

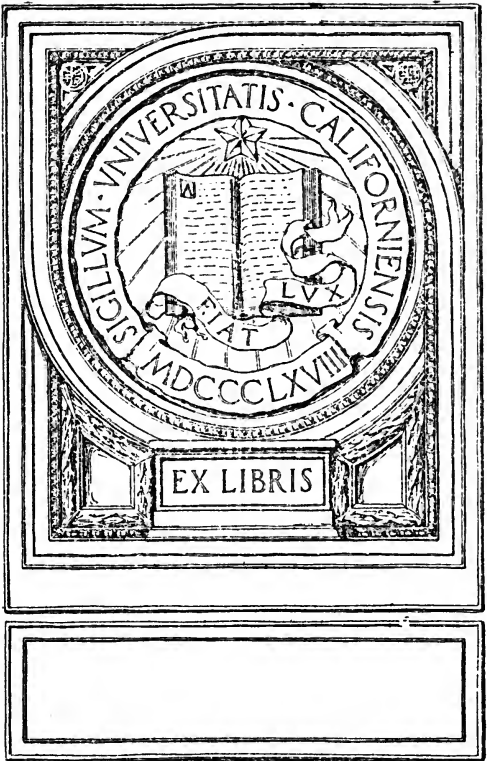
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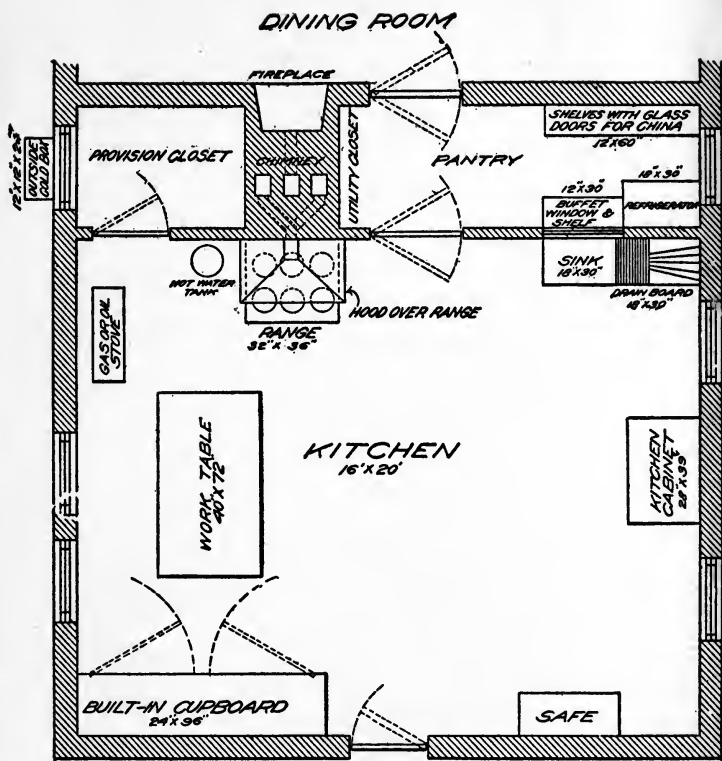
ECONOMY *in*
A KITCHEN

BY F. H. BRADSHAW



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**ECONOMY IN THE
KITCHEN**



BACK PORCH
Fig. 1

ECONOMY *in*
the **KITCHEN**

BY
J. F. BREAZEALE

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INTRODUCTION

DURING the last decade the scientists of the United States Department of Agriculture, and the state experiment stations, as well as other workers along agricultural lines, have been devoting much time and thought to the needs of the American farmer. Whether or not he has availed himself of it is another question, but certain it is that at present he needs little, in the way of information on the management of his farm, that is not available, but the housewife upon the farm is not so fortunate. Although she is usually more inclined to accept good advice, and probably needs information more than her husband, she somehow does not get it. The housekeeping magazines and other periodicals are not addressed to her, and if she attempts to read a few cook books, she is likely to end up with a vague suspicion that the authors have probably never kept house, and have never even tried their own recipes. The works on domestic science fail to reach her, as the writers upon such subjects usually write to the woman with means, the housewife who can afford to buy things, and not to the woman who is obliged to do with the things which she already has on hand. They overlook the fact that probably the majority of the housewives in this country are standing upon board floors and doing their own work.

My early life upon the farm has given me the viewpoint of the farmer's wife, who usually has but little and who spends most of her time in the kitchen, and my greatest desire in life is to help this busy little woman, for it is she, and not the woman with the dog in the automobile, who is the balance wheel of this nation. During the years that I have spent in the United States Department of Agriculture, I have published many articles in which I hoped to help the housewife on the farm. That these efforts were appreciated is proved by the many letters that I have received from all sections of the country. It is from these letters that I, in part, have learned what the housewife wants to know, and this little book is, in the main, an answer to these letters.

This is not a cook book, and I do not pose as an authority on domestic science. I do not expect to teach women how to keep house, but I do hope, in an informal and homely kind of a way, to bring more system into the household, to lessen the steps of the housewife and to inspire her with some new ideas of economy. This book is meant to be different and in every item the "reasons why" have been brought out. It is largely a description of my own experience. The canning of vegetables and fruits, which I so emphasize, has meant so much to me, from the standpoint of health, economy and labor saving, that it is no wonder that I have become a little enthusiastic over it and probably over anxious to tell other people about it. During the last few years I have had occasion to teach many housewives how to can. While some of these think it is too much trouble, the great majority become enthusiastic too, and want to can every-

thing in sight. They tell their neighbors about it and they go to canning too. This goes to show that the right kind of economy is contagious in much the same way as whooping cough or chicken pox.

It is with a feeling of apology that I use the term "I" so often, but in a work of this kind it is almost impossible to omit this form of expression. In the duties of our household I am not "chief cook" by any means. My wife is mistress of her kitchen, and in most cases I am but a helper. She has been the prime mover in this work, and we have agreed in everything except in some small details. She insists upon using a dish rag, while I think that such an article should be prohibited by law; she thinks that the harder water boils the hotter it gets, while I do not; but beyond such small differences of opinion we have worked together harmoniously, and the reader can take it that the term "I" in the majority of cases is meant to mean "we."

I might add that I practice what I preach. I can go into a kitchen and cook as complete a dinner as almost any woman. I can make good bread, can vegetables, preserve fruits, make good butter, prepare all kinds of salads, or make mayonnaise dressing, and my little children eat my cooking in preference to their mother's. Such work is my recreation and I try to do it with the same cleanliness and system that I use in making a chemical analysis. And last but not least, I can wash up the dishes and keep the kitchen clean generally.

In my twelve years' sojourn in boarding houses, a common complaint made against me was that I could not be kept out of the kitchen. I tell this only to show

my interest in kitchen affairs, and do not wish to be held in any way responsible for the boarding house cooking.

So these words of advice to the housewife go out from one who does not think that he knows it all, from one who is willing to learn, and whose one redeemable quality is that he takes interest in the home and likes to "fix up" around the house.

OLD-FASHIONED THRIFT

I am a great believer in old-fashioned thrift. The man who makes two blades of grass grow where only one grew before, is only half a benefactor. An old adage says that such a man is worth the whole race of politicians, but, while this may be true, it is not saying any too much for him. One who produces and wastes is little better than one who does not produce at all. The habit of taking care of things that come your way is what I call old-fashioned thrift.

The average American farmer probably does not exist, as our great diversity in agriculture makes it almost impossible to draw an average, but the average farmer's wife does exist, and although she is probably more thrifty than her husband, and probably more so than her sisters in the city, she has yet to learn a few lessons in economy.

From actual statistics we know that, in a prosperous agricultural state like Ohio, after allowing the farmers 5 per cent interest on the money they have invested in their farms, that 60 per cent of them are making less

than their hired help—and this is one of the best states in the Union. My experience in Virginia makes me think that probably 90 per cent of the farmers there are not making any more than a living off of their farms. During the last year or two, owing to the abnormal price of foodstuffs and such articles as cotton, many farmers have made some money, but this does not represent average conditions, and is certainly not what can be expected in the future. I do not believe that the average American farmer, if such a person exists, is making more than a living off of his farm.

Now, the average housewife on the farm attends to the garden and produces enough vegetables to supply the family during the summer, she takes care of the chickens and sells eggs and her surplus stock, and she makes butter and sells what the family does not use. The average housewife feeds the family, and if it were not for her the average farmer would come out in debt every year. But the average farmer does not know this; my experience with him makes me believe that he thinks he is the most important person on the ranch. He does not keep books, he is not thrifty, and he underestimates his wife's part of the work upon the farm. No piece of labor saving machinery is too good for him, yet he seldom thinks that his wife would probably like to have a good range or a kitchen cabinet to lighten her work. If he is not prosperous with all of his advantages, he deserves little sympathy. My sympathies are with the housewife, and my interest in her welfare will, therefore, justify my criticisms of her. She is not systematic, she does not like to use her own judgment, she

likes to do things by rule of thumb, which is usually the longest and hardest way, instead of studying the "reasons why." She thinks she is economical when she is not; she wastes her time, her labor and her steps. She has come to look upon her task as mere drudgery instead of realizing that it is a noble calling. She is often discontented, thinking that drudgery is a part of a woman's duty, when it is not.

Now, the first sign of progress is a realization of one's own shortcomings, so, if the housewife will begin by realizing some of her mistakes, she is on the highroad toward the betterment of her condition. I am not yet a graduate in the school of useful experience myself. I am probably only a few lessons ahead of the average housewife.

Many housewives think they are economical, and so they may be, but comparatively few are thrifty. One can be economical in a few things and yet lack the essential principles of thrift. I know many women who have "pet economies." They economize with butter, with sugar or with bread, and yet manage to spend every cent their husbands make in foolish extravagance. Such economy is absurd and gives one a feeling of scarcity. Thrift is the elimination of waste. There are general principles, of course, that can be given, but as an applied science it is after all an individual problem. There can be no shifting of responsibility—a good share of the high cost of living rests with the individual housewife. With nearly all of us at one time or another we will have to be economical, either from choice or necessity. With me economy began with necessity and now it has become

a matter of choice, and, take it from me, it is much better to be economical from choice than from necessity.

I never saw a thrifty person in want in all my life. The well to do people are usually thrifty, and conversely the thrifty are well to do. You can drive by a farmhouse and tell whether or not the farmer is thrifty. Thrift carries an atmosphere with it that is unmistakable. The white-washed fences, the gates that are all on their hinges, the "trim" appearance of the place in general, speak of thrift. The lack of thrift is characteristic of poor people, and this fact is really what makes them poor.

I once had a neighbor in Virginia who was so poor that she always carried a look of poverty around with her, although her husband got good wages for a laboring man. Once I had occasion to employ this woman for a short time, and she had not been in my kitchen but a few days when I found out why she was so poor. She would peel away probably 30 per cent of a potato in preparing it for the table, she would forget and leave the food in the oven to burn, and do many other things that would bring poverty into any household. Her lack of thrift had made her poor and was keeping her in the same condition. She was an exaggerated type and would probably come under the head of "shiftless," and the cause of her poverty was easily seen, but with the housewife who is not actually in want, but who always seems a little "hard run," the "reasons why" are not so plain. She may work hard and have little, and this is often attributed to poor business management, when really it is only a lack of thrift. She probably would not peel

away 30 per cent of a potato, yet she would waste enough in small amounts to make the difference between plenty and scarcity. For example, she is making gravy. She goes to the flour bin and dips up a little flour, thickens her gravy and has a little flour left over. This she throws away and dusts her hands off on her apron, without even thinking that she is extravagant. The thrifty housewife would have put the left over flour back in the bin, and the housewife who combines both system and thrift would have had a dredge convenient even if she had been obliged to make it herself by punching holes in the top of a baking powder can, and so would have used only as much flour as was necessary. Thus many housewives seem to get along and to have plenty, although they may have very little money to spend. This is because they are thrifty in every little detail.

The negroes of the South, as a class, are lacking in thrift, and at one time or another nearly all of them are depending upon charity for subsistence. However, one sometimes stands out from among his brothers as a thrifty individual. These are usually of the old slavery time school. I have in mind an old negro on my farm in Virginia who never wasted a penny. He made no more than his brothers, yet, while they were begging for bread during the winter, he had plenty to eat, good clothes and a little money in the bank. He was thrifty and they were not; he took care of what he made, and they, in times of plenty, wasted more than their white employers.

As a nation the Chinese stand out as an example of thrift. Owing to the dense population and the hard

struggle for existence, thriftiness has become a national characteristic. At the present time an individual in China who is not thrifty will soon starve. Economy is born in them, and even upon coming to this country they never lose it. We Americans are the most extravagant people on earth, and while it may not be necessary, or even advisable, to imitate the Chinese in their manner of living, we can at least draw a lesson from them. They are economical from necessity, and it behooves us to be economical from choice, rather than to be forced to be so from necessity. We are at the height of our national existence, living is easy and now is the time to economize.

Cook no more than is necessary. The cook books are full of suggestions as to what to do with "left overs" when there should be no left overs. "Left overs" suggest waste. The housewife who cooks six extra potatoes for dinner with the expectation of frying them for breakfast the next morning is planning ahead, but the housewife who aimlessly cooks more than she needs of anything and has a little left over, will probably throw it into the garbage pail.

You could leave off your "pet economy" and no one would ever notice it. It makes little difference in the expense of the household whether you use three pounds of butter or three pounds and a half a week, and your economy in one detail only makes you ridiculous. Look ahead and exercise watchful care over all your expenditures.

In the present national food crisis it is the duty of every housewife to economize in whatever way she can, but after all it is the housewife on the farm who holds

the key to the situation. The average housewife in the city, whose husband is working on a moderate salary has probably economized all she can. The necessary expenses of a family in the city nowadays usually take practically all of the average man's salary and there is nothing left for extravagance, and has not been for a good many years. The city housewife can probably economize by cutting down the amount of food for the family, if this can be called economy, but this certainly will not amount to very much. However, the housewife on the farm can economize by saving that which ordinarily goes to waste, which in the aggregate will amount to enough to feed a considerable part of this nation.

It is said that the successful business man is the man who never wastes anything, and this saying applies equally well to the housewife, for housekeeping is a business. There is no need for anyone to want for the necessities in this life, as there is plenty here for us all. Be thrifty and avail yourself of it.

SYSTEM

Closely allied with thrift is system. While a housewife may be very systematic and yet be lacking in thrift, it is almost impossible to conceive of one possessing thrift and lacking in system. System alone is sometimes a poor quality to possess, and is oftentimes a bore, but when combined with thrift it is one of the most essential principles of good housekeeping.

By system is not meant the monotonous grinding out

of the regular duties of the household. The housewife who, with set determination, invariably does her washing upon Monday, her ironing upon Tuesday, and her other duties upon regulation days is not necessarily systematic. System does not mean sameness, as many household economists would teach. By system is meant a scientific adjustment of resources, time and energy. Routine is not system. A housewife may do her washing upon Thursday of one week, and if necessary upon Friday of the next week, and yet be systematic. The "reasons why" and not worn out traditions should be the governing principles of housekeeping.

System is often a measure of efficiency and it fits into housekeeping just as it does into business. A business that is not run upon a systematic basis is almost sure to fail. There are experts whose whole duty it is to systematize business. They command good salaries and it is quite customary for big concerns to make use of their services in order to get the most efficient work out of their employees. They aim to fit the different parts of an organization together, to systematize it and thus secure coördination in much the same way as a jeweler would fit together the running gear of a watch. In this way they eliminate useless work and wasted energy. A business may be dependent upon any number of outside influences, but to be successful it must be complete within itself and systematic. The business of housekeeping is a complete business and the different parts need adjustment and systematizing in much the same way as any other business. System, like thrift, should enter into the smallest details of housekeeping, there-

fore to the housewife it becomes an individual problem. The fundamental principles are, however, exactly the same, whether it is big business or plain housekeeping. The business man plans to get the maximum efficiency with the minimum amount of expense and the housewife should plan likewise. It has been my experience that system is the crying need of the American housewife.

