

## WHERE'S SAM?

WE live, and soon our race is run :  
And still, for golden miles,  
On paths we trod, the ageless sun,  
The unworn morning, smiles.

Where's Sam? Where is the child I knew,  
Bright, resolute, and gay,  
The elder, bolder of the two,  
My champion in our play?

That nursery floor is now unstrewn  
With toys we used to share :  
May laughter echo, late and soon,  
And mirth be always there !

Where's Sam? Where is the daring boy,  
My faithful chum at school,  
Who swam with me—a fearful joy—  
The river deep and cool?

Who fought for me the common foe,  
Who cheered me, dull or sad—

Alone, companionless, I go—  
Where is that happy lad?

Where's Sam? Where is the gallant youth,  
With purpose in his face,  
High honour, loyalty, and truth,  
And bright ingenuous grace?

Who struggled to attain the prize,  
Nor paltered with a doubt,  
But spent his splendid energies,  
And carved his fortune out?

Where's Sam? Where is the thoughtful man  
Of large and kindly deed,  
My comrade since my life began,  
My truest friend in need?

He comes no more from day to day,  
The steadfast, strong, and brave :  
And love and grief can only lay  
Their garlands on his grave !

## THE GATHERER:

AN ILLUSTRATED RECORD OF INVENTION, DISCOVERY, LITERATURE, AND SCIENCE.

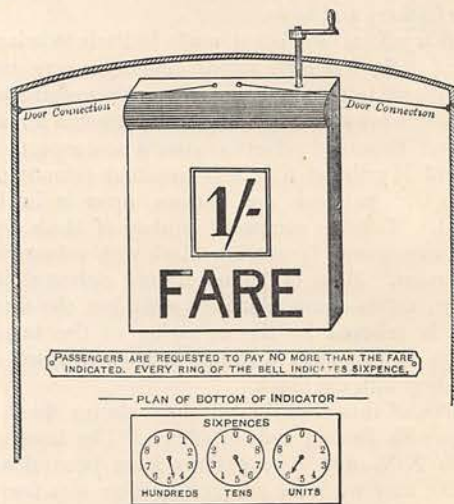
Correspondents are requested, when applying to the Editor for the names and addresses of the persons from whom further particulars respecting the articles in the GATHERER may be obtained, to forward a stamped and addressed envelope for reply, and in the case of inventors submitting specimens for notice,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

## An Electric Saw.

MR. H. N. WARREN, a chemist of note, has found that a platinum wire of moderate thickness will cut the hardest wood if it is heated to a bright red by the electric current. There is nothing new in this; but Mr. Warren was led by the frequent breaking of the platinum wire to prefer a steel one coated with platinum to prevent its oxidation. His method of coating the steel wire is to heat it red-hot by the current, and immerse it in a chemical solution of platinum chloride.

## A Cab-fare Indicator.

Our illustration shows a small indicator to be put in cabs in order to tell the correct fare to the passenger. The mechanism consists of a narrow tape on which the fares are printed, and which is caused to travel past the aperture in front of the indicator by means of a drum and coiled spring manipulated by turning the handle. The tape is worked by the cabman, every revolution of the handle augmenting the exposed fare by sixpence. At the same time a bell rings for every additional sixpence. Any backward movement of the



handle is prevented by the mechanism, but when the passenger opens the door of the cab to leave, the tape is brought back to zero, where it remains until another passenger enters. Should the driver cause a



passenger to pay more than his right fare the excess would be returned on reporting the matter to the proprietor of the cab. Having no interest in overcharging, the cabman would probably not attempt to do so.

