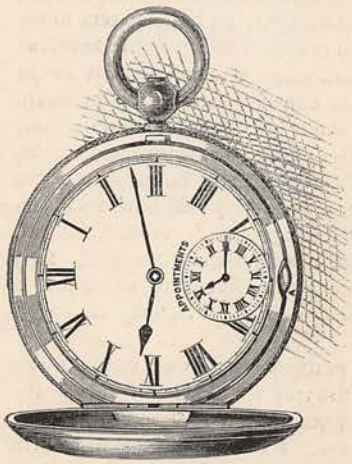
THE GATHERER:

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 Reminding Watch.

The watch we illustrate has a simple device for reminding the wearer of any appointment he may have on hand. A miniature dial, seen on the right, has hands which can be set to remain at any fixed time independently of the main dial. Suppose one has to catch a particular train, or see a particular person, these hands can be set to the time in question. They also serve to fix the duration of an event—say, a political speech, or the time taken up by a railway journey.



A Date Farm.

An Algerian valley, the Oued Rir', has been turned into a date plantation. Oases have been formed by sinking artesian wells, 900 acres of desert land have been brought under cultivation, and 50,000 palms planted. The cost of this, including the erection of homes for the servants of the company, has been £30,000. Henna, madder, cotton, flax, vines, and other plants are also cultivated; grass and cattle likewise form a part of the produce. The largest of the oases is 40 feet below the level of the sea, and the water in the wells comes from a depth of 230 feet below the surface.

Two Novelties for Ladies.

Unfortunately the number of ladies who knit well is not relatively so large as it was in our mothers' days; but all who do should welcome the new wool-holder which has just been patented by a Birmingham firm. Suspended by an ornamental hook from the belt or button-hole, the holder consists of a sickle-shaped bow of metal, hinged at one end to a cross-tree and fastening by means of a catch at the other. To this the ball of wool is readily fixed, and held in a position that enables a lady easily to draw from it the supply she needs without fear of her ball running away across the floor. A little clip is fixed to the holder by a light chain to secure the loose end of the wool when the ball is not in use. Possibly a short chatelaine chain between the hook that affixes the holder to the dress and the apparatus itself would be an improvement, but we advise all ladies who work with wool to try this handy little appliance. The "Doris" belt is a novelty that appeals specially to mothers of young children, and is best described as a safety belt for use in perambulators, mail-carts, and even cots. It consists, really, of two belts strongly linked together—one of leather to be strapped round the child's waist, and the other of webbing to be buckled to the back of the carriage, the chair of a swing, or the rail of a cot, leaving the little one in every case plenty of freedom, but at the same time providing against accident.

A New Mucilage.

M. Trojanowsky, a foreign chemist, has obtained a substitute for gum arabic by boiling one part of flax seed with eight of dilute sulphuric acid and eight of water until the mixture, which at first thickens, becomes quite fluid. This is then strained through muslin, and four times its volume of strong alcohol is added. The precipitate, when filtered, washed with alcohol and dried, is a clear gum without taste or odour, and 30 grains are sufficient to emulsionise an ounce of cod-liver oil.

The Edinburgh Exhibition.

Our illustration will give a fair idea of the main building of the forthcoming exhibition at Edinburgh, which is to celebrate the opening of the Forth Bridge Railway. It is in the style of the French Renaissance, with towers of a Moorish type. The architect is Mr. W. Allan Carter, M.I.C.E. Its length is 700 feet and its width 200 feet. A bridge across the Union Canal leads up to the main entrance. In the grounds, besides a park for football and other games, there will

THE EDINBURGH EXHIBITION.

be a panorama, a Japanese village, a lighthouse, kiosks, numerous cafés, and so forth, besides electric launches on the canal, and a working model of a ship railway. A special lecture-hall will also be provided for conferences and scientific meetings.

Black Silver Jewellery.

