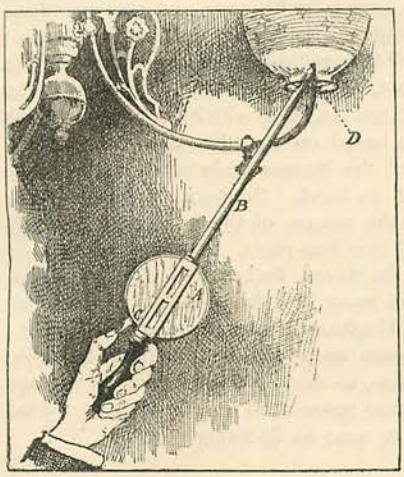
THE GATHERER:

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 Gas-Lighter.



The figure illustrates a device for lighting gas, invented by Mr. A. R. Molison, and known as the "Matchless." It consists of a flat vulcanite box, A, containing the apparatus which generates the electricity, and a stem or pointer, B, which applies the spark to the gas-jet. The generator consists of a small "influence" machine, which is started by pressing the thumb-key, C, on the side of the box. The rotation of a disc inside the box produces a supply of static electricity. which passes in a stream of sparks between two contact-points in the open end of the stem, D. The latter is tubular and contains a wire insulated from the metal of the tube, and forming with the tube the circuit for the electric discharge. The handle enables the contrivance to be readily applied. The apparatus is one of the few successful practical applications of static electricity.

Ideal Food.

Dr. B. W. Richardson, in recent lectures, has declared that, while man can live on animal and vegetable diet conjointly, and even sustain life on purely animal diet, he is originally a purely fruit and vegetable consuming creature, and with proper selection of his fare can economically live on the latter diet alone. In fact, according to Dr. Richardson, man is a vegetarian, though he can and does eat animal food. There is, perhaps, a probability of his diet in the future becoming of the purer and more humane description. He recommended nuts as a food, instancing the common filbert and the ground-nut as excellent foods; and he compared the banana to condensed milk. Dates he also considered a nutritious food; and so are figs. Oatmeal, so largely the food of the old Scotch, was preferred by Dr. Richardson to beef. Prime beef contains 50 per cent. of water, 30 per cent. of fuel food, 15 per cent. of flesh, and 5 per cent. of mineral; whereas good oatmeal contains only 5 per cent. of water, with 73 per cent. of fuel-food, 20 per cent. of flesh-formers, and 2 per cent. of mineral food. The latter class, as is well known, support the skeleton and denser parts of the body. The work derivable from 1 lb. of beef is 177 foot-tons (a ton lifted 177 feet), whereas that from 1 lb. of oatmeal is 488 foot-tons. With regard to the question of vegetarianism, Dr. Richardson declared that there was a good deal to be said on both sides, inasmuch as flesh was (at least to persons habituated to it) more easily digested than purely vegetable diet; but he pointed out that children took readily to vegetable diet. Diseases arose from carelessness and uncleanness in using both classes of food. On the whole, the evidence of Dr. Richardson goes to show that the vegetable world is competent of itself to supply the food of man, without any help from animal flesh, and to yield what Dr. Richardson has called the "ideal" food—that is to say, the best nutriment for human beings.

Asbestos Putty.

Asbestos putty is now manufactured for use in electric light installations. The asbestos renders it uninflammable. We may also add that tubes or pipes of asbestos are now made for running electric light wires in.

A Test for Olive-Oil.

M. R. Brulle, after a number of experiments, has adopted the following test for olive-oil:—To one grain of dried white of egg powder and two cubic centimetres of nitric acid, add ten cubic centimetres of the olive-oil to be tested. Heat the mixture gently for some time. When the acid begins to boil, incline the test-tube till the liquids mix more completely. A greenish-yellow colour will then indicate pure olive-oil. If any other oil be present, an amber tint will be visible. Colza, rape-seed, cotton, and linseed oils, all answer the test. The oil called exotic aveline gives a pink tint. The test is applicable when the adulterant is over five per cent.

