Scientific Museum.

Tanning.

The ancient process of tanning requiring a long period of time to produce leather, numerous processes have been latterly set forth, and many of them tried on a working scale, for the purpose of shortening this lapse of time. Although the end has been attained in a variety of ways, yet the quality of the leather has proved so inferior, that the slower process is still preferred for the finer qualities. The deterioration has been nearly, but not however quite, in direct proportion of the reduction of time in tanning, so that we may hope that methods will be devised for shortening the time without losing in quality. It is true that we are not thoroughly acquainted with the exact nature and progress of the change which a hide undergoes in its transformation, but we believe, on sufficient grounds, that it consists in the simultaneous metamorphosis of the hide into a gelatinous material and its combination with tannin. In some kinds of tanning, alumina, or aluminous salts, seems to act the part of tannin. It has been found that an elevated temperature hastens the transformation; that strong liquors, or the injection of liquors by force, hasten the combination of tannin. The same ends appear to be also attained by the free use of lime, whereby the hide is swelled and its pores opened. The precise action of acid is not well ascertained, except that the process is shortened. These are the main principles by which a shortened process of tanning has been accomplished. Where lime has been freely used, acid generally follows, and the hide is so puffed and porous, that tanning becomes expeditious; but the hide has been torn and rent asunder, and the organized structure must be necessarily impaired, and the strength and firmness of the leather consequently diminished. It will be observed that in the older processes the change was so slow that the organized structure of the skin was not impaired; that but little matter was removed from the hide, while a quantity was added to it. In accelerating the change, a portion of the matter is removed by solution while undergoing transformation, before it can unite with, and become fixed by, the tannin. Hence the greater looseness and levity of leather prepared by the more modern and rapid processes. It may perhaps be stated as an ascertained fact, that leaving the side in the vats during two years instead of one, the increase of weight and quality thereby, compensates for the loss of time, by paying a fair interest on the capital invested.

A patentee, in Lond. Journ. xxxvi. 310, proposes a combination of the white leather (alum and salt) process, with the tanning process by means of catechu. Another (Lond. Journ. xxxvi. 319) suggests the use of sulphuret of calcium instead of lime for unhairing.

Since liming tends to lengthen tanning, by preventing the more rapid union of tannin with gelatin, Turnbull treats the hides after liming with a concentrated solution of sugar, so that the access of air is prevented during the action of the bark-liquors on the hides, and the formation of gallic acid thereby prevented. In this manner, the same amount of leather is obtained in fourteen days from 100 lbs. oak-bark, as has been heretofore obtained in 18 months from 800 lbs. bark.

TANNIN.—Kampfmeyer states, as a result of his comparative experiments with oak-bark, alder bark, catechu, dividivi, that sole-leather tanned with dividivi is, in dry weather, about as good as the oak-tanned, but that in wet weather it is inferior. It may, nevertheless, be used in conjunction with oak-bark.

Elsner states that in Wallachia, Moldavia, and Transylvania, the root of the tormentil or septfoil is largely and successfully employed in tanning, and that its value is shown by chemical analysis, which gives 17 to 34 per cent. tannin in it.

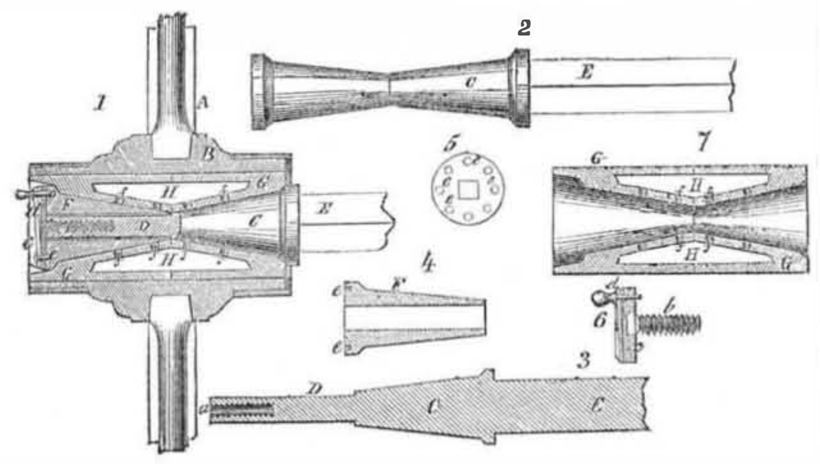
The best method of determining, practically, the amount of tannin in a substance is that proposed by Pelouze, which is to hang a strip of hide (freshly deprived of hair and ready for the tan-vat) in a tannic solution, and keep it there until it ceases to increase in weight. This increase is tannic acid, the gallic being left in the solution.—Prof. J. C. Booth.

