

THE SUGAR BOWL IS FILLED BY MOTLEY CREWS—THE PRICE NOW THE LOWEST IN YEARS

(Philadelphia Bulletin)

When you reach for the sugar bowl of a morning and sprinkle your breakfast cereal with the snowy white crystals, you probably do not realize what a huge organization is required to keep that sugar bowl filled.

Sugar is a major product of manufacture in Philadelphia and its story is an interesting one. The city's "big three" refineries—the Pennsylvania, Franklin and McCahan—produced more than 4,000,000 tons of beautiful snowy sugar in the past five years. Of these, the Pennsylvania, at Delaware avenue and Shacamaxon street, which is the largest, refines nearly one-tenth of the nation's 5,000,000 ton annual output.

When the raw cane sugar is brought to the refinery, it has already been through several processes in the place where it is grown—Cuba, Puerto Rico, the Philippines or Hawaii. The sugar cane is crushed, and the juice so extracted boiled to a form of flaky brown substance which looks like dark sand.

"Kanakas" and "Japs"

At a pier on the Delaware river a string of steamers is constantly discharging the 325-pound bags in which the raw sugar is imported. The ships are manned by swarthy Hawaiians and wiry, lithe Japanese (who look so small that one wonders what they are doing at sea) and motley crews of sea-going drifters picked up from various ports throughout the world.

The bags are sampled and weighed by Government revenue officers. Your Uncle Sam receives \$2.14 duty on each 100 pounds of sugar, which the refiners sell at \$3.70, the lowest price at which sugar has ever sold.

Then they are cast on a rubber belt conveyor five feet wide and 350 feet long. Every hour during the working day nearly 400 tons of raw sugar are moved on this belt. Near the discharge end, workmen stand by with huge knives and cut the strings of the bags, which are emptied into huge hoppers, where the sugar is elevated to a 1,000 ton bin on the roof of the melter house.

Five Tons Washed from Bags

The bags are laundered and repaired for re-use, giving up in the wash five tons of sugar a day—which is all recovered.

The raw sugar next goes to the minglers, where the crystals are pulped with saturated syrup to make it a fluid mass. This dark brown substance, which now looks like molasses is passed through high speed centrifugals similar to laundry dryers, which spin about at breath-taking speed and washes the sugar free of the impurities and molasses. A huge mass of ivory-colored sugar now clings to the sides of these machines, and then is dropped down to the melters.

Starting with a long corridor of mechanical filters, the syrup passes through a series of metal cloth filter leaves and an intricate series of tubes, until it is filtered to a sparkling am-

ber color. The filtered syrup is then pumped through the copper piping to the char house.

5,000 Tons of Charcoal

The 12-story char house is equipped with numerous pumps and batteries of filters charged with 5,000 tons of hard granulated charcoal, through which the amber syrup passes, to emerge water-white. The operator must keep an eagle eye on the liquid, and as soon as he detects a slackening of the decolorizing power of the char, he drains the sugar syrup and washes the char with hot water, sending it through tight retorts to a fiery furnace for purification and ultimate re-use.

The clear white syrup now goes to storage tanks in the top of the pan house to await its turn to be drawn into the vacuum pans. These pans are large tanks built of heavy copper and fitted with steam coils for evaporating, with a condenser and vacuum pump to create a vacuum and therefore cause the liquid to boil at a temperature of 30 to 40 degrees lower than ordinary boiling temperature. Thus scorching may be avoided, for this would produce sugar with a caramel flavor, as any cook knows.

Crystals Made Any Size

In the pan it requires skillful manipulation by experts to produce crystals any size desired by the trade, from the finest sugar of minute grain, to as large as one quarter inch diameter rock candy. These crystals are patiently formed and built up, and float in the "mother syrup," which is subsequently removed through the aid of a long row of centrifugals. The centrifugals spin vertically like a top with a speed of 1,000 revolutions a minute, the centrifugal force throwing the syrup out while the crystals remain on the screen to be washed and later discharged from the basket.

The wet sugar is then delivered to revolving dryers for removal of moisture. Here it is tossed around and around, falling like snow from the tops of the dryers, to be caught up at the bottom and spun around again. The dryers discharge through electric screens for separating in various sizes and the sugar is then ready for the packing house.

Bags Become Towels

Pure and white and crystalline it is now—if any impurities were present, crystallization could not have been achieved.

From now on all handling is mechanized to preclude any possibility of contamination. Some sugar is still packed in wood barrels of 350 pounds, but the bag and box trade is the main item in these days of tiny pantries and cramped cupboard space. The 5-pound bag is most popular.

Export buyers demand moisture-proof bags, while housewives in Dixie, loyal to the cotton growing industry of the Southern States, prefer cotton bags.

100-pound bag is produced of an excellent grade of cotton which has

a stripe in two tones woven in, so that when washed to remove the printing, the bag produces a fine towel which the thrifty housewife has only to sew together for roller use, or cut and add a bit of hemming to acquire two fine tea towels. Smaller bags become dishcloths.

A "Double-check" Gadget

The sugar is weighed mechanically and packages and bags filled to an accuracy within a tiny fraction of an ounce. One amazing machine fills the box with the prescribed weight, then passes it on to another part of the same contraption to be weighed again and filled in should there be a small amount lacking. "Check 'n' double check!"

Cubes and tablets are made in cylindrical presses resembling printing presses, and packed by automatic packers.

One reason for the present low price of sugar is the growth of the by-products in industry. The first syrups strained out at the centrifugals are re-processed for brown sugars, which of late are greatly increased in popularity. There are 14 different shades of this delicious sugar with the maple flavor.

