Rhododendrons.

The Garden (London) considers the rhododendron the "queen of flowering shrubs." After naming a number of the choicest varieties, but which do not endure the winter climate well, the writer adds:

To those who may be interested in procuring a few of the very grandest varieties of hardy rhododendrons —whether old or new—in cultivation, and who do not care to wade through nurserymen's bewildering catalogues, I would suggest a trial of the following twenty kinds as almost certain to give satisfaction in their respective colors if properly planted and attended to. If the former is well done, they do not require much of the latter, beyond well watering and syringing just when they are coming into bloom. Baroness L. De Rothschild, superb conical truss, brilliant scarlet, with lighter throat; Mrs. John Penn, salmon pink edges, with waxy cream center; Helen Waterer, white center, with most brilliant scarlet edge; Kate Waterer, rose crimson, with yellow center; Lady Eleanor Cathcart, salmon pink, finely marked, very beautiful, but shy bloomer; Mrs. R. S. Holford, superb truss, salmon pink; H. W. Sargent, dark velvety crimson; James Mackintosh, rich velvety crimson, fine truss, and splendid foliage; Michael Waterer, an old favorite, bright scarlet, rather poor foliage; Marchioness of Lansdowne, light red, intense maroon blotch, very fine flower; Marie Stuart, lovely shade of rose lilac, with intense purple blotch, splendid truss and habit, flowers as beautiful as an orchid; the Queen, one of the most beautiful whites; Lady Gray Egerton, pearly white, magnificent truss; Sir T. Sebright, metallic bronzy purple, free and long bloomer; Joseph Whitworth, dark maroon, beautiful flower and foliage; Martin Hope Sutton, brilliant dark scarlet—if perfectly hardy, one of the finest in cultivation; James Marshall Brooks, scarlet, with a curious mossy bronze eye; Broughton (or Lord Palmerston), very similar, but not synonymous, grand trusses, bright pink, fine foliage; Frederick Waterer (or John Walter), different habit and foliage, but very similar flowers, bright scarlet, perfect trusses; Sigismund Rucker, rich magenta crimson, with a black intense blotch.

It would be easy to add twenty more almost as good as the foregoing, but it would be hard to name twenty better. When varieties such as those enumerated cost very little more than the ordinary ponticum, it is strange that they are not more extensively planted.

Potash Soft Soap.

Potash soft soap for engineer's lubricating purposes may be made as follows: Take 20 pounds of absolutely pure, fine, strong caustic potash, dissolve it in an iron or earthenware vessel, with 2 gallons of soft water. Add this strong lye to 9 gallons of oil, heated to about 140° F., pouring it in a small stream and stirring continually until the two are combined and smooth in appearance—about ten minutes is necessary. The mixing may be done in a wooden barrel. Wrap it up in blankets to keep in the heat that is generated by the mixture itself slowly combining and turning into soap. Put it in a warm room and leave it for three days. The result will be 120 pounds of the finest concentrated potash soft soap, pure, and free from adulteration. Any vegetable or animal oil will do. Pale seal oil for wire drawing and lubricating is the best. For ordinary washing, when made with cottonseed oil, the soap is both cheap and good, and, besides being useful for machinery purposes, produces a very superior soap for flannels and greasy or stained woolens in cold water.—Textile Industries.

New Machine Guns Wanted.