**A Discovery in "The Broads."**

In some of the rivers and "broad waters" of Norfolk, a small hydroid has been taken this summer, living under conditions which, if maintained, will cause considerable modification in the generally received views concerning it. This little animal is *Cordylophora lacustris* (the "club-bearer" that lives in lakes), so named by Prof. G. J. Allman in 1844. These animals form tree-shaped colonies, from one inch to three inches in height, springing from a base something like the root stock of a fern. At the end of the branches the polyps, or hydranths,

COLONIES OF CORDYLOPHORA ON STEM AND LEAF OF POND-WEED.

bearing sometimes as many as sixteen tentacles, are situated. With these tentacles the prey is seized and conveyed to the mouth at the upper extremity. Prof. Allman, in his book published by the Ray Society (1871), says that *Cordylophora* "is a light-shunning animal, delighting in such obscure places as the under side of a large log of floating timber, and always avoiding exposure to the direct rays of the sun."

This statement was founded on the habitat of all the animals whose capture had been recorded up to that date, and no one seemed to doubt its correctness. Of late the animal has been met with from time to time in Norfolk, and this year it has been found in vast quantities in the Thurne, not only on submerged roots and stems, but in innumerable colonies on stalks and half-decayed weed, floating on the surface of the water, exposed to the full power of the sun. Strange to say, these colonies appear much cleaner and stronger than those growing in what was formerly supposed to be the normal habitat. Those figured were taken from the top of the water near Potter Heigham Bridge, and were sketched from life. They are now living in the three-pound jam jar in which they were brought from

Norfolk, and a Toynbee student has some (taken at the same time) doing well in an ordinary bell aquarium.

**An Automatic Tram Starter.**

An ingenious device for assisting horses to start a tram-car has recently been brought out and tried successfully at Chiswick. It consists of coiled springs, which are wound up by the action of the brake in stopping the car, and then stored energy is afterwards applied to the wheels to force them round in starting the vehicle. The starter is applied by the brake handle, and has sufficient energy to propel the car thirty yards on a level. Part of this energy can also be utilised in helping the car round a sharp curve.

**Coffee as a Germicide.**

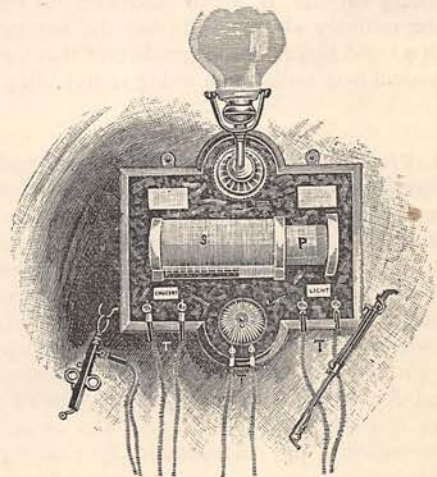
According to the experiments of Dr. Luderitz, an infusion of coffee made of 5 to 30 grains of the berry in 10 cubic centimetres of distilled water has the property of killing the germs of typhus, cholera, anthrax, and erysipelas. Periods, varying from two or three hours to as many weeks, are required to effect the purpose. Dr. Luderitz does not attribute the result to the caffeine, but to the products obtained in roasting the coffee.

**A Surgeon's Transformer.**

A handy transformer has been devised by Dr. Arnold B. Woakes, surgeon to the London Throat Hospital, and is specially adapted for the needs of medical men. It is shown in our engraving, and is designed to convert a continuous or an alternating current as the case may be, so as to light a small glow lamp for examinations, to heat a wire for the cautery, or to give "faradaic" shocks. To this end the transformer has three pairs of terminals, T T T, answering to three circuits from which the different currents required for such purposes are obtained. The outer ones are marked "cautery" and "light," the inner one for the shocks. An incandescent lamp of eight-candle power is fixed above the apparatus, and by its light shows when the current is passing through



HYDRANTHS OF CORDYLOPHORA, SHOWING TENTACLES, GREATLY MAGNIFIED.

