

RISKY BUSINESS.

MUCH PERIL CONNECTED WITH MAKING GUNPOWDER.

Various Processes of Manufacturing the Explosive—Ingredients Used—How the Powder is Caked and Classified.

THE first process in the powder-making is the weighing out and mixing of the ingredients. The charcoal and sulphur are put together in the right proportions and thoroughly pulverized by placing them in swiftly revolving barrels or drums with a number of small iron cannon balls. In rubbing against the sides of the barrel and being ground between the balls the mixture becomes homogenous and very fine. It is then taken out and the proper amount of saltpeter is added. Again the charge goes to the drums, this time copper or zinc balls being substituted for iron, because they are much less likely to ignite the powder. After having been rolled for several hours the workmen take the mass out, and after moistening it a little to prevent accidents, they carry it away in a gingerly fashion to the crushing mills or "wheel houses," as they are called.

A wheel house is built with due deference to the explosive nature of the powder. Seemingly every opportunity is given it to blow everything to atoms. On three sides of the building, which is twenty feet square, there are enormously strong stone walls varying in thickness from thirty-six to sixty inches. The fourth side and the roof are constructed of light boards so that if the powder "goes off" it will do as little harm as possible. Inside of the inclosure stand the grinding mills. They consist of large basins, not unlike small fountains with sloping sides, usually made of smooth limestone. From the center a shaft rises and fastens to the axle of a huge stone wheel or "chaser," weighing twenty-four tons. The machinery for operating the shaft is usually hidden away underground where it will be uninjured in case of an explosion.

When the powder has been spread over the bottom of the basin and moistened a little the great chaser begins to rumble around over it, crunching and kneading it as a woman would knead her dough. At one side of the wheel there is a busy little mechanical device, made all of wood, and known to the workmen as a "plow," which roots up the powder after the wheel crushes it down. It may be imagined that the workmen spend a little time in the place as possible. There is no telling a what moment the whole thing will blow up. They stand just around the corner of the stone wall and dodge in from time to time—softly in their rubber boots—and moisten up the charge. In case of an explosion there is an automatic device which will let a whole tank of water down over the wheels, thus helping to extinguish the flames.

When the mass is uniform in composition—and the time necessarily varies from eight to sixteen hours—the "mill-ake," as it is now called, is removed and carried to the "breaking-down" machine by means of an endless canvas belt having strips of leather sewed across it. Here it passes between two sets of copper rollers arranged so that they will spring apart if the pressure is too great between them. It shifts from the lower end of the machine like fine dust or "meal" into trucks in which it is trundled away to the powder press, and ordinary hydraulic press, in which the power can be absolutely controlled by a movement of the finger.

The meal is stacked into the form of a great cheese two or three feet in diameter and three or four feet high, consisting of layers of powder one to two inches thick, separated by disks of copper or vulcanite. Then the piston begins to strain upward out of the water, and the powder is reduced nearly one-half in thickness, the cakes

being a dark gray, hard and lusterless, strongly resembling a boy's slate without a frame. The degree of pressure given is one of the most important considerations in the process of powder manufacture, the ultimate density of the powder being determined by it, and this in turn determining the rate of combustion. By merely varying the degree of pressure the powder may be made either violently explosive or mild and easy in its action.

The cakes of powder are now carried along on a canvas belt to the corning or granulating machine. This consists of a series of copper rollers separated by screens of varying sizes of meshes. After being crushed through the first set of rolls the finest powder falls through the screen and the rest is shaken on down to the second set and so on to the end, where the powder pours from the various screens into trucks. The grains thus obtained are sharply angular and require rounding and smoothing to prevent their fine edges from being ground into dust by the wear of handling and transportation. While still moist from the corning machines the granulated powder is put into rolling barrels or "tumblers," where it is revolved from six to twenty-four hours. The friction of grain upon grain wears it perfectly smooth. Sometimes the glazing is heightened by the addition of a minute quantity of graphite, a tablespoonful of which will impart its peculiar lustre to half a ton of the powder.

The last operation, drying or "storing," takes place in a long, low room heated to a temperature of 130 to 140 degrees.

Gunpowder is classified according to the size of the meshes through which the grain is sifted. The United States Government designated it as a musket, mortar, cannon and mammoth-powder. Some other kinds of powder are cut or molded by pressure into various shapes and sizes, the grains often being two inches square. Others for artillery use are the shape of iron washers and have a hole in the middle. These powders are made large and pressed more compact so that they will burn with less rapidity. In big guns the use of small-grained powder causes so great an initial strain before the projectile is started that a good deal of force is lost.—Chicago Record.

A Dirty Race.

