

Cutter, (E.)

BAKED BEANS:

A

Serio-Humorous Medical Paper.

BY

EPHRAIM CUTTER, A.M., M.D., HARV. ET UNIV. PENN.,

Associate Mem. Philosophical Society of Great Britain; Corresponding Mem. Soc. Belge de Microscopie; Honorary Mem. N. H. S. Med. Soc., California S. Med. Soc. and Gynecological Soc. of Boston; Mem. Com. for Revising U. S. P., 1860, Am. Med Ass'n; Mass. Med. Soc., Com. One Hundred, Mass. Sold. Fund, 1861; Δ KE, Φ, 1852, and Am. Soc. Microscopists; Author of Boylston Prize Essay, 1857.



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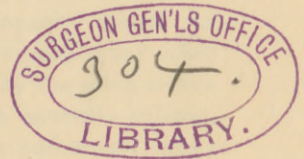
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BAKED BEANS:
A SERIO-HUMOROUS MEDICAL PAPER.

BY EPHRAIM CUTTER, M.D., NEW YORK CITY.

Ethics, Chemics, Physiologics, Morphologics, Pathologics and Culinary Ethics.

It is curious that the term "Beans" is a standard of ethical knowledge. For example, I have known boys and men to say of a person, most likely a new-comer who proved to be unusually ignorant of the local manners and customs of their neighborhood, in a sneering way, "That fellow don't know beans."

This means that the person in question was almost *non compos*. Why intellectual, mental and moral capacity should be connected with beans is difficult to explain, as a good many other customs are. It is more difficult to explain why the same article of food has been humorously connected with æsthetic culture, since the science of æsthetics deals with sight and sound only; there seems no reason why it should not include taste, because mankind, as far as possible, selects food by the pleasurable taste of the article in question, and because the delight and pleasure found in food comes closer to life than music and the fine arts. People can live without music, sculptures and paintings, but not without eating. Surely all food should be judged not on the ground of tasting good, looking good, smelling good, or because it is an ethical food (that is, a conventional food for a certain locality, class or race of people). It is wise to select food on these grounds, but not on these alone; because what is sweet to the taste, savory in smell, beautiful in looks and an ethical food may not contain—

(a.) Chemical elements enough for a good food.

(b.) Its form (morphological) elements may be such as to resist more or less thoroughly the digestion, and thus not be a good

(c.) Physiological food, but be

(d.) A pathological food, or one which causes, sooner or later, chronic or acute diseases.

Can the average man who is very hungry for food be attracted by the delights of the eye or ear? To be sure, these are found in a first-class banquet, in order to make the pleasures of the occasion complete. The arts of architects, painters, florists, upholsters, drapers, gold, silver and iron smiths, potters, glass workers, tailors, dressmakers, hair-dressers, perfumers, jewelers, sculptors, musicians, and after-dinner speakers are added to the arts of confectioners, caterers, cooks and waiters, to charm the eyes, ears, tastes and olfactory nerves of the guests; and when all these are harmoniously and fittingly combined, the result is what may be termed a supreme effort to gratify the love of the beautiful and to make the occasion memorable because the bodies and souls of the guests have been so pleasantly influenced from so many different points of æsthetic contact.

It must be admitted that eaters of "Baked Beans" (when well cooked) get a pleasure without the above additional attractions. Culture has been mentioned in connection with this article of diet. It goes as a jest that the modern Athens is indebted to *baked beans* for its high intellectual standing!—perhaps on the ground that beans are rich in phosphoric acid and that the same element is found in nerve tissues. The more highly organized the nerve tissues, the better brain-work will they produce. Be this as it may, we cannot go quite so far as the opinion we heard expressed lately, that "this article of New England diet may explain the abundant crop of 'isms' and novel ideas in social and political economy, theology and mechanics; that were a high wall built up round about New England to shut out the world, the inhabitants would perish from their own conflicts of new ideas and the baneful effects of mal-nutrition; that emigration has been a conservant power, breaking up old habits of living and hence introducing a closer adaptation to the ordinary intellect and body." We quote this not in approval, but to show how this class of people appears to an outside thinker who does not follow the same lines of diet as to *legumes*.

