A Prevalent Popular Error.

By the burning of a Chinese wash house in San Francisco a short time since, eleven of the occupants who were asleep in bed lost their lives. The account published in the newspapers described them as exhibiting, by the positions in which their bodies were found, the agony they suffered from the fire. As editors and reporters are considered to possess more than an average amount of intelligence and information, it appears singular that they should propagate or perpetuate such an error. It may be safely asserted as a general rule that persons who lose their lives while sleeping in burning buildings, are suffocated and die painlessly without waking, and before the flames had reached their bodies. The merest tyro knows what would be the effect of going to bed with a pan of burning charcoal in the room, or the effect of blowing out the gas instead of turning it off. An individual going to sleep under such circumstances inhales the impure air, which acts as an anæsthetic and rapidly converts the natural sleep into stupor and coma, from which there is no waking. Persons sleeping in a house which takes fire are smothered in this way by the carboniferous gas long before the fire reaches them. Their bodies or remains are found—not in the halls or stairways where they would have been had they awakened and attempted to escape—but in bed, or in the spot which the bed had occupied, and in the very position in which they had been lying asleep. The exceptions are mostly noticeable, as when persons are seen to make attempts to escape. There is something so horrible in the idea of being burned to death that it were well for the community not to suffer needlessly from sympathy for the victims. To the relatives of persons who lose their lives in burning houses, particularly to parents whose children may die in this way, it may save a lifetime of grief to know that death entered the chamber quietly and performed his task without so much as disturbing the slumbers of his victim.—*Pacific Med. and Surg. Journal.*

NEW USES FOR OLD TIN CANS.

BY A. W. ROBERTS.

I give below the result of an extended experience in the utilization of tin cans, such as are used by the million by

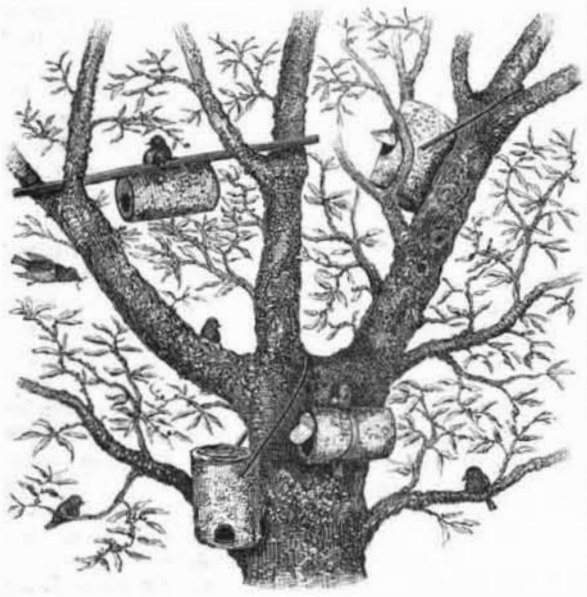

Fig. 1.—Bird-houses made from Old Cans.

packers of fruits and other articles. These cans, after serving their original purpose, are usually thrown into obscure corners, battered and rusty, a nuisance to every one.

By the method given below these troublesome articles are made useful and even ornamental, such articles as flower-pots, hanging baskets, bird-houses, etc., being produced from them with little trouble or expense.

The cans were prepared in the following manner: Procuring a large dishpan, as much asphalt was melted in it as it would hold with safety. Into the boiling asphalt the cans were dipped; as each can was taken out it was rolled in dry sand, to give it a natural ground color; without the sand the effect of the black asphalt coating would be somber and out of keeping with the color of the surroundings. To give some of these bird-houses a still more picturesque effect they were rolled in the ordinary dry packing moss used by florists and wood mosses; also short dry twigs, small cones, and burrs were fastened on the cans. In this way very nice effects of color were produced. It is a well known fact that birds avoid brilliant or artificial colors; for this reason greens, grays, browns, and neutral tints are best for bird-houses. Where cans had been opened so that the top piece was still attached by a small piece of metal, it was bent down so as to form a rest for the birds when feeding their young, or a porch or rain screen over the entrance. All these little points when carried out gave character, variety of form, and completeness. The different ways of fastening and suspending the bird-houses are shown in Fig. 1. I sometimes fastened branches of vines over the birdhouses to more thoroughly obscure them.

