WOMEN AND GIRLS AS INVENTORS, AND DISCOVERERS.

By S. F. A. CAULFEILD.

PART I.

PARAGRAPH which recently appeared in the *New York Ledger* could not but provoke a smile, although the reader might be — as in my own case — in thorough sympathy with the indignant and very plain-spoken lady whose words were quoted. She had the reputation of having been eminently successful in her own career; and demonstrated in her person the ability of a woman to accomplish whatever enterprise or work she might choose to take up.

"I cannot see," she said, "anything phenomenal in the fact of a woman's carrying to a successful completion any ordinary branch of business. All their lives they have been grappling with the most complicated situations, turning the shortest corners, putting up with all sorts of inconveniences, and producing order out of confusion, that would have made a man tear his hair in sheer despair. I am sick of the twaddle about successful women. Just now, because she happens to have taken up something new that her sex has not been in the habit of doing, and that she seems to have done well, the papers and the public are 'oh'-ing and 'ah'-ing in a manner that is absolutely wearisome. Why can't these gushers, and croakers, and predicters of all sorts of calamities just keep quiet; and when a woman does something that no woman has done before, take for granted that she can do not only that, but almost anything else she sets about. A woman who can manage a large household, ought to be able to do nearly anything."

The slightly depreciatory style of this notable lady in reference to the other half of the human family, exhibits a weak point in her character, and a narrowness of mind that seems unworthy of one so gifted with talent and energy. I only quote from her speech because I wish to stimulate my young readers to make full and zealous use of such powers as they may likewise possess, and such opportunities as the Divine Providence may place within their reach.

The grievous lack of—what has hitherto been regarded as—a "masculine education" has doubtless deprived the world of an incalculable amount of valuable work, and of intellectual power, leading to scientific discoveries, and to all the manifold benefits of original thought. The difficulties experienced by the mother and mistress of a family are abnormal. Her work is never done; from the time she leaves her bed-room in the morning, till she retire for the night. Nay, too often she continues her labours in the night, and she sacrifices her sleep to the care of her children. Thus, in pursuing a literary, artistic or scientific life, she adopts a double career; one within, and one without the threshold of home. This, doubtless, is an exceedingly difficult, and very fully filled-up and exhausting life. There is no time left for recuperation of the bodily and mental power, and the lack of sleep and repose must detract from those of assimilation, let the food she takes be of the best and most nourishing.

They have special difficulties in the way to bread-earning or fame; notwithstanding we have wonderful examples to emulate, and notably so amongst our cousins of the great western world, of women, who, having lost their husbands, have acquired a learned profession and practised it with signal success, with an infant in arms, and a crowd around them, fed, clothed, nursed, and trained by them.

But while these observations may be practically suggestive, and appeal rather to their unmarried readers, than to their already over-weighted sisters, the wives and mothers; the subject-matter of this brief series must concern all alike, and come within the reach of every well-educated woman, wedded or single.

There are three royal roads that lead to the goal of both discoveries and inventions, the latter being in many cases the offspring of the former; and these highways are mathematics, chemistry and practical mechanics. Into such a school of thought and of experiment but few of womankind have, until very recently, been admitted. I do not say that all the gates have been barred against them; but the force of custom and public feeling and fashion, and the old-time prejudices shut up the purse-strings of the otherwise good "papas," so far as their children in petticoats were concerned. It did not occur to them to ascertain the character, and the amount of brain-power in the woman-child, so dependent on them for the advantages requisite for the development of any special gift. All had to be cast into the same mould. "The three R's," Lindley Murray, and "the use of the globes;" a modern language or two, and the inevitable piano-strumming; beyond these no *pater-familias* could see. No career of any kind, but inefficient tuition, or marriage.

I by no means say teach all your little girls mathematics, chemistry, and practical mechanics, but make it your serious duty to appraise the intellectual powers, and promise both of your girls and boys; and in this time of struggle for bread in a desperate competition, cultivate the individual tastes and gifts of each, so as to prepare them for such higher training and fuller development later on, as shall bear the most profitable fruit in the end.

