THE PRESERVATION OF EGGS.

The question, "How can eggs be preserved for market?" just now engages the attention of many of our readers. The following will prove of timely interest to many.

In the common "liming" process a tight barrel is half filled with cold water, into which is stirred slaked lime and salt in the proportion of about one-half pound each for every pail or bucket of water. Some dealers use no salt, and others add a small quantity of niter—one quarter pound to the half barrel of pickle. Into this the eggs, which must be perfectly fresh and sound, are let down with a dish, when they settle to the bottom, small end down. The eggs displace the liquid, so that when the barrel is full of eggs it is also full of the pickle. Eggs thus pickled, if kept in a cool place, will ordinarily keep good for several months. Long storage in this liquid, however, is apt to make the shells brittle and impart a limy taste to their contents. This may be in a great measure avoided by anointing the egg all over with lard before putting in the pickle. Eggs thus prepared are said to keep perfectly for six months or more when stored in a cool cellar.

A much better method of storing eggs is the following: Having selected perfectly fresh eggs, put them, a dozen or more at a time, into a small willow basket, and immerse this for five seconds in boiling water containing about five pounds of common brown sugar per gallon of water. Place the eggs immediately after on trays to dry. The scalding water causes the formation of a thin skin of hard albumen next the inner surface of the shell, the sugar effectually closing all the pores of the latter.

The cool eggs are then packed, small end down, in an intimate mixture of one measure of good charcoal, finely powdered, and two measures of dry bran. Eggs thus stored have been found perfectly fresh and unaltered after six months.

A French authority gives the following: Melt four ounces of clear beeswax in a porcelain dish over a gentle fire and stir in eight ounces of olive oil. Let the resulting solution of wax in oil cool somewhat, then dip the fresh eggs one by one into it so as to coat every part of the shell. A momentary dip is sufficient, all excess of the mixture being wiped off with a cotton cloth. The oil is absorbed in the shell, the wax hermetically closing all the pores. It is claimed that eggs thus treated and packed away in powdered charcoal in a cool place have been found after two years as fresh and palatable as when newly laid.

Paraffine, which melts to a thin liquid at a temperature below the boiling of water, and has the advantage of being odorless, tasteless, harmless, and cheap, can be advantageously substituted for the wax and oil, and used in a similar manner.

Thus coated and put into the lime pickle the eggs may be safely stored for many months; in charcoal, under favorable circumstances, for a year or more.

Dry salt is frequently recommended as a good preservative packing for stored eggs, but practical experience has shown that salt alone is but little better than dry bran, especially if stored in a damp place or exposed to humid air.

A mixture of eight measures of bran with one of powdered quicklime makes an excellent packing for eggs in transportation.

Water glass—silicate of soda—has recently been used in Germany for rendering the shells of eggs non-porous. A small quantity of the clear sirupy solution is smeared over the entire surface of the shell. On drying a thin, hard, glassy film remains, which serves as an admirable protection and substitute for wax, oil, gums, etc. Eggs thus coated and stored in charcoal powder or a mixture of charcoal and bran would keep a very long time.

In storing eggs in charcoal the latter should be fresh and perfectly dry. If the eggs are not stored when perfectly fresh they will not keep under any circumstances. A broken egg stored with sound ones will sometimes endanger the whole lot. In packing, the small end of the egg should be placed downward; if in charcoal or other powder they must be packed so that the shell of one egg does not touch that of another, the interspaces being filled with the powder.

Under all circumstances stored eggs should be kept in as cool a place as possible. Frequent change of temperature must also be avoided.

The Strength of Small Spruce Beams.

Mr. F. E. Kidder has recently performed a series of experiments at the Massachusetts Institute of Technology, having for their object the determination of the moduli of elasticity and of rupture in small beams of white spruce (*Abies alba*), and such other information as might be derived from the data obtained. The results of these researches are embodied in a paper read before the American Academy of Arts and Sciences and printed in the current number of the *Journal of the Franklin Institute*. The conclusions drawn from the results of the experiments are as follows: The modulus of elasticity depends not only upon the elasticity of the material, but also upon the length of time that the load is applied. When subjected to loads not exceeding one-sixth of the breaking weight, spruce beams do not take a permanent set; but even under very small loads, if applied for any length of time, there will be a temporary set. Knots and gnarls in beams loaded at the center, when not within one-eighth of the span of the center of the beam, do not materially affect the elasticity under small loads. Deflection is very nearly proportional to the load, far beyond the customary limits of the strain, and the modulus is consequently very nearly constant for all moderate deflections. A high modulus of elasticity does not always accompany high transverse strength. In spruce beams the upper fibers begin to rupture by compression under about four-fifths of the breaking weight, and the neutral axis, at the time of rupture, is very near the center of the beam, as shown by the fracture. Beams which are subjected to severe strains for a long time, bend more before breaking than those which are broken in a comparatively short time. The modulus of elasticity of small spruce beams, of a quality such as is used in the best buildings, may be taken at from 1,600,000 to 1,700,00 pounds, and the modulus of rupture at 11,000 pounds.

