Register 20/7/21

ate the animals, and so obtained the nitrates that our voracious maws demanded. During the war the quantity of nitrates available constituted the absolute limit of one side or the other to win. All military considerations turned on that point. If Germany had had in her soil a sufficiency of nitrates to feed her people she might have been victorious. She very nearly had enough, and with better management it might have been made enough to give her teeming population enough protein. Fortunately their adequate quantity failed her. One way plants had of obtaining nitrogen was through the decay and the delequescence of the proteins of other living matter. Through the agency of bacteria nitrogen found its way into the soil, and in turn furnished protein vegetation, which passed it on to animals, and through them to man. Man's remains created such bacteria, so that he could be said, like the phenix, to arise from his own ashes. The bacteria which produced nitrogen were largely associated with the roots of certain plants, such as peas and beans, which were capable of transforming the nitrogen of the air into nitrogen of the soil. It was on the action of those minute organisms that the cycle of active existence was absolutely dependent, whether the life of man, animal, or plant.

—"A Treble Parasite."—

With all the vast intellectual capacity of man, the speaker went on, he was nothing but a parasite—a double, a treble parasite. He fed on animals, the animals fed on vegetation, and vegetation fed on the nitrogen yielding atoms. The quantity of nitrogen in the world meant the limitation of population which any part of it could carry. Such limitation had been reached many times. For instance, China to-day was short of nitrogen. Her soil had become so exhausted of it that it was only by an incredible amount of labour that her people could live. There was no six or eight hours for the Chinese coolie. He had to think of his work nearly all the 24 hours. If he did not he died. Turning to nearer home, the lecturer asked what the cost of protein was in Adelaide in July, 1921. Our requirements as healthy beings constituted, he said, a little over 3 oz. of protein in a dry form (100 grams). That quantity in the form of oatmeal would daily cost 5½d. Split peas were about the same price. Beef and mutton, and bread were a little more. Rice would run into 1/6, so it could be seen where the trouble of the Chinamen, whose chief diet was rice, came in. Potatoes were fairly cheap, but milk was expensive and eggs were very expensive. If we depended upon bananas for our necessary protein, the cost would be £1 4/ a day. (Laughter.) Protein, whether contained in oatmeal or split peas, required a lot of rearrangement and a good deal was thereby wasted. About 80 per cent of protein was got out of 100 grams of oatmeal and more of it had to be taken to get the other 20 per cent. That was why Scotsmen were so fond of oatmeal, perhaps. (Laughter.) Meat, butter, cheese, fish, and eggs were somewhat easily convertible into protein, and by combing them we got that element with a little more comfort than if we ate vegetable products alone.

—Human Heat.—

Human beings, said Professor Robertson, radiated heat, just as did a fire, although at a low temperature, and thereby expended energy which had to be made good. They had to make their own calories, which might be likened to a motor car made of paraffin, working on its own paraffin. In the creation of those calories he had pointed out the supreme importance of nitrogen. The first man to propound the theory of the creation and conservation of energy was the Frenchman Lavoisier, 125 years ago, whose life was cut short by the Revolution. Then came the eminent German Liebig. Lavoisier stated that the amount of energy in the world was unalterable and that the energy derived by man from his food was returned in various ways to its original sources. And so the economies of food was as he had already said, a cycle. There was yet much to learn. It was not a mere matter of mechanics. While man was a machine, just as a mechanical piano was a machine, yet behind the two was the intellect. The mechanical player had its bellows and perforated notes and its keys, but there was the genuis who conceived the music represented by the mechanism. Man was something more than a mere creature who lived on hydrogen, nitrogen, oxygen and carbon. The next lecture will be delivered on July 26.

Advertiser 20/7/21

WHY GERMANY LOST THE WAR

THE IMPORTANCE OF FOOD

Professor T. Brailsford Robertson, who succeeded his father-in-law, the late Sir Edward Stirling, in the chair of physiology at the University of Adelaide, has a world-wide reputation as a bio-chemist. He is also an eloquent and entertaining speaker, and the course of University extension lectures by him on "The Physiology of Every-day Life" has been awaited with eagerness by many people. Professor Robertson delivered the first of a series of three lectures at the University on Tuesday evening, and the Prince of Wales' Theatre was crowded to the doors. Among those present were the vice-chancellor of the University (Professor Mitchell), Lady Weigall, and many members of the professorial staff of the University.