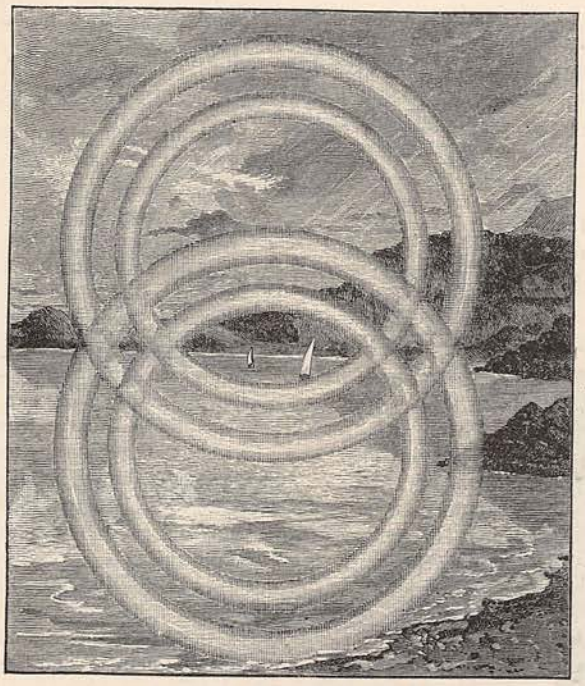
Black silver—really, we believe, the sulphide of silver of chemists—is now being used by a Parisian firm in the manufacture of all sorts of jewellery, and gives a very pleasing result. The bluish-black surface of the metal is stamped with gold and silver designs, apparently in the same way as tortoise-shell work, and the outcome is a very pretty and tasteful ornament. For mourning jewellery and for table ornaments this new process (in which, by the way, the black silver is permanent) ought to prove very useful.

The Seat of the Diamond.

From a consideration of the rocks associated with the diamond, M. Daubrée, the well-known French mineralogist, infers that this mysterious gem is brought up to the surface of the earth by irruptions from the infra-granitic rocks. It is commonly associated with peridotite, and has also been found in meteorites. Moreover, some volcanic blocks of Greenland have been found to contain cubical graphite, which is evidently formed from the diamond. Everything considered, M. Daubrée is of opinion that some of the deeper igneous rocks of the earth's crust contain a large percentage of diamond dust and crystals. While upon this subject we may mention that according to a report from America, gold has been discovered in a meteorite which recently fell there.

A Cluster of Rainbows.

On the 18th of September last, Mr. W. Scouller, an old student of the Natural Philosophy Class in Glasgow University, observed a group of three rainbows at Valparaiso. The sun was about to set in a very smooth sea, and there was a bright reflection from the water. Opposite the luminary, inland, Mr. Scouller saw a primary bow and its secondary parallel to it but higher up the sky, while a third bow started from the roots of the primary bow and intersected the secondary bow at two points. Fig. 1 will give some idea of the phenomenon. The unusual third bow was produced by the *reflection* of the sun in the ocean. Soon after sunset Mr. Scouller saw a single bow, all pink, and traced it to the light of a cloud just above the hidden sun. Rainbows are very common in the West Highlands of Scotland, with their singularly pure atmosphere and flying showers. The writer has counted as many as seven distinct bows in the course of two or three hours, some of great brilliancy. Dr. Percival Frost, of Cambridge, relates that from the top of Dunstaffnage Castle, near Oban, he once observed the curious effect seen in Fig. 2. The cluster consists of eight distinct bows—namely, the usual primary and secondary bows; primary and secondary bows of sunlight reflected from the bay; primary and secondary bows formed by the sun reflected from the water after leaving certain drops; and primary and secondary bows formed by light from the sun reflected at the water, and, after leaving other drops, again reflected at the water.



A CLUSTER OF RAINBOWS.—FIG. 2.

A CLUSTER OF RAINBOWS.—FIG. 1.

A Double-Wedged Photometer.

The late Mr. R. Sabine devised a photometer in which the light to be measured was weakened or partially quenched by passing through a wedge of neutral-tinted glass, and thus brought to the same intensity as a standard light of known intensity. The thickness of the glass became in this way a measure of the light under test. At a recent meeting of the Royal Society Mr. Edmund Spitta described a photometer on this principle with two wedges of neutral-tinted glass, one sliding over the other, by means of a turning-screw. The double wedge is preferable to the single for optical reasons. But Mr. Spitta's apparatus appears to be substantially described in a British patent numbered 6,114 of the year 1882.

Perennial Pasture.

Practical agriculture is indebted to Sir J. B. Lawes for his valuable paper on the history of a field laid down in permanent grass thirty years ago on the Rothamsted estate. During this time it has been mown for hay every season, and the result shows that by the judicious employment of manures, natural and artificial, arable land can be converted into perennial pasture, not only without loss, but with profit to the farmer. If hay is to be removed, it is essential to supply not only nitrogenous but an abundance of mineral manures, and especially potash, a large quantity of which is removed by the crops, and has, therefore, to be replaced. When the grass is not mown but browsed, the exhaustion is much less ; but it is more pronounced if consumed for the production of milk than if for fattening of stock. Full particulars are given in Sir J. B. Lawes' paper, which first appeared in the journal of the Royal Agricultural Society of England, and has been reprinted by Messrs. Spottiswoode.

