THE GATHERER.

Self-Watering Flower-Pots.

If it were not for the trouble of tending them, we might reasonably expect flowers and plants to be reared indoors to a far greater extent than is at present the case. The love of nature's jewels is innate, let us hope, in every human being; but most people, we are afraid, have also an inborn dislike of what they call "bother." It will, therefore, be gratifying to many to know that a species of flower-pot which waters itself has been invented, that so completely minimises the labour of tendance as to remove all cause for complaint or excuse on the score of inconvenience.


Fig. 1.

The "parlour-garden" form (Fig. 2) is made of terra-cotta, sheet metal, or other material, and in any desired shape. The upper portion is pierced with openings, and the lower contains a reservoir for water. The earthen pots are perforated with several holes and are provided with projecting collars. They fit exactly into the apertures of the cover and stand within one or two inches of the water underneath. The top of the pot has a segmental cover with openings in the centre, through which the stem of the plant protrudes. Summer's heat or the room's warmth in winter causes the water to evaporate and, the outer casings being water-tight, to condense on the sides of the flower-pot. Thereupon the earth absorbs the necessary moisture through the holes, and the rest drips back into the reservoir. The segmental covers prevent the water from evaporating from above, and should there be excessive dampness, one or more of these covers can be raised. The water constantly passes to and fro, from the reservoir to the earth, and is thus kept pure and sweet and seldom needs renewing. Flowers that are grown in these miniature winter-gardens will, it is said, remain fresh and green with very little care.

Fig. 1 represents a more ornamental design on the same principles.

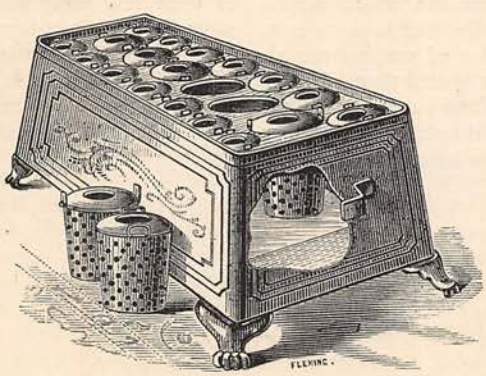


Fig. 2.

The Little Moons of Mars.

The moons which have been recently discovered circling round Mars are satellites of extremely limited dimensions, smaller indeed than any which have hitherto been discovered. The distance which separates us from that planet, 35,000,000 miles or more, renders it impossible to speak with certainty as to their size, yet it is thought that their diameter is probably about ten miles; so that could a vigorous Englishman be transplanted for a day on to one of these moons, he would walk across and round it easily during the course of the day, and even be prepared for further exercise when he had concluded his promenade. The two moons are thought to be situated at a distance of about 12,000 and 3,500 miles respectively from the surface of the planet—one making its revolution in 30¼ hours and the other in less than 8 hours. Thus an inhabitant of Mars would not only see the moon rise and disappear, but would see it rise again in the course of a single night.

Novel Application of the Screw-Press.

American inventions, if they are not always useful, are at any rate always novel; but a recently patented appliance seems to combine both features in a high degree, and ought to be found a really valuable adjunct to the stock of kitchen utensils. By its means brawn can be thoroughly pressed, fruit effectually crushed, and even sausages capitally made at home, each process being done ever so much better than by hand. The machine consists of an enamel-lined cylinder for holding the ingredients, and of a strong screw for forcing a plate (technically called the "plunger-head") down upon them. In making the last-named article, by the revolution of the screw the "meat" inside the cylinder is gradually pushed out at the nozzle into the skin, which is drawn over the mouth of the spout. This operation is considerably facilitated by the fact of the bottom of the cylinder having a uniform descent from its circumference towards the spout. When it is desired to crush fruit for jelly, &c., a tin strainer (which should have a cloth inside to prevent the egress of pulp or seeds) is placed in the cylinder, then the screw is revolved as before, and the juice escapes by the nozzle into the dish prepared for its reception. The cylinder is kept upright by a spring-bolt at the side, which acts much in the same way as the screw that adjusts a looking-glass to any required position.

By pushing the cylinder back it can be easily filled, while by tilting it forward and withdrawing the bolt, it can be taken out and cleaned or emptied of pulp, &c. Each machine has two plunger-heads—one for stuffing, the other for pressing. It is better to use the enamelled cylinder, stuffer, and plunger-plates, because they will not stain the fruit, are readily cleaned, and will not rust. The whole apparatus is made of iron, yet is as light as is compatible with the necessary amount of strength, while the screw has a power equal to that of any ordinary screw-press.

