

A GRAIN OF CORN.

Science Turns It Into Everything from Auto-Tires to Fireworks.

There once was a time—and not such a great number of years at that—when Indian corn was considered fine feed for fattening cattle and poultry, and that was about all.

Just see what the wizard of science, otherwise the food expert and chemist, is able to do with a grain of corn today. He separates the shell or hull from the starchy inside, or endosperm, and also removes the heart, or germ, of the grain, and from these three different substances he makes such a variety of products that they must not be written down in one long list. Some of them, such as bread and syrup, have a food value. Others, such as fireworks, soap and rubber heels, have not.

This article gives an idea of the widely diversified range of foods, substances and compositions which the wizard of science has already been able to extract from the wonderful grain of corn, and it is possible that further experiments may reveal many other uses to which the grain of corn can be put.

Back in 1881, Dr. H. W. Wiley, chief of the bureau of chemistry, department of agriculture, said: "Corn, the new American king, now supplies us with bread, meat and sugar, which we need, as well as with whiskey, which we can do without." Today he might add to the foregoing table sirup, oil for frying, candy, gum, feed cake for cattle, preserves and jelly. And then, turning for a moment from the food value found in a grain of corn to the other substances and compositions derived from that same grain, Dr. Wiley might add laundry starch, the new "safe and sane" Fourth of July firecrackers known as "sparklers," automobile tires, rubber heels, soap, paint, varnish, and hair tonics.

"Wonderful!" you may remark. The wizard of science says it is all very simple. The secret consists in knowing just how to divide the grain of corn in order to extract fine sirup from one part, starch from another, oil from another and so on without getting them mixed.

"How do they make automobile tires out of grains of corn?" may be asked. To answer frankly and honestly, they don't. But out of the very heart, or germ, of the grain, a certain oil, known as corn oil, is extracted. Then by a vulcanizing process this oil is converted into a rubber substitute, which

is used in the manufacture of various articles, such as insulating material, rubber heels, automobile tires and raincoats. As for the corn oil itself, it is used in the manufacture of soap, soft soap and soap powders, oilcloth and leather, paints and varnishes.

The old way of using corn was to feed it to the cattle, either on the cob or in grains, or by grinding it up, just as it came from the cob, to make corn meal. Today the wizard of science takes a grain of corn and first of all steeps it in water. The grain absorbs a certain portion of the water, swelling somewhat in consequence, and there results a loosening and softening of the various component parts of the grain. The steep water containing the solubles of the corn is drawn off and subsequently evaporated and incorporated with other parts of the grain to make gluten feed.

The next step is to grind the steeped corn somewhat closely, so closely, in fact, that the little heart or germ of the grain is not broken. Then follows another steeping process, by means of which the component parts of the ground corn are easily separated. The light and oily parts, in obedience to the laws governing specific gravity, rise, and the heavier parts sink, and so a separation of germs, hulls and endosperm is effected.

The germs are dried and from them is produced oil and oilcake. The hulls are likewise separated and mixed with the gluten and corn solubles to form gluten feed. The endosperm is separated into its component parts, starch and gluten. From the starch the three following classes of products are derived: Dry starches, corn sirups and are obtained by a process known as hydrolyzing the starch. This simply means the chemical decomposition of the starch and the formation of new compounds when the starch is absorbed by water. A subsequent refining and evaporating process is necessary for the production of the corn sirups and sugars. The dextrines, otherwise the gummy compounds formed by the action of heat on starch are produced from the corn starch by a process of roasting.

Getting back to the very germ of the grain of corn, it is interesting to follow its career still further. When the germ which contains the oil is separated from the

remaining portion of the grain it is dried, ground and subjected to hydraulic pressure, whereby the oil is extracted. The oil is filtered after settling and still further refined to get rid of any free, fatty acids, to improve the taste and to lighten the color. Then this oil is ready for frying and cooking purposes, salad oil, for shortening for bread and cake, for pharmaceutical purposes, such as ammonia liniment and camphorated oil.