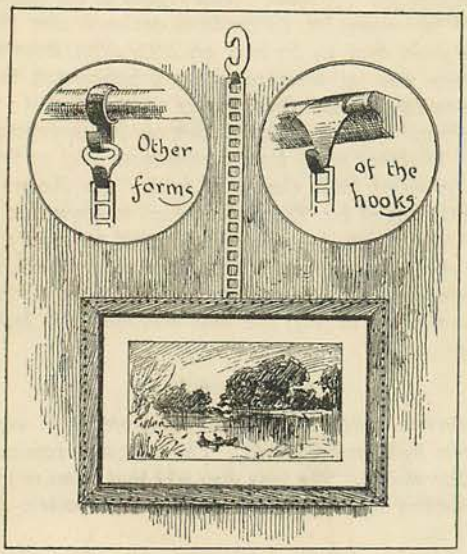
A Steam-Canoe.

A steam-canoe has been built for the Universities African Mission Society. The "Nyassa," as she is called, is intended for service on the lake of that name. She is 21 feet long, 7 feet in beam, and 3 feet deep. She draws 16 inches of water, and is provided with a centre board. The vessel is made of Delta metal and teak; and has two masts, the longer being fitted with a copper lightning-rod. She is driven by a three-bladed screw propeller, and can make seven miles an

hour with seven persons on board. The furnace is adapted for burning wood or other tropical fuel.

Digestive Tea.

A prepared tea has recently been introduced, for which is claimed the undoubted advantage of greater ease in digestion than the tea ordinarily prepared. By the patented process used it is said that tannin is entirely neutralised, and the injurious oils, to a great extent, extracted. Several doctors have made trials of this new tea, and agree in recommending it as not liable in any way to injure the nervous or the digestive system. Those who suffer from dyspepsia will, no doubt, be glad to hear of a tea which is quite safe for them to use.



A New Picture-Tape.

The woodcut shows a new picture-tape of steel or other metal, together with the hook by which it is hung from a nail. Other hooks are provided for hanging from rods. The figure shows the tape considerably reduced in size; and it can be broken into lengths between the fingers by bending and re-bending. The tape is not likely to snap and allow the picture to fall, as is sometimes the case with ordinary wire cord.

Electric Sentinels.

Mr. Drawbaugh, a well-known American inventor, has devised an arrangement intended to announce the approach or movement of bodies of troops. It consists of microphones enclosed in hollow iron tubes, buried in the ground. Wires lead from each of these to the general's quarters, where an indicator is placed. The vibrations of the tramp of marching men, by affecting the buried microphone, disturb the flow of an electric current in the circuit, and cause the indicator to give the alarm. The device is intended to assist the picket lines of an army in the field; but, if successful, it might have other uses.

Dress Cutting-Out Diagrams.

Some diagrams on sectional paper embodying a simple system for class and self-teaching, published by Longman, Green, & Co., have done good work with the Recreative Evening Schools' Association in teaching home dress-making. There are three sheets—one for the back, another for the front of the bodice, and one for the sleeve—on which also appear measurements for housemaid's skirts. Paper prepared with inch squares can be bought ready, and the plan of drafting is quite easy, and the directions are so minutely given, that they would seem to meet all difficulties, if the preliminary measurements of the waist, neck, bust, &c., are accurately taken. These dress-making diagrams, from which so many systems have arisen, are based on sound scientific principles. Each member of the human body is proportioned by the measure of its head. Sculptors ascertain these proportions by the square of the head, which square is again divided into four parts. A perfect waist in a woman should be seven inches less than the chest measure; but in most it is from one to three inches still smaller. Haphazard measurements are of no use; and accurate ones can be obtained by these excellent diagrams, so that no woman with an average amount of common sense need now be without a good bodice pattern, or wear an ill-fitting gown.

Gas for Locomotives.

Experiments have recently been made at Fort Wayne, on the Cincinnati and Louisville Railway, with natural gas as a fuel for locomotives, and for heating and lighting the trains. The gas is carried in steel vessels in a condensed form, and burned in the furnace of the locomotive as fuel. The experiments, which are still in progress, are being watched with great interest by American railway engineers.

