

Notes on Turpentine, Rosin, and Allied Products.

BY THOMAS F. WOOD, M. D.

Of the turpentine collected in this district very little is shipped North. Most all of it is distilled upon the water courses near the pine forests. The small quantities of crude turpentine now sent North are used in making printer's ink.

Turpentine is distilled in copper stills now. Formerly iron stills were used. Then the resulting oil was red. When the first copper still was used in Wilmington the clear uncolored oil shipped North was rejected, because it was not considered genuine "spirits."

All crude turpentine is distilled with water. The part which water plays in the process will be seen hereafter.

The present distinction as to the grades of rosin are somewhat different from *yellow* and *transparent*.

It is not the presence of water which makes rosin *yellow*. If water gets into rosin, which it does sometimes by accident, the rosin becomes opaque. All the better grades of rosin are yellow or amber color, more correctly; but the term "yellow rosin" is not used here commercially or otherwise. The grade of the rosin depends, first, upon the quality of the turpentine, and second, upon the skill in distilling. "Virgin turpentine," the first exudation from a newly chip-ped tree, if skillfully distilled, will yield "window-glass rosin," of which there are two or three grades. If by any means water gets into prime rosin it becomes opaque. This accidental addition of water must take place after the rosin has been drawn off from the still.

"Yellow dip" turpentine, which is the running of the second and subsequent years, yields the medium grades of rosin, while the "scrapings," the inspissated gum from the tree facings, yields an inferior rosin, from very dark to almost black. The black rosin is not due to burning in the still, as has been stated.

Anhydrous rosin is the greater part of the stock produced; the opaque rosins, being accidental, are limited.

The following description of the process of distillation may explain further.

A fifteen-barrel copper still (barrel weighing 220 lbs. each) is charged early in the morning. Heat is applied until the mass attains a uniform temperature of from 212° to 316° F. This is continued until the accidental water, that is, the water contained in the crude turpentine as it comes from the forest, has been driven off.

The first product distilled over is pyroligneous acid, formic acid, ether and methylic alcohol, with water. This is known as *low wine*.

All the accidental water having been distilled off, a small stream of cold water is now let in, so that the heat is kept at or below 316° F., the boiling point of oil of turpentine. The oil of turpentine and water now come over, and the mixture is caught in a wooden tub. This tub is constructed as follows:—

The distillate is caught at A from the still and separates into water and oil. At B there is an overflow spout, which discharges into the tub D. The water is kept low enough in the lower part of the tub to prevent its overflowing through the cock B into the receptacle D. From this receptacle it is put into oak casks, well made with iron hoops, and securely glued inside.

The distiller tests the quality of the flow from time to time in a proof glass. The distillation is continued until the proportion of fluid coming over is nine of water to one of oil of turpentine. At this stage the heat is withdrawn, the still-cap is taken off, and the hot rosin, which remains in a fluid state in the still, is drawn off by a valvular cock at the side of the still near the bottom.

This rosin passes through a strainer before it reaches the vat, to rid it of foreign substances, such as straw, pine cones, chips, etc. From the vat it is bailed by wooden buckets, fixed on a long handle, into the barrels.

Rosin is graded by standard samples fixed upon by the "Produce Exchange."

The yield of oil of turpentine from "virgin dip" is about six gallons to a barrel.

The yield of oil of turpentine from "yellow dip" is about four gallons to a barrel.

The yield of oil of turpentine from "scraping" is about two gallons to barrel.

Other products now attract our attention, viz., the distillation of *rosin oil*.

The rosin oil of commerce is produced in the following way: Rosin is introduced into an iron still, the lower grades being used for this purpose, and heat is applied until the temperature reaches from 316° to 320° F. Water and pyroligneous acid and naphtha come over first, and for some time, until the rosin is exhausted of naphtha. The heat is then raised to near the red heat of iron, when the rosin boils, and water and oil of rosin distill over together. This is crude rosin oil. It is a heavy, nearly opaque, whitish viscid fluid, opalescent on the surface.