In a properly adjusted piece of machinery there is no "lost motion," and the same might be said of a well regulated kitchen. Drudgery is but another name for "lost motion," and the only way to eliminate drudgery is to first eliminate "lost motion." The average housewife is not using her time or energy to the best advantage. The ability to plan ahead, to do two things at one time, to make one trip across the kitchen accomplish what two had done before—this will bring the so-called "swing" into the kitchen work and will eliminate drudgery or "lost motion."

Being an individual problem, it is almost impossible to lay down hard and fast rules for systematizing the kitchen. The balancing of accounts at the end of the week, or the hanging up of a slate in the kitchen for outlining the daily tasks, as is often advocated, may help some, but such schemes as these do not alone constitute system.

After all, system consists largely of three elements:

First—In knowing what you are trying to accomplish.

Second—In thinking about what you are doing as you go along.

Third—In knowing in advance what you are going to need.

These elements may seem a little abstract to some housewives, but they have an every day application. All three may be illustrated in the baking of bread. In the baking of bread the housewife should know some of the elementary principles upon which she is working, she should keep in mind that she is growing a yeast plant in her dough, that this plant is using up the sugar and starch of the flour, and is forming carbonic acid gas, that this gas is mixing with the dough and making it light, and that when enough gas has been generated to get the dough in the proper condition she must stop the growth of the yeast by heating the dough or baking the bread. She must not wait until the dough is ready to mold into loaves before preparing and greasing her pans, neither must she wait until the pans are ready to put into the oven before she builds a fire in the grate. She must know in advance what she is going to need and must have things ready. The housewife may do all these things properly in the case of the baking of bread, and yet fall down upon one of the same essential principles in some of the smaller details of housekeeping. It is an easy matter to give a long list of "don'ts," but housewives are somewhat like children, they seldom profit by "don'ts." Housewives and children need positive and not negative instructions.

My years of work in a chemical laboratory have taught me a few principles that all housewives should know. A chemist must have developed in him an appreciation of system, he must know how to do two things

at a time before he can hope to succeed. He must appreciate neatness, and must keep things clean as he goes along. He must know what he is doing and must understand the "reasons why" or else he will never do good work. A chemist who tries to work by rule of thumb will never get anywhere. Now, a kitchen is nothing but a chemical laboratory; you may not have the delicate balances, or the reagents to work with, but it is a chemical laboratory just the same, for all kinds of cooking, bread making, canning or preserving are but chemical processes. I do not mean to convey the idea that a woman must have a knowledge of chemistry before she can hope to be a good cook, but I do want to impress the fundamental idea of thinking what you are doing and of working intelligently.

I would build a kitchen upon the same plan as a chemical laboratory and run it upon the same principles. A good chemist will never let soiled dishes accumulate on his work table or in his sink; when he is through with a vessel he washes it out and hangs it up to dry. If the housewife would imitate him in this respect alone it would be a great help. Wash up the cooking utensils as you go along and hang them up out of the way. Have a place for everything and keep everything in its place. A chemist will never allow unnecessary things to accumulate in his laboratory, and the housewife should imitate him in this particular. Put everything out of the kitchen that does not belong there. Unless the housewife is continually on the alert, unnecessary things seem to have a tendency to accumulate in the kitchen and under her feet. One often sees kitchens where almost

one-half of the contents belong in the attic or in the barn. Everything, from old clothes to plow points, or pieces of harness, have been left there in the way of the cook. This is poor economy and only adds to the steps of the housewife. Clean out the kitchen and keep it clean.

Ordinarily a chemist adds enough of a reagent, an acid or an alkali, to get a reaction and never thinks of how much the recipe calls for. The methods or recipes are necessary, as they furnish a principle or working basis, but the little details are always left to the individual worker, and it is these little details that count for so much. In the same way a good cook adds her salt or her spices until she knows in reason that the dish is sure to taste good. It is said that the best cooks never use cook books—they think what they are doing. I have in mind a woman who was probably the best cook I ever knew. I don't believe she ever possessed a cook book, and she never followed a recipe. It was impossible to find out from her exactly how she did anything. "Oh," she would say, "I add a little of this and a little of that until I think it is properly seasoned." She seemed to have an intuition which told her what to do, but in reality she knew exactly what she wanted to accomplish and she was thinking about what she was doing. The few recipes that will be given hereafter do not necessarily represent the perfect way of doing things, and it is earnestly hoped that the housewife will use them as a working basis only, and use her ingenuity in improving upon them. I do not always follow my own recipes, but take "short cuts" whenever possible.

Study your housekeeping as you would any other subject. I do not mean that it is necessary for you to study how to kindle a fire or such details as are often put down in works on domestic science, as these are the A, B, C's that you should already know, but think more of the principles involved and work upon that basis. It is not a difficult matter to see the principle when once you look for it. There is a principle in everything you do, and it is these simple fundamentals that every housewife knows, but the knowledge of which she fails to use, that make such a difference in housekeeping. The very simplest piece of cookery, such as the boiling of an egg, has a principle involved. In this case it is largely a matter of heat penetration. When putting an egg into boiling water, make a mental note of its size, and this will give you an idea of the length of time required for the heat to penetrate to the interior. After a little practice, you will become adept and can tell almost exactly when to take it out in order to have it soft or hard boiled. Three minutes is not an invariable rule for cooking a soft boiled egg.

If a man should conduct his business as his father or grandfather did, the chances are that he would fail. He must keep up to date. What a successful business man wants is an idea, and he will work out all the details. The housewife should do likewise. A woman who will ask you how much salt you mean when you say, "Salt to taste," will never get anywhere in cookery unless she gets herself out of this habit.

Ordinarily I advise housewives to follow directions implicitly, for few of them are inclined to think what

they are doing. They are apt to be careless and will omit small but important details. Get yourself out of this habit, study the "reasons why" and it will save you many failures and many steps. Think more about what you are doing and less about what the recipe calls for. This is a part of good management as working by rote is poor system. Herein lies my greatest objection to cook books; they have a tendency to cause a woman to lose her individuality in cooking. The recipes are all right if properly used, but for general cooking they should be used as a working basis and the individuality of the cook allowed to assert itself. The commercial baker in his bakeshop must follow a recipe, for his great aim is uniformity in his product. He must control every condition possible in order to keep his bread the same day after day, but uniformity is not what we want in a kitchen. Did you ever notice that the cooking of a good cook tastes different every day? Try uniform cooking upon your children for a few days and see if they do not get tired of it. What we want in the kitchen is variety or the so-called "spice."

You will not have to sacrifice anything for system, for system brings order and comfort. Ask yourself if your management of your kitchen is really economical and systematic, and try out any schemes that suggest themselves that might improve it. System is something that may be acquired. If you are a poor manager and hard run, it is probably due to the fact that somebody is not systematic. Banish poverty from your home—you can do it with system and old fashioned thrift.

THE KITCHEN

Usually the least desirable room in the house is set aside for the kitchen. The architect of the home may spend much time in planning the parlor or living room of a house, overlooking entirely the fact that the greater part of the daily life of the housewife is spent in the kitchen. A convenient, well regulated kitchen will do much to insure the comfort of the family and therefore should receive first consideration in planning the home. The kitchen is the woman's workshop, and it has been truthfully said, "A smiling kitchen makes a happy cook."

The large, rambling kitchen of our grandmothers, with its big closets, storerooms and pantries, with its high ceilings and heavy oak beams stained with smoke, and with an occasional spiderweb, with its strings of onions and herbs hung from its walls, with its long rows of brass, copper and pewter saucepans and pots that required tremendous effort to keep clean; with its wide fireplace full of sooty hooks and cranes that hung from some mysterious place above, is a thing of the past.

There was another kitchen of the olden times, common throughout the South, a little one-room cabin built of logs, situated under the shade of some big tree, at least fifty yards from the "big house," and usually presided over by a colored cook almost as large as the cabin itself. She was queen of her domain and was held in awe both by the mistress and by the younger generation. It was around this kitchen door that the little

slave babies from the "quarters" down by the spring played and were "looked after" by "Black Mammy," while their own mothers wove homespun in the attic of the "big house." Here, too, was the gathering place of the grown-up negroes from the plantation on moonlight evenings. This kitchen has long ago tumbled down, and exists only in romance. It was practical in its day and had many good features to justify its existence.

With our grandmothers housekeeping was a business. They usually had plenty of help, and time then was not considered as valuable as it is today.

At the present time most housewives are forced to do all or a part of their own work, hence the development of the modern kitchen. The kitchen of today should be convenient, well lighted, well ventilated, easy to keep clean, comfortable and attractive. It often has to serve both as dining room and sitting room, therefore it should be cheerful. A well appointed kitchen should be the most attractive room in the house, and not merely the place where the cooking is done and where the dishes are washed.

The writers on domestic economy in recent years, almost without exception, advocate a small, compact kitchen. Theoretically this is all right, as it saves a housewife steps, and step-saving is the keynote of the modern kitchen. It must be remembered, however, that steps may be saved without sacrificing room, light or ventilation. By arranging a large kitchen so that the conveniences in most common use are placed as near together as possible, the housewife can economize steps and still have the freedom of the rest of the room. There is a

feeling of luxury and a suggestion of comfort in a big, roomy kitchen, that is cool in summer and warm in winter. It is almost impossible to ventilate a small kitchen well enough in summer to keep it cool. I prefer to cling to the old style of the big room with the high ceiling that reminds one of the old-time kitchen on the farm. My kitchen is 16 by 20 feet, with a 9-foot ceiling, and it is not any too large. There are times in the summer, during the rush of work of the canning season, when nearly all of this space is needed.

A few years ago I bought an old plantation in Virginia. The dwelling house and outbuildings were characteristic of an old, run-down farm, and it took a person of somewhat optimistic frame of mind to see the possibilities of making the farmhouse habitable. However, as I had spent part of my early life in somewhat the same kind of a house, I knew it was possible to live in it. It is sometimes cheaper to pull down an old house and put up a new one in its stead, but to me there was something fascinating about remodeling that old house, and I did it. It was during this work that I got my first experience in arranging a kitchen upon scientific lines, and when it was all over I was a little bit proud of my efforts. I found it was possible to have as neat and as convenient a kitchen in the country as in the city.

All who try to remodel an old kitchen will find that difficulties will arise, due to previous construction, that will make it practically impossible to follow out the original working plan and make a perfect job of it. I found this so and therefore the reader will have to pardon me if I theorize in some respects in order to make the working plan coincide with what really happened.

Fig. 1 represents the working plan of my remodeled kitchen. Previous to the rearrangement it was a fair representative of the ordinary farm kitchen, in which little thought had been given to convenience. The stove was in the center, and the other pieces of furniture scattered about the room, which involved miles of steps during the preparation of a meal. Fortunately the kitchen here had the right exposure, facing the north, thus allowing the windows on the east and west sides to furnish an excellent cross draft.

The floor which, preferably, should have been of hardwood, was covered with linoleum, which is without doubt the best floor covering for the kitchen, the only objection being that it seems cold to stand on. This was obviated by placing a few washable rag rugs where there was much standing to be done.

For the walls a wainscoting, painted a light brown, three feet high was put in. The space above the wainscoting, as well as the ceiling, was painted a light buff with enamel paint. This may be readily washed or cleaned with a wall broom. The color of the kitchen wall should be determined by the amount of light in the room. Very dark kitchens require light walls and ceilings, while very light kitchens may be painted in darker colors.

The windows were thirty-four inches above the floor. They were extended to the ceiling and arranged to pull down from the top. When heated, air always expands and therefore rises and, ordinarily, accumulates against the ceiling. If the windows do not extend all the way up a pocket is formed against the ceiling, which often

gets over ten degrees hotter than the lower part of the room. By extending the windows upward and pulling down the sashes, a cross draft will sweep the heated air out and keep the kitchen cool. The odors of cooking also escape in this way. Roller shades and screens of a good quality were placed at the windows. The outside window, near the sink and drain board, was designed to give light for the dishwashing. Above the sink is another window, opening into the pantry, and closed with a glass slide, at the base of which is a shelf wide enough to hold the dishes that come in from the dining room to be washed and returned to the pantry shelves.

The doors between the dining room and kitchen were made to swing both ways and each had a small glass panel placed in the center. They may be easily opened by any one with both hands full, while the glass panels prevent collisions, by enabling persons to see one another when going in the opposite direction.

The range was then moved over to the side next to the dining room, and a sink and kitchen cabinet placed in the positions shown in the diagram. Many of the conveniences which will hereafter be mentioned were then installed, but the fundamental idea of the rearrangement was the placing of those conveniences that are in most common use, the range, sink and cabinet, close to the dining room door and as close together as possible.

Whether or not a house is supplied with running water, a sink is one of the necessities of the kitchen. The galvanized iron sink, with one hundred feet of drain pipe in the house costs only \$6. A porcelain lined or

enameled sink, while a little more expensive, is much more desirable. The plumbing below the sink and drain

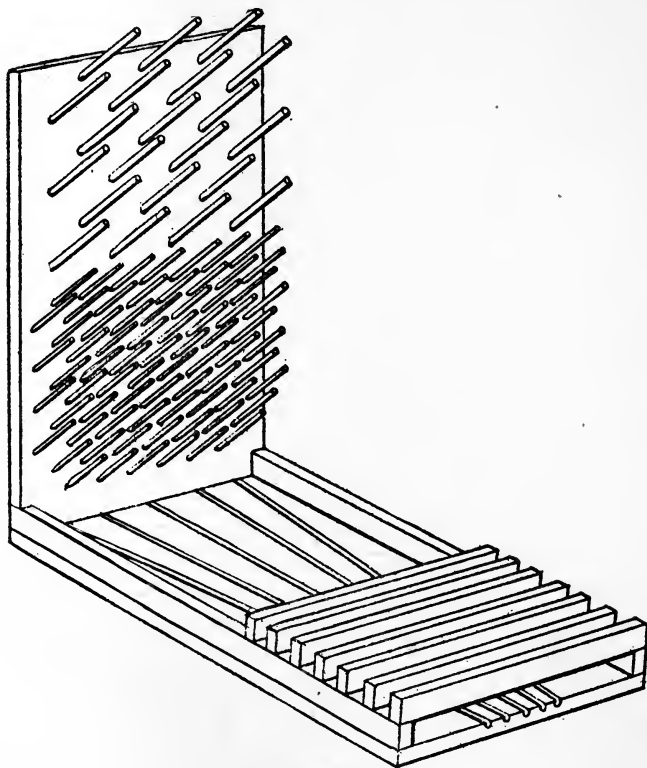


Fig. 2

board was left open to avoid furnishing a hiding place for bugs and a place for dirt to collect. It has been

my experience that water bugs and roaches will not come into a house unless they have a place to hide. A 3-inch terra cotta drain pipe led to a small cesspool about one hundred feet away. On the right of the sink were installed a drain board and drain rack, see Fig. 2. This simple little fixture probably saves more work than any other one of the smaller items of the kitchen. I made it myself in a very short time, with very little expense. It was devised as a substitute for the familiar dish cloth. The upright board or rack is fitted with a convenient number of pegs upon which cups, glasses, bowls, etc., are hung to drain. The lower board is fitted with grooves to carry off the water, which drains from the dishes. On either side is a narrow strip and across the bottom are nailed other strips, one inch wide and one inch apart. The plates, saucers and other flat dishes may be taken from the hot rinse water and placed between the cross strips of the board in an almost upright position. The hot dishes will drain readily and dry in a few minutes. This will eliminate the tiresome process of "drying the dishes." This is another item that I learned in the chemical laboratory; you will never see a chemist using a cloth to dry his dishes. A shallow wire basket, designed to hold knives, forks and spoons, was purchased for 10 cents and nailed to the wall above the drain board and out of the way of the other dishes.

