American Republic has been so extraordinary that it is not strange that it should overshadow advances in other directions. But if material growth has been our only achievement we must admit that our civilization is as yet incomplete or a failure, for "That society," says Emerson, "can never prosper, but must always be bankrupt, until every man does that which he was created to do." Is it true, however, that there has not been remarkable advance in scientific pursuits in this country?

In astronomical investigation the work of this country is in the first rank; the science of meteorology may be almost claimed as a national product; as in America it was first placed on a scientific basis, and it is in this country that its application is most general and most appreciated. Paleontology, geology, ethnology, biology and botany have in our American universities representatives of the highest rank. The archeological work of North America has been naturally more directed toward the archeology of this continent, but the recent researches in Chaldea and Babylon, as well as in Greece, have been of such excellence as to be universally recognized.

It can certainly not be claimed that the country is incapable of scientific effort. And if this is granted, and there is no lack of ability in the medical profession, the lack of achievement in this country in research in the medical sciences is evidently a defect. If the bridge over the Nile at Atbara is given to Americans because they are the best bridge-builders in the world, and if more than half the new stars discovered in this decade have been found by American observers, why is it that in the recent scientific investigations which have revolutionized medicine — the discovery of germs, toxins and antitoxins — America has taken almost no part? It is not that there is lack of energy or of ability in our profession or of wealth in our communities. The difficulty lies simply in the fact that the profession has not yet addressed itself earnestly to the problem of scientific medical research, but has been contented with the training of medical practitioners. So much is this true that the defect has hardly yet been realized, for as common-sense in the practitioner is the ideal striven for by the profession, so scientific research has been left to the efforts of others. Common-sense was of value in the days of theoretical speculation. But of what avail is common-sense as a help to a patient dying of cancer, or tetanus, or hydrophobia? The world to-day is waiting for new research. Is the American profession to remain behind? The remedy for this condition is simple and lies with the profession. The public should be informed of the needs of the time — a public which has never withheld financial support where the want has been shown. Well appointed and well supported laboratories for medical research are needed in every community, at every medical school and every hospital. Our medical schools should be organized for a greater purpose than granting diplomas or licensing young practitioners of medicine.

America is destined to be the great distributor of the world's products — natural and manufactured; it is certain to be blessed with wealth almost beyond limit, but as our great preacher has said, "God's gifts do not measure our worth but our responsibilities," and it is a serious question how our debt to the world is to be paid.

When the fleet at Cavite fired the volleys heard around the world, unexpected anxieties unnumbered came upon the country, but one great benefit will follow if the nation is brought to a sense of responsibility to the highest standards. We are no longer a young country to be judged apart from the rest of the world — we are to be measured by what is expected of us. This, from a land of our resources, will be the greatest gift to human welfare possible in human effort. Nothing less than this will save us from the stigma of shortcoming. There are difficulties in rising to the level of our opportunities, but

"Steep and craggy is the path of the gods,"

and this high standard is held up to us in art, in science, as in commerce and in power.

America has been said to breed

"A race of victors,
A race ready for conflict, the race of the conquering march."

The conflict of the next century will be against ignorance, sorrow and suffering, and in this the medical profession must be foremost in strenuous endeavor.

Original Articles.

THE NON-RETARDING ACTION OF COMBINED HYDROCHLORIC ACID ON STARCH DIGESTION.

BY A. E. AUSTIN, A.M., M.D.,
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I HAVE shown in my previous investigation[1] that different albuminous foods, both of animal and vegetable origin, combine with or neutralize the free hydrochloric acid of gastric juice, and contrary to the usual conception, hydrochloric acid thus combined with albuminous foods has no hindering action on the diastasic digestion of starchy food, and that such state of neutrality exists during a period of one to three hours after eating, which period is proportional to the amount of nitrogenous food eaten; thus, practically the larger part of the starchy food we eat is digested in the stomach by the action of ptyalin of saliva before the free hydrochloric acid of the gastric juice presents its appearance and accumulates to the point where it hinders the salivary digestion of starch food.

The object of this effort is to supplement and confirm the results of my previous experiments in the human stomach. With the usual diet the amount of albuminoid food constitutes approximately one-fourth and the starchy or carbohydrate food constitutes two-thirds; the remainder, one-twelfth, consists of fats and other elements, whether the person is a meat eater or vegetarian. The former derives his albuminous material chiefly from animal food, such as meat, fish, etc., while the latter derives the nitrogeneous matter principally from leguminous food, such as peas and beans. I have observed the fact that all grains and other vegetables contain more or less albuminoid bodies, and they have the same properties of combining with hydrochloric acid as animal, so that the digestion of starchy food occurs in the stomach for the period of one hour, at least, even when one takes vegetable food only.