However, it must be said that canned beans are shipped to all quarters and Boston baked beans are advertised freely, showing that emigration does not kill the love of them. A traveler all over the Union remarked in the cars, a short time since, that wherever he goes in Kansas, Nebraska, Idaho, Dakota, etc., and finds a Boston lady keeping house, he was sure to find baked beans prepared in the conventional style. During the war, in 1861, the New England troops were not satisfied until baked beans were put on the army ration. No æsthetics in baked beans! They are liked because they excite pleasure in eating. The eaters anticipate their pleasure, and make more talk about them than of any other article of food. It is doubtful if any amount of persuasion could induce them to give up beans, even if proved to be deleterious, an exciting cause of consumption, and the diseases that arise from imperfect digestion. Indeed, if the gentleman who expressed the opinion above quoted were to take it "down east," he would have a hard time, from the very fact that he would touch a tender chord. To show the truth of this position the following is quoted from the *Boston Commercial Bulletin*, February 12, 1887, from an article entitled "Forefather's Food—Poetry and Pork": "Nine (9) million pounds of canned baked beans annually consumed in this country, of which Boston packs 70 per cent."

The following is a sample of baked beans poetry, four verses of which are from the *Baltimore Weekly Magazine*, October 13, 1818, and the fifth verse added by a Chicago daily of late date:

BAKED BEANS.

Oh! how my heart yearns for my own native land,
 Where potatoes, and squashes, and cucumbers grow;
 Where cheer and good welcome are always at hand,
 And custards and pumpkin pies smoke in a row;
 Where pudding the visage of hunger serenues,
 And, what is far dearer, the pot of baked beans.

Let Maryland boast of her dainties profuse,
 Her large watermelons and cantaloupes fine,
 Her turtle, and oysters, and terrapin stews,
 And soft crabs, high zested with brandy and wine;
 Ah! never my heart from my native land weans,
 When smokes on the table the pot of baked beans.

The pot of baked beans! With what pleasure I saw it,
 Well season'd, well pork'd, by some rosy-faced dame;
 And when from the glowing hot oven she'd draw it,
 Well crisp'd and well brown'd to the table it came.
 O give me my country, the land of my teens,
 Of the dark Indian pudding and pot of baked beans.

The pot of baked beans! Ah! the muse is too frail
 Its taste to descant on, its virtue to tell;
 But look at the sons of New England so hale,
 And her daughters so rosy—'twill teach thee full well.
 Like me it will teach thee to sigh for the means
 Of health and—oh! rapture!—the pot of baked beans.

A YANKEE.

Poor "Yankee!" You lived half a century too soon,
 And pined in your loneliness for the loved dish;
 To-day, any grocer would sing a new tune,
 And give you the article just as you'd wish;
 And you every day could revive youthful scenes
 With Spriggins and Company's Boston Baked Beans.

"Canned beans are cooked as follows: After soaking and dosing with molasses and three or four ounces of best salt pork, they are sealed in a tin can; then heated to 250°–260° Fahrenheit in a closed steam retort. When removed the cans are pierced to let out the steam and afterwards resealed."

This mode is thought to be very effective, and a morphological examination by the writer shows the following:

Sample I. Boston Baked Beans, patented August 7, 1877, put up and warranted by the Grocers' Packing Company. The starch grains retained their form and polarized light as much as the sac of cellulose that contained them. Hence it is doubtful whether this mode of cooking is as effective as the old-fashioned way. These beans were put into a Chamberlain steamer and steamed for half an hour. The result was that the starch grains ceased to polarize light, but their forms were not destroyed.

Sample II. Packed by the Oneida Community, New York. Under microscope, the starch grains did *not* polarize the light and were distinct in form, though slightly changed, showing a better cooking than in Sample I.

Sample III. Riverside Farm Baked Beans, Portland, Me. "Every can guaranteed." Under microscope, starch grains polarize light and retain their raw form. I should advise more cooking for this brand.

The dangers of improperly prepared beans are touchingly set forth in the following contribution to baked beans literature in a California journal (see *Boston Commercial Bulletin*, February 12, 1887):

BOSTON BAKED BEANS.

The boy stood at the kitchen fire,
 Upon it was a kettle,
 Within its spacious, hollow sphere
 A can of bright, white metal.

The can contained two pounds of beans,
 The "What-you-may-call-it" brand ;
 The poorest, meanest kind of beans
 That's in the market canned.

His father called, he could not go,
 His face grew brighter still,
 He watched the steam with happiness,
 And never thought of ill.

