

A CRY FROM THE BLACK COUNTRY.

[There are at least sixteen thousand females engaged day after day in the nail-making industry in the Black Country. A whole household—father, mother, and children—will work week after week, from early morning until long after midnight, shaping molten iron into the form of nails, and the net weekly earnings of them all will not amount to more than sixteen or seventeen shillings.]

HERE the forge-sparks glow and glisten,
Where the smoke-clouds veil the sky,
There, if you will only listen,
You may hear a bitter cry—
Cry of utter woe and sadness
Rising up amid the din ;
Cry of thousands in their madness
Vainly striving bread to win.

Day and night the fires are burning,
Day and night the iron glows,
And the toilers' hearts are yearning
For a respite for repose ;
But the flames of fire are leaping,
And the molten masses run,
And 'tis vain to think of sleeping
Till the tale of work be done.

And these toilers night and morning—
Are they strong men in their prime,
Weary of their work, but scorning
To be paupers ere their time?

Nay, but women—wives and mothers,
Girls who are but children still,
Slaving on with fathers, brothers,
Many a hungry mouth to fill.

Day and night the iron's riven,
Barest pittance but to gain ;
Day and night the nails are driven
Into many a heart and brain.
Day and night the sparks are flying,
Searing many a bright young life ;
Day and night all grace is dying,
Blasted in the bitter strife.

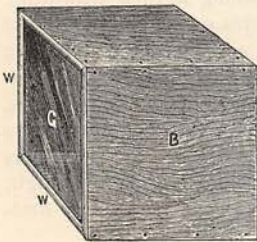
There, then, where the red fires glisten
Lurid in the midnight sky,
Brothers, sisters, if you listen,
You will hear a bitter cry—
Cry of utter woe and sadness
Rising up amid the din ;
Cry of thousands in their madness
Vainly striving bread to win.

GEORGE WEATHERLY.

THE GATHERER.

A Seaside Spy-Glass.

In a recent number of the GATHERER we gave an account of a submarine observatory in use at



Naples for examining the sea-bottom. The simple contrivance which we illustrate herewith will enable persons at the seaside to explore the bottom in clear water for themselves, and enable them to see the marvels of the weedy shore in a way which they could not otherwise do, owing to

the surface ripple on the water. It can be made for a few pence, and consists of a wooden box, B, having the bottom knocked out, a pane of glass, C, being put in its place and fastened all round with putty or slips of wood, w w, so as to be watertight. On placing this box, with the pane downwards, on the water, the observer looking into the open mouth of the box sees down into the clear water, and it is surprising how distinctly all the shells and life of the bottom can be seen. For examining coral reefs, the apparatus is invaluable.

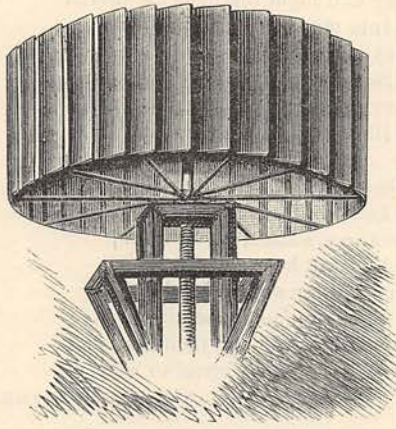
Metallising Wood.

Wood can be made to give a beautiful metallic lustre and is greatly increased in strength and solidity by the following treatment, originated by Herr Rubennick. The wood is immersed for three or four days according to its permeability in a caustic alkaline lye (calcareous soda) at a temperature of 75° to 90°. Then it is put immediately into a bath of hyposulphite of calcium, to which is added, after twenty-four or thirty-six hours, a concentrated solution of sulphur in caustic potash. The duration of this bath is about forty-eight hours, and its temperature from 35° to 50°. Finally, the wood is immersed for thirty to fifty hours in a hot solution (at 35° to 50°) of acetate of lead. The lustre of this metallised wood is further increased by rubbing it with a piece of lead, tin, or zinc, and then polishing it with a glass or porcelain burnisher.

Electric Light Bouquets.

