MARTINEAU, Harriet. 1851. “The Magic Troughs at Birmingham”. *Household Words* 4 (83), 25 de octubre: 113-117.

never shall acquire, the means. I have neither the virtue nor the industry. I tell you, I am utterly good for nothing. I am a rascal—a scoundrel, and a despicable knave. I played for a large sum—meaning to take it if I won it—and not being able to pay, I lost it—and *that*, I have still sense of honour enough left to call a rascally proceeding Now there is one way, and one way only, of cancelling all this in the eye of the world. When a man destroys himself, the world is sorry for him—half inclined to forgive him—to say the least of it, absolves his family. But—if he turn tail—and sneak away to America, and has so little sense"—he went on, passionately and earnestly—"of all that is noble, and faithful, and honourable, that he can bear to drag on a disgraced, contemptible existence, like a mean, pitiful, cowardly, selfish wretch, as he is—why, then—then—he is utterly blasted, and blackened over with infamy! Nobody feels for him, nobody pities him—the world speaks out, and curses the rascal as heartily as he deserves—and all his family perish with him. Now, Ella, choose which you will."

"I choose America," she said, with firmness.

"And how am I to get to America? and how am I to live there when I am there? To be sure, there are your mother's diamonds," he added.

"Those are included in the bill of sale. Did you not say so?" she asked.

"Well, perhaps I did. But if a man is to live, he must have something to live upon. If he is to take flight, he must have wings to fly with."

"I will provide both."

"You will?"

"I am of age. What I have—which was not your gift—is at least my own. Lionel has been generous; I have the means to pay your passage."

"Aye, aye—Lionel! But afterwards, how am I to live? He will not like—no man would like—to have to maintain a wife's father, and that man a defaulter too. You should think of that, Ella."

"I do! I will never ask him."

"Then who is to maintain me? I tell you, I shall never manage to do it myself."

"I will."

"My poor child!" he cried—one short touch of nature had reached him at last—"what are you talking of?"

"I hope, and believe, that I shall be able to do it."

"I stood with my household gods shattered around me," is the energetic expression of that erring man, who had brought the fell catastrophe upon himself.

And so stood Ella now—in the centre of her own sitting-room, like some noble figure of ruin and despair; yet with a light, the light divine, kindling in an eye cast upward.

Yes! all her household gods—all the idols she had too dearly loved and cherished, were shattered around her, and she felt that she stood alone, to confront the dreadful fate which had involved all she loved.

What a spectacle presented itself to her imagination, as drearily she looked round! On one side, defaced and disfigured, soiled, degraded, was the once beautiful and animated figure of her father,—the man so brilliant, and to her so splendid a specimen of what human nature, in the full affluence of nature's finest gifts, might be. Upon another side her lover!—her husband! who was to have been her heart's best treasure! who never was to be hers now. No! upon that her high spirit had at once resolved; never. Impoverished, and degraded, as she felt herself to be, never would she be Lionel's wife. The name which would, in a few hours' time, be blackened by irremediable dishonour, should never be linked to his. One swell of tender feeling, and it was over! All that is wrong, and all that is right, in woman's pride, had risen in arms at once against this.

The last figure that presented itself, was that of her delicate and gentle sister. But here there was comfort. Clementina was of a most frail and susceptible temperament, and eminently formed to suffer severely from adverse external circumstances; but she had a true and faithful heart; and if to Ella she would be obliged to cling for support, she would give consolation in return.

Ella looked upward—she looked up to God!

That holy name was not a stranger to her lips. It had been once, until the child of charity had taught the rich man's daughter some little knowledge of it. But such ideas had never been thoroughly realised by her mind; and now, when in the extremity of her destitution, she looked up—when, "Out of the depths she cried unto Him,"—alas! He seemed so far, far off, and her distresses were so terribly near!

Yet even then, imperfect as all was, a beginning was made. The thick darkness of her soul seemed a little broken,—communion with the better and higher world was at least begun. There was a light—dim and shadowy—but still a light. There was a strength, vacillating and uncertain, but still a strength, coming over her soul.

THE MAGIC TROUGHS AT BIRMINGHAM.

On the 7th of next May, it will be twenty years since the largest meeting ever held in our island was assembled at Newhall Hill, Birmingham. At the bottom of the hill were the hustings, whence it was declared that the Reform Bill should become the law of the land; and from every part of the slope, from tens of thousands of voices, came the solemn chant of the Union Hymn, and the words of the oath, singly spoken, by every man present,

to devote himself and his children to the great cause. There is no room now for such a meeting on Newhall Hill. Within these twenty years, buildings have sprung up, over nearly the whole surface; and the roaring of the furnace and the din of the hammer are heard where the hymn and the solemn oath resounded in a less peaceful time.