A Silent Air-Propeller.

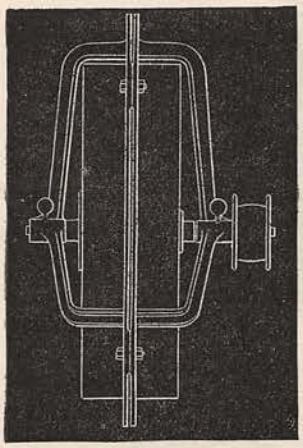


FIG. 1.

A new silent-working air-propeller is shown, both front and side, in Figs. 1 and 2. It consists of an air-wheel or fanner which is capable of supplying fresh air to a building, or withdrawing foul. It has been applied to several public buildings with great success. The quantity of air delivered in a minute by a fan 3 feet in diameter is, according to Professor A. B. W. Kennedy, 12½ cubic feet multiplied by the number of revolutions it makes in that time. That delivered in the same time by a 2 ft. fan is 5.7 cubic feet multiplied by the number of revolutions per minute. The fans are capable of revolving up to speeds of six or seven hundred revolutions per minute.

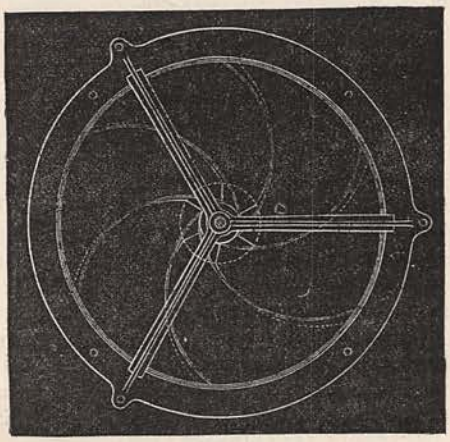


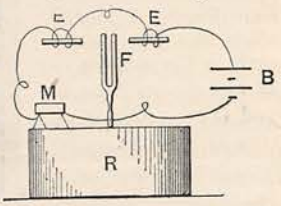
FIG 2.

Rustless Iron.

In Pittsburg, United States, iron is given a rustless coat by heating to a white heat in an oval furnace, made air-tight, and then allowing steam to act upon the glowing surface for eight hours. A magnetic oxide of iron is thus formed, and a subsequent bath of acid completes the process.

A Tuning-Fork Relay.

It is sometimes convenient to keep a tuning fork or diapason in continual vibration, and it is important that the impulse or fillip should be given to it without actually touching the fork. This can be done by the method illustrated in our figure, where F is the fork mounted on a resonator, R. Two electro-magnets, E, E, are brought near the sides of the fork as shown, and when these are excited by the current from a battery, B, they pull the forks apart. If the current be weakened, the forks will approach each other. To keep the fork in regular vibration, it is necessary that these impulses should keep time with the rate of the fork, and this is done by including a microphone, M, in the circuit of the battery and magnets. The microphone is agitated by the resonance of the box, R, and varies the strength of the current so as to regulate the pull of the magnets, and keep the fork sounding.



The Spread of Epidemics.

Dr. R. Assmann, a German observer, has arrived at the conclusion that the atmospheric conditions most favourable to the spread of organisms in the air are dryness of the soil, deficiency of snow and rainfall, existence of fogs and low clouds, high barometer with little intermixture of air in a vertical direction. These conditions, he remarks, were common throughout eastern and central Europe during last autumn, and the easterly winds may have carried the organisms of influenza to the west. It may also be mentioned in this place that Professor Schönbein, the discoverer of atmospheric ozone, found that by inhaling it he could produce effects of influenza—such as inflammation of the mucous membranes. Is it that an excess as well as a deficiency of ozone in the air is deleterious?

