

Charlie gave me a lovely engagement ring, a half-hoop of whole pearls, which was very valuable, but he insisted that I should not buy anything for him. I had some onyx studs which were in my cuffs on that memorable eighteenth birthday, and he asked for those, and wears them to this day. I don't know how many pairs he has not given me since. If we were going out anywhere in an evening, he always sent me a few flowers for my hair or dress, and he brings them home for me still; but he never wasted money on elaborate bouquets, where the poor blossoms are killed by wires thrust through their very hearts.

He often brought a nice book, and would read aloud to Connie and me in our own little sanctum, where we both stitched busily at such portions of my trousseau and plishing as were made at home; and, in summer time, he played tennis with us on the lawn, or we went to his mother's tennis parties, and in this way we became companions to each other and learned

a great deal about one another's thoughts and tastes. When I see engaged couples who have nothing to talk about, I think they can never have read a book or shared any intellectual pleasure together.

Sometimes on a Sunday afternoon Charlie would take his sister and me to Westminster Abbey, or St. Paul's, to hear some noted preacher, and at other times, after the ordinary evening service at our own church, he came home with us and had supper, or his mother would take me back with her, saying that Charlie could be trusted to walk home with me after supper; but on those occasions he never came in for more than a minute or two, because he would have considered it taking a liberty to stay late on the evening of a day consecrated to rest and quiet.

So, you see, we were a pair of lovers who did not bore either of our families, or make any difference to the accustomed routine of either one household or the other.


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## THE GATHERER: AN ILLUSTRATED RECORD OF INVENTION AND DISCOVERY.

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Correspondents are requested, when applying to the Editor for the names and addresses of the persons from whom further particulars respecting the articles in the GATHERER may be obtained, to forward a stamped and addressed envelope for reply, and in the case of inventors submitting specimens for my hair or dress, to prepay the carriage. The Editor cannot in any case guarantee absolute certainty of information, nor can he pledge himself to notice every article submitted.

### A New Wire Rope.



In the ordinary wire rope a number of wires are wound together round a centre forming a strand, and a number of these strands are similarly wound round a centre, thus forming the rope. The outside twists are longer than the central core, and the latter is therefore considered less reliable than the outside in bearing the stress upon the rope. A new kind of rope, called the locked-coil rope, has recently been brought out, and is illustrated in the accompanying figure in perspective and cross-section. The wires composing the rope are made of such a shape as to fit into each other round the core, thus building up a solid sheath of metal in the manner shown. The rope is, therefore, smooth externally, and it is also flexible as well as strong. The flexibility is increased by using smaller wires and more of them. The section shows a telegraph core with copper conductors in the black insulator. Strength for strength, the new rope weighs much less than the old forms. A new rope, 3 inches in girth, is said to weigh 13½ lbs. per fathom, and to be equal to a 4-inch old rope weighing 18½ lbs. per fathom.

### A Photographic Tricycle.

The camera has been applied to a tricycle by a well-known firm of cycle machinists. The black chamber is mounted on a spherical universal joint, permitting it to take up any position when the tricyclist stops in

his course and takes a rapid photograph of any bit of scenery that strikes his fancy. Each box encloses six plates, 6½ inches by 4¾ inches in size. Amateur photographers given to tricycling will appreciate this combination of appliances. It is to be hoped that Mr. Stevens, who is now on a tricycling tour round the world, has provided himself with a camera.

### A Cure for Chilblains.

A new drug, prepared from the dry milk of a Persian plant, is being administered with success as a cure for chilblains and chapped hands. It stimulates the blood in the extremities, especially when taken after waking in the morning on an empty stomach. The drug is given in small doses in the form of pills.