What the plow is to the farmer, the cook stove is to the housewife. In furnishing a kitchen, therefore, the first consideration should be given to the stove or range. There are so many good stoves upon the market that it is usually an easy matter to find one that is well

adapted to the needs of any particular kitchen. The value of the stove depends largely upon the efficiency of its use and the economy of fuel. Some of the large ranges are so well constructed and insulated that they require less fuel than the smaller stoves and at the same time give out less heat into the room. Other considerations being equal, a large range should be selected in preference to a small one. There is a feeling of comfort in always having plenty of room in the oven and on top of the stove. My range is 32 by 36 inches. A hood made of sheet iron was placed over it to carry off the odors and smoke of cooking and the heat of the range. This necessitated an extra flue in the chimney. Care should be taken to avoid reducing the size of the pipe of a range. A range fitted to carry a 7-inch pipe with an ordinary draft may be reduced to a 6-inch flue, but it is never safe to reduce one of 7-inch dimensions to five inches or less. Many of the troubles the housewife has with her range can be traced to this cause.

The hot water tank, which is usually a collector of dust both on the top and underneath, and is always hard to keep clean, was inclosed in a little cupboard, a small door only being left at the side.

The roomy provision closet has a large window on one side and all the rest of the wall space was fitted with strong shelves, from three feet above the floor up to the ceiling. In this closet can be kept a supply of potatoes, a barrel of flour, and a barrel of apples, and a supply of canned fruit and vegetables.

The cold box outside of the provision closet window can be used in place of the refrigerator for a great part

of the year. Cooked vegetables keep better in a well ventilated box than in a refrigerator. This box is really only a frame of wood covered with ordinary wire screen. This is an improvement on the old fashioned safe that used to sit up on high legs under a tree out in the back yard. The box rests on a shelf and is fastened to the window sill with two stout hooks. It can be taken down occasionally and scalded out. The lid is made of zinc, fits tightly and is fastened down with a hook. Food placed in this box is, of course, always covered.

The work table is 40 by 72 inches and is covered with zinc, which is easily cleaned, and hot cooking utensils may be set upon it without any danger of burning. It is fitted with casters, so that it may easily be rolled back and forth the length of the room. The convenience of casters on the kitchen table will be a surprise to most housewives. A set can be bought for 25 cents and put on in a few minutes. During the summer the table can be pushed over near the windows and the dinner prepared away from the heat of the stove and in a better light. During the canning season the fruits and vegetables may also be prepared with the table near the windows and, when everything is ready for cooking, it may be pushed over near the stove. The height of this table is thirty-four inches, as this was determined to be the most convenient height for the person who was to use it.

All kitchen shelves should be inclosed, thus keeping everything out of sight and out of the dust. The built-in cupboard in my kitchen is 24 by 96 inches and has upper and lower compartments, each equipped with a

separate pair of doors which open outward. If sliding doors could be guaranteed in a kitchen they would be found to be a great convenience, but the heat and steam of cooking is almost sure to cause such doors to swell and stick, therefore it is best to dispense with them in the beginning. This cupboard has ample proportions. The kitchen utensils are stored in the lower compartments and the kitchen crockery and small items of kitchen equipment are stored in the upper compartments.

The safe was placed in the corner of the room farthest from the heat of the range. As this is made of perforated tin and well ventilated, much of the cooked food, crackers, the cooky box and the jam for the children's lunches are kept in it.

The kitchen cabinet was placed between the two big windows on the side of the room next to the sink. Here the housewife can sit on a high stool and prepare the greater part of each meal. The modern kitchen cabinet is designed primarily to save the housewife time and labor and to keep her off her feet as much as possible. The "handy man around the house" can make one with very little expense. In the cabinet are stored all the materials for the baking of bread, cakes and pies. The flour bin is there with its rotary sifter, and the sugar bin, the spice jars and the rack of flavoring extracts, the coffee, tea, baking powder and rice, as well as the bread board and rolling pin. At one side are the linen and cutlery drawers and the metal bread box, while underneath is a closed space for the aluminum and lighter cooking utensils.

The utility closet at one end of the butler's pantry

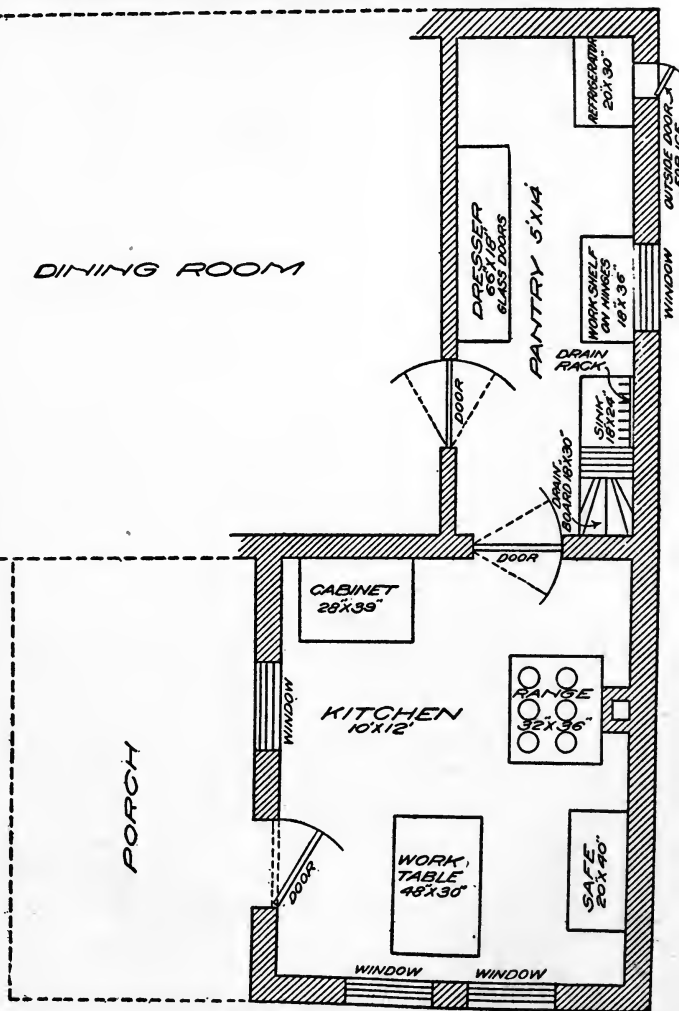


Fig. 8

was designed to hold brooms, aprons, dust pans and the like. The refrigerator was placed at the other end of the pantry, close by a window. If desired it can be filled with ice through the window above it. Opposite the refrigerator is a closet with glass doors for the dining room china.

This remodeled kitchen (Fig. 3), while perhaps not perfect in every detail, represents very closely my idea of what a kitchen should be. I did nearly all of the work myself at odd times, upon holidays and whenever I could spare the time from my regular work. I advise every housewife to consider her own needs and study the possibilities of her own kitchen. Nearly every kitchen can be improved without a large outlay of money. The kitchen on the farm can be made just as convenient and just as attractive as the kitchen in the city.

A SMALL KITCHEN

To many housewives a kitchen 16 by 20 feet seems entirely too large. For a bungalow or a house for a family of two or three, a smaller kitchen might be more convenient. The floor plan of a convenient small kitchen is shown in Fig. 3. Here again the idea of keeping the range, the cabinet and sink as near together as possible is carried out, the sink in this case being in the pantry. The work shelf beside the sink is on hinges to allow it to be let down out of the way when not in use. The refrigerator at the end of the pantry has an outside door. It is usually best, especially in a small kitchen, to have all cupboards and shelves built into the walls.

EQUIPPING A KITCHEN

The best equipped kitchen is not necessarily the one that contains the greatest number of the so-called labor saving devices. Many of the small patented articles advertised so extensively at the present day and advocated by the "Household Guides" for use in the kitchen are impractical. They run up the expense and detract from one of the fundamental ideas of the kitchen—simplicity. The best way for the housewife to peel a potato, for example, is in the old-fashioned way, with a knife, and not with a patented potato peeler. At the recent Panama Pacific Exposition, a model bungalow was built and equipped for two persons. In the kitchen of this little bungalow was a dishwashing machine that would have done credit to a moderate sized hotel. It is not such labor saving machines as this, but the simple little inexpensive conveniences that work themselves into every day use. For example, a 5-cent stiff brush for cleaning saucepans and kettles, a strainer fastened securely in the sink to prevent crumbs from stopping up the drain pipe, an asbestos pad for picking up the hot cooking utensils, or a wooden spoon for use in cooking vegetables—many such things as simple as these, which may be made at home or purchased for 5 or 10 cents, become almost indispensable after the housewife has become accustomed to their use. One-half of the articles outlined in the long list of the "Household Guides" are either not necessary or are not practical.

Aluminum is without doubt the best material for

kitchen utensils. For most purposes it is as far superior to enameled ware as enameled ware is to the old-time iron or tin. It is light and attractive and easy to keep clean, and most housewives who have a supply take pride in their aluminum and experience genuine pleasure in keeping it bright. It is true that the initial cost is a little high, but considering the amount of wear that it gives it is the most economical. I purchased my first piece of aluminum, an 8-quart preserving kettle, ten years ago. This has been in constant use ever since, and it is as good now as it was the day it was bought. It cost \$1.25, and an enameled kettle of the same size would cost about 75 cents and would wear out in about two years with hard usage.

The housewife is not advised to discard all enameled or tin kitchen utensils and replace them with aluminum at once, but when a piece of enameled or tin ware wears out, it is well to replace it with aluminum. The expense then will not be felt and in a few years she will have a full supply of aluminum. The old-fashioned black iron frying pans and muffin rings, polished on the inside or worn smooth by long usage, are, however, superior to aluminum ones. A good pair of scales in the kitchen will pay for themselves in a short time. An open-faced clock, in addition to being a step saver, will add cheeriness to the room. Keep a supply of red and black pepper, salt and a flour dredge on a shelf near the range, convenient for use while cooking.

Every housewife knows her individual needs better than anyone else and does not need to be told of them, but, as I have said before, she has not thought seriously

of her own convenience, she is not systematic, and insists upon doing things in the longest and hardest way. Systematize and study your needs. You can afford the little conveniences that mean so much in the way of time and steps. Even with the things already on hand a little planning and rearrangement will work wonders.

CANNING VEGETABLES

Probably no one item in kitchen management means so much to the housewife, not only with respect to economy, but to health and general good living, as the canning of vegetables. A healthful diet must include vegetables. The housewife knows this and to keep her table supplied during the winter months is one of the hardest problems that she has. What can I have for dinner today? is a question often heard. In the summer time when there are plenty of vegetables out in the garden, her troubles are few in this respect, but when the winter comes on she wants a nutritious dinner for her husband and her children. I know from experience that her pantry, at this season of the year, is not over supplied, and it is no wonder that she often asks herself this question.

In order to insure an abundance of vegetables for last summer's use from her garden she probably planted twice as much as she really needed. The surplus that was not given away went to waste. I have seen it demonstrated a great many times that enough vegetables annually go to waste from a garden to supply the table

during the winter. But usually the housewife cans a few tomatoes, preserves some fruit and leaves her most nutritious vegetables to decay in the field, under the impression that it is impossible to keep them. This is a great mistake. It is just as easy to keep sweet corn, string beans or English peas as it is to keep tomatoes, if only you go about it in the right way. Every housewife should run a miniature canning factory in her own kitchen.

Here again I will say that I practice what I preach. For a good many years my wife and I have canned for each winter over a thousand quarts of fruits and vegetables—mostly vegetables. Every vegetable that grows in our latitude and is served cooked is canned at our house. It is so easy and is becoming easier as time goes on, and we develop more system. We do not lose one jar out of a hundred, and every housewife can do equally as well, if not better.

My garden is less than three-quarters of an acre, yet it supplies us with vegetables during the summer season and gives us an ample surplus for canning. It is wonderful how much can be produced upon a little space of ground if it is properly managed. Miss Salina Smith, one of the girls in the club work of the Department of Agriculture, canned over a thousand cans of tomatoes from one-tenth of an acre. In the summer season there is always something to can upon the farm and the best kind of economy that I know of consists in taking care of these products that would ordinarily go to waste. Exercise a little foresight and store up things in the time of plenty.

While there need not be any especial rush during the canning season, all the vegetables must be canned as they come along. You will have to put other things aside if you are to can successfully, for when vegetables are ready they should be canned. It is poor economy to delay until they are old or half spoiled.

A man can help his wife so much in this way. Many times have I come home from work in the afternoon and gathered, prepared and canned as much as twenty quarts of vegetables. Of course with some vegetables I could not work so rapidly, but with such things as tomatoes or beets, there is very little labor involved. These were canned and sterilized while my wife was cooking supper. They were seasoned and, of course, well cooked in the process of canning, and were set away in the store-room, ready to be opened and served upon ten minutes' notice.

About ten years ago I stopped eating meat, not from religious or sentimental reasons, but on account of my digestion. My diet was largely restricted to vegetables, and in the winter I found great difficulty in getting such as were palatable and nicely canned. My sympathies still go out to the people who have to live out of tin cans. I could can tomatoes and fruits, but when I tried string beans and okra I made a failure. A majority of housewives have had this same experience. One day in my laboratory I noticed a scientist sterilizing some material that he intended to use for cultures to grow bacteria in. I noticed that he stopped up the little tubes containing the material with cotton and heated them up to the temperature of boiling water for thirty minutes on one day,

waited until the next day and heated them another thirty minutes. I inquired why he gave the tubes two heatings and he explained it to me.

I saw the possibility of applying this system to the canning of vegetables, and since that time I have not had to depend upon the canning factory for my winter supply. I wrote up my experience for the benefit of others, and this was the beginning of the canning work in the Department of Agriculture.

The art of canning or preserving, in one form or another, is almost as old as history itself. The Chinese possessed this secret long before the era of modern civilization. They sterilized their fruits and vegetables and made preserves and jellies, but the "reasons why" which lay back of the art have only been recently explained.

STERILIZATION

The great secret of canning or preserving lies in what is known as complete sterilization. The air we breathe, the water we drink, all fruits and vegetables, are teeming with minute forms of life which we call bacteria, or molds, or germs. These germs are practically the sole cause of decomposition or rotting. The exclusion of air from canned articles, which was formerly supposed to be so important, is unnecessary, provided the air is free from germs. The exclusion of air is necessary only because in excluding it we exclude the germs. In other words, air which has been sterilized or freed from germs by heat or mechanical means can be passed continuously

over canned articles without affecting them in the least. If a glass bottle is filled with some vegetable which ordinarily spoils very rapidly—for instance, string beans—and, instead of a cork, is stoppered with a thick plug of raw cotton and heated until all germ life is destroyed, the beans will keep indefinitely. The air can readily pass in and out of the bottle through the plug of cotton, while the germs from the outside air can not pass through, but are caught and held in its meshes. This shows that the germs and their spores or seeds are the only causes of spoilage that we have to deal with in canning.

Germs which cause decay may be divided into three classes—yeasts, molds and bacteria. All three of these are themselves plants of a very low order, and all attack plants of a higher order in somewhat the same way. Every housewife is familiar with the yeast plant and its habits. It thrives in substances containing sugar, which it decomposes or breaks up into carbonic acid and alcohol. This fact is made use of in bread making, as well as in the manufacture of distilled spirits. Yeasts are easily killed, so they can be left out of consideration in canning vegetables. Molds, like yeasts, thrive in mixtures containing sugar, as well as in acid vegetables, such as the tomato, where neither yeasts nor bacteria readily grow. Although more resistant to heat than yeasts, they are usually killed at the temperature of boiling water. As a general rule molds are likely to attack fruits, jellies and preserves, and are not concerned with the spoiling of canned vegetables. The spoiling of vegetables is due primarily to bacteria.

Bacteria are also much more resistant to heat than yeasts. They thrive in products like milk and in meats and vegetables rich in protein, such as peas, beans, etc. All known species of molds require air in which to work. This is not true of bacteria, certain species of which will live and cause vegetables to decompose even when no air is present. When these particular species are present the exclusion of air is no safeguard against decay, unless the vegetable is first thoroughly sterilized. Bacteria are so small that they can only be seen with a microscope, and they reproduce themselves with amazing rapidity. One bacterium, under favorable conditions, will produce about twenty millions in the course of twenty-four hours. Accordingly certain vegetables spoil more rapidly than others, because they furnish a better medium for bacterial growth.