A Combined Seat and Table.

The woodcut shows a convertible seat and table, which may be useful in workmen's clubs, schoolrooms or lecture-halls, and such places. By a simple mechanism at the back of the board, which is made

to fold, the latter is doubled up at right angles, or spread out flat, thus making a bench or a table at will.

A New Dynamo.

A dynamo of novel construction, and giving alternating currents, has been invented by Mr. W. M. Mordey. Contrary to the usual practice, in this machine the armature is fixed and the field magnets

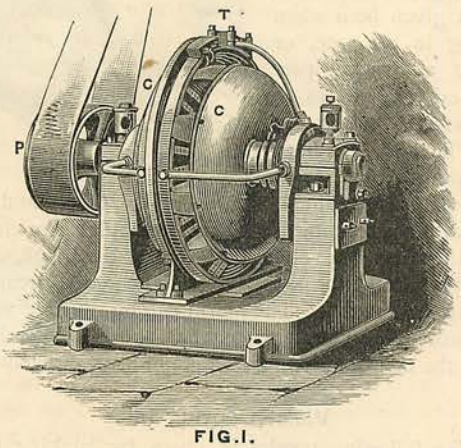


FIG. 1.

revolve. The entire machine is illustrated in Fig. 1; the armature in Fig. 2; and the field magnets enclosing it in Fig. 3. In Fig. 2 the coils of the armature, C C, consist of copper ribbon, each coil being properly fixed to a gun-metal ring, R, and the ends of the series brought to terminals at T, from which the current generated in them by the rotation of the field magnets is led away. The field magnets, M M (Fig. 3), are claw-shaped masses of soft iron mounted on a spindle, S P, and so placed as to enclose the armature coils between their talons, as shown. They are excited by the current from a separate Victoria dynamo not depicted; this current traverses an exciting-coil surrounding the spindle of the magnets and induces magnetism in the talons, such that each pair of opposite poles, N S, N S (Fig. 3), is of contrary polarity, "north" and "south," whilst adjacent poles on one side of the armature are of the same polarity, S S. The field is partially enclosed by copper covers, C C (Fig. 1), to check the air-draught when the machine is working. A pulley, P, carries the belt which drives the spindle; and other necessary devices, such as a collector for the exciting current, are provided. The machine is designed to supply alternating currents of high electro-motive force. It gives an output of 17½ ampères at 2,000 volts when running 650 revolutions per minute.

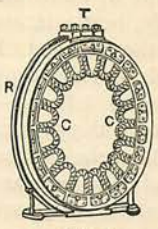


FIG 2

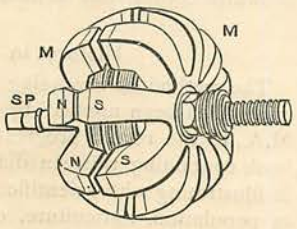


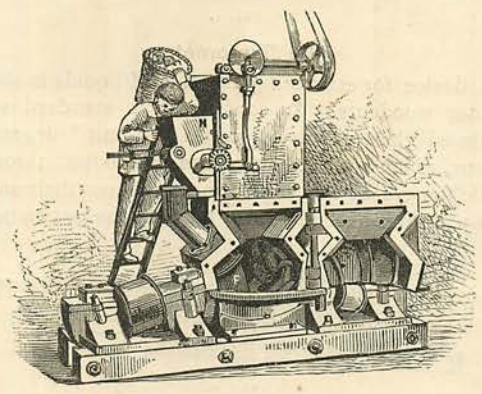
FIG. 3.

The Coldest Region.

According to the Russian meteorologists, the coldest spot yet found upon the earth is Werchojansk, in Siberia, where an observing station of the Government has been established. The mean temperature there for the year 1885 was 2·9° Centigrade below zero. For the month of January of that year it was 62·9° C. below zero, but for July it rose to 60·6° C. above zero. The lowest in July was 39·2° C. above zero; and in January the thermometer fell as low as 88·6° C. below zero.