Bouquets for table ornament, or to hold in the hand, are now mingled with small electric lamps, which have a very pretty effect among the flowers. The lamps are lighted by an electric current led to them by concealed wires. For personal use a small primary battery, or a

charged accumulator, is carried in the pocket or under the dress to supply the current; but for dining or drawing-room table use the current may be taken from the dynamo supplying the house with light. Thus in Mr. Swan's house at Bromley a large Japanese calabash filled with roses, and placed every evening on the dining-room table, is lighted here and there by electric lamps done up in artificial rose-leaves, the current being led from the floor through the table and table-cover to the calabash lamps. The golden effulgence of the light suggests some new species of yellow rose. The artificial fruits of lemon and other trees are also lighted internally in the same way with pretty effect.



A New Windmill.

An ingenious new windmill, to which the inventor gives the name of "Pamemone," has been erected at Grand-Quevilly, near Rouen. It is really an air-turbine, as may be seen from the accompanying sketch. The axis is vertical and supported by a wooden scaffolding, which is ascended by a ladder not shown. The cylindrical wheel carries thirty vanes of light wood over 6 feet high by 1½ feet wide. These vanes can turn round their vertical axes, which are placed so as to divide the breadth up in the ratio of 1 to 2. The angle given to the vanes the better to catch the wind is controlled by the thin radial arms shown below the wheel. Now that electric accumulators give us a means of storing power it is probable that windmills will be revived to some extent, and the Pamemone of MM. Lequesne and Lefebvre appears to have several advantages over the older forms.

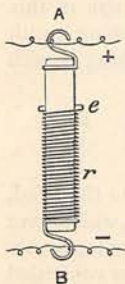


FIG. 1.

Fourgeot's Fire Alarm.

M. Jules Fourgeot has devised a simple fire alarm which he has called by a less simple name—the "Pyroménite." It consists, as shown in Fig. 1, of an insulating stem of porcelain, A B, having two metal hooks, A and B, fastened to the ends. These hooks link with two bared wire conductors (+, —) in circuit with the positive and negative poles of a voltaic battery and an alarm bell. A spiral

spring, *r*, fixed to one hook, B, encloses the insulating stem, but is held back from making contact with the upper hook, A, by two little triggers or detents, *e*, of fusible metal, let into the porcelain stem. This arrangement is seen in Fig. 1. When, however, an outbreak of fire melts the plugs of fusible metal, the spring, *r*, makes contact with the hook A, and the electric circuit is thus completed, causing the bell to ring. This condition is shown in Fig. 2. A number of these alarms can be connected in one circuit so as to protect all the rooms of a house.

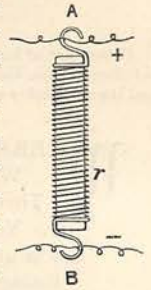


FIG. 2.

A Floating Telescope.

At the Brussels Observatory a large telescope has been installed, which floats on water to permit of its smooth and easy movement. The system is so successful that it is to be adopted for a new one to be erected in Paris. Provision is made to keep the water from freezing in winter time.

A New Tricycle Saddle.

A very convenient tricycle saddle has recently been brought out. This saddle is supported by a spiral spring, whose tension can be altered to suit the rider's weight. Ventilation is efficiently provided for, the leather is cushioned on the seat, and the back-rest is formed by a cyclist's wallet, which also holds his oil-can, tools, and other necessities.

Frozen Meat.

Meat is now frozen in Sydney and sent in refrigerated chambers by steamers to London. The hulk *Rica Genova* is fitted up with the freezing apparatus in Darling Harbour and can accommodate the carcasses of 10,000 sheep or 1,000 bullocks. The cold is produced by compressing air, cooling it, then permitting it to suddenly expand. In this way a temperature of 72° below zero is obtained in a few seconds. This cold air is then let into the freezing chamber where the carcasses hang. A sheep is completely frozen in 36 hours, a bullock in five or six days. The frozen carcasses are transferred to the freezing rooms of the Orient steamers and conveyed to England, at an extra cost for freight and freezing of 3d. per pound on the price of the meat in Sydney.

A New Breakwater.

A cheap but effective breakwater has been devised by Mr. Greenaway and named after him. The principle on which it is made is to divert without totally resisting the action of the breakers. The accompanying illustration (Fig. 2) will explain its peculiar mode of action better than words. The breakwater consists of a line of buoys of triangular



FIG. 1.

shape and concave sides. The pointed prow is turned towards the sea. The buoys are each moored by an anchor fore and aft at a distance from each other of a buoy-width. They draw ten feet of water, and each wave as it meets them is cleft in two and diverted to the right and left. This action leaves the water calm within the protected circle. Fig. 1 gives the shape and dimensions of the buoys.

