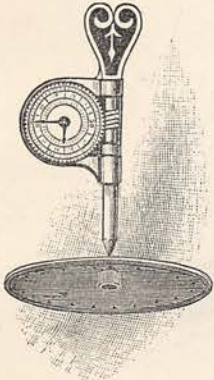


## THE GATHERER :

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.



### A Handy Measurer.

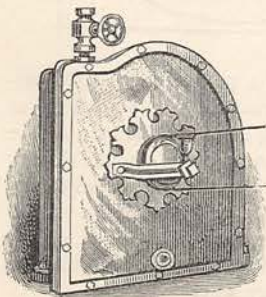
This neat little device for measuring distances will be useful to engineers and others as a substitute for the clumsier measuring tape. It consists of a thin disc or wheel eight inches in circumference, which is mounted on an axle that revolves, and by means of a screw works a counter. When the edge of the wheel is run along the distance to be measured, the number of revolutions it makes is registered upon the

dial, and two-thirds of that number is the length in feet.

### A Game for Small Lawns.

We have before us the rules of "Poko"—a new lawn game which was, we believe, first played during last season, though it was patented some two years ago. The game is intended, primarily, to meet the wants of those who have available for use a lawn which is not large enough for lawn tennis. For Poko the lawn need not be more than thirty-nine feet by seventeen feet for two players, or thirty-nine feet by twenty-six feet for three or four players. A net is used as in lawn tennis, and the chief difference in the marking of the ground for the two games is, that in the new one it is the outer court which is always divided by the half-court line instead of the inner court. The game is played with rackets and tennis-balls, and the ball must always be struck *on to the ground* before it bounds over the net. "Volleying" a ball in play is allowable; but the "volleying" must be on to the ground on the striker's side of the net, the object of this, and every other stroke in the game, being to make the ball bound over the net after leaving the ground. The game is worth trying where tennis is not possible.

### A Domestic Water-Motor.



A small water-engine for domestic and general purposes is illustrated herewith. In the home it will be useful for driving washing machines, churns, sewing machines, coffee mills, and so on. It is portable, and will work wherever a small supply of water under

pressure is obtainable. Inside the outer case there is a drum mounted on a spindle, and having several cams round its rim. The water entering by the supply pipe strikes the cams and turns the drum, escaping by an exhaust pipe. The working parts are of hard steel, gun-metal, and brass, and can be readily renewed. The motor will drive light machinery from an elevated cistern, but a pressure of twenty pounds is recommended. It is made in various sizes, from a half to three-man power.

### A New Life-Belt.

The life-belt which we illustrate is a jacket or vest of duck or canvas fastened by straps in the manner

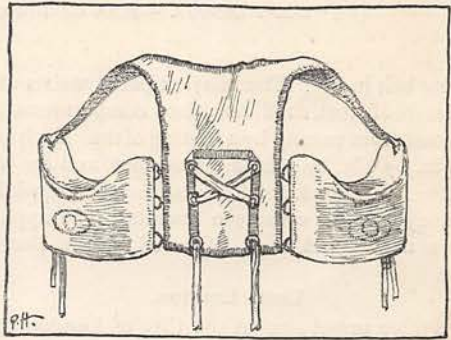
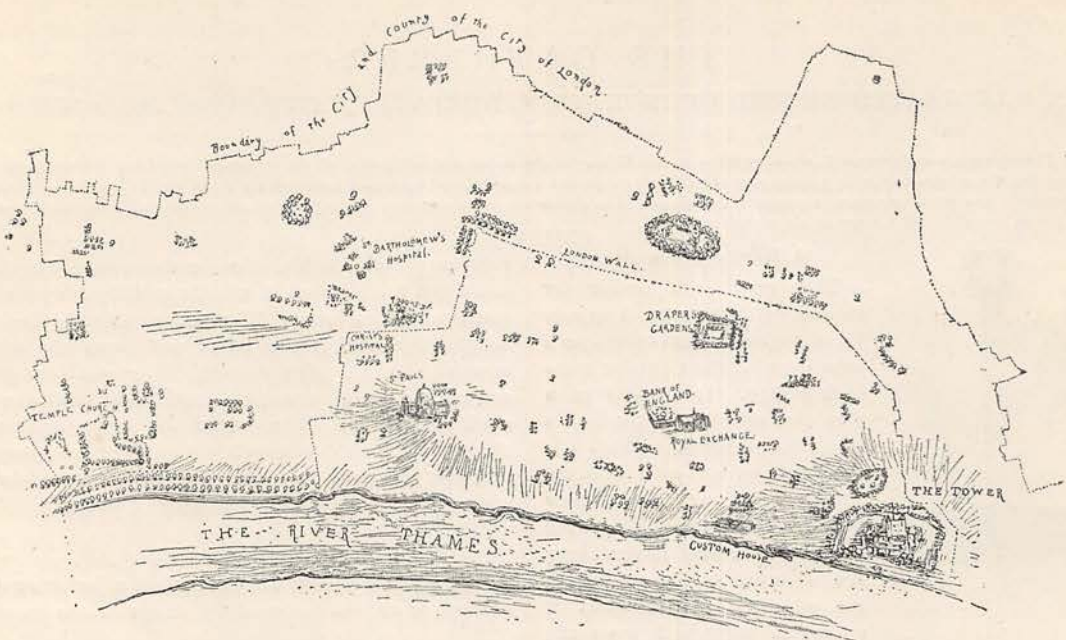