I have now thrown some light on the question of why, until recently, with a few remarkable exceptions, no great discoveries nor inventions have been given to the world by women. But they are now entering into many fields of competition with their more favoured and privileged brethren, and "the day of small things" must not be despised.

It will be observed that in my title I include "Discoveries" with "Inventions," but by this term I do not mean to denote those made by sea and land in little known, or wholly untraversed regions. In a previous series I have given a few examples of women-explorers, and that may suffice. Those to whom I may now refer are the discoverers more especially of the uses of certain existing agents, and the methods of their application to our service by combination, or otherwise.

And now I propose to give those of my readers who have devised something new, or have any ambition to use their perceptive faculties (which are said to be so quick in the sex), a few practical directions, and what information may be essential, before entertaining them with examples of the inventions already presented to us.

From the Branch Office for Patents, specially devoted to women's work, at 76, Chancery Lane (address Messrs. Hughes, Eli & Hughes), I have obtained the following information direct. There are two methods of taking out a patent. A "Complete Patent" may be applied for at the outset, and the cost of this, including government stamps and the agent's fee, amounts to about £12 12s. The other plan is to take out "Provisional Protection" for a period of nine months only, at a cost of from £3 3s. to £4 4s., and if desired, this term of nine months, or at any time during this term (of nine months) the patent may be completed for the full term at a further cost of about £10 10s. Although this latter mode of procedure is rather more expensive, it gives the inventor the option of abandoning the venture at the expiration of the protection stage. At the same time it should be fully understood that infringement cannot be stopped, nor damages recovered for the same, until the patent be complete and sealed.

In applying at the office for either a "Patent," or "Provisional Protection," all that will be required is a brief written description of the invention to be secured, and if possible a rough sketch of it. From these the agents undertake to prepare all the requisite documents, and to transmit them to the inventor for her approval and signature; and on their return to the office, the application for the patent, or the protection is duly filed and conducted. In the case of good and useful patents, a sale outright may be effected, and possibly for a large lump-sum; or else arrangements may be made with one or more manufacturers to make and sell the article, upon payment to the patentee of a "royalty," previously agreed upon between them—say upon every dozen, or gross of the articles so made and disposed of. These royalties are usually paid quarterly, and an account of the sales is at the same time rendered to the patentee, access to the books of the firm being afforded during business hours for personal inspection. Also the articles sometimes bear secret marks on them, to enable the patentee to have some check upon the sales.

The number of applications for patents by women has been greatly on the increase during the last two or three years; and happily there is always a good market for useful domestic appliances more especially. The patent agents are very willing to assist their clients by introducing an approved invention to the London trade, and giving practical aid after passing the articles through the legal process of protection, by negotiating on her behalf for the sale of the patent, or manufacture on royalty.

Having given all requisite information as to where application should be made by the inventor for the patenting and subsequent sale of her brain or hand work, I would impress on her a very grand old maxim, that nothing is an insignificant trifle—no, not even a thought, a look, a word; nor stitch of the needle, nor stroke of the pen. And it is strange to see that some of the simplest of inventions are amongst the most fruitful in their profits to the inventor. In one of the transatlantic papers it was stated that, for example, a small invention called "the rubber pencil tip," brought its inventor $100,000. The pasteboard trays for shipping eggs made a fortune for the patentee; a common little "needle-threader" makes its inventor a return of $10,000 per annum; and the "return ball," with an india-rubber string, is stated, "on credible authority," to have been worth, for a time, $50,000 a year to the ingenious man who evolved the idea.

Since the passing of the Patent Act of 1883, which greatly reduced the cost of securing inventions by patents, nearly three times as many were taken out during the first twelve months.

The duration of the patents varies in the different nationalities of the old and new world respectively. They last the longest in Belgium; *i.e.* for twenty years; and next follow the United States with seventeen years; Denmark, Germany, Canada, Austria and Hungary, France and Brazil with fifteen years; Great Britain, India, and our other colonies with fourteen years. In Russia, Sweden, Spain, Portugal, Italy, Turkey, Paraguay, and the Argentine Republic the period is not fixed, but may be for a brief or more extended periods of time, according to arrangement. The cost of them also varies in all these countries. I believe that in the year 1890 there were no less than 21,308 applications made for patents in Great Britain; and 400 were taken out by women alone in the course of the last year.

