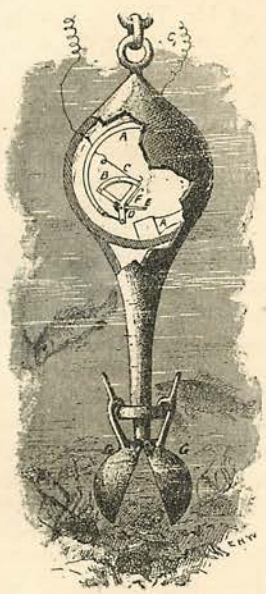
THE GATHERER:

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 Sounder.



A sounding apparatus which indicates on board ship the depth in fathoms to which the lead has descended, was recently tried in the seas of the West Highlands, and found to give results agreeing with the depths marked on the charts. It will be understood from our illustration, where there is a circular chamber in the upper part of the lead containing a Bourdon pressure tube, A, which tends to straighten itself under the pressure of the sea-water. The motion of the tube by a simple mechanical device, D, E, F, turns a quadrant, B, which interrupts an electric circuit, C C; the number of interruptions being proportional to the depth. The circuit runs to an electro-magnetic indicator on board the ship, and works a needle which indicates the depth on a graduated scale. The bottom of the lead is fitted with tongs, or grippers, G G, which, on striking the bottom, close on the mud and secure a specimen.

Storing Life.

At the anniversary meeting of the Sanitary Institution of Great Britain, held recently, Dr. B. W. Richardson delivered an address on "The Storage of Life," or, rather, the conservation of life, since it was directed to the best means of living long. The conditions favourable to long life he gave as hereditary qualification, continence, maintenance of the balance of the bodily functions, perfect temperance, and purity from implanted or acquired diseases. He showed that whatever stimulated the heart's action beyond its natural force and speed was a stimulant reducing the "storage" of life.

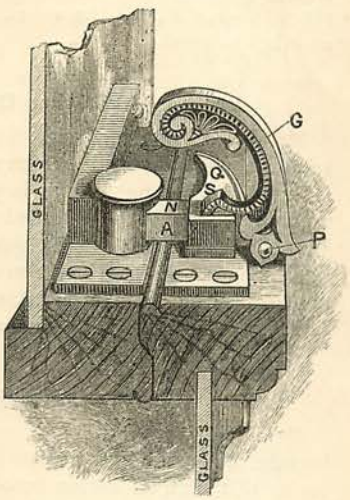
A New Radiophone.

MM. Chaperon and Mercadier, at a recent meeting of the French Academy of Sciences, described a voltaic battery which is sensitive to light, and, when connected in circuit with a telephone, will cause the latter to sound if an intermittent ray is allowed to fall on the cell. The latter consists of a plate of silver coated with a thin layer of sulphide of silver by the electrolysis of sulphide of sodium. Another plate of clean silver forms the element. These plates are plunged into a glass tube filled with water mixed with sulphuric acid. Caustic potash may also be used for the liquid, but not the alkaline sulphides. When exposed to light the current from this battery changes, and results are obtained similar to those from the well-known selenium radiophone.

A Poison Stopper.

An ingenious stopper has lately been patented for use in bottles containing poisons. The stopper is made of india-rubber, and is surmounted by a perforated ball of india-rubber brightly coloured so as to render it distinctive in the light, and containing a bell which rattles when the bottle is moved, thus drawing attention to the character of the contents even though it be impossible to see the label. Such a warning stopper would have rendered impossible many of the accidents which have from time to time taken place, notably one a few months ago, when a distinguished surgeon lost his life owing to a mistake as to a bottle containing poisonous medicine.

A New Sash Fastener.



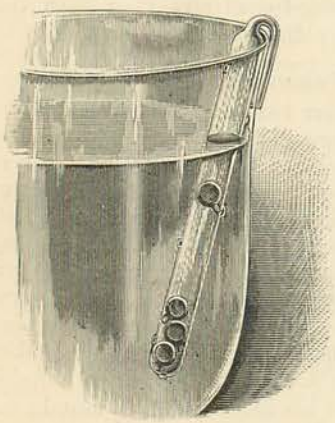
An ingenious and serviceable fastener for sashes is shown in our figure. It answers the double purpose of locking the sashes, so that they cannot be opened by inserting a blade from without and undoing the fastener; and also of preventing blinds from catching on the handle of the fastener while being lowered. It consists of a stout spring bar fastener, A, which crosses the sashes in the ordinary way, and slips under a quadrant holder, Q. But the curved handle, or cant, G, hinged at P, has a bevelled projection, S, upon it, which drops into a niche, N, on the quadrant and locks the bar. The cant, G, is also formed so as to "shunt" or deflect the blind as it is lowered, and prevent its being caught

A Paper Test for Gas.