Among those buildings, at the bottom of the hill, are the large premises of Messrs. Elkington, Mason, and Co.—the firm celebrated for their electro-gilding and plating. They have actually enclosed the canal within their premises—built over it—and their workshops are still extending. There may be seen nearly four hundred men and boys employed, diligently and constantly, upon work of so high an order, that the wonder is how, in the imperfect state of our popular education, so many can be found to manage such processes. As for the diligence—arts of so high an order as these cannot be served by halves. Here must be no Monday laziness after Sunday's rest; no caprice as to going to work or staying away. Like time and tide—like brewing and dyeing—the work at Messrs. Elkington's cannot wait for men's humours. Any one who engages himself here must go through with what he undertakes. He is told, on being engaged, "We find you six days' work, and you are to find six days' labour." And the wages given are such as to justify this compact being made stringent. They rise from twenty-five shillings to three pounds a week, according to the nature and quality of the work.

Any one who has seen the contributions to the Exhibition from this house, will understand that a special education is required for almost every department of this manufacture. The fruit-baskets, twined with the convolvulus and the vine, are graceful enough; but the inkstands, with their groups—Rebecca at the Well; the Milkmaid and her Goats; and the race-cups and the statuettes—are productions which require artistic heads and hands at almost every stage. And, as yet, this order of art is new in England, and so is the process of manufacture. Formerly, we bought our plated candlesticks, and table-forks, and mustard-pots, and inkstands from Sheffield. There was a small choice of patterns; very rarely anything new—seldom anything remarkably beautiful. The few who could spend money largely—princes and peers, and half-a-dozen wealthy commoners—might go to Rundell and Bridge, and indulge their taste for works of art in gold and silver; but in plated goods there was little beauty, little variety, and very poor wear. Preparation was making, half a century ago, for the day which has arrived. Mr. Rundell was bringing over works of art—seizing every interval of continental truce to import pictures, statues, and gems, and paying Flaxman six hundred and twenty pounds for his model and drawing of the Shield of Achilles—of which four casts only were made—for two royal princes and two peers: but meantime, the middle classes were served with patterns almost as hackneyed as the willow pattern in our dinner-plates. Preparation was making, unawares, for the other grand improvement, by Mr. Spencer, of Liverpool, and Mr. Smea, of the Bank of England, having applied the process of electro-plating to taking copies of embossed surfaces. Where the discovery originated, is not yet settled. Russia claims it. Italy claims it. But while it was used only for taking copies of gems and coins, we of the middle classes, who cannot afford to buy silver plate, were annoyed by seeing the copper peeping through the edges and prominences of our plated candlesticks, forks, and sugar-basins; and, too often, a bend or a dent here and there, showing that there was as little wear in the metal and its solder in one way, as in its silver covering in another.

Mr. Elkington was one of those who first saw how the process of electro-plating might be extended to the supply of our needs. He saw that by the agency of electricity, the gold or silver plating might become one substance with the material on which it is deposited, instead of being a mere covering, liable to be rubbed off by use. He saw that a whiter and harder metal than copper might be used as a base, and employed German silver for the purpose. He saw that the most various and elaborate designs and ornaments could be produced by this method, in place of the few old forms; and that it would be an inestimable advantage to do the plating last, after all the repairs and finishings, instead of the clumsy old method of smoothing, and finishing and burnishing, after the frail coating of silver had been laid on. Seeing all this, he took out a patent for his process in 1840. About thirty other manufacturers in England are licensed by him to use his process; and there are not more than two houses now which maintain the old Sheffield method of laying silver on copper, and using the old soft tin solder. That any such houses remain, may be very well, because they turn out their work cheap, and keep down the price of the superior article. By the time they also have recourse to the new method, the patent will have expired, and competition will keep prices reasonable. The process has also spread widely over the Continent; so that society may consider that it has the discovery safe for general use. What remains to be wished is, that our Schools of Design should be extended and improved; and that a Museum of practical work, in various departments of manufacture, should be attached to them. We have not enough of fresh and beautiful designs actually offered; but, few as they are, they are more than can be used, from the designers' want of knowledge of the practical business of the manufacture. While we are complaining of the dearth of employment for educated women, here is one, remarkably suited to the female faculties,

much needed, and therefore very profitable; but from which young women are at present almost excluded, for want of the practical part of the study. One, here and there, may design a pattern, unexceptionable in taste, and in every sort of fitness but one: but if it cannot be wrought, her labour and her hopes are lost.