FIG. 1.

shown in Fig. 1, which is a back view, and from which the construction will be understood. Fig. 2 shows



A NEW LIFE-BELT.—FIG. 2.



"LEAFY LONDON."—PLAN OF THE CITY AREA, SHOWING ONLY THE GROWING TREES.

the new belt in use. The buoyant part consists of two air-vessels of steel, subdivided into compartments, and preserved from rusting by a coating of tin. Each vessel is  $10\frac{1}{2}$  in. by 9 in. by 4 in. in dimensions, and the whole jacket weighs only four and a quarter pounds, while its buoyancy exceeds seventeen pounds. The appliance has, we understand, been approved by the Board of Trade.

#### Leafy London.

It is often urged against the City of London that it is without trees, as compared with Paris and other Continental cities. But Leigh Hunt used to say that one could not take a street in the City of London from which it was not possible to see at least one tree. Some of the trees of his day have gone down before the improvements of recent years, but many more remain than most people know. They are lost in the maze of streets and buildings, but if we could imagine the site of the City cleared of all houses, as our artist has depicted it, the comparatively small area would be considered fairly well wooded by the trees which are standing and flourishing to-day. When London is compared with Paris it is probable that the broad Boulevards are taken as representing the French capital, and it must never be forgotten that Paris has far less suburban life than London. There are treeless districts of Paris, on the one hand; and, on the other, suburban London is quite as well wooded, taking it all in all, as the residential portion of Paris.

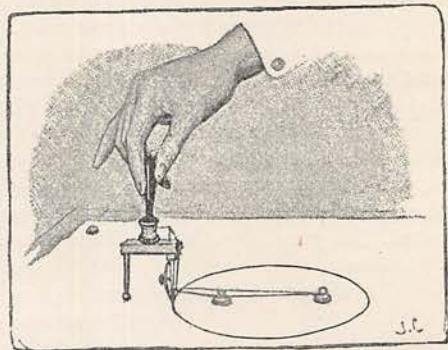
#### Milk by Pipes.

An American company is now supplying milk to different local dairies in New York by a system of pipes like that used in distributing water. The milk is contained in a central reservoir, and retailed to customers

at the dairies from the tap. While upon this subject, we may mention that the Academy of Sciences, Paris, has recommended that all milk used in a liquid state should previously be boiled in order to destroy any germs of disease there might be in it. Recent investigations have shown the sanitary importance of this measure.

#### A Simple Elliptograph.

The elliptograph for drawing ellipses, which is shown in the engraving, is based on the method requiring a pencil and a thread whose ends are fixed at the two foci



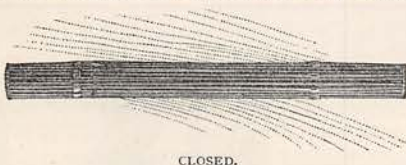
of the figure. It consists of a pen or pencil fixed perpendicularly to a small horizontal bar, supported at the other end by a leg rolling on a ball-point. Above the bar is a small reel, wound with a double thread, and over that is a handle. The thread passes to the point of the pen and is held in place by a screw. Two pins are fixed in the paper at the foci of the ellipse, the thread is carried round their heads, and the curve is drawn in the ordinary way.



A NEW PORTABLE SEAT.—OPEN.

