

A WHITE-FLOWERED BRAMBLE.

Though rarely seen in gardens, this is one of the most striking of all early flowering shrubs; it was originally discovered in 1822 by Dr. James, who found it on the Rocky Mountains, where it grows at considerable elevations. The plant was brought into cultivation, says a correspondent of the *English Garden*, in Great Britain, by Mr. Anderson-Henry, of Hay Lodge, Edinburgh, who raised it from North American seeds, the produce of which first bloomed in May, 1870. Our illustration was prepared from a bush of it 4 feet high, in the Royal Botanic Gardens, Regent's Park, London, where we saw it bearing numerous large white flowers among serrated trilobate leaves. Its single roselike blossoms are succeeded by reddish purple blackberry-looking fruits, which have an agreeable flavor. The plant is perfectly hardy, and is well worth a place in every choice collection of flowering shrubs; its proper position, however, is unquestionably on the outskirts of plantations or in the wild garden. Like nearly all other species of *rubus*, it may be readily increased by means of root cuttings.

True Economy of Life.

The true economy of human life looks at ends rather than incidents, and adjusts expenditures to a moral scale of values. De Quincey pictures a woman sailing over the water, awakening out of sleep to find her necklace untied and one end hanging over the stream, while pearl after pearl drops from the string beyond her reach; while she clutches at one just falling, another drops beyond recovery. Our days drop one after another by our carelessness, like pearls from a string, as we sail the sea of life. Prudence requires a wise husbanding of time to see that none of these golden coins are spent for nothing. The waste of time is a more serious loss than the extravagances against which there is such loud acclaim.

There are thousands who do nothing but lounge and carouse from morning till midnight—drones in the human hive, who consume and waste the honey that honest workers wear themselves out in making, and insult the day by their dissipation and debauch. There are ten thousand idle, frivolous creatures who do nothing but consume, and waste, and wear what honest hands accumulate, and entice others to live as useless and worthless lives as they do. Were every man and woman honest toilers, all would have an abundance of everything, and half of every day for recreation and culture. The expenditure of a few dollars in matters of taste is a small matter in comparison with the wasting of months and years by thousands who have every advantage society can offer, and exact every privilege it affords as a right.—*Philadelphia Commercial List.*

THE COCA PLANT.

The habit of chewing the leaves of the coca plant, common among the natives of many parts of South America, has recently been commented on by many medical authorities; and we present herewith an engraving of a branch of the plant, taken from a specimen in flower of the Royal Botanical Gardens, Kew, England. The use of the leaves of this plant as a masticatory is of great antiquity in Peru; indeed, it is said to have originated with the Incas, and at the present time is common through New Grenada, Quito, and Peru, and also on the banks of the Rio Negro. The South American Indians always carry with them a little bag of the dried leaves, and a gourd containing finely powdered lime, which is mixed with the leaf before chewing. Used in moderation, coca is said to pleasantly excite the imagination, and it also powerfully stimulates the nervous system. In illustration of this, Dr. Spruce remarks that an Indian, with a supply of his favorite coca leaf, will travel two or three days without food and without showing any desire for sleep. Among recent contributions to the history and effects of this plant, we may allude to a paper read before the April meeting of the Edinburgh Botanical Society, from which it appears that without doubt the leaves of the coca, when rightly prepared and used discreetly, possess the effects ascribed to them by all travelers in Peru since Pöppig was there in 1827, but that their effects are not always precisely the same on different individuals. From experiments conducted by Sir R. Christison, the author of the paper above cited, and those of fourteen other gentlemen who undertook to try the plant at his request, the following conclusions have been arrived at: (1) That, taken in quantities of two drachms by healthy persons, it has no injurious, unpleasant, or suspicious effect whatever; (2) that in a very few cases this dose, of an inferior sample, had no effect at all; (3) that in by much the greater number of instances, and with a fine sample in every case, extreme fatigue was removed and prevented from returning, and that no doubt can exist that, in such persons, its restorative and preventive powers will render protracted exercise easy, without any subsequent harm, so far as the restorative is concerned; (4) that it does not in the end impair the appetite or digestion, although hunger, even after long fasting, is taken away for an hour or two; (5) that the use of it probably does not agree with more than a very moderate use of alcoholic stimulants. At the same time the