There came a burst of thunder sound—
 The boy—oh ! where was he ?
 Ask of the steam that fragments left
 Wherever one could see.

The water, kettle, boy and can
 Of beans, the floor bestrew.
 But when I tell the cause of this
 You'll say he got his due.

The beans were cheap and poorly canned,
 The can with gas was filled ;
 For fermentation had set in,
 By which the boy was killed.

And so the boy has disappeared,
 But in one sense remains,
 And leaves a moral—"Use a brand
 Of which no one complains."

This is more applicable when it is remembered how remarkably fond children are of this dish.

The English never eat beans, and call them "horse food."

Given a food that is good for man, (1) aesthetically, (2) chemically, (3) morphologically, and (4) physiologically, there is danger of its being a bad food unless it is properly cooked. This remark introduces a fact of incalculable moment in our day and generation—that the culinary department of life's

work is one which may be made an engine of life or death. The difficulties which now trouble the kitchen, and the painful stories of girls and women starving over needle-work, in serving counters and other departments of ill-paid labor, calling on our compassion (for some find the path to moral ruin while at the same time there are plenty of kitchens calling for help), show the need of impressing the fact that kitchens are a greater source of power than the thoughtless cooks dream of.

Who are cooks? Our mothers, grandmothers and servant girls. Why should cookery be thought drudgery? It is one of the misnomers of Satan and designed to injure mankind. Any honorable labor which is necessary to the existence of the human race should not be deemed drudgery. Certainly cooking is essential to human existence, and hence a cook is not a drudge; rather, a cook is like air—a life supporter. Is there dishonor in this employment?

Again, a practical and indispensable acquaintance with subjects of the highest importance, which involve topics that have challenged the best intellectual talents of the savants of all ages, certainly is compatible with the highest dignity and grandeur that a human being can attain to.

If we refer to the physics and chemics of heat in cooking, we have such a subject, containing intricate, abstruse and hidden phenomena which have defied the scientific world. Count Rumford's fame comes from having done the most of any in this direction. He will be remembered not because he was a count, wealthy, clad in fine raiment, the pet of the nations, the associate of kings—although these things are not to be despised—but as the discoverer and demonstrator that heat is a form of motion, equally convertible. Besides, he was a cook. He did not dignify the office of cook; it dignified him; indeed, his culture was an ornament to his cooking. Every cook who does good work is in the same company as Rumford. Perhaps the greatest satisfaction one can take in life is the fact of having done something for somebody which has made him happy or done good to his physical existence by keeping his body in good condition so that he may in time do good to others. If cooks did but know it, they can take this satisfaction every time they broil a steak properly, make good bread, tea, coffee, bake beans rightly, etc. They can feel that their services are of positive value, whether recognized or not, and entitle them to self-respect three times a

day. Away, then, with the false notion that cooking is worse labor and more degrading than sewing and clerking on starvation wages! I once knew a man who kept a restaurant in Boston who retired wealthy because he made a specialty of baked beans properly cooked. Now, this man's success in life shows that the good quality of the cooking pays well. The same is true of other articles of diet. The Parker House at Boston was built up on the good quality of the bread, also the house of Smith and McNell of this city, which gives ten thousand (10,000) meals a day because of good cooking. This firm cooks potatoes so that the starch is changed into glucose, as I have proved by chemical tests.

The connection of food with æsthetics may seem to some far-fetched, but I assert that while a man's bowels wrestle in intestinal conflicts with illy or improperly cooked food he cannot be very æsthetic as to music and painting, from the physical impossibility of having his nervous system engaged in two such works; *i. e.*, first, difficult digestion, and second, æsthetic excitement. For a time the cerebral nerve centres might ignore the intestinal nerve centres, but as life can go on without cerebration and cannot go on without digestion, so the latter will triumph and claim attention, provided the cause (illy-digesting food) is not removed. On the other hand, a man kept warm with a stomach filled with a good, well-cooked dinner, will be an agreeable husband (so I have heard a good housewife say), and is in a condition to take delight in a concert room, or in a picture gallery, or in intellectual enjoyment.

CHEMICS.

The following tables are from Johnson's "How Crops Grow," O. Judd & Co., New York, 1881:

TABLE I.

Field Beans.