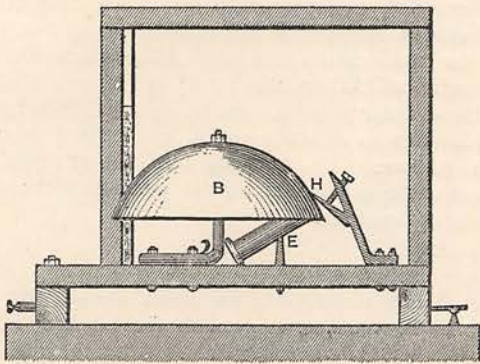




the primary circuit of the transformer. The primary circuit or coil, P, is seen drawn partially out of the secondary coil, S. By regulating its position with regard to the secondary the strength of the induced current is controlled. For the purpose of the cautery a maximum current of twenty ampères at an electro-motive force of six volts can be obtained. When a continuous current is supplied to the primary it is first interrupted by a special key. In dentistry as well as surgery the apparatus will be very convenient.

#### The Palsiphone.

M. Guerre, a French experimenter, recently exhibited the germ of a new musical instrument before the Academy of Sciences, Paris. It consisted of a



series of sonorous bodies—for example, bells, gongs, or rods—rapidly struck by a small hammer, vibrated by electro-magnetism, after the manner of an electric bell, but much faster. The tone of the bell or sounding body is thus rendered more musical and graver. It is, in fact, like the note of an organ pipe. Pending the development of his new instrument, M. Guerre and his collaborator have brought out a modification of it in the shape of an “*avertisseur chantant*,” which we illustrate: It is simply an electric bell, B, having an electro-magnet, E, fixed under it so as to actuate the vibrating hammer, H, which interrupts the current as in the ordinary electric bell; but the hammer gives such a rapid succession of gentle taps that the tone is a musical note rather than a ring or trembling peal.

#### Waterproofing Boots.

A French process for making a composition to render boots and shoes waterproof is the following: Mix of soda, 20 parts, oil of turpentine 50, tar oil 160, resin 25, linseed oil 16, isinglass 16, gutta-percha 125, and glue 25 parts, and apply it to the leather. We may add that a waterproof blacking can be made by mixing 60 parts of bone black, 45 of syrup, and diluting the whole with 12 parts of strong vinegar, then adding 12 parts of sulphuric acid. The mixture should stand for seven days, and then be diluted with 12 parts of caoutchouc oil. It may also be mentioned that vaseline is now recommended for cleaning rubber shoes.

#### An Underground City.

About sixteen miles from Kachar, on the Shahyar river, and in other parts of the same district, there are remains of subterranean towns. Some of the houses are still to be seen, either in tunnels through a hillside, or clinging to almost perpendicular cliffs. The walls of the underground dwellings are plastered and ornamented with geometrical patterns. Their origin is at present a mystery. We may add that Herr Lumholtz has gone to investigate the cliff dwellings of the Barranca, in New Mexico. These curious habitations are tenanted by a singular race of people, different from the Indians, and perhaps a remnant of the ancient Aztecs who built the “*pueblas*,” or communal towns, of Arizona.

#### Cradina.

The ancient Greeks believed that a part of the fruit of the fig-tree had a digestive virtue, and Dr. Mussi has now isolated the digestive principle in question, calling it “*cradina*,” after the Greek *krade*. It is a yellow substance, insoluble in water, but dissolving in acid or alkali. The liquid thus obtained will speedily digest moist fibrin. Cradina differs from pepsine by preserving its digestive properties in alkaline liquids, and from papaine by maintaining them in hydrochloric acid. It is obtained by filtering, evaporating, and treating with alcohol the juice of the fig-tree and its fruit.

#### The Comptograph.

The Comptograph is simply a calculating-machine in the form of a type-writer, which prints the results of every calculation which it makes and thus saves the time of users. It is likely to be serviceable in banks and offices where calculating-machines are required.

