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Contents:

(Illustrated articles are marked with an asterisk.)

ANOTHER NEW AND REMARKABLE TEXTILE.

It will be pleasant indeed to find the enthusiastic anticipations of M. Benito Roezl, of the eminent French naturalists, Blume, Decaisne, and others, and of Mr. A. B. Bacon, chairman of the Section of Agriculture, New Orleans Academy of Science, realized in respect to the *Ramie* or Boehmeria tenacissima, of Java. From the nature of the case, anticipations so high must seem extravagant, and be held subject to extra hazards of disappointment, until their actual accomplishment leaves no place for conjecture. From a communication by the last-named gentleman to the Academy of which he is a member, we learn that at present the exotic is introduced and flourishing in a large plantation in Mexico, and that the conviction of the naturalists who have nursed it and experimented upon it for the last twenty-three years, that its fibre is stronger than hemp, as fine and white and twice as durable as linen, and more productive than cotton, is so far confirmed that in 1865 M. Roezl exported and sold in England over 5000 lbs. of the staple at double the price of the best quality of cotton. Its beautiful fabrics will be displayed in the Paris Exposition, but we have as yet received no account of them.

The Ramié belongs, like the hemp and the nettle, to the *urticaceæ*, and was transplanted from the island of Java to the Paris Jardin des Plantes, by Blume, in 1844, where it was reared in the hot-house until its introduction into the more congenial climate of Mexico by M. Roezl, former head of the Horticultural Institute of Belgium, within eleven years past. It is considered that only the middle and southern portions of our Gulf States will afford it a suitable climate, and that in that latitude it will make three or four crops a year, each equal in quantity to the most prolific of hemp.

The perseverance of Mr. Roezl in domesticating the staple in the western world has been almost romantic—perhaps we should say heroic—and richly deserves the high reward his friends anticipate for it. Having first gone to Java and spent a year in familiarizing himself with the character and growth of the plant, he emigrated to Mexico with a store of its roots. On his way to the capital he was robbed of his treasure by the Mexican banditti, who took little benefit from their crime, and was obliged to write to his friends in Europe for a new supply, which was at length procured through the good offices of the British navy: but this perished on the voyage to England. Again it was attempted, and again the plants were killed. A third attempt succeeded, but the plants had to be placed under hot-house cultivation in England, to give them strength for another great voyage. At last, in 1859, after six years of waiting and endeavor of this kind, his plants arrived half dead, and with the skill of an accomplished and scientific horticulturist he nursed them successfully into life, and within two years found himself the owner of a thriving plantation.

This was but raw material, and the least part of the difficulties had been overcome. He imported from England the most approved machinery for cleaning flax and hemp, but it proved unsuited to the requirements of so fine a fibre. Two years of effort in this direction were spent in vain, when he fell back upon his own tireless resources, and in two years more produced two inplements of his own invention by which the stalks were converted within twenty-four hours after cutting, into long skeins of pure, white and silk-like fiber, ready for spinning. In February last, Mr Roezl visited Cuba with specimens of the results of his eleven years labor, which after careful examination were pronounced of the first importance by the naturalists and agriculturists of the island, who predict that it will supplant tobacco and coffee as a preferable staple for Cuba. Mr. Roezl takes five crops per annum from his plantation, the matured plant, which is perennial, attaining when well rooted the hight of twenty feet.

CONDITION OF THE PATENT OFFICE.

Nearly two months ago, in announcing the passage by Congress of a bill to increase the examining force of the Patent Office, we commented as follows:—"The Commissioner is now clothed with ample authority. We understand that he intends to fill all new positions by promotions, which is certainly very commendable. We earnestly hope that the Commissioner will act promptly and energetically in carrying the new measure into effect. The business of the office is suffering very much from the delay which attends the examination of cases, and now that the Commissioner has the power, we hope that he will employ it to infuse new life and vigor into the Department."

