acid and water, followed by an alkaline wash and then distillation. It is only the most impure oils, and those from the wells of certain localities that require tho use of acids, which, like the strong alkalies, when used in excess, greatly impair the illuminating properties of these hydro-carbons. The lighter the oils the lighter will be their color. At proof 45° Fah. they are colorless. At proof 42° Fah., colouring matter begins to appear in the distillate, and continues to increase until the charge is exhausted. In order to present the lamp oil of a light color, some refiners have sent it to the market at proof 45° Fah.; but it should be understood that such oils are much more inflammable and liable to explode than those at proof 46° Fah. Color, in this instance, should be sacrificed to safety.—A valuable property of all the before mentioned oils consists in the fact that they never become rancid or ferment. Indeed they become improved by age, and gradually lose their unpleasant odor.

Natural Barometers.

Chick-weed is an excellent barometer. When the flower expands fully, we are not to expect rain for several hours; should it continue in that state, no rain will disturb the summer's day. When it half conceals its minature flower the day is generally showery; but if it entirely shuts up, or veils the white flower, with its green mantle, let the traveller put on his great coat. The different species of trefoil always contract their leaves at the approach of a storm; so certainly does this take place, that these plants acquire the name of the husbandman's barometer. The tulip, and several of the compound yellow flowers, all close before rain.

An Ancient Tree.

A tree has recently been cut down in California, the circumference of which was 90 ft., and its height 325 ft. The bark was in some places 4 ft thick. The tree contained 250,000 ft. of solid timber. Its age was 3,100 years. The wood was sound and solid.

The age of a tree is ascertained by counting the number of rings which are exhibted in its trans verse section, each ring representing one year's growth.

Centrifugal Force of Revolving Shafts.

To ascertain the bursting or centrifugal force on the rim of a fly-wheel, multiply the square of the number of the revolutions per minute by the diameter of the circle in feet and divide the product by 5,780. The quotient is the centrifugal force in terms of the weight of the body.—*Scientific American.*

Preservative Properties of Coal-Tar.

M. Rottier has placed a paper before the Royal Academy of Belgium, upon the preservation of wood by the heavy oil of coal-tar, in which he states that, after reviewing the number of compounds this complex product contains, the volatile hydrocarbons, aniline, phenic acid, and napthaline, do not possess any preservative properties; but that a green oil, which is produced in the distillation of coal-tar at a temperature of about 572° Fahrenheit, is the substance alone that resists the decay of wood.

The Guano Supply.

The measurements of the guano beds on the coast of Peru has shown the Macabi Islands to contain about 1,500,000 tons, the Guanape group 2,500,000, the Lobos Islands 4,000,000.

The Virtues of Borax.

The washerwomen of Holland and Belgium, so proverbially clean, and who get up their linen so beautifully white, use refined borax as a washing powder instead of soda, in the proportion of a large handful of borax powder to about ten gallons of boiling water; they save in soap nearly half. All the large washing establishments adopt the same mode. For laces, cambrics, &c., an extra quantity of the powder is used, and for crinolines (required to be made stiff) a strong solution is necessary.

Borax, being a neutral salt, does not injure the texture of the linen; its effect is to soften the hardest water, and therefore it should be kept on every toilet table. To the taste it is rather sweet, it is used for cleaning the hair, and is excellent dentrifice.

Artificial Marble.

Sir James Hall upon one occasion produced crystalline marble by subjecting chalk to a high heat in a close vessel. Professor Rose, of Berlin, Prussia, tried the experiment, and failing to produce such a result, denied the correctness of Sir James Hall's statements. Being assured that crystalline marble had thus been produced, and that the specimens could be seen in London, he entered upon a second experiment, and in a recent communication to the Berlin Academy of Sciences, Professor Rose states that marble can be produced by exposing massive carbonate of lime to a high temperature under great pressure. His experiments were made with aragonite from Blin, in Bohemia, and with lithographic limestone. In one case the mineral was heated in a wrought iron cylinder, and in the other in a porcelain bottle, the vessels being air-tight. They were exposed to a white heat for half an hour, and on cooling, both the aragonite and the lithographic limestone were found converted into crystalline limestone; the former resembling Carrara marble, and the latter a grey granular limestone. The change was effected without material decomposition; the resulting marble containing a trifle less carbonic acid than the lithographic limestone, from which it was produced.

New Patent.

A Frenchman has patented an invention for pulverizing the refuse of slate, and mixing with it some substance which produces a most durable material, and which answers the same purposes as some kinds of our most valuable stone.

ERRATA.

In the Journal for December, 1863, the following *Errata* occurred at page 357, in the article on "Heat and Motion:" first column, 18th line from the top, for *winter* read *water*, and, in 20th line, for *water* read *air*.