In my next and concluding article on the subject in question, I propose to give a list selected from amongst the inventions so far produced by women, and these mostly English and American. This may prove not only interesting to my readers, but usefully suggestive to any original thinkers, whose education has paved the way to the development and utilising of their powers. Moreover, I hope to add to the list of articles already produced, some suggestions for certain appliances which, according to a Canadian wise-head in such matters, are amongst the requirements of the present time. I may add some ideas of my own, but have not leisure to supplement them with many; hoping that I have already said enough to set a good many clever heads at work, to devise and to carry out a good many of their own. This I trust they may accomplish with credit and profit to themselves, and no little benefit to the community at large.

(*To be continued.*)

HER OWN WAY.

By EGLANTON THORNE, Author of "Aldyth's Inheritance," "The Studio Mariano," etc.

CHAPTER VI.

JULIET IS INSPECTED.

"MOTHER, do you think it can be anyone belonging to us?" asked Juliet eagerly, when she had told of her meeting with the unknown clergyman that afternoon, and the question he had put to her.

"Oh, no, dear! Tracy is not an uncommon name. And yet—it is very strange—your father had a brother who went to Australia; but he has been dead for years—at least, it was always believed that he was dead."

"But it was a mistake—it was a mistake, and he has come back to claim us as his next-of-kin!" cried Juliet excitedly. "Oh, that's so, I am sure! Of course, he is rich, and I shall not need to be a governess——"

"My dear child, how you talk! You quite bewilder me! You forget what a big place Australia is. There may be hundreds of Tracys there. And your father always believed his brother to be dead. To be sure he went off in a huff, and perhaps wished his relatives to think him dead. His name was Ralph. There were only the two children, your father and he. They were early left orphans, and were brought up by their grandfather. I believe there was some jealousy between them. At any rate, there was a quarrel, and Ralph took himself off; but I never heard the particulars. Your father did not care to speak about it."

"Oh, mother, I can't help thinking that it is my uncle who has returned! How I wish he would make haste and look us up! I could snap my fingers at Hannah and Salome if I had a rich uncle to defend me."

"Juliet! What a way to speak! You really are a very naughty girl."

"Just so. Quite incorrigible. I shall consider it my duty to inform Mrs. Campbell that I shall not make an exemplary instructor of youth."

Mrs. Tracy glanced quickly at Juliet. She caught a gleam of mischief in her eyes that caused her some misgivings. How would the child behave on the morrow? But she took no notice of Juliet's words. She wished to avoid all reference to the interview arranged for the morrow. She was fearful lest anything should be said that might throw Juliet into an intractable mood. So she did not attempt to check the girl when she presently launched out into glowing descriptions of what their life might become on the advent of the rich uncle. Castle-building is undeniably an amusing diversion, and we learn soon enough the unsubstantial nature of the airy structures we rear.

Juliet's mood had changed by the next morning. She had no longer any hope of something wonderful happening to brighten the horizon of her future. Her spirit rebelled more than ever at the thought of the hated inspection to which she was to be subjected in the afternoon. She was petulant and irritable in her speech; looked at times very cross and at others exhibited a mischievous glee accompanied by that wicked gleam in the violet eyes which had already caused her mother uneasiness.

"You will be careful to dress yourself neatly," said Salome to her when she was about to prepare for her visit. "So much depends upon the first impression."

"You need not be afraid," returned Juliet with sparkling eyes, "I mean to be very careful as to the impression I make."

There was little fault to be found with her appearance when she came down a few minutes later. To her mother's eyes she had never looked prettier. Salome scrutinised her carefully from head to foot; but gloves, boots, gown, all were neat. Salome's disapproving glance fell on the unruly locks which showed in soft, flossy confusion beneath the wide Leghorn hat which so charmingly became the fair, young face.