The final product of the refining process is black molasses, which contains sugar, glucose, potash and a myriad of small quantities of chemical combinations known only to chemists. This molasses may be refined into table syrup but in the refinery of which we are speaking, most of it goes to the by-products plant.

So Cold It Burns

On arrival here it is carefully weighed by revenue agents for a check against alcohol production. The molasses is then passed to a mixer for dilution with water and inversion of the sugar content into glucose.

It's going to be made into alcohol now, and yeasts of special strains are required. These are prepared and propagated with the same care that the breeder of fine horses gives to his stock. The yeast breaks up the glucose into alcohol and carbonic gas. Alcohol is produced under government bond, and it is only released when it has been denatured by various poisonous or disagreeable substances which make it unfit to drink.

In the fermentation process which produces alcohol, carbonic acid gas is also produced, recovered and compressed in that mysterious new substance "dry ice," such a boon to shippers of perishable products. Dry ice has a temperature of 109 degrees below zero, and is so cold that it will burn a blister on your hand and smoke when exposed to the air.

Mash May Become Fertilizer

The market for alcohol is not especially heavy, but Uncle Sam has a man on the job night and day in this distillery. It is necessary to produce alcohol to get dry ice, for which the demand is steadily increasing.

Industrial Chemical plants do have a great variety of uses for alcohol, however, among which are ethyl chloride, for medical purposes, the basis for flavoring extracts and perfumes, anti-freeze for automobile radiators, solvents for the production of photographic films and to be used in the making of lacquers.

STICKING PINS IN SHIRTS

(Philadelphia Bulletin)

It is an axiom that Government should keep out of business. This, however, does not lessen its obligation to aid business by wise laws and helpful advice. If it were not for the valuable information gathered by consular reports, American exporters would doubtless still be packing in bulky 300 pound cases, goods that have to go by mule back over the Andes, expecting to market wares in Latin-America on ten-days credit and endeavoring to sell electric refrigerators to the Aleutian Islands and hot water bottles to Liberia. There are numerous bureaus at Washington dedicated to the service of industry, and all of them feel free to offer counsel for industrial practices. Why, then, has none of them taken up the subject of pins in new shirts?

It is bootless to inquire why new shirts should be infested with pins, or why many of them are placed with such devilish ingenuity of concealment that the harassed shirt buyer cannot locate them until he puts the shirt on and feels the points penetrating the tender parts of his anatomy. Probably at some time in the remote past a contest was held in a shirt factory to ascertain who could plant the most pins in the most obscure places in a shirt, and the prize winner's achievement was adopted as standard practice by all makers.

Now, whatever the purpose of converting a shirt into a pin cushion, the Government should investigate and report to manufacturers upon its effect. It will probably find that pins appreciably diminish the demand. This is the way the pinning works:

John Doe decides he needs a new shirt, and either buys one or commissions his wife to do so. The garment is delivered and goes into the chiffonier drawer. John opens the drawer to extract a shirt and sees the new one on top of the pile. He immediately transfers it to the bottom, because he remembers the 19 pins and the time it will take to extract them, and he thinks that Sunday will be a good day for the job. When in the course of time the new shirt works to the top again it is promptly demoted. When all its companions are worn to rags and not until then, Mr. Doe heaves a sigh, tells his wife to telephone the office he is going to be a little late, and sets to work patiently to make the shirt suitable for wearing. In the period which has elapsed before he is forced to his labor he might have bought six new shirts and had them half worn out. The loss is the shirtmakers'.

Surely this matter should be officially brought to the attention of the trade. If there is a tradition in the Shirt-Makers' Guild that their product must be presented for sale, folded in rectangular form it does not follow that pins must be used to uphold it. How about glue? Or better still, some of that starch that the laundries use to plug up the holes in which collar-buttons are supposed to be inserted?

Probably manufacturers would have no objection at all to leaving pins out of shirts. Perhaps they never even thought of it, just as it never occurred to a tailor to stop putting useless buttons on men's coat sleeves. It goes without saying that if they are authoritatively shown that pinless shirts will sell better, a great and necessary reform will be achieved.

BEACH REVERIE

Against the charge that she'd go out
My sweet would need defenders.
Oh, little did I ever think,
Clad only in suspenders!

RUSSIAN TEA

4 cups freshly brewed tea
4 teaspoons raspberry jam
Sweeten the tea with jam. Pour
over cracked ice.

opponent. He doesn't need to explain why he is unable to keep his campaign promises.

The mash from the distillery is not used at present, but chemists are at work expecting to complete the cycle from earth to earth by producing a valuable fertilizer from its use in the growing of sugar cane.

Red Rose Tea

The New **20¹/₂ lb.**
BROWN LABEL, 40¹/₂ lb.

"It is good tea or it would not be in a Red Rose package"

A woman who marries for money The young ladies attending the works more than eight hours a day. Teachers' Institute put the "Queen" One can be famously indignant in Queen street yesterday. Without losing his temper. Why If a mob had any sense there would be no mob.

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British Government delegates to the Imperial Economic Conference at Ottawa photographed aboard the Canadian Pacific liner "Empress of Britain" and who held a Cabinet Council on the ship, an event unique in marine or government annals. Seated left to right, they are: Rt. Hon. Walter Runciman, M.P., Rt. Hon. Neville Chamberlain, Chancellor of the Exchequer; Rt. Hon. Stanley Baldwin, Lord President of the Council; Rt. Hon. J. H. Thomas, Dominions Secretary; standing, Rt. Hon. Sir Philip Cunliffe-Lister, Colonial Secretary; Rt. Hon. Sir John Gilmour, Minister of Agriculture; and Rt. Hon. Lord Hailsham, Secretary of State for War.