It is stated that two German chemists, Dr. Bunte and Herr Schauffers, have devised a paper test for gas leakage. It is made by steeping filter paper in alcohol containing one part of chloride of gold to every three parts of chloride of palladium. A drawback to the use of the paper is that tobacco smoke, chimney smoke, fusil oil, and the odour of onions, sulphuretted hydrogen, or the vapour of mercury, also discolour it, and may mislead the observer.

A New Hydrometer.

Mr. J. Hicks has brought out a convenient glass bead hydrometer, which is useful for testing the strength of solutions, especially those in accumulator cells, for which the apparatus has been specially adapted. It consists of a glass tube shaped as shown in the woodcut, and containing four coloured glass beads—red, blue, violet, and green. There are holes in the tube to admit the solution into which it is plunged; and a hook at the top to hang the instrument on the side of the jar. The green bead rises when the liquid has a certain strength—say 1·150; the violet, blue, and red beads at other strengths.



A Talking Doll.

Mr. Edison has, it is stated, devised a doll with a small phonograph inside, which talks when the handle is turned. The phonograph is placed in a receptacle within the chest of the doll, and the handle protrudes. When it is turned the words appear to issue from the doll's mouth. Edison has also devised a clock which announces the time by speaking; the talking apparatus being, of course, a phonograph.

Breathing in Smoke.

Mr. Loeb's respirator for enabling a person to breathe in smoke and poisonous fumes consists of a series of filters, of cotton wool, wet sponge, cotton wool damped with glycerine, and animal charcoal. The respirator has an india-rubber mouthpiece, which is fastened to the head. It is comparatively easy to inhale from it; and the exhalations are discharged to the atmosphere by means of valves. The eyes are also protected by spectacles having elastic rims, which close upon the face. Recent experiments show that the respirator will enable a fireman to enter a dense smoke, and remain in it for half an hour or more, thus enabling him to direct the water on the seat of the fire. The appliance has been adopted in the German navy.

Drugs from Damaged Tea.

Enormous quantities of damaged tea are annually left in the London Custom House, and hitherto it has been given to German chemists for little or nothing to extract theine or caffeine therefrom. Now, however, through the exertions of Mr. Thomas Christy, F.L.S., with the assistance of Mr. Prowse, Secretary to the Customs, this tea will be utilised by English chemists, and thus a source of profit be retained in the country. The damaged tea, after being treated with assafœtida, to prevent its sale as food at a loss to the revenue, will be sold to British chemists for the manufacture of caffeine, a process which is not affected by the assafœtida. Caffeine, it is stated, has proved a valuable remedy in certain dropsical conditions associated with affections of the heart. Medical men, both in England and in Germany, are carefully studying the properties of this drug, which has already given evidences of great utility. It is to be hoped that the Chamber of Commerce will also be able to carry another important reform by which English chemists will be able to manufacture drugs for export. At present this trade goes to Germany, where the drugs are compounded with an inferior potato spirit, and sent to our colonies direct. Obviously these drugs should be manufactured at home, so that a useful branch of trade may be kept in the country, and the colonists provided with better drugs.

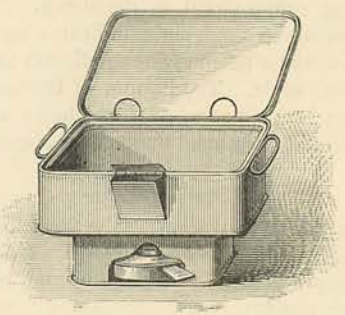


FIG. 1.

New Hot-Water Bottles.

Hot-water and ice bottles of tin and copper, shaped to the body, have recently been introduced. A pan or box for heating poultices by means of hot water, and another for warming plaisters, are also made by the same firm. Fig. 1 represents a poultice heater. It is filled with hot water to the lip, and kept warm by the spirit-lamp shown beneath. Fig. 2 shows an ice or hot-water tin for the knee.