"Nutrition" was the branch of the subject upon which Professor Robertson discoursed. He apologised for venturing to lecture on such a commonplace and threadbare subject as food. Most people, whatever doubts they might have about prescribing proper fuel for an engine or an aeroplane, would feel no hesitation about deciding what was a proper fuel—in other words, a nutritious and wholesome food—for the most complex machine on earth, the human being. (Laughter.) He proposed to draw attention to certain curious things which could not be so universally known. Everything turned on the fact that there were material substances in this world which did not alter, though they went through many apparent changes. They were called by chemists elements. Many things in this world to many people were identical because they looked identical, but the knowledge gained by chemists in centuries of research showed that things were not always what they seemed, and that certain substances, although they kept entering into what was called chemical combination with other substances, nevertheless were not altered, and might be recovered, after many changes, in the form in which they started. There was that dull-grey, inert, heavy metal, lead. When treated with the acid which was found in vinegar and evaporated it became a white crystalline substance, lead chloride, from which lead nitrate might be got by treating it with nitric acid. In turn it could be made oxide of lead, and then by driving off the oxygen gas there was left the familiar dull-grey, flexible metal. Such unalterable materials were called chemical elements, and the quantity of any of those elements was unchangeable. The law of the conservation of matter applied no less certainly to the matter that was passing daily through the bodies of human beings, for the body could not possibly create or destroy one single atom of any element. Yet all the time the human body was consuming or wearing out bodily substance and turning it into chemical forms which were no longer useful but would be harmful if accumulated. Thus there was a wastage of hydrogen, oxygen, nitrogen, carbon, &c., and the same amount had to be taken in, or the human body would vanish away. The taking in of these elements, in various forms, constituted the act of feeding. Nitrogen was important, for the reason that the amount available for food was limited. Four-fifths of the atmosphere was nitrogen, but it was not of any use in that form. It must be in the form of proteins, a notable instance of which was the white of an egg, which was protein in water containing a little salt. Scientists were much concerned about how much protein was available and whence it came. The most convenient sources were animals, milk, and eggs. Animals obtained it from plants, and the plants from nitrates, which were compounds of various metals with nitric acid. If the supply of nitrates gave out people would cease to inhabit the earth.

The Important Nitrates.

All people had not enough protein, and that constituted the limiting factor of the possible resistance of Germany. All political, social, and military considerations in the great war rested in the amount of nitric acid, in the form of nitrates, which Germany had in the soil. The actual amount was not sufficient, towards the end of the war, to maintain Germany. Had that been better recognised at the beginning, the shortage might have been guarded against by the enemy. In the days to come, when the population of the earth is vastly greater, the question of where to obtain nitrates would become vital. There were two ways in which plants could obtain it. One was by the decay of protein that had formed part of animals and plants. In the course of time bacteria altered it, and ultimately it became nitrates and returned to the soil. The nitrogen of life underwent many cycles, and man, in the course of time, had veritably risen from his own ashes. The fable of the Phœnix had a good deal of truth in it. Literally, some of the atoms in the history of mankind must have passed through many human bodies. It was perhaps a gruesome thought, but there was a certain nobility about it. As the increasing population required more proteins certain bacteria in the soil associated with the roots of plans transformed the nitrogen of the air into nitrates, and therefore man, with all his intellectual advancement, was nothing but a parasite of these lowly organisms. In many crowded communities nitrogen set an inexorable limit to population. That limit had been reached many times—it had been reached to-day in China, where the Chinese laborer had to work almost endlessly to produce enough nitrogen.

How to Live Cheaply.

