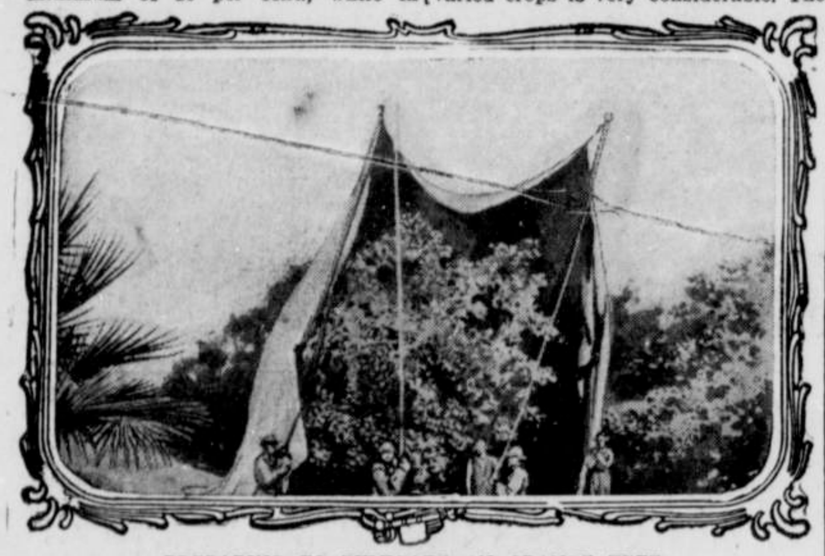
INSECT DEPREDATIONS.

The Annual Loss Occasioned by Destructive Insects in the United States.

GUY ELLIOTT MITCHELL.

Farmers of the United States in addition to county, State and national taxes, probably pay a much heavier toll than they do to all three of the above. The tax collector in this latter case is one which is merciless and overbearing, paying no attention whatever to the necessities or obligations of the agriculturist each year, calling for his dues unremittingly, and gloating over the misfortunes of his tenant. The tax collector in this case, however, is the insect. The losses resulting from the depredations of insects on all plant products of the soil, both in their growing and in their stored state, together with those on livestock, exceed the entire expenditures of the National Government, including the pension roll, and the maintenance of the army and the navy. Enormous as is the total value of all farm products of this country it often would be much greater were it not for the injurious work of insects. According to figures compiled by the Department of Agriculture the estimate is made that the total value of farm products during the last year amounted to $5,000,000,000. The Bureau of Entomology, of the Department of Agriculture, being familiar with the work of the important insect pests, estimates the probable shortage due to insect damage at a minimum of 10 per cent., while in



PREPARING TO FUMIGATE AN ORANGE TREE.

years of excessive insect damage the shortage may amount to 50 per cent. The annual shortage of 10 per cent. is a low estimate, which is more often exceeded than fallen below, and indicates at current farm prices a money loss of $500,000,000—the minimum yearly tax which insects lay on the products of the farm. This estimate, however, does not include the damage caused to farm products in storage, such as cereals and forage crops and to natural forests and forest products, assigning at least $100,000,000 to each of these two items. The total annual tax then chargeable to insects is $700,000,000 annually.

The item of loss from insect damage not only includes the actual destruction or injury to crops, but the estimate must also include a very important item—the amount of money devoted to insect control. This amounts to a very considerable percentage of the value of the crop in the case of orchard fruits, truck crops and such field crops as cotton and tobacco. For instance in estimating the losses due to the codling moth it has been shown by figures of the Department of Agriculture that over $8,000,000 a year is expended in spraying apple trees, allowing a cost of only 5 cents per tree. The cost of gassing and spraying citrus fruit trees ranges from 5 cents to $1.50 per tree. Another source of loss is that occasioned by a diminution of certain crops such as wheat or cotton.

THE HESSIAN FLY.
(Magnified)

Shortage may so increase values as to occasion the shutting down of mills. A shortage of a finished product such as flour, cotton or fabrics, may mean a corresponding loss to transportation companies and to shippers. In other words shortage in an important product starts a train of losses to the end of the chapter, the total amount of which is quite beyond calculation or estimate.