As every one knows, an umbrella or stick ends in a metal ferrule, the object of which is simply to prevent the wear of the staff. By a "happy thought" Mr. Henry Heath has devised a ferrule which serves a double purpose. In making it of gun-metal a guarantee is thereby afforded of its durability, and further, by constructing it of sufficient length and of a square shape instead of round it becomes transformed into a



A NEW BREAKWATER.—FIG. 2.

Waterproof Canvas.

Sackcloth or canvas is made as impervious to wet as leather by steeping it in a decoction of 1 lb. of oak-bark in 14 lbs. of boiling water. This quantity of liquor is sufficient for eight yards of stuff. The cloth has to soak twenty-four hours, then is passed through running water and hung up to dry. The flax and hemp fibres absorb the tannin and are rendered more durable as well as water-tight.

Copying Fossil Prints.

A simple method of getting prints in ink of fossil forms has been communicated to the Society of St. Etienne Engineers by M. Fayol. It consists in painting the object with ink and taking an impression on moist paper; but when the fossil will spoil by wetting it is first brushed over with dilute silicate of potash, which on drying leaves a thin layer of silicate over the surface. This artificial surface takes the ink well and gives a good impression after.

A Novel Railway Key.

An ingenious mind has hit upon the device of furnishing umbrellas, canes, and walking-sticks with a novel and serviceable feature without in any respect impairing the primary usefulness of these articles.

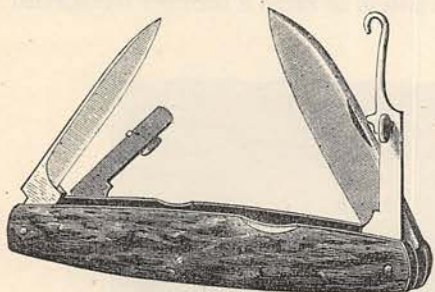
capital railway key—always at hand and often likely to be of great use. In connection with this "Dunbar tip"—the name by which the ferrule has been registered—it is interesting to note that there is high legal authority for the opinion that any one is at liberty to carry and use a railway key. Obviously the manufacture of such keys is quite legitimate, and it has been stated by eminent counsel that, even when there is a bye-law, their use might be perfectly justifiable.

A Tricycle Boat.

The novel experiment of crossing the Channel on a tricycle was recently accomplished successfully by a seafaring man named Terry. The tricycle is an invention of his own, and is so constructed as to form the framework of a boat. The latter is 12 feet long by 3 feet 9 inches wide, and 2 feet deep. It is formed of a single covering of tarpaulin. The rider carries the tarpaulin and a pair of sculls with him by road, and when he wishes to cross a river or lake, transforms his tricycle into a boat and launches it. The frame of the tricycle is constructed to serve the double purpose with a little alteration. Mr. Terry completed the journey from Dover to Calais in eight hours. He then re-formed his tricycle and proceeded to Paris by road.

An Easily-opened Pocket-Knife.

The difficulty sometimes experienced in opening the blades of pocket-knives that are either stiff or furnished with strong springs is well known. Often enough a finger-nail has been seriously damaged or the hand cut in the process. The accompanying engraving shows an ingenious appliance for remedying the defect. This



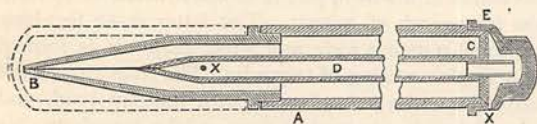
consists of a pivoted blade-raiser, adapted to shut within the handle, and supplied on its inner side with a stud for catching in the notch in the knife, and on its outer side with a knob to receive the pressure of the thumb. These raisers may be used solely for the purpose of lifting the blade and need not, in such case, be longer than the notch; or, by making them work on the same pivot as the blade, they may be made nearly as long, and employed both for opening the knife and also as button-hooks or nail-cleaners. This simple equipment may, it is said, be readily applied, at a trifling expense, to knives that have not been originally provided with it.

An Incombustible Insulator.

Mr. A. Parkes has devised a new material for insulating electricity on wires, which has the valuable property of not catching fire. It consists of paraffin, castor oil, and india-rubber in certain proportions, mixed with oxchloride of zinc.

An Electric Tram-Car.

A tram-car lighted and propelled by electricity stored in Faure accumulators was recently run in Paris along the Quai de la Conférence and back, the speed being eleven miles per hour. The accumulators weighed 2½ tons and were stored under the seats. The experiment is considered successful, but it is probable that the question of cost has not been sufficiently considered.