Number of analyses.....	6
Per cent. of ash.....	3.45
Potash.....	40.50
Soda.....	1.20
Magnesia.....	6.70
Lime.....	5.20
Phosphoric acid.....	39.20
Sulphuric acid.....	3.10
Silica.....	1.20
Chlorine.....	2.90

Garden Beans.

Number of analyses	9
Per cent. of ash	3.06
Potash	44.1
Soda	2.90
Magnesia	7.50
Lime	7.70
Phosphoric acid	30.40
Sulphuric acid	3.80
Silica	0.80
Chlorine	0.90

TABLE II.

COMPOSITION, GIVING THE AVERAGE QUANTITY OF WATER, SULPHUR, ASH AND ASH INGREDIENTS IN 1,000 PARTS OF FRESH OR AIR-DRY SUBSTANCE OF SEED BEANS (*PHASEOLUS VULGARIS*), COMPARED WITH WHEAT, BY PROF. WOLFF.

	<i>Wheat.</i>	<i>Field Beans.</i>	<i>Garden Beans.</i>
Water	143.00	141.00	148.00
Ash	17.70	29.60	26.10
Potash	5.50	12.00	11.05
Soda .....	.60	.04	.08
Magnesia	2.20	2.00	2.00
Lime .....	.60	1.50	2.00
Phosphoric acid	8.20	11.60	7.90
Sulphuric acid .....	.40	1.50	1.40
Silica .....	.30	0.40	....
Chlorine .....	....	.80	.30
Sulphur	1.50	2.80	2.50

A glance at the analysis of wheat, which is *par excellence* a good food for man, which has stood the test of ages, and which is called one of the royal grains, shows that "beans" are a good food chemically, containing more mineral matter, and hence admirable from this standpoint of view as a food for the solid tissues, teeth, hair, bones, corneas, nails and epidermis.

But on this view alone we should not estimate the value of beans as food, any more than from the æsthetic point of view. One could get these chemicals, isolated in these proportions, and eat them, but it would not necessarily follow that the human system would assimilate them, even if they did not prove poisonous and destructive to life. As the mineral food of plants must be in soluble and assimilable forms, combined with carbon, hydrogen and oxygen—that is, in properly prepared manures (which are mainly soluble forms of mineral food), so must these same mineral and organic food-elements be prepared for man in morphological or form-elements which are so disposed and arranged as to be easily digestible—that is, easily broken down by the human digestive organs and easily assimilable. For if the tissues of the "beans," for example, are constructed to resist outside attacks, somewhat like an iron-clad, it is evident that no

amount of chemical excellence will make them a first-class food worthy of the high estimates placed on them in some quarters. This introduces the next point of view to take in testing a food, to wit:

THE MORPHOLOGIC.

Morphology of Beans.

Taking the bean botanically, it is the seed of the phaseolus species of the leguminose family. The seed is made of the germ and two lobes, called cotyledons, which are seed leaves loaded with starch to serve as food for the germ and for animals. The points of interest are :

The seed is covered with a thick skin or envelope, which is made up of a set of beautiful prismatic crystal-like shapes of

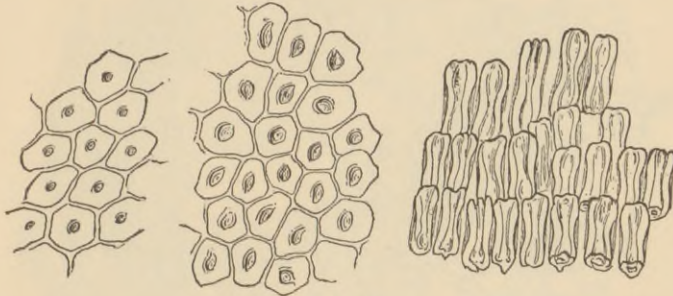


FIG. 1.

