

### The Hygiene of Occupations.

The hygiene of occupations has been attracting the attention of the State Board of Health of New Jersey, who have as a preliminary to the study set forth the general considerations involved in a paper by Dr. E. M. Hunt. He is followed by Dr. J. W. Stickler, who, after having dealt in detail with the various processes included in hat making, finds that from the beginning, when the different furs are dealt with in the mixing and blowing room, to the end, when the finishers take up the manufacture, certain diseases, and especially affections of the respiratory organs, are liable to be induced. In fact, out of a total number of 722 hatters, the cause of whose death could be accurately determined, no less than 51.8 per cent died of pulmonary phthisis, and 63.5 per cent of some form of lung lesion. The next subject of work is that of silk, flax, and jute, which is taken up by Dr. W. K. Newton. As regards silk, he would strongly discourage weaving in dwelling houses, where the loom or reel is often set up in an already overcrowded kitchen or living room; but he holds that if factories could be built and maintained so as to afford proper lighting, heating, and ventilation, the silk manufacture ought to be a healthful one. In the case of flax and jute, the hackling process, for which no satisfactory machine has been invented, fills the air with dust made up of dirt and minute fibers, leading to paroxysms of coughing and often to early death. The spinning process charges the air in much the same way, the hair and clothing of the operatives being covered with the dust. Hemp and flax dressers inhale a dust that is peculiarly irritating, and the processes generally tend to destruction of the lung tissues in some form or other, and lead to a high mortality among the workers. Fans are stated but rarely to effect a proper change in the state of the air, and hence some form of air filter over the mouth is recommended. In wet spinning, the air, instead of containing dust, is loaded with moisture, which drops like a fine mist on the operatives, who are practically subjected to a vapor bath—an arrangement provocative of bronchial and other catarrhal affections, as also of rheumatism. The diseases occurring in the manufacture of rubber boots and shoes are considered by Dr. J. P. Davis. After a description of the processes of this trade, it is pointed out that the greatest danger attends the compounding process, in which a large quantity of white lead, litharge, etc., is mixed with the rubber or gum, lead poisoning being especially frequent during moist hot seasons in summer, when the factory windows have to be kept carefully closed. The heat and want of ventilation are also very injurious. The other conditions leading to mischief are the introduction of naphtha into the caldron of liquid; the machinery, with resulting accidents; and the fixing of the rubber when completed on to the heels and soles of the boots and shoes, the last being pressed against the pit of the stomach. It is to be hoped that the series commenced in this report will be extended to other trades. —*Lancet*.

### The Best Evergreen Barberries.

Now that the planting season for evergreens is at hand, it may be well to direct attention to the best kinds of barberry to plant, as they are so indispensable in every shrubbery. Of the many species of *Berberis* in cultivation, which number over half a hundred, only about half a dozen among them are what may be termed really handsome shrubs; and although they differ widely in structural peculiarities, many of them possess a striking resemblance to each other. The genus is divided into two sections, the *Berberis* proper and the *Mahonia*, which sometimes ranks as a distinct genus. Among the true barberries a few are really beautiful shrubs. The finest, no doubt, is *B. darwini*, first discovered by the late Mr. Charles Darwin in Chili, and than which no more beautiful hardy shrub exists. This species is now too well known to need description. This year it has been very beautiful, the winter having been favorable to it, though even this season it has not been so fine as it was in the spring previous to the two disastrous winters of 1879 and 1880, which crippled it severely. Being a native of Chili, it will not stand any great degree of cold, and it is all the better for a mild spring. Next to Darwin's barberry in point of beauty is *B. stenophylla*, a garden hybrid between *B. darwini* and *B. empetrifolia*. The long slender branches of this barberry droop gracefully on all sides, making the bush, when profusely laden with blossoms, look like a fountain of molten gold. It is, moreover, a shrub that is not at all fastidious as to position, for it grows in shade as well as exposed, but it flowers most freely when in a good light soil in a warm, sunny situation. It is much hardier than *B. darwini*, and seldom suffers from severe frosts. *B. empetrifolia*, though a fine shrub, is not equal to either of the preceding in point of floral beauty, but its habit of growth is elegant and it is very hardy. *B. dulcis* and *buxifolia* need only be grown where a variety of barberries is required. Of the *Mahonia* section, the commonest and most useful is, of course, *B. aquifolium*, perhaps the most beautiful of all evergreen shrubs. As it is, or ought to be, in every