### A Fancy Clock.

A novel form of clock has recently been designed: the face taking the form of a tambourine decorated with a wreath of twelve flowers at equal distances apart. These mark the hours, and over them glide two gaily-painted butterflies, one larger than the other. These are the hands, the larger indicating the minutes, the smaller the hours. The works are concealed behind the tambourine, and the motions of the butterflies, which are made of magnetic metal, are produced by magnets carried on the arms forming the real hands of the clock. Another clock worthy of mention is exhibited in a well-known West-end clock-maker's window. It is a framed and coloured photograph of the Houses of Parliament, Westminster, with a real

dial let into the tower to represent "Big Ben." The dial is very small, to match the photograph, nevertheless it keeps good time.



#### A Balloon Camera.

Our illustration represents the arrangement of the instantaneous photographic camera employed by M. Gaston Tissandier in his recent balloon excursion from Paris to the neighbourhood of Rheims. During the trip many photographs of the country below were taken, some showing the details of the Seine very distinctly; and it is thought that the method will ultimately become very useful, not only in military reconnaissance, but in the preliminary surveys of a country for engineering or geographical purposes. At a height of 600 metres a balloon need not fear artillery fire, yet some of M. Tissandier's pictures were taken at a height of 1,000 to 1,100 metres. The camera is operated by the pneumatic pump shown in the engraving. A good light is indispensable for the production of clear photographs, but the travelling motion of the balloon does not seem to affect them. It is necessary, however, that the operator should keep perfectly still, as the car should not oscillate at the moment of exposure of the plate. Amongst the views taken during the ascent, the most perfect are those obtained while the rays of the sun fell directly on the city of Paris. The experience of the voyage, according to M. Tissandier, is that, on the whole, photographs may be obtained in a balloon as beautiful and clear as the best produced on *terra firma*. The impressions were taken on very sensitive gelatine plates.

#### An Electric Safety-Lamp.

Mr. J. W. Swan, the well-known electrician, exhibited a very compact little electric miner's safety-lamp at the British Association meeting in Aberdeen last September. The lamp consists of a small Swan incandescent lamp, together with a secondary battery to supply the electricity, enclosed in a suitable box. The weight of lamp and battery is  $6\frac{3}{4}$  lbs., the case con-

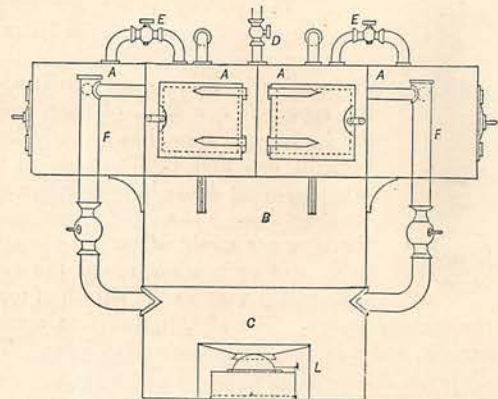
taining the cells measuring  $8 \times 4$  inches. A light of half a standard candle is given by the lamp for twelve hours, or three-fourths of a candle for eight hours. The lamp requires no air to make a light, and the connections are arranged with great care to make it as safe as possible. With a Fleuss breathing-dress and one of these electric lamps, Mr. Swan thought that the work of exploration in mines could be successfully carried on. The cost of the lamp would, he estimated, be about three times that of an ordinary safety-lamp. Several miner's safety-lamps, worked by electricity, have been devised before, but that of Mr. Swan appears to be very neat and light. He announced, at the meeting in question, that a number of them are to be manufactured for possible use.

#### Refining Sugar by Electricity.

Professor Friend has applied the electric current to the refinement of sugar. The details of his process are not yet disclosed, but it is electro-chemical in its nature, and dispenses with boiling and the use of animal charcoal. No syrups or soft sugars are produced, all the saccharine matter being turned out as hard sugar. Such is the account given of the results; but until further particulars are published it would be premature to say more.

