our system with the necessary quantity of azote, by the means of feculents and vegetables alone, we would be compelled to introduce into the stomach a disproportionate quantity of starchy food, with all the dangers of an excess of this kind of alimentation. In short, no one group of aliments is capable of alone properly sustaining healthy life and a combination of all, or nearly all the different constituents of diet is required to accomplish the best results.

It remains to me, now, but to thank you for your kind attention. I fear that I have perhaps abused your good will by the length of my paper. The only excuse I have to offer is that I had unfortunately no time to make it shorter. As it is, all my ambition has been to interest you. If I have succeeded I declare myself happy and satisfied.

SUMMARY

OF

Canadian Mining Regulations.

NOTICE.

THE following is a summary of the Regulations with respect to the manner of recording claims for *Mineral Lands*, other than Coal Lands, and the conditions governing the purchase of the same.

Any person may explore vacant Dominion Lands not appropriated or reserved by Government for other purposes, and may search therein, either by surface or subterranean prospecting, for mineral deposits, with a view to obtaining a mining location for the same, but no mining location shall be granted until actual discovery has been made of the vein, lode or deposit of mineral or metal within the limits of the location or claim.

A location for mining, except for *Iron*, shall not be more than 1500 feet in length, nor more than 600 feet in breadth. A location for mining *Iron*, shall not exceed 160 acres in area.

On discovering a mineral deposit any person may obtain a mining location, upon marking out his location on the ground, in accordance with the regulations in that behalf, and filing with the Agent of Dominion Lands for the district, within sixty days from discovery, an affidavit in form prescribed by Mining Regulations, and paying at the same time an office fee of five dollars, which will entitle the person so recording his claim to enter into possession of the location applied for.

At any time before the expiration of five years from the date of recording his claim, the claimant may, upon filing proof with the Local Agent that he has expended $500.00 in actual mining operations on the claim, by paying to the Local Agent therefor $5 per acre cash and a further sum of $50 to cover the cost of survey, obtain a patent for said claim as provided in the said Mining Regulations.

Copies of the Regulations may be obtained upon application to the Department of the Interior.

A. M. BURGESS,
Deputy of the Minister of the Interior.

DEPARTMENT OF THE INTERIOR,
Ottawa, Canada, December 1892.