This crude rosin oil is rectified by redistillation, and the resulting oil is transparent, dark-red by transmitted light, with a decidedly bluish cast by reflected light. It is deeply opalescent, more so than petroleum oil.

The residuum left in the still is a black mass with a shining fracture, giving the hues of crystal aniline.

Other products still remain to be spoken of, viz., *naphtha* and *oil of tar*.

Tar when distilled yields pyroligneous acid, water, naphtha, or spirits of tar, and oil of tar. The naphtha, when purified by a second distillation, is clear and of a very pleasant terebinthinate odor. The oil of tar comes over in the latter part of the process, and a black residuum remains in the still resembling pitch. All but the last-named of these articles have a commercial value.

Tar is distilled in iron retorts, just as rosin is. There are many complex bodies which have come to the attention of the manufacturers during their operations. Some of them have been very intelligently worked out and identified by Mr. William A. Martin, the chemist of the works we have visited. Some remain to be investigated. Terebinthine products have always been exceedingly interesting chemically, and just now we are moving toward practical commercial results. I am expecting to announce at no distant day, that we have made a sure step in the right direction.—*Scientific American*.

—Cape Cod, the long spit of sand reaching out like a horn from the coast of Massachusetts, is to be made an island. Several hundred men are already at work cutting a ship canal between Buzzard's and Massachusetts bays. The effect of the canal will be to give cheaper coal to Boston and the East, save millions of property and lives from shipwreck, and, in case of a foreign naval war, give a first-class advantage to the Government in protecting its whole Eastern coast. The length of the water-way will be 42,000 feet, the breadth at the bottom sixty-six feet, and at the top 250 feet. The depth below water will be twenty-five feet. It is to cost \$10,000,000. There will be a saving of a distance of 150 miles on a dangerous coast. This makes Boston nine hours nearer New York by steam. The time for building the canal is two years. It is to be tide-level water-way without locks.—*Evangelist*.

"It is a fine thing," the country parson says, "to ripen without shriveling, to reach the calmness of age, and yet keep the warm heart and ready sympathy of youth."

Fine Works of Art For All.

Onward, improvement, progress are the watchwords of the hour with the great American people, and in the front rank of progressive Americans we find the great Art Publishing firm of Messrs. George Stinson & Co., Portland, Maine. During the year 1879 they sold over two million more pictures than ever sold before in a single year, and the sales for 1880 thus far are much larger than for the corresponding period in 1879. It is believed that they pay more for postage stamps than any other house, not only in this country, but in the world at large; we will give some of the figures, which we have direct from Messrs. Stinson & Co., and therefore know they are correct. During the year 1878 the amount of money that they paid postage for postage stamps was over fifty thousand dollars. During the year 1879 the amount that they paid for postage stamps was over eighty-seven thousand dollars. For the first eight months of 1880 the amount paid for postage stamps rises seventy-five thousand dollars, and will doubtless go considerably over one hundred thousand dollars for the year. While the amount paid for postage is simply enormous, it must be remembered in this connection that only the small orders go by mail, all larger orders being sent by express and freight. From the above some idea of the magnitude of their business can be formed. Their trade extends, not only to the most remote parts of the United States and Dominion of Canada, but all the civilized world. Messrs. Stinson & Co., are not behind the times in understanding the great power of the judicious use of printers ink and in this connection we wish to state that during the last ten years they have spent for newspaper advertising over two hundred and fifty thousand dollars. Enterprise, industry, and good judgement will accomplish great things, and in the success of this great Art Publishing House we have a striking example of that fact, and now they may, we feel sure, fairly claim to stand at the head of the Art Publishing business in this country. We have lately received four elegant Steel Engravings just published by Messrs. Stinson & Co. Size of each 30 by 40 inches. These plates were engraved in London by well-known English masters of Art, and cost, when they came into the owners' hands, in Portland, customs duty paid, the great sum of almost thirty thousand dollars. The reader shall have a brief glance at these magnificent works of high art through description.