LOAN EXHIBITION OF THE OHIO MECHANICS' INSTITUTE.

In view of the large assemblage of scientific men to be expected in Cincinnati during the convention of the American Association, beginning August 17, the department of science and arts of the Ohio Mechanics' Institute are organizing a preliminary loan exhibition of scientific apparatus, chemicals, microscopes, minerals and materials illustrating natural history and archæology. This exhibition will be open during the week of the association, in the Exposition Building, and it is expected that the exhibits will remain to compete for premiums and awards in the regular Exposition in September.

We are informed that from the number of applications for space already received the loan exhibition promises to be the largest of its kind ever held in this country. The display cannot fail to be interesting and instructive to the members of the association and the large number of students, teachers, engineers, and others likely to attend the meetings; and the opportunity for manufacturers and dealers to place their goods before those most likely to buy seems to be exceptionally promising.

The committee in charge consists of Prof. F. W. Clarke, of the University of Cincinnati; Prof. Wm. L. Dudley, Miami Medical College; E. A. Kebler, Esq.; J. B. Stanwood, C.E.; and Prof. Ormond Stone, of the Cincinnati Observatary.

THE JEANNETTE RELIEF EXPEDITION.

The Jeannette Relief Expedition, in the Rodgers (late Mary and Helen), sailed from San Francisco, June 16.

The Jeannette (formerly the Pandora) left San Francisco for Arctic exploration, by way of Behring Straits, July 8, 1879, under the command of Lieut. Geo. W. De Long, U. S. N., with a crew of thirty-one men. The Jeannette was last seen on the morning of September 3, 1879, in the neighborhood of Herald Island, sailing north.

The relief steamer Rodgers is commanded by Lieut. Robert M. Berry, U. S. N., and the other officers are Master H. S. Waring, Executive Officer and Navigator; Master Charles F. Putnam; Ensigns H. J. Hunt and G. M. Storey; Assistant Engineer A. V. Zane; Pay Clerk W. H. Gilder (late with the Schwatka Expedition); Passed Assistant Surgeon M. D. Jones, and Assistant Surgeon J. D. Costillo. The crew consists of a carpenter, a steward, two cooks, a blacksmith, three firemen, three machinists, and fifteen seamen.

The Rodgers is 155 feet in length and 30 feet beam, with a depth of 16½ feet, and registers 420½ tons. She is bark-rigged, with double topsails and auxiliary steam power, the engine developing about 156 horse power. She carries three years' full navy rations for her crew, besides a large quantity of pemmican and other stores, so as to be able, if necessary, to supply the Jeannette, or the missing whalers Mount Wollaston and Vigilant, which, with their crews of some sixty men in all, have not been heard of since, on the 10th of October, 1879, they were caught in the ice about eighty miles N. E. by E. of the spot where the Jeannette was last seen.

Chemical Examination of Drinking Water.

Dr. J. W. Mallet, University of Virginia, has undertaken for the National Board of Health, a special study of the methods of examining drinking water for organic impurities; and the board urgently request that physicians and sanitarians shall promptly report to Dr. Mallet any well marked cases of disease which may seem on medical grounds to be fairly attributable to organic impurities in the drinking water used by the patient. It is further desired that samples of each such water shall be forwarded to Dr. Mallet for examination, but not until after the reasons for suspecting the water have been submitted to Dr. Mallet, and notice has been received from him that the analysts are ready to proceed with its examination. Such notice of readiness will be accompanied by clear instructions as to the quantity of water required, and the mode of collecting, packing, and shipping it. The cost of packages and transportation will be borne by the Board of Health. Dr. Mallet's post office is University of Virginia P. O., Albemarle County, Va.

It is to be hoped that physicians will not neglect to aid this important inquiry, especially as it furnishes so favorable an opportunity to have tested *gratis* any water the wholesomeness of which they may have cause to doubt.

Water in an Amethyst.

An Atlanta paper reports the recent finding, in Rabun County, Ga., of an amethyst bearing a drop of water or similar liquid in a cavity near the center of the stone. It is not an uncommon occurrence to find such water-filled cavities in crystals of quartz and other minerals, but this cavity in amethyst is said to be unique.