Improved Carriage Axles.

The engravings herewith presented are illustrations of an improvement in Carriage Axles, the invention of W. D. Titus, and J. Atkiss, of Brooklyn, N. Y., of which a notice appeared in our columns three weeks since.

Fig. 1 is a vertical section of a hub and axle to which these improvements are applied. Fig. 2 is a side elevation of the axle. Fig. 3 is a section of one part of the same. Fig. 4 is a section of the remainder or movable part. Fig. 5 is an end view of the same. Fig. 6 is a section showing the screw for securing the axle to the hub, and the spring catch for preventing it from getting loose while backing. Fig. 7 is a vertical section of the box which holds the oil and serves as the bearing for the axle. Similar letters indicate correspondent parts.

This invention is designed to effect several important objects. The wheels will always run true in consequence of the arrangement of the cones giving them a tendency to throw the weight upon the center of the journal. No washers will be required, and the wear at the ends of the hubs will hardly be perceptible, as it will be distributed over the whole surface of the cones. An equal and constant supply of oil will be obtained, thus insuring them against grinding and heating.



A represents a spoke inserted in the hub, B, which is made in the ordinary manner. C, D, E represent the axle, the conical part, C, serves as one half of the journal and the square part, D, serves for holding the movable cone, F, as shewn in fig. 2. *a* is an outer screw in the end of the square part, D, for the screws, *b*, of the cap, *c*, to fit in, as shewn in fig. 1. This cap is provided with a spring catch, *d*, which fits in either of the holes, *e*, in the outer end of the movable cone, and prevents the screw, *b*, from unscrewing when the wheel is turning backward. This cap may completely fill up the opening in the end of the hub, so as to give a neat exterior finish, and prevent the entrance of the dust. The screw serves to tighten up the hub and axle when necessary.

G is the cast-iron double journal box; it is fitted in the hub in the manner shown in fig. 2, being provided with feathers to prevent its turning. This box is cast with an oil chamber, H, of the shape shown in figs. 1 and 7; *f f* are passages through which the oil is supplied to the journals of the axle. This loose cone and the double conical box can be made of malleable iron. The oil is supplied through a hole in the hub, which is closed by a screw.

This is a very good invention, and a patent has been applied for. The claim is for the described method of making and combining the axles and journal boxes. Any further information can be obtained from the inventors as above.

Andrew's Planing w.

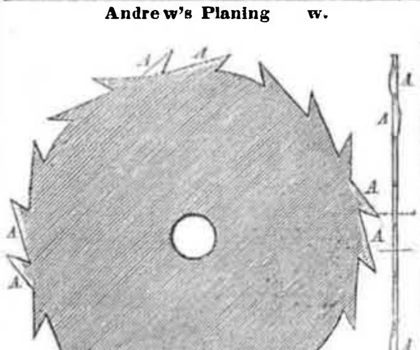


Fig. 1 Fig. 2.

The engraving herewith presented is an illustration of a cir ular saw patented by R. A. & A. T. Andrews, of Avon, Conn., on the 4th inst.

The nature of this invention consists in the peculiar form given to the teeth of saws for cutting wood, by which they are enabled to cut and plane at the same operation.

The saw plate is the same kind usually employed for circular saws, and upon this the teeth are cut, as shown, in the engraving. One portion of the teeth are cut in the usual manner for sawing, and the other portion are formed like those marked A A, having the appearance of being cut backwards; these teeth have a sharp chisel-shaped edge, and are intended for planing. It is the peculiar form of these teeth that gives the merit to this invention. These teeth, instead of being set in the usual way, are curved sideways a small distance beyond the thickness of the plate, each one being also the thickness of a shaving beyond the one preceding. The curve of the tooth commences well down into the plate, and gently curves outwards up to the point, which is turned inwards sufficiently to clear the point of the set of the cutting teeth.

