



Dr. E. J. Maguire of Warren, O. who showed how little food a man needs when he lived for a week on 50 cents a day and gained weight.



# Science's New Glass Stomach to Test Food!

## How the Chemists at Washington Have Now Invented a Way to Watch What Goes on When a Dinner Is Digested.

**F**OUND! A perfect stomach! It never aches; it has no hunger pangs; change of climate doesn't affect it. It's just a perfect stomach—but it's made of glass.

About it, every day, where it stands in the organic laboratory of the bureau of chemistry of the department of agriculture, Washington, D. C., are grouped many experts. They feed it apple pie, potatoes, juicy steaks; even give it a drink at times. Then they watch the process of digestion through its glass walls.

When the food has been digested they do just what every dyspeptic would do with his own stomach if it were possible—they take it apart, clean it thoroughly and then—they feed it some more.

According to Dr. Breeze Jones, head of the laboratory, and Dr. Henry Waterman, his assistant, the importance to human life and longevity of this latest triumph of science cannot be too greatly stressed. For through it science expects to discover new secrets of the mysterious process of building new tissue and new ways of prolonging life.

Under the long-employed experimental

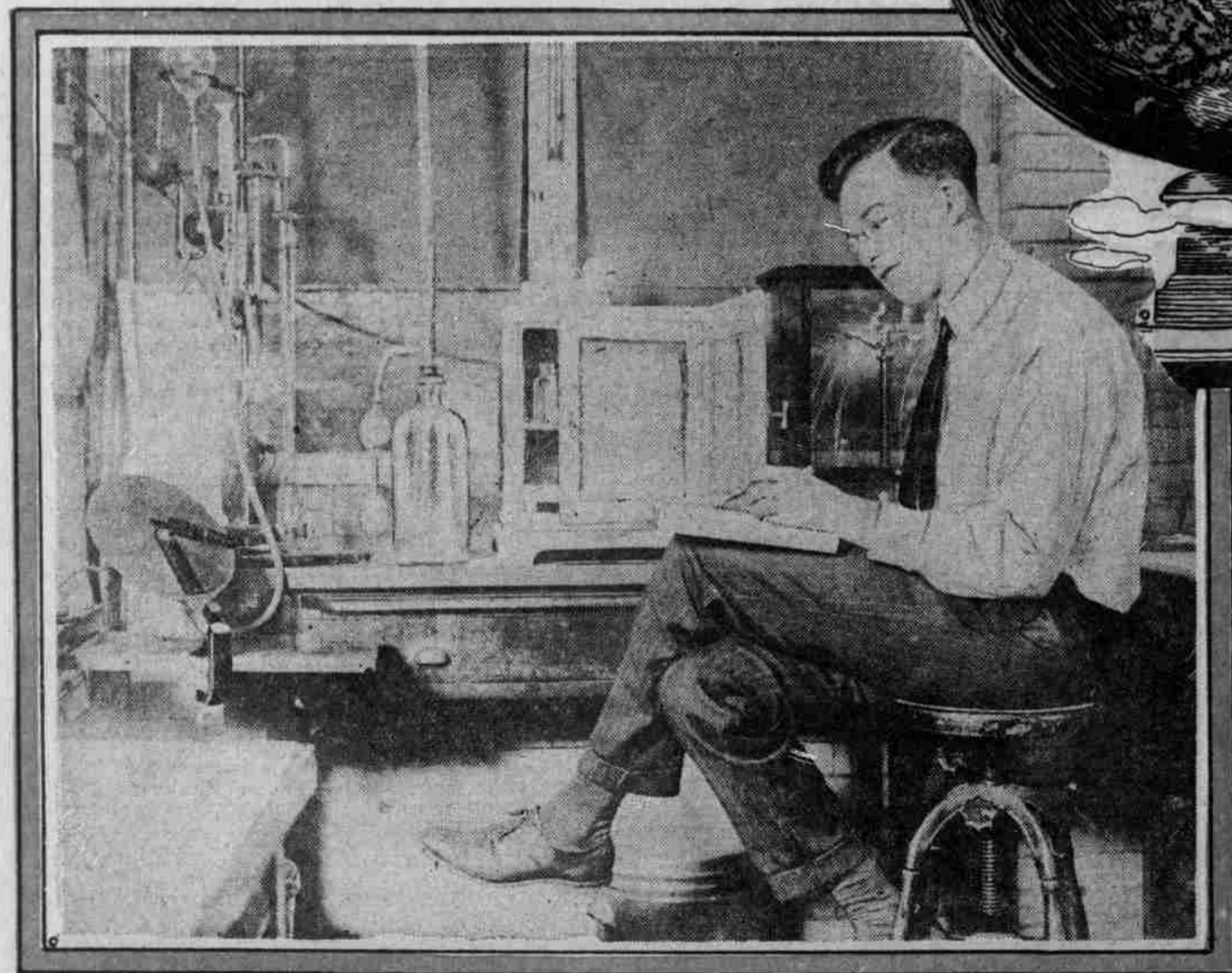
The digestive effect is measured by the ratio of what is known as amino nitrogen to total nitrogen.