The reproduction of bacteria is brought about by one of two processes. The germ either divides itself into two parts, making two bacteria where one existed before, or else reproduces itself by means of spores. These spores may be compared to seeds of an ordinary plant, and they present the chief difficulty in canning vegetables. While the parent bacteria may be readily killed at the temperature of boiling water, the seeds retain their vitality for a long time even at that temperature, and upon cooling will germinate, and the newly formed bacteria will begin their destructive work. Therefore it is necessary, in order to completely sterilize a vegetable, to heat it to the boiling point of water and keep it at that temperature for about an hour, upon two successive days, or else keep it at the temperature of boiling water for a

long period of time—sometimes as much as five hours. The process of boiling upon successive days is always employed in scientific work and is the one I always use, except with such vegetables as beets, which are very easily sterilized. The boiling on the first day kills all the molds and practically all the bacteria, but does not kill the spores or seeds.

As soon as the jar cools these seeds germinate and a fresh crop of bacteria begin to work upon the vegetables. The boiling upon the second day kills this crop of bacteria before they have had time to develop spores. Among scientists this is called fractional sterilization, and this principle constitutes the whole secret of canning. If the housewife will only bear this in mind she will be able, with a little ingenuity, to can any fruit or vegetable.

Even after sterilization is complete the work is not yet done. The spores of bacteria are so light that they float about in the air and settle upon almost everything. The air is alive with them. Therefore it is necessary, after sterilizing a jar of vegetables, to exclude carefully all outside air. If one bacterium or one of its spores should get in and find a resting place, in the course of a few days the contents of the jar would spoil. This is why the exclusion of air is an important factor, not because the air itself does any damage, but because of the ever present bacteria.

I advise every housewife to read this chapter over and study it until she thoroughly understands what it means. When she does understand, it will throw much light upon many experiences that she has had before.

She will know why it is that she has been able to keep tomatoes and has failed with lima beans or sweet corn. Tomatoes contain only a few molds, while sweet corn has some of the most resistant bacteria.

PRESERVING POWDERS

I am often asked about the so-called preserving powders. There are a great many such powders on the market and they usually do what is claimed for them, that is, they prevent the decay of the fruit or vegetable. Recipes for such powders are sold by agents and peddlers throughout the country. In the directions for use the housewife is told to fill the jar with the fruit or vegetable to be canned, to cover with water and to add a teaspoonful of the powder. They usually consist of benzoate of soda, boric acid, salicylic acid, or some preservative of that nature. While I am not afraid to use them myself, I certainly would not feed to my children vegetables that had been preserved in them. They encourage careless and uncleanly work, and it is a "lazy man's" way of doing things and it does not pay. The proper way to can vegetables is by heat, and this can be done so easily that I never recommend preserving powders.

Before the National Pure Food and Drugs Act went into effect in 1906, it was a common practice for commercial canners to use some kind of preservative, especially for ketchups, pickles, relishes, etc. Now, however, if they use anything they must so print it upon the label and the housewife is thus protected. It can be said that few first class canners are now using preservatives. I

advise every housewife in buying canned articles to always read the labels and to refuse any article that contains benzoate of soda or any other form of preservative.

A GOOD JAR

The first requisite for home canning is a good jar. At the present time glass is much more economical than

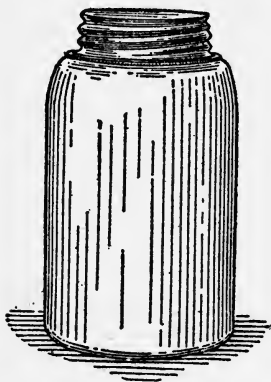


Fig. 4—Ordinary screw-top jar.



Fig. 5—Improved screw-top jar.

tin, as No. 3 tin cans are now retailing at 90 cents a dozen. As it is advisable to use these only once, this price makes their use in the home entirely out of reason. The housewife who has to buy canned vegetables in the near future is likely to feel this increase in the price of tin. Vegetables put up in tin are less attractive than when put up in glass. This is quite an item to every

housewife who takes pride in the appearance of her "canned stuff."

There are a great many kinds of glass jars on the market, many of them possessing certain distinct points of advantage. The ordinary screw top, or Mason jar, is the one in most common use (Fig. 4). Although cheap in price, these jars are the most expensive in the long run. The tops last only a few years and, being cheaply made, the breakage is usually greater than in

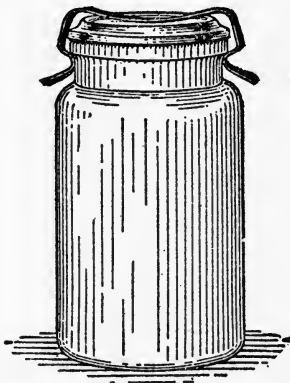


Fig. 6—Jar with metal lacquered top.

that of the better grade of jar. The tops also furnish an excellent hiding place for germs, which makes sterilization more difficult. I never advise canning any vegetable except tomatoes in Mason jars. If you already have a supply it is best to use them for tomatoes and fruits, and to buy a more improved kind for vegetables. An improved type of screw top jar is shown in Fig 5.

These are fitted with a glass top held in place by a metal cover which screws down over the neck of the jar. If the canning or sterilization is done properly, practically all of the air will be driven out of the jar by the steam. Upon cooling this is condensed, a vacuum is formed on the inside which clamps down the glass top against the rubber ring and seals the jar automatically. The metal cover can then be removed, as the pressure of the outside air will hold the glass top securely in place.

Another type of jar in common use is shown in Fig. 6. These require no rubber rings, but are fitted with a metal top, lacquered on both sides and having a groove around the lower edge. This groove contains a composition of the consistency of rubber which is softened during the canning process and forms a seal that takes the place of the rubber ring. These metal tops must be renewed each year, as it is necessary to puncture them in order to open the jar. I have used them but do not like them.

The most satisfactory jar that I have had any experience with is the one shown in Fig. 8. This has a rubber ring and glass top which is held in place by a simple wire spring. There are several brands of these jars on the market, so no difficulty should be experienced in obtaining them.

The best quality retails at from 85 cents to \$1 a dozen for quarts, or about \$8 a gross. The initial expense may, therefore, be somewhat high, but with proper care they will last a great many years. The annual breakage should be less than 3 per cent on the average.

The breakage during the canning process is usually greater the first year than thereafter, as jars that have small cracks or are poorly tempered, break when they first get hot. Those that go through the first season will last almost indefinitely if properly taken care of.

The rubber ring is another important item. The most expensive kind are not necessarily the best. I prefer black rings to white ones. We get little enough genuine rubber in any of them, and the white rings have usually been more thoroughly bleached out or have had more cheap material worked into them. A good ring will not come to pieces or lose its elasticity during the canning process. It should never be used but once.

In selecting a jar, always give preference to those having wide mouths. In canning whole fruit or vegetables and in cleaning out the jar the wide mouth will be found decidedly preferable. When buying examine every jar, take off the top and run your finger around the under edge; if it has the smallest crack or broken place, reject it. In canning you might as well leave off the top entirely as to have an opening in it even as small as a pin point.

CONTAINER FOR STERILIZING

In all methods of canning, some form of sterilizer must be used. To be able to do with the things she already has on hand is an important item to the housewife. Almost every one has a tin clothes boiler, and this can easily be converted into a convenient sterilizing

vat. The only things necessary are a tight-fitting cover and a false bottom, as is shown in Fig. 7. A false bottom is absolutely necessary in order to prevent the jars from coming in contact with the bottom of the sterilizing vat, causing them to break during the boiling. For this purpose I use an ordinary No. 16 wire netting of one-half

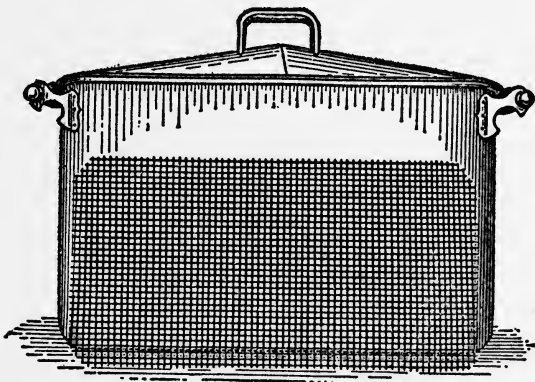


Fig. 7—A tin wash boiler with a false bottom made of wire netting, used as a convenient sterilizer in canning.

inch mesh, which is cut to fit the bottom of the boiler. If the netting can not be had, thin pieces of wood tacked together, or almost anything of this kind, will answer the purpose. If a clothes boiler is not available, a deep saucepan or a bucket with a tight fitting cover will answer equally as well. I have found that rubbing the inside of the boiler with a cloth and a little cooking oil will prevent rusting in a great measure.

HOME CANNING OUTFITS

During the last few years, since the Department of Agriculture has taken up such extensive work on home canning, a great many kinds of small outfits, suitable for use on the farm, have been developed. These can be bought at prices ranging from \$6 to \$20. If tin cans are to be used, or if much canning is to be done for market, one of these small outfits is essential, but I have never felt the need of them in canning for home use. The old clothes boiler that has gotten a little rusty, with a chicken wire false bottom, is good enough for me. However, if any housewife is interested in buying one of these outfits, she can obtain the names and addresses of the principal manufacturers by addressing the Department of Agriculture, Washington, D. C.

SELECTION AND PREPARATION OF VEGETABLES

To be successful in canning one must use care and thought in every detail. Vegetables are better if gathered early in the morning while the dew is still on them. If it is impossible to can them immediately, do not allow them to wither, but put them in cold water or in a cold, damp place where they will keep crisp until you are ready to use them. Never attempt to can any vegetable that has matured and commenced to harden, or one that has begun to decay. As a general rule, young vege-

tables are superior in flavor and texture to the more mature ones. This is especially marked in such vegetables as string beans, okra, asparagus and corn. Experience will soon teach you at what stage your vegetables should be gathered for canning.

In the following pages are given directions for canning some of the more common vegetables, but the housewife can add to them at will. The principles of sterilization are the same for all meats, fruits and vegetables. These directions apply to quart jars.

ENGLISH PEAS

When prepared and canned in the proper way, peas are easily kept and never lose the delicate flavor they possess when fresh. Shell the peas, wash and pack them in the jars and add salt to taste, a light teaspoonful to each quart is sufficient. Fill up the jars with cold water, put the rubber rings on the necks of the jars, and place the glass tops on loosely, as is shown in Fig. 8. Be careful not to press down the springs at the side of the jars. Place the wire false bottom in the boiler and put in as many jars as it will conveniently hold. Pour in about three inches of cold water, or just enough to form steam and to prevent the boiler going dry during the boiling. It is not necessary to have the water up to the neck of the jars, as the steam will do the cooking. Put the cover on the boiler and set it on the stove. Bring the water to a boil and keep it boiling for one hour and a half. At the end of that time remove the cover from the boiler and

allow the steam to escape. Press down the springs at the side of the jars, which clamp on the tops, as shown in Fig. 9. This will prevent any outside air from getting in. The jars can now be removed from the boiler and allowed to stand until the next day. In removing the jars from the boiler be careful not to expose them to a draft of cold air, as the sudden change in tempera-

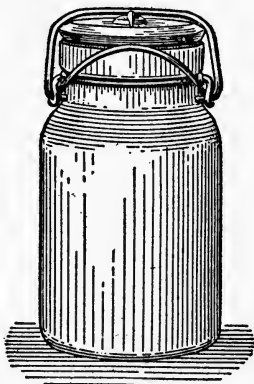


Fig. 8

ture is likely to crack them. It is best to stand them on a cloth and cover them over with one until they are cool.

On the second day raise the springs at the side of the jars, place them in the boiler, and boil again for one hour, clamp on the tops and remove from the boiler. If properly done, the peas will now keep indefinitely, and I defy anyone to tell the difference between those canned in this way and the fresh article. After the sterilization is complete the jars may be set aside for a

few days and then tested. This is done by releasing the spring from over the top and picking up the jar by the top, as shown in Fig. 10. If there has been any decomposition, or if the sterilization has not been prop-

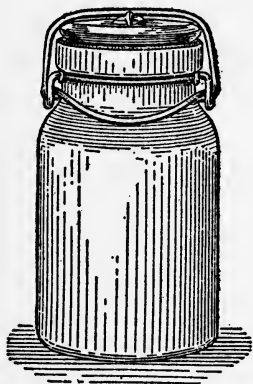


Fig. 9—Position of spring after sterilizing.



Fig. 10—Manner of testing.

erly done, the top will come off. During the boiling process, the outside of the jar is filled with steam; when the top is clamped on and the jar cooled, this steam is condensed and leaves a vacuum inside the jar. Now the weight of the air, or atmospheric pressure, is about fifteen pounds for every square inch, so, as there are about four square inches of surface upon the top of the jar, there is an inward pressure of nearly sixty pounds.

If you have not used a leaky rubber, or a defective jar, and the top comes off when you test it, it means that sterilization has not been complete—that probably a few bacteria were left in and these have multiplied and formed enough gas to release the pressure from the outside. If the top does not come off, you can be reasonably sure that the peas are going to keep, and they can be set away. Three pounds of average sized peas will shell out enough to fill a quart jar.

As a general rule I use the system of fractional sterilization, or boiling upon two successive days, and I always advocate it. However, some housewives prefer to do all of their sterilization at one time. In this case put the jars into the boiler, as has been described, and boil for two hours and three-quarters. Take off the top of the boiler, and press down the springs which clamp on the tops of the jars. Don't let any outside air into the jars and the sterilization will now be complete.

In counting the time of boiling, begin when the water begins to boil. If some of the water boils out of the jars during the process it will make no difference. Never open a jar in order to fill it up with water. The space inside the jar is almost a vacuum and it is saturated with moisture, and therefore the vegetables can not dry out. If you are using the screw top jars, begin with the tops screwed on lightly, and boil for two hours and three-quarters, screw down the tops and remove from the boiler. If you ever have any trouble with any vegetable a safe rule is to increase the time of boiling.

Sterilization depends to a great extent upon how rapidly the heat penetrates the jar, and the housewife

should always bear this in mind when canning the different vegetables. If a quart jar is filled with cold water and set in a vat of boiling water, its temperature will run up very rapidly, and in about twenty minutes the water inside the jar will be about as hot as the water in the vat. However, if the jar is filled with a thick substance like starch paste, for example, it will take over two hours for the center of the jar to reach the temperature of boiling water. In canning peas, beans and vegetables of this kind, there is always plenty of water around the vegetable, and this can move inward freely and carry the heat with it. But with such vegetables as corn, which is apt to form a rather thick, pasty mass, there are no currents of water to carry the heat inward, therefore the heat will penetrate the jar very slowly. As it is absolutely necessary with most vegetables to have the center of the jar reach the temperature of boiling water and be held at that temperature for some time, the rapidity of heat penetration must be always kept in mind. If your vegetables are thick and pasty when packed in the jar, increase the time of boiling.

STRING BEANS

Select young and tender beans, string them and break into short lengths. Put them into a saucepan of water, bring to a boil and boil for a few minutes. This will "blanche" them, that is, it will remove the strong tasting, gumming material from the surface. Pour off the water and pack the beans into the jars, cover with

fresh water, add a teaspoonful of salt to each quart jar. Put on the rubber rings and tops and boil for one hour upon two successive days, as has been described under English peas. A small pod of red pepper placed in the bottom of the jar will add much to the flavor of the beans. String beans do not take as long to sterilize as corn. When wishing to complete the sterilization upon one day, put the jars into the water as has been described for English peas, and boil for two hours, remove the cover of the boiler, clamp down the springs that hold on the tops and remove from the boiler.

CORN

Contrary to the general opinion, corn is easily canned. It only requires a longer period of sterilization than most other vegetables. The varieties of sweet sugar corn that are usually the best to can, Stowell's Evergreen and Country Gentleman, contain about 27 per cent of sugar, on the basis of their dry weight. It has been recently shown that the sugar decreases very rapidly after the ear has been pulled from the stalk. The loss of sugar is more marked when the corn is pulled and husked than it is if the shuck is allowed to stay on the ear. Therefore, in order to retain the original sweetness, it is best to can the corn very soon after it has been pulled—within an hour if possible. The same fact is true of the volatile compounds which give the corn its flavor. This loss in sugar and flavor explains why the corn that is eaten in hotels and restaurants usually seems

of such a poor quality. Such corn often has been pulled from the stalk as much as a day or more.