paper avoided all reference to the possible medicinal uses of this plant. Similar conclusions have also been arrived at by Professor Bouchardat, of Paris, who considers that its services in therapeutics have been most valuable, almost equal to those of cinchona, and that as a nervous and muscular stimulant it ranks with tea and coffee. On the other hand, evidence is not wanting to show that its effects (like those of tobacco, opium, hemp resin, gunjah or bhong, alcohol, and other vegetable stimulants) are certainly highly injurious when used habitually or in excess. A confirmed *conquero*, as an habitual chewer is termed, is said to be invariably known by his haggard look, gloomy and solitary habit,



RUBUS DELICIOSUS.

listless inability, and disinclination for any active employment. Its use is regarded by Europeans as befitting only the Indians; nevertheless, many whites are addicted to it. Dr. Weddell, who inquired very carefully into its effects on the constitution, states, as the result of his observation, the opinion that its habitual use acts on Europeans more prejudicially than on the Indians accustomed to it from early years; and in some cases is attributed to its abuse a peculiar aberration of intellect, characterized by hallucinations.

Dr. Mantegazza, says the *English Garden*, fully confirms the statements of Pöppig, and carefully describes its effects, stating the result of intemperance in its use to be frequently confirmed idiocy. The principle to which the effects of the coca leaf is due has been named cocaine; but much re-

rica and the West Indies, but others are found in Madagascar and the Mauritius. In nearly all the species a distinct pale band runs up the center of the back of the leaf, as shown in our engraving; indeed, in some descriptions of the leaf of the coca plant, we find it stated that two veins, in addition to the mid-rib, run parallel to the margin.

The leaves of this plant are used to make an infusion, as few as four or five leaves making drink enough for six persons. The coca is not to be confounded with the *cacao*, of the genus *theobroma*, which furnishes the nuts from which cocoa, chocolate, and the shells used for infusion are made.

Curiosities of the British Patent System.

A writer in *Chambers' Journal* has been examining into the history of the British Patent Office; and he describes many curious grants in the early history of the office. Among other facts, the writer states that there are four thousand applications for patents every year; and that the office receives the snug sum of \$750,000 a year in fees and stamps.

The first patents, issued in the time of James I, were more in the nature of monopolies or privileges, for which a consideration was paid to shrewd Jamie himself. The very first patent of all was an exclusive privilege for drawing, engraving, and publishing maps of London, Westminster, Windsor, Bristol, Norwich, Canterbury, Bath, Oxford, and Cambridge. The next was for the privilege of publishing portraits of His Sacred Majesty. The third was for an unexplained group of wonderful inventions, for plowing land without horses or oxen, making barren land fertile, raising water, and constructing boats for swift movement on water.

Many of the patents relating to clothing are singular either for their immediate objects or for the language in which they are

couched. One patent for breeches, at a date when trousers had not yet come much into use, described a mode of cutting out and making "to do away with all the inconveniences hitherto complained of"—by the aid of elastic springs, morocco elastic supporters, straps, buckles, etc. Another "protects trousers from mud," by means of a shield attached to the hinder part of the boot heel, which shield receives the splashed mud. Martha Gibbons, early in the present century, patented "a certain new stay for women and others, called the '*Je ne sais quoi*' stay which may be padded in any part when required for persons to whom Nature had not been favorable"—probably a euphuism for "flat figures." George Holland patented a mode of "making false or dummy calves in stockings." A famous *modiste* has an improvement in ladies' dresses, "rendering the same body capable of adapting itself to fit different figures." For those "who cannot bear a ligature round the leg," a patentee has a garter made of steel springs, connected with a silver plate placed in the waistband of the dress. One patent tells of a machine for brushing trousers: a frame work supports a spindle which carries a set of concave brushes; a cylinder of wicker or cane is placed inside the trousers to keep them distended; and the spindle is set rotating by an endless band acting on a beveled pulley.