Cereals Damaged Most.

The cereals suffer most from insect damage, the yearly amount of loss aggregating $200,000,000. The leading cereal crop of the United States, of course, is king corn, with a value last year of $1,216,000,000. While corn is less subject to insect damage and wheat next, the most important cereal, which is the corn product, would be considerably greater were it not for important insect pests. The corn rootworm causes an annual average loss of at least 2 per cent. of the crop or some $20,000,000. The next most important insect pest of this cereal is the bollworm or earworm. This insect, according to the Bureau of Entomology, probably attacks from 90 to 100 per cent. of the ears of sweet corn throughout the country and the damage caused by this pest is probably nearly as great as that caused by the corn rootworm. The chinch worm causes depredations nearly as severe as the above mentioned insects, making another loss of $20,000,000 annually. Every year the Department receives reports from different sections of the country describing injury to corn by such insects as billbugs, the various wireworms, cutworms, army worms,

THE CODLING MOTH.
(Magnified)

stalk-borers, various species of locusts or grasshoppers, corn plant lice and other insects. This undoubtedly causes a loss of an additional $20,000,000, or with a total annual loss to the corn crop of $80,000,000.

Of a large number of insects which depredate wheat crops, the three important species are the Hessian fly, the chinch bug and the grain plant louse. While the chinch bug is notably a wheat pest, its damage to other cereals and varied crops is very considerable. The losses from depredations of this insect on wheat in single States have ranged between $10,000,000 and $20,000,000 in one year. A very reasonable average annual estimate of loss, taking the country as a whole, would indicate about $20,000,000 a year chargeable to this insect. While in some years the damage caused by Hessian fly is enormous, taking the average of ten years, the loss to the wheat crop caused by this bug has a value of $40,000,000, and so on, numerous other insects and pests lay toll on the wheat crop of the farmer. Were it not for their destructive work the wheat crop of the country this year would be 20 per cent. greater.

Insect Damage to Hay.

Hay and forage crops are damaged by numerous insects to an extent of about 10 per cent. The cotton crop is reduced through the agency of the cotton boll-weevil, the bollworm and

CORN IMPAIRED BY GRAIN MOTH.

the leafworm, while many other insects inflict minor damage. Without counting the losses due to the latter class of depredators we have a total loss of more than $40,000,000 chargeable to the three important insect pests of cotton.

Vegetable and other truck crops are especially subject to insect injury, and furthermore in the case of these crops there is always a large expenditure for the control of insects. The orchard and smaller fruits suffer heavier loss from insect pests, both directly and because of the expensive methods of treatment necessary to prevent still greater losses. There are several hundred insects which depredate on the roots, trunk, foliage and fruit of the apple. The important pests are the woolly aphis, injuring the roots; the trunk and limb borers, the leafworms, canker-worms and tent caterpillars, and the various scale insect pests, including the San Jose scale. Injuring the fruit are the codling moth, the cuculio, and the apple maggot.

The insect losses to other deciduous fruits are quite as heavy as in the case of the apple and especially when the treatments for the San Jose scale and other scale pests are considered; and in the case of citrus fruits the cost of treatment is much greater and the actual losses again heavier.

Forests—especially planted forests of artificially wooded areas on farms—pay toll to numerous borers, which

COTTON BUD ATTACKED BY BOLL WORM.

often almost utterly destroy the trees, as in the case of the black locust, to leaf defoliators and many other varieties of depredating insects.

Cattle the Prey of Insects.

The losses due to biting and parasitic insects of cattle are considerable. The principal culprits are the ox-warble, and various biting flies and ticks. Horses, sheep and other farm animals are subject to attacks of similar parasites and other insect enemies. If all these be considered including, for example, the buffalo gnats, often very destructive in the South, the many gadflies, botflies, the screw-worm fly, and such parasites as the ticks and lice, a heavy percentage of loss must be reckoned. A conservative estimate of the Department of Agriculture of these losses is $175,000,000 a year.

