

It is also well to have a small stopcock attached to the steam coil, so as to blow from time to time a little vapor into the room, for obtaining a more wholesome degree of atmospheric moisture, which by continual heating becomes deficient.

It is unnecessary to mention here proper ventilation; it has been objected, and with good reason too, that these steam coils only heat the air which is in the room, however bad it may be, and do not introduce fresh air; therefore, it has been proposed to place such coils, under windows, so as to be able to heat fresh air when admitted in the room, or to make openings behind the coils, which may be used to admit fresh air when required; with such provisions the steam heating is undoubtedly preferable to hot air furnaces, where the air is oftentimes drawn only from cellars, kitchens, etc., and heated, or rather scorched, by passing along the often red hot sides of a large stove. It is, therefore, not to be wondered at that many persons of delicate constitutions cannot live in houses with ill constructed hot air furnaces, without being continually subjected to headaches and other inconveniences.

The system of heating by steam tubes is becoming more and more prevalent; among the many buildings thus provided, we may mention the large building in which the SCIENTIFIC AMERICAN has its office, the Cooper Institute, the Astor Library, hundreds of banks and other public buildings, and thousands of private residences.

SCIENTIFIC AND PRACTICAL INFORMATION.

THE EFFECT OF LIGHT ON SMALL POX PUSTULES.

Among the many investigations now being made of the chemical action of light, there are none more interesting or more important than those which are directed to the observation of its effects on the health. It has been observed by Dr. Weber that the sensibility of the skin is very much increased in those parts of the body which are always exposed to the light, and this difference has even been measured by that eminent physician. This remarkable fact is especially observable on persons suffering from small pox, the severity of the skin disease being visibly augmented if the patient be not confined in a dark room. Dr. Waters has recently published a paper on this subject, in which he states that if the room be so darkened that not a single ray can enter it, the effect is to arrest the disease at the papular or vesicular stage; it never becomes purulent, and the skin between the vesicles is never inflamed or swollen; the *U. quor sanguinis* is not changed into pus, nearly all the pain and itching are absent, and the smell is, if not entirely removed, greatly diminished. Another advantage, important in a therapeutic point of view, is the assistance given to medicines, the absence of light increasing the excretory powers of the skin.

CARIES OF THE TEETH.

The acids which cause the decay of the teeth are conveyed in the secretions of the gums and the mucous membrane of the lips and cheeks; and the usual points of attack are in the interstices and the grooves in the facial walls of the teeth. The calculary nature of the saliva is antagonistic to the acids, and preserves the teeth from their dilapidating influence. Teeth are protected from this disease by the following conditions: Their regular shape and order, that the situations for the deposit of acid be as few as possible; the conservation of the teeth from noxious influences, by constant brushing; the healthy structure of the tooth itself, and of the mouth generally. Meider observed that the yellowish white teeth are less subject to the attacks of caries than those of a bluish shade, the enamel of the former being much harder; and the molars have been found to contain more mineral substance than the incisors. In this connection, we would recommend a patent tooth soap preparation which we have used for some time past with much satisfaction, manufactured and put up neatly in glass boxes, by J. O. Draper & Co., Pawtucket, R. I.

DYEING BLACK SILK.

A German authority forwards us the following directions for dyeing black silk piece goods: Clean the silk in the usual way with soda, wash off the fluid, and pass the fabrics through a tepid bath containing a little turmeric and vitriol. Wash them once more, and leave them during one night in a bath of a solution of nitrate of iron of the strength of 6° B. On taking out, wash them well, and put them in a bath containing fustic and logwood, increasing the heat by degrees. If the silks be overdyed by the last process (this will be detected by its brown color), put them through a slightly acid bath. If not, put them in a lukewarm bath, containing soda and the double muriate of tin in the proportion of two parts to three; leave them in this bath till the requisite shade is produced.

ARCHITECTURAL COMPETITION IN BERLIN.

The German government intends to erect a new Parliament house in Berlin, and architects of all nations are invited to send in designs for the building before April 15th next, appending their names, to the Imperial Chancery in Berlin. A prize, amounting to about \$4,250 of our money, will be awarded for the accepted design, and smaller premiums will be given for each of the next four, in the order of merit.

IMPURITIES IN WOOL.

M. Féron, a French expert of large experience, has recently given to the world a valuable paper on the above subject, from which we extract the following: If it sufficed that the carded wool of commerce should be of good color, and its fibers smooth, clean, and parallel, we might congratulate

ourselves on the progress made of late years in wool carding. But it is different when we come to consider the same wools with regard to their industrial value, that is, their aptitude for taking dyes and their suitability for spinning and dressing. The great majority of wools used in France are but imperfectly purified from the earthy and fatty matters which they naturally contain, and from those with which they become contaminated in the process of carding, either accidentally or to facilitate the operation. Now, these impurities are the essential cause of numerous imperfections in each of the subsequent operations, and if not removed, perfection is impossible, either in dressing, spinning, or dyeing.

In conditioning wool, that is, in ascertaining by absolute desiccation the true weight of wool in any bale, samples are taken of clean carded wool, and carefully weighed; they are then submitted to a temperature of from 105° to 108°. By this means, the water they contain is evaporated, and, on re-weighing, the absolute weight is supposed to be obtained. If the wools were pure, this mode of ascertaining the value would be very rapid and exact; but all substances dissolved in a liquid hinder its evaporation and elevate its boiling point, and the influence thus exerted becomes greater with increase of the affinity of the liquid for the substance in solution.