Let us send a glance over what we saw at Messrs. Elkington and Mason's the other day, where a friend, connected with the establishment, showed us whatever we wished to see. From the show-room—the Art-chamber—which we shall not describe, because every one may go there, we were conducted to the room where the modellers were at work. There, on a shelf, stood some tall volumes—books on Art, and choice engravings. Engravings, and patterns of beautiful forms were hung up; and at their respective tables sat several artists, modelling in wax. One should come here to understand what pains are spent on the common articles which we use every day. Here is one side of a stand for castors. This one side consists of three pieces; the straight centre, and the two oblique sides, on which the pattern must be reversed, every hair's-breadth of each of which must be modelled with the nicest care,—a smooth stroke here, a gentle touch there. And then there is the stem, with the handle at the top, and two sides again. These common articles surprise one more by the detail than the more luxurious productions—the nautilus shell, for instance, in pink wax, which is the pattern of a flower-stand; or the group of palm-tree and oak, overshadowing the sick Hindoo, and the soldier-surgeon stooping over him, lancet in hand;—the piece of testimonial plate presented to the surgeon of a regiment.

It seems as if as much precision and care were necessary in the coarse interior parts of the work as in the outside finish: for instance, in raising the foundation of a sugar-basin, which must have no join in its circumference, because it is to be gilt inside. It is one of the nicest arts in cookery to make a raised pie a true circle or oval; and, in the hair-dresser's business, to make one side of a wig match the other. In forming the foundation of a sugar-basin, the flat sheet of metal has to be raised in a bulge first, and then contracted; and then it must bulge again: and this form must be truly given by turning the metal with one hand, on the vibrating steel bar, which serves for the anvil, while the other hand uses the hammer, with equal and steady strokes. A similar process is used for raising an embossed pattern on the metal, when the form renders casting out of the question. Under the process of *snarling*, as this is called, it is curious to see the bumps rising under the hammer—bumps caused by the round head of the steel bar beneath, and destined to group themselves into clusters of leaves or fruit as the work advances. When a hard mixed metal is used for these foundations, and the copper scales at the surface, the work must go into *pickle* before it can be further dealt with. In a yard, therefore, stand little vats of this pickle, in which sulphuric or nitric acid predominates, causing the copper to scale away.

But the foundations must be annealed before hammering, that the pores of the metal may be opened. In the annealing room is a furnace, such as was formerly blown by bellows, like that of a blacksmith's forge. Now the engine saves that labour. A cock is turned, and there is an instant commotion among the lazy embers. Blue, yellow, red, and white flames dance and leap, and want something to devour. A sugar basin or tea-pot is held over them on a metal slice; and, in a few seconds, the black metal becomes a deep red; and then, in a few more seconds, scarlet, pink, white; and then it is laid down on the ground, to grow black again at its leisure.

Meantime, the ornamental rims, and little panels, and all the decorations which are to be afterwards attached to the article, are in preparation elsewhere. A man stands at a pair of shears fastened to his counter, and cuts out pieces of German silver, as marked roughly from a pattern. These are the little plates which are to receive the embossed patterns, now in course of being struck off from steel dies in another room, or the slips which are to become rims themselves. In that other room are three or four men, who seem to be seized with a frantic convulsion, at intervals of a minute or so. They are the stampers. Having fixed the concave part of the die under the stamper, and attached the punch to the stamper, they lay on a slip of German silver, throw themselves by one foot and hand into a sling of rope, raising the stamper by their weight, and then let it fall, punching the slip of metal, which then gives place to another. There are no less than thirty tons of steel dies on the premises, each die being a costly and precious article of property. They are the most expensive part of the apparatus; as the castings are the most expensive process of the manufacture, from the time and minute pains required. Of the castings, nothing need be said here, as the process is the same as in every iron-foundry,—the work being only on a smaller scale, and more delicately finished. The sand, employed in the castings, is from the neighbouring Cemetery. As fast as the red sandstone is hewn away there, to make room for new chambers of the dead, and fresh nooks for flowering shrubs and green graves, the rubbish is bought by the manufacturers for their castings, to an amount which materially supports the funds of the Cemetery.