#### An Ideal Electric Light.

Some remarkable experiments which promise a new and more convenient kind of electric lamp in the future, have been made by Mr. Nikola Tesla, a well-known foreign electrician now resident in America. They have been described by him, in a lecture delivered before the American Institute of Electrical Engineers at Columbia College, and without going over the whole ground of his investigations we will give three of his leading results. The improvement of the dynamo has placed in the hands of electricians a new and powerful source of “*alternating*” or sea-saw currents, that is to say, currents which rapidly reverse their direction, and some curious effects have been obtained from them. Mr. Tesla has devised a form of dynamo which yields a current having more than a million reversals in a minute. Such a current in a wire may be compared to a “*surge*” of electricity, rather than a continuous stream. When passed through the primary wire

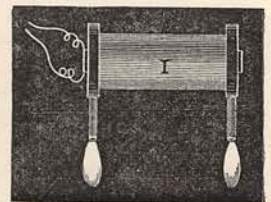


FIG. 1.



of an induction coil, the terminals of the secondary wire become tipped with light, as shown in Fig. 1, where I is the coil. They are veritable electric torches or candles, and the flames are hot as well as brilliant, yet nothing is consumed. We have in fact an intensified "brush" discharge or artificial

who are cast away at sea, or to the Irish peasantry of the west coast during a potato famine.

#### Mists on Hills.

Mr. John Aitken, whose researches on dust in the atmosphere have shown that fogs and clouds are formed by the collection of water vapour on the dust particles of the air, has now discovered that whenever mists are seen on hills, it means that there is an abnormal quantity of dust particles in the atmosphere there. He also finds that clouds often dissipate themselves in a steady shower of minute drops which do not reach the ground, they being evaporated by the radiation of the latter.



FIG. 2.

**St. Elmo's Fire.** Again, when a vacuum bulb or glow lamp containing a block or filament of carbon is brought in contact with one of these terminals, as shown in Fig. 2, the bulb lights up, and the carbon glows to a white heat, although there is no circuit for the current as in the ordinary incandescent lamp. Moreover, with the same current Mr. Tesla has produced what he calls an ideal method of lighting a room, by means of vacuum bulbs or tubes devoid of any electrodes or connections with the current. This method is illustrated in Fig. 3, where D is the dynamo generating the see-saw currents; C is a condenser, in circuit with the dynamo and the primary wire of an induction coil or transformer, T; and P P are two metal plates connected to the terminals of the secondary wire, as in the case of Fig. 1. Now the space between P P is found to be in such a condition that when a vacuum tube, especially if it contains a slip of metal foil on its inside or outside, is brought into it the tube is seen to glow with light, as shown in Fig. 3. Wherever the tube is placed between P and P it is illuminated, so that if a room had plates of metal in two opposite walls and these plates were charged with electricity in the manner indicated, a light could be had in any part of the room from a vacuum tube placed there.

#### Lignite Briquettes.

Experiments are now being made in Victoria with a view to utilise the lignite fields of the colony as fuel. Briquettes have been made of it, and found serviceable for locomotive and general purposes. One specimen gave 44.5 per cent. of volatile matter, 31.7 of fixed carbon, 9.8 of ash, and 14 of water.

#### Food for Castaways.

The copepoda is a minute inhabitant of the sea, which forms the principal food of the Greenland whale, and, according to the recent researches of Professor Herdman, it is capable of supporting human life. Captured with a tow net or trawl of a fine mesh, and served with butter, it was found to be quite palatable. The information may be useful to persons

#### The Wild Horse.

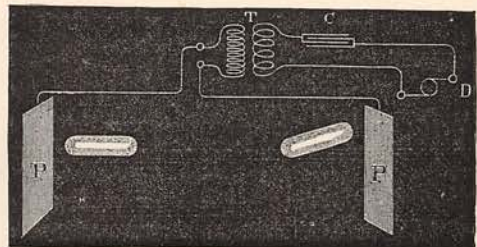
The so-called wild horses of the pampas of South America, and the mustangs of the Texan prairies, are merely Spanish horses, or rather ponies, run wild. But in the great desert between the Altai and Tian-Shan Mountains, Central Asia, a variety of the horse was found by the late General Prjevalski, which had the appearance of being a real wild species. It differed from the domesticated horse in that the long hairs of the tail did not begin till about half-way down, the mane was short and erect, there was no fetlock, the legs were thick, and, while the body was comparatively small, the head was large and heavy. This species, called the *Equus Prjevalskii*, after its first discoverer, has again been found in Central Djim-garia by the brothers Grum-Grzmailo, two Russian travellers.