We have yet to learn that the Commissioner has made a single new appointment or taken any active measures towards bringing up the back work of the Office. Hundreds of applications are awaiting action, some made six months and more ago. Inventors are getting discouraged, and everybody who has business transactions with the Office is disappointed that the Commissioner does not avail himself of the authority vested in him by Congress to increase his force. In some classes the examinations are closely up, but in others they are several months behind. This condition of things should not exist, and with the power ceded to the Commissioner by our last Congress, there is no occasion for it. Wake up! Mr. Commissioner: inventors are busy, applications for patents never were greater, the treasury of the Office is plethoric, and now all that is wanted to make the Patent Office the most prosperous department under Government is a vigorous administration.

MODES OF WORKING WOOD.

So much of the public attention has of late years been directed to the new preparations and applications of the metals, particularly iron and steel, that the merits of that old time friend of man civilized as well as savage, wood, are likely to be overlooked. Volume after volume is issued from the press, and our periodicals are filled with articles devoted to the properties, qualities, uses, and manipulations of the metals, while those which treat on wood are few and far between. Still, it would be difficult to imagine, in our present state of advancement, where to look for a substitute which should combine so many qualifications of usefulness and such adaptability to diverse manipulation.

Besides the hundred applications of cutting, splitting, and sawing, wood can be worked in many more ways. It is doubtful if any substance with which we are acquainted is suceptible of so many radical changes—changes which alter the very structure of the material and adapt it to the most opposite uses. It can be torn into fibrous shreds which make elastic cushions or beds; made into a spongy, porous mass; hardened by chemicals which change its texture and make it semi-mineral in nature; compressed by mechanical means, closing its pores, until it is nearly as compact as the metals. It may be molded into various forms; bent to keep its enforced position; dissolved into pulp and made into paper; separated into *laminæ* by percussion, and, in short, treated in any conceivable manner except melted and cast.

Perhaps one of the most interesting of the methods of working wood is that of separating one layer from another by percussion, or by compression joined to bending. Those woods only can be treated in this way which grow by external concentric accretions, as many of our hard wood trees. The wood for this treatment should be tough, elastic, and straight-grained.

The Indians of this country, and the basket makers in others, separate the layers of the wood by beating upon the surface of a log with heavy mallets, when the wood comes off in thin *laminæ*. This method of disintegrating wood is one of the oldest of human arts; probably no mode of working wood is older. What was formerly done by hand is now, however, performed by machinery. We saw the other day, in Jersey City, machinery which performed this work in a remarkably rapid and effective manner. It was run by the Wilder Hoop Machine Company, and was designed for making (rolling) hoops of wood from a "bolt" split from a log. The wood used was black ash, although any tough, straight-grained wood would answer. The bolt was a longitudinal cleft the cross section of which might approach either a parallelogram or a triangle. One end was presented to a space between two swiftly-revolving heads armed with cutters which almost instantly formed a wedge-shaped point, then to another disk with thin cutters which splits the V-shaped end at intervals corresponding with the thickness of the hoops to be made. These splits do not extend more than one or two inches from the end. The bolt is then run between circular saws and trimmed to nearly a square form, or to a parallelogram, one side of which corresponds with the width of the hoops.

Then the bolt is passed between upright corrugated feed rollers held in contact by powerful springs. Directly behind these were a set of smooth rollers, placed horizontally, between which the bolt passed, being compressed powerfully, and by means of a curved guide compelled to take a short curve. The result was a splitting from end to end of the bolt, forming perfect hoops, or rather slips of equal thickness throughout. The philosophy was not difficult to understand. The slits cut in the end of the bolt were starters for the thickness of the splits. The wood, being wet, yielded to the compression of the rollers, and the direction given the bolt by the curved shoe compelled one piece to slide upon another sufficiently to divide the cross fibers and insure a separation. The whole process is a very brief one, occupying no more time probably than would be spent in reading this description. It is very interesting and gives the observant man new ideas concerning the capabilities of wood. That its fibers can be cleanly separated, simply by compression and bending, to make as smooth a job as if sawed, and preserve the longitudinal grain and consequent strength as perfectly as if split by ordinary means, is at least surprising.

THE GULF STREAM AND THE CUBA TELEGRAPH.

