

to the demand. Instead of destroying the spruce forests there, they simply thin them out, taking only the large, matured trees, while the young saplings are allowed to remain for future use.

The hardwoods yield many by-products as well as the soft kinds, and especially in producing the charcoal for our iron furnaces. We also make quantities of cedar oil, wood alcohol, or pyroligneous acid, and oil of sassafras. In the manufacture of paints, soaps, varnishes, medicines, perfumes and disinfectants, all of these products of the hardwoods are in demand. The forests of hardwoods are more limited in extent in this country than the soft woods, but they meet with sufficient injury to threaten them with entire extinction. There are considerable quantities of wood used for the manufacture of hoops, barrels, tubs and pails, and only the hard species of trees are available for this work. A curious fact is that most of the poles used by hop-growers to support their vines are imported from Canada, or at least by those growers living along the great lakes. Many poles are used for the vineyards, but these so far have been gathered on home territory.

There are several other minor by-products that are used, but they represent no great value yet, although their future has not been determined. In the aggregate all these by-products of the forests are of greater value than the lumber and timber annually cut.

QUEER USES OF PAPER AND PULP.

(From New York Sun.)

Nothing of recent years has given a greater incentive to the exercise of the forester's art than the discovery of the method of making paper out of wood pulp. Wood pulp to-day supplies 20,000 weekly and daily periodicals with paper, and each year the number increases from 10 to 20 per cent, making the demand upon the spruce forests so great as to threaten their extinction unless intelligent efforts are made to preserve them. In Germany, where the manufacture of wood pulp is even greater than in this country, the forester's art is exercised so that the forests steadily keep up the supply. It is to imitate this method of using, but not abusing, the natural spruce forests here that paper makers are trying to buy up the large areas of woodland covered by these trees.

In the arts and trades new uses are found for paper every year, so that the demand increases as fast as the production. The records at the Patent Office in Washington show an astonishing number of uses to which paper is put, and applications are made for patents for other queer inventions that never see the light of day.

Cigar boxes are made of paper and flavoured with cedar oil to give the impression that they are manufactured of cedar. Medals are pressed out of paper and then coated with a preparation to make them resemble either silver or bronze. Similarly cornices, panels, and friezes are moulded out of the paper pulp, and both interior and exterior architectural effects are obtained at a relatively low cost by this method.

The manufacture of car wheels out of paper is an old story. It is probably the good results obtained with them that suggested the idea of coating ironclad men-of-war with paper. Inventors are now working on the problem of finding a preparation either of compressed paper or of compressed ramie that will form a bullet-proof coating for war vessels. The car wheels and steampipes made of paper admit of being moulded and formed to suit any purpose, and it is suggested that by using paper for coating armour plate the surface could be formed like fish scales with tiny overlapping plates. The surface could be made rough or smooth, and besides giving more strength to the steel armour the paper coating would protect the metal from corrosion.

Another queer use to which paper promises to be put is in the manufacture of telegraph poles. The paper poles are hollow, and are made from paper pulp, and then coated with silicate of potash to preserve them. Electric conduits in successful use are made out of paper pulp, and also steam and water pipes of great strength and durability. Paper roofing material is so common that it is unnecessary to mention it, and also paper pails, basins and pans.