Per-centage of Tannin in Substances Used in the Arts.

The annexed article by Prof. Fehling, from the "Polytechnisches Central Blatt," (German) is of great interest to our tanners:—

Among the various substances which precipitate tannin from solution, such as gelatine, quinine, animal skin, &c., the latter has hitherto been recommended as the most appropriate for determining the percentage of tannin.—This method of valuation has been preferred, because it represents in miniature the operation to which the results refer. There are, however, no detailed directions for its application; and in repeated trials made by the author, under a variety of conditions, he has has found that the tannin is never perfectly precipitated, and that the solutions soon become moldy.—Experiments with solution of quinine, freshly precipitated oxyd of iron or alumina, did not give more satisfactory results. He then tried gelatine in solution; and instead of weighing the precipitate obtained, by adding an excess of gelatine, preferred adopting the volumetrical method, estimating the quantity of solution of gelatine of known centrigrade value required to precipitate the tannin. For this purpose it is indispensable that the precipitate should separate readily; but with most kinds of tannin this is not the case. The author has found it advantageous to use a dilute solution of gelatine, and to have the liquids quite cold.—His mode of operating is as follows:—

The solution gelatine is prepared by digesting 10 grms. of dry gelatine (containing about 18 or 19 per cent. of water) in water for twelve hours, and then applying heat until the solution is complete. The volume is then made up to 1 litre.

For the purpose of determining the centrigrade value of the gelatine solution, 0·2 grm. of pure tannic acid dried at 212° F., is dissolved in 100 or 120 grms. of water, and the gelatine solution added from a graduated burette until the precipitation is complete. Filtration is generally necessary towards the end of the operation, or as a substitute, the following plan may be adopted:—A narrow open glass tube is covered at one end with some tolerably thick linen bound tight by a cord; on immersing this covered end in the liquid, and sucking out the air by the mouth at the other end, a portion is rendered clear by passing through the linen, and may be poured into a tube, and tested with gelatine.

The author found that the 0·2 grm. of pure dry tannic acid required from 32·5 to 33 cub. centims. of the gelatine solution for perfect precipitation; when the gelatine solution is some days old, a larger quantity is necessary, 35, 38, or even 40 cub. centims. It is therefore necessary in all cases, when the gelatine solution has been kept any time, to determine its centrigrade value by means of tannic acid immediately before making any experiments with it.

If it is required to estimate the value of oak or other barks for tanning, they are first dried in a warm room, powdered finely, digested in quantities of 10 grms. with warm water, and exhausted by means of a displacement apparatus, constructed of a tube 2 feet long, 1 inch wide, and drawn out at the lower end, which is loosely stopped with cotton wool. Some substances may be introduced dry into this apparatus, and exhausted by warm or cold water.—The extraction may likewise be facilitated by the pressure of a column of water, applied by fitting a narrow glass tube with a cork into the upper end.

In most cases the extraction is completed in one or two days. When the operation is properly conducted, the quantity of liquid extract amounts to half a pound or a pound. It is then treated with gelatine solution so long as a precipitate is produced. A few drops of dilute hydrochloric acid facilitate the separation of the coagulum.

The quantity to be taken for an experiment of substances rich in tannin, such as galls, is about 0·5 or 1·0 grm. A simple calculation gives the percentage of taunin.

The author states that he has adopted this method in repeated examinations of tanning materials during the last ten years; he has found the results tolerably constant, and, notwithstanding its apparent imperfection, more trustworthy than any other yet known.

He estimates the relative value of several substances of this kind as follows:—

Pine bark contains from	5	to 7	per cent.	tannin.
Old oak bark contains	9		"	"
Best oak bark contains	19	to 21	"	"
Galls nuts contain	30	to 33	"	"
Aleppo galls contain	60	to 66	"	"
Chinese galls contain	70		"	"

These data at least admit of compárison with each other, and indicate with tolerable certainty the respective value of these substances to the tanner. This method of valuation is indeed based upon the assumption that the same kind of tannin exists in all these substances. It is, however, extremely probable that this is not the case; but, at the same time, it may fairly be assumed, that if different kinds of tannin combined under similar conditions with different quantities of gelatine, they will also combine animal skins in the same relative proportions. If, therefore, this method does not indicate the absolute percentage of tannin, it still gives the percentage value of the substance examined; and it is precisely this which the tanner requires.

It is another question, whether gelatine solution precipitates all the substances of the tanning material which combine with the skin; and it therefore remains to be determined by experience whether such a method of valuation is sufficient for the purpose of the tanner.