Stored Products Preyed Upon.

While mention has been made of the damage done to vegetable products during the growing and maturing season, these crops after they have run the gauntlet of insect enemies during their entire period of growth, are still subject to the inroads of insect depredators while in storage on the farm, in elevators and mills, or again while in transit especially in the case of long shipments by sea. Food products in the kitchen and house-storeroom suffer from insect damage. Animal products are attacked by larder beetles, etc., fruits by various fruit and vinegar flies and the woolens and household furnishings by beetles, moths, silver fish, etc. Cured tobacco is especially subject to insect attacks and damage, the most important source of injury being a minute insect known as the cigarette beetle which not only eats into cigarettes but all other forms of cured tobacco. While an estimate of $100,000,000 a year is placed upon the damage done to the store products, this does not include the destruction to products in the household or to tobacco.

A very considerable item which might be chargeable to insects and yet which cannot be estimated is that of preventing insect damage. No one can estimate how much is expended on wire screens for the household to prevent the ingress of flies, mosquitoes and moths, nor can an estimate be placed upon the amount of money expended to eradicate mosquitoes, but it is believed that the estimate of $700,000,000 made by the officials of the Department of Agriculture is far below the actual annual loss. The problem the economic entomologist of the future must solve is the lessening or prevention of this loss.

A Seedless Persimmon.

The latest sensation in the seedless fruit line reported at Washington is a seedless persimmon. The officials of the Department of Agriculture the other day received a visit from Mr. John H. Drury, who brought with him a specimen of seedless native persimmons from his place near the national capital.

The general impression is that the seedless persimmon is either non-existent or nearly so in this country. A seedless variety of this fall luxury is not, however, a new thing, but, on the other hand, a number of trees are scattered throughout the South bearing seedless persimmons. Seedless specimens are occasionally found in the big Japanese variety and they are rather rare and the flavor is nothing to be compared to the native sort.

A number of instances are known by the officials of the Bureau of Plant Industry of solitary persimmon trees bearing seedless fruit, but when pollen from other persimmon trees in the neighborhood is brought in contact with the flowers of the seedless sort the resultant fruit will be full of seed.

The fruit brought to the Department of Agriculture by Mr. Drury proves to be a little smaller than the average native persimmon. The specimens when cut across were absolutely seedless and while the fruit was comparatively small it had really more meat in it than the bigger seed-bearing varieties.

It is understood that the Department of Agriculture will keep watch on the Drury persimmon tree and at the right season endeavor to make some grafts of the seedless buds upon other stock and try to breed a race of seedless persimmons.

GASOLINE SPRAYING OUTFIT.

THE ARTIFICIAL LIFE.

Consists in Part in Eating Adulterated and Injurious Foods.

The State Board of Health of Massachusetts has had chemical analyses made of prepared foods and the report of the Board shows what we really eat in the course of everyday life. When we use pepper, we also get ground nutshell and fruit stones with a little pepper mixed in. Mustard consists chiefly of wheat flour and turmeric, this latter is an East Indian saffron colored root with an acrid and pungent taste. When we use lime juice we get a little of the juice with 40 to 63 per cent. water, the whole preserved with sulphurous, salicylic or benzoic acid. Ale is preserved with salicylic acid, also porter and likewise beer; "pure Vermont" maple syrup is nothing more than cane syrup. Canned clams are preserved with boric acid.

While this revelation of the Massachusetts authorities is something awful to contemplate, yet we are staggered by a further report of the Board which shows that an enterprising chemist has discovered that the odor of spoiled eggs can be neutralized through the addition of formaldehyde. Since this discovery a number of establishments have entered into the business of collecting bad eggs, treating them with formaldehyde and selling the mixture to bakers, who use it in cake and other foods sold to the public. While the addition of formaldehyde utterly destroys any bad odor, the process renders the eggs extremely hurtful to the human system. Formerly the mixture of bad eggs was sold to leather manufacturers, but since this later discovery the price of mixed eggs has risen from 10 cents per case to more than a dollar.