garden, there is no need to describe it. Similar to it, but different in foliage and dwarfer in growth, is *B. repens*, which makes a capital margin to larger groups. Less common kinds are *B. glumacea* and *fascicularis*, but they are not so desirable as *B. aquifolium*. Even without reckoning the many varieties of the *Mahonia* section which are more or less rare, there is quite a wealth of beauty in the evergreen barberries alone, and they can be obtained cheaply in nurseries.—*W. G., The Garden*.

### A CONVENIENT ESCRIBOIRE.

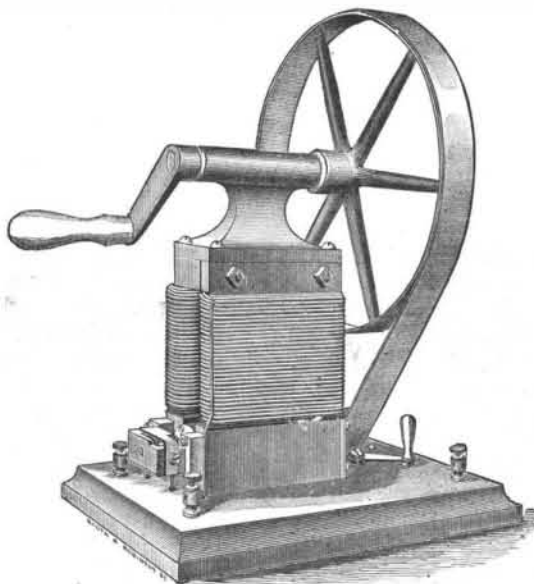
This convenient case is designed to hold various articles of stationery for individual use, both when at home and when traveling. The receptacle contains every requisite for correspondence, and the arrangement is such that each article can be seen at a glance and readily secured. The interior is specially fitted and adapted to hold particular articles of stationery, which will be retained in position, no matter how the case, when closed, may be thrown or handled. The case is small, so that, when traveling, but little space is required in the trunk or valise. The exterior of the bottom is made smooth, to form a writing surface when the case is inverted, and held on the arm or lap. The annex box, which is shown open, is placed within the main receptacle, and contains a screw cap inkstand, seal stamp, sealing wax, tapers and pens.

This useful article is the invention of Mr. J. F. Tannatt, of Springfield, Mass., to whom all inquiries should be addressed.

### SMALL DYNAMO ELECTRIC MACHINE.

It is gratifying to learn, by letter and otherwise, that the description of the small dynamo given in SCIENTIFIC AMERICAN SUPPLEMENT, No. 161, has enabled many of our amateur electricians to make successful machines; and we are pleased to know that one of our enterprising firms has undertaken to supply something that has been wanted since the SUPPLEMENT above referred to was published, namely, the parts of the dynamo.

Messrs. Goodnow & Wightman, of 176 Washington Street, Boston, Mass., in response to many inquiries, have made patterns and produced castings of the field



HAND POWER DYNAMO.

magnet, the armature, wheel, pulley, crank, etc., which they have placed at reasonable prices. They are willing to furnish the parts either separately or all together, and will finish any parts as may be desired. We present herewith an engraving of the dynamo referred to.

### The American Exhibition, London.

During the last fortnight, remarkable progress has been made with this novel and extensive undertaking, and despite the short time that now remains before the opening, we think there is little doubt the work will be at least as near completion as any exhibition ever attains on the day it is thrown open to the public. Next week Mr. Smith, the chief of installation, will be ready to receive exhibits, and from his great experience at Philadelphia, Paris, and elsewhere, there is little doubt that the tedious and thankless task of arranging exhibits and satisfying exhibitors will be well accomplished. The large hall now shows its noble proportions, which adapt it admirably for the purpose, and the general effect from the entrance will, we think,

be far more striking than the view from the grand vestibule of the South Kensington Exhibition. The other structures, as well as the extensive grounds, are making rapid strides toward completion, the stabling, corrals, and other accommodation for the "Wild West" being ready, and the great amphitheater finished except as regards the roof covering. One very remarkable feature about the exhibition will be the facilities of access it will enjoy, the West Brompton, Earl's Court, and West Kensington stations each being situated close to the different entrance gates.