Select the ears with full grains before they have begun to harden, as this is the period of the greatest sugar content. Husk them and brush off the silk with a stiff brush. Shear off the grains with a sharp knife and fill the jars, but do not pack them. Add salt to taste, usually about a teaspoonful to the quart is sufficient, and fill up the jars to the top with cold water. Corn will swell and absorb a great deal of water during the sterilization, so it is well to have enough in the beginning. However, if all the water disappears during the boiling, it will make no difference in the keeping of the corn. Put on the rubber rings and tops and steam, as has been described under English peas, for two and one-half hours on two successive days. When wishing to sterilize in one day, boil for at least five hours, then clamp on the tops and remove from the boiler.

When I am out on the farm I usually can the ordinary field corn. This can always be obtained in such abundance, and if canned when young and tender, with about a teaspoonful of sugar added to each pint, no one can tell the difference between it and the sweet corn.

Corn is often subject to the attacks of anaerobic bacteria, and some years these will be worse than others. These bacteria do not require air in which to work and do not generate any gas, but form a sour smelling mass. Their spores are sometimes very hard to kill, and in my early experience with canning corn I had some difficulty with them, until I found out what the trouble was. At that time I was only heating the jars for one hour at

each period, and as has been explained, the heat was penetrating the jars very slowly, so I had not given sufficient time for the interior of the jars to become thoroughly sterilized. I increased the time to two and one-half hours on two successive days and had no further difficulty. If ever you have any difficulty with corn, increase the time of boiling.

If you ever want a "show" can of corn, first put the ears in boiling water for about ten minutes or until the grains harden, now shear them off, pack the corn in the jar with water and sterilize. The grains treated in this way will remain plump and the jar will not have the characteristic milky appearance of corn canned in the usual way.

LIMA BEANS

While lima beans are very easily kept, they should be very carefully handled, as they are one of the most delicately flavored vegetables we have, and one that loses its flavor very rapidly after being picked and shelled. Lima beans will usually shell out about one-quarter of their bulk. Discard all pods that have begun to harden and proceed exactly as you would with English peas.

BEETS

While beets will keep in the cellar over winter, it is much better to can them while they are young and tender, as the mature beets are apt to be stringy and lacking in flavor. Wash the young beets, cut off the

tops and boil them until tender. Take off the skins, slice and pack in the jars. Cover with water and sterilize for one hour upon one day only. If a mild pickle is desired, make a mixture of equal parts of water and good vinegar, sweeten and salt to taste, and cover the beets with this mixture instead of water.

ASPARAGUS

Cut the asparagus the length of the jar and pack as many in the jar as it will hold. Cover with water, add a teaspoonful of salt to each jar, and sterilize as you would English peas upon two successive days. If you are anxious to make the jar hold as much as possible, open it up after it has been boiling about a half hour. By this time the asparagus has been partly cooked and is soft, and you can put several more pieces in the jar. Ten pounds of asparagus will fill about six quarts.

OKRA

The traveler through the South is usually impressed with the amount of okra grown. The negroes always have their sweet potatoes, their collards and a few rows of "okry." The young pods are used for soups and stews. The people of the North usually have to cultivate a taste for it, but in the South it is considered a delicious vegetable.

Wash the young pods, cut into short lengths, pack into the jars, cover with cold water and sterilize as you would English peas.

EGGPLANT

Pare the eggplant, cut in thin slices, and drop in boiling water for fifteen or twenty minutes. Drain off the water and pack the slices in the jars. Cover with water and sterilize as directed under English peas. The slices of egg plant are pliable and may be taken from the jar without being broken, and either fried in bread crumbs or made into pudding and baked.

KOHL-RABI

This vegetable is very much like a turnip except that the bulb grows above the ground. In flavor, however, it resembles the cauliflower. It is almost unknown in the South, where it should be extensively grown. Gather it when young and tender, cut into small blocks, pack into the jars, cover with water, add a teaspoonful of salt and sterilize as you would English peas. Serve as you would cauliflower.

BELL PEPPERS

Gather the peppers, either green or ripe, cut around the stem end and remove the seeds, put in boiling water or steam for a few minutes, or until they are soft and pliable. Pack carefully into jars, but do not add any water, and sterilize for two hours on one day only. If you have not broken them in handling, these can be

taken out in the winter and stuffed with corn, rice and tomatoes, macaroni and cheese, etc. Bake these to a light brown and serve with tomato sauce.

Pimentos may also be canned in this way for salad.

COW PEAS

The ordinary black-eyed pea, or cow pea, that is planted so extensively as a forage crop, is also an excellent vegetable. The peas are best if gathered just before they are ripe and while they are still soft. Shell the peas, pack into the jars, add a teaspoonful of salt to each quart and sterilize as you would English peas. Use as you would lima beans or mix with tomatoes, and bake.

CAULIFLOWER

This vegetable usually keeps very well, but if the supply for the winter begins to spoil, it may be necessary to can it during the summer. Prepare it as you would for the table, pack into jars and sterilize as you would English peas.

CARROTS AND PARSNIPS

While these vegetables will keep all winter, they are apt to get a little stringy and develop a strong taste that is objectionable to most people. This can be overcome by canning them while young and tender. Prepare them

as you would for the table, pack into jars, cover with water, and sterilize for one and a half hours for one day only. Few housewives know how much cooked tender young carrots add to a salad.

SUCCOTASH

Mix green corn and tender lima beans in about equal proportions, cover with water, add a teaspoonful of salt to each quart and sterilize in the same way as you would corn.

PUMPKIN AND WINTER SQUASH

There is no need of any hurry in canning pumpkin. If gathered at the approach of frost and brought indoors, nearly all the varieties will keep a few months at least. I usually wait until some time in December, or until the pumpkins show signs of decay, to do my canning. By this time many jars that had been full of other vegetables have been emptied. These are now refilled with pumpkin and the jars thus made to do double duty. Some varieties have very hard skins and are difficult to peel in the ordinary way. First place the whole pumpkins in the wash boiler and boil until the skins are soft, take them out and the skins will peel off easily. Cut them open, remove the seeds, cut them up in small pieces, put into a large preserving kettle and cook with a little water until soft. Put through a sieve or potato masher to remove the stringy portions, sweeten and season, as

you would if preparing for pies, pack into the jars while still hot and sterilize as you would corn.

When making pies, first prepare the crust, put in the tins and bake a light brown. Empty a jar of pumpkin into a mixing bowl, beat it up with the yolks of eggs and milk and butter, turn it into the crust and bake until set. Now add the meringue and again bake a light brown.

Another attractive way of using the canned pumpkin is to prepare it as for pies and turn into a shallow buttered baking dish, without crust. Bake until set and add the meringue as usual. Serve with cream and grape jelly.

TOMATOES

Tomatoes are very easily canned, and almost every housewife has canned them with more or less success. This is because the acid of the tomato prevents the growth of the troublesome bacteria. The spoilage is due largely to molds which are easily killed.

Tomatoes may probably be used in a greater number of ways than any other vegetable, and there are as many ways of canning them as there are of using them. The wash boiler is not altogether necessary, although I nearly always use it.

The simplest way of canning tomatoes is to dip them in boiling water for about a minute, remove the skins, cut them up, and put them into an open preserving kettle, and add salt at the rate of a teaspoonful for each quart. Bring to a boil, stirring frequently to prevent scorching, and boil for about thirty minutes, or until the

tomatoes are thoroughly done. If you are using the screw top jars, first put on the rubber rings and immerse the jars for a minute in boiling water, fill them with hot tomatoes; have the tops in boiling water, remove them as needed, being careful not to touch the inside of the tops with the fingers, and screw the tops on tightly. Invert the jars and let them stand in that position until cold. Some housewives have a habit of tightening up the tops after they have gotten cold. This is a bad practice, and is apt to do more harm than good, for if there has been a leak and the germs have already gotten in the jar, it is certainly too late to remedy matters, and tampering with the top will have more of a tendency to loosen up the seal and let in more air than otherwise. By inverting the jars the hot tomatoes are brought in contact with the tops and this destroys any germs that may have been left there. Never put anything, such as a spoon or a fork, inside the jars during the canning, unless you first dip it in boiling water.

In using the wash boiler, prepare the tomatoes, take off the skins, and pack them as nearly whole as possible into the jars, add a teaspoonful of salt to each quart. Put on the rubber, and screw on the tops loosely, set in the boiler and boil for one hour. Screw down the tops and remove from the boiler.

If whole tomatoes are desired for baking and bread-ing, proceed as follows: Remove the skins and cut up some tomatoes, put in a preserving kettle, and boil for twenty minutes. Remove them from the stove, and run through a strainer, and return the strained liquid to the fire. Now select ripe tomatoes that are small enough to

go into the mouth of a jar, dip them in boiling water, remove the skins, and drop them whole into the jars until full. Add a teaspoonful of salt to each quart, and pour in the strained liquid, boiling hot, over the tomatoes until the jars are full. Put on the rubber rings and tops and place the jars in the wash boiler. Have the water in the boiler already hot to prevent the jars from breaking. Bring to a boil and boil for twenty minutes. Clamp on the tops tightly and remove from the boiler. The strained juice may be used for soup. One bushel of good tomatoes will can about eighteen quarts.

SOUPS

It has been my custom for a good many years to can from one to two hundred quarts of vegetables and mixtures of vegetables for soups. Tomatoes, of course, form the basis of most of these mixtures. In the winter these soups are a palatable and nutritious addition to our bill of fare. The vegetables are prepared, mixed in the desired proportions, seasoned with salt and pepper and canned in the regular way. Although corn occurs in many of these mixtures, the acid of the tomatoes assists in sterilizing it, therefore it does not require so long to sterilize as does corn alone. One can be perfectly safe in giving these mixtures the same time in boiling as English peas, that is, one hour and thirty minutes each upon two successive days, or two and three-quarters hours upon one day. The mixtures that I usually can are: Tomatoes and corn; tomatoes and okra; tomatoes

and cow peas mixed half and half, or tomatoes, corn and okra, mixed in equal proportions. Sweet peppers may be added to either of these if desired. A mixture of all vegetables that usually occur in vegetable soup, tomatoes, corn, carrots, onions, beans, okra, etc., may also be canned together and used as a soup stock. As these vegetables are seasoned and cooked, in order to make good soup, it is only necessary to add water and a little butter and heat to boiling. When turned into a saucepan and heated with a little butter, these mixtures make excellent stews. Tomatoes may also be cooked alone in an open kettle until a great part of the water has been boiled off, then put through a sieve to remove the seeds, and canned for soup. Green black-eyed peas, canned in this way, are also excellent.

POSSIBILITIES OF HOME CANNING

The possibilities of home canning are almost unlimited. "Everything that is served cooked" hardly expresses it. There is no excuse for hard living; if it is possible for anyone to live well, it should be the person upon the farm.

Plant with the expectation of canning, and can everything that otherwise would go to waste. This will remove much of the hard living and keep many a boy upon the farm. The canning of Irish potatoes is even practical. In the South they bear abundantly, but do not keep well. Prepare them as you would for the table, can the small ones whole, and cut the larger ones in quarters, and can

them. One sterilization of two hours is sufficient to keep them. I take up my spring onions while still tender, peel off the outer skins, boil a few minutes to soften them slightly, so that a great many more will go into the jar, then pack the jars full, cover with water and sterilize for one hour on one day. In the winter they can be taken out, heated and served with a cream dressing, scalloped or dipped in bread crumbs and fried whole.

Turnips may be canned when they are plentiful, also spinach and mustard greens. These are easily sterilized, requiring about two hours on one day.

When salsify has reached maturity it is well to take it all up at one time, prepare it, cut into short lengths and sterilize it as you would carrots. The work of preparing is all done at once and the vegetables can be had for use the year round.

Any one who has to buy their vegetables will find it convenient to can them even for summer use. There are always times when the market is overloaded and certain vegetables are cheap. Buy then in large quantities, and get the benefit of both quality and price; can your summer supply at one time, and your vegetables will be cooked and ready to serve when needed.

Take care of your jars, and add as many as you can to your supply each year, and you will soon have all you need. Rightly considered, there is no extra work in canning. The vegetables have to be prepared and cooked anyway, and in canning you are doing your cooking in the summer instead of the winter, and in jars instead of in pots. By canning in large bulk you are actually saving fuel, for it takes almost as much heat

to cook one quart of beans as it does to cook a dozen. You can prepare the vegetables for twelve dinners at once in much less time than you can prepare them for twelve dinners separately.

A housewife with plenty of "canned stuff" will never be taken unawares by company. She will have an "emergency shelf" that is not easily exhausted. She will have soup, salad, vegetables and dessert already cooked, and can make a "company" dinner inside of twenty minutes.

CANNING FOR MARKET

There is a great opportunity for the housewife on the farm to can fancy vegetables and fruits for market. I could dispose of all I could can and more at good prices. During the last few years, as a result of the pure food agitation, people are demanding a better quality of canned goods, and are willing to pay for them. People of means, the best hotels and restaurants, or the social clubs of the cities, are always on the lookout for fancy canned goods. If you can prepare any vegetable, fruit, preserve, ketchup or sauce, better than the average, you will have no difficulty in selling it. Many housewives who live in the city, and leave home during the summer, would gladly give an order in advance for a supply of home canned vegetables to last during the winter. It has been my experience that such people want nicely canned corn, lima beans and peas especially.

After you have had a little experience in home canning you will find out wherein you excel, then I advise

you to specialize along that particular line, and work up a reputation and market for that product. Some housewives excel in making ketchup, while others have better success with pickles. Take up something a little out of the ordinary, chili sauce or watermelon rind preserves, for example, and make that a specialty. You will not have to compete with the ordinary canned goods, for your products will be better than these. You never saw "fancy" goods upon the bargain counter in all your life.

I have a friend, Miss Elizabeth Emory, of Washington, D. C., who has been canning a mixture of okra and tomatoes for market for several years. She cans this in glass for soups and stews. She began in a small way, but now her sales average between five and six thousand jars a year. A lady in Richmond, Va., has made a national reputation with her "Pin Money Pickles." She, too, began in a small way, but now her products are so well known and so popular that they can be found almost everywhere in the eastern part of the United States. I could name many other instances where women have specialized and made a success of canning for market. Whether it deserves it or not, there is still a charm about the word, "homemade," that gives it a preference over factory canned goods. I find the greatest objection to home canned articles is that they are not usually put up in an attractive way. When one sees the home canned goods that are often put upon the market it is no wonder that they do not sell. Attractiveness is one of the fundamental principles of trade. I remember that Miss Emory once came to me and was worried because the wires across the tops of her jars became a little tarnished dur-

ing the sterilization. It is no wonder that she is succeeding when she is so careful of little details. Her customers know that she will exercise just as much care in what she puts into the jar. Have your canned goods put up just as attractively as possible.

There is quite a talent in knowing how to approach people. Dress neatly and go to see as many as possible, carrying samples of your products with you. You must know that you have a better product than the ordinary and do not lack confidence in yourself to find a market for it. The housewife upon the farm has the advantage inasmuch as her vegetables do not cost her anything, so her sales will largely be a profit. As a source of income for her, there are few opportunities that offer so much as canning vegetables for market.

COLOR AND FLAVOR

Vegetables, when properly canned, should retain their attractive color and lose very little of their flavor. I find it almost impossible to detect any difference, either in taste or in appearance, between the canned and fresh article, when these directions are carefully followed. In the canning process of the commercial canning factories it is customary to put many of the vegetables under pressure and to raise the temperature considerably above boiling point of water. Corn is heated up to 240 degrees Fahrenheit. During the last few years a great deal of investigational work has been done upon the compounds known as vitamins. These vitamins seem to be definite

chemical compounds that exist, sometimes in exceedingly small amounts, in many fruits and vegetables, as well as other foodstuffs. It has been definitely shown that these compounds have a great deal to do with keeping the body in health. The high heat employed in commercial canning has a decided tendency to destroy these vitamins. Therefore, when vegetables are properly canned at home, they are not only more palatable but more nutritious.