The Earth's Population.

The population of the world is rapidly increasing. In 1876 the combined populations of every nation exceeded those of the previous year by about 27,000,000; and according to recent careful computations, the number of inhabitants is 1,423,917,000, or twenty-eight persons for every square mile.

The following table shows the populations of the great divisions of the globe :—

Europe.....309,178,300	Africa 199,921,600
Asia 824,548,500	Australia..... 4,748,600
America..... 85,519,800	

Sea-water as a Beverage.

Visitors at the sea-side who out of curiosity have sipped a little of the salt water, will easily understand the intense thirst generally caused by its continuous use. This thirst is the chief torture endured by persons who have taken refuge from a foundering ship in a small boat, and find themselves without fresh water on the open ocean. Many instances are on record of men, thus exposed, being driven mad by resorting to sea-water to quench their intolerable craving for something to drink : and in works of fiction this great horror of shipwreck has been frequently depicted. Yet it appears that upon some of the coral islands of the Pacific Ocean there exists a race of men who actually use sea-water as their daily beverage! These islands are situated at an immense distance from the mainland, surrounded by the boundless ocean ; they are of small size, and being elevated only very slightly above the level of the waves, and without vegetation except a few cocoa-nut trees, contain no streams or springs of fresh water. If wells are sunk they yield a brackish liquid, little differing from that of the ocean. The inhabitants are therefore obliged to drink from the sea, and they do so constantly without ill effect. So extraordinary a circumstance has caused much conjecture as to whether these men are constitutionally different in some manner from others ; or whether they have gradually accustomed themselves to its use at times when cocoa-nuts were scarce, and the milk that they afford unavailable. Perhaps the ability arises from both causes, since now and then instances have been known of sailors drinking from the sea on board ship, at first from partial necessity and afterwards without hesitation, while their companions could not touch it. So that it would seem to require a peculiarity in the constitution, developed by exercise. In one case, a sailor who drank sea-water found his complexion become yellow. The human body appears capable of accommodating itself by degrees to the most poisonous substances : even corrosive sublimate is stated to have been taken safely by some persons. The particular places where these sea-water drinkers are found are the Paumoton Islands, and Easter Island, in the Pacific.

Some Busy Workers Underground.

It is not generally known to what extent we are indebted to worms for the productiveness of our gardens and fields. It has been found, by a series of experiments carried out by a German naturalist, that the tunnels made by worms into the earth are frequently of much service to plants whose roots occupy the channels that have thus been made. The mould of our gardens, and fields too, is improved to an almost inconceivable extent by the burrowings of this humble insect. Each worm in less than a week passes through its body its own weight in mould, and the soil thus produced is fine and light, and extremely helpful to the growth of plants. When it is remembered that there are in every acre some 34,000 worms, and that in addition to forming every day about 37 lbs. of fine mould, they open up the subsoil and render it fertile, we shall gain some slight conception of our indebtedness to these apparently insignificant and generally unthought-of little workers.

Some Effects of Gaslight.

Though you will occasionally meet with people who of their own free will have a decided predilection in favour of paraffin or other oil-lamps, it can scarcely be doubted that for all household requirements—in kitchen or drawing-room, bed-room or study—gas is the best means of illumination. It may be true of the coal-derived vapour that, like fire, it is a good servant and a bad master, but ordinary care and common sense ought to prevent it from ever gaining the upper hand. However, leaving the general subject, let us say a few words about the interesting question of the influence of gaslight upon persons reading or working by its means.

Eminent oculists tell us that experience and experiments both show that when the eyes are protected from the direct action of the bright flame, no injurious results follow. Globes of ground and milk-like glass and shades will serve the purpose of protection, but those of clear glass should certainly not be used, for the obvious reason that they do not intercept the flame. The entirely dark tin shades are said to be absolutely hurtful, because they keep the eye in total darkness and make it look upon a glaring strongly-lit surface, which dazzles and irritates the eye. The main point to be borne in mind is that the flame ought to be broken up and the light equally diffused.