First. The Welcome Step. After a painting by G. G. Kilburne. Engraved on steel by W. H. Simmons.

"His very step has music in it, As he comes up the stairs."

The artist has shown in an inimitable manner a mother and beautiful little girl at the glad moment of the first sound of the welcome step of the husband and father. The picture tells its own story an hundredfold more powerfully than may be possible by any words descriptive of it.

Second. Rustic Thoughts. Painted by W. C. T. Dobson, A. R. A. Engraved on steel by F. Bromley. In the midst of a broad and beautiful landscape, is seen, though half hidden by the foliage, a cottage. A rustic little maiden has gone forth for a pitcher of water. But lo! "What has come over the spirit of her dreams!" She stands before you a charming picture of rustic beauty, wrapped entirely in her own thoughts and meditation. The whole story is plainly and truthfully told, and is comprehended at a glance.

Third. Mamma's Birthday. Painted by W. T. C. Dobson, A. R. A. Engraved on steel by J. J. Chant. Here is one of the most beautiful scenes that can be imagined, shown with great power and effect. Two bright and charming little girls are making a bouquet for their mamma; it is her birthday. Beautiful flowers are the

gifts of God's goodness. This is one of the most effective works of high art ever placed before the American public.

Fourth. Ready. Painted by S. P. Cockerell. Engraved on steel by R. Josey. The fame of William Tell is world wide, and the nerve, courage, and powerful character exhibited by both father and son in the shooting of the apple on the boy's head, at the mandate of the tyrant, has fired the hearts of millions. Pen is powerless to describe the scene. "Ready!"—every nerve is strained and fixed—a moment of terrible suspense—the arrow has sped straight to its mark. This sublime work of art must be seen to be appreciated, for no description however graphic, can give more than a faint idea of it.

It is believed, and generally conceded that these engravings make up the finest and most elegant set of works of high art brought out by American publishers. American homes should be made beautiful by refined works of art, and prices for really good and meritorious pictures are now so low that there can be no excuse for the walls to remain gloomy, unadorned, and cheerless. American homes should be made beautiful, and the tendency of this will be to make more refined and beautiful lives of all dwellers therein.

How to Return a Favor.

It happened that an old Scotchman was taking his grist to the mill in sacks thrown across the back of his horse, when the horse stumbled and the grain fell to the ground. He had not strength to raise it, being an aged man, but he saw a horseman riding along, and thought he would ask him for help. The horseman proved to be a nobleman who lived in the castle hard by, and the farmer could not muster courage to ask a favor of him. But the nobleman was a gentleman also, and, not waiting to be asked, he dismounted, and between them they lifted the grain to the horse's back. John—for he was a gentleman, too—lifted his cap and said: "My lord, how shall I ever thank you for your kindness?" "Very easily, John," replied the nobleman, "whenever you see another man in the same plight as you were in just now, help him, and that will be thanking me."—*Ex.*

Another Discovery.

Prof. Swift, Astronomer of the Warner Observatory, at Rochester, N. Y., discovered another large comet on the evening of October 10th. The fact was noted in the associated press dispatches, but some important details which could not be telegraphed are herewith given. The new celestial visitor is in the Constellation of Pegasus, right ascension, 21 hours 30 minutes, declination North 17 degrees, 30 minutes. Its rate of motion is quite slow being in a North-westerly direction, so that it is approaching the sun. It has a very strong condensation on one side of the centre, in addition to a star-like nucleus, which indicates that it is throwing off an extended tail. From the fact of its extraordinary size, we are warranted in presuming that it will be very brilliant, and the additional fact that it is coming almost directly toward the earth, gives good promise that it will be one of the most remarkable comets of the present century. This is the fifth comet which Prof. Swift has discovered, and the increased facilities which Mr. H. H. Warner has given him, by erecting a magnificent Observatory for his benefit, promise much more for the future. There is a possibility that further developments may prove this to be the comet of 1812, which is being constantly expected, in which event astronomers will have an unusual opportunity to test the spectroscopic for the first time upon these eccentric bodies, and ascertain certainly what they are.