Sorghum Sugar.

The British Consul at Chicago, in a recent Parliamentary Report, describes the results of experiments made during the last seven years in the United States to obtain sugar from Sorghum juice. The experiments show that this new industry promises to be profitable, and that six times as much value per acre can be realised by cultivating Sorghum in Kansas than from ordinary cereals. The Sorghum seed is also useful for fodder. The canes produce the sugar, but the seed and chips are also useful. The intention is to pursue the subject, with special care to the development of the Sorghum plant.



The Cyclone Pulveriser.

This ingenious machine is intended to pulverise quartz, rock, coke, plumbago, ores, bones, india-rubber, and other substances. It consists, as shown in the figure, of an iron chamber containing two fan-blowers, seen at F, with blades like those of a screw propeller. They are inclined to each other, but close together, and revolve in opposite directions, producing cyclones which conflict, and dash the raw materials against each other. The fans revolve at a speed of 2,000 revolutions per minute; and the air is admitted behind them by pipes. Hard materials fed into the hopper, H, can in this way be reduced to powder. We may add that the idea of the machine is said to have occurred to an American farmer, on seeing the devastation worked by a cyclone on his farm in the West.

Three Useful Novelties.

Whether the jocular saw which says that "The hat makes the man" be true or not, it is certain that all wearers of silk hats like to see them with glossy surfaces, and for their benefit there has recently been invented a "Magic Hat Renewer," which is very easily used and is very efficacious. The peculiar feature of the invention is the patented preparation of a silk handkerchief with which the hat is to be rubbed. Otherwise the appliance is very simple, and consists merely of this prepared handkerchief and a velvet pad.—Smokers will welcome a new safety pipe, which has recently been patented, in which a tiny roll of thin absorbent paper is inserted into the mouthpiece and catches any juice which may collect there. The paper does not spoil the draught of the pipe and does its work very well.—Housekeepers who go in dread of infection will be glad to hear that a new plate-powder has recently been introduced which not only cleans silver or plate, but also removes from it any danger of its carrying infection, as we are told it often does.

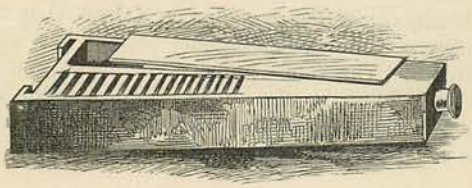


FIG. 1.

The Tintometer.

A device for estimating the tint of liquids is shown in our woodcuts. It consists of a standard scale of tinted glass supplying panes of "unit" degree of colour, which are put into slides and looped through, while the eye at the same time compares their united tint with that of the liquid. This is done by two tubes,

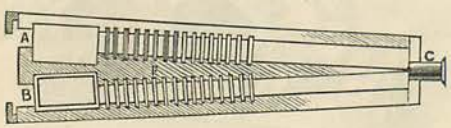


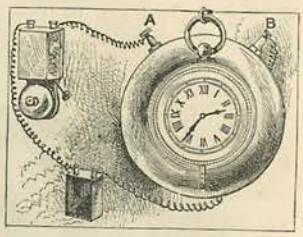
FIG. 2.

A C and B C (Fig. 2), meeting in one object-glass, C. The eye applied to C looks through the set of tinted glasses in the tube, A C, while it has a clear view of the liquid through the other tube. The glass panes are inserted in A C till the eye can distinguish no difference between their colour and that of the liquid. The glasses required to produce this result give the degrees of colour of the liquid, according to the scale adopted.

A Mechanical Burglar Alarm.

A mechanical alarm for telling the presence of burglars has been introduced. It consists of a bell attached to a small metal barrel containing a coiled spring, and acting like a spring roller blind. The bell is attached to the woodwork of the door or window to be protected, and a long thin cord is wound round the barrel. This cord is passed across the door or window. When the latter is opened ever so little the cord is displaced, and the bell is rung. The bell will also ring if the cord is cut or otherwise severed at any point; for example, by fire.

An Alarm Watch.