The searchers after a machine for producing perpetual motion—that dreamy fallacy of the middle ages—have not failed to make their appearance in the patent world. In 1859 two Germans, Krause and Rotman, residing at Milwaukee in the United States, sent a letter to "Her Majesty the Queen Victoria, Patent Office, London." Her Majesty most likely did not read it, but the Patent Office folks did. It ran thus: "Your Majesty, we humbly advertise that we find out the perpetual motion, a machine very singular in its construction, but the same time very important by the power it gives. We intend to secure ourselves the patent right for the United States; and as we are informed your Majesty has secured a reward for the invention, we respectfully ask your Majesty if we may come to show our invention? To prevent mistake, we humbly beg not to believe any person without having the original patent of the United States, and the copy of this letter."

From the cradle to the grave, says the writer, patentees take care of us in some way or other. Even Dolly is attended to. One patent among many tells us that "dolls hitherto made have never been so constructed as to allow of their being placed in a sitting posture, with the legs bending at and hanging down from the knees", and announces that this important desideratum has now at length been secured. Another inventor "gives a rocking motion to dolls' cradles" by an elaborate array of clockwork, eccentric wheel, winch, and connecting rod. One of the early patentees had "a hydraulike, which being placed by a bed-side, causeth sweete sleepe to those which either by hott feavers or otherwise cannot take rest." A patent medicinal powder, compounded of tobacco and herbs, was so meritorious that "if one teaspoonful be struck for a dose up the nose as snuff, will cure various disorders of the hypochondriac and melancholy kind." Eighty years ago many persons believed in a patented mode of curing numberless aches and pains "by drawing over the parts affected various pointed metals, which from the affinity they have with the offending matters, or for some other cause,



ERYTHROXYLON COCA.

Leaf (natural size), single flower, and ovary enlarged.

mains yet to be done before we can speak with any precision as to the properties and uses of this comparatively modern introduction to the pharmacopeia. The plant is easily cultivated in an ordinary plant stove in a compost of fresh fibrous loam, leaf mold, and sand; when growing it requires copious supplies of water at the root, and frequent syringings with tepid water keep down insect pests. Cuttings of both stem and root may be employed for purposes of propagation. There are about seventy other species of *erythroxylon*, some of which have stimulating qualities, while others furnish a tonic bark somewhat resembling that of cinchona. The bark of one species—*e. tuberosum*—supplies a reddish dye. The majority of the species are natives of South Ame-

extract or draw out the same, and thus cure the patient." One patentee has a thief-proof coffin, in which the corpse is secured by chaining or hooping it to a false bottom; and another a coffin made impregnable by some special application of "tapped and case-hardened screws."

If we cut short our budget of curious patents, it is only because space fails us. Two of the Lillywhites, the celebrated cricketers, have at different times patented bowling machines; in one instance for the adoption of machine bowling in actual play; in the other only for practice at batting, when a trained bowler is not at hand. If the reader will imagine something of the catapult or cross-bow kind, he may form some idea of these cricketing oddities. One patentee has a balloon for catching fish; a balloon, inflated with air and ballasted with water, is supposed to drag or trawl the fishing lines or nets. Before the Manchester and Liverpool Railway was constructed, a bright genius conceived the idea of using balloons to draw a ship overland between those towns, on a tramway of twenty feet gage! A balloon has been patented for preventing sea sickness: a platform, resting on a huge ball and socket, supports the seats for the passengers; the platform is connected by cords with a circle of small balloons; and the balloons are expected to keep the platform always horizontal—of course to the great satisfaction of the passengers. Balloons are also intended, by another patentee, to keep in motion the swings which are such a source of delight at country fairs. One of the very earliest patents was for "a fish call, very useful for the fishermen to call all kinds of fishes to their nets, spears, or hooks; and for fowlers to call severall kinds of fowles or birds to their neets or snares." In one part the inventor speaks of his fish call as a "looking glass"—rather a puzzle to interpret. Acrobats are invited to use a patent shoe soled with iron, which will enable the wearer, with the aid of a powerful electromagnet, to walk head downwards along a metallic ceiling. There are patents for milking cows, for preserving the hands from chapping, and for curing the croup in fowls. Snuff-taking is made easy by "two snuff boxes, one with a slider and the other with a sweep, out of which snuff may be taken without pulling it (the box?) out of the pocket, and without spilling."

