

determinative as those which produce and guide the motions of the heavenly bodies. The parallelism of the progress of life through the geological ages with that of the growth of an individual from a germ, is so close that most students of paleontology are inspired with the conviction that the life forms of the different ages are links in a connected chain; in other words, that the latter forms are derivations from those which preceded them. This is evolution, and therefore most geologists are evolutionists, and they believe that evolution is not only exemplified in the progress of life, but that it is a law of nature.—*Prof. J. S. Newberry.*

**For the detection of resin in shellac** take 5 grains of shellac finely powdered and boil with 15 grains of petroleum benzine. The dissolved portion is evaporated and weighed. If the residue be greater than 10 per cent. of the shellac, such excess is due to the presence of resin. Another method is to take 25 grains shellac and boil the same with 2.5 grains of caustic potash and 50 c. c. of water until all is dissolved. If the shellac be pure, the solution is of a red color and transparent when held to the lamplight, and contains muddy portions in the upper strata, which are easily separated on agitation. The shellac adulterated by means of resin forms a thick deposit, not easily broken up by shaking. This precipitate can be washed with water, and boiled in 2.5 per cent. hydrochloric acid; this, when dried, melted and weighed gives, when multiplied by 1.25, approximately the quantity of resin contained.—*Oester. Ungar. Tischler u. Drechsler Ztg.*

**Vienna Bent Woodware.**—The growing popularity of this style of furniture, first brought to the notice of the American public at the Centennial, will doubtless give interest to a brief description of the methods of making it. The industry is conducted chiefly in Moravia and Hungary, but promises to become very general. Articles of this description are remarkable for their neatness, clean finish, light lines, great strength, and the fewness of their joints; this latter point being usually accomplished by bending the wood used so as to necessitate as few pieces as possible; thus, an ordinary chair contains, according to this method, only six pieces besides the cane seat, and is said to be an article which has no superior in its way. For this kind of furniture, beech is the only sort of wood used, it being found excellently adapted for the purpose. The trees being felled, the tops are removed and made into charcoal, for use in the glass works; the trunks are sawed into planks of suitable thickness by gang saws, and the planks are in turn ripped up with circular saws into square pieces for turning. If intended for the back and hind legs of a common chair, which are composed of only one piece, the square piece of proper length is put into a kind of gauge-lathe, which does its work very rapidly, and varies the size where needed. The ordinary dowel lathe is used for pieces of uniform size, such as the hoops, which are placed inside of the leg to stay them, instead of straight pieces or rungs, and the hoops are so placed so that the feet cannot rest upon them. After being rounded as required, the wood is steamed in the green state for 24 hours, in boilers adapted to the purpose, when it is taken out and bent to the shape desired, on a cast iron frame, by hand. If intended for the seat, the piece is first strapped with iron on its outside, so that the bending shall be a process of compression, lengthwise rather than an expansion. It is then attached by one end to a pattern fastened to a turn-table, the other end being held by a chain wound upon a drum, to which is applied a brake, so as to regulate the tension with which the piece is delivered to the pattern: the turn-table is then set in motion, and winds the wood on its own form. If designed for a scroll, the pattern may be complicated and in several pieces, which are put in place at the proper time in the progress of the rotation; for a double scroll, two of the tension bands are employed.—*Iron Age, March 14.*

**Practical Uses of Sawdust.**—The *Oester. Ungar. Tischler u. Drechsler Ztg.* refers to the increasing utilization of sawdust for the production of a variety of articles of utility and ornament. The general method consists in producing a plastic mass, composed of two-thirds sawdust of common hard woods, and one-third glue or resin as a binding material (occasionally with some gypsum). This mass composed, say, of fine sawdust, asphalt powder, and ox blood, after thorough mingling is filled into suitable brass moulds, where it remains for 24 to 36 hours exposed to a considerable pressure, and gradually heated until the water moisture has evaporated and the mass is made homogeneous throughout by the fusion of the asphalt. In this way are produced beautiful and perma-

nent bas-reliefs and a variety of articles for wood ornamentation, imitation of ebony, piano keys, doorknobs, brush handles, knife handles, etc.