The various starches obtained from the grain of corn are almost too numerous to mention, but among others are the familiar corn, laundry and confectionery starches. They have a multitude of uses; for foods, such as jellies and puddings, baking powder, pastes, sauces, candies, gum-drops, lozenges, for brewing beers and ales, for stiffening and finishing yarns and fabrics in textile industries, in paper manufacture as a filler, finisher and size, for cosmetics, asbestos, soaps and adhesives and in the manufacture of coal briquettes.

The dextrines, made by roasting the starch, are used in the textile industries for strengthening the fiber and finishing the fabrics, for cloth, carpets, twine, for thickening colors, for calico and other printing, for leather dressings, pastes, food, sauces and paper, for gums and glues, ink, mucilages and adhesives, for coffee and rice polishing, and finally in the new Fourth of July fireworks known as "sparklers."

To make the corn sirup starch is mixed with water and heated under pressure to form a liquid composed of about equal parts of dextrose and corn sugar and glucose. The acid is neutralized to form table salt. The remainder is filtered to remove any fat or protein from the starch and decolorized by passing through boneblack, just as cane sugar factories. It is then subjected to an evaporating process and, presto change, there is your corn sirup.

In addition to being mixed with cane sirup and molasses in the preparation of table sirup, many other valuable uses have been found for corn sirup. Among others may be mentioned the confectionery uses, such as for baking, sirups, jams, jellies, preserves, mince and other desserts, brewing of beer, flavoring chewing tobacco, food sauces, canning of meats, pastes and sizes, tanning of leather, blacking, printer's rollers, shoe polishes for finishing molds and cores in tin foundries, in extracts such as birchwood, in silvering glass for mirrors and in liquid soaps, hair tonics, sponges, coffee and rice polishing. Corn sugar is used in the manufacture of caramel and sugar coloring, in the brewing of beers, ales and porters, in vinegars and in the manufacture of lactic acid for tanning and for filling leather.

Mrs. S. T. Rorer, well known as a cooking authority, gave a series of practical demonstrations with corn recipes some time ago. To persons who think only of yellow and white mush, Johnny cake Indian pudding and "pone" as possible from corn flour, it may be a revelation to read merely a list of the dishes which Mrs. Rorer prepared. She made corn bread with yeast, southern rice bread, Louisiana corn bread, Adirondack corn bread, Victoria corn gems, mush gems, hockeecake corn dodgers, waffles, griddle cakes, hominy muffins, plain boiled hominy blanc mange, cream of cornstarch pudding, strawberry starch with marigold, Heaton pudding, strawberry float, vanilla souffles, hominy flour-entree, corn starch cakes, plunkets, pilau, chicken and hominy, fried cream, mush croquettes, cream pie and Boston brown bread.

"And in all these recipes," declared Mrs. Rorer, "I have not used one ounce of wheat flour. Corn has been used every time."

This account of the wonders of corn would not be complete without a brief reference to the uses of corn cobs, stalks and even the "silks."

Laboratory tests made at Columbia university, New York, have shown that gas can be made from corn cobs and corn stalks more cheaply than from coal. In Berlin a German engineer named Drewsen has invented a process for making all kinds of paper from corn stalks. Secretary James Wilson of the department of agriculture, announced some time ago that simple methods of fermentation will result in the production of eleven gallons of alcohol from one ton of corn cobs. J. T. Schaffer, of Rochester, N. Y., has invented a process for making fireproof railway ties out of corn stalks. Cellulose, smokeless powder and dynamite are being made from corn stalks. The cellulose is used as a lining for battleships and cruisers, to serve as an automatic leak stopper in case of a puncture below the water line. New York World.

SQUIRRELS OR TREES?

SERIOUS PROBLEM CONFRONTS EXPERTS IN FORESTRY.

Little Animals Cause Serious Trouble Wherever Forest Service Has Tried to Reforest Cut-over or Burned Areas.

Whether we have squirrels or forests in the United States is a question that is now presenting itself urgently to the department of agriculture. Dr. H. H. Henshaw, chief of the biological survey, has just returned to Washington after a tour of the west, where the forest service is worried over this problem.