STORING CANNED VEGETABLES

Any room or dry cellar will be found suitable for storing canned vegetables. They should always be kept out of direct sunlight. The principal objection to a damp cellar would be the rusting of the wire springs on the tops of the jars. As the interior of the jar is almost a vacuum, even if the jars freeze during the winter, there is little danger of their breaking. Have plenty of shelf room and some to spare. The spare shelves will be found convenient for storing the jars as fast as they are emptied.

HOW TO OPEN A JAR

Jars of vegetables are sometimes hard to open unless it is done in just the right way. If using a spring top, run a thin knife under the rubber next to the jar, and press against it firmly. This will usually let in enough air to release the pressure on the top. In case it does

not, place the jar in a deep saucepan of cold water, bring to a boil and keep boiling for a few minutes. The jar will then open easily.

With the screw top jars run the knife blade under the rubber and loosen it from the jar, or stand the jar upside down in a saucepan of hot water for a few minutes. It can usually then be easily unscrewed. It is sometimes necessary to pull out a piece of the rubber in order to let in some air.

CAUTIONS

If the housewife has never had any experience in canning, I would advise her to go slow during the early part of the season, and can only a few things at a time and see if they keep. Allow plenty of time during the boiling for the interior of the jar to become thoroughly hot, and above all use common sense.

I recently had a letter from a discouraged housewife, saying that she had just canned a great many vegetables according to my directions and had lost every jar. Fortunately at the end of her complaint she told me that she had made an improvement upon my directions—she had left off the tops of her jars until they had gotten cold and then she had sealed them up. This prevented the tops from breaking, she said. Now, this woman was doing exactly what I had told her not to do, and her letter is a fair sample of a great many that I have received. She was trying to follow directions without thinking of the “reasons why.” She sterilized her vege-

tables thoroughly and then allowed a fresh crop of bacteria to get in and begin work. She will probably use preserving powders next time and say that she knows from experience that it is impossible to keep vegetables without them. Don't repeat her experience.

I have never lost a jar of string beans, lima beans, okra, egg plant, carrots, parsnips, beets or asparagus. I had a few jars of peas and corn to spoil during early trials and it was from these failures that I got valuable experience. Any housewife can do equally as well. Follow directions until you get your experience and you will have no difficulty whatever. It is not a difficult matter to can vegetables properly and no housewife who once knows the comfort and convenience of a winter supply will ever regret the trouble or difficulties experienced in learning.

CANNING FRUITS

While not so essential as vegetables, fruit and fruit juices have a definite place in the diet. Owing to the fact that most of the common fruits contain so much water, their real food value is rather low. However, they have a value that is all their own. They aid digestion and serve in many ways to keep the body in good condition. They add acid and flavor, and furnish an agreeable variety so necessary to a good meal.

Since the advent of the modern cold storage plants the housewife in the city can go to market and buy fresh fruit every day in the year, but it is not so with the

housewife on the farm, even if she could afford it. In the winter her family is probably more in need of fruit than that of her sister in the city, for their diet is more apt to be restricted. Nature is so generous in her supply of wild fruits and there is usually such an abundance of the cultivated varieties upon the farm that quantities of them go to waste annually, yet the average family has very little in the way of fruit during the winter. They are so easily canned that there is certainly no need for this condition of affairs. Every housewife has canned some fruits successfully, yet few realize the economy of storing up and canning in time of plenty for the season when everything of this kind is scarce.

It is not the object of this chapter to teach the housewife the art of canning fruit, for she already knows how, but rather to encourage her to do more of it. No long list of recipes will be given, but a few which either have some fundamental principle involved or represent the most economical way of disposing of or saving that which would otherwise go to waste. The canning of fruits will be considered, not as a preparation of luxuries, but more as a standard article of diet. As there is still a demand in most households for some preserves, a few recipes will be given.

The principle involved in canning fruit is exactly the same as in canning vegetables, the principle of complete sterilization. Whether the fruit is sterilized by means of heat, as in ordinary canning, or by alcohol, as in brandied peaches, or by sugar, as in preserves, the end accomplished is the same in every case—the destruction of yeasts, molds or bacteria.

Most fruits are better flavored when canned with sugar, but, contrary to a widespread opinion, sugar is not necessary in the canning—fruits will keep just as well without it as with it. However, for several reasons it is advisable to can all fruits without sugar and to sweeten them when used. In this way one can use the fruit in any way they may wish during the winter; it may be opened and used as stewed fruit, or made into jams, preserves or sweet pickles. Sugar, too, is usually higher in price during the canning season than at any other time of the year.

The old-time preserves that used to grace every pantry shelf are almost a thing of the past, and the sweet canned fruits have taken their place. The two reasons for the disappearance of the preserves are that they take up too much time and too much sugar. Canning is one process and preserving is another, and while in both cases sterilization is necessary, in canning we rely entirely upon heat, while in preserving largely upon sugar to do the sterilization. If you have plenty of fruit it is best to can nearly all of it, and to preserve only a little, for preserves can hardly be considered a standard article of diet.

The housewife does not need an elaborate assortment of utensils in canning fruit. She can do well enough with the things she already has on hand. Plenty of jars, a preserving kettle, and the old wash boiler are all that is necessary. It has been my experience that many housewives often let their fruit go to waste because they think they can not afford to buy the jars to put it in. This is poor economy, as a fruit jar is more or less a per-

manent asset, and should be considered as an investment and the initial expense charged up to future years. Every housewife with a family should have at least one thousand jars for home use. They can be easily filled up with the things that ordinarily go to waste, and will pay good interest upon the investment.

APPLES

Probably no cultivated fruit is allowed to go to waste in amounts equal to the apple. Throughout the South the summer varieties bear in great abundance, but will keep only a few weeks after ripening. These summer apples are the most suitable for cooking and, when canned, will largely take the place of the winter or keeping varieties. There is an almost endless number of ways in which apples may be canned or used after they have been canned, but only a few suggestions will be given which may be enlarged upon by any ingenious housewife.

SLICED APPLES WITHOUT SUGAR

As summer apples are apt to cook to pieces easily, select those that are a little under ripe, peel, remove core, cut into small sections or slices and drop into a pan of cold water, to which a little salt has been added—about one-half teacupful to the gallon. The salt will prevent them from darkening and will keep them white and fresh looking in the jar. Pack the slices into the

jars without rinsing off the salt. Put the rubber rings in place, put on the tops loosely, place the jars in the clothes boiler upon the false bottom, and bring to a boil, and boil for twenty-five minutes. Clamp on the tops and remove from the boiler. These may be used with cream and sugar or for sliced apple pie, apple dumplings, brown Betty, and in a variety of other ways. The sour or acid varieties may be sliced with the skins on them and canned in this way for frying.

STEWED APPLES WITHOUT SUGAR

Peel, remove core, cut into small sections and drop into a pan of slightly salted water. In a few minutes transfer to a large saucepan or open kettle, add a little water and cook to the consistency of apple sauce. When thoroughly done, remove from the stove, and put through a potato masher or strainer, fill up the jars with the hot apples, having first put on the rubber rings. Put on the tops loosely. Have the water in the clothes boiler already hot to prevent the jars from breaking. Put the jars into the boiler and sterilize for thirty minutes. Clamp on the tops and remove from boiler. In being prepared in this way apples should be heated up very slowly when put into the wash boiler, as they are apt to stew out of the jars during the boiling. They can be sweetened and used for apple sauce, apple float, apple pie or any way desired.

PEACHES

There are more peaches canned commercially than any other fruit, and while freestone varieties are used almost exclusively in commercial packing, some of the clings are equally as good for home use. There is no finer peach for canning or preserving than the White Heath. The fruit should not be allowed to get too ripe, but should be picked when just beginning to turn soft. With the freestone varieties, peel, cut into halves and remove the seed. Pack the halves into the jars, cover with water, place in the boiler and sterilize for forty-five minutes. With the cling varieties, prepare by first rubbing the fruit off with a damp cloth, then run a paring knife around it and wring one-half from the seed. This is an accomplishment that requires a little practice to become proficient in. Cut out the seed from the other half, peel, pack into jars, cover with water and sterilize as before directed. Canned peaches are often much improved by putting one or two kernels in each jar.

CHERRIES

Either seed the fruit or not, according to preference. Pick over the fruit, wash, pack into the jars, cover with water and sterilize for thirty minutes.

APRICOTS

Allow the fruit to get thoroughly ripe, as its distinctive flavor is developed largely during the latter part

of the ripening period. It is usually unnecessary to peel off the skins. Open, remove the seed and proceed exactly as you would for freestone peaches.

BERRIES

Blackberries, blueberries, dewberries, gooseberries, huckleberries and strawberries are all canned in much the same way. Pick over the fruit, hull or stem it, wash in a colander, pack into jars, cover with water and sterilize for twenty-five minutes.

PEARS AND QUINCES

It is always advisable to can pears and quinces with sugar, although they will keep equally well without it. Peel and remove the core, cut into quarters and drop into a pan of cold water, to which a little salt has been added. In a few minutes remove from the salt water, pack into the jars, cover with water and sterilize for forty-five minutes.

CANNING FRUITS WITH SUGAR

Open Kettle Method

All fruits may be cooked with sugar in a preserving kettle and when done transferred to jars and sealed. This is not advisable with any except possibly some of the smaller fruits, as cooking in this way is apt to make

the fruit come to pieces. It is often convenient, however, and it is a perfectly safe method to follow.

Soft fruits and berries require little or no water. The amount of sugar to be used for the different fruits depends largely upon the individual taste. Below is given a table, which probably represents the amounts that would suit the average housewife. This is what might be termed a light sweetening, and more may be easily added if desired.

AMOUNT OF SUGAR TO BE USED FOR EACH QUART OF FRUIT

Apples	$\frac{1}{4}$ pound	Grapes	$\frac{1}{3}$ pound
Apricots	$\frac{1}{2}$ "	Huckleberries ...	$\frac{1}{3}$ "
Blackberries	$\frac{1}{3}$ "	Peaches	$\frac{1}{4}$ "
Blueberries	$\frac{1}{3}$ "	Pears	$\frac{1}{4}$ "
Cherries	$\frac{1}{4}$ "	Plums	$\frac{1}{2}$ "
Crabapples	$\frac{1}{2}$ "	Quinces	$\frac{1}{2}$ "
Currants	$\frac{3}{4}$ "	Raspberries	$\frac{1}{4}$ "
Dewberries	$\frac{1}{3}$ "	Strawberries	$\frac{1}{2}$ "
Gooseberries	$\frac{3}{4}$ "		

BERRIES

Wash and prepare the fruit, put into the preserving kettle, add sugar according to the table, bring slowly to a boil, and boil for fifteen minutes. First put the rubber rings on the jars, and then immerse them for a moment in hot water. Do this carefully to prevent breaking the jars. Fill with the hot fruit. Dip the tops in boiling water and put them on the jars. Clamp or screw down the tops, and if using a screw top jar, stand upside down out of a draft to cool.

SOFT FRUITS — APRICOTS, CHERRIES, GRAPES, PEACHES, PLUMS, PEARS AND QUINCES

Peel or seed the fruit. Put into a preserving kettle with a little water. Add sugar according to the table, bring to a boil and cook until thoroughly done. This requires about twenty minutes for pears and quinces. Put in jars and seal as directed.

CANNING WITH SUGAR IN JARS

For such fruits as apricots, cherries, grapes, peaches and plums and all berries, prepare the fruit, put in the jars, add the amount of sugar shown in the table, cover with water, put on the rubber rings and tops loosely. Place in wash boiler upon false bottom and sterilize for twenty-five minutes. Clamp on the tops and remove from the boiler.

For such fruits as pears and quinces increase the time of boiling to forty-five minutes.

GRAPE JUICE

Many of the grapes that go to waste upon the farm every year should be used in making grape juice. This can be prepared with very little trouble and may be canned either with or without sugar. There are few

drinks that are as palatable or as nutritious as cold grape juice.

The juice of the grape contains from 12 to 25 per cent of sugar, depending upon the variety. As long as the grapes are sound and attached to the vine the juicy interior is sterile, but as soon as the skin is broken many kinds of ferments, principally yeasts, which exist almost everywhere in great abundance, drop into the juice and begin to break up the sugar into alcohol and carbonic acid gas. This decomposition of the sugar by yeast is the process of wine making, and the process will go on as long as any sugar remains in the juice. When all the sugar is used up a different set of ferments begin work and converts the alcohol into vinegar. So it is necessary to stop the action of the ferments as soon as possible after the juice is pressed from the grapes. This may be done in two ways, by the use of some preservative or by heat. A little sulphur is sometimes burned and the fumes passed into the juice. This will stop the fermentation, but it is a procedure that I never recommend.

It has been proved that all kinds of grape juice may be sterilized at a temperature considerably below that of boiling water, about 175 degrees Fahrenheit, and that the flavor is some better if the sterilization is done at this temperature instead of that of boiling water. But the housewife seldom has a thermometer that will register this high and must depend upon the temperature of boiling water.

Use sound ripe grapes. Pick them from the stems, put into a preserving kettle, crush a few of them and add a little water to start the boiling. Bring slowly to a boil

and boil for thirty minutes. Crush the grapes and pour the contents of the kettle into a clean cloth sack. Hang up the sack and allow most of the juice to drain out, then twist or press out the rest. Pour the strained juice into fruit jars, put on the rubber rings and the tops loosely, place in clothes boiler upon false bottom, bring to a boil and boil for fifteen minutes, clamp or screw down the tops and remove from the boiler.

This may not be the most scientific, but it is the most practical way of handling grape juice. A sediment will form in the jars after a while, so when opening the jars for use pour off the juice carefully and leave the sediment in the bottom of the jar.

If a wine or cider press is convenient the juice may be pressed out of the grapes first, then heated slowly up to near boiling point or until it begins to steam, and allowed to stand in a glass, enameled or aluminum vessel for about twenty-four hours. By this time a greater part of the sediment will have settled to the bottom of the vessel. The juice may now be poured off through a piece of thick cloth, put into fruit jars and sterilized as before directed.

APPLE JUICE OR CIDER

Put clean, sound apples through a cider mill and press out the juice. Strain the juice through a thick cloth sack. Put into fruit jars and sterilize for fifteen minutes, as described under grape juice.

The common muscadine and fox grapes that grow wild in such abundance throughout the South make

excellent unfermented juice. Blackberries, cherries, plums and currant juice may also be canned in this way. Unfermented fruit juice when opened may be used for making jelly.

QUINCE PRESERVES

There is no preserve that is finer than the quince, if it is prepared with care. You will find that your time has been largely wasted if you try to make quince preserves from inferior fruit. Unless perfect fruit can be obtained it is best to use it only for jelly. The imperfect fruit can be used for jelly, but even then it is troublesome to prepare and will hardly repay you. The fruit should be ripe when used for preserving. With a soft, damp cloth rub the quinces clean, peel, cut into quarters and core, being careful to remove all the hard, gritty portions around the seed. Drop into cold water, to which has been added a little salt to prevent discoloration. As you peel the fruit save all the perfect cores and all good skins, rejecting the blossom end. Place these in a preserving kettle and add enough water to cover them, let them simmer until soft and strain off the juice through a coarse cloth. Rinse the quinces in cold water, weigh and place them in the preserving kettle with this juice. Bring to a boil and boil slowly. Watch the fruit and remove the pieces as they begin to soften. Spread these on platters, each piece separate as much as possible. When all fruit has been removed from the juice add sugar, a pound of sugar for each pound of fruit, to this juice. Bring to a boil, stirring frequently

until the sugar dissolves. Carefully return the quinces to the syrup and let cook very slowly. Scald a jar and put the rubber ring on the neck, and as the pieces of quince turn the desired color dip them out and place in the jar. When the jar is full, cover with syrup and screw on the top that has been dipped into boiling water. Repeat this until all the fruit has been put into jars. All the fruit does not cook in the same length of time and in this way you will not overcook any and all will be done. Stand the jars upside down until cool.