ECONOMY IN BUYING MEATS.

Cheaper Cuts, Well Cooked, Equal to Most Expensive in Flavor and Nutritive Quality.

By Ida Finney.

"Roasts are bought, good ones, and after one meal the bone and the rest of the meat is thrown away. I don't know whether women are too lazy, or whether they actually don't know how to make the soups which they could make out of so little. See the German women. They can make you a meal that is good out of a scrap of meat, and two or three cents' worth of vegetables. But American women, the most of them, don't know how, and they dont' seem to learn. For instance, take a chuck piece of beef or a cut of the lower round, and if a young housekeeper only thought so she could make some good dishes out of it that her husband would enjoy eating, and praise, too. A good stew cooked slowly in the oven; a pot roast; beef a la mode, or a meat pie; and especially good, nourishing soups. But they think they must have steaks and roasts—the best cuts—and if not those they resort to canned meats. We're here to sell meat, only I do hate to see people throwing their money away."

The butcher was a thrifty German, and knew what economy meant. The truth of his statement is proven every day in the big markets. Steaks and roasts, roasts and steaks—these are the standbys. And if, by chance, the cheaper cuts of meat are suggested, oftentimes the reply will me: "Oh, but my family likes only the best cuts."

I always feel sorry for the housekeeper who speaks thus, feeling sure she is ignorant of the nutritive value and delicate flavor of the "cheap cuts" when properly cooked. And the unfortunate fact is that many housekeepers leave this important matter to the ignorant and unskillful servant.

Happening into the kitchen of a friend at four o'clock one afternoon I saw the negro cook drop a piece of meat, evidently intended for a stew, into a kettle of cold water and light the gas under it. "Pearl, what are you doing," I asked.

"Putting de meat on fo dinner. It's a little late, but ill boil it hard and maybe it'll git done by six o'clock. Howsomever, dey's got to eat it, for we ain't got nothin' else."

Here was a good piece of beef, a rather expensive cut, too, utterly ruined by the cooking. The cold water drew out the juices and the rapid boiling hardened the fibers, with the result that the finished product was not fit to put in any human stomach. And it should have been such an appetizing and thoroughly satisfying dinner. Both the mistress and the maid were ignorant and indifferent concerning the question of the daily food for the family.

Didn't Know a "Pot Roast"

To a neighbor complaining of the size of the meat bills was suggested the plan of buying cheaper cuts. A "pot roast" was suggested as a substitute for the expensive "prime ribs." "Why, what is a pot roast?" she asked. And that little woman, with a husband on a moderate salary, was trying to run the house. She was about as well fitted for the work, as far as knowledge and skill were concerned, as a child ten years old. And the pity of it was that the husband was straining every nerve and working overtime to make the money to keep things going.

A little knowledge; a little skill
Will save the stomach and fill the till.

If the courses in cookery in the public schools of to-day succeed in teaching the girls that much needed lesson of economy in buying and proper preparation of plain foods with which we are so abundantly supplied, and can be extended to reach every school in the land, they will serve a great purpose, and the benefit to the coming generation will be incalculable.

A Woman's Beautiful Memorial.

A beautiful memorial to a noble woman will be maintained henceforth in the little city of Pasadena, Cal., the home of the late Helen Peabody, founder of the Western College for Women at Oxford, Ohio. Miss Peabody, who died recently, provided in her will that her Pasadena residence, one of the loveliest in that lovely town,

TREE PROPERLY BANDED TO RESIST CODLING MOTH.

should be used henceforth as a "resting place for weary Christians, either from the home or foreign field, and is to be called the House of Rest." For its maintenance about $8,000 has been set aside. Miss Peabody willed all her other property for the advancement of missions under the Presbyterian Church.