This method of forming the teeth is applicable to all kinds of saws, whether straight or circular. It is particular useful in small work. The claim is for the position of the teeth.

We should think that for many purposes this was a very good invention. Further information can be obtained of the patentees by addressing them as above.

Davidson's Process of Rendering Fetid Whale Oil Inodorous.

This cheap method of purification consists in the employment of chloride of lime, the quantity depending on the degree of putrefaction of the whale oil. In general, one pound is sufficient for a hundred and twelve pounds of oil; but if it is in a state of putrefaction, then there may be one and a half or two pounds required.—With one pound of chloride of lime, about twelve times the quantity of water must be employed. The chloride is bruised in a mortar, and the water added by degrees till it forms a soft liquid paste, and afterwards by the addition of the remainder of the water it takes the consistency of cream. This is to be mixed with the oil, and often carefully stirred. After some hours one pound of sulphuric acid previously dilluted with from twenty to thirty parts of water is poured on the mixture, and the whole brought to boil with a moderate fire, and stirred continually, till drops of oil run off at the end of the stirring pole. It is then left for some hours for the oil to precipitate, and the acidulated water to be drawn off. A common cast iron boiler with sheets of lead at the bottom is the best adapted for this purpose, and likewise a copper or iron vessel may be used when the quantity of acid is not too great—the chloride of lime must not be bruised in a copper or iron mortar.

The Bahama Herald of December describes a terrific huricane, which destroyed a great amount of salt at Turks Island. The sea rose 15 feet.

The Paradise of Fishes.

In his narrative, (just published,) of the disastrous mission to Terra del Fuego, in 1851, Dr. Hamilton observes, that with its colossal sea-weeds, Fuega might well be the paradise of fishes. These gigantic weeds are the home and the pasture-field of countless mollusks and crustaceans. The leaves are crowded with shell-fish. The stems are so encrusted with corallines as to be of a white color. And "on shaking the great entangled roots, a pile of small fish shells, cuttle-fish, of all orders, sea-eggs, star-fish, and crawling nereidous animals of a multitude of forms, all fall out together."—To such a well-stored larder it is not wonderful that shoals should resort, forsaking for it brighter but less bountiful waters; and in the wake of these fishes come armies of seals and clouds of sea-fowl. Among the latter are shags petrels, ducks, red-bills, sea-pigeons, geese, steamer-ducks and penguins.

Cure for Corns.

A correspondent writes that a pint of alcohol poured in his boats caused all his corns and calluses to peel off, leaving his skin smooth and soft. If this be so, alcohol in the boots must have an effect contrary to the usual one, for we have known many individuals to get tremendously *corned* on much less than a pint of alcohol, largely diluted with Croton.

LITERARY NOTICES.

THE PHRENOLOGICAL and WATER CURE JOURNALS.—Published by Fowlers & Wells, 131 Nassau st., are among the most readable of our exchanges. These journals are not devoted exclusively to the subjects from which they derive their name, as Phrenology is made by the publishers to embrace not only Phrenology, but Physiology, Magnetism, Education, Mechanism, Agriculture, and almost everything else of interest to the general reader. Water Cure also includes everything pertaining to Hygiene and Physiology. Our readers will do well to subscribe. Price of each $1 a year in advance.

MANUFACTURE OF SOAP AND CANDLES—A very neat volume on the above subject has just been published by Lindsay & Bliston, of Philadelphia. The author is Philip Kurten, a practical soap and candle maker in the city of Cologne. It is a very excellent and useful work as it describes clearly the different methods of making all the soaps, and much new information about lard and oils. An article on purifying oil—to be found on another page—is selected from its columns; it deserves an extensive circulation.

MECHANICS—By Oliver Byrne. This is a neat little volume, published by De Witt & Davenport, this city. Its matter is certainly no addition to our stock of knowledge; it does not, so far as we can see, contain a single new idea.

THE STUDENT—A Family Miscellany and Monthly School Reader. This excellent publication for the student is very ably managed by N. A. Calkins, Editor, 131 Nassau street. Terms $1 in advance.