

What They Discovered at Prof. Hawk's Horrid Dinner

Dirt, Disorder and Bad Smells Suddenly Sprung on the Jefferson College Diet Class to Test the Results on Their Digestion



How the Table Was Set to Disgust the Students and Make Sure That the Investigators Would Find an Opportunity to Study the Scientific Data Desired.

SOME of the greatest stomach specialists in the world have been experimenting to see whether food served badly—all mixed up and on dirty dishes and cloths—and with an accompaniment of extremely bad smells, digests as easily and gives as much value to the eater as does the same food served nicely.

Of course, everyone knows that we eat with more relish when our meals are served neatly on clean dishes and clean cloths. What pleases the eyes, as a rule, pleases the palate. Unscrupulous chefs take advantage of this often to dish up "left-overs" with little food value but all dressed up like a Christmas tree. People eat these messes without a quail who would shrink away in horror if they knew what was camouflaged under the trimmings.

Fine clothes do make fine birds and many a crime has been committed in the name of the culinary art.

But it is also true that the languishing appetite of the ailing or convalescent is legitimately tempted by dressing up perfectly good food attractively.

The interesting experiments were carried on by Drs. Ralph C. Holder, Clarence A. Smith and Philip B. Hawk, of the Jefferson College medical staff in Philadelphia. Students of the college volunteered as subjects.

The purpose of the experiment is sufficiently formulated by the experimenters thus:

"It is well known that different psychic stimuli promote or retard the secretion of digestive juices. The experiment was conducted to determine whether the ultimate return to the body from unpalatable food was different from that of the same food palatably served."

When the experiment began the students were marshalled into a large and sunny room. Flowers decorated the table upon which were the daintiest of china and silverware and glass. The napery was immaculate. Soft music played and altogether not an aesthetic device had been overlooked to make the dining room the pleasantest of pictures. The food was of the best and was served in the most attractive form possible.

For seven days the enchanted subjects ate their three meals a day in this, in a fashion, Lucullan chamber. They liked it so well that several began to have doubts as to whether home would ever content them again. "Home," they murmured doubtfully, "was never like this. Would that it could be!" or words to that effect.

And at stated times each day the scientists observed the fate of the food carefully, noting how much of it the stomach digested of each article, how long it took to do it, etc., etc.

The seven days passed like a dream. The happy subjects, soothed by a constant gastronomic lullaby, forgot, like the lotus-eaters, all but the present delight. And then—

The eighth day dawned. Not into the pleasant room of the past week did the smiling students march. Instead they were ushered into a long-unused room at the hospital. It had been thoroughly dirtied. The windows were covered with dust, cobwebs hung from the ceiling, smears covered the cracked walls. It was all cluttered up with broken old furniture. It was, in fact, the very reverse of what they had been treated to during the past seven days. An old and rickety table and chairs precariously balanced on three legs.

But the words of the serious scientists are better to describe the picture accurately. Their report says:

"The food was rendered unpalatable and unappetizing by the following treatment:

All the food ordinarily used for each meal (meat, biscuits, jelly, cornstarch, pudding, oleomargarine, etc.) was stirred together in a large, flat, porcelain dish. The dish itself was smeared with animal charcoal, as was the beaker used as a drinking glass. The table was dirty and strewn with dirty dishes. A little indol was sprinkled about under the table. The subjects were kept in ignorance of the constituents of the unpalatable mixture."

Indol, it should be explained, has a peculiarly offensive and sour smell. It is not the sort of thing an epicure would like to think of as the odor of the meal he was eating. But it was sprinkled about to give the subjects of the experiment that very idea.

The descent into this culinary sty from the paradise they had been enjoying was extremely painful to the subjects. So painful, in fact, the report gravely remarks, that one student had to leave the table in precipitous haste, losing, upon his way, the food that he had managed to stuff into himself!

The majority of the students, however, managed to stick it out for two days. During this time the same tests were taken as during the seven days of their happiness.

The experimenters report that the psychic effect was profound!

But, although this was so, imagine their astonishment when they discovered that the process of digestion had been practically unimpaired! Or, as the report says, "the difference in utilization of the palatable and unpalatable foods were quite small. The test indicates that flavor is not the outstanding dietetic asset that some people would have us believe. If the stomach and intestines can only be coaxed into making the proper effort, the unpalatable concoction can be digested just about as satisfactorily as can the food mixture which make a stronger appeal."