"Can't you make your hair a little tidier?" she asked. "It seems frizzier than ever to-day"

"No, I can't," said Juliet, giving her head a shake which made the wayward, golden curls stand out farther from her brow than before. "My hair is just part of myself, and I cannot alter it. Most people find my golden locks admirable."

"There, you look very nice, dear!" said her mother fondly. "Run away now; you must not keep Hannah waiting, or you will miss the train."

Mrs. Tracy and Salome stood side by side at the window and watched Hannah and Juliet as they walked to the gate.

"She does not look much fit to be a governess, does she?" remarked Salome.

"No, indeed, poor dear!" responded Mrs. Tracy with feeling. "You look much more suited for it," she added, not without a touch of satire.

But Salome was unconscious of the satire. She received her mother's words as complimentary. She prided herself on the extreme simplicity of her dress, and the contrast it presented to the general mode. She liked to think that she was not as other women. To her the word fashionable appeared quite synonymous with sinful. She believed the attitude she maintained towards the world and its fashions to be indicative of a superior mind and character. It cost her no self-denial to refrain from wearing pretty things, for she had little taste for these; nor did it pain her to be considered odd. She had her reward in many a glow of self-esteem, many a proud, complacent sense of her own heroic, martyr-like fortitude.

Juliet had little to say as she and her sister walked to the railway station. She responded so briefly to the remarks made by Hannah that the latter concluded she was "sulky." As soon as they had taken their places in the train, Hannah, who had a horror of wasting time, unrolled a copy of the *Educational Times*, with which she had provided herself for this opportunity, and read intently till the train stopped at Hampstead station. Once or twice she glanced at Juliet, who had seated herself at the further end of the compartment, which they had to themselves. Juliet appeared to be absorbed in contemplating her gloves. Hannah was short-sighted, and she failed to see that Juliet's right hand held a tiny penknife with which she was carefully opening the seams of the glove on her other hand just at the tips of the fingers. Nor did she observe that Juliet afterwards gave some attention to her boots.

The house for which they were bound was at some little distance from the station, and Hannah experienced difficulty in finding the way. She was anxious to be punctual to the hour Mrs. Campbell had named, and as she hurried along she gave little heed to Juliet; but she was aware that whilst she was growing worried and impatient, Juliet's mood had taken the reverse change. Her sulkiness had vanished.

table," so perhaps weeping and wailing would have been somewhat out of place.

As I have mentioned above, we are paid by the piece, and get for ourselves half what we make for the office. Ordinary work is charged 1s. 3d. a thousand words; of this we get 7½d., and consider from 10,000 to 12,000 words a good day's work. Law work is charged 1½d. a folio (seventy-two words). Plays cost 5s. an act of eighteen pages, with an extra charge of 3d. a page afterwards. Of course the amount of work a girl can do in a day varies very much. A great deal depends on what she is copying; when the subject is an easy one and the manuscript well written she can cover a good deal of ground. Very difficult or very complicated work is charged extra to make up for the long time it takes to copy. It is somewhat difficult to say what our yearly earnings are, but I think that, taking one week with another, about 30s. would be a good average for the week; that is, of course exclusive of holidays.

In this paper I have only given my own experiences; I have not said anything about typists who are employed as correspondence clerks in houses of business. Their work is neither so varied nor so interesting as ours, but many prefer a fixed salary to being paid by the piece. I cannot imagine anyone who has once tried life in a type-writing office with its many interests ever leaving it for a post in a commercial house where she has to transcribe her own shorthand notes of business letters every day of her life from half-past nine to six.

WOMEN AND GIRLS AS INVENTORS, AND DISCOVERERS.

PART II.