End and side views of the prisms of cellulose that make up the skin of the common white bean. Baked, but not thoroughly cooked.

cellulose placed side by side longitudinally, so that these ends make the outside and inside surfaces of the skin or envelope and appear very much like the tops of the Giant's Causeway crystals of trap-rock. See Fig. 1. The group to the right shows three or four rows of these cellulose bodies. They are displaced by the pressure of the cover and slide and appear to be end to end. In the middle of each prism is an hour-glass contraction which is in the central axis and is surrounded with clear cellulose which fills out the contour. To the left, two groups of the face of the outer bean-membrane are seen showing the prism ends in contact. The crystal-elements of the membrane are quite insoluble, polarize light, and resist the digestive influences of the alimentary canal. They are found in large quantities in the excrement of bean-eaters, and furnish a sure proof, when found, that

beans or peas entered into the diet of the case under examination. In Fig. 5 are seen seven of these prisms which came from Lima beans; here the lateral surfaces are narrowed, leaving tack-like heads of irregular shapes at both ends. Of course, the membrane thus made cannot have the strength of the membrane of the common white bean, as the prisms do not touch along their sides. The epithelia of the common bean are seen in Fig. 3, in the left lower quarter of field; while the epithelia of the Lima bean are seen in Fig. 2, left group. It is well to note the remarkable interdigitations of these epithelia. When interlocked, unsoftened and unseparated by cooking, they must hold together the parts over which they are spread with great firmness. Indeed, if beans

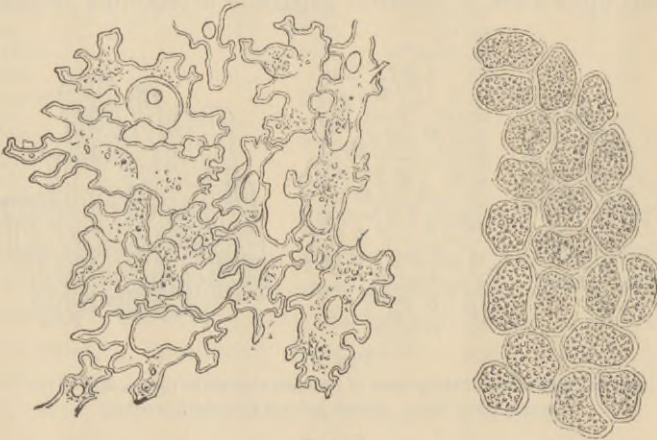


FIG. 2.
Pavement epithelia of Lima bean (boiled), with curious digitations.
Cells filled with coloring matter (may be legumen).

uncooked sojourn in the meatus of the ear, in the nostril, or in the alimentary canal, they remain unchanged more or less, for a time, and are voided almost in the same condition as when they entered. No sane person would think of eating mature dry beans for food. The toughness, thickness and peculiar structure of the envelope of the bean make it such a strong obstacle to digestion and assimilation.

THE SUBSTANCE OF THE BEAN

is made up of starch grains, connective tissue, spiral vascular tissue, etc., etc.

The starch is not peculiar in its appearance and is readily recognized. In a section of an uncooked bean, the starch grains

appear in globular masses of varying sizes, filling up, apparently, the meshes of the connective fibrous tissue, which is quite thick, fibrous, homogeneous, polarizes light, and is probably cellulose or woolly fibre, very resistant to outside influences of any kind (see Fig. 4). In a section of raw Lima bean, the meshes appear as in one continuous net-work, making areolæ; but when cooked by baking or boiling, there is a great change wrought which is surprising, for the starch grains are found to be contained in sacs

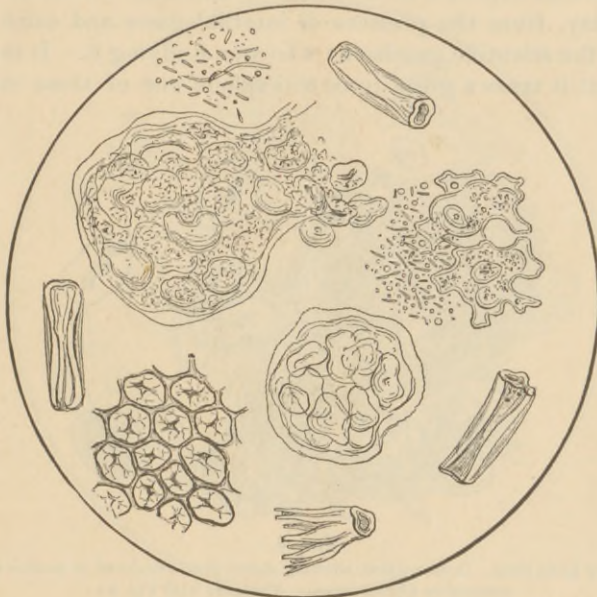


FIG. 3.

Common small white bean baked, not thoroughly cooked; kept several days.

Bacteria abundant. Prism elements of skin. Digitate epithelia.