"If the things we eat have proper food value we need not worry unduly as to their digestion, absorption and utilization by the normal body."

"This ought to be good news to millions of people," continue the doctors, comfortingly, "who eat unpalatable food in untidy surroundings, in spite of the fact that one of our leading physiologists says, 'what man likes best he digests best.' This experiment simply shows how insulting we can be to the normal stomach and get away with it. But it does not necessarily prove this to be the wisest policy."

And nothing could summarize the experiment, perhaps, more plainly than this. This is not the only common idea that the specialists at Jefferson College have exploded. In his book, "What We Eat and What Happens to It," recently published by Harper & Brothers, Dr. Hawk shatters many widely held notions on eating. All his conclusions are the result of experiments as carefully carried on and as painstaking as the one just recited.

For instance, many people believe that it is a bad habit to drink ice water with meals, contending that it chills the stomach and delays digestion.

"Fortunately, this popular belief has no basis in fact," writes Professor Hawk in his interesting volume. "It is astounding how rapidly the temperature within the stomach approaches that of the body after one drinks a glass of ice water. For example, if a normal resting woman drinks a glass of ice water the temperature within her stomach becomes approximately the normal temperature of the body in twenty minutes. If one drinks more than a single glass of ice water it will, of course, take longer for the stomach to regulate the temperature, hence there will be

a corresponding delay in digestion. The best temperature for drinking water is about 60 degrees F."

He warns against the drinking of ice water when one is over-fatigued, however. Another idea is that food in the stomach swims around in the water drunk with meals and will not digest.

"If the human stomach were constructed of concrete or copper an aquatic simile might hold," writes Dr. Hawk in the same book. "Fortunately, however, most stomachs are not so constructed. Instead, the lining of the stomach is a very delicate membrane studded with little workshops (glands) where the gastric fluid or juice is manufactured. Certain things will stimulate these glands to greater activity and cause them to make the gastric fluid more rapidly. Water is one of the most important of these. In fact, one-fifth of a glass of water, under proper conditions, will cause the outpouring of a considerable volume of a very active gastric juice from the lining of the stomach. Consequently the subsequent digestion of the food proceeds more satisfactorily than would have been the case had no water been drunk."

Most people believe that drinking milk slowly is better than drinking it rapidly, because, they think, that milk taken very slowly curdles in small curds in the stomach, and that these are more easily digested than what are supposed to be large curds of rapidly drunk milk. Of this Dr. Hawk writes:

"This line of reasoning sounds logical enough, but, unfortunately, it is wholly false. Our experiments have clearly demonstrated that curds formed in the stomach when the milk is drunk slowly are fully as large as those which follow rapid milk drinking. This point was nicely shown by a test upon our regurgitator. One day he drank a pint of milk in ten seconds, and on the next day at the same hour he drank the same volume of milk in ten minutes. In each instance we examined the contents of his stomach at the end of a half-hour. Not only were the curds larger when the milk was drunk slowly, but the total weight of the combined curds was greater than when the milk was passed into the stomach with maximum speed. The curds were of practically the same consistency in each case. We may conclude, therefore, that the rapid drinking of milk in no way interferes with its proper digestion in the stomach."

Then there is the old belief that hot bread causes indigestion.

"No!" exclaims Dr. Hawk. "It has become pretty well established in the scientific and lay mind that fresh bread is 'notoriously indigestible,' and leading books on dietetics have emphasized this view. Our tests, however, failed to show this 'notorious indigestibility.' We fed bread direct from the oven and so hot that the steam rolled out in clouds when the loaf was cut. Then two days later we fed bread from the same 'batch' to the same men, and failed to find any marked difference in the stomach digestion of the breads. We did note, however, that the hot bread generally left the stomach somewhat more slowly than the bread which was two days old. We could secure no evidence of the formation of a 'doughy mass' in the stomach after the hot bread was fed. In fact, the samples of the stomach contents withdrawn at short intervals while the hot bread was in the stomach were very similar in character to those withdrawn after the 'two-day' bread was eaten."

"Hot bread has a very pleasing flavor, and if the bread he properly chewed there is no reason why it should not be eaten."