A WISE man once said, in reply to one who boasted of rising very early in the morning, "Your getting up early is not of much consequence; the question is, how much you do when you are up?" This was the practical view of the matter. And so also it is comparatively of little consequence how many sciences are studied, how many distinctions have been gained at school or university, nor how many letters you may inscribe after your name; but rather, how much have you accomplished by means of all this learning? Whom have you benefited? But few of my readers have both the capacity or the means for attaining to any of these distinctions, and, therefore, have the less "talents" to trade with and less responsibility; but no amount of knowledge, however small, is without it, and none should be unproductive. Even amongst the stars that glorify our sex, and we have an increasing number continually rising, all have not constructive ability; and so the devising of little things for the use and comfort of their fellow-creatures may be left, in a multitude of cases, to less highly-gifted, less extensively-cultivated minds. Whatever you may have learned, cultivate that knowledge to the utmost of your power, with a view—not to self-glorification nor entertainment, but to its practical use, for either the private advantage of the home-circle, or of the outer world beyond it.

Between the years 1637 and 1852, that dark period in the history of our sex as regards educational advantages, I find a list of fifty-six patents taken out by women. A gap occurs, so far as my own information goes, from 1852 up to 1892; I am sure, however, that no *hiatus* occurs in the history of women's original thought, and practical use of the same. Indeed, so far from any diminution, no less than 400 patents were taken out by them, in this country alone, within a period of about twelve months; last year, and the year before.

In 1637 we find one Amye Everard, widow, whose acquaintance with chemistry and the art of distillery, enabled her to produce a preparation of tincture of saffron and of roses, etc., which she patented; and two years previously, viz., in 1635, Sara Jerome, assisted by William Webb, patented an engine for cutting timber into pieces. In 1675 we have an example of inventive power on a perfectly different line, when Rebecca Croxton, together with two coadjutors, William Fanshaw and Gabriel Cox, produced point-lace, after the manner of the *Point de Venise* and *d'Espagne*, and in 1678, Amy Potter produced woollen lace, then used for trimming shrouds. It was in this year that the Act of Parliament was passed for "burying in woollen stuff, or a kind of thin Bays," or Baise (according to Misson, whose words I quote), "which they call Flannel; nor is it lawful to use the least thread, or Silk. The Shift is always white . . . and the sleeves at the wrists purfled." This garment was tied round the ankles, so as to make a "purfle," or deep frill, covering the feet, which were bound together. Thus it occurred to Amy Potter to produce a garniture of the same material for those who could afford a little extra tribute of regard to the departed. Whether this "woollen lace" were pillow-made, or knitted, I cannot say; but probably the former method was employed, as the knitting of lace was a German invention, first introduced about the middle of the sixteenth century, at St. Annaberg, by Barbara Uttmann. She died 1575, in the sixty-first year of her age; the number of her children and grandchildren amounting to sixty-two. That she invented this art is unanimously affirmed by all the annalists of Saxony—some five or more histories.

It must not be supposed that the art of knitting was originated by this lace-maker. It is of much earlier date, the term "knit" being derived from the Anglo-Saxon *cnittan*, meaning "threads woven by the hand." But it was an art that seems to have been forgotten in England, though practised both in Italy and Spain, until the sixteenth century. A tradition exists that it was first introduced in the Shetland Islands, when the ship commanded by the Duke of Medina Sidonia (of the Spanish Armada) was wrecked at Fair Isle, and the rescued sailors taught the art to the natives; and no modern knitting exceeds in beauty of texture that produced at Unst, Shetland Islands.

In 1684 we find that Mary Marshall devised the production of a stuff, and the method of staining and colouring it, so as to resemble tapestry, and as a substitute for it. To work the latter demanded years of labour; whereas the painted or stained cloth was comparatively quickly produced. Proficiency in ornamental needlework was, according to the Lady Wilton (in her *Art of Needle-work*), "an absolute requisite in the accomplishments of a country *belle*;" but "the Arras looms," in the time of Queen Elizabeth, "superseded the painful fingers of notable dames in the construction of hangings for walls . . . intermingled and varied in the Palaces and nobler mansions by painted cloth." Thus we gather that to this Mary Marshall was owed the discovery of how to supersede, or at least supplement, the use of the "painfully"-produced tapestry hand-work, and the woven hangings of the Arras looms. With this example of inventive power, most usefully applied, I must limit my list of patents for the seventeenth century.