50 BULBS 25 Cents. Will grow in the house or out of doors. Hyacinths, Tulips, Gladiolus, Crocus, Fuchsias, Oxalis, Tuberoses, Begonia, Jonquils, Daffodils, Chinese Lily, Dewey Lily, Gloxinia, Lilies of the Valley—all postpaid, 25c. in stamps or coin. As a premium with these Bulbs we will send FREE a big collection of flower seeds—over 200 kinds. HILLSIDE NURSERY, SOMERVILLE, MASS.

THE FIRE ENGINE DRIVER.

There May be Better Drivers on Earth, but if There Are, Where Are They?

Is there a better driver in the world than the man who drives the fire engine? If there is, he is yet to be discovered.

Here was an engine coming along a cross street, to turn up an intersecting avenue. Under the edge of the rounded-off corner where the machine was to turn there was a sewer opening, with the street pavement sloping down smoothly toward it all around from the higher general level of the street.

If the driver, coming as he was at a dead gallop, should make a broad turn around this corner, out where the street was level, the engine would swing more or less, thus checking the horses' speed, and there would be a second or two lost before they could get the load straightened and get under full headway with it once more, up the avenue. But if the driver could make that corner with the two wheels on the inner side of the curve down in that sloping depression leading to the sewer opening close by the curb, and the two outside wheels on the higher level nearer the middle of the street, the higher level here would be for the engine what the banked up outer rail is for the locomotive rounding a curve, making it so he wouldn't lose an inch. And that's the way he did make it.

Before he knew it a man who had been standing at the edge of this corner, waiting to see the engine go by, saw it so near to him and pushing in so close to him that he could have touched it. The driver, aloft in his high seat leaning inwards as he was, too, actually hanging over him as the engine passed, with whistle screaming and steam hissing, and that driver, as he flung 'em in this fashion 'round this curve, was talking low to his horses and calling on 'em each by name—a man absorbed if there ever was one.

Substitute for a Duel.

A new humor has been added to the French duel. A. M. de Groze had an engagement with swords with a M. Carillot. At the last moment he sent word that he would not fight, but was sending his second in his stead. Happily the second acquitted himself so brilliantly that the principal's absence was not felt, for he actually shed some of his adversary's gore. It was a delightful touch, the courtesy of not disappointing a waiting antagonist, but sending instead a nice, obliging friend to pink him.

Roosevelt Translates Gaelic.

President Roosevelt in the near future may publish for private circulation a book of Irish poems which he translated from the Gaelic. The President was taught Gaelic by James Jeffrey Roche.

An O'er True Tale.

"Does anyone know how to make a Maltese cross?" asked the instructor in architecture. "Yes," answered the son of the Chief of the Naval Board, "Step on her tail."

Kirk
AMERICAN CRO[WN]
SOA[P]
is a green soap, consistency of ... cleanser for automobile machin... vehicles; will not injure the ... polished surface. Made from ... oils. If your dealer does not carry Crown Soap in stock, send us ... address and we will see that you ... supplied. Put up in 12½ 25 and 50 ...
James S. Kirk & Co.
CHICAGO, ILL.

5,000 Rifles
FREE TO BOYS
Just send us your name and address so that we may tell you how to get this fine rifle Absolutely FREE.
YOU CAN HAVE ONE
As we are going to give away 5,000 of them. We mean it, every word, and this is an honest, straightforward offer, made by an upright business firm who always do exactly as they agree. All we ask is that you do a few minutes work for us. It is so very easy that you will be surprised. This Handsome Rifle is not a toy air rifle, but is a genuine steel, blue barrel, hunting rifle, that is strong, accurate and safe and carries a 22-calibre long or short cartridge. If you want a fine little hunting rifle, just write and ask us for particulars. They are free and you will surely say it's the best offer you ever saw or heard of.
BE SURE and WRITE AT ONCE before the 5,000 rifles are all gone, as the boys are taking them fast. Address
Peoples Popular Monthly, 560 Manhattan Building, DES MOINES, IOWA.