#### A New Portable Seat.

Even the most enthusiastic devotee of the gentle craft may be pardoned if he prefers a comfortable seat, which he can carry with him, to the dangerously damp bank of the stream. Our illustrations show a new seat which has been invented and patented by Mr. George Gathercote, himself an experienced angler. It is constructed of jointed metal ribs, like those of an umbrella, and when folded can be easily carried with



the rod, as its weight is less than two pounds. When the desired spot is reached, all that it is necessary to do is to put the bottom of the stool on the ground, and press steadily downwards, when the frame opens automatically in the manner shown, and furnishes a firm seat, 13 in. in height and 12 in. in diameter. A folded newspaper provides all that is necessary as a cushion; and when the seat is done with it may be closed, as readily as it was opened, by pulling a ring at each end of the frame. Of course this seat is equally available for use by artists, and in other outdoor sports than angling, such as on cricket and lawn-tennis grounds.

#### A Bathing Butterfly.

Mr. G. Lyell, junior, of South Melbourne, reports a curious habit of the Victorian butterfly (*Papilio*

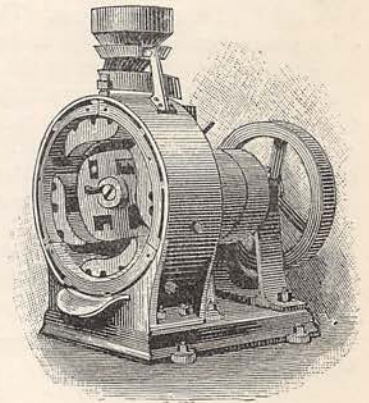
*Macleayanus*). In the hot season it is observed to fly down from its usual haunts on the hillsides to the margins of the brooks, where, taking firm hold of the ground with its forelegs, it immerses the rest of its body in the water for half a minute or so, then flies back to the hills, apparently refreshed.

#### A Load-Adjusting Cart.

An ingenious arrangement for enabling a draught-horse to adjust the load on its cart to suit the gradient of the road, and also to actuate the brake, has been introduced by Mr. Hollingworth. By his plan the weight is taken off the back of the horse in going downhill, put on when going uphill, and evenly balanced when the cart is at rest. To effect this, the harness hooks are fastened to sliding rods on the shafts of the vehicle, and these rods are secured to levers working on brackets beneath the shafts. The levers are connected to the axle, which works in slides and is governed by the brakes, so that when the horse ascends a hill it pulls the levers, and thrusts back the axle under the centre of the cart. The reverse action takes place in descending a hill, with the addition that the wheels come against the brake with a pressure according to the steepness of the hill. The device is intended to spare the horse as much as possible.

#### A Small Grinding-Mill.

A small grinding-mill intended for crushing quartz, cement, coal, ochre, or metallic ores, and any non-fibrous mineral, whether wet or dry, is illustrated herewith. It consists of a hopper, seen above, for the reception of the crude mineral, and a chamber, seen underneath, where the revolving grinder of hard steel brays the mineral to powder, which falls through a sieve and is delivered at the bottom. The mill is light, does not require a special foundation, and is complete in itself. It will grind from 10 to 30 cwt. of ore per hour, with an expenditure of 4 horse-power. Its weight is 22 cwt., and it only occupies a space of 2 ft. 6 in. by 3 ft. 3 in.



#### An Electric Test for Iron.

The hardness of iron is tested by Mr. C. A. Caspersson, who is interested in Swedish ironworks, by means of that general factotum, the electric current. It is well known that an electric current of sufficient strength will fuse a piece of metal in passing through it, and it is this principle which Mr. Caspersson has applied.

A test piece of the iron or steel is taken and connected in the circuit of the current, which is graduated in strength until the piece melts under the heating action of the electricity. The strength of the current which produces this effect is noted and compared with that required to fuse a standard piece of the metal having a known degree of hardness. The harder the metal, the more it will resist the fusing current, and by trying different pieces in this way, Mr. Caspersson has worked out a scale of hardness in terms of the current required, in amperes. With this table, it becomes an easy matter to test other pieces of unknown hardness.