In carrying out this experiment Mr. McL., a student of mine, who has a rare faculty of being able to evacuate a portion of his stomach contents at his own will, without feeling any inconvenience, volunteered his services. He was in perfectly normal health.

[1] Boston Medical and Surgical Journal, April 6, 1899.

The free hydrochloric acid was indicated by the use of one-per-cent. alcoholic solution of dimethyl-amido-azo-benzine as indicator, and then quantitatively determined by the decinormal solution of sodium hydrate. The total acidity was indicated and determined by the use of rosolic-acid solution as indicator. The presence of other acids was also tested for, such as butyric, lactic and acetic, each time, but having found the quantity was very small, no quantitative determination was made. Neither were acid phosphates determined.

The following are the results of the experiments:

No. 1. The lunch Friday, March 17, 1899, consisted of one plate of fish chowder, fried perch with salt pork, chicken liver sauté au Maderia, mashed potatoes, boiled rice, squash, cold boiled ham, four slices of bread (four ozs.), bottle of beer, hard crackers, American cheese, coffee.

The stomach contents were tested thirty minutes after eating. They contained no free hydrochloric acid, but contained a small quantity of combined acid and plenty of undigested starch.

At one hour after the meal a sample was again taken. There was no free hydrochloric acid; amount of total acidity increased with plenty of starch still undigested. At one and one-half hours another sample was taken, and the contents at this hour showed the presence of free hydrochloric acid and quantitative determinations of the acidity were as follow:

Total acidity . .	0.020805 grm. in 10 c. c. or 2 per m.
Free acid . . .	0.006185 grm. in 10 c. c. or 0.6 per m.

No. 2. Normal case. Breakfast, March 18, 1899; finished 8.45 A. M.; consisted of one plate of oatmeal with milk and sugar, one cup of tea, one slice of bread with butter, one small steak.

Sample at thirty minutes after eating showed no free acid. The sample that was taken at one hour after the meal showed the following results:

Total acidity . .	0.01350 grm. in 10 c. c. or 1.3 per m.
Free hydrochloric acid,	0.001745 grm. in 10 c. c. or 0.4 per m.

At three hours a sample was taken; showed a marked increase of free hydrochloric acid, and, in order to prove that the albuminoid food does neutralize the free hydrochloric acid, two raw eggs were eaten; fifteen minutes afterward the contents taken showed no free hydrochloric acid, thus proving the complete neutralization of free acid by the egg albumin.

No. 3. Normal. Breakfast, March 20, 1898, consisted of one large saucerful of oatmeal, with milk and sugar, two fried eggs, two slices of bread with butter, one cup of coffee with sugar and milk.

A sample taken thirty minutes after eating showed no free hydrochloric acid, but showed the presence of a large quantity of starch. A sample taken at the end of one hour showed the amount of free hydrochloric acid to be as follows:

Total acidity . . .	0.0219 grm. in 10 c. c. or 2.1 per m.
Free hydrochloric acid,	0.00949 grm. in 10 c. c. or 0.9 per m.

No. 4. With atropine. The foregoing are the results of tests on normal stomach contents, and, in order to see the effect of cutting off the supply of saliva upon starch digestion in the stomach, one-fiftieth grain of atropine sulphate was given half an hour before the meal, which stopped the flow of saliva to a remarkable extent.

The lunch following the atropine was taken March 20, 1899, and consisted of the following dishes: One plate of consommé vermicelli, fried cod with salt pork, pork chops with fried apples, potato salad, orange sherbet, one glass of milk.

Forty-five minutes after the meal a sample was taken, which showed a very slight digestion, and contained no hydrochloric acid, while the starch was practically untouched. Second sample, obtained one hour and fifteen minutes after eating, was still thick, and showed very slight digestion and no free hydrochloric acid. Third sample, taken after one and three-quarters hours, showed the presence of free hydrochloric acid and plenty of undigested starch.

Total acidity . . .	0.01642 grm. in 10 c. c. or 1.6 per m.
Free hydrochloric acid,	0.00730 grm. in 10 c. c. or 0.7 per m.

No. 5. With taka-diastase. Breakfast, March 31, 1899, consisted of one saucer of oatmeal with milk and sugar, two slices of bread and butter, one beefsteak, boiled potatoes, one cup of coffee with milk and sugar.