Hard-boiled eggs are supposed to be indigestible. In his volume Dr. Hawk declares they are not. They are digested more slowly. He found that it takes the stomach thirty minutes longer to empty

Diagram, Based on Professor W. B. Cannon's Experiments, Illustrating the Idea That Unpleasant Smells and Bad Odors Impede Digestion.

1. Beginning of Great Pneumogastric Nerve, Which Conveys Stimulating or Depressing Messages to the Digestive Chain. 2. Higher Brain Centre, Where Mental Conceptions Are Formed and Where Unpleasant Smells or Smells Cause Undesirable Stimulation of the Pneumogastric Nerve. 3. Nerves Controlling the Salivary Glands, Which Are First to Respond. 4. The Heart, Which Pumps Blood to the Digestive Organs and Whose Work Is "Punished Up" or Retarded by the Stimulated Nerve, Causing an Increased Flow of Blood to the Stomach. 5. The Stomach, Whose Muscular Movements Are Strengthened or Weakened by the Kind of Stimulation of the Controlling Nerve. 6. The Pancreatic Duct, Which Is Also Affected, Aiding or Retarding the Digestion of Fat and Starches. 7. The Kidneys, with the Important Adrenal Glands.

two hard-boiled eggs than two soft-boiled eggs. Fried eggs behave in just the same manner. And while on the subject of eggs, there is a prejudice in certain quarters for white-shelled products of the hen rather than brown-shelled. Professor Hawk thus disposes of this notion:

"No! It is not the shell that determines the character of the eggs any more than it is the 'clothes that make the man.' The lay mind of some localities (e. g., New York City) prefers the white egg, whereas in other localities (e. g., Boston) the brown egg is preferred. Therefore, many first-class hotels and restaurants cater to these popular preferences."

The high cost of living sustains a blow in the statement in "What We Eat" that while cheap, tough meat may be less pleasing to the taste and certainly causes more work for the jaw muscles, the body ultimately derives as much benefit from it as it does from choice, tender cuts.

"In our work on tough meat," writes Dr. Hawk, "we fed the toughest steaks we could find after diligent search, and compared their digestion with the digestion of the tenderest of sirloin steaks. In one case we were surprised to find that it took three and one-half hours for the tender steak to leave the stomach, whereas its 'tough associate' left in two hours. It would seem that this stomach, at least, did not desire to prolong its intercourse with the tough visitor, but got rid of him quickly by introducing him to the bowel. A human characteristic in a way! Just why a tough steak leaves a certain stomach more quickly than a tender one is not clear. It may be due to the fact that more care is given to the mastication of



The Olfactometer, to Measure the Sense of Smell.

a tough meat and that it, therefore, reaches the stomach in the form of smaller pieces."

There is the same misapprehension about the white meat of a chicken and the dark.

"There is a deep-seated opinion," the physician says, "that the white meat of the chicken is more digestible than the dark. So far as the stomach is concerned our experiments fail to verify this claim. The stomach poured out about the same kind of a digestive secretion (gastric juice) upon the white meat as upon the dark meat, and retained each about the same length of time. If we examine into the actual composition of these two kinds of meat we fail to find any basis for expecting the stomach to show favoritism in the matter. The dark meat contains a little more fat and somewhat less protein (the substance of the meat fibres), but the differences are too small to influence the digestive decision of the stomach. In view of these facts why buy the breast of chicken when you can purchase the dark meat for about one-half the money?"

Dr. Hawk also mentions, in passing, that the stomach does not seem to discriminate between cold storage fowls and fresh killed.

Nor do, as popularly believed, raw vegetables, such as cabbage and carrots, give the stomach more work to do than when cooked. In fact, Dr. Hawk found that in the majority of cases the raw carrots, cabbages, tomatoes, etc., leave the stomach rather sooner than do the cooked vegetables. But this observation is not to be taken as an endorsement of any "raw food cult."

It does no harm to eat ice cream at the end of the meal. "What We Eat and What Happens to It" says: "The eating of ice cream along with cake or pie leads to the formation of a more satisfactory gastric juice than is produced when cake or pie is eaten without the ice cream. There is apparently little basis for the claim that ice cream, because of its low temperature, interferes seriously with digestion in the stomach by checking the activity of the glands which manufacture the gastric juice."