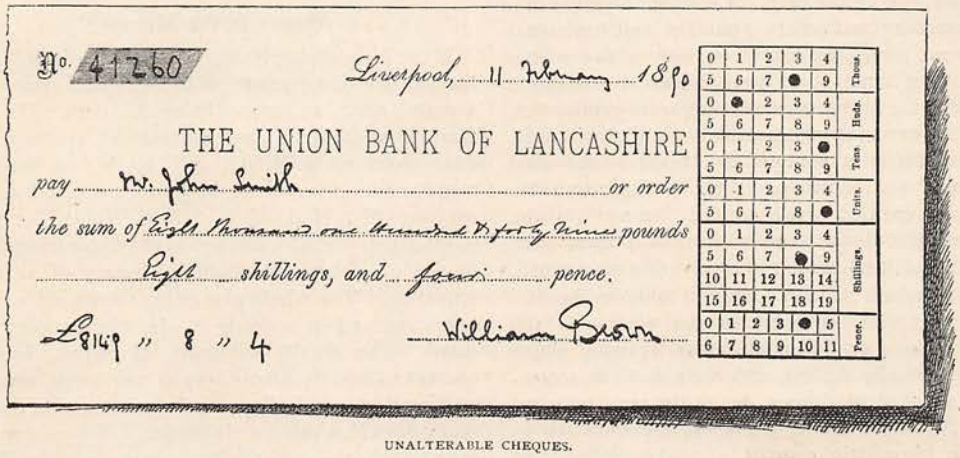
A Piloting Lighthouse.

The "spectro-telegraph" of Captain Paul La Cour, inventor of the "phonic wheel," has recently been applied in part to the harbour lantern of Aarhuus in Jutland. The light is seen to be red when a vessel is in the proper course to make the entrance of the harbour, and green or blue if it deviates to one or other side of that course. Another part of La Cour's invention is, however, to make the light signal its name by

the Morse code. This is not done by eclipsing the light into long and short flashes, as proposed by Sir W. Thomson. The light remains quite steady, but some of it is cut off by a perforated screen, and it is passed through a prism which scatters it, so

Unalterable Cheques and Receipts.

The accompanying illustration shows a new form for cheques and receipts, for which Mr. T. C. Taylor has just applied for a patent. In the table at the side of the body of the cheque or receipt the amount for



UNALTERABLE CHEQUES.

that when viewed in the telescope the spectrum is seen to be broken up into the "dots" and "dashes" of the code which indicate the letters of its name. Ships' forelights may also be made to signal their name in this way, and ships can converse at night in the same manner. Whether this method is better than the occulting plan above referred to is, perhaps, doubtful, but it is highly ingenious. The simpler mode of guiding ships into harbour, as carried out at Aarhuus, appears to be free from all objection except that arising from the possibility of colour-blindness on the part of the steersman. We may add here that the French Government has instituted trials in fog-signalling at sea by means of a cannon. The gun adopted is a very long self-loading machine weapon capable of firing twenty to thirty shots a minute.

Marks of Handicraft.

M. Bertillon, director of the Identification Department at the Prefecture of Police, Paris, has applied photography to study the physical peculiarities engendered by different occupations. Obviously if the trade of a murdered person can be proved by examining his hands it is an important clue; but the results may have a still wider influence in helping to keep the said peculiarities in check. M. Bertillon finds that the hand of a navvy looses its fine lines, and a callosity appears where the spade handle rubs on the skin. Tin-plate workers have their hands covered with little cracks produced by the acid used in soldering. The hands of lace-workers are, on the contrary, smooth, but callosities are apt to grow on the front of their shoulders, and blisters to appear upon their backs, owing to the friction of the loom straps. The thumbs and first joints of the right hands of metal-founders have often very large blisters, whilst their left hands are scarred with sparks of the metal.

which it is made out is to be indicated by punching out the figures—an operation which may be very readily performed, and which, of course, makes any subsequent alteration in the document practically impossible. The principle of this device is one that seems capable of very wide extension to other forms of documents in which it is desirable to have a safeguard against possible unauthorised alterations. We need hardly say that, under the existing law, these new cheques would require stamps, and the inventor's specimen, from which we have made our illustration, must not be taken as establishing a new departure in this respect.

A Binder for Lantern Slides.

The two glasses forming a magic-lantern slide are usually bound with black strips; but Mr. Vevers has introduced a coloured strip, gummed and ready for use, which has several advantages. It admits of the colours being varied so as to distinguish the slides, and the titles of the latter can be written on them. They are more adhesive than the black ones, and their price is just one-half.

The Gymnastics of To-day.

