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DR. TANNER'S FASTING EXPERIMENT.

Of all the exhibitions which have attracted the attention of the people in and around New York city, the forty days' fast of Dr. Tanner is not the least remarkable. If his aim was to draw public attention and be extensively noticed, he has fully attained it, as no daily paper can be taken up which does not contain a full account of his doings and feelings of the last twenty-four hours, while he is watched by the physicians of the allopathic as well as of the eclectic school, and in addition to this always by a *Herald* reporter, to make sure that there is no deception practiced, as has been so frequently the case with other pretended fasters.

That his experiment is not altogether useless, as is maintained by some, we will try to elucidate, notwithstanding we agree that the sacrifice and danger he exposes himself to appears so great that it is doubtful if they will be compensated for by the physiological and pathological lessons to be learned by it.

His fast has, in the first place, proved the mistake of those who judged all men alike, and reasoned that, because a weak, hysteric, and ill fed girl of 18, perhaps consumptive besides, died within two weeks from starvation, as soon as she was carefully watched, therefore nobody could be without food for a period of forty days, forgetting that the case is quite different where we have a man of between 40 and 50, the age of maximum resistance, a man well fed, of whom the weight is far above the average for his size, and who was provided with a copious layer of adipose tissue around his body, a man who had practiced fasting for sanitary purposes, finding it the best way for him to cure gastric derangements, for which he had a liability, and who had gradually increased the time of fasting until, at his last fast in Minneapolis, he had extended it to forty-two days. This was not believed and deception suspected, hence a challenge for $1,000 if he succeeded when carefully watched. Dr. Tanner accepted, but the challenger backed out under some pretext, and Dr. Tanner, to save his reputation and prove his theory, came on and submits for nothing to the task under the eye of careful watchers.

It must be conceded that few persons would possess such a strong will and determination to persist in subduing all appetite, and disregard the no doubt exceedingly disagreeable and perhaps distressing feelings consequent to total abstinence from food; but Dr. Tanner possesses this determination in the highest degree, and he never thought of cutting the fast short, whatever may sometimes have been the opinion of his watchers.

In order to understand what may be learned from this experiment we will, for the benefit of the non-professional reader, remind him of a few physiological principles.

The chemical constituents of the human body have to be constantly renewed, and the waste has to be supplied by the food. Some of these constituents are wasted rapidly, others slowly, and in case of starvation the elements rapidly wasting away must be present in the body in sufficient quantity to keep the functions of life in operation. These rapidly wasting constituents may be divided in three classes, those in which carbon prevails, those in which nitrogen, and those in which phosphorus is the prevailing element.

The carbonaceous compounds are wasted in keeping up the animal heat. This is accomplished by a slow combustion, that is, a combination of the carbon with the atmospheric oxygen, which is continually going on in the capillaries through the whole body, the oxygen being furnished by the blood, which absorbs it in the lungs, and which by the arteries is sent through the body. The product of this combustion, the carbonic acid, still absorbed in the blood, is by the veins sent to the lungs, where it is given off and escapes in the act of respiration. After having stripped Dr. Tanner, when he commenced his fast, for the double purpose of ascertaining his physical condition and leave no doubt that he had no food about him, it was seen that he had plenty of fat in and around his body to furnish carbon enough to last him more than forty days.

The second element of rapid consumption is nitrogen; it proceeds from the waste of the muscular tissue, which is always going on, even during sleep, as the heart is a muscle continually contracting, and respiration is kept up by muscular action. The blood takes up this waste in the form of a compound, of which the chemical name is cyanate of ammonia, but which by physiologists is called urea. It is the function of the kidneys to secrete this from the blood, and numerous experiments have settled the nature and amount of this secretion, which in healthy persons consuming food varies from 25 to 35 grammes every twenty-four hours. When Dr. Tanner began his fast it was secreted at the rate of 29 grammes, and as the nitrogen in any excess of nutrition is similarly changed and secreted, it was expected that a large reduction would be observed as soon as the fast began to have effect on the system. This expectation was realized, and the amount soon fell off to 23, 20, 17, 16, and finally 13 grammes, at which it remained stationary, with slight oscillations beyond. This amount of nitrogenous substance represents, therefore, the waste necessary to sustain the functions of life, and would at once be increased in case food was taken by the experimenter, at least nitrogenized food, such as beef extract or its equivalent, albumen, casein, milk, etc., the only substances which would be of benefit to him. Analytical chemistry, therefore, acts here as a reliable detective, and to the credit of all concerned it must be said that never the least suspicious increase of urea was observed, it remaining very nearly constant, and will no doubt become double and more as soon as after the fast food is again taken.