Perhaps none of my travelling and picnicing readers are aware that they owe to one, Jane Tasker, the happy thought of protecting flask-bottles with a casing of plaited rushes and straw. For this bright idea she took out a patent in 1709. The utilising of straw was further carried out in a very pretty way rather more than a hundred years afterwards by Grace E. Service, who patented a method of manufacturing work-boxes and other articles with it, combined with some description of gauze. Much pretty work of this kind, applied to similar purposes, comes to us from the far East, that land of distinctively original art, out of whose book we have taken a good many beautiful as well as quaint ideas.

In 1731 we find a still more important invention when Elizabeth Coppin devised a method of extracting silver from mundic, and of fluxing it into a metal. This word "mundic," I should explain, is that employed by the Cornish miners to signify "iron pyrites" or "arsenical pyrites." Had such a woman as Elizabeth Coppin lived in these days, when colleges for scientific education are open to women, with how much more might the world have been benefited by her genius, that so battled with, and triumphed over, the tremendous odds against its efforts and success?

In 1762 we find a benefactor to the shipwrights in Elizabeth Taylor, who produced tools for making blocks, shivers, and pins for the rigging of ships; and again, another mechanical genius in (1789) the person of Mary Hewson, who invented boilers for distilling; and worthy of mention amongst these, Ann Still, who, in 1769, patented a stirrup. We find a very valuable gift to the public produced in the form of a suitable bed for invalids, invented by Henrietta Caroline Bentley (1794). Two more women gave us bedsteads for general use, viz., Elizabeth Guppy in 1815, and Elizabeth Beveridge, who struck out a new idea in 1831.

It is a curious fact that women have shown much inventive ability in the department of mechanics at a time when no advantages whatever were available for their instruction. Elizabeth Bell patented machinery for making pottery used for chimneys and drain-pipes (1807), as also some appliance for sweeping the former, and in 1809 Mary Townley produced something for curing smoky ones. This record offers a suggestion to others of our sex to devise some means of deliverance from smoke in this London of ours, which need not to be as great and aggressive as it is, supplementing so grievously the natural ground-fogs of its original swamp. Elizabeth Perryman invented a street and hall lamp (1809), and in 1805 Isabel Levi (in conjunction with John R. Irving) patented an apparatus for determining the specific gravity of fluid bodies. In 1818, Mary Sedgwick patented a method of obtaining certain products from refuse, slime or wash of starch, and the year following a machine for cutting corks was patented by Sarah Thompson. Two appliances were produced for the purpose of teaching music by women, one (1801) by Ann Young, consisting of a game, and the other (1832) by Harriet Grant Gillitter, an instrument for beating time, and in the same year (last-named) Caroline Burgess made a contribution for the furtherance of a sister-art consisting of an apparatus for drawing. I have already recorded the name of a woman who served the interests of shipbuilders, and should not omit that of Janet Taylor, who, in 1834, produced a nautical instrument for the measurement of angles and distances. The year 1838 gave us two practically scientific

and mechanical women-patentees, viz., Anne Byerley, who devised an instrument for obtaining motive power; and Sally Thompson, new locks and fastenings, and an enamel for pins. In the patent records of the years 1811 and 1842, we find the names of Ann Hazeldine, who designed a plough, and the Lady Ann Vavasour, who invented machinery for the tilling of land. In 1830 a method of refining sugar by means of charcoal was invented by Marie E. A. Pertins; and we find that another benefactor to art arose some years later in Margaret Henrietta Marshall, who produced a cement for application to artistic purposes (1843). In this year we also read that Sarah Beadon patented an appliance for drawing-off liquids from casks, and the following year Elizabeth Cottam invented a method for the heating of Italian irons. Three years later we find a patent for ornamenting glass taken out by Sarah Tonge, and the next year (still in the department of art) Elizabeth Wallace took out another for the fitting and decoration of houses; and at the same date (1847) Elizabeth Odinot Lutel obtained one for indiarubber. Doubtless it was a special preparation, or the production of the component parts from other than the ordinary sources; but on this I can throw no light. Exhibits were made in this material by women at the exhibition of 1851, when Louisa Piece contributed stockings designed for invalids knit by her in caoutchouc. In 1847 a new filter was invented by Caroline Watson. Another of our female mechanics produced metallic casks and other vessels of which the patent appears in 1850, and two years later Sarah Lester served the interests of agriculture, now so successfully followed as a profession by women, in the discovery of a method for the promotion of vegetation by covering flax and hemp-seed with an oily mixture composed by herself.