FIG. 2.

Pigeons in the Navy.

The French military authorities are making experiments with carrier-pigeon posts in the navy. At St. Louis a large dovecote painted in brilliant colours has been fitted up to enable the birds to distinguish it afar off. The birds are taken on board war vessels and inured to the fire of guns, and are then liberated at sea to return to their home. Pigeons played an important part in the siege of Paris; but whether they will be equally successful on sea-voyages remains to be seen. If so, their use in the mercantile marine will probably be attempted to some extent, though the fact that one liberated in the Irish Sea last autumn was picked up, exhausted, by a passing ship in the English Channel, shows that their usefulness is likely to be limited.

The Sand-Grouse.

The Sand-grouse of Tartary, or "Partridge of the Steppes," was discovered by Pallas, west of the Caspian, in 1773, and sometimes bears his name. Occa-

sionally they migrate to the west of Europe, and have appeared there this summer, not only in Germany, Austria, and Hungary, but in Great Britain. The Duke of Argyll has caught specimens in the west of Scotland. It is hoped to acclimatise the bird, which, although not very excellent eating, is extremely pretty, as may be gathered from our illustration. It is in strictness a partridge, and its scientific name is *Syrrhaptes paradoxus*. Its colour is a sandy-yellow and bay. The head, throat, and region of the eye are orange, the breast grey, and the belly black. The wings are brown, striped with black, and the legs are furred with hair-like feathers. It has only three toes. Why it should come so far away from its native regions is something of a mystery. But it is swift on the wing, and the migratory impulse may therefore carry it far.

A Hydraulic Coal-Getter.

The accompanying figure illustrates a hydraulic machine for getting coal. It consists of a steel bar having cavities containing small rams, which are forced out by water pressure. The water is conveyed to the machine by a copper pipe from a force-pump. A bore-hole is first made on the upper part of the working face of the seam, and the machine inserted in it. The under part of the face is then cut away, and the pump started. The pressure of the rams then brings the coal down. The coal is not broken in the process, and fourteen to twenty-four tons can, it is stated, be displaced at each operation.

The Uses of Woodite.

This invention of Mrs. Wood, which is a preparation of india-rubber, has come into considerable use. It can be made either solid or cellular, rigid or flexible, and is employed for certain parts of engines and machinery, such as valves, packing, and sheeting. It can also be employed for protecting vessels from the intrusion of sea-water when damaged. In fact, as Sir Edward Reed, M.P., recently pointed out, it is a most useful material for a variety of purposes, including the construction of lifeboats.

A Natural Compass.

We all know how easy it is to lose one's way in a dense fog or a blinding snowstorm. And yet, during the daytime, the right direction may readily be ascertained by a very simple means of finding the position of the sun. All that is required is to place the point of a knife-blade, or of a sharp lead pencil, on the thumb-nail, when a shadow will be cast directly from the sun, however dense may be the fog or snow.

A HYDRAULIC COAL-GETTER.

A Portable Time Detector.

A small time detector for watchmen, which is carried by the latter while upon their rounds, has been introduced into England. It is a small metal box, four inches in diameter, and one inch and three-quarters deep, and contains a fifty-four-hour clock moving a paper dial marked with radial lines corresponding to the division of time. At each station of the watchman is chained a key, which inserted into the detector makes a record on the paper dial. The keys are all different, so that the watchman is compelled to visit each station. The clock cannot be arrested, and the impressions on the dial show at a glance the time and order in which the stations have been visited.

Exotic Flax.

Consul Williams, of Rouen, reports that M. J. de Turck, of Lille, a manager of spinning mills, has brought to light a textile plant of Chinese origin which he has called "exotic flax." It is only about half the price of ordinary flax, and the finest lace or the strongest cord can be made from it, as well as a great variety of intermediate fabrics—such as table-cloths, napkins, and so forth. The material can be spun without combing, and worked by the ordinary flax machinery. The refuse fibre resembles cotton, and can be worked in the same manner. The exotic flax plant is the "dolichos catgang" of Cochin China, called "dâu" in Tonquin, and bears the *dolique* or Tonquin bean. It is cultivated on lands near the rivers or the sea.

Inducing Sleep.

A gentleman has written to the newspapers making public a plan of his discovery for inducing sleep. It is simply to try and recollect the last dream one had. The plan, he says, is very successful in his case; and others have also found it effective. This effort at recollection seems favourable to the inducement of sleep.

