their own people the most good, regardless of the people of other townships who had to pass over them to get to market or to the railway station. Then, again, is it fair that those townships nearest the city or market town should have to maintain the roads for the other parts of the county from which people must pass over them to get to such town or city?

Under a county system the work is done by experienced men. Skilled labor is always the best and cheapest, and every man is not a practical road-builder. As to the taxes of Hastings county, I think they will compare very favorably with those of other counties in the province, if we do spend about twenty-five per cent. of rate levied on roads. Then we have a great many bridges over rivers and streams (about two hundred in all), which were maintained last year for less than $4,000.

The council of the township of Sidney have passed a by-law commuting the statute labor, and they intend to adopt a system much the same as the county for the keeping up of the township or lesser roads. The township has sixty-three miles of county road in it. I have travelled over a good many of the roads in the township of Murray, and I do not think that the best roads in that township will at all compare with the county roads in Sidney at all seasons of the year. J.A.H.

Foxboro, Ont., Feb. 28th, 1900.

# Preservaline in Foods

## Is Advantageous

To the Editor of FARMING:

An article appeared in your issue of Feb. 13th, 1900, which in justice to your readers should be replied to. I have no doubt but that Mr. Weston was perfectly honest in his belief as to the truth of what he wrote, but it is quite evident that he has not given the subject any studious consideration else he would have arrived at different conclusions.

Let us consider the article in the order of its paragraph. The first and second paragraphs admit of no questions, they are axioms. The writer makes the statement in the third paragraph that "digestion is a process of decomposition." In this he is in error. The Standard Dictionary uses as synonyms of decomposition, "decay," or "putrefaction." Certainly, digestion is none of these. Decomposition is a separation of a substance into its component parts, as for instance, water is resolved into free hydrogen and free oxygen by a strong electrical current, but foods are not thus decomposed. In the words of John C. Dalton, than whom there is no better authority on physiology of digestion: "The alimentary materials are not decomposed, nor converted into substance of a different kind. They are simply tranformed into soluble material of the same class with themselves." Meat and starch are not decomposed by digestion, but the chemical arrangements of the elements decomposing them are altered in proportion. In the language of chemistry, the architecture of the atom is changed. Starch which is made up of the elements, carbon, hydrogen and oxygen, is immediately transformed into the digestive ferments of the saliva and the secretion from the pancreas. It is not decomposed any more than water is decomposed by freezing. The atoms of carbon, hydrogen and oxygen still remain in combination, but in different relation.

He speaks of the four most important conditions for digestion of food as "(1) food, (2) moisture, (3) warmth, (4) gastric, or digestive juices." This tabulation reminds one of a formula for making rabbit stew, the first requisite of which was to get a rabbit. Mr. Weston states that "if these four conditions are present, digestion will go on whether in the stomach or in a dish." This last statement is an error. If it were true we could nourish a patient without a stomach by rectal feeding for an indefinite period, but we are all well aware that rectal feeding has a short-time limit. The behavior of the digestive enzymes or ferments is quite a different thing in a "dish," or test-tube, than it is in the live digestive canal in which it is secreted. No artificial means yet devised has succeeded in reproducing digestion as it is accomplished in the live stomach. We cannot imitate the constant pouring in through the walls of the organ of the digestive fluids; we cannot imitate the gentle peristaltic kneading motion which brings all contained particles into harmonious contact and equal mixture with the ferments. Another very important reason why "dish" digestion is deceptive, were it possible, is this: the digestive ferments of different animals vary widely in the different species. Chemically, the pepsin of a hog and a man may be hard to differentiate. We may not be able to say which is which, still there is a wide difference in the behavior of the two. A better illustration perhaps would be the gastric juices of a hyena as compared with a man. The hyena will digest raw bones of large size, but it is not so with a man's stomach. Digestive ferments may be likened to eggs in a way. We look at an egg, note its size, shape, and color; we examine it chemically and microscopically, but this gives no clue to the kind of a bird that will hatch from it.

The writer reasons that because foods treated with Preservaline "are proof against warmth, moisture, oxygen, and other elements of the air," that they are likewise proof against digestion. This is another error. Putrefaction of substances is brought about by the development of bacteria, which development is favored by warmth and moisture. Let us take for a typical illustration milk, which is a fluid containing all the essential food elements, and is at the same time the best known natural culture-field for the growth of germs of putrefaction and disease. The reason milk turns sour is because of the development of minute bacteria or germs, the principal of which is spoken of as the oidium lactis. This germ is present in small numbers in all milk, but when they increase in numbers, a product of their development being lactic acid, the milk becomes sour, which is the first stage of putrefaction. This oidium lactis is a live and well defined microscopical body, and is illustrative of nearly all other germs in food, whether simply putrefactive or disease-producing, like the typhoid fever, diphtheria, or tubercle bacilli.

Now the digestive juices are complex fluids made up of many distinct enzymes, or ferments as they are called, but they are not organized bodies to be distinguished by the microscope, but organized chemical substances of a very definite character. Take the pancreatic ferment for example, the microscope gives no clue to its action on starchy food; and so it is with diastase, pepsin trypsin, lipase, rennet, and the other ferments. It does not follow because a certain chemical agent retards the development of live bacteria, that this same agent will retard the action of other chemical agents. For instance, hydrochloric acid is one of the natural secretions of the stomach, andpeps in will not act unless it is present; at the same time hydro chloric acid is an antiseptic and kills many germs.

Much of late has been written on the subject of this preservative. An article in the London *Lancet* of Jan. 27th, 1900, by Samuel Ridfal, D.Sc., Lond., F.I.C.' also an article in a recent number of *Science*, by Oscar Leow, of the U.S. Dept. of Agriculture, Washington, D.C., and many other equally eminent authorities might be quoted in confirmation of the statement that "in strengths sufficient to prevent decomposition no perceptible retarding of digestion is accomplished." But as was above stated, laboratory experiments are fallacious, but vital statistics and bedside observations are conclusive, and I will take the liberty to quote from the report (1899) of the secretary of the Board of Health of Augusta, Maine:

"The conclusion that has been reached after a most careful microscopial examination of milk and a chemical examination of the preservative used, is that it is not harmful, but beneficial to the public health. My reasons for this conclusion are further based on vital statistics now in the hands of the city clerk, which show a lessening of deaths from intestinal zymotic diseases of over 40 per cent