CENTENNIAL NOTES.

We continue below our notes on the various objects of interest.

THE SANDWICH ISLANDS EXHIBIT

contains a large number of very curious articles; but owing to the lack of necessary descriptive labels, the visitor is unapprised of their remarkable features. For instance, spread out in a glass case is a cape or tippet, which on close inspection seems to be made of bright yellow feathers. As few birds wear such intensely yellow plumage, it would naturally be supposed that the feathers are dyed. The reverse, however, is the case. The cloak is termed the kehele, and the plumes are obtained from the mamu or royal bird, under each of the wings of which a single yellow feather grows. Now in the cloak there are perhaps thousands of the feathers, and hence the number of birds which must have been killed to secure the requisite quantity must have been enormous. Add to this the fact that the birds themselves are becoming very rare, and the difficulty of producing the garment accounts for the circumstance that it is seldom found out of the possession of kings. The cape exhibited belongs to Queen Emma, and was loaned by her for display. It is about ten inches in breadth, and quite short, yet its value is about \$600. A relic of the days when human flesh was considered wholesome food is shown in a spittoon inlaid with human bones. Articles connected with the reign of the founder of the line of Kamehameha are religiously preserved, and Kamehameha the First's war clubs form a part of the exhibit. There is also a cane made of a lancewood spear which also belonged to the same doughty warrior. A fiber, little known here, called *olona*, may prove to be worthy of further experiment as a rival of hemp or even of flax. It is the inner bark of a shrub, which at the age of three years is of the right size for stripping. It can be shred into very fine threads, which are remarkably strong. A bird's nest is peculiar from the fact that it contains no vegetable or animal matter. It appears to be made of horse hair, but is made of what is called pele's hair, a form assumed sometimes by hot lava.

The highest point reached by vegetation is 12,000 feet, and at that elevation the silver sword plant grows, the flower of which is on exhibition. One large case contains the birds found on the islands. They are not named. One red bird, as large as an oriole and with a brilliant red plumage, is the bird that constructs the nests from pele's hair. Castor oil and candle nut oil is also exhibited; the latter is made from a nut bearing the above name.

The Oahu College sends a collection of land shells, containing between 800 and 900 varieties. They are all found on the island of Oahu and nowhere else in the world. Their habitat is under the mosses and lichens attached to the bark of trees. Many varieties are not found alive, and are believed to be extinct.

But few industrial products are exhibited, and native manufacturers appear to be of a very primitive nature. Cloth is made from the inner bark of the bread fruit tree by a kind of felting process; the fiber is steamed and then pounded with wooden mallets, on whose surface grooves are cut. A cloak made in this manner on the island of Tahiti, and ornamented with shells, is shown, and also several larger pieces of cloth or felt, quite thin and tough, and ornamented with floral designs.

From the Micronesian Islands there is an exhibit of beau-

tiful pink corals which are unsurpassed in beauty by any thing of the kind ever seen here. They attract great attention and the majority of them have been already sold. This variety of coral is said to be found nowhere else than on the reefs about these islands, where the natives, who are expert watermen, dive for them.

The full dress of a Caroline Island belle is shown, and consists simply of a cape about a foot broad, made of strips of cocoa bark and worn about the shoulders. A waterproof cloak of novel construction is also shown. At each knot of an ordinary fish net is tied a bunch of seaweed. This being spread over the shoulders, net side under, forms a perfect protection against wet.

The display of firewood is quite large, and includes many curious varieties. Of these the wood called *kou* is said to be the most valuable. It is similar in appearance and character to black walnut, but has a finer grain and is not so heavy. It can be turned into all shapes, and never cracks or checks, as is the case with most woods. A large number of jars are shown made from this wood and the black koa. These are used by the natives as receptacles for the food called *poa*, the staff of life among them, a farinaceous food made from a root called taro, something like a turnip. This is baked and made into a porridge. The natives do not like it until it begins to ferment.