The chasing of the cast articles is one of the most astonishing processes to an observer. It seems as if every man so employed must be an artist. One sits with a salver before him. With the left hand, he turns it this way and

that, while with the graving tool which he holds in his right, he runs graceful patterns, without hesitation and without fault. Parallel curves, and curves that meet, are marked off with a roundness and steadiness that no mechanism could surpass. The folded leaf, the pendulous flower, the wandering tendril, grow under his touch; and no one of them wanders out of its place. Near him sits another artist, at work upon a statuette, fixed in the position he wants by being stuck in pitch. A row of little chasing tools is arranged at his side, each pointed with a different pattern. Here he, by gentle taps of the hammer on the tool in hand, makes a rim round the head or arm: there, by using another tool, he produces a diced pattern, where shadow is to be represented. Then, the folds of the drapery are more finely streaked, and a finish is given to the bands of hair. Close by is another man, so intent on his work, that he twists a wire round his head to keep his hair from falling over his eyes. He is engaged on a vase filled with pitch, to preserve the smallest indentations of the pattern from injury, while he hammers away, daintily, at the minutest finishings of the bark of a tree, or the fleece of a sheep.

Next, we see how the stamped rims, or other loose parts, are soldered on to the main body of the work. It is not now as in the old days, when the spout of a teapot was liable to come off, or the top of the nozzle of a candlestick to part company with the cylinder. Those were the days when the soft tin solder was used: and the soft solder was used because the work had to be carried to the fire; whereas now, the fire is brought to the work. On stands in the middle of the room are huge iron pans, like saucers, containing cinders. At each of these pans or saucers stands a man, with pincers in one hand, wherewith he applies the solder, and turns over the article to be soldered; and, in the other hand, a flexible tube, by which he administers air and oxygen gas to the fire among the cinders. This tube consists of two compartments, one of which conveys air, and the other gas; and it is in the power of the holder to increase the flame to any intensity, and apply it in any direction, to this side or that, above, below, and around the most delicate ornament that has to be united with any other piece. The white powder that is thrown on, where the solder has been applied, is borax, which fuses the solder. One sees the metal bubbling and running like a liquid; and when it has diffused itself, and shown by a white streak that it is done enough, and then become cool, the join is evidently as lasting as any other part of the work. Nothing comes to pieces that is soldered under this blowpipe.

There is, of course, some roughness at these joins. Formerly, under the old method of plating, the silver had to be laid on before such blemishes were removed. A finishing process was gone through after the plating. The advantage of electro-plating, in this respect, is great. The gilding and silvering are done the last thing. Now, therefore, the goods are carried from the soldering to receive such touches from the file, and smoothing apparatus, as may make all sharp, and polished, and fit for the final process. When the file has removed all roughness at the joins, the whole surface of the article is smoothed and polished, under the hands of sooty workmen in paper caps, who apply the surface to swift revolving cylinders, which administer a polishing with oil and sand. After being cleansed in vats containing a ley of caustic potash, the goods are ready for the final process. The fumes from a little congregation of vats, direct the observer to the place where this cleansing goes on; and he finds them suspended in the liquor, where they part with the oil, and every other kind of soil that they may have brought from the workman's hands.

The visitor may next find himself introduced to what looks like a dinner-party of nearly fifty people. A second glance, however, shows him that the guests are all women, and that their dress, however neat, is not precisely suitable to the decorations of the table. The long table is set out, from end to end, with epergnes, candelabra, fruit baskets, cruet frames, bottle stands, and silver dishes; and between forty and fifty women are employed in burnishing and finishing, giving the last polish with the hand, and clearing out the last speck of dust or dimness which may lurk in any crease or corner.

As for the gilding and silvering chambers, they are like seats of magic. One might look on for a year, and have no idea of the process, but that it must be done by magic. There is a machine, containing a great wheel, and large bands of a horse-shoe shape, which we are told are magnets. From this machine, loose wires extend to the troughs, and dangle over the sides. In the troughs are plates of silver, standing in a brownish liquor; and in this liquor hang the articles to be silvered, suspended by copper wires from thicker copper wires laid across the top of the troughs. There hang the teapots, and spoons, and trays; and nothing ensues till the magician, in the shape of a man in a dark-blue blouse, takes hold of one of the dangling wires, and unites it with the wires on which the goods are hung. Then, in an instant, they become overspread with silver. The coating is a mere film at first, and it requires some hours (from five to ten, according to the quality of the article) to obtain a sufficient silvering. The brownish liquor in the troughs is a solution of oxide of silver in cyanide of potassium. At the magnetic touch of the loose wire from the machine, the silver is deposited upon the surface of the article communicated with; and not only laid upon it, but intimately united with it. Gilding is done more rapidly than silvering; and the gilding process is therefore