CHERRY PRESERVES

The best cherry preserves are made from the sweet red cherries, commonly known as sweethearts. When the cherries are thoroughly ripe, gather, wash and remove the seed. Place the cherries in a preserving kettle in layers, sprinkling each layer with sugar, allowing a half pound of sugar to a pound of cherries. Put over the fire and bring slowly to a boil. When the syrup is rich in color and about the thickness of honey, put in jars and seal.

If the sour varieties of cherries are being preserved, use three-quarters of a pound of sugar for each pound of fruit.

PEACH PRESERVES

Cut the peaches in halves, remove the seed, peel them and place in a preserving kettle in layers, sprinkling each layer with sugar, allowing three-quarters of a pound of

sugar for each pound of peaches. Pour in just enough water to start the steam, about a cupful is enough, and place over the fire. After the sugar has dissolved and the syrup formed, let the peaches cook slowly until they begin to turn pink. Lift them carefully from the syrup and spread upon a platter, each piece separately as much as possible. Cook the syrup on until it is about as thick as honey. Return the peaches to the syrup and when they are as red as desired put them in jars and seal.

The flavor of the preserve is improved by leaving two or three peach seeds in each jar.

If the peaches are to be preserved whole, peel and proceed exactly as for those without seed except allow one-half pound of sugar to each pound of fruit.

PRESERVED TOMATOES

If the housewife would always plant a few vines of the small red or yellow, plum or pear varieties of tomatoes, she would never be left without something to preserve if the other fruit should fail. Even if there is plenty of fruit, tomato preserves will make an excellent addition.

Take the ripe tomatoes and immerse them, a few at a time, in boiling water for a few minutes only. Remove the skins carefully so as not to break the tomatoes. Weigh them and put them into a preserving kettle with as many pounds of granulated sugar as you have of tomatoes.

Prepare green ginger root by carefully scraping off

the skin and shaving it into small bits. Add one level teaspoonful of these ginger shavings for each two pounds of tomatoes.

Let the contents of the kettle come to a boil and boil for ten minutes. Remove the tomatoes from the syrup and spread them upon a flat dish to cool. This will keep them from coming to pieces. When cool return them to the boiling syrup and boil gently until they are about the consistency of honey. Put into jars while hot, adding a slice of lemon to each jar before sealing.

TOMATO MINCEMEAT

Slice up a quantity of green tomatoes and sprinkle well with salt. Put into a bag and hang up to drip all night. The salt which is left on the tomatoes will not need to be washed off. In the morning take equal weights of sugar and tomatoes and cook until the tomatoes are thoroughly done. To seven pounds of the mixture of tomatoes and sugar add three pounds of seedless raisins, with mace and cinnamon to suit the taste. Cook a short time after adding the seasoning and put into jars. This will keep without being sealed and will make pies that many consider as good as those from ordinary mincemeat.

PICKLES, KETCHUPS AND RELISHES

In nearly every garden, upon the approach of frost, there are quantities of green tomatoes and green peppers

still left upon the vines. The canning and preserving for the winter is all over by this time and the housewife can well utilize these in making pickles, ketchups and relishes, not only for home use but for the market. The last of the ripe tomatoes may be used for making chili sauce and ripe tomato ketchup, and the large green ones, if gathered and put in a cool place, will gradually ripen and may be used on the table, while the small green ones may be worked up into mixed pickles, piccalillis and ketchups. When properly made, there is a good demand for homemade chili sauce, chopped pickles and other relishes. I will give a few recipes that will be found suitable either for home use or for market.

I have a friend, Miss Helen Boyd, of Washington, D. C., who a few years ago made the chopped pickle for a social club of that city, after the following recipe. She received \$3 a gallon for it:

CHOPPED PICKLE

Chop fine with a knife or run through a coarse food chopper:

$\frac{1}{4}$ peck of green tomatoes.	3 cucumbers.
$\frac{1}{4}$ peck of small onions.	6 large red peppers.
$\frac{1}{4}$ peck of yellow string beans.	3 cauliflowers.

Place in a brine made by dissolving one pound of salt in five pints of water and let set over night. In the morning bring the brine, with the vegetables still in it, to a boil and keep boiling for a few minutes.

In a separate vessel bring one gallon of cider vinegar to a boil. With a little water make a paste of:

$\frac{1}{4}$ pound of ground mustard.	1 cup of brown sugar.
$\frac{1}{4}$ ounce of tumeric.	2 level tablespoonfuls of flour.

Put this paste, with a half ounce of celery seed, in the vinegar and boil until it begins to thicken. Now take the vegetables up, drain off the brine, put the vegetables in another saucepan, and pour the boiling vinegar mixture over them. Mix well, put in jars, and seal while hot. This pickle is best when about the consistency of thick cream. If very much water is left in the vegetables in the form of brine it will be too thin. In this case use more flour and thicken it. Instead of the cauliflower an equal part of celery or cabbage may be substituted.

A few years ago I was out upon the United States Reclamation Project at Fallon, Nevada, and Mrs. F. B. Headley, the wife of the Superintendent of the Experiment Farm, had some tomato relish which I thought was excellent, and since that time I have put up a great deal of it. This is her recipe:

TOMATO RELISH

Scald and skin fifteen ripe tomatoes. Pare, core and cut into small pieces six sour apples. Peel five medium sized onions. Chop all of these very fine, using a food chopper, if you have one. Put into a large saucepan with:

- 2 level tablespoonfuls of salt. $\frac{1}{3}$ teaspoonful of cayenne pepper.
- 3 green peppers or 1 level teaspoonful of black pepper. $\frac{1}{2}$ pint of vinegar.

Bring to a boil and boil slowly for one and one-half hours. Remove the vessel from the stove, put the relish into jars or bottles and seal while hot. This is mild and delicious when served with meats, oysters or vegetables.

Dr. B. L. Howard, of the Department of Agriculture, has originated the following recipe for chili sauce, which I think is superior to anything of the kind I have ever put up :

CHILI SAUCE

Scald and peel sound, ripe red tomatoes. Chop into small pieces by pressing through a half-inch screen or by running through a coarse meat chopper :

- 36 pounds of tomatoes. 10 ounces of ripe bullnose peppers (after stems and seed have been removed).
- 2 pounds of chopped onions.

The bullnose peppers should be hot enough to give the proper flavor to the sauce. In case they are too mild, a small amount of cayenne should be added. A pound of large, sweet, or Chinese peppers, if they can be had, will also add richness and color. Put into a granite-ware or enameled kettle and concentrate to eighteen pounds. Because of the tendency to settle to the bottom

of the kettle and burn, it is a good plan to allow the tomatoes to stand for a few minutes after chopping, during which time considerable juice will separate out. This can be poured off and placed in the kettle and concentrated before the rest of the above ingredients are added. After concentrating to eighteen pounds, add two and one-quarter pounds of cider vinegar and nine ounces of salt.

Concentrate further to eighteen and one-half pounds and add six pounds of sugar. Boil slowly five to ten minutes. Put into jars that have been washed in boiling water and seal while hot. The above quantity will yield about twenty-three pounds, or sufficient to fill eighteen to twenty pint jars.

Throughout the boiling care must be exercised by stirring to keep the ingredients from settling to the bottom and burning. This is especially necessary after the sugar is added. In order to weigh the contents of the kettle at different stages in the process of concentration, the weight of the empty kettle should be noted at the start. The kettle, with its contents, can then be set on the scales or hung on the balance from time to time without inconvenience, and the weight of the contents easily determined. This sauce is not likely to mold; but, as a precaution against spoiling, it is advisable—after filling the jars and putting on the rubbers and tops—to place them in the clothes boiler and sterilize them for about thirty minutes. If this sauce is properly made, it will have a bright red color and a rather mild and sweet taste. It is good when served with meats, oysters, baked beans, etc.

For those wishing a sauce not quite so sweet, but more on the order of a pickle, the following recipe, which was given to me by Mrs. P. H. Smyth, of Falls Church, Virginia, will be found satisfactory :

Recipe No. 2

Scald and peel twenty-four ripe tomatoes ; chop these up with two red bullnose peppers, two green bullnose peppers and two large onions. Put into an enameled saucepan and add :

4 cups of vinegar.	2 level teaspoonfuls of
1½ cups of brown sugar.	whole cloves.
2 level tablespoonfuls of	2 level teaspoonfuls of cin-
salt.	namon.
2 level teaspoonfuls of	2 level teaspoonfuls of
whole allspice.	ground ginger.
	2 level teaspoonfuls of
	ground nutmeg.

Bring to a boil, stirring frequently to prevent scorching, and boil until the sauce begins to thicken. The onions will then be well done. This should not take over an hour. Remove the vessel from the stove, put the sauce into jars, and seal while hot. This will keep in wide-mouthed bottles if they are well corked and dipped in paraffin.

TOMATO SWEET PICKLE

Take one peck of green tomatoes and six large onions. Slice, sprinkle one cup of salt over them, and let stand

over night. In the morning drain, add two quarts of water and one quart of vinegar, boil fifteen minutes, then drain again and throw away this vinegar and water. Add to the tomatoes and onions:

2 pounds of sugar.	2 level tablespoonfuls of
2 quarts of vinegar.	ginger.
2 level tablespoonfuls of	2 level tablespoonfuls of
cloves.	mustard.
2 level tablespoonfuls of	2 level tablespoonfuls of
allspice.	cinnamon.
	1 teaspoonful of cayenne.

Boil for fifteen minutes. The allspice and cloves should be tied in a piece of thin cloth, which should be removed when through cooking. Put in jars and seal while hot.

PICCALILLI

Slice up one peck of green tomatoes and two quarts of onions. Place the tomatoes and onions in a colander in alternate layers and sprinkle each layer with salt. Let these drain all night. In the morning put into an enameled kettle with:

4 level tablespoonfuls of	4 level tablespoonfuls of
whole allspice.	cinnamon bark.
4 level tablespoonfuls of	5 red bullnose peppers.
whole cloves.	2 cups of sugar.

Press down into the kettle and add enough vinegar to cover. Cook until tender. Put into jars and seal while hot.

TOMATO KETCHUP

It is quite an art to make good ketchup. The tomatoes should be of a red variety and thoroughly ripe. They should be gone over carefully, and all hard or green spots discarded. The boiling should be done as rapidly as possible in an enameled, aluminum, or porcelain-lined preserving kettle. Long boiling has a tendency to darken the product. With the exception of cayenne pepper, which should be ground, whole spices should be used whenever possible. Ground spices darken the ketchup.

I have used the recipe given here with good success: Take one peck of red ripe tomatoes, clean them, put them in a preserving kettle, and cook until thoroughly done. Mash them through a fine strainer to remove the skin and seeds. Add to this eight level tablespoonfuls of salt and one level tablespoonful of cayenne pepper. Suspend in the tomatoes a flannel bag containing:

2 level tablespoonfuls of	black pepper.	of	1 level tablespoonful of all-spice.
6 level tablespoonfuls of	mustard.	of	1 level tablespoonful of cloves.
1 level tablespoonful of	cinnamon.		

Boil as rapidly as possible until the ketchup begins to thicken; then add one quart of vinegar and continue boiling until a teaspoonful placed in a saucer will not give off any water. Remove the bag containing the spices, put the ketchup in jars or bottles, and seal or cork while hot. If paraffin is convenient, melt a small quantity in a saucepan, invert the bottle of ketchup and dip the cork and upper part of the bottle neck in it. The paraffin will help to keep out mold spores.

PICKLED CUCUMBERS AND ONIONS (UNCOOKED)

1 gallon of vinegar.
1 pint of salt.

1 pint of sugar.

Mix these ingredients thoroughly. As your cucumbers reach the size you like, gather them each morning, when still cool, wash them, but be sure they are dry, and drop them into the vinegar. The onions may be added whenever convenient and in any proportion desired. Red peppers improve the flavor, and any whole spices may be added that the individual taste may like. Keep in a cool place and be sure that the liquid covers the cucumbers and onions. This pickle is best after it has been standing for about six weeks.

SWEET PICKLED CHERRIES

It is best to use the Early Richmond, or some other large sour variety. Wash the cherries, and cut the stems

to a half inch or less. Weigh the fruit and put it into the jars. For every pound of cherries, weigh out one-half pound of sugar. In a preserving kettle put a cup of vinegar for each pint of cherries, add the sugar, place over the fire, and when thoroughly dissolved, distribute it throughout the jars so that each jar will have the required amount of sugar. If any space is left in the jars, fill it up with pure vinegar. Put on the rubbers and tops. Place in the wash boiler on the false bottom and sterilize for twenty minutes.

SWEET PICKLED PEACHES OR PEARS

For twelve pounds of fruit use four pounds of sugar and a pint and a half of vinegar, with a few cloves and a few sticks of cinnamon. Place all together in a preserving kettle. Cook slowly until the fruit begins to get a little soft. Dip out the pieces as they soften and fill up the jars with them. Cover with the boiling syrup and seal.

BREAD MAKING

It has been said that more divorces are due to poor bread than to any other one cause. This may be an extreme view of the case, but certain it is that few housewives can make good bread. By good bread I mean wholesome, nutritious bread, and bread that can be easily digested. The hot biscuit, so common in the South, are good, there is no question about that, if taste alone is to

be considered. I ate them regularly for twenty-six years, but I don't want to have to do it again. At a bleached flour hearing in Washington, D. C., I heard a miller from St. Louis say that the Southern housewife required only fifteen minutes to get the flour from the barrel into her children's stomachs. My sympathies went out to the children, for a few years ago I was one of them myself.

The New England housewife is far ahead of her Southern sister when it comes to making bread. She has her "baking day," which is unknown in the South, and bakes enough at one time to last her all the week.

It is possible for every housewife on the farm to make as good a loaf of bread as that which is turned out by the ordinary commercial bake shop. It is not a matter of luck, but she can not expect to do this on the first trial. It will necessitate repeated efforts with plenty of patience, until the skill or so-called technique, is developed.

In this short chapter it is, of course, impossible to give full directions, as the baking of bread can not be described in a few words, but enough may be said to cause the housewife to set out to improve her loaf, and the vast majority of loaves are capable of being improved. Bread making depends largely upon the individual, so practice and exercise patience, there is a reason for every step, think what you are doing as you go along and watch the improvement in your loaf.

In this chapter by bread is meant the ordinary risen loaf, or bakers' bread.

Bread is the most important part of the diet, the

“staff of life,” and the ability to make a good loaf is one of the greatest accomplishments a woman can have. Its importance as a foodstuff is shown by the fact that every man, woman and child in the United States consumes about four and one-half bushels of wheat a year, or about as much as is required to make one barrel of flour.

As in all kinds of cookery, there are many of the so-called essentials, but probably the most essential part of bread making is a good flour. All flours are not suitable for bread making. A flour that will make good pastry will not make a good loaf of bread. The quality of flour depends absolutely upon the character of the wheat from which it is ground, and the character of the wheat depends largely upon the locality in which it is grown. The strong flours, or those suitable for bread making, are made from hard wheats, while the starchy flours, or those suitable for pastry, are made from soft wheats. In the United States the hard wheats are grown in a rather limited area, the best of them, the hard spring wheats, such as Blue Stem and Velvet Chaff, coming from Minnesota and the Dakotas, while hard winter wheats come largely from Kansas. The soft wheats are grown throughout the Eastern, Southern and Central states and in California.

While not an infallible guide, the housewife can often judge a flour by where the wheat was grown and milled. While the hard wheats are often shipped out of their own locality to be milled, it is a rare occurrence when a soft wheat is shipped in and milled in a hard wheat section, therefore a flour coming from Minnesota or the Dakotas, under a good brand, is almost sure to be a strong flour,

and suitable for bread making. On the other hand, a flour that is milled in Virginia, for example, is almost sure to be a soft flour and suitable for pastry.

The word "patent," or "fancy patent," upon a sack means little or nothing so far as the average housewife is concerned. She had better try out several brands that are available and select the one with which she is the most successful. As a general rule, the lower grades of flour are more nutritious and will be found just as satisfactory as the "fancy patent."