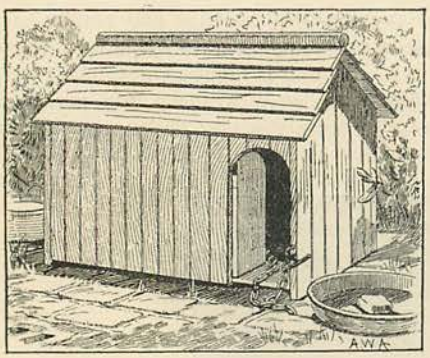


FIG. 1.

A New Dog-Kennel.

Figs. 1 and 2 illustrate a combined dog-kennel and bench, which possesses several advantages over the ordinary watch-dog kennel. The entrance is at the side, not by the gable, and a wind-guard, seen in Fig. 1, keeps the interior warm and dry. Moreover, one side of the kennel is hinged to fold down and make a dry bench for the dog to lie on, as shown in

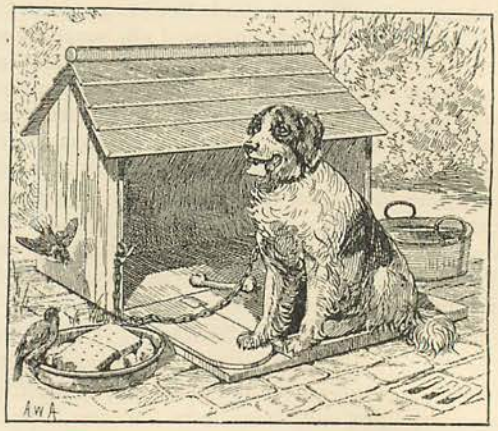


FIG. 2.

Fig. 2. The roof is also movable, to allow the kennel to be cleaned out. The price of these improved kennels is said to be no higher than that of the ordinary ones, and varies with the kind of dog.

Hygienic Braces.

An improvement in braces for the use of round-shouldered or weak persons has recently been patented. The novelty consists in the arrangement of the strap across the back of the shoulders, which may be shortened or lengthened as desired, and is fastened by means of studs instead of the old buckles. The braces are put on in the usual manner, and when they are in position the tightening across the shoulders is secured by fastening the loops under the armpits. These loops are formed of india-rubber tubes coated with webbing, and do not incommode the wearer as hard-edged, flat straps would. Where a medical man advises artificial support of this kind, we should think these new braces admirably adapted to afford it.

Lighting by Water or Wind Power.

In one of the extensive hotels of Florida there is an artesian well which delivers over 10,000,000 gallons of water a day. The bore-hole is 12 inches in diameter and 1,400 feet deep. The water as it rises is made to drive a turbine which works the dynamos supplying electricity to light the hotel and grounds. Such wells have been used for heating purposes ere now, the temperature of the water as it is discharged being high—in this case 86° Fahr. At Grenoble an artesian well warms a hospital, and in Wurtemberg large manufactories are heated in the same way. It is proposed to sink other wells in Florida in the hope of reaching the same water-bearing strata. An interesting application of wind-power to supply electricity has recently been published by Professor Blyth, of Glasgow, who erected a small windmill in the garden of a cottage

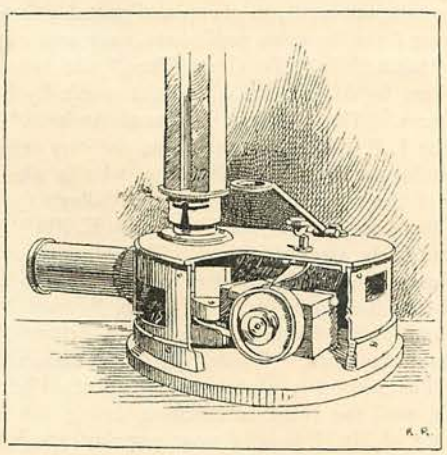
he was staying in at Marykirk. The mill was of the old English type, and had four sails, 13 feet long, raised 33 feet on a tower. A dynamo was driven by the mill, and the current stored in twelve accumulator cells. By this means ten eight-candle power incandescent lamps were fed with current and lighted the cottage. A "cut-out" was put in the charging circuit so as to cut out the accumulators when the speed of the dynamo fell too low; and thus the mill could be kept joined up to the dynamo and accumulators so as to work day and night. The experiment was successful, and, as Professor Blyth points out, wind-power is free to all and costs nothing. We may mention here, *à propos* of electric lighting, that it is proposed to establish an electrical section of the London Chamber of Commerce.

