

THE CASH ACCOUNT.

I cannot make the thing come out
Thought I have thought and thought
And tried to make a careful note
Of everything I have bought.

ECONOMY IN FOOD.

By Russell H. Chittenden

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If thou wilt observe
The rule of not too much, by temperance taught,
In what thou eat'st and drink'st, seeking from thence
Due nourishment, nor gluttonous delight,

Milton was not alone in his conception of the value to mankind of temperance in diet. Many of the old time philosophers and thinkers were plainly of the same opinion.

HABIT AND CRAVING
Cornaro, the Venetian, who wrote his last treatise, "The Birth and Death of Man," at the age of ninety-five, says in one of his discourses, "It is nature that habit in man eventually becomes second nature, compelling him to practice that to which he has become accustomed, regardless of whether such a thing be beneficial or injurious to him."

It is interesting to observe from the foregoing quotations how clearly these writers recognized the effect of custom and usage upon dietetic habits; and we have in this view a partial explanation at least of the origin of the dietetic rules and standards which exist even in this present day of scientific method.

DIETETIC STANDARDS
In harmony with what has been stated, dietetic standards have been set up by various authorities, in many lands, and for different classes of people; but they are based primarily upon observations as to what people, living under different conditions of life, are accustomed to consume.

In the United States, a systematic and cooperative study of the nutrition of man has been conducted by the Department of Agriculture, through the Office of Experiment Stations, and many interesting and valuable data have been obtained and recorded.

total that Congress has provided sums ranging from ten thousand to twenty thousand dollars a year from 1894 to 1905, making a total of \$182,500, for the study of human nutrition in this country.

Table with 3 columns: Person, Grams Protein, Calories or Heat Units. Includes entries for Man with very hard muscular work, Man with hard muscular work, Man with moderately active muscular work, etc.

* Fats and carbohydrates in sufficient amounts to furnish, together with the protein, the indicated amount of energy.
These standards are much the same as those adopted by most other countries in the civilized world, though perhaps calling for somewhat higher values; but even perfect agreement on standards devised by this method of study does not carry conviction that the standards in question represent in any degree the daily needs of the body for food.

NATURE AND COMPOSITION OF FOODS

All the food-stuffs made use of by man are composed essentially of four distinct groups or classes, viz.:
(1) Protein or albuminous foods. These occur in both the animal and the vegetable kingdom, and are especially conspicuous in meats, fish, eggs, milk, flour or bread, cereals, peas, beans, etc.

(2) Carbohydrates. These are pre-eminently vegetable products, and as they are entirely free from nitrogen, they are termed non-nitrogenous foods. They are represented mainly by starches and sugar, and, unlike the protein foods, are frequently used as pure products separated more or less completely from the admixtures with which they occur in nature, i. e., as cane-sugar, beet-sugar, etc., and as corn-starch, arrowroot-starch, etc.

(3) Fats. These foods, like the carbohydrates, are free from nitrogen and occur in both the animal and the vegetable kingdom. They are widely distributed, being mixed in varying proportions in nearly all natural food-stuffs, but are especially conspicuous in fat meats, bacon, cream, butter, vegetable oils, etc.

(4) Inorganic salts or mineral matter, the bulk of which passes through the body more or less unchanged.
The nutritive value of the food-stuffs is expressed in terms of nitrogen or protein, or in terms of heat value (calories), or heat-producing power, i. e., the amount of heat free in their combustion, or in terms of the amount of heat required to raise one gram of water one degree centigrade, i. e., from 14.5° to 15.5°.

With protein or albuminous substances when oxidized in the bomb-calorimeter, are completely burned to carbonic acid and water. The same thing happens in the body, and the heat liberated is the same as in the laboratory.

With protein or albuminous substances the case is somewhat different. When protein foods are taken into the body they are transformed and mainly oxidized to carbonic acid, water, and urea. The latter substance is then eliminated from the body in the excretion from the kidneys. When burned in a calorimeter, on the other hand, proteins are completely oxidized to carbonic acid, water, and nitrogen. Consequently, the heat value yielded in a calorimeter is somewhat in excess of that yielded in the body, the urea being a substance which is composed of carbon, hydrogen, nitrogen, and oxygen, and therefore containing a small store of energy which is lost to the body. In the body, 1 gram of protein

yields 4100 small calories, or 4.1 large calories.

Protein or albuminous foods, however, are chiefly of value because of the need of the body for nitrogen in this particular form to make good the loss of tissue material. Further, no other form of nitrogen than protein can supply this need; hence, as previously stated, the protein foods are essential foods, without which the body cannot exist. They are of value, however, for their nitrogen, and not for their potential energy or fuel value, the latter being more advantageously supplied by fats and carbohydrates.