A glue-pot, a grater, a fruit gatherer, and a bailer, shown respectively in Figs. 2, 3, 4, and 5. The glue-pot, Fig. 2, was made in the following manner: Selecting an empty two pound can, enough tin was cut away to admit of an empty one pound can. This inner can projected one inch above the top of the one pound can, and was held in position by four wooden pegs, which were slightly tapering, so as to bind. Holes were made in the shoulders of the cans, through which wire bails were fastened.

Fig. 3, a bread grater, is so simple that it hardly needs

Fig. 2.—Glue Pot.

Fig. 3.—Bread Grater.

Fig. 4.—Fruit Gatherer.

describing. Out of a piece of one inch board a holder was shaped on which a perforated piece of tin was fastened. This piece of tin consists of a side of a fruit can flattened out. Tines were then drawn diagonally over it for guides when punching in the holes. The tin was laid on a piece of wood, in which a hole had been made of the exact depth required for the uniform projection of the burred cutters of the grater. The tin was then nailed to one side of the holder and bent over in as perfect a curve as possible to the other side, when it was again fastened.

Fig. 4, a peach gatherer, was made by attaching a circular piece of board to the end of a long pole and fastening to this a can. Inside of the can there was a bag to receive the fruit without bruising. The bag was sewn inside of the can through a circle of small perforations. The rim of the tin was sharpened, so that when pressed against the stem of the fruit it would cut through it.

Fig. 5 shows a liquid measure or a water bailer. A hole is made in a can two inches below the edge; through this hole a handle is inserted which presses against the opposite side and is secured with a nail or screw.

Fig. 6 represents a fruit can converted into a respectable looking flower-pot. The can to be operated on was first dipped in the hot asphalt. A piece of well-seasoned white birch bark was cut out of the same height as the can and sufficiently long to reach around it. This piece of bark was so shaped that it flared out from the bottom of the can, leaving considerable space between the can and the bark. This space was filled in with hot asphalt. For ornamentation of the pots burrs of the liquid amber, black alder, and acorns were used. A hole must always be made in the bottom of the pots for the drainage of surplus water.

Fig. 7 is a hanging pot, planted with ferns. This was also covered with white birch bark, fastened on the straight sides of the can with asphalt. Three wires, by which it was suspended, were fastened to the rim of the can. In using cans for flower-pots or hanging baskets care should be taken to thoroughly coat the insides and outsides with the asphalt; this secures the tin from rusting.

Fig. 5.—Bailer.

Fig. 8, a hanging log, was made by partially telescoping two cans together, after the opened end had been entirely removed. A section of the side of each can was cut out, to leave an opening for the reception of the soil and plants. The cans were then heavily coated with asphalt, particularly where the cans joined, so as to strengthen the joint. Barks of chestnut and oak trees were used for covering the cans.

Fig. 6.—Flower-pot.

Fig. 9 is a standard for plants and flowering bulbs. Having secured an old center-table, two cheese-boxes of different sizes were placed one on top of the other, the smaller one on top. Around the side of the lower box fruit can flower-pots were ranged, above these ranged another circle of pots, which stood on top of the largest cheese-box and against the side of the smaller one. On top of the smallest box more pots were placed, so that but little of the cheese boxes could be seen. All the pots were ornamented with burrs, cones, lichens, or barks. The spaces left between the boxes were filled in with wood mosses. Around the rim of the table was nailed hooping from a flower barrel. The inner angle formed by the hooping and the top of the table was patched with putty. Over the entire top of the table, the hooping, and the putty, hot asphalt was applied with a brush. This rendered the top of the table watertight, so that when watering the plants water could not run on to the floor. A hole bored through the top of the table afforded an escape for surplus water. The cheese boxes were coated inside and outside with asphalt, to prevent them from warping. The open space between the first circle of pots and the rim of the table was filled in with earth, on top of which moss was built up to the first circle of pots. The plants used were tradescantia, German ivy, English ivy, vincas, saxifraga, hyacinths, and calla lily.