Exhibition of Milling Machinery.

The British *Mercantile Gazette* has the following respecting the threatened invasion of the domain of the English miller by their enterprising cousins of the far West:

It has been stated that there are 10,000 millers in the United Kingdom, and that a very large proportion of that number had not, previous to the late exhibition, even so much as seen the devices by the aid of which our American cousins have asserted they will, before long, secure for themselves the exclusive manufacture of the enormously increasing growth of American wheat that now flows into this country. To enable the British and Irish millers to take stock of their position, and decide whether they will give up the fight, as many of our British farmers are doing, or embark more capital, energy, and skill in their business, the Council of the National Association of British and Irish Millers resolved to hold an international exhibition of milling apparatus, and although only a comparatively short time elapsed between the mooting of the suggestion and the actual accomplishment of the intention, the display of milling machinery was emphatically the largest and finest ever made.

It is the surprising growth of the milling industry in the United States which fills our home trade with the most serious misgivings; for, whereas the quantity of flour coming from the States was only 1,772,000 cwt. in 1877, it was 3,635,000 cwt. in 1878, rose to 6,863,000 cwt. in 1879, and nearly reached 7,000,000 cwt. last year.

There is also every apparent indication of the permanency of the rapid increase. One authority has it that in the State of Minnesota alone the mills turned out 6,000,000 barrels of flour in the year 1879, and that the mills in Illinois, Wisconsin, Iowa, and other States produced no less than 15,000,000 barrels in the same year. The city of Minneapolis has twenty-two mills with a capacity of 15,000 barrels daily. At St. Louis nearly 2,000,000 barrels of flour were manufactured last year; and in both of these two great centers of the industry a number of new mills are in course of erection. The substitution of flour for whole grain in exporting lessens the weight for land transport and shipment by about 30 per cent, as the proportion of fine baking flour yielded by the wheat is some 70 per cent; the remaining portion of inferior flour, offal, and bran being used as a valuable interchange with maize for fattening American cattle. Even the packing in bags in place of barrels has had its effect. It has contributed toward the economizing of room in the holds of vessels, and the matter of cost reduced to a minimum by the smaller outlay necessary for the bags, and the realizing of their values when discharged in this country. Indubitably, therefore, the situation is, "not to put too fine a point upon it," serious, and millers are apprehensive that their anticipations—that at a not very remote period the vast imports from the other side of the Atlantic may, for the greater part, if not indeed wholly, take the form of flour instead of grain—may assume an unpleasantly material aspect. Without wishing to be "alarmist"-like, or to prognosticate that our national milling industry will become obsolete, it serves no good purpose to mince matters, and the British miller had better look to his guns if he wishes to hold his own in the whirlwind of competition. If anything is calculated to stimulate the energies of English millers and millwrights, certainly the great exhibition at Agricultural Hall ought to have done much to obtain the desired effect.

Comparative Value of Steam Engines.

Hallauer's recent experiments have led him to the conclusion that the difference between engines of one and two cylinders, in point of economy, is very slight. In ranging from 80 to 8,000 horse power, with revolutions varying from 25 to 90 per minute, the expenditure of steam for a given amount of work remains the same for the same type of motor; the consumptions for two cylinder motors are identical for Woolf and compound, whatever may be the volumes of the cylinders, provided the motors are regulated so as to give the maximum efficiency; the expenditures of steam in motors of one, two, and three cylinders, suitably regulated and constructed, are so nearly alike that the choice may be governed in each instance merely by the fitness of the type of the engine for the particular purpose desired.—*Bull. de la Soc. Ind. de Mulhouse.*

A NEW ballot box has just been submitted to the French government. It has two locks, each opening with a different key, and an apparatus which clips a stub or corner from the ticket deposited by the elector, and drops the stub into one part of the box, the ticket going into the other division. Simultaneously the machine registers on a tablet before the voter the number of tickets clipped. The ballots must agree in number with the stubs, and both with the "tell-tale," and the voter sees for himself that his ballot has been cast and taken account of.

THE *Archiv der Pharmacie* gives the following formula for making paper for wrapping up silver. Six parts of caustic soda are dissolved in water until the hydrometer marks 20° Baume. To the solution add four parts of oxide of zinc, and boil until it is dissolved. Add sufficient water to bring the solution down to 10° Baume. Paper or calico soaked in the solution and dried will effectually preserve the most highly polished silver articles from the tarnishing action of the sulphureted hydrogen which is contained in such notable quantities in the atmosphere of all large towns.