The woodcut illustrates a watch adapted to ring an alarm bell at a given hour when hung in its case, or even elsewhere, provided there is a "pocket" battery and bell handy. The hour hand as it moves over the dial makes contact with a small platinum stud fixed on an insulated ring, and thereby completes an electric circuit through a voltaic battery and alarm bell. The binding screws for connecting up the alarm circuit are shown at A and B. The alarm can be sounded at any minute to which the watch has been set beforehand, and the device may therefore be of use to travellers.

Violet Copying Ink.

The following receipt is given for making violet copying ink :—Dissolve 40 parts of extract of logwood, 5 of oxalic acid, and 30 of sulphate of aluminium, without heat, in 800 parts of distilled water and 10 parts of glycerine. Let the solution stand for 24 hours, then add a solution of 5 parts of bichromate of potassium in 100 parts of distilled water, and set aside for 24 hours. Next, raise the mixture to boiling-point in a bright copper boiler, and mix with it, while hot, 50 parts of wood vinegar. When cold, bottle it, and after a fortnight decant the liquid from the sediment. It writes a dark violet, and furnishes a bluish-violet copy.

A receipt for red copying ink is as follows :—Dissolve 50 parts of extract of logwood with 750 parts of distilled water, in a mortar and without the application of heat. Add 2 parts of chromate of potassium, and set aside for 24 hours. Then add a solution of 3 parts of oxalic acid, 20 parts of oxalate of ammonium, and 40 parts of sulphate of aluminium, in 200 parts of distilled water, and again set aside for 24 hours. Boil in a bright copper vessel, add 50 parts of vinegar, and after cooling, bottle it, well corked. After a fortnight decant the clear liquid. The ink writes red, gives brownish copies, and turns darker on the paper.

History in Curves.

The method of arranging statistics in the form of curves has been applied by Mr. Alex. B. MacDowall, M.A., to the recent progress of Ireland. In a little book containing thirteen diagrams he has succeeded in illustrating with scientific accuracy the fluctuations in population, agriculture, crime, education, emigration, evictions, and so on, which have taken place in Ireland during recent years. The facts were collected from official and other reliable sources, and have been arranged without political partisanship. Obviously,

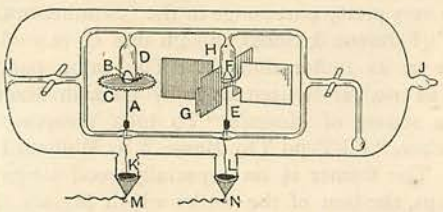
the method is a good one, and capable of similar application to England, Scotland, and other countries, thus summarising their progress or retrogression. It is also applicable to numberless other subjects, and is likely to come more and more into service in the future. The results can be seen at a glance, and readily compared.

A New Antiseptic Soap.

A Scotch chemist, Mr. John Thomson, has prepared a soap of strong antiseptic properties from the red biniodide of mercury dissolved in iodide of potassium. It is a very powerful destroyer of fever and other disease germs, more powerful than "carbolate of mercury." The biniodide soap has been used successfully in the treatment of eczema and other parasitic diseases—such as favus and ringworm.

The Radiograph.

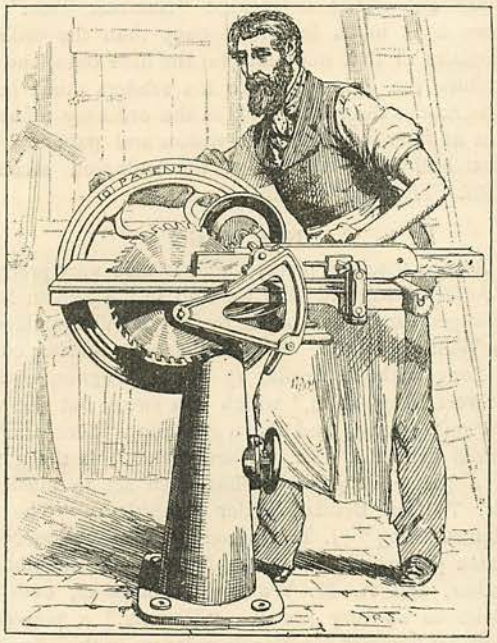
Photographic plates of slower action are better when they have a counter for timing the length of exposure. This is provided by the "Radiograph," an adaptation of the Crookes radiometer or "light-mill," so often seen revolving in the shop-windows of opticians. The radiograph is a radiometer which, at every rotation of the vanes, closes an electric circuit, and, through the medium of a relay, moves an indicating needle step by step. The figure shows its mode of action. An envelope of glass, I J, encloses a high vacuum in which a vertical steel pivot, E, supports a light cap, F, carrying the vanes as shown. Another vertical pivot, A, supports a cap, B, which carries a light toothed wheel,