AMOUNTS OF FOOD REQUIRED BY STANDARD DIETARIES

Accepting the daily dietary standards previously enumerated, and which are based upon observations as to what people are accustomed to consume, it is plain that the average man doing from light to moderate muscular work must take each day approximately 116 grams of protein matter (18 grams of nitrogen), with sufficient fat and carbohydrate to yield a total value of 3050 large calories. The usual proportion of carbohydrate (mostly starch) foods is about 500 grams to 500 grams of fat. In other words, the average man needs, according to the above hypothesis, approximately 120 grams of protein, 500 grams of carbohydrate, and 60 grams of fat for his daily ration.

A more elaborate diet, one in large measure free from meat and having essentially the same content of nitrogen, and with a total fuel value of approximately 3000 calories, would be as follows: fried hominy, six ounces; corn, three ounces; baked potato, eight ounces; butter, one and one-half ounces; baked spaghetti, two ounces; mashed potato, ten ounces; boiled turnip, six ounces; bread, two ounces; apple-sauce, eight ounces; apple-tapioca pudding, twelve ounces; fried sweet potato, eight ounces; fried bacon, one ounce; fruit jam, four ounces; coffee, one and one-half pints; and tea, one-fourth of a pint. Such a diet, owing to its vegetable nature and lack of concentration, is naturally quite voluminous. A greater concentration of diet is easily obtained by replacement of a portion of the vegetable matter by meat; and this the ordinary man, with his highly developed palate, usually prefers to do, because of the increased flavor which his acquired taste now calls for. Further, the concentration of the diet, by the loss of water, renders possible great variety in matters of diet; but whatever the character of the diet, food, or however great the number and variety of the ingredients, it will be found that the nitrogen content and fuel value of the daily food of mankind will in general correspond to the standards of the dietary standards usually adopted throughout the civilized world.

The writer's experience, indeed, leads him to the conclusion that there is a great tendency on the part of the ordinary person to consume far more food than even the standards call for. This is well illustrated by some recent observations made in the writer's laboratory. Further, the recreational habits of a group of United States soldiers who, while living on the ordinary army ration, were allowed reasonable freedom as to the quantity of food consumed. This was on one day the following dietary was thus used:

Breakfast: Beefsteak, nine ounces; fried potatoes, nine ounces; fried onion, one ounce; thick meat gravy, two ounces; bread six ounces; coffee, one and one-half pints, with one-half ounce of sugar.

Dinner: Roast beef, seven ounces; boiled potatoes, fourteen ounces; boiled onions, two ounces; bread, nine ounces; coffee, one quart, with one ounce of sugar.

Supper: Corned beef, eight ounces; boiled potatoes, seven ounces; fried onions, one ounce; bread, six ounces; fruit jelly, four ounces; coffee, one pint, with one ounce of sugar.

At a period of two weeks each of the soldiers in this dietary consumed every day an amount of food approximately equal in nutritive value to the above, though naturally there were variations from day to day in the character of the food taken. Yet these men were not doing any unusual amount of muscular work; indeed, the amount of work they were called upon to perform was considerably less than what they were accustomed to do in the ordinary performance of their duties as soldiers in the regular army.

Naturally, variations in the degree of muscular activity, i. e., the amount of muscular work to be performed, will call for variations in the amount of food to be taken; but there is no justifiable reason for such excessive quantities of food—quantities far beyond the amounts indicated by the so-called dietary standards.

Another illustration of this common tendency toward excessive eating, especially on the part of persons who are engaged in vigorous muscular work, was seen by the writer in studying the dietetic habits of a group of university athletes who were in a high state of training for their competitive contests. It was found that these men, under the mistaken belief that their strength was to be maintained and increased by a hearty meat diet, were in the habit of taking each day of meat and other protein foods at least fifty per cent. more than is called for by the existing dietary standards, and this in addition to an amount of non-nitrogenous food sufficient to yield far more than the fuel value implied as necessary for men of their weight and activity.

the true physiological requirement is no doubt desirable in order to prevent any danger of under-nutrition, but any great excess must of necessity be detrimental. The ideal diet is that which suffices to meet all the wants of the body—i. e., the maintenance of body-weight, nitrogen equilibrium, health, strength, vigor, and endurance—and, in the period of adolescence, to supply material for the growth and development of the tissues of the body. Anything beyond this quantity is just so much of an excess which must inevitably do harm if continued indefinitely, and detract in some measure at least from that high degree of efficiency which every enlightened man desires to attain.