#### A Domestic Food-Preserver.

A process, quite usable in private houses, has been introduced for preserving food by the displacement of the air in food-chambers by carbon dioxide, monoxide of hydrogen, nitrogen, and other gaseous antiseptics. The simplest form of the apparatus for small house-



holds, hotels, and restaurants, is as follows:—Several small chambers, containing the meat or vegetables to be preserved, are arranged round a water-vessel, and under the latter is a chamber with a lamp burning pure paraffin, or other liquid hydro-carbon. This is connected by a pipe with the meat-chambers, and these again are connected with the upper part of the water-vessel. When the lamp is lighted the water is allowed to flow out of the vessel, producing suction which draws the air out of the food-chambers, and the

gaseous products from the burning lamp into them. These gases, being inoxidisable, preserve the food from decomposition, according to the statement of the inventor, for several months. In hot climates the water-vessel can be made to produce carbon dioxide by chemical action, and this gas utilised to preserve the edibles. The accompanying woodcut shows the disposition of the parts with the connecting pipes and stop-cocks. Here A A A A are the series of food-preserving chambers set round the water-cistern B, which is immediately over the lamp-chamber C, where the lamp L is placed. An inlet pipe, D, lets the water into the cistern, and an outlet pipe (not shown) lets it out at will. Other pipes, E E, allow the air to escape from the meat-chambers as the water flows out of the cistern, and the gases from the burning lamp pass into the meat-chambers by the pipes, F F. The food-chambers are fitted with doors, as shown in the figure.

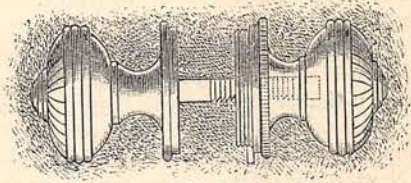
#### Cocaine in Sea-Sickness.

Dr. Manassein, of St. Petersburg, having read of the efficacy of "cocoainum muriaticum" in certain cases of vomiting, has tested its value as a preventive of sea-sickness during a recent trip at sea. Among his fellow-passengers were a man and woman very

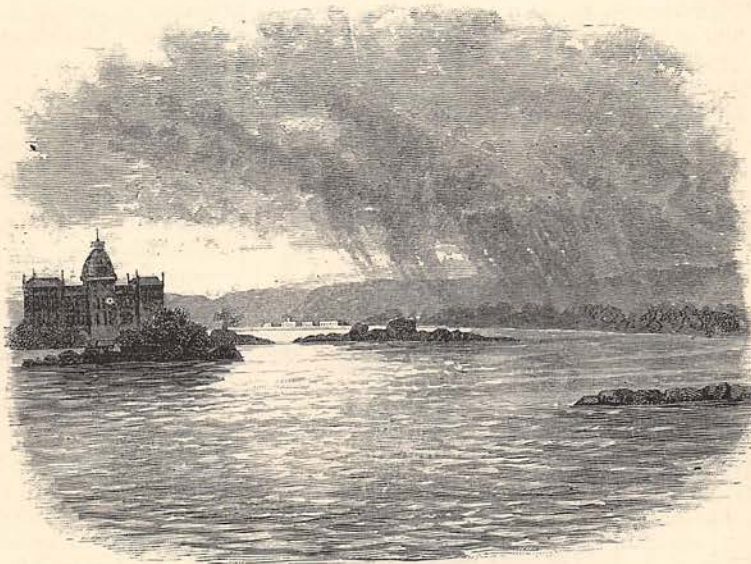
two doses during the first half-hour, and half a tea-spoonful every three hours afterwards. A girl of eighteen, who had been sick for twenty-four hours before the drug was given, had a double dose every half-hour, and after the sixth dose she jested and began to complain of hunger. Dr. Manassein comes to the conclusion that the cocaine is a harmless and good remedy for sea-sickness.