Another important fact in connection with gaslight has reference to its heat. The burner should be kept at a good distance from the head, as the radiant heat is apt to cause headache and even, in some instances, congestion of the brain. Where several persons use the same flame the source of light has to be raised, and there is then less likelihood of danger from the radiant heat, but assurance will be made amply sure by the use of a funnel-shaped globe of milky glass, closed beneath with a plate of the same material, which will scatter the downward rays and deprive them of their intensity. By this means, also, currents of air are prevented from causing the flame to flicker, and a steady light is thus secured. Where the eyes are particularly sensitive, a chimney of a deep blue colour may be used with advantage.

Double Acrostic.

THE WHOLE.

Two opposites—the first as light as air,
Quite immaterial; the second, *au contraire*,
Matter without a soul, that makes the vulgar stare
Since 'tis oft moved to act with delicacy rare.

I.

For something common, this the learned name.
That hath in light and cleanliness a part;
No house without its most benignant aid
Can either be endurable or smart.

II.

A town whose country is, if we may take
Poetic licence, apt on any day
To hungry Englishmen to fall a prey.

III.

A weapon in disuse, that yet might be
A lover that no dame would care to see.

IV.

What we object to when our wish it crosses;
Yet we all wish to see it joined with losses.

V.

It may be cattle, it may be men;
Try till you find out again and again.

VI.

'Tis everywhere where you can find
Spectators, if you are inclined
Before the world to stand.

VII.

What, though we separate and set aside, yet we,
If we add "s," ne'er out of wish to be.

VIII.

The title of a nobleman,
Which if you add a letter to, 'twill make
Another title that men often take.

IX.

A piece of money, 'tis not of much worth,
Used in the European portion of the earth.

J. G.

A Vegetable Hercules

No one who has seen a tree strike its root through a stone wall, or displace by the mere action of its growth the most solid masonry, can doubt the extraordinary power which vegetable life, in its higher forms at least, can at times exert. But that a simple fruit, the slender stem of which is too feeble to bear it, and therefore acts as a mere feeder or conduit pipe to convey nourishment, should be capable of developing an energy many times greater than that of any animal of equal size, is even more remarkable. The pumpkin, the water-melon, and the gourd are, it appears, reservoirs of unsuspected strength, actually as well as relatively greater than that of the most muscular of the mammalia.

The curious experiment on the growing force of a pumpkin, carried out by Mr. W. S. Clark, president of the Massachusetts College of Agriculture, in his own garden, resulted, as will be seen, in a complete victory for the vegetable combatant. The fruit, a fine young specimen of the pumpkin tribe, twenty-two inches in circumference, was fitted with a sort of oval mask or crown of bent iron bars, surmounted by a long bar of iron acting as a lever, and at the opposite extremity of which a weighing apparatus registered the various weights which were to be applied to the pumpkin. Care was taken that the monstrous fruit should have fair play. The slim stalk, lying on the earth like a soft green rope, was kept free of all pressure, which would prevent the healthy flow of nourishing sap. And in this respect the pumpkin was better treated than many a starving human victim of our English *peine forte et dure*, some century and a half ago.

The Pumpkin in the Iron Mask got, after all, the best of the battle. On the 15th of August, 1876, the experiment had commenced. By the 31st of the month, the growing gourd supported the almost incredible weight of two tons and a half. On the ensuing morning it was found that the vegetable tissue had forced itself between the bars and round the mask, that the apparatus was dislocated, and the balance out of gear. There then, of course, was an end of the trial.

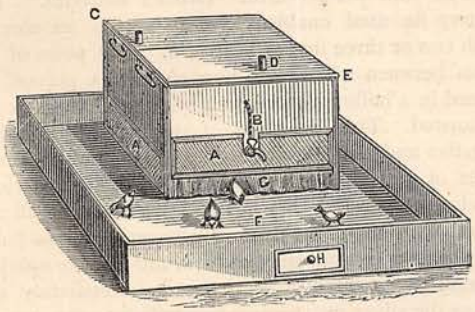
To estimate the extraordinary power which the vegetable victor in expanding put forth, we must compare its exploit with other developments of force. To lift a hundredweight in each hand is quite enough for any but the strongest man. A troop-horse of heavy cavalry carries about 250 pounds of dead weight. In the East, a fair camel-load is 1,000 pounds, the dromedary bearing but half as much, and the elephant from 600 to 900 pounds. Five camels, then, would be required to bear the load which pressed so lightly on the elastic energies of a pumpkin.

Answer to Hidden Quotation on p. 125.

"A rose by any other name would smell as sweet."
Shakespeare.