Sawdust is also used in the manufacture of oxalic acid, and of artificial vanillin, and more recently mixed with the mortar for house plastering, to prevent the fine hair-like cracking of the plaster.

**Unpleasant Peculiarity of Toughened Glass.**—We have already recorded in the REVIEW instance, of the peculiar disposition of vessels made of the so-called tempered glass to disintegrate with a violence, and without apparent external cause. Prof. Ricard, in the *Polytechnische Notizblatt*, records in substantiation of this statement, the case of a child's drinking glass, of "indistructible" glass, which, while standing empty upon the dining table, and without visible cause, or contact of any person, or approach of a light, suddenly exploded with a loud report, and scattered its fragments disintegrated to the size of a lentil about the entire room.

Prof. Ricard notices that instances of this kind in the laboratory and the household are numerous, and believes that the property may manifest itself with such violence as to become a source of personal danger to those using such vessels.

He qualifies this remark, however, by the statement that the so-called *Hart-glas* of Siemens which is made under pressure, is free from this dangerous peculiarity.

**Utilizing a Desert.**—Our Commissioner of Agriculture proposes to make the date a staple American product in the now useless desert regions of Arizona and Southern California. Seed from Egypt has been planted, and more is coming.

**California** will show at the Paris Exhibition, a gilded pyramid, twenty feet square at the base, and nearly seventy feet high, to represent the 7,000,000 cubic inches of gold that have been produced on the Pacific Coast. The State will likewise show her mineral wealth by a display of 500 tons of minerals.

The Pictet ice-machine which has for some time been running successfully at No. 530 West street, New York, has been sold to a Virginia company. The cost of manufacture on a small scale was about \$1.80 per ton. On a large scale the patentees of this system (employing anhydrous sulphurous oxide gas) claim that it can be made at \$1 a ton.

**Metallic Freight Cars.**—There are now in use on the Chicago, Burlington and Quincy Railroad some 20 box cars of the La Mothe pattern. At a distance they bear much resemblance to the ordinary wooden railroad car; but on approaching nearer the difference is at once discernible. The same trucks are used as on other cars, the manufacturers furnishing at present the car bodies alone, or mounted on such trucks as a railway company may desire. The bodies are made of boiler tubing and steel rods. The sills are of 24-inch tubing; the top framing of soft steel rods, united without joints or bolts, and forming a combination of strength and lightness. The box cars are covered with sheet iron, united by lap and groove (no rivets), and lined inside with a light felting of paper. The interior is lined with very thin lightwood; the purpose of the paper and wood lining is to preserve an even temperature with the car, and it is claimed that these cars are thus rendered cooler in summer and warmer in winter than the ordinary box car. Externally the metallic box is neat in appearance—much more so than the wooden car. It is susceptible of any amount of ornamentation, and passenger cars built in this way can be made very handsome. The weight of the bodies of these cars is from 8200 to 8800 lbs. With the truck they weigh from 17,000 to 18,000 lbs.—nearer the former figure than the latter. The average weight of the wooden cars of the Chicago, Burlington and Quincy Railroad is 20,050 lbs. It should be noted that the newer cars, such as are now built entirely of wood, average over 21,000 lbs. As between them and the La Mothe cars there is therefore a difference of nearly 4000 lbs. in favor of the latter. In addition to the saving in dead weight, the metallic cars have a greater carrying capacity. The ordinary car load is 10 tons; the La Mothe cars will carry 15 tons easily without danger.—*Iron Age, March 14.*

A PAIR of Siberian hares has arrived at the Jardin d'Acclimatation in Paris. The peculiarity of these animals is that they are gray in summer and white in winter. The French naturalists want to ascertain what effect the temperate climate of France will have on this change of color.