BOOKS—BOO[KS]
We have published some good ... ially suited for farmers. Books that ... every farmer to make more out of ... Write for our catalogue.
WEBB PUBLISHING C[O.]
St. Paul Minn.

Marlin
Repeaters are the original ... top and side ... This feature ... solid shield of ... between the ... head and the ... at all times, throws empties away from ... instead of into ... prevents smoke gases from entering eyes and lungs, keeps the line of ... unobstructed. MARLIN ... works easily ... smoothly, making little noise. Our automatic recoil-operating locking ... makes the Marlin safest breech-loading gun ever built. ... page catalogue ... lustrations, cover nine colors, mailed three stamps.
The Marlin Firearms ... New Haven, Con...

HOW TO MAKE SCHOOL GARDENS.

By H. D. Hemenway.

This suggestive little book is a practical manual of school gardening for teacher and pupil, and supplies the first adequate work of the sort in this cou[ntry]. This volume is based on actual experience (the author is an authority and dir[ector] of the Hartford School of Horticulture).

CONTENTS: Introduction; How to Make a Garden; Twenty-One Le[ssons] in Garden Work—May to September; Bibliography; Lessons in Greenhouse W[ork]; Planting Seed, Potting, etc.; Root Grafting; Lessons in Budding.

Size, 5 x 7; pages, 107; binding, cloth; illustrations, 26.

By special arrangement with Doubleday, Page & Co., I am able for the pre[sent] to make the following

SPECIAL OFFER.

The new *Garden Magazine*, 6 months, and *How to Make School Gardens*, $1.00 edition, postpaid, both for $1.00.

The GARDEN MAGAZINE is finely illustrated, and is the finest magazine [of] its kind published in America. To take advantage of this special offer, or[ders] should be sent at once to H. D. Hemenway, Hartford, Connecticut.

This offer may be withdrawn at any time.

SUCCESS MAGAZINE
The Great Home Magazine of America
makes this unequaled offer for a limited time only:
NEVER before in all our wide experience have we been in a position to make a book offer of such exceptional value. The Continental Encyclopedia has been edited, illustrated, printed and bound with the view of filling a long-felt want in the home and office. It is comprehensive in scope, complete in topics, systematic in arrangement, and exceedingly convenient for use. The set weighs nearly eight pounds, is seven and one-half inches high, and occupies a shelf space of eight inches. Encyclopedias have become almost a necessary adjunct to business and most essential to home study. Questions are constantly coming up which require definite and authoritative answers.

Our Limited Offer
Success Magazine One Year
Continental Encyclopedia Express Prepaid
Our Price only $2.95 for both
Eight Vols., Strongly and Richly Bound in Red Vellum de Luxe cloth.
Edited by CHARLES LEONARD-STEWART, B. A. of the staff of the Encyclopædia Americana, International Encyclopædia, Biographical Dictionary, etc.
Over sixty-five thousand important subjects are treated at length. The latest occurrences of international interest, such as the Russo-Japanese Dispute and War—Panama's Independence—Radium—Wireless Telegraphy, and the Alaskan Boundary Decision—all have their places in this most modern work. In short, there is much later and better information in this set than in many a much more pretentious work. The business man, the teacher, the farmer, the professional man, the student, will all find it the ideal reference work of modern times, where concise, accurate, up-to-date information can be had on every subject without wasting words on non-essentials.
WE GUARANTEE SATISFACTION
We will send the eight volumes to you, neatly packed, express charges prepaid, upon receipt of your remittance of $2.95, and if you are not thoroughly pleased, send them back at our expense and we will refund the amount paid by you.
Fill out this coupon and send in TO-DAY.
This offer is limited to Feb. 1st., 1906.
THE SUCCESS COMPANY Washington Square NEW YORK
Herewith find $2.95 for which send me, express charges prepaid, The Continental Encyclopedia, 8 vols., and Success Magazine for one year with the understanding that if I am not satisfied I may return them without cost to me.
Name.........
Address.........
Mutual. E