After the food has been acted upon by the hydrochloric acid it is then treated by trypsin and a dilute alkaline solution chemically similar to the digestive juices found in the intestinal tract. This informs the observer just what happens to food in the digestive process after it leaves the human stomach.

One of the things that the glass stomach is expected to determine is the relative nutritive values of certain foods cooked and uncooked. Take cabbage, for instance. Many stomach specialists assert that the only way to eat it is raw; that when cooked it causes indigestion. Yet the practical physician points to the healthy man who eats his "cornbeef and" and never minds the fact that it is cooked and cooked well.

But there is one man, at least, in the United States to whom the news of the perfection of the glass stomach gave great satisfaction. He isn't a scientist, unless of the domestic order. He isn't interested in the scientific results of the machine except in one particular. That particular is apple pie.

Newton H. Whitis of Continental, O.



About the glass stomach every day are grouped experts. They feed it apple pie, potatoes, nice juicy steaks, even give it a drink at times.

...eronautics as the man who built and navigated from Milwaukee to New York, a 25-passenger air machine, has turned his attention to the prolongation of life. He declares that long life can be obtained through a perfect balance between food, sleep and exercise. Each man should understand the operation of his own system just as an engineer his engine or a good horseman his horse. Enough exercise and enough sleep should be had to digest the amount of food the day's activities demand. If the glass stomach at Washington determines what a perfect balance is, it will be the scientific instrument through which Methuselah's record may yet be approached or passed.

This balanced living is practiced by the world's champion eater, Tobias Jason of Pecos, Tex. Mr. Jason lays claim to the heavyweight title and is willing to meet all comers. Recently, on board the steamship President Harding, he amazed the other passengers—and wearied the cooks and waiters—by the demands of his appetite. His breakfast included sliced pineapples, oranges, bananas, fresh strawberries, cereals, eggs, chops, potatoes, coffee rolls and toast topped off by two extra portions of eggs. His dinner consisted of—well, he just went through the bill-o'-fare three times from soup to nuts. But he always exercises and sleeps properly and that accounts for his good health.

The proper food is cheap enough, too, according to results of dietary experiments which are undertaken at regular intervals by college girls; scientists and even those disputing over the high cost of food. They have offered pretty good evidence that 50 cents a day can feed a healthy man—or girl.

College students should make dietary tests, according to Director Francis G. Benedict of the Nutrition Laboratory of

the Carnegie Institution in Washington, D. C., who says that steers take better care of their stomachs than students. Steers which had been half-fed during winter months released to pasture in the spring suffered no ill effects from gourmandizing, but college students starving themselves for a test got colic from over-eating when they returned to regulation fare, says Director Benedict.

Six girls of the Pennsylvania State college lived for several weeks at an actual cost of 47.1 cents a day. They cooked their own food and purchased everything as cheaply as possible. But Dr. E. J. Maguire of Warren, O., went a week on 50 cents a day, living on meals purchased at a restaurant. He actually gained one ounce during the week and thereby won a wager he made with Drs. C. A. Stedman and A. A. Hallock.

Here is the menu Dr. Maguire ate for a week at a total cost of only \$3.50:

Monday—Breakfast, rolls and coffee, 10 cents. Lunch, vegetable soup, brown bread and butter, 15 cents. Dinner, two poached eggs, fried potatoes, brown bread and butter, 25 cents.

Tuesday—Breakfast, toast and coffee, 10 cents. Lunch, roast beef (small), boiled potatoes, brown gravy, bread and butter, 25 cents. Dinner, vegetable soup and crackers, brown bread and butter, 15 cents.

Wednesday—Breakfast, buttered toast, 10 cents. Lunch, vegetable soup, brown bread and butter, 15 cents. Dinner, two poached eggs, graham bread and butter, glass of milk, 25 cents.