Two parenchymatous beans' sacs; one ruptured and discharging starch grains, the other whole.

of thick cellulose which are distinct from each other and are of various sizes, shapes and contours, containing a variable number of starch grains (see Figs. 3 and 5). They are globular, pyriform, elongated, compressed, apparently triangular, sometimes reminding of *diffugia cratera*, sometimes of *pelomyxæ*, and so on, but all covered with a transparent envelope or sac of cellulose which looks like the clear margin of *gemiasma verdans, rubra*, and *plumba*, found in malaria. The thickness of this coat is

worth attention. Taking an average sac, I found it measured 8.5 mm., while the thickness of the clear investing sac measured 0.5 mm., so that the proportion for the case measured would be 8.5 to 0.5, one-seventeenth of the whole diameter for the investing sac. Or, to put it differently, if the sac were an egg two inches long and had a proportionately thick shell, it would be one-quarter of an inch thick, which certainly would be an extraordinary thickness for a hen's egg and make it tougher than an ostrich's egg, one of which exploded at the Peabody Museum, New Haven, the other day, from the pressure of internal gases and came near killing the scientific gentleman who was studying it. It is probable that it takes a great force to explode one of these sacs of



FIG. 4.

Raw Lima bean. Cross section, showing starch grains enclosed in meshes of connective fibrous tissue. (Compare with Fig. 5.)

baked beans (see Fig. 3). The fact that so few of the sacs are found ruptured after cooking and after migrating through the alimentary canal shows a great power of resistance to digestive agencies. In Fig. 3 the beans are not thoroughly cooked. This diagnosis was based on the following:

1. Action of polarized light.
2. Condition of the starch contained within the sacs.

First, Polarized Light.—On the uncooked starch grains, polarized light sets with great beauty, but when the starch is cooked, polarized light has no action; hence a good test of cooking is by polarized light. As the beans' starch grains are cooked they polarize light less and less, and when cooked (to repeat) polarize

it not at all; so one can judge at once, as to whether beans are cooked or not, by polarized light. The purple selenite stage slip is the best. The writer discovered this about ten years ago and thinks he has the priority. However, this has been found so good a practical test that he thinks it must be adopted in the future.

Second, Condition of the Bean Starch-Grains.—Before cooking they are clean cut, distinct; after thorough cooking they

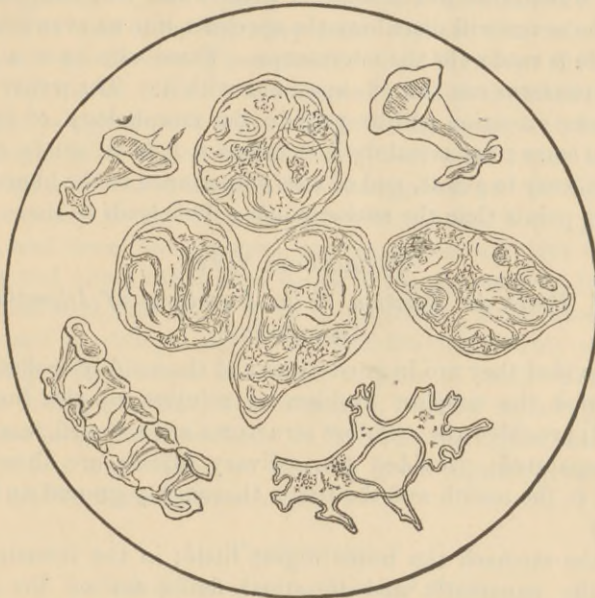


FIG. 5.

Boiled Lima bean. Four sacs unbroken, contents partially disorganized. One digitate epithelium. Group of five skin elements with tack-heads in contact, while the bodies are apart, thus making a much weaker membrane than that of the common white bean (see Fig. 1). Opposite are two skin form elements more highly magnified. Lima bean better than the other, because more easily cooked. (See Fig. 4 for raw Lima bean, to compare.)

lose their outlines and forms, blend into one homogeneous mass, that is granular, devoid of structure, sometimes striated in coils, looking much like the solid extract of an herb as found in pharmacy, only not so deeply colored. The amount of disintegration, breaking down and homogeneousness constitutes, in my opinion, a very good test for the thorough cooking of baked beans.