Impressed with the importance of this problem from a physiological, economical, and sociological standpoint, the writer began, some two years ago, a careful study of the true needs of the body for food, with a view to ascertaining how far the so-called dietary standards of civilized man are in accord with physiological requirements. The investigation was made upon a large number of men, representing different types, ages, and nationalities, under different degrees of mental and physical activity, with a view to having the inquiry as broad as possible. Further, the study was continued over a long period of time, in order to afford ample opportunity for the detection of possible changes, favorable or unfavorable, that might be slow in developing.

How, now, are we to ascertain with any degree of accuracy the true requirements of the body for food? As a preliminary to answering this question, it must be remembered that the living body is constantly undergoing change, that it is the seat of incessant chemical decomposition, varying in extent with the degree of bodily activity, the temperature of the surrounding air, etc. The material composing the tissues and organs of the body—the protein, fat, and carbohydrate—is constantly undergoing oxidation with liberation of energy in the form of heat, by which the body is kept warm, and in the form of muscular work, both voluntary and involuntary—i. e., the voluntary movements of the limbs as in walking, and the involuntary movements of the heart, respiratory muscles, etc. To make good this loss of tissue material, food is necessary, and in amounts sufficient to counterbalance the loss incidental to the daily activities. If this loss is not made good by the daily diet, there is a gradual diminution of body weight, owing to the using up of the store of reserve material and of the organized structures of the body itself. Further, it is to be remembered that the final decomposition or oxidation products, which result from the changes going on in the body, are the gaseous carbonic acid excreted through the lungs, water excreted through the skin, and urea, and nitrogen in various forms, but especially in urea, eliminated through the kidneys and in the smaller measure through the bowels.

It follows from these statements that the amounts of nitrogen, carbonic acid, and water passed off from the body are a measure of the extent of decomposition taking place within the system. For example, if the excretion of 26 grams of nitrogen in the day's excretion from the kidneys, that means the breaking down in the body of 100 grams of protein material, since the nitrogen thrown out from the kidneys can come only from the decomposition of protein substance. This obviously implies the necessity for 100 grams of protein food to make good the loss. (Pure, dry protein material contains on an average 16 per cent. of nitrogen.) If, now, a man is kept under daily observation, comparing each day the composition of the food taken with the composition of the various excretions, noting at the same time the body weight, physical strength, and reaction time of the nervous process, etc., it is possible to ascertain with accuracy the influence of different quantities and quantities of food, with reference both to the maintenance of strength and vigor, and to that of body-weight and nitrogen equilibrium.

THE MENTAL WORKER.
Professional men, whose work is mainly mental rather than physical, would not seemingly require as much food for the maintenance of a high degree of physical strength and mental vigor as the purely physical worker. In order to test this question and at the same time to ascertain what the real demands of the body for food are in the case of the mental worker, six men, professors and instructors in the university were selected, upon whom the effects of smaller quantities of food could be studied. The men chosen ranged from twenty-five to forty-seven years of age. They were all men of good physique and good health, and varied in body-weight from 146 to 170 lbs. These men were under daily observations for periods of from six months to two years.

The results of these experiments with these subjects may be summed up as follows: Professional men, whose daily work is primarily of a mental character rather than physical, though by no means excluding a reasonable amount of physical activity, are quite able to maintain their bodies in a state of nitrogen equilibrium—i. e., to balance the loss of nitrogen from the body by the intake through an intake of fifty grams of protein per day, and with an additional amount of carbohydrate and fat sufficient to yield a total fuel value of about 2000 calories per day. This was accomplished by several persons for periods ranging from five to nine months, with maintenance of a constant body-weight (after the initial loss of weight due to the restriction in diet) and with continuance of mental and physical vigor, etc. This means that all the apparent needs of the body, with men of this class, can be met by at least one-half the amount of protein food called for by the existing dietary standards, and by approximately two-thirds of the calorific power generally considered as necessary.

This is surely a physiological economy worthy of some consideration. We are informed that man with light to moderate muscular work requires 112 grams of protein food per day, with a total fuel value of 3050 calories, while a sedentary person needs 100 grams of protein and 2700 calories daily. As these standards are based upon the observations made on 15,000 persons, we are justified in assuming that people ordinarily consume at least this quantity of food. But the subjects of our experiment, men leading very active lives, were quite able to maintain unimpaired their mental and physical vigor, and with every evidence of gain in their general health, on quantities of food far below the standards adopted as necessary for health and strength.