A New Stylographic Pen.

An improved writing-pen has been brought out in New York. As illustrated in section, A is the holder of metal or ebonite. A conical point with a fine iridium tube for nib, B, is screwed into it, as in the ordinary

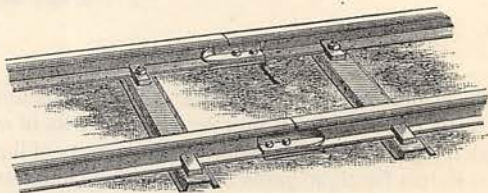
pen of this kind. A diaphragm of soft rubber closes the other end of the holder, and also supports an air-tube, D, ending in a needle which runs into the hole of the iridium nib. A hole in the air-tube at X allows air to enter the ink-holder or outer tube, A, to replace the ink expended in writing. This air-tube, D, opens into an air-chamber formed by the cap, E, which screws on the holder and permits air to enter the pen by the hole, X. The spring of the rubber diaphragm at C renders the writing very pleasant.

An Anti-Torpedo Vessel.

Sir E. J. Reed, the well-known naval architect, has suggested a novel kind of invulnerable war-ship. He proposes to construct a vessel with convex decks to contain engines, battery, stores, magazine, men's quarters, &c., supported by a lower portion that shall take the form of a cellular boat, consisting solely of small air-tight and water-tight compartments. These, as readers are probably aware, will enable a ship to float in spite of local injury; but even should the whole of the lower vessel be destroyed by a torpedo, or other "infernal machine," the upper vessel would then become a serviceable raft. The convex deck would deflect missiles and the under portion would be the only means of ready movement, though if the worst came to the worst the upper portion would float, although it might not lend itself easily to manœuvring.

An Iron Permanent Way.

It is sometimes necessary at home as well as in the colonies to lay a light railway track for private purposes; and the iron way exhibited at the recent



Engineering and Metal Trades Exhibition appears well suited for this purpose. As shown in the figure, it consists of rails in lengths easily carried by two men. These are joined by fish-plates on the sides of the track. The sleepers are of iron too, and formed as well as laid in the manner shown. Such a railway can be rapidly laid or lifted and transported to another place.

Another Electric Launch.

A launch, propelled entirely by electricity, and well suited for pleasure purposes, owing to the absence of smoke or noise, has been constructed at Millwall. It is constructed of galvanised steel, is 40 feet long by 6 feet beam, and draws 2 feet 9 inches of water. The dynamo-electric machine or electric motor—a Siemens dynamo of the type called "D 2"—is connected directly to the propeller shaft. The reversal of the motion is effected by two pairs of brushes on a rocking shaft; one pair sending the current through the motor in a direction opposite to the other pair, and thus

securing a backward or forward motion of the vessel. Cords are led from the brushes, or rather their rocking supports, to the hands of the steersman, who thus acts as helmsman and engineer in one, and has the steering of the craft entirely under his control. The launch carries eighty of the Faure-Sellon-Volckmar accumulators, each containing a power stored equal to one horse-power for an hour. Sixty-five are employed at once, the rest being used in reserve. The dynamo can transmit eight horse-power if need be, and the boat can be run full speed for ten hours; but, as is well known, it is not desirable to entirely empty the accumulators. At half-speed a longer distance can be traversed. The battery boxes stand along the keel under the floor, and serve as ballast; the weight of the craft when void of passengers being four tons. No deck-space is thus taken up with engine and boiler, as in steam-launches; thus a vessel forty feet long can carry as much as a steam-launch ten feet longer. There is besides no smell of oil, smoke, steam, or cinders, and the motion of the vessel is as noiseless as that of a row-boat. The speed of the launch is eight and a half miles per hour, and she recently made a trip from Temple Pier to Greenwich in forty minutes with the tide. Later in the day she made the return journey. These electric launches are well adapted for pleasure-trips, and it is not unlikely, therefore, that if the builders were to take steps to provide electric stations at Richmond, Windsor, Oxford, and at other points on the river, electric launches on the Upper Thames would soon be seen in operation. Electric stations are necessary to renew the electric store in the accumulators.

A Portable Blow-pipe Lamp.