The Mongols, says Frank G. Carpenter, are perhaps as dirty as any other people in the world. Those whom I saw were greasy and filthy, both as to their clothes and their persons. I am told they never wash their bodies, and seldom their faces and hands. The poorer classes dress in rags, but the richer wear costly garments lined with the finest lamb-skin. I have a picture of a Mongolian Princess who was at Peking a year or so ago. Her head was framed in silver beads, and she had long tassels of silver hanging down from her black fur cap. Her hair was done up in two long braids, which were pulled around over the ears and hung down over the breast. These braids are often smeared with glue, which makes the hair shine and keeps it in place. The girl was very beautiful, and some of the younger girls are by no means bad looking. They fade soon, however, and the older women whom I saw made me think of our Indian squaws. They have no night clothes, and they sleep in the same garments which they use during the day. They have no such things as stoves. A fire is built inside their tent, and the smoke goes out at the roof. The tents are made of skin and sometimes of cloth. They are circular in shape, and the people huddle up in them and sit and sleep where they can.

How Silver is Cleaned.

Silver is cleaned at the shops by pressing the piece against a rapidly revolving wheel made of cotton flannel in many rolls. The wheel reaches all irregularities of the surface and the silver is polished without being scratched.—Chicago Times Herald.

RELIGIOUS READING.

RANDOM SHOTS.

The man who is on the fence in a great moral issue, usually finds it a barbed-wire fence.

Better to vote in the air than to vote in the mud.

It is better to be heart-strong than head-strong.

The liquor traffic is a highwayman, who demands, not your money or your life, but your money and your life.

Some men will pray for twenty minutes, and then ask the Lord to forgive them their short-comings.

He is a mean man who works for the devil and looks to God for pay.

The rum business has three pillars—appetite, avarice and apathy.

No man's name is likely to be on the rum-sellers application for license and the Lamb's book of life at the same time.

It is a poor religion that bursts out on Sunday and bursts up on Monday.

It was Great-Heart, not Great-Head, who was sent to conduct Christiana and her children to the Celestial City.

He who lives within the sound of a catenact is unconscious of its roar.

Men have sought to save their country; but who, before Jesus, sought to save the world?

Jesus does not simply give light—he is the Light. He does not show the way, he is the Way.

Creatures below man cannot pray; those above him, need not.

To sin is wicked, but to tempt others to sin is Devilish.

The man who does one thing is terrible. Heathenism has no homes.

Temperance takes the man from the saloon. Prohibition takes the saloon from the man.

Simeon held Jesus in his arms, but we can hold him in our hearts.

Antinomianism feeds the roots of hell with the dews of heaven.

God had but one son, and he became a missionary.

The use of wine and beer as a remedy for drunkenness is like swallowing a cat to catch a mouse.

BUTTERFLY SINS.

Sin as a caterpillar is bad enough, but sin as a butterfly is a thousand times worse. The butterfly, for all its gorgeous colorings is only a caterpillar with wings. The swallow recognizes it as a worm and makes his dinner off it in spite of the wings. So sin is the same disgusting thing at the bottom, however concealed under an attractive name. In the interests both of truth and of virtue the circumlocutions euphemisms at present so much in vogue ought to be sternly discarded. Not many comprehend the power of words. To change the name of a thing is equivalent with most persons to changing its character. The true name of a sin is the best exposure of it, strips off its seductiveness, and sets forth in the glaring light of its own grossness. The effort to do away with these plain, homely words and glide over wickedness must be resisted.

He who jocosely alludes to the devil as "the old Nick," or "his Satanic majesty," has done something to put out the fires of righteous indignation against the Evil One. The smooth, fair phrases under which crimes are so frequently alluded to in the public prints do much to detach public sentiment. Adultery is an unfashionable word; so is lying and theft; but if these terms were faithfully applied to what are pleasantly called "marital infidelities," "commercial irregularities," "financial irregularities," it would be much better for the moral health of the community. Conversation is educational. Let us keep to the strong Anglo-Saxon words wherein yea is yea and nay is nay, lest we fall into condemnation.

HOW TO WIN FRIENDS.

True friendship is beyond all price. "Poor is the friendless master of a world; a world in purchase for a friend is gain." A crowd is not company, and talk is but tattle, where there is no love. A friend opens the heart, wonderfully relieving the pressure of its grief; he strengthens the mind, wonderfully clarifying the movements of thought. Joys are doubled and sorrows divided at his coming. He corrects our thoughts by wise and faithful admonitions. He is one in whose presence we can be truly sincere, and feel perfectly safe. He brings out the best there is in us. His society is a perpetual fountain of refreshment. His confidence in us no array of seeming wrong can for a moment shake. When our need is sorest he clings the closest. Full of tenderness and full of truth, come weal or woe, his place is by our side, his truth undiminished, his hand and heart at our disposal. We well may say,—

"Lord, give us such a friend as this,
And then, whatever may come,
We'll taste even here the hallowed bliss
Of our eternal home."

The Lord Jesus is surely waiting to be just such a friend as this to all who sincerely seek Him.

GOD'S GUIDANCE.