A special survey has been made under the direction of the Acting Superintendent of the U. S. Coast Survey, Mr. J. E. Hilgard, at the instance of the International Ocean Telegraph Company, with a view to determine the conditions to be encountered in locating the cable between Florida and Cuba, through the Gulf Stream. The examination reveals a very irregular and precipitous descent from the Cuban coast, reaching the maximum depth of the channel, 843 fathoms (say 5,000 feet) 37 miles from the Moro. From the northward, the bottom falls away in terraces without abrupt slopes. It is in the deep canons or gorges of the southern portion that the Gulf Stream and its counter currents find their channels; while the sea lies almost motionless above the terraces of the northern coast. About 21 miles from the coast of Cuba, a submarine mountain rises in the midst of the southern channel, with the extreme depths of 748 and 843 fathoms on either side of it. The summit of this mountain is 2,400 feet above the bed of the straits and reaches to within 2,400 feet of the surface; the current running over it so strongly that soundings were made with great difficulty. It appears to be triangular in its general form, with precipitous sides, presenting at its west angle a bold prow to the stream.

Assistant Henry Mitchell, from whom these data are derived, states that the observations indicate the depth of the Gulf Stream to be scarcely more than one-third the maximum depth of the channel. He concludes that the Gulf Stream is not a profound movement, but an overflow of water from the Gulf, having for its office the restoration of surface level, while the office of the counter stream, or "polar current," beneath, is the restoration of equilibrium thus disturbed between waters of different specific weights or densities. This view of compensating currents is illustrated by observations in the Hudson river. In the dry season (July) the surface outflow of the river through the Narrows has been found to occupy three-fourths instead of half the twelve tidal hours; while in the under stratum the case is more than reversed, and the inflow predominates to such an extent that as a general thing it is constant along the bottom, although not in velocity; and the same conditions with variable proportions, obtain for some distance up the river. On running a line of levels from New York to Albany, it was found that the bed of the Hudson river lies below the mean level of the sea for over a hundred miles, while the surface of the fresh water, or river proper, in the dry season, is above this level, yet not so much above as to counterbalance the excess of specific gravity in the sea water, which consequently during the summer months flows in along the bed of the stream, while the fresh water overflows into the ocean. In other words, the Hudson, for one hundred miles, is in the summer but an arm of the sea analogous to the Gulf of Mexico, deriving much of its elevation as a stream, from a like cause with that of the Gulf stream, viz: its lightness, lifted above the sea level by the bottom pressure and inflow of the heavy sea water in the opposite direction.

The striking variations in the velocities of the Gulf Stream, which were particularly remarked by navigators during the late survey, the weather being exceedingly calm, are accounted for on the hypothesis that they follow the changes in mean sea level which depend upon the declinations of the sun and moon—more especially the latter. Prof. Bache has shown that the mean level at Key West is one foot higher when the moon is in the equator than when she is at her greatest declination; while, on the contrary, in the North Atlantic the mean level is about three inches higher at her *maximum* declination: giving a variation of fifteen inches in level to account for the variations in the velocity of the stream.

THE PRICE AND PROSPECT OF BREAD.

We have remarked the extraordinary phenomenon of breadstuffs going from east to west instead of west to east, and even from Europe to America in a few exceptional instances. The fact is that there is more flour and wheat at the east than at the west, and although the stocks on hand in New York are much larger than last year at this time, while large shipments are made from California, those in the west are much more than proportionally smaller, and prices equally high; so that the aggregate of breadstuffs in the country is evidently reduced enough to fully account for the present enormous prices. Among the causes of scarcity are the short western crops of last year (resulting partly from a scarcity of labor which the war has left as a melancholy memorial of its carnage) the half extinct agriculture of the South, and its heavy drain upon the northern markets. The anticipated crops, rich as their promise is, cannot therefore exert their natural effect upon prices, and will not begin to replenish the market at all under two months. But before that time, if no new calamity or portent intervenes, the coming harvests will cast their shadows before, and discourage the extortion of speculators materially. When they are fairly in the field, it may be rationally hoped, the prices of food will come down to a more reasonable scale than has been known for years. The most cheering accounts of the wheat prospect pour in from every section of the country. The South has devoted an unprecedented proportion of land to food, and the crops promise unusually well, while in the West, the mighty tide of immigrating labor has filled up the ghastly chasm left by the war, the high prices have