—Here must be the heir, if yonder be the inheritance. Here must be the laborer, if yonder be his rest. Here must be the candidate, if yonder be his reward. As he now adds excellence to excellence, as he is not "bargen nor unfruitful," so shall an entrance be ministered to him abundantly into the everlasting kingdom of our Lord Jesus Christ.

Heaven.

BY LIZZIE RAY.

I'm thinking of my home so radiantly bright,
Which my eyes in glory shall see;
When God upon his throne of light
Has passed the last judgment on me.

If he shall claim me as his own,
And give me a place among the blest;
Saying, "Faithfully thou my work hast done,
Enter now into my rest."

O, the glories of that wonderful land
My eyes shall eternally behold!
When I shall sit at my Lord's right hand
Or walk the streets of purest gold,

Where the streams of living water flow
Through meadows ablaze with flowers;
Richer than in our gardens grow
And sweeter than brighten our bowers.

Where the Tree of Life its wondrous fruit
Yields,
No hunger in that land is known;
And the leaves on the tree from sickness
Shields

Those who worship around the throne.

Where the fluttering sweep of the snowy wings
Of the angels dazzling fair;
Keep time to the glorious music that rings
And fills with melody the heavenly air.

Where the city of precious jewels shines
In God's own glorious light;
More dazzling far than Indies' mines,
And banished ever is the shade of night.

Where the redeemed—the ransomed throng
Are robed in raiment white as snow;
They are saved from the power of wrong,
And the perfect love of God they know.

Where golden harps are in their hands
Tuned to glorious strains of love;
And voices of the shining bands
Sing the glad new song above.

There I shall meet the friends I've known
Who worshipped on earth with me;
Together we'll bow at the great white throne
When the King in his beauty we see.

All fear of parting forever is o'er
And death no more shall sever;
For the friends that meet on that glad
shore

Shall live together forever.

The eyes that glow with tender love
Shall weep no more in sadness;
The brows immortal crowns above
Shall wear, where all is gladness.

O'er pulseless heart shall folded be, no more

The hands that clasp in greeting there;
But palms they'll wave on that fair shore
And with harps in God's praise they'll share.

There cheeks no more shall lose their bloom

Nor lips forget to smile;
Be hid within the silent tomb
E'en for their dreary "little while."

But all is joy unspeakably deep
And peace everlasting above;
And we shall eternally reap
The reward of the God who is love.

There one deep, grand hymn shall raise,
To our God upon His throne;
One glorious, endless song of praise
To him who rules alone.

O, none can join that shining throng
Who love not the Savior's voice;
Nor sing in that triumphant song,
And evermore rejoice.

O, that sanctified, glorified, holy place,
Where God my Savior is!
Where I shall see His glorious face,
And dwell in sweetest bliss.

O, "Benah Land!" "Our Beautiful Home!"

The "Golden City!" the "Eden Above!"
From the "New Jerusalem" we ne'er
shall roam,
The home of infinite love.

We call it by many a name that's dear
That city wherein is given
All that we love that's beautiful here,
But the dearest, sweetest name is Hea-

ven.
Centerville Or., Sept. 9, 1880.

—I had rather study a rose than a botany, a person than a theory about persons; doubtless the systematic knowledge is necessary, but the experimental is absolutely indispensable. The best text-book on mental metaphysics is my own and my neighbor's mind, for man is a living epistle known and read of all men who will open their eyes. There is to me a nameless charm in following Jesus Christ through a whole day's walk, work, and words, as we probably can do several times by the New Testament narrative, amid Galilean hills, on Perea mountains, or in the streets of Jerusalem.—*Rev. Emory J. Haynes*.