#### A Self-Emptying Watering-Can.

No inconsiderable part of the labour in watering a garden comes from having to hold the can at an angle to secure the flow of water; but a new can which has been invented by Mr. Bracher, and provisionally protected, reduces this labour to a large extent. Our illustration shows a section through one of the new cans, and will serve to explain its not very complicated manner of working. The great feature about the invention is that it enables a gardener to do his watering while keeping

the can perpendicular throughout. It will be seen in our diagram that the rose, R, is near the bottom of the can, and that it is fed through a valve or trap, T, that is lightly connected by means of a chain and ring, C, with the handle, H, of the can. The can having been filled with water, and the bed to be watered reached, the gardener puts his finger in the ring, C, and so lifts the chain and opens the trap which admits the water to the rose. If he only just tightens the chain, the flow will be very gentle; if he lifts it to its greatest height, the flow will be full; and if he releases the ring, the trap will fall by its own weight and so cut off the flow altogether. A strainer, S, is supplied with the can for holding manure, &c. &c., which may thus be made to impregnate the water without choking the rose of the can.

#### A Reference Map-Holder.

The map-holder shown herewith is designed for ready reference to maps, and admits of more than one part of the world being displayed at once. It consists of a wooden pillar with a number of horizontal arms suspended by iron rods. The arms are from 2½ feet to 6 feet long, and easily adjusted without screws. The number of maps contained in one case may vary from two to sixteen, and the case is made either to fasten to a wall, or stand, like that illustrated, on the floor.

#### Amberite.

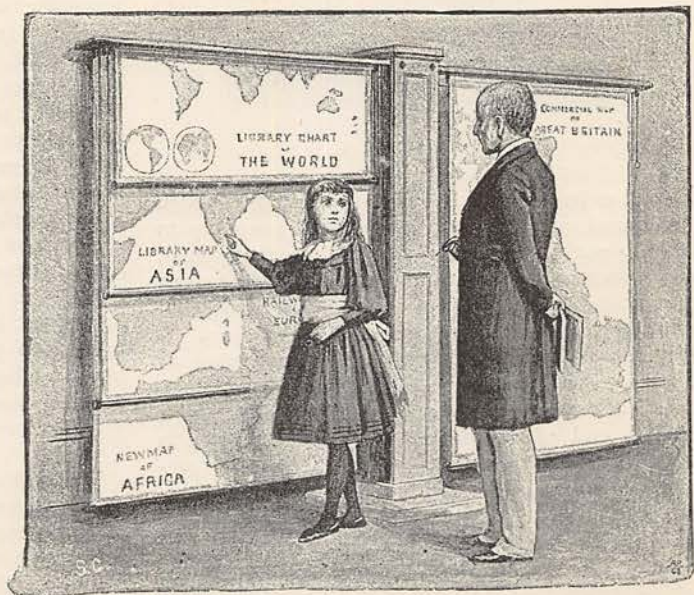
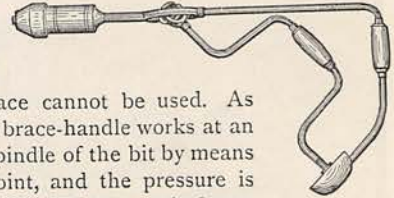
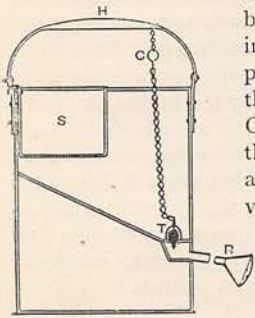
Amberite, or fossil gum, is found in a coal-seam of the Hawakawa Colliery, Bay of Islands, New Zealand. It is a peculiar substance, undiscovered outside of New Zealand, where it often occurs in large masses, but generally in layers and nodules imbedded in the coal. It has a yellowish-grey colour, is translucent, and of specific gravity 1.034. It consists of carbon 76.88 parts, hydrogen 10.54, and oxygen 12.77, and is soluble in alcohol, ether, turpentine, and dilute acid. It burns with a yellowish flame, and the ash is found to contain iron, lime, and soda. Amberite is in fact the fossilised gum of the Kakauri tree. The coal in which it is found burns well and has very little ash, but deposits a cinder on the bars of the grate.

#### A Brace for Corners.

Our woodcut shows a brace for boring holes in corners, where the ordinary brace cannot be used. As will be seen, the brace-handle works at an angle with the spindle of the bit by means of a Hooke's joint, and the pressure is applied directly through the vertical arm instead of through the handle. The brace is equally well adapted for work in the ordinary positions.

#### The Dental Vibrator.

A new method of extracting teeth in a painless way has been introduced of late. It consists in distracting the attention of the patient by sending through him an intermittent electric current from an induction coil of sufficient strength to be bearable, and to produce the well-known sensation of "pins and needles." The poles of the induction coil are grasped in the hands of



A REFERENCE MAP-HOLDER.