Clippers of the Lakes.

The writer of this has just finished a new schooner called the "Clipper City,"—named after this port—of 185 tuns government survey, which he has furnished with a scale of displacement, intended to illustrate the new tunnage law proposed by our leading architect, John W. Griffiths, of your city, and at the same time to demonstrate the absurdity of the old one in stupid operation at the present time. By this scale not only the displacement or weight of the vessel when ready for sea is shown at the proper draught of water, but every tun of cargo subsequently put on board is exhibited in tuns as the lading goes on, and as the immersion is increased in feet and inches. A vertical section of the sheer plan amidships, is shown on a scale of half an inch to the foot, exhibiting the rail, bulwarks, plank sheer and two strakes of wales, colored to correspond with the paint of the vessel. A vertical scale (in feet and inches) is disposed on this section of sheer plan, which indicates the correct hight of water-line at any given draught, and from which lines (dotted) are levelled out at every three inches to the sweep or curve of displacement, and from these dotted down to the scale of tuns below base line. With this scale in hand, and the accompanying calculations of stability, propulsion and elementary exponents of shape, it is supposed that a commercial man of intelligence could not mistake the qualities of marine fabrics.

Tunnage of this vessel by displacement,	121·50
Actual capacity at 7 feet draught,	160·50
Measurement by government rule,	185·30
With bottom of plk. shr. 11 inches free, will carry,	185·30

Exponent of load-line displacement, ·54 per cent. Very Respectfully,

WILLIAM W. BATES.

Manitoowoc, Wis.

Cashmere Goat in America.

The Editor of the "Farmer and Planter," says that the above named kind of goat has been introduced into the United States from Turkey, by Dr. Davis, of S. C.; it is of larger size than our common goat, is as easily kept, and by his experiment is proven to be admirably adapted to our climate. Its great excellence is, that instead of a coat of hair, it has a fleece of fine silky appearance from four to six inches long in one year's growth. It is from the fleece of this goat the celebrated Cashmere shawls from China are made. Besides its beautiful and silky appearance, textures made from the fleece of this goat outwear all known substances. Stocks made of it have been worn six winters without material injury. They can be shorn annually, and the average weight of each fleece is about four pounds, sometimes weighing as much as seven pounds, and the price is very high. We hope that more of these animals will soon be introduced into our country.

Deodorizing and Disinfecting Properties of Charcoal, &c.

The following is an interesting article, by J. Stenhouse F. R. S., in the "Journal of the Society of Arts," (London):—

The powerful effects of freshly-burned wood-charcoal, especially when coarsely powdered, in absorbing gases and vapors, have been long known. Hence the limited extent to which charcoal has been occasionally employed to sweeten fœted water and animal substances in the incipient stages of putrefaction. Sufficient attention has not, I think, however, been hitherto bestowed on a second and still more important effect which charcoal exerts upon those complex products of decomposition, viz. that of rapidly oxydizing them and resolving them into the simplest combinations they are capable of forming.

When coals or wood are burned with an inadequate supply of air, a variable amount of intermediate or secondary products is generated, constituting what are called soot and smoke; when, on the other hand, the combustion of the fuel is conducted with an adequate supply of oxygen and a sufficiently high temperature, carbonic acid, water, ammonia, with perhaps a little nitric acid, are almost the sole products.

The putrefaction of animal and vegetable substances is likewise in general a process of imperfect oxydation. Hence, under ordinary circumstances, when this is the case, a variety of more or less complex secondary products is formed, which usually possess very disagreeable odors, and exert exceedingly injurious effects upon the animal economy. To these substances the general name of *miasmata* has been given. Not much is known of their nature; but they are believed to be heavy, complex, nitrogenated vapors, which are decomposed by oxygen, chlorine, sulphurous acid, nitric acid, and other disinfecting agents.

My attention was particularly drawn to the importance of charcoal as a disinfecting agent by my friend John Turnbull, Esq., of Glasgow, the well-known extensive chemical manufacturer. Mr. Turnbull, about nine months ago, placed the bodies of two dogs in a wooden box, on a layer of charcoal-powder of a few inches in depth, and covered them over with a quantity of the same material. Though the box was quite open, and kept in this laboratory no effluvium was ever perceptible; and on examining the bodies of the animals at the end of six months, scarcely anything remained of them except their bones. Mr. Turnbull sent me a portion of the charcoal-powder which had been most closely in contact with the bodies of the dogs. I submitted it for examination to one of my pupils, Mr. Turner, who found it contained comparatively little ammonia, not a trace of sulphuretted hydrogen, but very appreciable quantities of nitric and sulphuric acids, with acid phosphate of lime.