#### Ocean Rollers.

The great waves or "rollers" which break on coasts in calm weather, have long been believed to indicate a distant gale; and Professor Cleveland Abe, an American meteorologist, has come to this conclusion after a study of them on the coast of Ascension. The Ascension rollers are the deflection of the windward swell on the leeward side of the island. "Double rollers" are, he states, produced by two sets of rollers coming round the right and left sides of the island and interfering with each other.

#### "Beggars All."

Under the above title Messrs. Longmans have published a very readable story of some 460 pages, by a



AN IDEAL ELECTRIC LIGHT.—FIG. 3.



promising young writer, Miss L. Dougall. The story turns upon the marriage of a well-educated and refined girl—reduced, through the failure of a bank, to very poor circumstances—to an intelligent self-taught man, who, left an orphan at an early age, was brought up at the expense of the parish. We will not go further into the plot but leave our readers to follow the couple through the vicissitudes resulting from so unusual a marriage. The story certainly possesses the merit of originality and the only thing to desire is that its ending had been a little less abrupt.

#### For the Young

Despite the many well-known and established fairy-tales, and their many versions, old and new, Mr. Fisher Unwin has decided to publish another series, the first volume of which is now before us,

entitled "The Brown Owl." In it the author—Ford H. M. Huefier—gives us a very pretty story, told in a simple manner, which is sure to delight the children. Dainty in appearance and attractive in reading, it deserves to be popular, and if its successors reach the same standard of excellence, we venture to predict that this series will become a favourite with young people, and, indeed, with their parents also. Turning from amusement to instruction, we have to notice another contribution to Messrs. Longmans' useful series of "Elementary Science Lessons," by Mr. W. Hewitt, B.Sc. This is adapted for Standard III., and is in every way a worthy companion to the volume for Standard II., which we mentioned some months ago. This series would form a valuable acquisition to the library of any teacher.

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## SHORT STORY COMPETITION.

### FURTHER AWARD OF PRIZES.

#### SPECIAL PRIZES.

AS announced in our last issue, additional Prizes, under the general conditions of the Competition, have been awarded to several competitors whose stories, though failing to obtain one of the three prizes originally announced, are far above the average.

Special Prizes of £4 each have been awarded to:—

ANNIE Q. CARTER,  
24, Heaton Road,  
Withington, Manchester;

EMMIE NICHOLSON,  
Woodford, Acton Homes,  
Natal, South Africa;  
and

L. SHARP,  
2, Coltbridge Terrace,  
Edinburgh.

Special Prizes of £3 each are awarded to:—

W. P. M. BLACK, Glasgow;  
A. MARSHALL BOSWORTH, Sherborne;  
BESSIE E. DUFFETT, Redhill;  
WILLIAM J. FOSTER, Bishop's Lydeard;  
CHARLOTTE FRY, Chobham;  
HELEN HARDIN, Montacute;

NORA M. MARRIS, Birmingham;  
FLORENCE E. McLAREN, Manchester;  
A. C. MURRAY, North Kensington;  
CAPTAIN CHARLES OZANNE, Chatham;  
MARY PRENDERGAST, Kingstown;  
ILSA REID, Edinburgh; and  
ETHEL L. SALMON, Bristol.

The Editor also considers the stories by the following competitors worthy of

#### HONOURABLE MENTION.

C. J. Blake, Worcester;  
K. de B. Bruce, Pallas Green;  
F. Cassin, Antigua, West Indies;  
E. G. Elliott, Dublin;  
G. Frankland, Liverpool;  
M. Gidley, Surbiton;  
R. Henry, Canfield Gardens, N.W.;  
R. Jenkins, West Ham Park;  
J. Kirkwood, Glasgow;  
Lieut.-Col. McCausland, Bournemouth;  
Mrs. Beaty-Pownall, West Kensington;  
C. Pullein, Crowborough;  
L. M. Rice, Crieff;  
E. W. Robinson, Leeds;  
L. K. Trotter, Edinburgh; and  
E. A. Wright, Cork.