#### A New Door-Handle.

Our figure illustrates a new door-handle which can be fixed to the door without screws entering the wood. The knob is firmly fixed to the spindle, and a close adjustment is secured without any strain upon the



wood of the door, and in a very short time. The device has been on view at the International Inventions Exhibition during the past summer, and was awarded



HELL GATE, NEW YORK.

prone to the malady; but after giving them every two or three hours a tea-spoonful of the following mixture—muriate of cocaine, 0.15; rectified spirits of wine, a sufficient quantity; and water, 150 parts—they were free from sea-sickness for the first time in their lives, although the sea was very rough for forty-eight hours. The doses were administered on starting, and continued at intervals during the trip. A child six years old, who was attacked by sickness on rising in the morning, was also treated to one tea-spoonful in

a prize medal. Considering that so many door-handles are apt to work loose or come off altogether, one that will hold fast or be easily tightened and removed would be a decided advantage.

#### The Largest Explosion on Record.

The breaking up of Flood Rock, a solid barrier of nine acres, which obstructed the channel of Hell Gate, New York, was successfully accomplished on Saturday,

October 10 last, by means of explosives fired by electricity. Thousands of people assembled along the shores to view the spectacle, which was a very picturesque one. The nine acres of rock were honey-combed by cells containing over 300,000 lbs. of explosives, including 75,000 lbs. of No. 1 dynamite, and 240,000 lbs. of "rack-a-rock," a powerful mixture of potash and denitro-benzali. The rock had been pierced from below with four miles of tunnelling in galleries, the floors of which were from 50 to 64 ft. below the mean level of the water at low tide. The partition walls between these chambers were 10 to 24 ft. thick. Nearly 14,000 holes of an average depth of 9 ft. had been drilled into the rock from the galleries, and then loaded with 6 lb. cartridges of rack-a-rock, and 3 lb. cartridges of dynamite. These cartridges were all connected by wires to a battery so as to be exploded simultaneously by a single electric spark. When Halletts Reef in the same channel was destroyed in a similar way nine years ago, the blast was the largest ever accomplished; but the recent explosion was six times larger. A little girl of eleven, daughter of General Newton, the chief engineer, pressed an electric key with her fingers, completed the circuit of the battery, and fired the mine. A dull rumble was heard, and then a mighty column of water nine acres in area rose 200 ft. into the air and descended in hills of foam, a great wave splashed on the shores, and a cloud of yellow gases hung over the boiling waters. The spectators burst involuntarily into a shout of admiration, and all was over. It is expected that the channel when cleared will be 1,200 ft. wide and 26 ft. deep, suitable for ocean steamers at all tides, but it will probably take two years to remove the broken rocks.

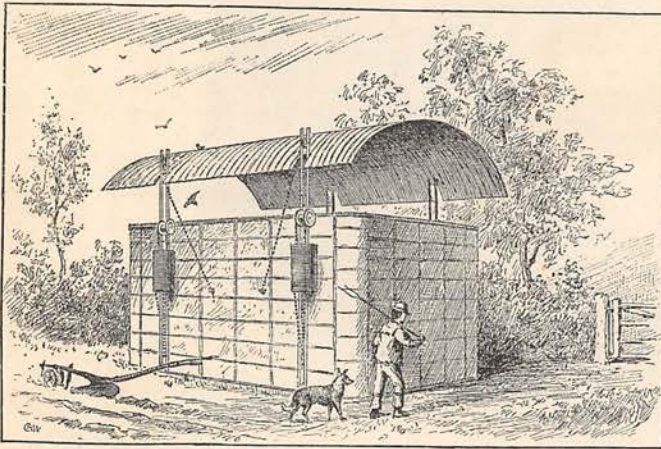


FIG. 1.

#### An Iron Silo.

An iron silo which can be converted into a granary, cow-shed, or other useful iron structure was recently exhibited at the Royal Agricultural Show, Preston. The figure shows the silo in perspective. The galvanised iron roof is capable of being raised or lowered

by the chains and pulleys. Fig. 2 shows the silo in transverse section, with the "pressure beams" for giving continuous pressure to the ensilage. In this figure, A indicates the galvanised sheets of the body of the silo, B the pressure beams, C the guides for the beams, F the cast-iron weights, and G the chains, for conveying pressure from the weights to the pressure beams; L is the corrugated roof with the chains, M, for lifting it.