A dose of taka-diastase was given at the end of the meal. The first sample, taken in thirty minutes after eating, showed no free hydrochloric acid and indicated the presence of a slight quantity of starch. Second sample, obtained one hour after eating, showed some acidity and a very small quantity of undigested starch, consisting chiefly of pieces of crusts of bread.

Total acidity . .	0.019710 grm. in 10 c. c. or 1.9 per m.
Free hydrochloric acid,	0.008395 grm. in 10 c. c. or 0.8 per m.

No. 6. With taka-diastase. Lunch, March 21st, consisted of one Manhattan cocktail, one plate consommé, barley, broiled shad, maître d' hôtel, one bottle of beer, calf's liver and bacon, baked macaroni with cheese mashed potatoes, boiled onions, watercress salad, vanilla eclairs, jelly tarts, one cup of coffee, three slices of bread with butter.

At the end of the meal a dose of taka-diastase was given. The first sample, taken forty-five minutes after eating, showed no free hydrochloric acid and some undigested starch. A second sample, taken after one hour, showed no free hydrochloric acid, but still some starch. The third sample, taken after one and one-half hours, possessed no free hydrochloric acid, and starch was shown to be present to a very slight extent. Fourth sample, taken two hours afterward, showed that the starch particles were practically digested, with the exception of a few specks here and there, which consisted of hard starch particles from the food.

Total acidity . .	0.025915 grm. in 10 c. c. or 2.5 per m.
Free hydrochloric acid,	0.010220 grm. in 10 c. c. or 1 per m.

This case shows a remarkable contrast to experiment No. 1, in the diminished amount of undigested starch left in the stomach.

No. 7. With taka-diastase. Breakfast, March 22, 1899, consisted of one saucer of oatmeal with milk and sugar, piece of beefsteak, fried potatoes, two slices of bread and butter, one cup of coffee, with dose of taka-diastase after the meal.

The first sample was obtained one hour afterward and found to contain no free hydrochloric acid, while the starch was practically digested.

Total acidity was found to be 0.015885 grm. in 10 c. c. or 1.5 per m.

Three and one-half hours after eating the stomach was practically empty, so that no sample could be procured.

No. 8. With taka-diastase. Lunch, March 22, 1899, consisted of one plate of consommé printanière, fried perch with pork, one bottle beer, lamb sauté bourgeoise, mashed potatoes, squash, cold ham, celery salad, one slice of bread and butter, hot gingerbread,

orange cream, one cup of coffee; dose of taka-diastase was taken after meal.

The first sample was taken one hour after eating and some starch was found, but no free hydrochloric acid. The second sample, taken one and a half hours after eating, contained no free hydrochloric acid, while the amount of undigested starch was greatly diminished. The third sample was taken after two hours. Still there was no free hydrochloric acid and the starch was practically all digested. Fourth sample was obtained two and a half hours afterward and showed presence of free hydrochloric acid, while the starch was practically gone. The quantity of acid was as follows:

Total acidity . .	0.014965 grm. in 10 c. c. or 1.4 per m.
Free hydrochloric acid,	0.005475 grm. in 10 c. c. or 0.5 per m.

No. 9. With Ewald-Boas's test meal. Breakfast, March 23, 1899. In order to determine the period of the first appearance of the hydrochloric acid where the usual test breakfast is given, in order to compare that result with those of ordinary meals, the Ewald-Boas meal was given, which consisted of two slices of bread, one cup of tea, one glass of water.

First sample was taken twenty minutes after eating and showed presence of a trace of free hydrochloric acid. The second sample was obtained thirty minutes after eating, and the acidity was as follows:

Total acidity . .	0.0113505 grm. in 10 c. c. or 1.1 per m.
Free hydrochloric acid,	0.007665 grm. in 10 c. c. or 0.7 per m.

Quite a visible quantity of starch was left undigested. Third sample taken at the end of one hour showed:

Total acidity . .	0.021535 grm. in 10 c. c. or 2.1 per m.
Free hydrochloric acid,	0.014600 grm. in 10 c. c. or 1.4 per m.

Some starch was still undigested, which was comparatively large for the small amount of starchy food taken, namely, one slice of bread.

These experiments confirm all the previous records on such test meals where very little or no nitrogenous foods are taken, that is to say, the free hydrochloric acid makes its appearance at the end of twenty minutes after eating, and at the end of thirty minutes the amount of free hydrochloric acid already equals that amount which one finds one hour after eating an ordinary lunch. At the end of one hour the amount of free hydrochloric acid is doubled as compared with the sample of half an hour and corresponds to about the quantity of free hydrochloric acid found two or three hours after one has eaten an ordinary lunch. This shows that the stomach under investigation is that of an average healthy person. It strikes me that some of the previous investigators observed the condition of secretion of hydrochloric acid after giving a light, non-albuminous test meal, and applied the result of such investigation to the condition of the stomach after eating the usual meal, thus causing a misunderstanding or mistaken representation of the actual secretion of acid in stomach.