Fig. 10 shows the complete plant standard. In hanging baskets, pots, and standards, where the plants are planted closely together and in a comparatively small bulk of soil, they require frequent watering and occasional applications of liquid manure. Our fowls provide us with a very fair article of "domestic guano," from which we make good liquid manure of sufficient strength by mixing one shovelful to a barrel of water. Still there is danger in a too generous use of liquid manure; if too strong or too frequently used the tender roots of the plants are injured and the leaves begin to fall.

Fig. 11 is a fern rockery for table or Wardian case. For the rockwork the most picturesque of rocks in form and color were selected. The rocks were fastened together with plaster of Paris, which was mixed with dry colors, grays and browns predominating. As fast as the plaster was applied sand was thrown on it. The effect of the coloring and sanding of the plaster was to destroy its whity glaring look, and to harmonize it with the general colors of the rock work. The cans used for the flower-pots were first wrapped in wet paper, to increase them in size, before applying the

Fig. 7.—Hanging Flower-pot.

plaster against them when building up the rock work. In a few hours the paper wrappings had so dried that the pots were easily withdrawn, after which the paper was removed and the pots put back in their places.

Fig. 12 is a vase for dried grasses and autumn leaves, which was constructed as follows: To the top of a broken-off lamp standard of glass was fastened a fruit can that had been previously dipped in asphalt. The outside of the can was then carefully covered with selected lichens and tufts of "sealing wax moss." Shells and parts of pine cones were used for ornamentation.

Weighing an Elephant without Scales.

An Indian writer relates an interesting anecdote concerning Shajee, the father of the first ruling prince of the Mahrattas of Hindostan, who lived at about the beginning of the seventeenth century. On one occasion a certain high official made a vow that he would distribute to the poor the weight of his own elephant in silver money; but the great difficulty that at first presented itself was the mode of ascertaining what this weight really was; and all the learned and clever men of the court seem to have endeavored in vain to construct a machine of sufficient power to weigh the elephant. At length, continues *Little Folks*, it is said that Shajee came forward, and suggested a plan, which was simple, and yet ingenious in the highest degree. He caused the unwieldy animal to be conducted along a stage, specially made for the purpose by the water-side, into a flat-bottomed boat; and then, having marked on the boat the height to which the water reached after the elephant had weighed it down, the latter was taken out, and stones substituted in sufficient quantity to load the boat to the same line. The stones were then taken to the scales, and thus, to the amazement of the court, was ascertained the true weight of the elephant.

The Use of Asphalt and Mineral Bitumen in Engineering Works.*

Adopting the nomenclature of M. Léon Malo, which had received general sanction, the author considered asphalt as

Fig. 8.—Hanging Log.

a combination of carbonate of lime and mineral bitumen produced by natural agency. Asphaltic mastic was the rock ground to powder, and mixed with a certain proportion of bitumen. Gritted asphalt mastic was asphalt mastic to which clean sharp sand had been added. Asphaltic or bituminous concrete was gritted asphalt mastic mixed when hot with dry flint or other stone. Boussingault's analysis of bitumen gave $C_{85}H_{12}O_3$. It was, therefore, an oxygenated hydrocarburet, and quite distinct from the preparations of gas tar and pitch which were sometimes erroneously styled bitumens and asphalts. It was important that these distinctions should be borne in mind when specifying asphalte, as their disregard might lead to the employment of a material having few of the properties of the natural rock, although bearing to the uninitiated a strong resemblance thereto. Messrs. Hervé Mangon and Durand-Claye, of the Ecole des Ponts et Chaussées, Paris, had supplied the author with detailed analyses of different kinds of natural asphalts, which were given in the paper, and specimens were exhibited. But beyond knowing the numerical value of the proportionate constituents, it was highly necessary that the engineer should be acquainted with their quality.