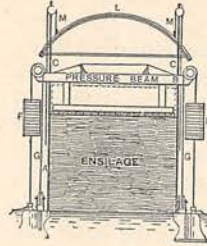


FIG. 2.

Being very strong these silos are durable, and being of iron they are fire-proof. The sides are made of galvanised iron sheets fixed to angle irons. The silo shown is 16 ft. long by 10 ft. 8 in. wide, and 10 ft. high. It is capable of holding 35 tons of ensilage.

#### The Submarine Boat.

Mr. Nordenfeldt, the inventor of the Nordenfeldt gun, has designed a submarine vessel for naval operations, such as the planting of mines and torpedoes, besides other more peaceful purposes. The boat is of steel, and it is stated that during recent trials in Denmark it worked very satisfactorily. It is of a cigar-shape with a coffin-like projection amidships, and a glass dome or look-out one foot high. The length of the hull is 64 feet, and the central diameter 9 feet. It is sunk below the surface, when required, by vertical propellers, which work the boat up or down; the buoyancy being first slightly reduced by taking in about 1 cwt. of sea-water. On stopping the vertical propellers the boat can rise of itself to the surface, so that if the engines break down there need be no danger. The motive-power is steam, which, when the vessel is preparing for a submarine trip, is accumulated in the boiler till a pressure of 150 lbs. per square inch is obtained. The boat can, it is stated, be driven for sixteen miles at a speed of three knots per hour under water with this pressure. The surface speed is about eight knots, and the boat has been run for 150 miles without coaling. No compressed air is carried, and the crew therefore breathe the air enclosed in the hull, which is sufficient to supply four men for six hours without any special inconvenience.

#### A New Dynamo.

At the International Inventions Exhibition there was on view a novel form of dynamo, invented by Professor George Forbes, and named the "non-polar" dynamo, perhaps because there is no external magnetic polarity appreciable, all the magnetism being confined to the interior of the machine. As the dynamo gives superior

results, especially in electro-deposition, we will explain its peculiar construction. The action is based on the principle of the well-known electrical toy known as Barlow's Wheel. This is shown in Fig. 1, where *W* is a metal wheel or disc revolving on a spindle between the two poles of a magnet, *N S*. As

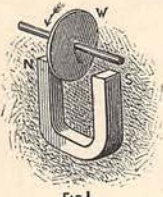


FIG 1

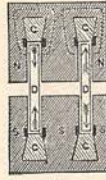


FIG 2

the disc cuts the lines of magnetism between the two poles *N S*, a current of electricity is excited in it, and this current can be led away by a wire, touching the disc at its centre and at its circumference. For the centre contact the axle itself may be used if it is of metal. Now, suppose that instead of having merely the two poles, *N S*, we had a whole circle of poles round the disc, north poles (*N*) on one side, and south poles (*S*) on the other, and a wire in contact with the whole circumference of the disc, while the spindle formed the other contact of the wire, we should in such a case obtain a much greater quantity of current from the disc. This is in substance what Professor Forbes has done in his new dynamo. He employs one or two large discs of iron, *D D* (Fig. 2), mounted on a spindle, and rapidly rotated in a magnetic field produced in a large body of iron, *N N*, *S S*, by coils of wire, *C C C C*, traversed by an electric current. The iron discs rotating in the enclosed magnetic field have an electric current excited in them, which is drawn off at the spindle and the circumferences of the discs by wires, and used for electrotyping. In some forms of the machine the disc takes the form of a cylinder of iron, and the contact is made with its circumference by means of a ring of carbon connected to the wire in question. Carbon or iron makes a good clean rubbing contact, and Professor Forbes proposes to use it for the copper "brushes" now so much used in drawing off currents from the commutators of ordinary dynamos. If it answers there it may be a good improvement, as the present copper brushes wear a good deal. The current obtained from such a machine has a low electromotive force, but a large quantity, and is therefore suited for electrotyping; but by building up the armature of concentric shells of iron connected together in a particular manner, Professor Forbes hopes also to obtain an electromotive force suitable for electric lighting.