The third element of rapid waste is the phosphorus; it proceeds chiefly from the waste of the brain and nervous tissues. It is so important in these functions that a great German chemist has formulated the expression, "without phosphorus, no thought." Every mental act and every nervous excitement is accomplished by a consumption of phosphorus, which, combined with different bases in the body, especially soda, magnesia, and lime, is secreted by the kidneys as a soluble salt, not only easily detected as crystals by the microscope in the sediment, but even an approximate estimate may be had of its reduction or increase by the number of crystals seen in the field under the same circumstances.

This third element did not at first show any reduction in quantity, but, to the contrary, for a few days some increase. It was at the occasion that Dr. Tanner had been unjustly accused by a physician present that he had surreptitiously accepted food from one of the watchers; this appears to have preyed upon his mind. Attention was therefore called to the danger in this direction, a danger proceeding from the more rapid waste of the nervous system. Relaxation was therefore devised, and daily carriage rides, which eased his mind and were followed by a more sound sleep, soon reduced the phosphates secreted, and at the same time reduced the irritability and temper of the experimenter.

This observation tallies perfectly with what has been observed in the case of such clergymen who have every week the periodical labor of preparing and delivering two sermons on Sunday. Chemical analysis has proved that at that time they secrete more phosphates than in the middle part of the week, after the rest of Monday and Tuesday.

We will only add that the suspicions occasionally expressed by those who cannot realize the possibility of so long a fast are utterly unfounded. All those who have taken the trouble to watch long enough, especially if they became acquainted with Dr. Tanner, came to the conviction that he is too high minded, upright, and honest to deceive any one with so mean a device as to take food secretly; while in regard to the responsibility of the watchers it must be considered that Dr. Tanner can any time obtain what he wants. If he asked, for instance, for a beefsteak it would be procured at once, but this of course would end the watch, being the close of the experiment.

He told us that some years ago he was married, but became disgusted with his wife, who, he says, continually stuffed her stomach with all kinds of food. He could not stand this, and when remonstrance did not improve her he obtained a divorce.

OUR POTTERY INDUSTRY.

Among the special industries of the country which but seldom attract general interest is that of the manufacture of China and other earthen ware for table use. Thirty years ago there was but one pottery in the country, but some thirty kilns have been built during the past year, increasing the annual production to about $4,000,000. The imports for the last fiscal year were $4,082,787, and they have averaged about this figure since 1873, although in that year they amounted to $6,015,925, and in 1872 were $5,270,785. For the eleven months to June last the imports of earthen, stone, and china ware, were valued at $5,101,504.

At the last meeting of the United States Potters' Association, which was the sixth annual convention of that body, the members were congratulated that "American manufacturers were rapidly gaining, and foreign manufacturers fast losing, the control of the American market." As the business was then said to be in a generally healthful condition, we suppose manufacturers here have shared in the increased trade to an even greater extent than the imports have been augmented, but still our business in this department seems small when compared with the extensive pottery industry which is carried on in Great Britain. The British exports in this line from 1869 to 1879 amounted to £17,748,028, equal in round numbers to $8,850,000 annually. The business in this specialty has formed an important department in British manufactures since Josias Wedgwood, in 1763, made some of the most valuable improvements in the art, and from that time the reputation of the Staffordshire potteries has been worldwide. With the excellent supplies of crude materials we have, however, the aid of a very considerable duty, and constant accessions to our labor supply from the immigration of skilled English workers, it would seem that this industry should continue to meet with a healthful development here until its productions are at least sufficient for the supply of the home market.

In a report of the committee on raw materials of the Potters' Association, it was suggested that funds be appropriated for making analyses of the different clays, feldspar, and quartz found in various parts of the United States, so that each member might have the results of an authoritative examination, instead of being dependent, as at present, upon their individual experiments, which were described as "crude, costly, and empirical." The ordinary methods of testing clays employed by potters were said to be very imperfect; "one clay is unctuous, another refractory; one dries hard, another crumbles; one burns pure white, another yellow; one is short, another tough," etc., few if any of the members knowing the real causes of such differences. The same difficulties were said to exist in relation to spars and quartz, which were ground without an exact knowledge of their nature, and mixed with many foreign substances and impurities. The want of proper care and system in opening and working clay pits was also the subject of considerable