BOILING THE BEANS

(see Fig. 5) serves to coagulate the protoplasm into a nucleus leaving a clear ground work about it; the grains are swelled and distributed more than in baking. These morphological changes are easy to study. A good one-quarter-inch objective, a two-inch eye-piece, with a slide, cover, stand and tooth-pick, are means ample enough to verify these statements from off one's own table. With the tooth-pick small portions of the baked beans can be transferred to the slide, a little water and manipulation with the cover will distribute the specimen into an even field, and the slide is ready for the microscope. Those who have a polarizing apparatus can test the specimen with it. The writer hopes that more attention will be paid to the morphology of food in time to come; for certainly it furnishes a field of study always present, easy to get at, and of vital importance to the human race in more points than the æsthetic one. This leads to the

PHYSIOLOGIC VIEW.

Baked Beans in Relation to the Functions of Digestion and Assimilation.

(Provided they are in good order and thoroughly cooked, so as to furnish the simplest problem of solution by the functions named; provided the cellulose structures are softened, macerated and separated; provided the salivary liquids are thoroughly mixed in the mouth and the beans thoroughly ground up by the teeth.)

In the stomach the beans digest little; in the intestines the bile, the pancreatic and intestinal fluids act on the starch, complete the changes already begun by the cooking, the mastication and the gastric juice, and turn it into glucose, in which soluble condition it is taken up into the portal circulation and transmitted to the liver.

The other elements of the beans that are made soluble are also absorbed into the system, and it is fed and warmed by the beans. The longer this food stays in the stomach the more it ferments. For it must be remembered that the alimentary canal is a great reservoir of fermentative vegetations, as a rule, so that sedentary persons have more trouble with this article of food. Persons who live out of doors and who move about actively and work hard, digest vegetable foods better than the sedentary, as the food is accelerated in its passage through the

alimentary canal and the undigested remainder has less time in which to ferment. Hence, when we hear of a Maine lumberman thriving on baked beans, which frozen solid by the barrel and cut out with axes, are then cooked, we lay the benefit to the fresh air of the woods and the violent exercise.

From what has been said it must be admitted that baked beans are not easy to digest, and that there is good reason for the unusual amount of intestinal gases that accompany their digestion. This gas is usually carbonic acid; it is formed inside the bean sacs, and they must explode like microscopic *dynamite bombs in the intestines!* (See Fig. 3.) If we consider that nerve force is the agent by which digestion is regulated, if not produced, other things being equal, it takes more nerve energy to digest baked beans than some other kinds of food, and, of course, there is less energy left to run the rest of the economy in the departments where nerve force predominates, and hence the cerebral centres cannot act with that efficiency and energy that they could if the system was fed on a food that took less nerve force to digest it. To be sure, *allowance must be made for differences in individuals in the power of digesting baked beans* and other articles of food. Some will digest their meals when others cannot, because their organs are in remarkably good condition to do their work; but aside from this, it is not profitable to abuse a good digestion; sometime there will be a break-down.

PATHOLOGICS.

Baked Beans as a Cause of Disease.

Some years ago, Dr. J. H. Salisbury (Albany Medical College, '50) made some unique but most valuable experiments as to baked beans. He put himself and six strong, healthy laboring men on an exclusive diet of baked beans, coffee and milk. They were sedentary, save that in the morning and evening they all marched out on the street in military order for exercise. Almost immediately there was diarrhœa, followed in all the cases (in about fourteen days) by *consumption of the bowels*. If any one doubts this, he is asked to live on the same diet exclusively for the same time and report results, which were so uniform in the above cases that there is no hesitation in predicting like issues. This may be called too severe treatment of any food, and that no food would

stand such a test, because so unnatural. Dr. Salisbury found that lean beef also would stand all the test of a healthy food, hence its adoption as a basis for his treatment of disease. It is to be hoped that Dr. S. will publish the full accounts of his experiences for the benefit of the human race, but until then it may be remarked here that he found this diarrhœa was caused by the alcoholic fermentation of the baked beans, producing alcohol, carbonic acid and vinegar. The alcohol showed itself by the fuddling of the men, while it did good by arresting for the time the active process of the fermentation. The results of the action of the alcohol were:

1. Distention of the bowels by gas.
2. Paralyzing them by direct contact.
3. Paralyzing the epithelia of the mucous membrane, making them, as it were, drunk, causing a thickened catarrhal condition, hence the profuse liquid discharges, and later on some sulphuretted hydrogen.