The plan of the ground occupied is, it will be remembered, very irregular, and cut up by various railways passing through it; but this, under the skillful management with which it is laid out, will add greatly to the charm of the place as a summer resort, while access to every part of the grounds is fully provided for by numerous bridges crossing the lines. The main building is essentially utilitarian, and will be practically devoid of ornament, except for the internal draperies, among which 1,200 American flags and banners will make no mean display. Major Russell, Mr. Landreth, and others of the American executive will shortly arrive in England, and complete the eminently practical and energetic staff already engaged on the enterprise, the work, so far as America is concerned, being complete. The American Exhibition will certainly be a novelty, and we believe one of the greatest attractions London has seen for many years.—*Engineering*.

### Wine and Brandy from Raspberries and Strawberries.

Raspberry ferment, *Levure wurtzii* of Le Bel, is not able to convert all the sugar of the raspberry into alcohol. To learn whether this is due to lack of activity in the ferment or to the action of some constituent of the fruit, energetic ellipsoidal wine yeast was mixed with the liquid. Fermentation then quickly ensued, and the sugar of the fruit, as well as two or three times its quantity of added sugar, was converted into alcohol. Raspberry brandy, obtained by distilling the wine, is very aromatic, and has the odor of raspberries, then becomes slightly smoky, but finally acquires a very fine bouquet.

Strawberry ferment is more active, but fermentation is accelerated by the addition of ellipsoidal wine yeast. Wine from French strawberries is less acid than that from raspberries, and keeps well if it contains 16 per cent alcohol. The brandy has a strawberry bouquet, which becomes stronger after some time, but does not alter in character. English strawberry brandy, even if containing a double quantity of added sugar, is still so strong as to be unpleasant, but if diluted with water the bouquet develops in perfection.

*Levure wurtzii* and others, such as *L. apiculatus*, have no invertive properties, and can therefore act only on invert sugar, and are unable to alter the saccharose, which also exists in the juices of many fruits. A higher yield of alcohol can be readily obtained by adding an invertive ferment like the ellipsoidal yeast of wine.—*A. Rommier, Compt. Rend.; Jour. Chem. Soc.*

### Distribution of Power by Rarefied Air.

In the central station of the Rue de Beaubourg, Paris, a 40 horse power plant is now at work actuating vacuum engines in the neighborhood, some of them being situated at a distance of about a third of a mile. Motive power at the central station is provided by a steam engine, which works an air pump producing a partial vacuum in a system of small lead tubes laid underground throughout the district. At the different places where power is required, there are small vacuum engines constructed similar to steam engines, the largest giving out two effective horse power. The plant has worked so well that additional power had to be provided, and two new steam engines, representing 130 horse power, have just been installed at the central station, so that power may now be supplied to an extended circle of customers.

One customer requires at his premises 30 horse power, and for him there are now in construction two 15 horse power vacuum engines. It is also intended to work electric light machinery by means of these engines; but this employment has justly been characterized by M. Hospitalier as a roundabout and uneconomical method of distributing electric light from a central station. Payment for the power supplied is made in the shape of a fixed quarterly rental for the vacuum engine, and an additional charge according to the total number of revolutions made by the engine during the quarter. This method is only a rough approximation, and it is intended to substitute meters which will register the actual energy supplied. At present, the average price of the horse power hour is about 3d. The total loss of the system is estimated at 50 per cent. As the degree of vacuum is approximately in inverse ratio to the distance of the vacuum engine from the central station, it is necessary, before placing an engine, to regulate it according to the position it will occupy, and for this purpose a special apparatus is fitted at the central station, which allows the testing of each motor in the same conditions as it will work under when handed over to the customer.—*Industries*.