In fact, the statement made above is quite conservative, as the writer has no desire to over estimate the degree of economy it is possible and profitable for the mental worker to practice in his daily dietary. To give an illustration of the actual economy practised by some of the subjects of our experiments, mention may be made of one person—a university professor, 47 years of age, weighing now 127 pounds—who for a period of nine months maintained a constant body-weight and general physiol-

ical equilibrium on an average daily intake of 39 grams of protein food with an average fuel of 1600 calories. A second subject, however, likewise a university professor, but with a body-weight of about 160 pounds, maintained equilibrium, etc., for nearly nine months on a daily intake of 51 grams of protein food and with a total fuel value of 2400 calories. This latter person was much more active physically than the first subject mentioned, which fact added to his greater body-weight, called for a somewhat larger fuel value in his daily diet.

(Continued next week.)

People to Blame for Corruption

Governor at Missouri Makes Reform Speech in Philadelphia.

Philadelphia, Oct. 17.—The great battle between the local Republican organization and the City Party, the municipal reform organization recently formed here, was enlivened by the visit of Governor Joseph Folk, of Missouri, who came to lend his voice in the interest of good government. The Missouri governor addressed a large and enthusiastic audience in the Academy of Music. He spoke under the auspices of the City Club, which claims no connection with the City Party.

The crowd that attempted to gain entrance to the Academy was so great that the doors were closed before the meeting began. Several thousand persons who could not get in were addressed by City Party speakers. Governor Folk said in part: "The most conspicuous fact of municipal governments in the United States today is that they are governed by the few and not by the people. There is more aggressive rotteness and less aggressive patriotism in our large cities than anywhere else. If the patriotism can be made as aggressive as the rotteness, the problem of good government would be solved by the people taking the government into their own hands. If corruption exists in Philadelphia, the people are to blame; if corruption is to be eradicated, the people alone can do it. The fight you are making here is a battle which will be felt by every man, city and state in the land. The benefit of a victory for good government will be universal, and the evil efforts of a defeat will demoralize those who believe in good government by the people. The garage man does not appreciate the solemn duty he owes his city, state and his country.

"The strength of the lawless element is great, but it is nothing when it comes in contact with a public conscience thoroughly aroused. Philadelphia at last seems to be awakening, and though the gang has been strong it is being shattered beneath the shafts of public opinion under the leadership of Mayor Weaver. The people can overthrow civic evils whenever they want to and get just as good government as they deserve or as bad as they permit it to become.

"The moral revolution that is now sweeping over the land is merely a revival of the rule of the people. Four years ago the laws against bribery in all of the states were considered as practically dead letters. Not because the offense was uncommon, but because it was uncommon for officials to be prosecuted for it. Here was a crime worse than any other, for their offense violated the law, while bribery strikes at the foundation of all laws. Yet the law denouncing it was not enforced; bribery became the usual and expected thing all over the land; corrupt men feasted and fattened at the public expense, laws became merchandise on the market, and all this time the public conscience was asleep. When the revelation came the people saw how they had been plundered, they saw the offense in all its enormity, and from one end of the land to the other there was a civic awakening.

"I have spoken of corruption, bribery and grafting, using the terms as they are commonly used synonymously. While the effect on the public may be as injurious from grafting as from hoodluming there is a distinction between them. The hoodlum sells his vote and prostitutes his trust for bribe money contrary to law, but the grafter is not always a hoodlum. The remedy for corruption, bribery and grafting of every kind is to enforce the law. If the system is working an illegal game instead of trying to beat the game, the better way is to stop the game."

Three Killed on Railroad.
Harrisburg, Pa., Oct. 16.—Within a few hours three men met death on railroads in or near this city. Mark Corryell, a Pennsylvania railroad yard brakeman, whose family reside in Sunbury, caught his foot in a guard rail at the Union Depot, and a locomotive struck and killed him before he could escape from its path. The body of a man, whose name is believed to be Harry Kroh, residence unknown, was found on the Philadelphia & Reading railway near Derry Church, this county. Pennsylvania railroad trackwalkers found the mangled remains of an unknown man in Steelton.

Pennsey Orders 500 Locomotives.
Philadelphia, Oct. 17.—The Pennsylvania Railroad company announced that it has placed orders for 500 locomotives and will shortly let contracts for the building of 15,000 freight cars. Half of the locomotives will be built by a locomotive company of this city and the other half will be constructed at the Pennsylvania railroad shops at Altoona.

Struck Monster Gas Well.
Parkersburg, W. Va., Oct. 17.—The Philadelphia Gas company, operating in Lewis county, has struck a monster gas well. The gas is beyond all control, and its roar can be heard for five miles. Every effort to control the gas has so far failed.