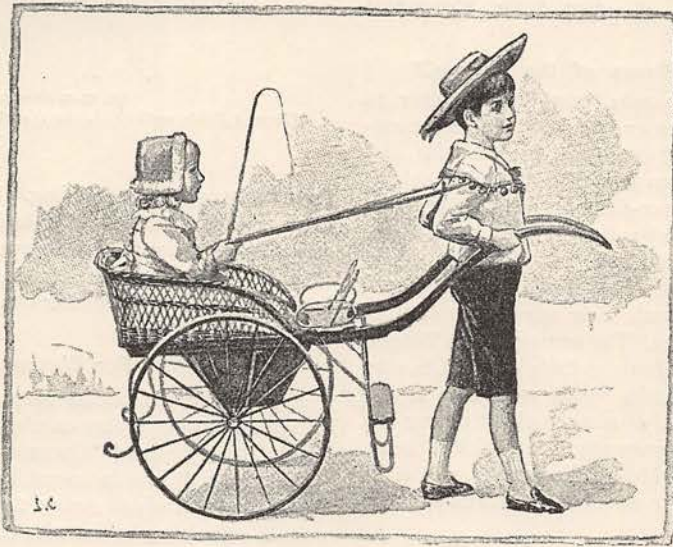
the patient, and the forceps of the operator are also connected to one pole of the coil. The current from the forceps may help in deadening the nerve of the tooth, which is removed without pain.

#### A Handy Go-Cart.

The child's cart which we illustrate has several good features, and can be used either as a perambulator for babies or a go-cart for older children. As will be seen, it cannot tip back or forward, and besides the seat in the body or well, there is a front seat with a movable back, enabling the sitter to put his feet in the cart, or, reversing his position, on the step suspended below the shafts.

#### Gas in Brussels.

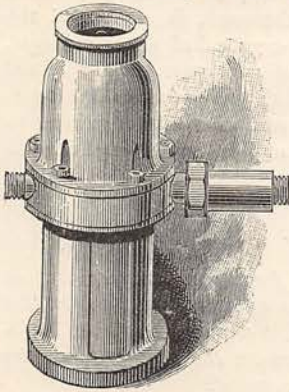
M. Aerts, director of the lighting department of the city of Brussels, has introduced the plan of hiring out gas-stoves to the inhabitants for heating and cooking purposes. The annual rent of a stove is about 10 per cent. of its value. Gas is becoming largely used for heating purposes in Brussels, and many excellent stoves have been invented. The Belgian Gas-fitters' Association have instituted lessons and lectures in cookery by gas, and opened an exhibition of their appliances.



A HANDY GO-CART.

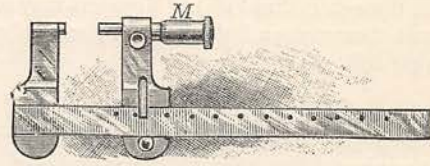
#### A New Water-Meter.

The water-meter which we illustrate is made of aluminium, and weighs only twenty-eight pounds. It will register the flow when it is a mere dribble, and is very prompt in its action. It consists of a measuring cylinder with three ports. The water is admitted from an upper chamber into the cylinder, and works a piston, which, by its reciprocating action, drives the counter, indicating the number of cubic feet or litres of water. The indicator is at the top of the meter, while the inlet and outlet pipes are at the side.



#### A Micrometer Calliper.

Our figure illustrates a pair of callipers fitted with a micrometer for measuring very accurately. It consists



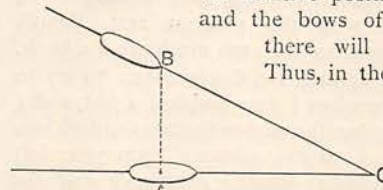
of a beam with two jaws, one fixed, the other sliding and capable of being clamped at any point of the beam. Small pins are placed every half-inch along the beam to aid in fixing the movable jaw. The micrometer, which is covered in, is fitted on the movable jaw as shown at M. These callipers are made in two sizes, for measuring up to 4 in. and 6 in.

#### A Solvent for Cellulose.

Mr. C. F. Cross and Mr. E. J. Bevan, two English chemists, have found a good acid solvent for cellulose, which does not attack it. The solution consists of hydrochloric acid with half its weight of zinc chloride dissolved in it. All who have occasion to examine vegetable fibres, either chemically or microscopically, will, according to these chemists, find it useful.