It is said that the Exposition is not very rich in antiquities, save, perhaps, in the Chinese pottery and old Japan bronzes. To inspect some portions of

THE TUNIS DISPLAY

is to go back to the time of Abraham, at least so far as progress is concerned, for agricultural implements that were used by the patriarchs are but copied in the tools which the Tunisians still employ to till their ground. A plow is shown made of two strips of wood; one, the beam, is crossed by the other at a sharp angle, the lower portion of the latter serving for the plowshare. Its point is shod with iron. Such an implement might be used to stir up the ground, but neither lifts nor turns it. Hand rakes are shown heavy enough for horse rakes. The thresher consists of what an American farmer would call a stone boat or sled, the bottom of which is stuck full of sharp stones. This implement is dragged over the grain as it lies on the floor. With all these discouragements very fine crops of grain are raised; and samples of different cereals are shown, put up in bags. Among them are corn, an inferior yellow variety; barley, which is quite plump and bright; wheat, a quality which would rank as No. 3 in this country; three kinds of beans, white, flat brown, and a small black-eyed variety; caraway, fennel, coriander, and other similar seeds; oats are said to be raised abundantly, but none are exhibited.

An object which is a genuine antique is the mosaic representing a lion and its prey. This was found by Davis' party during his explorations of the site of ancient Carthage. It was found within the precincts of the Byrsa of Carthage, and in close proximity to the site of the Temple of Astarte, the Juno of the Phœnicians. In this vicinity there appears to have been a temple dedicated to Diana, and this lion seemed a part of the pavement of that temple. Every other representation on this vast pavement had relation either to the chase or to wild beasts. Through the ignorance of native workmen of how to handle such easily broken objects, every one was hopelessly destroyed, in the attempt at removal, but the lion, which remains in possession of the Bey. The boldness of the design and exquisite execution of the work assign it to the most flourishing period of Carthage, say 2,500 years ago. The mosaic is about eight by ten feet square, and represents a lion who has seized his prey, a horse or other animal with hoofs, from whose wound the blood is trickling. The stones of which it is composed are about half an inch square and are set in cement.

The principal Tunisian exhibits are of silk, and these are profusely ornamented with gold and silver embroidery. It is a custom among the wealthy to ornament the walls of dwellings with silk hangings above the wainscoting, which is usually of tiles. One of these silk hangings is shown, which is about thirty feet long and six feet broad. It is a pink silk, and is covered with ornaments in various colors sewn on. One case of Moorish costumes contains loose white silk garments called bournouses. The silk is of pearly whiteness, and is ornamented with gold embroidery. Bournouses of striped silk, in which gold bands are woven, are also shown.

One case shows the trousseau of a Moorish bride. The garments, which are numerous, are all of pure white silk, and are so thickly embroidered with pure gold and silver that they are oppressively heavy. These costumes are all offered for sale. There are also goods manufactured expressly for the Exhibition, scarves, opera cloaks, and shawls. One is made of silk, through which runs a stripe of rough cotton, the effect of which is quite odd.

SOME NEW COTTON AND WOOL MACHINERY

on exhibition in Machinery Hall is attracting considerable attention among manufacturers. A new English gin separates the seed without cutting the fibers of the cotton, by means of a vibrating knife, a roller, and a combined action of fixed and moving grids. At each elevation of the moving knife, the grid which is attached to the same lifts the cotton to the level of the fixed knife edge and to the exposed surface of the roller; and on the descent of the moving knife, the seeds which have become separated from the fibers are disentangled by the prongs of the moving grid passing between those of the fixed grid. The machine on exhibition is about the size of a common 60-saw gin which would require at least 5 horse power to run it; while this

takes but little over 1 horse power. The machines being automatic, one man can feed two of them, whereas on the saw gin he could feed but one. The out-turn of cotton is from 120 to 200 lbs. per hour, and the seeds are much more thoroughly cleaned. There can be no danger from fire, as it would be impossible for it to communicate with the ginned cotton, and it would be effectively quenched by the action of the machine. Regarding safety, it is impossible to get the fingers cut or jammed, as the grids push them aside and prevent accident.