The strength of the flour, or its ability to make a good loaf of bread, depends largely upon the amount and quality of the gluten it contains. The gluten is the sticky, gummy material that one gets by chewing a few kernels of wheat, and it is this gluten that gives wheat its superiority over other cereal grains. This gluten is the protein that contains the nitrogen and varies from 18 to 14 per cent in flours. Without some gluten a dough would not rise and hold its shape, and this fact makes it impossible to make a loaf out of rice flour, for example, because rice flour contains no gluten.

The next essential in bread making is a good yeast. Yeast is just as much of a plant as the vegetables that grow in the garden and exists in nature in a great variety of species. It is so small, however, that it can not be seen with the naked eye, and, although it has no roots, it grows very much like some of our ordinary cultivated plants, that is, by throwing out buds or shoots. It is one of the oldest cultivated plants in existence, having been used by the Egyptians and other people of antiquity long before the dawn of history. In growing it has a

peculiar property of using up sugar and forming alcohol and carbonic acid gas. The fact that it produces alcohol is responsible for its use in the manufacture of whisky and beer, while its production of carbonic acid gas makes it valuable in bread making. Yeast is used in bread making for the same reason that baking powder or soda and sour milk are used in other forms of cookery, that is, because they liberate carbonic acid gas. It is necessary to have a gas mixed into the dough in order to stretch its particles apart and make it light.

Yeast will continue to work as long as it has air, food, water and the proper temperature. If left with a limited amount of air it sours and will not keep very long. However, if it is dried down it becomes dormant and may be kept for a long time and becomes the dried yeast of commerce. Fresh compressed yeast is always the most satisfactory, and in these days of rural mail and parcel post, a fresh cake can be gotten by almost every housewife when required. However, dried yeast may be used with excellent results, as will be shown later.

Sugar is added to the dough in order to start the action of the yeast. After it has once become active, it will secrete an enzyme, which converts the starch into sugar, and, if unmolested, the action will continue until all the starch has been used up.

SHORT PROCESS BREAD

PROPORTIONS FOR FOUR LOAVES

1 quart of water.	3 quarts sifted flour.
4 teaspoonfuls of salt.	1 cake of compressed yeast.
2 tablespoonfuls of sugar.	

In using the above proportions all measurements should be made level. The raising can best be done in some thick-walled vessel, such as an earthenware bowl or crock. Always have such a vessel warm and buttered before putting in the dough. Have the water luke warm, between 80 and 90 degrees, and mix into it the yeast and sugar. Mix the salt into the flour, and add this to the liquid. When all has been added and thoroughly mixed the dough should be at the proper consistency, and should not stick to the bowl or to the hands. A stiff dough will be apt to make a hard loaf. If it is still sticky, a little more flour may be added, but as little as possible to keep it from sticking. Knead the dough a few minutes until smooth. Cover closely in a bowl until it has raised to double its original size, keeping at a temperature as near 86 degrees as possible. The first raising will take two hours or a little more, work it back and let it rise again to double its size, which should take about one hour. Then make the dough into four loaves. Put into pans that have been lightly greased, cover and set to rise. When the dough has again doubled its bulk it is ready for the oven.

The most difficult feature of bread making in the ordinary kitchen is the control of the temperature while it is rising. For the best results a uniform temperature of 86 degrees is required ; however, a variation of several degrees up or down makes very little difference. It should be remembered that the temperature of the body is about 98 degrees, so that the dough should always feel cool to the hands. Always keep the dough covered, and the crock wrapped either in a heavy cloth or several thicknesses of paper. Keep in a warm place that is free from drafts or cold currents of air.

In the control of temperature a fireless cooker is often used with very good results. The use of an incubator, which may be found on almost any farm, has been suggested by Miss Hannah Wessling, of the Bureau of Chemistry, and will be found practical in many cases. The stove oven may also be used, a tea kettle of boiling water being placed in the oven with the dough to keep the temperature even. The yeast plant in growing is quickly affected by a change of temperature, and if once chilled to 50 degrees, will probably require four times as long to do the same amount of work as it would have done had it been held at the proper temperature. Therefore never let the dough get cold. Close both doors and windows when working over the dough and when forming it for pans, and have the bread board warm.

Yeast needs air the same as any other plant, and this is one of the reasons for working back the dough. Not only is the gas that has already been generated by the yeast distributed uniformly through the dough, but oxygen is worked into it at the same time, which gives the

yeast fresh vitality. The large bubbles of gas are broken up into small ones, which will give the fine texture to the bread. It is a common mistake for the housewife to knead her dough too much, fifteen or twenty minutes is enough. One can easily tell when the dough has been worked enough by its smooth appearance and its spongy feel. A well-worked dough is elastic and will rebound when struck with the knuckles of the hand. Don't try to shape the dough to the pan, the last raising will take care of this, but pull out the dough to about the length of the pan, fold it over so that the crease will be underneath, and pack it tightly into the bottom of the pan.

It is a rather difficult matter to tell exactly when the pans should be placed in the oven. If allowed to stand too long the dough will "fall," that is, the amount of gas in the dough will have become too great to be held by it, and the dough will break and allow it to escape. The pan should be placed in the oven about fifteen minutes before there is a possibility of this happening. At this stage in the baking process is where the experience of the housewife will be a great help. A safe plan is to allow the dough to rise to double the volume it had when placed in the pans. This can be roughly estimated by making a mark on the baking pan or by pinching off a piece of the dough and pressing it down into a warm tumbler, measuring its volume, doubling this, and marking on the glass the volume to be obtained by the dough. Submit this to the same temperature as the dough in the pans, and put the pans in the oven when the dough has reached the mark.

The oven should be about 400 degrees. The ordinary

household thermometer will not register this temperature, but the housewife can get a fair idea by sprinkling a teaspoonful of flour upon a piece of white paper and placing it in the oven. If it turns light brown in five minutes the oven is right for the bread. If baking rolls, the flour should be brown in three minutes. When baked in single loaves the time required in the oven varies from forty-five to sixty minutes.

Contrary to what most people think, the interior of the loaf never gets any hotter than the temperature of boiling water.

In a well-regulated oven, after about fifty minutes, the loaves will become brown all over and will begin to shrink away from the sides of the pans. They are now ready to come out. Remove them from the oven, turn them upside down and shake them out of the pans, and set them across the sides of the pans on the edges to cool. Do not wrap up the bread until cool, as it will sweat and turn sour quicker than otherwise. When cold put in a closed bread box or wrap up until used.

SOFT SPONGE METHOD

When fresh compressed yeast is not available, the housewife must resort to the dried yeast or homemade yeast. As has been said before, the yeast plants in this form are dormant and do not begin acting on the sugar nearly so rapidly as the fresh yeast, therefore it must be given more time. As the yeast develops more rapidly in a soft than in a stiff dough, it is customary to make

up all of the water, sugar and salt and to use only about one-half of the flour. This is made up and allowed to stand over night, and in the morning the balance of the flour is worked in. From then on, the method is exactly the same as for fresh yeast. One cake of dried yeast is usually enough for four loaves.

If preferable, the housewife may use milk instead of water, or a mixture of milk and water, in either of the two methods. The milk should be boiled before using. If any shortening is desired, about two tablespoonfuls of butter or any other cooking fat may be worked into four loaves when the first mixture is made.

ROLLS

Many housewives can make good rolls, when they nearly always fail on bread. Rolls may be made from the same dough that is used for bread, and oftentimes the same dough may be kept over from day to day, keeping it cool over night and working in flour to take the place of the dough removed for the daily baking.

Rolls are better if they have some butter or other shortening kneaded into them. Shape out the dough, put into buttered pans, and bake in an oven that is little hotter than that used for bread.

There is a flavor to good homemade bread that is seldom attained by the professional bakers, and the knowledge that it is the product of your own efforts, and is clean and wholesome, is worth much. There are few

things more beautiful than a well-shaped, brown loaf of bread, and when you learn to make one you will take great pride in your accomplishment.

HOW TO MAKE SAUER KRAUT

Prepare the cabbage as you would for the table by removing the stem and outer green leaves. Cut the head into quarters, and cut the four pieces into shreds with a large knife. Pack the shreds into any water-tight vessel that is not made of a material that will rust. A stoneware crock or wooden keg will be satisfactory. As the shredded cabbage is packed in, add salt at the rate of one pound of salt to forty pounds of cabbage. Add the salt as evenly as possible and when the vessel is full, pack down firmly and cover with a clean board or plate, and cover over the top with a cloth. The salt will extract part of the water from the cabbage and form a brine, which should cover the cabbage during the fermentation process. If a scum forms on the top of the kraut it should be removed. Be sure to keep the cabbage weighted down and covered by the brine. In cool weather it will take about four weeks before the kraut is ready to use.

It is best to make sauer kraut out of late cabbage, as this will keep all winter.

HOW TO MAKE COTTAGE CHEESE

The housewife upon the farm often has quantities of milk left over, which may be made into cottage cheese or schmierkase.

Skim off the cream and set the milk aside to sour or clabber. The cheese will be better if the milk is kept cool—about 65 degrees—while this is taking place. As soon as the clabber is firm, put it into a saucepan or kettle and warm up to about the temperature of the body—100 degrees Fahrenheit. Stir occasionally and keep it at about that temperature for one hour, or until whey has separated from the cheese. Pour into a clean cloth bag and allow the whey to drain off. Cool, add one pound of salt to every four pounds of cheese and work this in until the cheese is smooth. Now add the cream that was skimmed off the milk and work this into the cheese. This is not only a delicacy but a substantial article of diet.

HOW TO MAKE MAYONNAISE DRESSING

Mayonnaise dressing is one of the things often ordered in hotels and restaurants, but seldom received, as all kinds of dressings are served under the name of mayonnaise.

When properly made and cold, mayonnaise should be firm enough to stand up and should resemble somewhat the consistency of medium soft butter. While

very simple, the making of really good mayonnaise is a fine art. Olive oil is usually used, but any edible oil will do.

If shaken up together oil and water will not mix, for the oil clings together and will not break up into small globules, but if some other material, such as soap or buttermilk is put in and the mixture shaken, the oil will break up and mix with the water. This is called an emulsion. Mayonnaise is but an emulsion, and in this case the yolk of an egg acts as the emulsifying agent. As in the case of all other emulsifying agents, the action will take place quicker if all the materials are cold.

Put the yolk of one egg in a plate and rub it smooth with a fork. A thick yolk will act much better than a thin one. You will find that a three-pronged steel or aluminum fork will be better than a silver one, because silver is a good conductor of heat and will convey the heat of the hand into the egg. Add a little oil and rub it quickly into the egg. The emulsion will usually start immediately; if it does not, continue rubbing with the addition of a few drops of oil until it does. A little salt, added from a shaker at this point, will often start the emulsion. You can tell when the oil begins to take with the egg by the way it thickens up. When the emulsion once begins to take there should be no further trouble. Add a little more oil and then a little vinegar or lemon juice, and work it into the egg. Don't try to work too fast, add the oil only as fast as it can be worked into the egg, and alternate with an occasional sprinkle of salt and a little vinegar. If the dressing shows a tendency to

become thin or to curdle, sprinkle in some salt and beat quickly.

One egg is enough for about one-half pint of oil; if less oil is used the dressing is apt to taste of the egg. When enough has been made, add salt and cayenne pepper to taste. Don't be afraid to use plenty of pepper, as the flavor of mayonnaise depends largely upon the pungency that is given it by the pepper.

HOW TO MAKE A GOOD OMELET

Break three eggs and separate the whites and yolks into two bowls. To the yolks add one-half teaspoonful of salt, and one heaping teaspoonful of flour or corn starch. Add enough water to make a smooth paste, then one and one-half cupfuls of milk. Beat up the whites to a froth, add one level teaspoonful of baking powder to the yolks, mix the whites and yolks together lightly and pour into a hot frying pan. Have plenty of fat in the pan, and cook slowly with a cover on until the omelet begins to set; then put it into a hot oven until brown on top. When brown, take out of the oven, turn upside down upon a large platter, sprinkle with black pepper and fold over.

An omelet will take almost any kind of a sauce. The Italians stew tomatoes and onions to a thick consistency and pour this over the omelet.

PRESERVING EGGS IN WATER GLASS

In the spring, when eggs are plentiful, and there is no good market for them, the thrifty housewife on the farm often wishes she knew some practical way of storing them for the time of scarcity in the fall. There is no better or cheaper way of doing this than by the use of water glass. Water glass is sodium silicate, which is but a fused mixture of sand and soda. It may be bought at a drug store for about 25 cents a quart or less, and one quart, when diluted, is sufficient to keep twenty-five dozen eggs. For every quart of water glass add ten quarts of water, mix thoroughly, and pour the mixture into a stone jar, filling it about half full at the start. Put the fresh eggs into the jar each day as they are collected. Use only fresh, clean eggs and place them in the jar, carefully lowering them in by hand so as not to break them. The jar should be kept in a cool place and not moved very much after the eggs have been put into it, because of the danger of breaking them. The eggs should always be covered with the liquid, and if the water should evaporate off and leave them uncovered more water should be added. If the liquid becomes cloudy, it is no indication that the eggs are not keeping, for this cloudiness usually takes place. Eggs stored in this way may be used just as fresh ones, except that the yolks are apt to break easily and are therefore not well adapted to poaching. Water glass eggs may be marketed, but the greatest economy consists in using them in the home and selling those eggs that are laid during the fall and winter at fancy prices.

HOW TO KEEP WEEVILS OUT OF PEAS, BEANS AND POPCORN

The eggs of the ordinary weevil that is so troublesome are laid by a moth while the crops are still in the field, and, as the eggs are sticking to the outside of the seed, they may be easily destroyed before they have time to hatch out. As soon as the peas, beans or popcorn are gathered, put them in a bag and dip them for a few seconds in boiling water and spread them out to dry. This treatment is advisable for the seed that is to be used as food and not for the seed that is to be planted next year.

HOW TO KEEP DRIED APPLES FROM DISCOLORING

When apples are peeled and sliced for drying, they discolor, or darken, very quickly. This is caused by ferments or enzymes that exist in the fruit and may be prevented by dropping the apples in a salt solution. Dissolve about eight teaspoonfuls or about one ounce of salt in one gallon of water, and as fast as the apples are peeled put them into the solution. Take them out, one at a time, core and slice them, dropping the slices back into the same solution. In one or two minutes they may be spread out to dry. It is not necessary to wash off the salt, as the little that remains on the fruit will add to its flavor. Apples that have not become discolored will bring a better price than otherwise.

HOW TO KEEP SILVERWARE BRIGHT AND CLEAN

While silverware does not rust like iron, it tarnishes very readily. This black tarnish is due in a large measure to a combination of silver with sulphur or silver sulphide. Sulphur is found in coal oil gas, eggs, rubber and in many fruits and vegetables. Every housewife knows how quickly silver will blacken if left in eggs; this is because the sulphur of the eggs is uniting with the silver and forming the black silver sulphide. This tarnish may be removed either by rubbing it off with a silver polish, which is usually some finely divided substance like kaolin or white clay, or it may be removed by means of a weak electric current. In recent investigations in the United States Department of Agriculture it has been found that the silver is worn away much more rapidly with the silver polish than with the electric current.

Put the silverware to be cleaned into a graniteware or enameled saucepan. Put in a piece of aluminum—some old spoon or worn out cooking utensil—so that each piece of silver will touch the aluminum, or have one piece of silver touch the aluminum and the other pieces of silver touch this piece in a way to make contact with the aluminum. Cover with water and add a teaspoonful of salt and a teaspoonful of either baking powder or washing soda for each quart of water. Bring to a boil and boil for a few minutes, remove the silverware and polish with a dry cloth.

The contact of the silver with the aluminum produces a weak electric current which causes the black tarnish to leave the silver and to be deposited upon the aluminum. This is an excellent way of cleaning silverware that is heavily ornamented, as it is almost impossible to get all of the tarnish out of the crevices with silver polish. An aluminum saucepan may be used, and in that case it will not be necessary to put in an aluminum spoon. However, never use one that you expect to keep bright and clean, for the tarnish that accumulates in it is rather hard to remove.