Among the most common impurities of carded wool are to be found: Salts of lime, derived from the water in which the wools are washed, which form, with the oils of the wool and with the soap used, insoluble soaps, which add to the weight and deteriorate the wool, rendering it dusty and greasy; soap, and the substances used to adulterate it; starch, kaolin, resinous matters, silicate of potassa, etc., animal moisture, and glycerin, all increasing the boiling point of water; so that the effect produced on wool by heating to a temperature of 105° is proportionate to its degree of purity, and in no way to the amount which it contains. Under these circumstances, it is useless to deduct the amount of moisture evaporated and estimate the remainder as so much pure wool, since it really contains salts of lime, insoluble soaps, glycerin, etc., which hold water with a tenacity incapable of being ruptured at 105°. With this state of things, conditioning will never be anything but an empty word, and an illusion.

ADULTERATION OF LARD.

A Canadian druggist lately obtained some lard from a respectable pork dealer, the article being noticeable on account of its extreme whiteness. In using a portion of it in the preparation of ointment of nitrate of mercury, the color became gradually deeper till it was of a slaty hue. The lard was tested and was found to contain a large proportion of lime, and it was subsequently stated, by a man in the trade, that the mixing of two per cent or more milk of lime with melted lard is a common practice. The combination of the alkali with some portion of the fat saponifies, and allows 25 per cent of water to be stirred in without being detected.

SILKWORMS' EGGS.

The trade in silkworms' eggs has assumed large proportions. In 1869, two millions of cards, costing on an average three dollars each, were sent to Europe from Japan. Special steamers are chartered to bring home this valuable cargo as speedily as possible; and during the voyage, in suitable weather, the boxes are opened and the contents ventilated. In each box, which is three feet long, and on which a freight of fifteen dollars is paid, are packed 200 cards in separate grooves, so as to allow of ventilation between each card, and to avoid friction. Each card contains about five sixths of an ounce of eggs, and costs from three to four dollars in Japan. It is a matter of the greatest importance to export eggs as soon as possible after they have been laid, and before they have been exposed to any chill from cold weather, especially if they have to travel long distances.

A SUBSTITUTE FOR BUTTER.

It may interest many of our readers, in Texas and several countries of South America, to know that the demand for clarified beef suet, as a substitute for butter for cooking purposes, is increasing. It is sold in London for half the price of the best butter; and it will keep good much longer, without the admixture of salt.

A western paper gives the following recipe for keeping potatoes, and asserts that it will preserve them for years: Dust over the floor of the bin with lime; put in about six or seven inches deep of potatoes, and dust with lime as before. Put in six or seven inches of potatoes, and lime again, and repeat the operation till all are stowed away. One bushel of lime will do for forty bushels of potatoes, though more will not hurt them, the lime rather improving the flavor than otherwise. The lime may be used for fertilizing after this use of it.

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Practical Hints to Inventors.

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How Can I Obtain a Patent?

As the closing inquiry in nearly every letter, describing some invention which comes to this office. A positive answer can only be had by presenting a complete application for a patent to the Commissioner of Patents. An application consists of a Model, Drawings, Petition, Oath, and full Specification. Various official rules and formalities must also be observed. The efforts of the inventor to do all this business himself are generally without success. After great perplexity and delay, he is usually glad to seek the aid of persons experienced in patent business, and have all the work done over again. The best plan is to solicit proper advice at the beginning. If the parties consulted are honorable men, the inventor may safely confide his ideas to them; they will advise whether the improvement is probably patentable, and will give him all the directions needful to protect his rights.

How Can I Best Secure My Invention?

This is an inquiry which one inventor naturally asks another, who has had some experience in obtaining patents. His answer generally is as follows and correct:

Construct a neat model, not over a foot in any dimension—smaller if possible—and send by express, prepaid, addressed to MUNN & Co., 37 Park Row New York, together with a description of its operation and merits. On receipt thereof, they will examine the invention carefully, and advise you as to its patentability, free of charge. Or, if you have not time, or the means at hand, to construct a model, make as good a pen and ink sketch or the improvement as possible, and send by mail. An answer as to the prospect of a patent will be received, usually, by return of mail. It is sometimes best to have a search made at the Patent Office; such a measure often saves the cost of an application for a patent.

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In order to have such search, make out a written description or the invention, in your own words, and a pencil, or pen and ink, sketch. Send these with the fee of \$5, by mail, addressed to MUNN & Co., 37 Park Row, and in due time you will receive an acknowledgment thereof, followed by a written report in regard to the patentability of your improvement. This special search is made with great care, among the models and patents at Washington, to ascertain whether the improvement presented is patentable.

Caveats.

Persons desiring to file a caveat can have the papers prepared in the shortest time, by sending a sketch and description of the invention. The Government fee for a caveat is \$10. A pamphlet of advice regarding applications for patents and caveats is furnished gratis, on application by mail. Address MUNN & Co., 37 Park Row, New York.

To Make an Application for a Patent.

The applicant for a patent should furnish a model of his invention, if susceptible of one, although sometimes it may be dispensed with; or, if the invention be a chemical production, he must furnish samples of the ingredients of which his composition consists. These should be securely packed, the inventor's name marked on them, and sent by express, prepaid. Small models, from a distance, can often be sent cheaper by mail. The safest way to remit money is by a draft, or postal order, on New York, payable to the order of MUNN & Co. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents.

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