Thursday—Breakfast, oatmeal and milk, 10 cents. Lunch, vegetable soup, rye bread and butter, 15 cents. Dinner, two poached eggs, potatoes, brown bread and butter, coffee, 25 cents.

Friday—Breakfast, buttered toast, 10 cents. Lunch, one egg, cucumbers, bread and butter and milk, 15 cents. Dinner, two fried eggs, potatoes, graham bread and butter, coffee, 25 cents.

Saturday—Breakfast, oatmeal and milk, 10 cents. Lunch, vegetable soup, brown bread, butter and milk, 15 cents.

Dinner, two poached eggs, potatoes, graham bread, butter, coffee, 25 cents.

Sunday—Breakfast, cantaloupe, 10 cents. Lunch, hot egg sandwich and milk, 15 cents. Dinner, small roast beef, brown bread and butter, potatoes and coffee, 25 cents.

### Botulinus Toxin Deadliest of All Known Poisons.

Infinitesimal Portion Would Kill All People of Earth.

**P**OISON so powerful that all the people on earth could be killed by one-millionth of half an ordinary tumbler full, Drs. Jacques Brofenbrenner and M. J. Schiesinger of Harvard university have found that the strength of the botulinus toxin, which occurs in spoiled vegetable food, is so great that the average man would die from a dose of 0.000000000000001 cubic centimeter of it.

As there are 473 cubic centimeters in a pint, only an infinitesimal amount would be required to swamp the immigration authorities in heaven. One cubic centimeter would be enough to depopulate the whole earth with 999,999 parts left over.

Botulinus poisoning was first known as "sausage" poisoning and was detected after fatalities resulting from eating sausage, meats and fish. Recently this poisoning has been more common after the eating of decayed vegetable foods. It is caused by the germ bacillus botulinus and, unlike the toxin of diphtheria or lockjaw, it is deadly poisonous when introduced into the body by way of the mouth.

Contamination of foodstuff producing this poison is not common, and should such poisoning be present it is usually readily detected by the putrid odor of the food. If the poisoned food is boiled, it ceases to be harmful, while even when the poison is actually consumed, nature and an antitoxin may protect the individual.

system on human subjects it was impossible to arrive at a perfect conclusion. Women, because they smoke less and drink less and have fewer of the so-called "pernicious" habits which contaminate the human system with foreign matter, invariably were the experimental subjects. But feminine imagination often offered a stumoling-block by eliciting reports of "symptoms" that never existed.

Now the glass stomach seems to be the end-all of science's experimental troubles. The food to be tested is dropped into the stomach into which a dilute solution of hydrochloric acid of the strength found in the average human stomach has already been introduced. Pepsin, which is manufactured by nature for digestive purposes, is also included. Then an electric heater is started beneath the stomach "bag" and by the aid of thermostatic appliances a constant temperature of 37 degrees centigrade is maintained. Then the eye of the scientist watches and notes just what happens to the food inserted.

is the man. He sees in the glass stomach a means of proving the value of his strange recipe for marital happiness. He exports the latest scientific wonder to corroborate what he says about apple pie. His observations on this old-fashioned and popular pastry are as follows:

"If the young housewife would cut her apple pie differently there would be less marital unhappiness. She should do it as her grandmother did it. She should cut it across twice, making four pieces to a pie, not six, as the young idea does now. When a man wants a piece he wants a piece, not a sample. And apple pie is the finest thing that a wife can place before her husband."

Mr. Whitis spoke from the fulness of the knowledge of 60 years. His married life has been very happy he says. His wife is the old-fashioned sort of cook. His argument is so interesting as to demand chemical analysis. In "Diet and Health," written by Lulu Hunt Peters, woman dietitian and physician of Los

Angeles, apple pie is revealed as just what the practical Mr. Whitis says it is—the most important part of the meal. She shows that apple pie contains 350 calories of energy. Beef, pork, lamb or mutton, fish, eggs and milk contain 100 calories each. And the piece of apple pie cut into one-sixth contains that amount of calories! Following Mr. Whitis' recipe the pie would contain 520 calories. Only 3000 calories a day is needed by the average business man. Therefore, if he ate two pieces of the pie he would be getting more than one-third of the full day's needs in calories. It is worth observing that the healthy Herbert Hoover eats apple pie. Also, that the book containing this secret about apple pie is dedicated to Mr. Hoover.

If the glass stomach at Washington does nothing else than determine what is a perfectly balanced diet it may prolong life to the 200th year, according to the theory of Alfred W. Lawson. Mr. Lawson, who is known in the world of