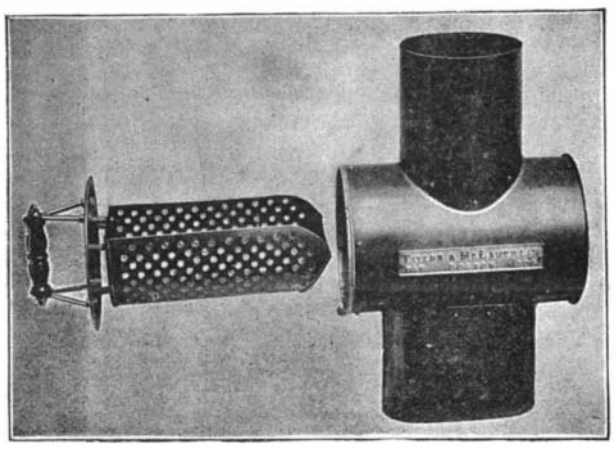
The Chief of the Bureau of Ordnance will shortly issue invitations to companies or individuals to submit machine guns of 6 millimeter caliber to a test, with a view to their adoption in the navy. It is probable that the first order of the bureau will be for 100 guns. An American invention will of course be preferred, but the best gun will be selected without reference to where it is made. Only guns using smokeless powder and jacketed bullets will be used. Ten thousand rounds of ammunition must be supplied. Great attention will be paid to the facility of dismounting and assembling the mechanism, and to the liability of the gun being injured by dust and rust. The guns will be fired for rapidity without aiming with ordinary and extreme elevations and depressions. Rapidity and accuracy of aiming will be tested by target firing at moderate ranges. Excessive pressure tests will also be made. It is expected the Driggs-Schroeder, Hotchkiss, Gatling, Gardner, Maxim and Robertson guns will enter the contest.

How to Drive Rats Away Alive.

Somebody who has tried it recommends putting pulverized potash, which soon becomes sticky when exposed to the air, in all the rat holes about the house. The special detestation of a rat is anything which will stick to his silky coat. Some persons find a mixture of equal parts of Cayenne pepper and Scotch snuff sprinkled well into the holes still more efficacious.

KITCHEN REFUSE READILY DISPOSED OF.

One of the most serious of the sanitary problems in all our large cities is that of the practical and economical disposal of garbage, or refuse and waste of the kitchen. Its removal by the local authorities is expensive and frequently the cause of much vexation and annoyance, although the necessity that it be promptly disposed of is everywhere recognized as imperative, in the interest of the public health, to which there is nothing more inimical than a quick decay of organic matter in warm weather. To obviate this difficulty and provide for the complete removal of all garbage in a most simple and inexpensive manner, is the object of the improvement represented in the accompanying illustration, and which is being introduced by the Sanitary Construction Company, of No. 113 Devonshire Street, Boston, Mass. The carbonizer consists of a horizontal cylinder about one-third larger in diameter than the stovepipe in which it is to be placed, according to convenience, in a joint or an elbow of the pipe making the connection between the stove and the chimney. It may be applied to any stove or furnace and any size of pipe. One end of the cylinder is removable, and attached thereto is a basket or scoop of somewhat reduced diameter, and with perforated sides and a tight bottom, affording free passage for the smoke and heat from the stove around the scoop and through the perforations. When this scoop or basket is filled with garbage and placed in the cylinder, the water is quickly driven off, and the residuum changed to charcoal, which burns freely when placed in the fire, affording in fact a valuable material for kindling the fire in the morning. The natural draught up the chimney prevents the escape of any odor into the rooms, and there is no odor from the chimney, as the gases from the stove thoroughly deodorize the gases escaping from the drying garbage. It is intended that the waste shall be placed in the carbonizer as it is made, so that there will be no accumulating garbage in the kitchen and no need of a garbage bucket. The device has been



A HOUSEHOLD GARBAGE CARBONIZER.

highly recommended by the chairman of the Boston Health Board and other sanitary and street cleaning officials. Many of them are in use in Boston and vicinity.

The Bordeaux Mixture.

The history of the cupreous solution popularly known as Bordeaux mixture is brief, but of much interest, more especially as it contains conclusive evidence that, as in the case of some other discoveries of great economic importance, this fungicide is the result of an accident. It is a matter of some interest to know that it was first used in the vineyards of the Medoc, not as now for the purpose of preventing or checking the ravages of fungoid diseases to which the grapevine is liable, but for the purpose of preventing the grapes being stolen. A thick paste was made with lime and sulphate of copper, and this was sprinkled upon the vines and trellises alongside the highways. There is no authentic information with regard to the length of time the practice had obtained previous to Professor Millardet visiting the region in 1882, but we know that when engaged in his investigations in the Medoc vineyards in that year, he was informed by the owners that the vines over which the paste was scattered escaped the ravages of the mildew.