A cheap, clean, and portable blow-pipe lamp, burning paraffin wax, has been devised by Mr. J. S. Thompson. As shown, it consists of a brass vessel, A, having a tube or wick-holder, B, of copper. This is carried down into the lamp, as shown in Fig. 1. The use of copper is to conduct some of the flame-heat to the paraffin to melt it. The small holes, C C, permit overflow of wax to drip back into the holder, A. As shown in Fig. 2, the lid is perforated at D to admit air to the interior. The channel, E, serves as a support for the nozzle of the blow-pipe. The wick should be soft and loose, and fit the tube as closely as possible. The paraffin is fed in lumps, but melted paraffin should be poured in to begin with, in order to soak the wick.

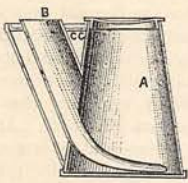


FIG. 1.

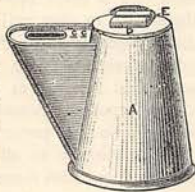
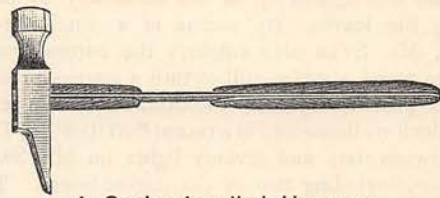


FIG. 2.

Coloured Prints of Flowers.

A pretty process for taking coloured prints of flowers by means of aniline colours has been devised by M.

Cyme, of Marseilles. The fern or plant is flattened and dried by a hot iron as if for preservation in a herbarium. The surface to be copied is then painted over with aniline dissolved in alcohol or wood-spirit. The paper to receive the print is damped with water, dried with blotting-paper, then placed on a sheet of tin-foil. The painted plant is then laid over it with the coloured face downwards, and pressed on the paper below by laying another sheet of paper over it and passing a roller or a cold iron over the latter. Several impressions may sometimes be got from one plant, especially if a violet print of methanylene be taken. To prevent blurring of the first proofs from redundancy of colour, the painted surface may be re-touched by a brush dipped in a solution of saltpetre or marine salt. Aniline colours have a great variety of shades, and with a little skill the natural colours of the plant can be closely imitated in this way.



A Spring-handled Hammer.

The annexed woodcut represents a hammer provided with a novel kind of handle, whereby not only is "truer" work performed, but muscles and nerves are saved, while a more rapid rate of work is attained. The handle is securely riveted to the hammer and supported by two wooden stays, while the handle proper is formed of two half-handles fastened together with a strip of leather placed between them. With this hammer the blows delivered are cleaner and stronger, and it is pleasant to use. It is adapted for heavy as well as for light work; the handle can be adjusted to all kinds of hammers, and indeed to all tools with which blows are struck.

An Electric-lighted Villa.

Lauriston House, Bromley, the residence of Mr. Swan, is now lighted throughout by electricity, and forms one of the most interesting private installations yet made. It is remarkable for its completeness, every room being lighted by the current, even to the coal-cellars and gate lamps. The lights are all controlled by small switches placed by the door, so that a person entering a room, say a bed-room, can light it up before going in, and darken it on leaving again. Again, if a light is wanted for the toilet-table or the writing-desk, it can be had in a moment by touching the proper switch. One of the beds has a reading-lamp just over the pillow for an invalid who desires to read, and the switch is ready to his hand. The gate lamps are controlled by switches in the engine-house. The drawing-room is lighted by three elegant brass chandeliers, holding six floral cups of pale blue glass, in each of which is a Swan incandescence lamp of ground glass. These lamps are controlled by switches,

one for each chandelier, against the wall. Besides these chandeliers there are six wall brackets with crystal reflectors behind. In the dining-room there are two chandeliers having globes of the new crinkled glass, which has the effect of fractured ice illuminated inside. The glowing filaments of the lamps are always shaded from the eye, either by ground glass bulbs or globes, except in the case of the cellar lamps. The nursery lamps are suspended by brackets from the ceiling, out of the reach of the children, and they can if necessary be protected from injury by wire netting. The dining-room table is further lighted by movable standard lamps, to which the current is led by wires through the floor and table, the connections being made by wires from the lamps, ending in bare metal bodkins, which are inserted through the table-cloth into holes in the table, through which the wires come. Flower table ornaments and artificial lemon-trees are also lighted up in the same way by lamps among the leaves. By means of a small electric motor, Mr. Swan also employs the current from a lamp to grind a coffee-mill or turn a sewing machine. He also provides lights for the candle by a device like that which we illustrated in a recent *GATHERER*. There are between sixty and seventy lights on Mr. Swan's premises, including two in the engine-house. They are supplied by two Otto gas-engines, each of half-horse-power nominal, but capable of developing two horse-power. Each drives a Siemens continuous current dynamo of the smallest size, and thirty Faure-Sellon-Volckmar accumulators are charged for an hour before the lighting of the house begins at night. The two dynamos feed thirty lamps when running, and the accumulators feed any extra ones required, besides yielding odd lights about the house by day. The engines consume seventy-five cubic feet of gas per hour, which, consumed in gas-lighting, would give thirty fifteen-candle jets; but the thirty electric lights are rather over fifteen candles in power, and the light is far more agreeable, pure, and healthy. This new installation of Mr. Swan's is, so far as we are aware, the first realisation of the coming state of things foreshadowed in our recent articles on "Household Electricity."