A Flameless Explosive.

"Flameless securite" is an explosive which is considered likely to be much used in fiery mines, as it is incapable of exploding inflammable gas. It is the invention of Herr Schoeneweg, and consists of a nitrated hydrocarbon combined with certain oxidising agents, and a proportion of organic salt. The securite emits a spark on explosion, but not of an energy sufficient to explode coal-gas or inflammable gas. Moreover, the slight spark is damped down by the action of the organic salt. Securite is a finely-grained yellow powder, non-hygroscopic, and cheaper than dynamite. Recent tests of the material, by Mr. Percy F. Nursey, C.E., and Mr. Rhodes, have shown that it forms a good and safe blasting powder.

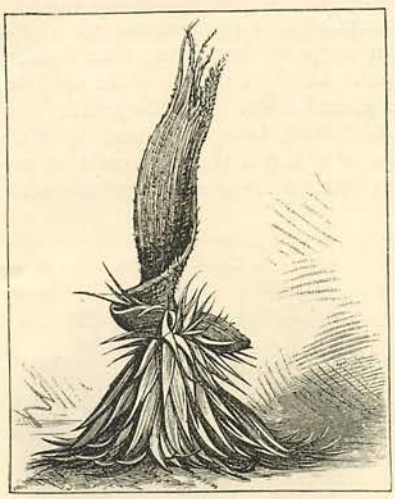
The Omni-telemeter.

The figure illustrates the Omni-telemeter, a remarkably complete instrument for measuring distances without triangulation. It gives vertical heights and horizontal distances and the length of ranges without measuring a base-line. In a recent GATHERER we noticed a range-finder of the same inventor, Mr. William Dredge, and the omni-telemeter is an improvement on it. Mr. Coles, of the Royal Geographical Society, is stated to have very thoroughly tested the apparatus, of which he speaks in high terms. For military and colonial work, for surveyors and travellers, the omni-telemeter is likely to be very useful.



A Vegetable Curio.

Our illustration represents a curious case of fasciation in a plant of the *Fourcroya Cubensis* at Caraccas. The branching flower-stem of the plant has become bound, and curved, as shown in the figure. The sides of the deformed stem are covered with bracts or small leaves, while the top of the growth



bears the flowers. Mr. Ernst, who reports the curiosity, states that he has never seen a case in the Agave, though another case of fasciation in Fourcroya was observed at Caraccas in 1854. He attributes the malformation to an injury done to the young and growing flower-stem.

The Perfected Phonograph.

The new or "perfected" phonograph of Mr. Edison is now in England, and we have had an opportunity of seeing and hearing it. We have, therefore, no hesitation in saying that Mr. Edison has now produced a practical instrument which realises the anticipations he had formed of this his favourite invention. It is possible to correspond by it instead of by letter, and the characteristics of the speaker's voice, his hesitations, coughs, laughter, and expression are all reproduced with surprising fidelity. Pieces of music are also rendered in a remarkable manner; and it seems probable that music-sellers will adopt the instrument to enable customers to sample a new piece of music without having to play it over, especially as this can be done in a private manner without disturbing the other business of the shop. We had the pleasure of hearing a dialogue spoken in America between Colonel G. E. Gouraud (Mr. Edison's English representative) and the inventor himself, and also the crying of an American baby, which was remarkably like that of most babies; painfully so, in fact. Cornet solos, and pieces played upon the cornet, violin,

and pianoforte in concert, were also faithfully rendered; and we were permitted to "hear ourselves speak" for once—it being understood that we do not exactly hear our own voices as clearly as others do, owing to the vibrations of the head. Since we gave an account of the new instrument, Mr. Edison has still further improved it; but we are not at liberty to describe these additions. We may say, however, that the electric motor which drives the phonogram of wax that receives the imprint of the sound is now more silent in its action; the phonogram can take down more words for a given surface of wax; and the indented surface of a used phonogram can be prepared for the reception of a fresh record whilst that record is itself in progress, thus saving time formerly lost in waiting until the whole surface of the used phonogram had been planed down. A loud-speaking phonograph is, we understand, being prepared by Mr. Edison. With this it is hoped that a roomful of people will be able to hear a piece of music reproduced.