Taking note of this fact, Professor Millardet, who had for several years been engaged in investigating the fungus, with a view to discover a remedy, conducted a series of experiments in 1883 with a similar preparation, and although the results were not satisfactory, he repeated them on a larger scale in 1884. These proved more encouraging, and at the end of the year the results were communicated to the Agricultural Society of the Gironde, and as the French vineyards were being seriously injured by mildew, the communication created much interest, and a considerable number of viticulturists at once instituted experiments with the mixture. Subsequently various formulas for its preparation were published, the proportion of copper sulphate recommended ranging from 13·2 pounds to 2·2 pounds to 22 gallons of water, but Professors Millardet and Gayon found in the course of their investigations in 1888 that the mixture in which the sulphate of copper was used at the rate of 2·2 pounds gave nearly, if not quite, as good results as one of much greater strength. While to the French is unquestionably due the honor of discovery of this important fungicide, the credit of extending its use as a preventive of diseases other than those of the grapevine and potato plant belongs to American investigators.

The use of Bordeaux mixture has extended in America at a very rapid rate, and although it has not been found a panacea for all the fungoid diseases of plants, it has proved of great value, as shown in the Bulletin prepared by Mr. Fairchild, assistant pathologist of the U. S. Department of Agriculture, in checking a considerable number of them. The more important of the diseases that may be prevented or checked by its judicious use include the downy mildew of the grapevine, the pear, cherry, and plum leaf blights, the apple and pear scab, the peach leaf blister, the quince spot, the chrysanthemum leaf spot, the black rot of the potato, and the well known potato disease. There are some other diseases for which Bordeaux mixture will probably prove an effectual remedy, but those mentioned are sufficient to indicate that its utility is by no means limited to preventing the attacks of the destructive Phytophthora infestans.—The Gardeners' Magazine.

The Iron Trade Situation.

The present situation of the iron and steel industries of the world is one of more or less suspended animation and unstable equilibrium. All countries alike are looking forward to a great improvement on the existing condition of things.

England must be content in the future to share the outside markets of the world with Germany, Belgium, the United States, and, to a less extent, other iron-producing countries, including probably Spain, Austria, and Russia.

It may now be said that there is no iron-making country that is not prepared to place a surplus of its produce, actual or possible, on outside markets. The following statement shows approximately the existing resources of the chief metallurgical countries for the production of pig iron and steel:

	Pig iron. Tons.	Steel. Tons.
The United States	14,000,000	7,500,000
Great Britain	9,000,000	5,000,000
Germany	6,500,000	4,000,000
Belgium	1,000,000	950,000
France	2,600,000	1,000,000
Russia	1,000,000	600,000
Austria-Hungary	1,000,000	650,000
Sweden	750,000	500,000
Spain	400,000	200,000
Italy	60.000	130,000
Canada	150,000	75,000
Totals	36,460,000	20,605,000

When we consider that the greatest quantity of pig iron hitherto produced in any one year has been about 25,000,000 tons, and that the largest output of steel in a single year has been about 12,000,000 tons, it is clear that there is a considerable margin available for meeting any possible increase of demand, and that there is little or no chance of such increase of demand leading to a material increase of the realized prices of either commodity. If a large demand springs up in the United States, and prices become inflated there in consequence, Europe will step in with unlimited supplies, while conversely, if the demand comes from outside markets, Europe and America will fight with the utmost vigor to secure and hold the field.

As matters stand at the present time, it is astonishing how nearly the chief iron-producing countries of the world come to one another in the matter of prices. Between the United States, England, and Germany there is not, at the moment, a difference of more than 10 per cent in the current prices of ordinary descriptions of iron and steel. In other words, it comes to this, that prices are tending to a virtual equality in all the chief countries of the world, except for special products, more or less indigenous to the different countries concerned.

All this is, or should be, a source of satisfaction and of protection to the outside markets, which for that reason should have the less hesitation in taking up new enterprises calling for large supplies of iron and steel. When the United States began to import steel rails from England, and for many years afterward, they had to pay from £10 to £15 per ton for them. To-day the same country is prepared to supply steel rails to outside markets for less than £4 per ton at works.