The squirrels that are forcing themselves into the balance against the trees are the gray squirrels of the west and the Pacific coast. There has been an immense amount of trouble wherever the forest service has tried to reforest either cut-over or burned areas from the small rodents that ate the seeds before they sprouted. The gophers, field mice and ground squirrels have been the worst offenders, and it has been found necessary to exterminate these little pests over large areas before reforesting was at all successful.

This has been done in some cases with the aid of the biological survey, and in cases where from 75 to 80 per cent of the seed were formerly eaten within 36 hours after planting, it has been found possible to kill off the small ground animals and get a good stand of new timber. In fact, in the Cochapaw forest of Colorado it is probable that the stand of young trees will have to be thinned out to give room the trees ought to have.

But now comes the gray squirrel and presents a new problem to the forester. In most of the reforesting areas the seed of the yellow pine is the most desirable seed to be planted. The gray squirrels, it is found, not only eat the seed that are planted, but if the seed crop is at all light they eat the seed before the foresters can collect them for planting. The rangers have tried the experiment of watching the squirrels and find they frequently can locate the hoards of the little red squirrel, getting as much as a bushel of seed sometimes from a single granary. But the gray squirrel does not hoard the seed. He either eats as he goes or else buries scattered seed so it is useless to look for them.

The biological survey does not want to exterminate the squirrels, and does not intend to poison them, at first at any rate, but will send out hunters to kill them off by shooting in "the worst infested regions to see whether they can be held in check till the new trees get a start.

Doctor Henshaw said he made a visit to the national bison range, where 20,000 acres have been fenced on the Flathead Indian reservation, and found the herd of bison installed there doing well and taking kindly to their new surroundings. The Flathead Indians have several thousand acres of land they want to irrigate, and they cannot readily get water to do it without running an irrigation ditch across the bison park. They are willing to do the work of ditch digging themselves or pay the department of agriculture for having it done, but the department does not want to risk this invasion of the bison territory, and the method by which the question shall be settled has not yet been worked out.

Golden Gate Fogs.

The fogs of the Pacific, and especially those on the coast of California and Washington, present some characteristic features of their own. They are low lying, dense and of frequent and regular occurrence, and have been the cause directly and indirectly of a large percentage of marine disasters in the vicinity of San Francisco. Owing to the general movement of the air from the sea toward the land, and the climate of the great interior valley, fog is frequent and well marked. In summer the afternoon sea-fog varies in depth from 100 to 1,700 feet, but it rarely reaches far inland.

On some afternoons the velocity of the wind at San Francisco rises with almost clocklike regularity to about twenty-two miles an hour, and a solid wall of fog, averaging 1,500 feet in height, comes through the Golden Gate, causing a fall in temperature to about that of the sea—namely, 55 degrees Fahrenheit.

The upper level of the fog can be plainly seen from the hills in the vicinity. Above the fog level the air is cloudless, and the afternoon temperature ranges from 80 degrees Fahrenheit to 90 degrees Fahrenheit.

Chance for Profit.

Considering the accommodations the young doctor thought the rental asked for the office exorbitant. He enumerated the drawbacks; no sunshine, limited space, stuffy elevator, threadbare and insufficient furniture. The agent listened in tolerant silence, then he turned and looked out of the window at the frenzied crowds dodging to protect life and limb from the onslaughts of trucks and four different car lines that crossed at that corner.

"Yes, sir," he said, "I admit all that, but just look at the opportunity for accidents."

Problem in Natural History.

"Evolution tells us," said the scientist, "that the ear is modified breathing apparatus of the fish."

"Don't believe it," replied the superficial person. "It's utterly impractical. How could the fish manage to breathe without waking himself up?"

Sash Doors Blinds

S HAND has
BUILDER'S that he will
SUPPLY as long as this is a
COMPANY for he sold them once.

Get on our list and be one one of our satisfied customers. If you cannot come Phone 81 or write,

W. D. STARLING, Mgr.
CAMDEN, S. C.

Lumber Moulding Plaster

Horses Ran Away.

