

gradually and not with a sudden jump or jerk. while, when it again meets the cut on the side, B, it will take the cut gradually, and will not meet the sand of the casting, which would rapidly dull the tool-cutting edge.

The first or roughing cut should be commenced at the circumference of the chuck, and fed towards the centre for the following reasons:—Suppose Fig. 8 represents a chuck-plate, the two tools, A B, taking their respective cuts. The metal being cut by B will sever more easily from the main body than will that cut by A, because it is not so well supported by the metal behind it; hence less strain under equal depths of cut is sustained by B than by A, and it will, therefore, not dull so quickly.

In turning up a new chuck-plate it may be necessary to take off three cuts, in which event the second should also be fed from the circumference to the centre. In truing up a chuck-plate that has worn out of true, or in taking the finishing cut on a new one, the straight-edge should first be applied to the face, and if the latter is found to be rounding, the finishing cut should be started of the centre and fed to the outside, so that whatever amount the tool-edge may wear away in traversing across the face, will tend to strengthen the face, whereas were the cut started from the perimeter and traversed inwards, the roundness of the chuck would be increased to the amount of the wear of the tool. Conversely it is obvious that if the plate is hollowing, the cut should be started from the outside and fed inwards.

If the lathe has a self-acting feed motion, that motion should be put in gear, and the cut put on by operating it by hand, the object being to prevent the lathe carriage from moving back while the cut is proceeding.—*English Mechanic.*

Miscellaneous.

A CURIOUS MODE OF TAKING TURTLE.—In the neighbourhood of Cuba a peculiar method of securing the turtle is pursued by the natives, advantage being taken of the habits of a species of remora, or sucking-fish, peculiar to those waters. Three or four species of remora are known, having collectively a wide range. The white-tailed remora (*Echeneis albicauda*, Mitch.) frequents our North Atlantic coast, and is sometimes taken in Long Island Sound, where it is known as the shark-sucker. The chief peculiarity of all these fish consists in an oval disc on the top of the head and the adjacent parts of the back, the surface of which is crossed by transverse cartilaginous plates, arranged somewhat like the slats of a Venetian blind; on the middle of the under surface are hook-like projections, connected by short bands with the skull and vertebrae, and their upper margin is beset with fine teeth. According to De Blainville, this organ is an anterior dorsal fin, whose rays are split and expanded horizontally on each side, instead of standing erect in the usual way. By means of this apparatus, partly suctional, partly prehensile by the hooks, the remora attaches itself to rocks, ships, floating timber, and the bodies of other fish, especially sharks, which it uses either for anchorage or for labour-saving transit. The species of remora inhabiting Cuban waters (called *Revé*—that is, reversed—by the Spaniards, because its back is usually mistaken for its belly) is employed by the native fishermen. The boatmen in quest of the turtle carry several *revés* in a tub, and when they approach their game a properly tethered *revé* is cast off. On perceiving the turtle the fish quietly attaches itself so firmly that the prize can be easily secured. Colcomb states that the fish's hold is so strong that it will allow itself to be torn asunder without letting go. This living fish-hook is held by means of a ring attached to the remora's tail, and a stout line made of the fibre of palm bark. By a peculiar manipulation the fish is induced to let go its hold upon the turtle, when both have been hauled into the boat. The remora is then returned to its tub, to await the discovery of another turtle.

THE MILK OF THE COW TREE.—Alexander Humboldt remarks that among the many very wonderful natural phenomena which he had during his extensive travels witnessed, none impressed him in a more remarkable degree than the sight of a tree yielding an abundant supply of milk, the properties of which seemed to be the same as the milk of a cow. The tree itself attains a height of from 45 ft. to 60 ft., has long alternate leaves, and was described by Linden as *Brosimum galeodendron*. The milk which flows from any wound made in the trunk is white and somewhat viscid; the flavour is very agreeable. Some time ago, on the occasion of M. Boussingault going to South America,

Humboldt requested him to take every opportunity of investigating this subject. At Maracay the tree was first met with, and for more than a month its excellent qualities were daily tested in connection with coffee and chocolate; but there was no opportunity for a chemical analysis. Nor does such appear to have occurred till the other day, when, amid the many curious things exhibited by the Venezuelan Government at the Paris Exhibition, there happened to be several flasks of this milk; and after a long period M. Boussingault has been enabled to complete his analysis of this substance, which is unique in the vegetable world. In a memoir laid before the Academy of France he gives a detailed analysis, and concludes by stating that this vegetable milk most certainly approaches in its composition to the milk of the cow; it contains not only fatty matter, but also sugar, caseine, and phosphates. But the relative proportion of these substances is greatly in favour of the vegetable milk, and brings it up to the richness of cream, the amount of butter in cream being about the same proportion as the peculiar waxy material found in the vegetable milk, a fact that will readily account for its great nutritive powers.

A remarkable accident happened a few weeks ago at l'Ecole Normale to M. Zédé, who was studying the properties of a composition formed of equal parts of gun-cotton and nitrate of ammonia. This was inflated in a bronze tube of 6mm. internal diameter, and expanded without detonation. Thirty experiments had been made, and M. Zédé then reduced the size of the tube to 5mm. When he tried the experiment anew under these conditions a frightful explosion occurred. The tube was shattered into 60 pieces, some of which passed through the roof of the laboratory and penetrated about 4 ctr. into a brick wall. The operator had one of his legs broken.

This accident is engaging the attention of the French Commission des Poudres et Salpêtres. M. Saint Claire Deville, in the Academy, pointed out that the fact belonged to a category including already several others, and he recalled an observation by Prof. Abel. About 0.2 gr. of chloride of nitrogen is placed in a watch-glass, and exploded with a piece of phosphorus; the noise is tremendous, but the explosion has little or no shattering effect. Now repeat the same experiment, after having breathed on the chloride so as to deposit a thin envelope of moisture (which cannot be more than a thousandth of a mm. thick). In this case the explosion is less noisy, but the effects are quite different. Not only is the glass pulverised, but the table supporting it is perforated.

Two deaths, under peculiar and painful circumstances, are recorded in a recent number of *Les Mondes*. One was that of a farmer of Landas, who took a foolish bet that he would swallow his pipe, the stem of which was 10 centimetres. He did so, then returned it intact; but he died ten hours afterwards. The other case is that of a young man who was leaving Paris for Lyons to visit his family, whom he had not seen for long. At the station, before entering a carriage, he wished to smoke a cigarette, and lit the match by scratching the phosphorus with his finger-nail. Some of the incandescent phosphorus penetrated under the nail, producing a burn, to which he gave no heed. In an hour, however, the pain was intolerable; finger, hand, and forearm swelled and inflamed. He got out and went to a doctor, who said immediate amputation of the forearm was absolutely necessary. The man wished to wait a while, and telegraphed for his father, who, however, arrived too late. The purulent disorder reached the shoulder, and operation was now impossible. Death ensued in twenty-eight hours.

BONE AND MUSCLE.

Liebig has shown that oatmeal is almost as nutritious as the very best English beef, and that it is richer than wheat bread in the elements that go to form bone and muscle. Prof. Forbes, of Edinburgh, during some 20 years, measured the breadth and height, and tested the strength of both the arms and loins of the students in the university—a very numerous class, and of various nationalities, drawn to Edinburgh by the fame of his teaching. He found that in height, breadth of chest and shoulder, and strength of arms and loins, the Belgians were at the bottom of the list; a little above them the French; very much higher the English; and the highest of all the Scotch and Scotch-Irish, from Ulster, who, like the natives of Scotland, are fed in their early years with at least one meal a day of good oatmeal porridge.