Manufacturers can hardly, in view of the facts just stated, look for any very large increase of price. They may, of course, secure much more remunerative rates than those current for the last year or two. If they had not this prospect to look forward to, it would hardly be worth the while of the majority to continue in the business. But where supplies can be drawn from such a great variety of sources, the profits that were formerly easy become virtually impossible.—Iron and Coal Trades Review, London.

The Paris International Exhibition of 1900.

The general plan of the next Paris Exhibition may now be regarded as practically complete, and it is possible to fill in some of the details that we have omitted in our former notices. The classification and allotment committees have fixed the locations of each group, and have also decided on the amount of space that shall be given to them; the methods of facilitating the circulation of the public within and around the Exhibition grounds have been decided on in principle, and after a few more questions of detail have been determined on, the complete project for this stupendous scheme, the cost of which is estimated at about 100,000,000 francs, or £4,000,000 sterling, will be submitted to the approval of the Chambers. The area inclosed by the boundary of the Exhibition will be about 270 acres, and of this 100 acres will be covered by buildings of all kinds. The actual size of the inclosure will therefore be less than half that of the Chicago World's Fair, which is very fortunate both for visitors and exhibitors; on the other hand, the covered area will be considerably larger, and a far greater outlay is contemplated than at Chicago; the public may, therefore, anticipate a more satisfactory result, both as regards the artistic effect of the Exhibition and their own comfort and convenience. We have already explained that it is intended to destroy the Palais de l'Industrie; this work will not be so simple as might be supposed, as it must be carried out with due consideration for the numerous uses to which the building is put. One half will be first demolished —that facing the Seine. By this means a sufficient area will be cleared for the commencement of the great avenue which is to connect the Champs Elysees with the bridge of the Esplanade des Invalides, and for the erection of the new palace which is to stand on the right side of this avenue. The other half of the Palais de l'Industrie will be preserved for two years longer, during which time it will be used for the various exhibitions now held there. At the end of two years the new palace will be completed, and the various expositions can be accommodated, setting the other half of the Palais de l'Industrie free for demolition. Afterward a second permanent palace will be erected on the new avenue, and these, which will form prominent features of the exhibition, will remain as monuments after its close. The Palais des Champs Elysees, on the right of the avenue, will contain the exhibits of modern art; on the opposite side will be the building devoted to retrospective art. The former of these buildings will have two entrances through rotundas, and giving access, on the one hand, to the Champs Elysees and on the other to the avenue, which will be known as the Avenue de l'Esplanade des Invalides: it will form a vast rectangle with a central gallery and two wings, but the side nearest the Seine will be open, and will, in fact, constitute a small park that will be enriched with the choice trees and shrubs so numerous in the Champs Elysees, and which will have to be displaced to a large extent in the alterations that will be unavoidable. In the other wing of the building there will be a great covered court, which, after the close of the exhibition, can be utilized for horse and similar shows.

It need hardly be said that practically all the trees in the Champs Elysees will be preserved, though, of course, many of them will have to be shifted, and the landscape gardening very possibly improved thereby. In one of the most picturesque locations in the park will be erected the pavilion of the government Sevres factory, where processes, as well as manufactured articles, will be shown. The Esplanade des Invalides, which forms a part of the exhibition, will be connected with the Champs Elysees by a bridge that will be a good example of modern engineering practice. It will be of steel, 360 ft. long and 328 ft. wide: on this extensive platform galleries will be erected and flower beds laid out. On the Esplanade there will be a series of magnificent structures bordering on the main avenue, and continuing the perspective commenced by the Fine Arts palaces on the Champs Elysees. In this part of the exhibition there will be the buildings devoted to the groups of education and teaching, the appliances and processes connected with literature, arts and sciences, as well as with the decoration of buildings and with furniture. On the esplanade all the trees will be preserved, though possibly rearranged, and there will be many small pavilions, scattered about this part of the exhibition, devoted to the practical exhibition of processes associated with the industrial arts—bronze, ceramics, crystal and glass, the working of precious metals, jewelry, horology, leather work, etc. The further end of the esplanade will be covered with buildings, and conspicuous among them will be a great portal placed immediately on the axis of the central avenue, the bridge, and the avenue on the Champs Elysees.