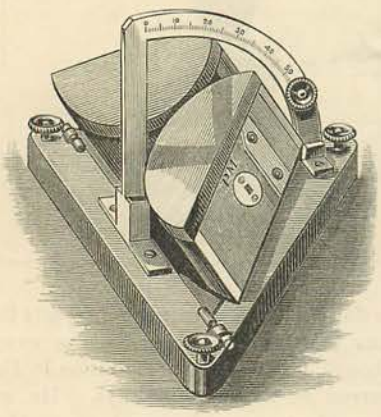


FIG. 1.

A Photographic Sunshine Recorder.

Fig. 1 is a general view, and Fig. 2 a plan, of the new Sunshine Recorder of Mr. Jordan. It consists of two semi-cylindrical dark chambers or boxes, A A (Fig. 2), into which the solar rays enter by the apertures B B, at different hours of the day. E I F is a triangular plate on which the cylinders are fitted, and which is pivoted on the centres G G. A divided arc for adjusting the

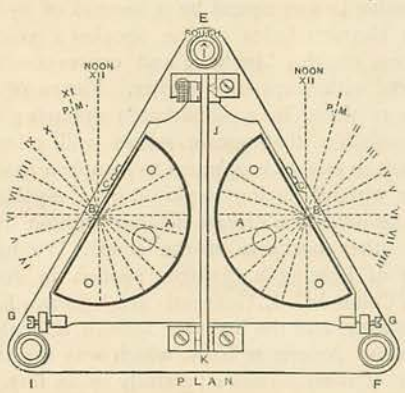


FIG. 2

recorder is shown at J K. The instrument is set facing the south, so that one cylinder gets the morning rays,

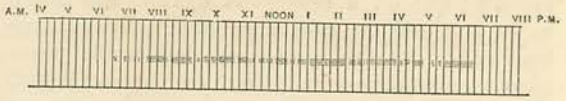


FIG. 3.

the other the evening; and the intensity is marked on ribbons of photographic paper within the chambers. The paper is graduated as shown in Fig. 3, which is a copy of a record, or chart, from half-past six in the morning to half-past six in the evening.

Copying Print.

It is stated that printed matter can be copied on any paper of an absorbent nature by dampening the surface with a weak solution of acetate of iron and pressing in an ordinary copying-press. Old writing may also be copied on unsized paper, if wet with a weak solution of sulphate of iron mixed with a simple solution of sugar syrup.

"The Black Arrow."

Mr. Stevenson's new story, "The Black Arrow" (Cassell & Co.), is a tale of the Wars of the Roses, and is a stirring picture of the recklessness and dash and withal carelessness of life which characterised that terrible epoch. Boys will like this story, for its hero, Richard Shelton, is, throughout the tale, hardly more than a boy, with not a little of boyish bravado and self-confidence. There is a touch of true pathos, showing the seamy side of war, in the description of the chance encounter of Richard, after the battle, with the old seaman, Arblast, whom he has, from want of thought, ruined by taking his ship in one of his exploits. There is life at its fullest in every page of this book, and the love element plays a more important part than is usual in Mr. Stevenson's stories.

Something to Play and Sing.

In their "Academic" series, Messrs. Weekes & Co. send us two books of vocal duets and trios, with pianoforte accompaniments, in cheap and portable form. A part-song from the same publishers, easy and exceedingly "taking," is "To Greet Thee," the words of which are by M. E. Garth, and the music by Frank H. Simms. The "Indian National Anthem," with music by J. P. Knight, is tuneful but not very original; the words are by F. B. Doveton, who is also the author of the words of a song, "The Valley's Queen," which has been set to music by Miss E. Philp in an easy and fairly attractive form. Three songs set by Mr. Henry J. Edwards come to us from the same publishers; the words of two of them, "From Night to Morn" and "Faithful," are by Mr. Arthur Chapman, and the third, "Rénée," by Mr. Claxson Bellamy. The second is a pretty song, effective but not difficult, and the third is far from being the least charming of Mr. Edwards' now popular songs. A setting of Lord Tennyson's song, "In Love," by Helen Coryn, with a violin obligato by Millie Coryn, is more ambitious than successful.