#### New Varieties of Christmas Gifts.

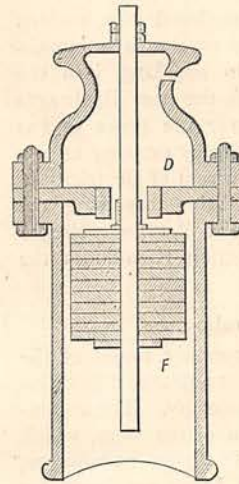
A Christmas "card," which at the same time conveys a seasonal greeting and a lasting memento of the sender, has been brought out by the London Stereoscopic Company. It consists of a portrait of the sender, permanently printed by the carbon process on porcelain or ivory, and coloured with all the delicacy and beauty of a miniature. The portrait is

mounted, and on the mount is inscribed some appropriate and timely greeting. To those at a distance from home or dear ones, this latest application of photography will be very welcome.

Of Christmas cards, the variety becomes every year more and more bewildering; not only does the style vary, but the shape too, screens, fans, envelopes, and portfolios, all being pressed into the service. Messrs. Marcus Ward and Co. have struck a new vein this year, in their reproductions of pictures by Fra Angelico at Florence. Angels, single and in groups, in the most delicate colouring, stand out on golden mounts, in all the beauty of the great Florentine's paintings, forming a most appropriate and beautiful means of conveying a Christmas wish. Wedgwood cameos, Thames views, and yachting sketches, old china, and flowers in clusters, wreaths and sprays, are only a few of this firm's subjects; to mention all would be impossible in the space at our disposal. A special word of notice, however, is due to Mr. Walter Crane's portfolio of "Winged Wishes," containing a series of four plates drawn in his well-known style. Another work by this artist, "Slate and Pencilvania," describing the adventures of a boy in Figure-land, is issued with their Christmas and New Year cards by Messrs. Marcus Ward and Co., together with two other Christmas books with coloured illustrations of a most attractive and beautiful order. One of these is "Punch and Judy," by a well-known writer in our own pages, Mr. F. E. Weatherly, who contributes several songs to the work; and the other, the story of "The Three Fairy Princesses," Snow-white, the Sleeping Beauty, and Cinderella, retold by Eliza Keary.

#### A Sanitary Valve.

Enteric fever sometimes arises from foul gases which escape from the service pipes into a house, and



Dr. Swete has designed the valve which we illustrate in order to prevent this occurrence. The gases get into the pipes while the latter are partially empty on the main being turned off, and can sometimes be heard hissing in a house. If these gases were pure air no harm would be done, but it would appear that sometimes this is not the case. The valve shown is of simple construction: a conical float, *F*, pressing against an elastic diaphragm, *D*, at low pressure, and when the water falls the float falls with it, admitting air into the pipe and preventing the vacuum or

partial vacuum in the latter, which is the cause of foul gases being forced into it from without by way of faulty joints and taps. In this way Dr. Swete seeks to remedy the evil of infectious exhalations getting

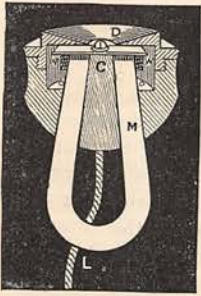
into dwellings when the water is cut off, and afterwards let on. A modified form of the valve has also been designed for high-pressure pipes.

#### The New Star.

Every one has been talking of the new star which has been discerned in the Andromeda nebula. The nebula in question is said to have shown signs of unusual brightness lately, and at length a bright stellar point has been discovered in it. Whether the appearance of the new star will support the nebular hypothesis of Laplace it is premature to say at present; but it is, nevertheless, a most interesting phenomenon, which will engage the attention of astronomers for some time to come. There is some reason to believe that the stellar point is what is known as a variable star: that is to say, it shines out brightly at intervals of time, and though recently discovered it may have been seen before. It may be mentioned that the distance of the nebula is such that the phenomenon recently discovered must have happened thousands of years ago, although light travels at the rate of 192,000 miles per second. The discovery was apparently first made by Dr. Hartwig, of Dorpat. The star has been seen by the aid of an opera-glass in the middle of the misty spot of light in the Andromeda nebula.