We have already referred to the important role it is intended that the Seine shall play in this forthcoming exhibition. It is proposed that not only shall the wide, sloping banks on each side of the river be utilized, but that promenades shall be arranged on the water level. On the right bank of the Seine there will be first a series of historical reconstructions, followed by the Pavilion of the Ville de Paris and the buildings of the Horticultural Section, for which there will be at least 20 acres covered. At the back and parallel with the river, on the road known as the Cours-la-Reine, will be a long range of miscellaneous buildings—kiosks, cafés, restaurants, etc. Opposite the Trocadero there will be erected the Congress Hall, which no doubt must be of very large proportions, seeing that congresses on every possible subject have become inseparable attendants on universal exhibitions. On the opposite side of the river, pavilions will be erected for the service of certain special foreign exhibits, and near the Pont de Jena is to be placed the very important structure devoted to naval and military exhibits, while close by will be the pavilion of ocean and internal navigation exhibits. Much care will be given so to arrange this water front of the exhibition that it shall be one of the most attractive centers, and as during the evenings all the business river traffic will be suspended, the position will be admirably adapted for the numerous night fetes that will form a special feature of the exhibition. For the accommodation of visitors passing from one side of the Seine to the other, there will be two new bridges, in addition to the Pont de Jena and the Pont de l'Esplanade des Invalides. As we have already stated, the ample space on the Trocadero grounds will be chiefly devoted to colonial exhibits, which it will be remembered occupied so brilliantly the Esplanade des Invalides in 1889. Here will be assembled pavilions containing colonial produce, mission exhibits, native villages, bazars, reproductions of famous buildings, etc. Complete as no doubt this part of the exhibition will be, it is difficult to understand that it can be more perfect than the similar display in 1889. As regards the Champ de Mars, it is not the intention to erect here the long series of buildings more or less similar, such as formed the chief features of the last two great French Exhibitions. The buildings of the Beaux Arts and of the Arts Retrospectifs are to remain, as well as the Machinery Hall. Between these, and on each side of the Champ de Mars, there will be erected long ranges of buildings extending down to the Seine; these buildings are not to be uniform in design or in size; the highest and most important will adjoin the Machinery Hall, and they will gradually decrease in size toward the Seine, where they will be relatively small. It is expected that this arrangement will possess many advantages, among others those of an improved perspective, and of showing at a glance the comparative importance of the groups to which the buildings are devoted. Near the Seine the smallest groups will be placed, or, at all events, those which do not occupy much space, and this system of graduation is to be extended toward the Machinery Hall until the buildings are sufficiently large to receive exhibits of the most bulky nature. It should be mentioned that this long range of pavilions is to be connected by two galleries, one on the ground level and the other on the first floor. It is to be regretted that the Machinery Hall of 1889 is to be preserved, yet it is doubtful whether it would be possible to devise a finer interior for the special purpose for which it was designed. It will, however, be much altered by the creation of a vast salle des fetes in the center, while the ungraceful exterior will be completely masked by the range of miscellaneous pavilions to which we have just referred.

We are glad to see that there appears no evidence of a vainglorious desire to make a record at the 1900 Exhibition with size of buildings; on the contrary, a leading idea seems to be to reduce the dimensions as far as possible and increase the number of structures.

There must be exceptions, of course, in this, such as in the two permanent buildings that are to replace the Palais de l'Industrie, and in the Electricity Building that will form the main architectural feature on the Champ de Mars. But, as a rule, it would seem that beauty rather than size, and true taste rather than ostentation, will be two of the leading characteristics of the exhibition buildings of 1900.—Engineering.

Bleaching Cotton.