#### Foreseeing a Collision.

The following easy method of finding out whether or not another ship will collide with that on which you are travelling may be new to our readers. Stand in the middle of your ship, and observe whether the bows of the other vessel appear to gain or lose way with respect to yours. If there is no change in the relative positions of your eye and the bows of the other ship there will be a collision. Thus, in the figure let A be the spectator amidships, and B the bows of the other craft. If



A is advancing along the line, A C, and B along the line, B C, at speeds which cause the line of sight, A B, to keep the same angle to the line, A C, the two ships will collide at C. If, however, the ship, B, gains on A, and

the angle,  $CAB$ , becomes more acute,  $B$  will pass the point,  $C$ , ahead of  $A$ ; and on the other hand, if  $A$  gains on  $B$ , and the angle,  $CAB$ , becomes more obtuse,  $A$  will pass through  $C$  ahead of  $B$ . Voyagers may sometimes save themselves a little anxiety by remembering this simple rule.

#### A Story with a Purpose.

Grown-up people are getting used nowadays to taking their instruction through the medium of their fiction—a course that thirty or forty years ago was reserved for stories addressed to juvenile readers. All sorts of “isms” and “ologies” have been propagated and attacked by turns in stories, so we are not surprised that the teaching of the Spiritualists and Theosophists should be shown up in this manner by Mr. E. F. Knight. This is the purpose of his story, “Save me from my Friends” (Longmans). As a story, his work has plenty of “go” and some well-drawn characters.

#### “The Watering-Places of the Vosges.”

A succession of monarchs, from Julius Cæsar to Napoleon III., has known and patronised the watering-places of the Vosges—Plombières, Contrexéville, and the rest—and Frenchmen have taken special delight in them since the Franco-German War. But, as a rule, English doctors and patients do not know them, although they are so accessible. In the little volume before us, and the title of which heads this paragraph, Mr. H. W. Wolff sets forth their advantages and the properties of their springs. The country of the Vosges, as every traveller from Paris to Bâle can tell, is very varied, and certainly offers ample means of killing time when the patient is not actually “taking the waters,” internally or externally. Mr. Wolff’s book, which is published by Messrs. Longmans, will serve equally well as a guide to the country and its springs.

#### Dr. W. G. Grace on Cricket.

Of all men who have associated themselves with our national game, it is a truism to say that no one has succeeded in so thoroughly identifying himself with it as “the Doctor,” so we turn with special interest to his work on “Cricket,” published by Mr. J. W. Arrowsmith. The work is more than a mere history of the game, though the historical portion of the volume is not the least interesting portion of it. The chapters of practical hints on the three divisions of the game—batting, bowling, and fielding—will, perhaps, be read with the greatest zest, though tyros must not expect to learn too much from a book. In his chapter on batting, Dr. Grace says: “I try to remember the time when I first handled a bat, and I can recall nothing but the advice that was drilled into me—Stand well up to the wicket; keep your left shoulder well forward; *practise constantly and put your whole heart into it.*” The words that we have italicised are an epitome of the champion’s practical hints. The chapters on “Cricketers I have Met” are illustrated by a number of portraits of heroes of the cricket-field, and are full of anecdotes that make



DR. W. G. GRACE.

(From a Photograph by Messrs. Hawkins & Co., Brighton.)

them very pleasant reading. The “Records and Curiosities” which conclude the book will appeal only to enthusiasts, but they will serve to give it a permanent value as a work of reference on the subject. The book is one that no cricketer can afford to be without.

#### For Students.

For the use of students preparing for local examinations in music, a very carefully drawn-out series of nearly three hundred “Questions and Exercises” has been prepared, and is issued by Messrs. Longmans. An appendix is added giving the requirements of the various examining bodies who conduct local examinations in music. We need say no more of this little work than that its authors, Messrs. F. Davenport and J. Percy Baker, are both connected with the Royal Academy of Music, the former as Professor of Harmony and Composition, and the latter as Associate. Another work for the use of students, issued by Messrs. Longmans, is Miss Edith Aitken’s “Elementary Text-Book of Botany,” for the use of schools. At once practical and thorough, it covers all the ground which can well be expected of young students. Evidently the guidance of an expert teacher is expected, but we should think the book would serve as sole instructor to anyone really desirous of gaining an insight into the mysteries of plant-growth and classification.

#### SHORT STORY COMPETITION.

*Intending competitors for the Prizes offered on page 192 of our February number are reminded that July 1st, 1891, is the latest day for receiving MSS. The regulations which govern the Competition were published with the announcement.*