The hide or butt, to tan it, is brought from the beam-yard and introduced into a poor and milky liquor, in which it is "handled” for four or five days ; that is, it is lifted by hooks from the pit, laid with others in a heap on the side, where it is allowed to drain, and is then returned into the pit. The lime is intended to be taken out here by the gal­lic and acetic acids of the poor ooze, as it is found in prac­tice that the presence of lime tends to darken the colour of the future leather : this effect is produced by *all αlkalies and alkaline earths.* The hide is next successively handled into, and out of, all the handlers, increasing in strength ; and in this way at length, having after some months got to the strongest handler, it is found to be stained through, though not tanned, when it is removed to the troughs which contain still stronger liquors : these it successively passes through, being handled at longer intervals. Upon arriv­ing at the end of this series, it is laid away in a pit of very strong liquor to colour, having had powdered bark of valonia sprinkled over its surface. When the process is deemed complete it is taken out, and it will be found con­verted into leather ; and a portion of its gelatine which has been dissolved from its interior is, by Combination with a portion of tannin from the strong solution, deposited upon its surfaces, where it is found in the form of a yel­low deposit, technically known as “ bloom,” or “ pitching,” which disguises the under colour of the leather, just as if it were covered with yellow paint. This, prejudice says, must be on its surface or it is not saleable ; but it is so much qua­lity and weight lost to the consumer, as he pays for it on the outside of his leather, to be scraped off by the shoemaker in the operation of buffing ; and the leather is so much the worse, as, if it had remained incorporated with the leather, this would not have been so porous, or so permeable to water. The health of the wearer of the shoe is perhaps sacrificed by wet feet occasioned by the desire of his shoe­maker to see a yellow paste on his leather, which in work he scrapes off with a piece of glass.

The theory of the formation of the bloom is this. As soon as ooze has penetrated into a hide, it loses its tanning mate­rial, but by capillary attraction is detained ; this exhausted ooze acts by maceration on the finer and more soluble in­terstitial gelatine, and dissolves it. In handling, about one twelfth of this flows out ; the remaining eleven twelfths ac­company the hide into the next stronger solution, of which only one twelfth is absorbed directly, and a small portion is slowly exchanged by endosmosis and exosmosis. The small portion of strong solution which passes into the pores of the hide contributes to tan the hard fibrous portions not dissolved ; and the small portion of weak solution passing out of the hide by exosmosis, gives up its dissolved gelatine to the tan of the stronger solution outside, to form tannate of gelatine, which partly adheres to the surface as bloom, and partly falls to the bottom of the pit as pitching. It is to be hoped that such an exposition will tend to explode this absurdity, and lead to the adoption of a system of tanning in which the exhausted ooze shall be so quickly removed by pressure as not to allow it to dissolve the finer and bet­ter portions of the skin. Some years since Mr Spilsbury endeavoured to introduce a new principle in tanning, by which some part of this action should be prevented, by bringing strong ooze at once into contact with the inside of the hide. He obtained a patent for a plan of tanning by infiltration. He fastened two hides in clamps, so that the frame represented four sides of a box, and the two hides two sides. By filling this box with strong tanning ooze, and forcing it through the pores by the pressure of a column of the fluid, he expected to tan them promptly and well ; but he was not aware that a large excess of tannin dissolves gelatine, and thus tannate of gelatine was found on the out­side of his box in long masses of slime, while the leather had lost as much in weight, was porous, and was tanned very much more in the thin than the thicker parts, as the fluid always passed through the easiest channel. Many other inconveniences attending the process caused it soon to be abandoned ; but the erroneous principle upon which it was founded not having been made public, three other patentees have followed in the same track. Mr Drake of Bedminster sewed hides together so as to form a bag, which he placed inside a hollow frame-work of wood to support the bag, and then filled it with ooze. Mr William Cox of Bedminster sewed up a hide as it was on the animal’s back, laced a can­vass support round, and then filled it with ooze ; and Mr Chaplin sewed his hide into a bag, filled it with ooze, but laid it in a reclining position, turning it periodically. Three if not the whole of these plans are now abandoned by the patentees themselves.

Seguin’s process of tanning by solutions, although a great improvement upon the old method, is still tedious, and most expensive. Where warm oozes are used it lasts six or seven months for sole-leather ; where cold oozes are in use, it ex­tends to twelve months, consequently the tanner can turn his money only once a year : he must have capital enough to pay for twelve months’ hides, bark, &c., labour and con­tingent expenses, besides keeping a stock of leather ; and when his capital has been turned at the end of twelve or more months, it must pay him in one single profit, the in­terest, &c. of twelve months. This has confined the trade to a few wealthy individuals, who look upon tanning as an in­vestment for capita], rather than as a business which might be improved by science ; and being in comfortable circum­stances, they are not driven to personal exertion and close application, which would be required of less wealthy trades­men. It is from these circumstances that tanning has been more stationary than any other manufacture, and the few improvements which have been made in it have not been made by tanners. A more recent patent appears at pre­sent to occupy considerable attention. It is founded upon the principles put into action in washing a sponge. The old tanner takes his sponge (the hide) full, or nearly so, out of one ooze, and inserts it nearly full into the next. The pa­tentees of the roller and belt system squeeze, by a simple and self-feeding press, their hide, before they drop it into the fresh ooze ; and this very simple modification bids fair to revolutionize the trade, and it is already very extensively introduced into this and foreign countries.

Messrs Herapath and Cox of Bristol, the patentees, say, that to tan 100 butts per week, they erect in a tanyard, at present capable of tanning fifty per week, six or eight large pairs of rollers, one pair over each pit. The lower rol­ler is thirty inches in diameter, covered with horse-hair cloth ; the top one eighteen inches, with levers for weights, covered with woollen cloth, each covering nailed on. For each pair of rollers there are from fifty to 100 hides connected toge­ther, head to head and tail to tail, each by about four strings. Now the first butt or hide is inserted between the rollers loaded to the proper pressure ; and upon turning the bottom

Becoming

Three gallic acid C21 H9 O15

Three acetic acid C12 H9 O9

Three carbonic acid . C3 O6

C36 H18 O30

So that it may be said that the air takes three atoms of carbon from two atoms of tannin, and leaves the remainder in the state of gallic and acetic acids. The letters C, H, and O, in the table, mean carbon, hydrogen, and oxygen.