He speaks of the sacs described above as bursting with fermentation, thus paralleling that explosion of the ostrich's egg. He said if he continued the diet of beans with the men some of them would have had consumption of the lungs, and he regarded a diet of baked beans as one of the most favorable for the production of consumption. He has told me for years that this article of diet was no doubt one cause of the prevalence of consumption in New England. These views should command respect, as they are based on food experiments (with men) the range, extent and thoroughness of which have never yet been equaled. The writer's experience with baked beans, based on a long study of the morphology of fœces, goes to sustain the positions of Dr. Salisbury.

It is always possible to detect the eating of baked beans by a microscopical examination of the forms found in the fœces of the eater. The beautiful cellulose prisms or double tack-headed elements of the outer membrane of the bean or pea will tell the tale, while an abundance of the sacs filled with starch grains, sure to be found, will testify to the same thing. At one time the writer verified this in his own person, and was astonished at the quantity of undigested beans and other food that ran the gauntlet of an alimentary canal which was called healthy. Once the writer visited the Massachusetts State Prison at Concord (before it was used as a

reformatory). Passing by the latrine, he saw a pile of baked beans large enough to load a horse-cart, most of which had passed through the digestive organs of the prisoners. Certainly if this exhibition meant anything, it showed that these baked beans are a poor prison ration. I think it would be more rational to feed the beans to animals whose organs are better adapted to digest them than man's, and, if need be, let man eat the animals. If the sacs of the bean-grains could be ruptured before eating, considerable objection would be removed. They might be crushed between rollers, or pounded in a mortar, or mashed like potatoes. If bean-eaters would take time to thoroughly cook and chew them, the situation would be improved. But probably one great popular recommendation of baked beans is their smallness, so that they are swallowed whole, easily, and thus save time in eating. If man had the gizzard of fowls, or five stomachs like bovines, this might answer; but it seems to me we do ourselves harm in the end by imperfect mastication, which fails to crush the bean-sacs and mix the juices of the mouth with the starch of the bean, and so prepare it for the digestive processes it should undergo; for if they are not prepared, a good portion is wasted, as the Concord latrine witnessed.

CULINARY ETHICS.

Importance of Cooking.

The writer has no idea of influencing the abandonment of baked beans as food, but he would like to put in a plea for better cooking. It goes without saying that the average cooking is bad. It is no wonder, for this vital matter is often put in the hands of the humblest and most unintelligent members of the household, whose views of doing things are so fixed, conventional and authoritative that they may be in truth termed "queens" of the kitchen. In the days when mothers and grandmothers did the cooking, there was a better chance for good results. Still, as we now know the peculiar physical conditions to be overcome, perhaps the queens of the parlor may join the battle for good cooking, as it is a vital battle. Good cooking means health and life, and bad cooking means disease and death. I hope it will become fashionable for families to cultivate the microscope as they do the piano; then there will be a chance to spread knowledge which will protect the rights of households. I do not know why good cooking is not as inal-

ienable a right as any named in the Declaration of Independence. Why should we go through life with our intestines waging an unequal warfare with any food, baked beans for example, simply because we are too ignorant or inactive to demand that they shall be cooked after a process like the following?

1st. Soak a quart of beans over night in two quarts of cold water.

2d. In the morning turn off the water, add fresh water and boil them till the membranes begin to separate; turn off the water.

3d. Put the beans in a baking pot, with half a pound of salt pork buried in the beans, add two tablespoonfuls of molasses, and cover the whole with water. Bake in a slow oven all day; a baker's oven is best. Watch the beans, and if they become too dry add more water. When thoroughly cooked it will be known by the softness of the beans in the mouth between the teeth, by the taste, and by the microscope showing the starch grains broken up and mixed in one homogeneous mass that will not polarize light with a selenite plate.

4th. Take time to eat and chew thoroughly.

5th. After eating, go out in the open air and walk or work. Do not go to church right after eating baked beans; they will stay in the stomach and their indigestion will do much towards spoiling the enjoyment of the exercises there. Dyspepsia and religion do not go together well, but good digestion and holiness are twins. Holiness, health, whole and hale, come from the same root. A holy man is a healthy, whole man, with all the functions in good order and no dyspepsia. Dyspepsia is a physiological sin.

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