Tramway Omnibuses.

On the Hamburg tramways a new vehicle, which can leave the track and return to it as readily as an omnibus, has been introduced. The wheels of the car are flangeless, like an ordinary omnibus-wheel, but a shaft carrying a disc wheel is fitted before each wheel, and the driver can raise or lower it at will into the grooves in the line. This disc wheel keeps the car on the line when it is desired to do so. The arrangement works well, and saves much inconvenience.

A Petrified Forest.

A very extensive forest of petrified trees has been discovered at Corizzo, on the Little Colorado, New Mexico. Ten miles from Corizzo the road enters an immense basin enclosed by high clay banks. The washing away of the clay strata by rains has exposed

hundreds of acres of petrified trees—some standing, others prone. Trunks, five feet in diameter, of solid stone are scattered about, and the ground is literally encumbered with twigs and branches. Many of the small branches and the trunks were thoroughly crystallised, and the "beautifully tinted cubes sparkled in the sunshine like so many precious stones. Every colour of the rainbow was duplicated in these crystals and those of amethyst-blue appeared to be the real gem." While upon this subject we may mention that Mr. Norris has found a new marvel in the Yellowstone Region in the shape of a "Goblin Labyrinth," formed of an immense number of stone pillars and tables confusedly mingled and taking every imaginable shape. The labyrinth was formed by rain denuding the softer rocks and leaving the harder veins and boulders.

An Experiment in Social Reform.

A LETTER TO THE EDITOR.

SIR,—I have read with considerable interest the opening of a discussion in the "Family Parliament" on a scheme for "National Assurance," and as a small contribution towards the solution of the difficult question of national pauperism, I venture to send you the following account of a social experiment which is now being tried in Westphalia, in Germany.

A charitable association, under Imperial patronage and approval, has been formed, and an agricultural colony has been established with this end in view: to lend a helping hand to all vagrants who may be willing to work, by offering them shelter, food, and clothing in return for their labour, so that the idle may be deprived of the excuse that they can find no work to do.

Farms have been bought in a favourable situation on the Lüneberg heath, where outdoor work can be done all through the winter, and on the land all necessary farm buildings have been erected, together with houses to accommodate 200 labourers. Every applicant for employment has to sign a contract setting forth that, being unable to obtain work elsewhere, he is willing to labour on the farm in return for food, shelter, and clothing. The association has been wise enough to see that if a pauper is to be raised from the depths to which he has sunk through vice or misfortune he must regain his self-respect, and as the first step towards this he is provided with a decent suit of clothes, which he pays for out of the first-fruits of his labour. The regulations require that when a man has earned his clothes he shall leave the colony, accepting whatever employment may have been found for him elsewhere. At the present time, as the colony is purely agricultural, it is not self-supporting, but it is hoped to make arrangements for the practice of all the commoner trades, so that vagrants may be employed at such work as they can perform most profitably.

All the subscribing members of the association—who pay at least half a mark (about 5d.) a year to the general fund—bind themselves to give neither money nor food to beggars, but to direct them either to the agricultural colony or to the nearest relief station. These relief stations, managed in a variety of ways, and situated at convenient distances from one another, are an important element in the scheme. The general regulation seems to be that persons having charge of relief stations must afford assistance to all applicants who bear tickets, and must provide them with means to reach the next station, first exacting, however, an amount of work equivalent to the cost of relief.

To my mind there are some promising elements in the scheme, and carried out on a small scale it has worked well. The results of its development will undoubtedly be waited for with some anxiety not only in the home of its adoption, but also in our own country.

I am, Sir, &c.,
POOR LAW.