Rearing Chickens by Water.

One reason why our Gallic neighbours have left us far behind in rearing chickens, is that they have not hesitated to avail themselves of several mechanical appliances for hatching, which have made them independent of the services of those capricious sitters, the brood hens. We are, however, becoming alive to the value of this method of obtaining chicks at all seasons, and an appliance known as the Hydro-Incubator has been already used with considerable success. Moreover, we have gone a step farther than this.



An ingenious inventor, Mr. T. Christy, jun., F.L.S., has patented an artificial mother, who, without sense or sensibility, rears the chickens that have been artificially hatched. Surely the only thing now wanted is a machine for laying the eggs.

Singular to say, these chickens, who have never known a mother's tender care, grow up strong, healthy birds, and—so far as we have been able to ascertain—decent members of gallinaceous society. We publish a portrait of the Hydro-Rearing Mother (for such is her name), and we shall now give a brief description of her person. In other words, the chicks are reared—to put it broadly—by hot water, and this is how it is done :—

F is an enclosure or tray, in which the "mother" C E is placed. Before putting her in position, care must be taken to lay down for her a bed of soft hay or straw. The mother is heated by pouring in at D water raised to a temperature of 170 to 175 degrees, which is to be maintained by supplying boiling water twice a day, say ten or twelve quarts each time, or more if necessary. As soon as the chicks are hatched they may be put under the mother by lifting the curtain G. They will dry, and in a few hours come out in search of food, which should be ready for them in a feeding-trough. The perforated metal slides A are used to keep the chicks under the mother, but they should always be raised during the night; for the youngsters, in the event of feeling cramped for space or too warm, should be able to go outside into the fresh air. After three or four days the chicks may be accustomed to the open air, for a short time at first, but gradually for longer periods, until they can bear complete liberty. As they grow up, the apparatus must be raised periodically by means of wedges. When the Hydro-Rearing Mother is done with, all the water should be drawn off at B, and it should be turned upside-down until again required.

The New French Military Map.

Our own excellent ordnance maps, hitherto surpassed only by the results of those costly surveys of the Rocky Mountains and western territories of which the Americans are so justly proud, seem likely to be outshone by the new map—or rather set of maps—which has recently been undertaken at the expense of the French Government. France, when the late disastrous war began, was poorly provided with maps of a handy size, which a mounted aide-de-camp or infantry captain could carry in his pocket. So great was this want that, at the outset of the campaign, French columns repeatedly lost their bearings on a French road, and staff officers were reduced to the humiliating necessity of asking their way, like so many mediæval pilgrims, from one village to another.

It takes much time, and infinite pains and patience, to produce a really good map ; and the French military engineers, or *génie*, as our neighbours style the branch, have travelled, sketched, and surveyed, have plied rule and compasses, and have called the photographer to their aid, before they could get ready the fine map of France, of which the first four sheets, or about one quarter, have now been published. Had it been brought out entire, its size, about eight feet by six feet six inches, would have rendered it very unwieldy and cumbersome ; but as it is, the fifteen divisions, with an extra leaf for useful indications as to marks, measurements, and foreign mileage as compared with French, will occupy but moderate space.

Geologically, M. Elie de Beaumont, a great authority on this point, has served as a pioneer to the new chart. The gigantic mural maps of the French staff corps, one of which is on the colossal scale of one to eighty thousand, have also been made available, so far as plane drawing is concerned. The exact condition of the earth's surface, with hill, table-land, mountain, valley, and watercourse, will be depicted with almost the fidelity of an embossed plan. Many colours are employed, and as each colour entails fresh printing, a great deal of delay has been thereby occasioned. Town, city, village, and hamlet are printed in black ; black, too, are the highways and cross-roads, the border-lines, and the limits of departments. Woods and forests are green. Land, arable and pasture, is painted brown, while rivers and canals are blue.

The new military map is on the handsome scale of one five hundred thousandth of the surface portrayed. It deals with France, reckoning from Utrecht, in Holland, to the mouth of the Spanish Ebro, and from Frankfort on the east to the lonely isle of Ouessant in the west. The same minute care to omit no important detail which characterises the purely French portion of the map, belongs likewise to that part of it which refers to districts beyond the frontier. And, in fact, a pedestrian in Switzerland, or a tourist in the Belgian Ardennes, might find his way from place to place with the assistance of the new French map.

Safety at Sea.