#### A New Magnetic Telephone.

The figure illustrates a new magnetic telephone in sectional view. It is the device of Mr. W. E. Irish, an electrician, and its chief feature consists in fixing the iron plate or diaphragm D, at its centre C, between the poles of a horseshoe magnet, M. These poles are both surrounded by a coil of wire, w, put in circuit with the telephone line, L. The whole is enclosed in a wooden or ebonite case with a mouth-piece. On speaking into the mouthpiece the iron diaphragm vibrates over the poles of the magnet, thereby exciting an undulatory current of electricity in the coil, w, and this current, after traversing the telephone line, passes through the coil, w, of a similar instrument, and by a reverse action reproduces the original sounds.



#### The Square Bamboo.

Canes and grasses are so commonly round at the stem, that the existence of a square-stemmed bamboo in China and Japan will be news to many. The accompanying woodcut shows the form of the stem, which has a picturesque appearance. The plant is, however, useful as well as ornamental, it being employed for walking-sticks, ink-slabs, pipe-stems, and so on. Some varieties of the stem are square, others have slightly rounded edges; and it has been observed that the stem is rounder in its earlier stages of growth. It grows in the provinces of Honan, Szechuen, Yunnan, and



Hunan; and it is cultivated for ornamental gardens and temple courts. There is a legend in connection with it that Ko Hung, the most famous of the alchemists (who flourished in the fourth century), once thrust his chopsticks, which were slender bamboo rods pared square, into the ground of a spiritual monastery near that city, and caused them to take root, and appear as a square variety of bamboo.

#### SHORT STORY COMPETITION.

*After a careful perusal of the One Hundred and Eighteen MSS. sent in Competition for the Prize of Five Guineas, the Editor begs to announce that the Prize has been adjudicated to the Story entitled*

"IN ROTHAM CHESTER'S HONEYMOON,"

By Miss MARIAN PENDLEBURY, Grange-over-Sands, Lancashire.

*The Editor has especial pleasure in testifying to an unusual average of excellence in the Stories submitted for this Competition. Among those entitled to Honourable Mention are the following, in order of merit:—*

MOST HIGHLY COMMENDED:—

"Flit," by Mrs. PRICHARD, St. Helier's, Jersey.

"She's Coming," by Mrs. MOORSOM, Onslow Crescent, London, S.W.

VERY HIGHLY COMMENDED:—

"Married," by Miss ALICE ANN BROWN, Rotherham.

"Artiste," by Miss A. E. HOLDSWORTH, Sutton, Surrey.

*The following are generally COMMENDED:—*

"Ennui House," by Miss FRANCES E. AXTENS, Bath; "Christian's Ambition," by LADY CARMARTHEN, Solberge, Northallerton; "The Newnham and the Spencers," by Miss F. FREEMAN, Norwich; "A Story of Six Years," by Miss K. F. SAINSBURY, Cambridge; "Mr. Pilbeam's Love-Story," by Mr. G. B. BURGIN, Fortis Green, London, N.; "Buried Alive," by Mr. W. BELL THOMSON, Clifton, Bristol; "Horace Reed's Inheritance," by Mr. W. J. LACEY, Chesham, Bucks; "For the Sake of her Dead Love," by Mrs. ROACH, Clifton, Bristol; "Was it Retribution?" by Mrs. COMPSTON, Taunton; "In Answer to an Advertisement," by K. EYRE, Peckham Rye, S.E.; "At a Dead-LOCK," by Miss M. HARVEY, Scarborough; "Not their Fault," by Miss E. T. DEWHURST, Bradford, Yorkshire.