One who carries a lantern on a country road at night sees only one step before him. If he takes that one step, he carries the lantern forward and thus makes another step plain. At length he reaches his destination in safety, without once going into darkness. The whole has been made light for him, though only a single step of it at a time. This illustrates the usual method of God's guidance. His word is represented as a lamp unto the feet. It is a lamp—not a blazing sun, not even a lighthouse, but a

plain common lamp or lantern which one can carry about in the hand. It is a lamp "unto the feet," not throwing its beams afar, but illumining a hemisphere, but shining only on the one little bit of dusty road on which the pilgrim's feet are walking. The duty for the moment is always clear, and that is as far as we need concern ourselves; for when we do the little that is clear we will carry the light on, and it will shine upon the next moment's step.

"Keep Thou my feet; I do not ask to see
The distant scene; one step enough for me."
—J. R. Miller, D. D.

REAL SORROW.

Real sorrow is always from within. The outward life may occasion it, but the inward life sustains it. "The heart knoweth its own bitterness." Sorrow commences with ourselves. Pity is its dominating element. It knows no rage, nor hate, nor resentment. It stirs the soul to its deepest depths. It drives the thoughts upward toward God, and heaven, and eternity. It makes the blessed abode of the future seem like a necessity to give meaning to life, explanation to death and compensation for boundless pain. Grace is the only balm for sorrow. Time may dull the pain of the wound, but hope of glad reunion is the only real solace. If the Christian's hope should perish, the afflicted heart would be hopeless, and the despair that kills would be the highest good. Thank God! His grace is sufficient. No depth of human misery is as deep as the divine mercy. "God doth distill out of the bitterest drink His glory and our salvation." To the trusting heart there is an undercurrent of comfort in the deepest waters of sorrow through which mortal is ever called to pass.—Michigan Christian Advocate.

It has been mentioned before the attempt to carry the Gospel into Tibet. It is about the only land on earth where Christianity is refused admission. Several missionary bands have been organized at different times and started off with the idea of capturing Tibet for Christ. But, according to latest reports, they are still lingering outside the closed doors of Tibet, meanwhile improving their time by perfecting themselves in the language. However, it is confidently hoped and expected that admission to the missionaries will be granted in the course of a year or so.

TEMPERANCE.

BEER AND CHILDREN.

Many things are done for "charity's sweet sake" that should not be done, and one of these things is the indiscriminate selling of intoxicating drinks at open-air festivals. Beer is said to be the least intoxicating of strong drinks, but when beer is sold, in the name of charity, to little boys in short pants, it is time to call a halt.—New Orleans Picayune.

A VOLCANO OF EVIL.

Intemperance, an evil most heinous before God, most dreadful in its results, has grown among us to gigantic proportions. In the countless homes it shoots its venom-laden fangs, and annually, aye, daily, it gathers into its coils whole hecatombs of victims. Its presence is felt through the entire land, and everywhere it revels with demonic nature in sin and misery.

Alcohol, ocean-like, floods the land. Mild distillations do not satisfy us; fermentation and distillation are called into service to provide it in more undiminished vigor; and whether it be wine or whisky, the vile art of adulteration is often employed to enhance its maddening power.

With this immense consumption of alcohol, upon what a volcano of evil and misery society rests! The direct expenditure of hundreds of millions for little except pleasurable excitement, is the least deplorable result. Alcohol taken beyond very moderate doses first weakens, then totally suspends, reason. Man is incapacitated for all the duties of life, and is left without protection, a prey to his vilest and most untamed passions. Alcohol directly inflames these passions; it is oil poured on their burning fire. It fills the mouth with blasphemy and arms the hand for murder. It is the deadly foe of purity. It withers all generous aspirations of the heart, and substitutes in their stead the coldest selfishness. It makes man the demon incarnate.

Now picture to yourselves two hundred thousand or more drinking shops in the Republic, belching forth over the land their alcoholic fumes; from your knowledge of two or three of them, imagine how many men in the whole country are bereft through them of their reason, and you will form an idea of the woe and sin that alcohol produces. All classes, high and low, offer holocausts upon the altar of intemperance. The brightest minds and noblest hearts are numbered among the victims. Human wrecks, whose fortune it has dissipated, whose intellect it has stifled, are strewn over the land thick as autumnal leaves in the forest. Homes are devastated; hearts of mothers broken; the joys of the wedding morning turned into ceaseless mourning; children scattered as waifs through a pitiless world.

What is to be done? Anything, but something. In the name of humanity, of country, of religion, by all the most sacred ties that bind us to our fellowmen, for the love of Him who died for souls, I beseech you, declare war against intemperance; arrest its onward march.—Archbishop Ireland.

WHAT IT MEANS.

The sale of drink is the sale of disease; the sale of drink is the sale of poverty; the sale of drink is the sale of insanity; the sale of drink is the sale of crime; the sale of drink is the sale of death.—Sir Benjamin Ward Richardson, M. D.