A new method of lowering boats at sea on a sudden emergency has been planned by Mr. Godfrey Laurence. The advantage this invention has over others of a similar nature, is the immunity which it insures against risk of collision between the lowered boat and the hull of the rolling ship. Each extreme of the curved davits is fitted with a head resembling that of a bird, and the davits themselves are hinged at the lower ends to the side of the vessel. The heads have protruding and fixed upper jaws, the lower jaws working on a pin at the base. A clever contrivance provides for the free motion of these heads, at the time when they are required to release their grip, and also for their firmness when they are required to hold fast. There is a very compact winch (the invention of the late Mr. Douglas) fixed on the deck between the standards, and to this winch the chains used for working the boat and davits lead. A powerful break controls the winch. The operation of lowering the boat at any angle of the ship is in this way performed with wonderful rapidity, certainty, and ease. This is yet another of the many clever inventions which, when brought into common use, will provide us with additional safety in travelling by water.

Electro-plating Extraordinary.

There are few of the applications of practical science which have been more generally and unobtrusively beneficial than that of electro-plating. A new art immediately sprang up when it was invented. All the ornamentation and cleanliness of gold and silver became the property of the nation at large, instead of being monopolised by a few. The young housewife could pride herself, if not on silver, yet on silver-*plated* articles. But useful and efficient though the present process of electro-plating has been, it is threatened with speedy extinction. It is not unaccompanied with danger to the operators, whilst the new process promises so far to be innocuous. Many of our readers are aware that goods intended to be silver-plated are immersed in a bath, wherein the metal to be deposited is in a state of solution. An electric current is now passed through the solution, which causes the dissolved silver to be precipitated. The degree of silver-plating can thus be carried on to any relative thickness. When the object thus coated is taken from the solution, the new metallic surface has to be burnished. It is evident, therefore, that effective though the process now in use may be, it is somewhat tedious and trying.

Within the last few weeks an entirely new method has been discovered—a method which may be said to be the first practical application of scientific research. It has been known for some time (thanks to that wonderful instrument the spectroscope, which enables us to tell what is going on and what is present in the most distant star) that most, if not all the metals we are acquainted with on the earth, such as iron, copper, &c., exist in the sun in the state of metallic vapour. This is owing to the intense heat which prevails on that luminary. Now vapours of any kind can be condensed when they come into contact with a cold surface, just as we know the vapour of water is on a pane of glass on a cold night. Reasoning thus, Professor Wright, of Yale College, has found it possible first to volatilise all kinds of metals—gold, silver, copper, iron, &c.—by the intense heat given out from an induction-coil in connection with the powerful "Grove's batteries." The battery he used enabled him to obtain an electric flash two or three inches in length. The poles of the wires between which this powerful spark played, are placed in a hollow vessel from which the air is nearly exhausted. The two poles of the battery are called negative and positive, and to the negative pole a small piece of metal, say silver, is attached. The article to be electro-plated on this new system (we will call it a sheet of glass) is suspended between the two poles. The battery is now set to work, the electric spark is generated, its intense heat almost immediately dissolves the silver on the negative pole into the state of metallic vapour. This vapour fills the whole of the vessel as air would, but is condensed immediately it comes into contact with the surface of the suspended glass, and leaves thereon a most beautiful uniform coating of silver. The process of volatilisation can be witnessed, and the spectroscope shows that the silver is actually in a state of vapour. Of course, if there be metallic vapour enough, there is no limit to the number of articles which could be so placed in the vessel as to have a coating of silver deposited upon them. Gold, or copper, or iron may be vapourised, and then deposited on any object, in exactly the same way. We think that this speedy and effective method cannot fail to be soon utilised in the arts. Professor Wright has already proved that he can produce the most resplendent mirrors from quite a number of metals. The metallic film can be deposited to any degree of thickness, from one-fourth the wave-length of a red ray of light, or something under the one-millionth part of an inch, upwards. Metallic *colours* can also be obtained by this process; for it is well known that, owing to the power of absorption and reflection of light differing with their degrees of thickness when spread out in films, metals are capable of producing the effects of various tints and colours. There can be little doubt that Professor Wright's discovery will prove of service to those engaged in the careful and exact study of physics, by providing them with another method of investigation. The simplicity of the process, and the light it throws on the highly heated condition in which the incandescent atmospheres of our sun and the "fixed stars" must be, are most interesting. We expect before long to see practical results from it, both scientific and commercial.