What was almost a serious accident was the runaway of two spirited horses driven by Mr. Frank Campbell on north Lyttleton street Sunday afternoon. Mrs. Campbell and little child were in the buggy with Mr. Campbell, when the horses became unmanageable and dashed down the street in front of Hobkirk Inn. When the horses were in front of "Bloomshury," they swerved towards the sidewalk and overturned the buggy on the occupants. All of the occupants were severely bruised, but not seriously injured. The buggy was demolished. Fortunately the harness broke when the buggy overturned and prevented the horses from dragging the buggy, which was on top of the occupants.

Bruce's Stables Sold.

Mr. R. H. White, who for several months past has made Camden his home, has bought the livery stable of Mr. T. B. Bruce, and will conduct it during the coming season. While Mr. White is a comparative stranger, he has made many friends here, and from all appearances, expects to make his headquarters here permanently. He states that he will place an order at once for several of the latest model huggies — that is, 22-inch seats.

Subscribe for The Chronicle.

Cool Springs Sold.

A real estate transfer of considerable importance is the recent sale of "Cool Springs," the home of Mr. and Mrs. T. J. Kirkland, four miles north of Camden, to Mrs. Snell, of Boston. "Cool Springs," next to "Mulberry" is the best known country home in this county. It is large house of colonial style and beautiful grounds, and several very cold springs in the yard, from which it obtains its name. Several acres of land go with the house. It is understood that Mrs. Snell will use it as a club house for the tourists that spend the winter here. Mr. and Mrs. T. J. Kirkland and family will move to Camden in the near future. The house and the several acres of land around it sold for \$12,000.

FOR SALE.

The Kirkwood Grocery. A splendid opportunity for live man. Reason for selling, manager leaving, no time for personal attention. Apply to J. B. Zemp, Camden, S. C.

Happy Hours of Christmas.

Happy hours are passing,
Filled with joy and mirth;
Comes the time of gladness,
Welcome to the earth.
Every heart rejoices
In its light and cheer;
Christmas is the day of days
That crowns the year.

Swelling strains of melody,
Merry bells are ringing out their jubilee,
Telling over land and sea;
"Unto Christ, the Glorious King, all glory be."
Ever sing His mighty love,
Magnify His power and fame;
While resounding anthems mingle
with their chimes
Praise and bless His holy name.

Share the joy of Christmas
With the friends you meet;
Loving words of greeting
Everywhere repeat;
Lonely ones around you
Hearten with a song;
Only golden memories to the day belong.

May the Christmas spirit
Brightly in us glow,
Thro' the year before us
Light for all bestow.
Heed the heavenly message,
"Peace, to all good will."
Strive its tender promises to ever fulfill.

Letter From Dr. Wightman.

The following letter upon the recent death of Mrs. Capers was received by Dr. H. B. Browne from Dr. John T. Wightman, of Baltimore, who was at one time pastor of the Methodist church in Camden:

"My dear Brother: I commit to your care the body of this sainted woman to rest in the old family graveyard in Camden. She gently fell asleep in Jesus at her home in this city. No disease, but the weary wheels of life stopped still at the golden gates. I had the great pleasure of knowing her for more than sixty years. She was a beautiful type of a Christian woman—an angel in the church; a mother in Israel of an honored household; sweet-spirited, active in all religious duties; the wife of a minister of the South Carolina Conference, and the sympathizing friend of all servants of Christ. She lived with her daughter in this city for about ten years, and I frequently visited her. She was always in Heaven when I saw her—so full of joy. I will prepare a full "In Memoria."

"Your brother in Christ,
"J. T. Wightman.
"Baltimore, Md., Dec. 6, 1911."

The Place to Get Your Turkeys.

I will be at King's Stables next Tuesday, the 19th inst., with a load of fine turkeys and chickens.
H. T. Johnson.

Little Town of Bethlehem.

O little town of Bethlehem!
How still we see thee lie;
Above thy deep and dreamless sleep
The silent stars go by;
Yet in thy dark streets shineth
The everlasting Light;
The hopes and fears of all the years
Are met in thee to-night.