I pass over all the dress appliances which early studiers of the question have patented, unless some improvement in umbrellas may be included under that head, which owed its discovery to Josephine de Bligny (1839), or the making of certain skins to resemble sable, by Isabella Larbalestier (1844).

I now pass on to patents of a more recent date, and may record the name of Sarah A. K. Blundell, who in 1893 patented a "Coal Economiser," consisting of a rectangular metal frame, provided with cross-bars at short distances apart, and supplied with a handle, which, resting upon one of the bars, is employed to regulate the thickness of the fuel and cause a freer draught and clearer fire. An acquisition to the household appliances is presented to us—and with much advantage in a sick-room—in a "Noiseless Coal-scuttle," devised by Matilda S. Barron in the same year. Likewise, the peculiar shovel which is now in use for removing dust and rubbish by miners, I may further observe, was the invention of a woman, but whose name I cannot give.

We are reminded of Elizabeth Coppin by her sister-inventor, of so many years later, Mrs. Barnston Parnell, of Wallington, who has patented drawings of inventions for extracting gold from base metal. One very valuable idea owes its origin to the clever brain of Miss Barron, M.A., of East Moulsey, of the same county, which consists of a deep dress-stand, but likewise provides a fire-escape, so sadly needed in every dwelling so long as the reign of paraffin and destructible glass-lamps shall be permitted. The "Million Type-Writer," a keyed type-bar machine, was invented by Mary P. Mynsbruggs, of Grapho House, Leytonstone. The Lady Isabel A. Margesson recently patented a shopping purse-bag, which I have seen and admired; and I hear that she has already realised upwards of £100 profits upon it. But this is nothing compared with the profit which, it is said, one lady has made on an original baby-carriage, amounting to £10,000; and a large fortune has been realised by quite a youthful member of the sex, through a most curiously-ingenious machine for the making of paper-bags.

I cannot too much impress on my readers the fact, that the simplest and least expensive inventions often bring the quickest and highest returns; and, before concluding, I will supplement my small list of successful ventures, and provide food, as I hope, for remunerative thought. It was stated by a London contemporary, not long ago, that a lady well-known in New York, has made much by a "happy thought," the devising of an appliance for "deadening the sound of the car-wheels" on the elevated railways, which was adopted, and proved perfectly successful.

I find myself under the necessity of crossing and re-crossing the "great fish-pond" to gather up my examples of women's work, attended with happy results to themselves and others. And now, on the further shore, I take note of "the Burden Horse-shoe Machine," a woman's invention, which turns out a shoe every three seconds! Also a "flying tricycle," and, amongst the exhibits in "the World's Fair," a very valuable article indeed, consisting of a "house-warmer" and a kitchen-range by Mrs. Wilcox. The former is so perfect in its construction that a house of ten rooms can be heated during a period of twenty-four hours, and the entire cooking for the family accomplished with four ordinary scuttlefuls of coal only. A coil of pipe passes through the furnace-part of the range, and through this pipe the water circulates, which is heated and passed to the different rooms through other pipes, packed with asbestos, to retain the heat.

It may be observed that I have omitted the inventions pertaining to dress, and will make an exception in favour of one by an Englishwoman, *i.e.*, a machine for the formation of patterns of every description of clothing, claiming to be so accurate that garments so cut out need not to be tried on. The patentee is Mrs. Cooke, of Osnaburgh Street, N.W. An appliance, not for dress, but for household drapery—such as curtains and other hangings, well known to most of us—we owe to Her Majesty the Queen. I allude to a very useful description of "Safety-pin." An invention for extracting gold from base metal has been patented by Mrs. Barnston Parnell, of Wallington; and an ear-trumpet by Mrs. Phillips, M.D. (of Kilburn). One more invention and I shall have completed my examples, viz., the invention of Stilton cheese, which, I have recently read, owes its origin to Mrs. Paulet, of Wymondham, Leicestershire, the county in which it was first produced. It is now manufactured also in the Shires of Huntingdon, Northampton, and Rutland. I do not at this moment recall my authority.