Examing the cost of nitrogen in Adelaide in July, 1921, the lecturer said the requirement of every adult was a little over three ounces of protein a day. If taken in the form of oatmeal that quantity of protein would cost 5½d. for a day, but he did not say people would enjoy eating the oatmeal. (Laughter.) In the form of split peas it would cost a little more, and beef, mutton, and sago about the same as the peas, but he would be sorry to recommend people to get all their protein from the last-named. (Laughter.) Cheese would be a little dearer, and rice would cost 1/6. Potatoes were low in protein; milk was high, but expensive, as also were eggs. Bananas to contain sufficient protein would cost £1 4/ per day. (Laughter.) The proteins of animal origin—beef, mutton, cheese, milk, fish, eggs and bacon—were easily transformable, and oatmeal and peas could be eked out with a little milk and cheese. The total amount of heat and energy in the universe also was unalterable. Human beings were warm-blooded animals, with a temperature above that of their surroundings, and therefore they radiated heat, and when they worked they suffered loss of energy. Foodstuffs replenished the heat and energy. Professor Robertson explained the advances that had been made in measuring the loss by the body in radiated heat and expended energy since the experiments of Lavoisier and Liebig. He pointed out that a calory of heat was the amount of heat required to increase the temperature of a cubic centimetre (a thimbleful) of water one degree centrigrade, and it was found that a human adult required 2,500 calories a day. In Adelaide it could be got in oatmeal for 4½d., and for another penny enough proteins also. It could be seen what extraordinary perspicacity a Scotsman displayed in making a diet of oatmeal. (Laughter.) In sago it would cost 5½d., in bread and split peas 6½d., and fat foods also were good. It would cost £2 2/ to get sufficient heat for a day from oranges. (Laughter.)

The lecturer was warmly applauded

Advertiser 19/7/21

MUSIC TEACHERS' CONFERENCE.

From C. M. LEUMANE, Gawler:—It is gratifying to find that one result of the Music Teachers' Conference is the formation of a committee to set about protecting teachers and students from quacks. One speaker at the conference remarked that singing was of more importance than teachers generally attached to it, or words to that effect. Well, we are getting on. As a public singer for 35 years, it has been my business to appear in nearly all the large towns of the English-speaking world, and in most of these I met with a crop of broken hopes, the result of seed sown by incompetent "teachers" of singing. In one well-known company I was with we had voice-trials for aspirants at intervals. The humor of these functions was, of course, patent, but the pathos overshadowed it. It would not be exaggeration to say that scores of good natural voices were tried and found maimed. A voice can be comparatively easily maimed by an incompetent tutor. I have often seen at the stage door, as they passed out, girls who had studied (as they thought) and spent their carefully-hoarded savings in fees to frauds, wipe away the tell-tale tear. A drastic remedy is needed. There should be a British Musical Association equally jealous of its status as the British Medical Association. Every diploma granted to singing teachers should, in my opinion, be issued on three major conditions (with, of course, several minor ones), and those should be:—1. That applicants should have themselves been taught in a reputed school. 2. That they should have been before the public as paid vocalists for at least five years in a reputed sphere. 3. That they should pass a searching examination before a medical board in the physiology of the human voice.

Advertiser 19/7/21

From CHARLES WARD, director Adelaide Orchestral College, Rundle-street:—Might I crave space to reply to what I, as well as thousands of others interested in musical matters, consider to be an unjustifiable statement made by Dr. Davies, reported in your columns, viz., that "you can purchase the privilege of appending letters to your name, and wear cap and gown, for the sum of 10/6 deposit, and £5 5/ yearly." One would think on the face of this that Dr. Davies has nothing else to occupy his mind than to try to belittle our oversea examining institutions. Dr. Davies should bear in mind that probably the greater part of his teachers have been educated and trained at these oversea institutions, or have gained their diplomas from them. There are thousands here holding such. I know that one gentleman who lectured at the Teachers' Conference, and also fills a Government position, holds the A.L.C.M. What is wrong with him? If Dr. Davies' statements are true, it is time for him to make a change on his staff; if they are not true, he should resign his position. Although we belong to the small fry, we are not so simple that Dr. Davies can make such charges with impunity. These oversea institutions have done good work in the past, and are still doing good work, otherwise the Conservatorium would send to England students to complete their musical education, which has been completed at our own institutions, thereby saving thousands of pounds to the country as well as our Conservatoriums. I must request Dr. Davies to make public the name of the college or institution that is trafficking in degrees, with cap and gown. It will be of no use to refer to Curwin's book or any other. We require the name of such college or institution. If Dr. Davies will not do this, or cannot back his statement, he should hold his peace and not belittle institutions that have benefited the world at large.