No. 10. With taka-diastase. Lunch, March 23d, consisted of one glass of rye whiskey with water, consommè, Italienne paste; broiled schrode, maitre d' hôtel; one bottle of beer, fricassee of turkey wings with peas, Boston baked beans, mashed potatoes, potato salad, pineapple frappé, jelly roll, one glass of milk. A dose of taka-diastase was taken directly after the meal.

First sample was taken one hour after eating; there was no free hydrochloric acid. A comparatively small quantity of starch was found. The second sample was taken half an hour after eating, which contained no free hydrochloric acid. The amount of starch was decreasing. Third sample was taken two hours after eating. No free hydrochloric acid. Fourth sample was taken two and one-half hours afterward and still there was no free hydrochloric acid, while the starch was practically digested. Fifth sample was taken three hours and ten minutes afterward and showed the presence of free hydrochloric acid, and the result of its determination was as follows:

Total acidity . . .	0.02007 grm. in 10 c. c. or 2 per m.
Free hydrochloric acid,	0.00912 grm. with 10 c. c. or 0.9 per m.

No. 11. Normal. Breakfast, March 24, 1899, consisted of one bowl of oatmeal, two fried eggs, two fresh biscuits and butter, one cup of coffee.

First sample taken at the end of an hour showed:

Total acidity . .	0.013505 grm. in 10 c. c. or 1.3 per m.
Free hydrochloric acid,	0.00803 grm. in 10 c. c. or 0 8 per m.

No. 12. With atropine and taka-diastase. Lunch, March 24, 1899. Half an hour before the meal one-fiftieth grain atropine sulphate was taken to stop as much as possible the secretion of saliva, and the meal was as follows: one plate of clam chowder, fried deep-sea flounders with pork, one bottle of beer, baked macaroni with cheese, cold boiled ham, mashed potatoes, vanilla cream. A large dose of taka-diastase was taken during the meal to supply the deficiency of the flow of saliva.

First sample was taken half an hour after eating. No free hydrochloric acid in start, remarkably well digested in comparison with No. 4. A second sample was taken one and one half hours after; there was no free hydrochloric acid and a small quantity of starch. Third sample was taken two hours after eating. No free hydrochloric acid and very little starch left. Four hours after eating the acidity was as follows:

Total acidity . . .	0.02518 grm. in 10 c. c. or 2.5 per m.
Free hydrochloric acid,	0.01314 grm. in 10 c. c. or 1.3 per m.

It will be observed that the digestion of starch in this case is very much similar to that of the normal, proving that the taka-diastase will perform the function of natural saliva, and in case, therefore, where the diastatic power of saliva becomes deficient from the weakening of its power or from its lessened quantity, the use of taka-diastase will benefit the case to a remarkable and satisfactory extent.

No. 13. Breakfast, March 25th, consisted of one plate of oatmeal, two lamb chops, fried potatoes, two slices of bread with butter, one cup of coffee.

A sample half an hour afterward showed no free hydrochloric acid, and a sample one hour after eating showed the following acidity:

Total acidity . . .	0.02198 grm. in 10 c. c. or 2.1 per m.
Free hydrochloric acid,	0.01350 grm. in 10 c. c. or 1.3 per m.

CONCLUSIONS.

The foregoing experiments seem to prove the following facts:

(1) That when a non-albuminous test meal is given, free hydrochloric acid makes its appearance at the end of twenty minutes after eating, and at the end of half an hour the amount of free hydrochloric acid equals that of one or two hours after eating where albuminous foods are taken, as shown by experiment No. 9.

(2) Under normal conditions, the ptyalin of saliva digests most of the starchy constituents of food in the stomach within one or two hours, which takes

place before free hydrochloric acid accumulates in the stomach to such an extent as to interfere temporarily with the diastatic action of saliva on starchy food. Those portions of starchy food which remain comparatively undissolved, and pass over to that portion of the digestive canal where they are acted upon by the pancreatic diastase, constitute a very small portion of the starchy food taken.

(3) That the administration of isolated diastase considerably enhances the digestion of starchy food in the stomach even under normal conditions is shown in experiments Nos. 7, 8 and 10.

(4) The elimination of the supply of the ptyalin of saliva to the stomach will cause marked retardation of starchy digestion in stomach, as shown in experiment No 4.