Cotton is never bleached in the unmanufactured condition, but in the manufactured state is frequently subjected to the process. As yarn, it is first "boiled out" with very dilute caustic soda, to remove the oil or gum, then washed or not, as desired, then immersed for one or two hours in a clear bath of bleaching powder, then washed to remove excess of bleaching liquor, and finally passed through a very weak bath of sulphuric or hydrochloric acid. When in the condition of warps (which may be 1,200 yards in length), it is subjected to the same treatment, except that special machines are required for the handling of threads of such great length. In the form of woven fabrics peculiar apparatus and special care and skill are required, and great ingenuity is displayed in the mechanico-chemical part of the operation. Two systems are in use, which are known respectively as the high pressure and low pressure systems. The essential difference between these lies in the length of time the goods are subjected to the boiling. In both, also, the operation is divided into two stages. The first, in which the cleaning of the goods is effected, consists in boiling with lime or soda, followed with a weak acid (termed a "sour"), then with soap and soda, followed by a wash. The second is the bleaching proper, in which the goods are brought, for a definite length of time, in contact with the actual bleaching agent, followed by a wash, and a passage through very dilute sulphuric acid, after which the goods are allowed to lie in heaps for a time, then well washed, and dried over revolving cans heated by steam. Modifications of the above processes have appeared from time to time. A notable one was that of Messrs. Mather & Thompson, and is admirably suited for warps and piece goods. The important feature in this process resides in the use of carbonic acid gas, by which hypochlorous acid is liberated, which, in turn, effects the whitening of the fabrics. The previous remarks cover the essential points governing the bleaching of cotton, and the same principles, with only slight alterations, are applied to the bleaching of linen and jute.—Industrial Record.

Incubation Period of Diseases.

The Clinical Society of London, wishing to establish a period of incubation for various diseases, instituted a series of investigations with the following results:

Diphtheria.—In this disease the incubation period does not as a rule exceed four days and is more often two days. It may also extend to five, six and seven days. The infection may take place at any time in the course of the disease. Mild cases may spread it.

Typhoid Fever.—This may vary within wide limits twelve to fourteen days, but not infrequently it is less. As the disease is usually introduced into the system by food and drink, it is not carried from one person to another, but several may get it from the same source. Contaminated water and milk is the usual cause.

Epidemic Influenza or "Grippe"—The shortest incubation period in this disease is from a few hours to three or four days. It generally strikes suddenly and without warning. A patient may carry infection throughout the whole course of the disease.

Measles.—The incubation period of measles is usually short. It is counted from the date of the eruption, which decides the disease.

Mumps.—The incubation period of mumps is rather long, from one to two weeks, and the chances of infection diminish daily.

Rubeola, Rotheln, or German Measles.—This has a long incubation period, like ordinary measles, and its infectivity diminishes in a day or two after the rash disappears.

Variola or Smallpox.—The incubation period of this disease is from one to three days.

Varicella, or chickenpox, has a period of incubation slightly longer than variola.

Asia and North America.

I would suggest a thorough exploration of the intercontinental tract which on the North Pacific unites North America with Asia—the Aleutian Islands and Peninsula, the Behring Sea and Strait, and the Peninsula of Kamtchatka. Where two continents approach one another so closely and give evidence of having been united at seemingly no very ancient date; where a connecting land bridge could not but most effectually influence the distribution of life, human, animal, and vegetable, upon two hemispheres—there, manifestly, the harvest of exploration must be great, for bound in with the research are problems of deep significance, touching alike the sciences of geology or physical geography, ethnology, geology and botany. We ask ourselves the questions: If North America and Asia were united, when and how did the separation take place? What heterostatic condition existing between the land and the water permitted of the incursion of the sea or the dropping of the land? To what extent was the union complete, and what were the initiatory steps that prefaced the fall? What were the nature and extent of the animal and vegetable migrations of which the connecting land mass permitted, and which way did they influence the present distribution of life upon the globe? It what way was the distribution of races effected or determined by that connecting bridge? Plainly enough the breadth of these questions indicates how vast is the field that is to be covered by the answer; and while it may be difficult to obtain these answers, they are surely locked up with the rocks that form the continental border lands, the islands that dot the sea, and the submerged bottom land of the ocean. And when they will have been obtained, they will constitute some of the worthiest contributions to geographical science the records of which adorn the pages of discovery. It is almost incredible that with so much promise in the exploration of this region so little should have been accomplished. Easy of access, and well within the resource of a moderately equipped expedition, the region should long since have attracted to it an army of scientists.—Prof. Angelo Heilprin.