C, made of aluminium. A projection, G, on one of the vanes makes contact with a tooth of the wheel at each revolution, and closes an electric circuit through N, E, G, C, A, and M, where N and M are mercury cups, into which dip the connecting wires, K L. The current in the circuit works the detached relay, and indicates a revolution of the vanes. The framework supporting the moving parts is of glass; and two short glass tubes, D H, serve to keep the caps, B F, in position. The current in the radiograph circuit is only strong enough to work a delicate relay, which brings into play a more powerful current to work the counter which records the number of revolutions. Such an apparatus tells the strength of the daylight, and so enables the photographer to time his exposure. Obviously it might be applied to other purposes—for example, in connection with electric lighting.

A Hand-Power Circular Saw.

Our illustration shows a neat and compact circular saw bench recently introduced. It is especially suit-



able for workers in wood who have no steam-power. The bench shown will take in a circular saw fifteen inches in diameter, and will saw wood up to six inches thick. One man can saw three-inch timber with ease. The wood is drawn up to the saw by a simple feed-motion, so that only one man is required to work the bench. It will also groove, "rabbet," saw on the bevel, and, by the addition of a simple device, cut out tenons. The machine is portable, and the table is adjusted to rise and fall.

A New Solder.

A soft alloy which adheres to metal, glass, and porcelain surfaces, and is invaluable when the articles soldered cannot bear a high degree of temperature, is made of the copper dust obtained by shaking a solution of sulphate of copper with granulated zinc. From twenty or thirty to thirty-six parts of this copper dust are placed in a cast-iron or porcelain-lined mortar, and well mixed with some sulphuric acid having a specific gravity of 1·85. To the paste thus formed are added seventy parts by weight of mercury while constant stirring is kept up. When thoroughly mixed, the amalgam must be well rinsed in warm water to remove the acid, and then set aside to cool. In ten or twelve hours it will be hard enough to scratch tin. For use it should be heated to a temperature of 375° C., when it becomes as soft as wax by kneading it in an iron mortar, and can be applied to surfaces.

The Royal Academy, 1888.

Most of the striking pictures in this year's Academy Exhibition have been reproduced in the special number of the *Magazine of Art* entitled "Royal Academy Pictures, 1888" (Cassell & Co.), which forms a pretty and interesting memento of the art work of the year. The Holiday Number of *Little Folks*

(same publishers) is entitled "Summer Tide." In form it is much larger in page than the ordinary numbers of that magazine for the little ones, and this enables the editor to give his readers much larger illustrations than is possible in the ordinary numbers. The number is full of good stories and papers. The first half-yearly volume of the enlarged series of *Little Folks* is now ready.

New Music.

A good teaching piece, which is also very pretty, is a *desideratum*, and this we find in "A Sylvan Lay," arranged for the pianoforte by N. von Wilm, published by William Czerny. From the same publisher comes a Song without words, by Oscar Wagner, entitled "Sweet Mignonette," which is a sweet, but not very original melody; and also a charming "Serenade" by Alfred Grünfeld. Mr. Gerard Bendall is the author of a pretty song which has been set to music by Mr. Wilfred Bendall under the title of "The Old Picture Song" (J. B. Cramer & Co.). "You May" (same publishers), of which Mr. Arthur Chapman is author, and A. M. Wakefield composer, does not strike us as very pretty. "Romola," a pianoforte piece by Leonard Gautier, is quite up to the average.