For Christ is born of Mary,
And gathered all above,
While mortals sleep, angels keep,
Their watch of wondering love.
O morning stars, together
Proclaim the holy birth!
And praise sing to God the King,
And peace to men on earth.

How silently, how silently,
The wondrous gift is given!
So God imparts to human hearts
The blessings of His heaven.
No ear may hear His coming,
But in the world of sin,
Where meek souls will receive Him
still,
The dear Christ enters in.

O holy Child of Bethlehem!
Descend to us, we pray;
Cast out our sin, and enter in,
Be born in us today.
We hear the Christmas angels,
The great glad tidings tell;
O come to us, abide with us,
Our Lord Emmanuel!

ADMINISTRATOR'S SALE AT THE GILT EDGE STORE.

In re estate of Paul T. Villepigue.

Notice is hereby given that in conformity with an order of the Probate Court for Kershaw county, S. C., all the stock and fixtures in the store on the west side of Broad street, Camden, S. C., of the late P. T. Villepigue, known as the Gilt Edge Store, such as then remain unsold, will be offered for sale at auction to the highest bidder for cash, at the said store, on January 2nd, 1912, commencing at 12 o'clock M. The stock of goods will be sold in bulk and schedule of the same will be found on the morning of January 2nd, at the said store. The fixtures in the said store will be sold either in bulk or detail as occasion will require.

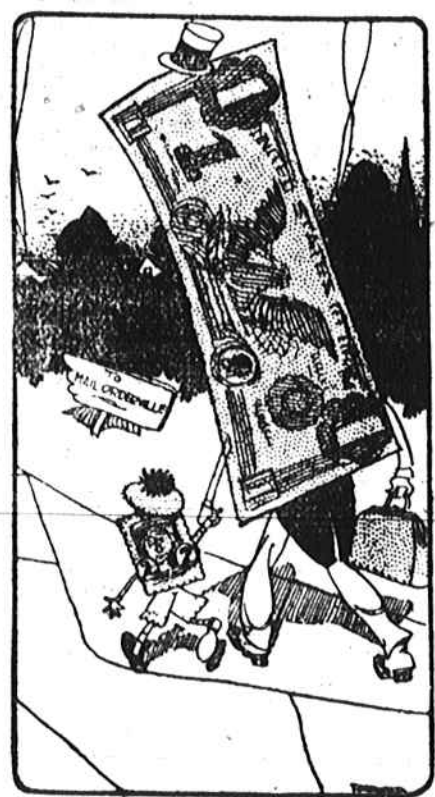
John M. Villepigue
Mary D. Villepigue
Administrators.

Dec. 14, 1911.

It is said that the National Loan and Exchange Bank of Columbia will erect a twin building to its present twelve story home, this being Columbia's "skyscraper."

**Mr. William Dollar,
Good Citizen.**

In a certain western town lives a gentleman whose name is William Dollar. They call him Dollar Bill when they get funny. But Mr. Dollar is a dignified, enterprising, good citizen.



Not every Dollar Bill is a good citizen. Many of them are prone to ignore the claims of their own community and run away to a big city to be spent. Many millions of Dollar Bills have left the smaller towns for the overgrown cities this present year of our Lord.

How many Dollar Bills have gone out of THIS TOWN — left home and gone to some big city, never to return? Every time a Dollar Bill leaves town it takes a two-cent stamp with it, for it goes to a Mail Order Store. That helps the postmaster a little, but it doesn't help the local merchant. It means just so much less trade for him.

Which means just so much less cash circulating in this community.
Which means just so much more social and business stagnation.
Which means the stunting of the town's growth just to that extent.

If you could figure up the Dollar Bills that leave town in this secret manner, like taking French leave—which you can't—you would know just how much the town is stunted by indulgence in this mail order stunt.

If these Dollar Bills were really good and enterprising citizens they would stay at home and circulate around, helping things along.

How many of YOUR Dollar Bills take the midnight express out of town on the Envelope Route?