Mr. Turner subsequently, about three months ago, buried two rats in about two inches of charcoal-powder, and a few days afterwards the body of a full-grown cat was similarly treated. Though the bodies of these animals are now in a highly putrid state, not the slightest odor is perceptible in the laboratory.

From this short statement of facts, the utility of charcoal-powder, as a means of preventing noxious effluvia from churchyards and from dead bodies in other situations, such as on board ship, is sufficiently evident. Covering a churchyard to the depth of from two to three inches with coarsely-powdered charcoal, would effectually prevent any putrid exhalations ever finding their way into the atmosphere. Charcoal-powder also greatly favors the rapid decomposition of the dead bodies with which it is in contact, so that in the course of six or eight months little is left except the bones.

In all the modern systems of chemistry, such, for instance, as the last edition of Turner's 'Elements,' charcoal is described as possessing antiseptic properties, while the very reverse is the fact. Common salt, nitre, corrosive sublimate, arsenious acid, alcohol, camphor, creosote, and most essential oils, are certainly antiseptic substances, and therefore retard the decay of animal and vegetable matters. Charcoal, on the contrary, as we have just seen, greatly facilitates the oxydation, and consequently the decomposition, of any organic substances with which it is in contact. It is, therefore, the very opposite of an antiseptic.

(For the Scientific American.)

Locks—Letter from Mr. Hobbs.

In your paper of the 25th of March, (received per last steamer) you state that "There can be no doubt of the fact that 'Day & Newell's American Lock,' under the care of Mr. Hobbs, now in London, has been successfully picked." I am most happy to inform you that both your own and the conclusions of the "Mechanics' Magazine" (which you copy,) are drawn without the slightest foundation in truth. Day & Newell's American Lock, since I have had it in my charge, has been operated upon by different parties 123 days, with the offer of 200 guineas as a reward, and the strong national feeling so often expressed, prompting them to pick it. But as yet the American Lock remains inviolate.

The recent excitement about lock picking was caused by Mr. Goater falsely stating that he had picked the American Lock, while in fact he simply picked some of my ordinary draw-locks, but that even was not done until after I had myself pointed out the defect in their construction, and in those of recent manufacture applied a remedy. The charge of tergiversion made by the "London Mechanics' Magazine" is fully explained by the fact that my remarks were made upon two different locks, while many are intentionally led to believe that the American lock and those made for ordinary purposes are the same. I enclose an official copy of the abstract of the remarks made at the Institution of Civil Engineers. The original paper together with a full report of the discussion will soon be published. I will then forward a copy to you. Yours,

A. C. HOBBS.

London, April 12th, 1854.

[We are very glad that Mr. Hobbs has written us this letter, as it sets the matter in the clearest light—the American lock is yet inviolate. We made a correction of the matter to which Mr. Hobbs refers in the succeeding number of the "Scientific American," which he had not received when the above letter was written. In the last number of the "London Mechanics' Magazine," it is stated that the workmen under Mr. Goater had presented him with a silver snuff box for picking Hobb's American Lock. This appeared significant to us; snuff clears the eyes and makes people sneeze.

Consumption of Sugar.

Last year there were consumed in this country about 705,000,000 pounds of cane sugar, and 27,000,000 pounds of maple sugar. This gives more than 24 pounds of cane sugar and 1 pound of maple sugar to every man, woman, and child. If this were put into barrels holding 200 lbs., and each barrel occupied the space of 3 square feet only, it would require 336 acres of land for it to stand upon. The barrels if placed in a row would reach 280 miles. If this sugar were put up in paper packages of 5 pounds each, it would require 146,400,000 sheets of wrapping paper; and if only a yard of string was used to each package, there would be required 439,200,000 feet, or 83,000 miles of string—more than three times enough to go round the earth. If every retail clerk sold 100 pounds of sugar each day, it would require nearly 25,000 clerks to sell it in a year. If the dealer, wholesale and retail together, made a profit of only two cents a pound on this sugar, these profits alone would amount to nearly $15,000,000.

New Line of Packets.

The Boston "Gazette" says Donald McKay, in connection with two or three other capitalists, is about building a new line of European packets, to be composed of eight ships of 2200 tuns each, the whole to be finished in two years.

Green, orange, violet, and white, are the complementary colors of red, yellow, blue, and black.