I may now suggest to those who are making chemistry their study the urgent demand existing for some innocuous, though effective, wash for the skin that will prove absolutely protective against the attacks of mosquitoes and other poisonous and more dangerous flies, certain spiders, and insects of the vermin order included. If quite harmless to the skin, the sale would be great, and the boon most highly appreciated. Also some preparation of a harmless character that will effectually prevent sea-sickness.

Our transatlantic friends are asking for a pencil which will quite supersede the use of pens and ink. They also ask for an "automatic omnibus starter," in the special interest of the poor horses; one which would act as a brake, as well as to start the vehicle. Also a collapsible apparatus, small and covered, to serve as a match-box, which would afford a shelter to the flame out of doors, for wet and windy weather. An "umbrella opener," consisting of a spring; to serve when one hand only is available; and also a bicycle so constructed that an upright position will increase its motive power, and the hump-back style of riding impede it. A lamp extinguisher is also wanted for these vehicles.

And now, according to my promise, I will conclude with a few words respecting discoveries made by women, for which no patents could be taken out We find them in the highest walks of mathematics. The facts that led to the theory of Professor Pickering as to the existence of double stars, were the discovery of a woman, Miss Murray, of Harvard University. Results of considerable value have been attained in biology in the laboratory of Bryn Mawr (U.S.A.) by the investigations of Harriet Randolph, a fellow in biology of that college, and whose discoveries have been published in the *Zoologischer Anzeiger* of Leipzic. Miss Florence Bascom, doctor of philosophy, of the "Johns Hopkins University" (U.S.A.) has made the comparatively new branch of geological science her speciality; and her genius has obtained for her the chair of "Petrology" in the geological department of the Ohio State University. In zoology also, the papers of the Misses Florence Mayo, Annie P. Henchman, and Julia B. Platt, have been considered so valuable, as to have been published in the "Bulletin" of the "Museum of Comparative Zoology" of Harvard University. In a former series I mentioned several gifted women, scientific discoverers in the regions of illimitable space, of one of whom it is said, that some of the most remarkable discoveries of the past few years have been made by her. I refer to Mrs. Mina Fleming, to whom, amongst other of her contributions to the world of science, we owe the discovery of twenty-one new and variable stars. Also, to the calculations of Miss Agnes Clerke the "speed of the transmission of light from the Pleiades." To the researches in archæology of Miss Amelia Edwards, and the Countess Ersilia Lovalilli, a word of remembrance should be accorded. Amongst our valuable contributors to the science of pathology is Dr. Giuseppina Cattani, assistant pathologist to the university of Bologna. The valuable work of four lady ethnologists, honorary members of the "Anthropological Society," at Washington, *i.e.* Mrs. French Sheldon, African explorer; Mrs. Anita Newcome, M.D., Mrs. Tilley Stevenson, and Miss Alice Fletcher should have a passing notice.

I do not propose to give my readers any information respecting the scientific discoveries and the inventions of women in other lands than our own, with the exception of the foregoing English-speaking cousins of the West. Yet I may incidentally name one or two.

The highway of science, in mathematical culture, has led up to the most sublime of all our researches amongst the stars. It has little affinity to those in ethnology, paleology, or botany; but it is of service in those of archæology and geology, in which valuable historical data may be arrived at, by the calculations and measurements necessarily involved.

The science of chemistry is of almost as wide-spread utility, comprehending the existence, nature, and uses of minerals and of vegetable products; and therefore it is essential to the study of both mineralogy and botany both in the way of discovery, and the application of either to practical uses.

Wishing my readers courage, zeal, and perseverance in trading with their talents, inborn or acquired, with a view to the good of others, and the glory of the divine Giver, I conclude. Of each and all may it be recorded "She hath done what she could."

S. F. A. CAULFEILD.