Asphalts which gave almost identical analyses might in practice yield widely different results, if the nature of the individual components was dissimilar. Powdered limestone should be white, and soft to the touch; if rough, it probably contained iron pyrites, silicates, crystals, etc. The presence of these substances was prejudicial, and if suspected the limestone should be subjected to a secondary analysis, directions for which were given. The proportion of bitumen to limestone in the natural asphalt should not exceed 10 per cent for carriage ways; indeed, less than that was preferable. For this latter purpose no asphalt should be specified which had not stood the test of at least three hot summers and three cold winters. These precautions being taken, the author was of opinion that a well laid surface of compressed asphalt, 2 inches to 2⅝ inches thick, on a foundation of

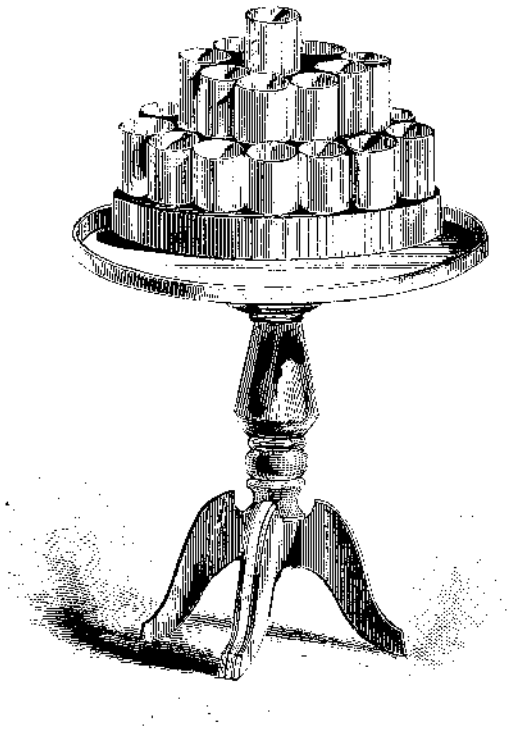

Fig. 9.—Plant Standard, empty.

Portland cement concrete, 6 inches to 9 inches thick, was superior to all other carriage ways. It was noiseless; hygienic, being impervious to urine and the liquids from dung; absorbed vibration; produced neither dust nor mud; was cheap, durable, and easily repaired, and the old materials could be used again. The charge of slipperiness which had been made against asphalt roadways in London was not due to the material, but to the absence of provisions for proper scavenging. In Paris, where the asphalt was regularly scraped, washed, and swept, the complaint did not arise. In support of the assertion that climate did not affect the asphalt in London, a table of humidity was given, showing the means of six years' (1873–8) observations to be: for Paris, 80·2; for London, 81·5. The cost of washing the roadways, when done systematically and on a large scale, was much less than was generally supposed, and the advantages far more than counterbalanced the expense. The author submitted a design for a portable washing and sweeping machine for use in London. Reference was made to the cost of compressed asphalt carriage ways. In Paris this amounted on the average to about 13*s.* per square yard on lime concrete 4 inches thick, but a thickness of 6 inches to 9 inches of Portland cement concrete was much preferable. The cost of transport of the material also exercised an important influence on the ultimate expense. Details were given of various works of asphalt paving carried out by the author, with particulars of the cost of maintenance.

The quality of absorbing vibration, which was a marked characteristic of asphalt roadways, had been taken advantage of in the application of the material for the foundations of machinery running at high speeds. This was instanced in the case of a Carr's disintegrator, which, being mounted in a pit lined with bituminous concrete, was worked at 500

Fig. 10.—Plant Standard, filled.

revolutions per minute, without sensible tremor, whereas with the former wooden mountings on an ordinary concrete base, the vibration was excessive, and extended over a radius of 25 yards. In the Paris Exhibition of 1878 there was shown a block of bituminous concrete, weighing 45 tons, forming the foundation of a Carr's disintegrator used as a flour mill, and making 1,400 revolutions a minute, a speed which would have been impracticable on an ordinary foundation. Extensive applications of the material for this purpose obtained in France, especially in connection with steam engines and steam hammers.

Another use of asphalt was for the flooring of powder magazines, where its non-spark emitting character made it particularly valuable. It was also largely applied in France, in the form of gritted mastic, for the flooring of casemates in fortifications, and in its pure liquid form for the coating of vaults and arches, where it protected the masonry from damp, and the subsequent disintegration caused by infiltration and by frost.