The Great Protector.

Mr. Frederic Harrison has written the life of Oliver Cromwell for Messrs. Macmillan's "Twelve English Statesmen" series in a manner which is deserving of all praise. Cromwell's career has never lacked critics since his own days, but no critic could be fairer than Mr. Harrison. So far as the limits of his by no means bulky volume allow, he has dealt with the main incidents of the great Protector's life. He shows us how Cromwell "grew ever larger, until he lay in his last sleep murmuring, 'My work is done'; in battle, a soldier who had never met with a reverse; and a statesman who, in a supreme place, never met with a fall."

Two New Stories.

There are some pleasing portraits in Mrs. Oliphant's "Joyce" (Macmillan & Co.), and there is much pleasant reading; but, on the whole, there is an indefinable air of melancholy about the book that we should have been glad to see avoided. All the same the book is a good one and decidedly worth reading, as are all Mrs. Oliphant's works. In "Beyond Compare" (Sampson Low & Co.) Mr. Charles Gibbon enters on a path in which we do not remember to have met him before. He has left Scotland—let us hope only temporarily—for the east coast of England, and has changed his Scottish characters for East Anglian ones. There is no lack of incident in the story, and we do not think Mr. Gibbon's readers will regret the journey with him.

Books for Everybody.

Walter Scott, Frances Burney, Bulwer Lytton—what library is complete without representatives of the works of these three writers, each typical of a school, and a good school, of English literature? Three of the most recent additions to Cassell's "Red Library" are a volume of Sir Walter Scott's poems, Frances Burney's world-famed "Evelina," and Lord Lytton's "Last of the Barons." In this attractive form these works should certainly find their way to such libraries as are still without them.

The Standard of Value.

Readers of our article on "What is Bi-metallism?" know how long and how fiercely the conflict has raged between political economists on the question of bi-metallism. The question is far from settled now, and any aid to its solution must be welcomed by all who are anxious to see this vexed problem at an end. We are glad to hear, then, that Mr. W. L. Jordan's excellent work on the "Standard of Value" (Longman & Co.) has reached its fifth edition. Whether we agree with his conclusions or not, we cannot doubt the honesty with which they are put forward, or the patient study by which they have been reached.

Songs New and Old.

Most of our readers will remember Mr. F. E. Weatherly's pretty verses entitled "Auntie's Rose," which appeared in our pages some little time ago. We are glad to welcome them now with a pretty musical setting by Frederic N. Lohr. Messrs. E. Ascherberg & Co. are the publishers of this song, and also of another well-written song by A. Romili, entitled "Dreams of the Past." Of "Kenneth and Marjorie" (same publishers), the music of which is by L. Denza, we can only say that it is very pretty. There are some very pretty part songs in the "Strathearn Collection" (Paterson & Sons), though one or two of them strike us as rather difficult. The same publishers send us two well-written songs by Hamish MacCunn, one a setting of Moore's "To Julia Weeping," and the other, "I'll Tend Thy Bower," by William Ferguson. The former is an especially good song. But, perhaps, the best of the works which Messrs. Paterson & Sons send us is "Fruhlingslied," a song, the words of which are by J. Hildesheim, and the music by Alfred Gallrein, which is arranged for the pianoforte with a violin and violoncello accompaniment.

Birds' Nests.

Mr. Fisher Unwin sends us a copy of the second edition of Newman & Christy's work on "Bird's-Nesting and Bird-Skinning." The first part of the work is admirably arranged in alphabetical order, according to the names of the birds; but we fancy that many a young student of natural history would be glad to have in such a work as this some full guide to the nests and eggs arranged according to colour and situation. On our table at the same time as this last work is another of Mrs. De Salis's helpful series of works on "Cookery *à la Mode*," from Messrs. Longmans; this time "Dressed Vegetables" afford the subject, and the author's hints are arranged in the same clever way as those in her previous works of the series which we have noticed.