that which is usually exhibited to strangers. In this case, a man holds a bent copper wire, from which is suspended the bunch of spoons, plate, scissors, watch-keys, or vinaigrettes to be gilt; he holds, at the same time, the loose wire in connexion with the other, and washes his charge for a few seconds to and fro, and, lo! it comes out golden. Having heard something of a cobweb having been gilded at this trough, in the service of Prince Albert, we made inquiry, and found that it was really so —that a cobweb had been gilt—but it was by accident. A rosebud was gilded in the Prince's presence, and when it came out of the trough, it was found to have been crossed by a delicate thread of cobweb.

We asked, what could be done in the case of articles *parcel-gilt?* where, for instance, bunches of silver flowers or fruit appear on a gold ground, or a gold net-work covers a silver ground,—and we found that the matter was very simple. The parts which are not to be gilt are varnished over, and the varnish is easily removed afterwards. The minutest atoms of the gold and silver are saved, by the goods being dipped in four or five troughs in succession, till every loose particle is washed off. The superintendence of these troughs is a situation of great trust. The value of a pint of the solution may be about fifteen shillings, and, of course, it would not be difficult to carry off small quantities of it. The whole work of the establishment, however, requires a somewhat superior order of men—men who might be supposed superior to the temptation of theft.

But here, alas! comes in the regret which cannot but be felt by the observer of the working-classes in Birmingham—regret for their extreme and unaccountable improvidence. Without doubting that there may be exceptions, we are obliged to see that, as a general rule, the best wages, and the most constant work, are no security against poverty and dependence. It is too common a thing to find that a man who has, for years together, earned from thirty shillings to sixty shillings a-week (twice or three times the income of a multitude of clergymen, retired military and naval officers, poor gentlemen, and widow ladies), has not a shilling beforehand when he falls sick, and must be sustained by a subscription—by private charity—as the only alternative from public relief. It is too common a case that women, employed in the manufactures of the town, buy expensive shawls or gowns, paying for them by weekly instalments (extending over years for a single shawl), and pawning them every Monday morning, to redeem them on Saturday night for the Sunday's wear. It is too common to hear employers speak coolly, if not with satisfaction, of this state of things, because it keeps the workmen dependent and humble, and lessens the danger of those strifes about wages, which are the plague of the manufacturer's life. "Well; never mind!" says the employer, significantly. "Let things be. It may be all very well."

To us, however, it seems not well that men, with incomes exceeding one hundred pounds a-year should fail to secure their own independence; should fail to educate their children; should fail to provide a soft pillow for a time of sickness; while indulging in pleasure and luxury during their best days. To us, it seems not well that, just at present, when the necessaries of life are one-third cheaper than they were when the men were receiving the same wages as now, no attempt at saving should be made by so many as, in Birmingham, exhibit their improvidence to all the world. Here and there, however, something better is seen. In the manufactory we have been describing, every workman above twenty-one years of age, is a member of a relief-club, paying three-pence a-week to secure support under sickness or accident. Many of the people on the premises, also, are members of the Freehold Land Association, and are acquiring property in that excellent manner. One pleasant change in their mode of life appears in their love of reading. At the tea hour, those who do not go home, and who used to gossip over a pot of beer, have turned readers; and under their counters several popular periodicals may be seen stowed away. We must hope that the improvement will proceed, and that, while dismissing from under their hands, to the houses of the great, the articles of luxury and beauty which Birmingham supplies, the men of Birmingham will aspire to have their own humble homes furnished with every needful comfort, and brightened by that intellectual enlightenment, and that peace of mind about their families and their future, without which neither luxuries nor comforts can yield any true and lasting pleasure.

A CHILD'S HISTORY OF ENGLAND.

CHAPTER X.

When King Henry the Second heard how Thomas à Becket had lost his life in Canterbury Cathedral, through the ferocity of the four Knights, he was filled with dismay. Some have supposed that when the King spoke those hasty words, "Have I no one here who will deliver me from this man!" he wished, and meant him to be slain. But few things are more unlikely; for, besides that the King was not naturally cruel (though very passionate), he was wise, and must have known full well what any stupid man in his dominions must have known, namely, that such a murder would rouse the Pope and the whole Church against him.

He sent respectful messengers to the Pope, to represent his innocence (except in having uttered the hasty words), and he swore solemnly and publicly to his innocence, and contrived in time to make his peace. As to the four guilty Knights who fled into Yorkshire,