(5) A maldigestion of starchy food, due to the deficiency of the diastatic power of saliva, can be regulated by the administration of isolated diastase, as shown in experiment No. 12.

(6) The impression held by many that the diastase of saliva becomes non-active fifteen or twenty minutes after eating is totally erroneous.

LOCATION OF THE RIGHT AND LEFT BORDERS OF THE HEART BY DISTANCE FROM THE MEDIAN LINE.

BY FRANCIS H. WILLIAMS, M. D., BOSTON.

I wish to advocate a determination of the right and left borders of the heart by their distance from the median line because it is a more accurate method that the one now generally used of designating its left border by reference to the nipple and its right border by reference to the sternum. In women the nipple line is too indefinite to be considered, and in men the position of the nipples varies considerably; for instance, in 21 men in one of my wards at the Boston City Hospital, the distances between the nipples averaged 21.5 centimetres; the shortest distance was 18.5, the longest 25.5 centimetres. In other words, in 21 patients the variation between the extremes was 7 centimetres, from nipple to nipple, or 3.5 between the median and the nipple lines. Thus we see that the position of the nipple may vary in its distance from the median line by more than an inch, or, to be exact, by one and three-eighths inches. Such a variation in the size of the heart as this might mean serious disease. The statement that the left border of the heart is a little inside the nipple line would not strike us so forcibly as if we were told that it was an inch further to the left than in health. Moreover, if we determine the right border of the heart as so many centimetres or inches to the right of, and the left border as so many centimetres or inches to the left of, the median line, we determine not only how much it is to the right or to the left, but by adding the two quantities together we readily get the total width of the heart. The width cannot be obtained so accurately when the right border is determined with reference to the sternum, and the left body with reference to the nipple.

The Deadly Headache Powder. — Three deaths from the taking of headache powders are reported to have occurred recently in Allegheny County, Pa.

Clinical Department.

CHRYSAROBIN A SPECIFIC FOR WARTS.

BY G. W. FITZ, M.D., CAMBRIDGE.
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Since 1895, when Dubreuilh [1] called attention to the presence of warts on the feet, the characteristic differences between warts and corns have been more or less generally recognized. Warts on the feet are readily distinguished by their location (usually upon the plantar aspect of the foot) and by their bleeding from a central, vertical bundle of papillae arranged like a pepper-box and ordinarily projecting somewhat above the pared surface. This central bundle of papillae is surrounded by a thickened area of skin penetrating to a greater or less depth and an outer painful zone of inflamed skin.

In 1891 I saw for the first time a wart in this situation and attempted to cure it with salicylic acid in collodion. I found after a trial of three weeks that this was not effective. I was then led, from its superficial resemblance to the lesion of psoriasis (bleeding points), to try a solution of chrysarobin in gutta-percha. The wart was thoroughly pared until there was profuse bleeding and the solution applied to the denuded surface. The patient was directed to cut the surface every night and apply the chrysarobin. In a few days the pain disappeared, and the wart seemed diminished in size. In two weeks' time the wart was practically gone and the surface restored to its normal condition.

Since that time I have been able to apply chrysarobin in eight cases of warts similarly located. Some were apparently due to stone bruises; others, to the irritation of defects in the boot; and of others, again, no history could be obtained. In one case there were three warts on the ball and two upon the heel of the same foot. Several of the cases came to me after having been treated for months by salicylic acid without success, even though the physician in charge had made the application himself each week.

In most cases the chrysarobin produced little effect before the end of the first week, except that the pain became less and the wart did not increase; in the second week, change was rapid in most of the cases, although in a few cases there was still little effect. In the third week the majority were cured.

In the series of eight cases there have been no failures. Two apparent failures were traced to difficulty in paring the wart and as soon as this was remedied by sandpapering the cure progressed favorably. On the whole, careful thinning of the surface with a sharp fine glass-paper gives better results than paring with a knife, as the patient is less afraid of injuring himself and can more conveniently handle the paper.

My experience has been that chrysarobin may be applied either in a ten-per-cent. solution of the ordinary gutta-percha solution or in a ten-per-cent. ether solution. It is best to apply the chrysarobin at night and to advise the patient to put on an old stocking, to prevent soiling the bed-clothing. Application once a day in this way seems ordinarily to be sufficient, but in obstinate cases it should be applied both night and morning.

The influence of the chrysarobin seems to be not

[1] Annales de Dermat. et de Syph., May, 1895, reviewed by Bowen in Boston Medical and Surgical Journal, vol. cxxxv, p. 262.