There is also a double cylinder burr picker for the cleaning of wool. The wool is placed upon a feed apron, and, passing between two feed rollers, is carried by the main cylinders on to two burr cylinders acting independently of each other; passing over these, the wool (which is now evenly spread with the burrs on top) comes in contact with a fluted roll, termed a beater or clipper, which removes the burrs and deposits them in a receptacle below. The wool, which is now freed from burrs, is carried by a brush to a beater, which removes all fine dirt. The wool is then blown into a wool room perfectly cool. The inventor of this machine claims that he can clean 500 lbs. of fine or 1,000 lbs. of carpet wool per hour. This picker is manufactured by the Atlas Manufacturing Company, Newark, N. J.

CARRIAGE WHEELS AT THE CENTENNIAL EXHIBITION.

MATERIALS USED FOR MAKING WHEELS.

For making light wheels, hickory is, in America, employed almost universally for the spokes and felloes, and elm or gum wood for the hubs; for heavy wheels, oak is used for the spokes, oak or ash for felloes, and elm, gum wood, or locust for the hubs. Hickory is an indigenous American tree, and is found in all States east of the Mississippi river; but the supply has mainly been drawn from Indiana, Ohio, New England (where it is now very scarce), the Middle States, and also, more recently, from Virginia and Kentucky. The term second growth, as applied to this timber, has from improper use grown to be a misnomer; it really means a growth of timber that springs up, more or less sparsely, on ground that has once been cleared from the forest; but, to justly rate the true value of hickory, each individual tree must be judged on its own merits. It rarely happens that a first growth tree has any value for carriage work, and then simply because it has stood alone. What are known as hedgerow trees generally give the best quality of wood, and they are in their prime when from forty to sixty years old. Hickory is cut at all seasons of the year, but from early fall into the winter is the time generally preferred; and it is claimed that timber cut during this period is less liable to the attack of worms. The butt only of the tree should be used for best work, and for a distance of from six to sixteen feet from the ground, according to the quality of the tree and the place of its growth. The butt is generally cut into lengths suitable for spokes or felloes, and, if intended for spokes, it is then sawn or riven into proper sizes, from center outwardly, and around by the annular growths; while for felloes it is simply sawn into strips of suitable length. The heart of the tree generally contains what are known as the pin knots, or marks of the small twigs which grew from the trunk when very small, and this portion in most trees has a brownish color, which features make the heart wood less salable, although sometimes equal to the whiter wood in all other respects. Four grades of hickory may generally be found in the market, which embrace varieties from the very best down to that which is so poor that it is only adapted for very common classes of work. In countries where this timber is comparatively unknown, the impression prevails that "hickory is hickory," always possessing the same qualities and characteristics; but a more intimate acquaintance shows that there is as much difference between the different grades of hickory as between totally different kinds of timber, some resembling ivory or whale-bone for hardness and elasticity, while other pieces possess no more value for wheelmaking than common pine or deal. Prices vary very materially in accordance with the quality, the best grade being worth in the market from three to five times as much as the fourth grade—a point which foreign customers are beginning to learn through costly experience. The best proves the cheapest in the end. The seasoning of hickory for spokes is an important matter, concerning which there exists a diversity of opinions. The method employed by some of our best wheel manufacturers is as follows: After cutting the timber into spoke sizes, it is usually allowed to season in the open air about six months, after which it is placed in the dry room, with a temperature of about 90° Fah., which should not, under any circumstances, be allowed to exceed 100°; and it is kept in this dry room for from ten days to two weeks, according to the size of the pieces. It is then ready to turn and finish, after which it should again be placed in the dry room for a few weeks, before making up into wheels. It is customary with some wheel makers to subject their spoke stuff, after it is cut into spoke sizes, to a process of steaming without pressure, which occupies from one to two hours, the object being to fix the albumen in the wood, render it stiffer, hasten the seasoning, and prevent checking or splitting.

American oak is fully equal in all respects to the best English oak. Take, for example, the dog cart wheel exhibited by Messrs. Hoopes, Brother, & Darlington, and no oak from any country could be better. Oak grows in nearly all parts of the United States, the present supply being received mainly from the Atlantic seaboard, and from Ohio and Indiana. It is commonly cut in the same season as hickory—namely from September to February—from eight to sixteen feet of the trunk being employed, which is cut up in the same manner as hickory. A tree growing in a heavy