THE WAR OFFICIALLY OVER

Russia and Japan Notified Treaty Has Been Signed.

St. Petersburg, Oct. 16.—Spencer Eddy, the American charge d'affaires, yesterday afternoon officially informed the foreign office that the emperor of Japan ratified the Russo-Japanese peace treaty Saturday. The French minister at Tokio at the same time informed the Japanese government that Emperor Nicholas had signed the treaty. The ratifications were exchanged at Washington.

Japan Evacuating Manchuria.
Tokyo, Oct. 16.—It is believed that the government has sent an order to Manchurian headquarters to commence the evacuation of Japanese troops today. It is expected that the Japanese will effect a complete withdrawal of their troops in six months.

CAPTAIN TAGGART WINS

Army Officer Granted Divorce and Custody of Children.
Wooster, O., Oct. 14.—Judge Eason, who heard the divorce case of Captain Elmore F. Taggart against his wife, has rendered his decision. The court grants Captain Taggart the divorce and the custody of the two children, Culver, aged 11, and Charles, aged 7. Although Mrs. Taggart is denied possession of the children, she will be permitted to see them. Captain Taggart was in court during the rendering of the decision. Mrs. Taggart is ill and was not present. The court room was crowded with an eagerly expectant throng of people. Judge Eason, before giving his decision, reviewed the petitions, cross petitions, answers and affidavits. In the course of his statement, Judge Eason said that the testimony was deeply touching. The charge of drunkenness against Captain Taggart, the court said, was not sustained.

COAL TAR DYE IN BUTTER

Chemist Wiley Makes Report on League Island Case.

Washington, Oct. 17.—That samples of butter submitted as portions of a large quantity supplied to the League Island navy yard at Philadelphia, prove to be colored with coal tar dye is the substance of a report which Chief Chemist Wiley, of the department of agriculture, will submit to Secretary Wilson. Specimens were recently taken for analysis from the League Island hospitals, kitchens and barracks, from the United States receiving ship Lancaster and other navy craft by representatives of the Pennsylvania dairy and food commission, who are said to have obtained similar samples from the men who sold the product. Secretary Wilson will refer the report to President Roosevelt, who will call the attention of the department of justice to the matter.

MARKLE MINERS STRIKE

Men Demand Reinstatement of Discharged Driver.

Hazleton, Pa., Oct. 17.—All efforts to adjust the differences between the employes of G. B. Markle & Co., of Jeddo, have failed, and one of the most stubborn strikes since the big strike of 1902 was inaugurated, and the entire operations of this firm were tied up, throwing idle between 2500 and 3000 men and boys. The miners' local union of Jeddo met, and while opinion was divided on the question of strike, the motion finally prevailed, and unless some wiser counsel prevails the struggle will be a long and bitter one, as Superintendent Smith, of the firm, asserts that under no consideration will the discharged driver, John Kardisko, be reinstated. Kardisko's reinstatement was one of the points in dispute.

DEFENDED HIS MOTHER

Son Kills Father, Who Was About to Attack Her With a Knife.

Trenton, N. J., Oct. 17.—William T. Bevins, Jr., aged 23 years, in defense of his mother shot and killed his father in a houseboat on the Delaware river. The father and mother had not been living together lately, having been obliged to give up housekeeping because of the father's drinking habits. The father visited the son's houseboat, where the mother was stopping. The father had a butcher knife with him and according to the statement made by the son was about to attack Mrs. Bevins when the young man rushed out and fired his revolver. The father fell and was at once taken ashore by the son. The father died in an ambulance while being taken to a hospital. The son was arrested.

Confessed to Save Another.

New York, Oct. 14.—Mary E. Golding, cashier for the Larkin Soap company, confessed in police court that she had embezzled at least \$2000 from her employers within four years and had made use of it to support and care for her father, mother and invalid sister in Buffalo. She was sent to prison in default of bail. The young woman was unsuspected even by her employers upon whom suspicion of her peculations had fallen, she voluntarily went to her employer with the same confession which she made in court.

Murdered By Unknown Man.

Tamaqua, Pa., Oct. 16.—At Coaldale, near here, Michael Starro, a miner, was stabbed to death by an unknown man. The chief of police and a posse are searching the mountains for the slayer. The mine workers are aroused, and it is feared that if the murderer is captured he will be roughly handled.

Earthquake In Cuba.
Santiago, Cuba, Oct. 16.—Another earthquake shock was felt here Sunday afternoon. It was stronger than that of Friday or Saturday.