In conclusion, the author referred to the imitation asphalt occasionally brought forward, and by some regarded with favor on the score of cheapness. The best of these, if properly made, was as dear as the natural material, without in any degree possessing its special qualities of appearance and durability; and in no case were any of them suited as paving materials to resist heavy traffic. In Paris the tricks of irresponsible paving contractors were many, and necessitated constant vigilance. Inferior cement was put into casks bearing established brands, and the concrete made with such cement was put down in thinner layers than was paid for. The author had even known cases where the concrete was omitted altogether, a layer of common mortar taking its place. Such foundations would insure the failure of the best asphalt, which ought to be considered only as a wearing surface or armor to the concrete. But the mode most difficult of detection was the ostentatious display, at the site of the works, of cakes of the particular asphalt specified, while an inferior material was in the boilers. Once laid, wear alone would reveal what had taken place. From these

Fig. 11.—Rockery.

malpractices asphalt had occasionally suffered unmerited condemnation, but the author claimed that with *bona fide* materials and workmanship satisfactory results could always be obtained.

* From a paper by Mr. W. H. Delano, lately read before the Institution of Civil Engineers,

Imitating Watermarks in Paper.

The following method for imitating watermarks is published in a number of the *Obsor Graphitscheski Iskustvo*, which is particularly suitable for designs, etc., in half tones. A plate glass plate, with the edges previously ground, is polished with talc, and the ground edges covered with weak albumen, then coated with collodion; afterward a solution of gelatine, lump sugar, and bichromate is poured on, so as to cover it equally to the thickness of one and one-half mills. When dry, detach, and expose under a negative in the sun.

In the meantime cover a polished zinc plate sparingly with a solution of gelatine in acetic acid containing a grain or two of chrome alum; after drying well, wash in hot water and stand up to drain. Now take the exposed gelatine, dip it into alcohol, and, while wet, squeegee it on to the moist surface of the zinc plate; in a quarter of an hour it is ready to develop and harden, the same as for pigment work. When the relief is thoroughly dry, it is only necessary to lay a sheet of fine paper over it, and pass it through a rolling press, to obtain an exact *facsimile* of the negative.

Our Berlin contemporary for October last contains an example of a similar method to the above executed by Messrs. Werner & Schuman, who have patented the process in Germany under the name of photo-diaphanie.

Herr Meyer has hit upon a plan for producing such watermarks, which is novel in the extreme, and at the same time very simple. A print of the required design, either from a typo-block or an India-rubber stamp, is pulled in a very sticky ink on a sheet of glazed wave paper; over this strew some fine silver sand, and let it dry for a short time, then brush off the superfluous sand, and place a damp sheet of evenly gummed paper carefully over it, and place between the leaves of a letter copying book to dry under pressure. The matrix so obtained can be used on either side, so that if it is placed between two sheets of paper, and the whole run through a rolling press, it will give two very good imitation watermarks. This, of course, has the drawback that

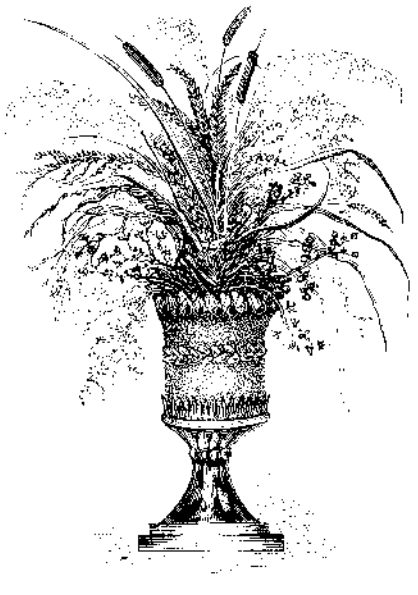

Fig. 12.—Vase.

it is only suited for line work, but, as Herr Meyer justly remarks, it can be used for a variety of purposes, such as drafts, checks, etc.; or any one furnished with a *facsimile* done in the above manner could use it for indorsing bills, etc., by merely passing the same, together with the *facsimile*, through a lithographic or rolling press.