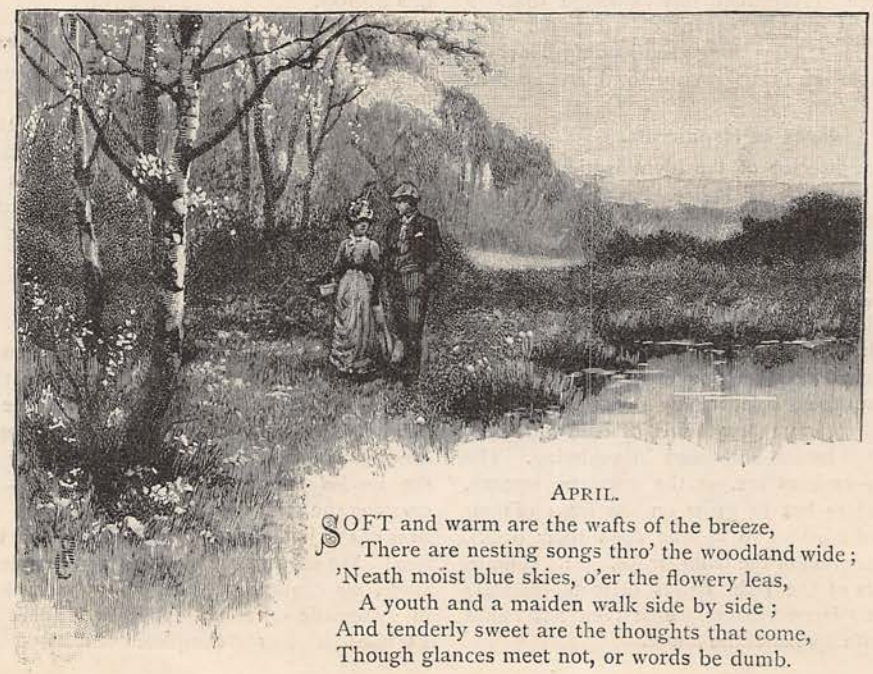
Despite all that pessimists have written about the "deterioration" of our race, we suppose that no one will be found to assert that we have one muscle or one joint the fewer than our fathers before us. Yet how widely different, how infinitely more varied, are the modes of exercise recommended to-day for increasing the strength of our muscles and the suppleness of our joints than was the case, say, thirty years ago! We suggest thirty years ago because, not long since, we chanced to pick up a "complete manual of gymnastic exercises" published about that time. Perhaps it *was* "complete" in its day, but the

whole work could hardly be compressed into the space of three chapters of the second, or "advanced," part of "Modern Gymnastic Exercises," just published by Messrs. G. Philip & Son. The author of this new book is Mr. A. Alexander, whose right to speak in authoritative fashion is evidenced by the fact that he is director of the Liverpool Gymnasium. Figure marching and running, parallel and horizontal bars, trapeze, table, and rings, are only a few of the branches that need—and here receive—exhaustive treatment at the hands of an instructor in gymnastics. Let no reader, even the most sedentary and debilitated, be frightened from a study of this book by the word "Advanced" on its title-page, for in the admirable first chapter, entitled "How to Get Strong" (by the way, when shall we *get* a more expressive word than "*get?*") he will find a course of exercise prescribed, by following which no man could fail to derive benefit. Not the least useful chapter in the volume is the introductory one on "Our Muscular System," which should be carefully studied, with the aid of the accompanying anatomical figures, by every tyro in gymnastics. And does not this suggest the direction in which the gymnastic courses of to-day differ most satisfactorily from those of preceding generations? It is not so much that we use more and better apparatus, or that we expect our athletes to go through more elaborate series of somersaults and throws, as that we are learning more and more to pay attention to the particular form of exercise needed to develop the individual, and enable him first to bring up the strength of the weakest member of his system to the general level, and then to train and develop the whole on sound anatomical principles.

Where is the Memory?

If the laws of supply and demand hold good in the literary world, the reader of to-day would seem to have a strong affection for psychological plots. We are all familiar with Mr. Louis Stevenson's creation of the dual character of Jekyll and Hyde, on whom the transformation was wrought by means of a drug. Now we have Mr. Harland in "Two Women or One?" (Cassell), giving us a change of character from the bad to the good, brought about by means of a surgical operation. The whole plot of the story turns upon this operation, and its undoing is also the undoing of the story. The details we must, of course, leave our readers to find for themselves in the book, which will well repay perusal. To our minds it suggests the question with which this note is headed. Will our surgeons ever be able to locate the memory so exactly that by the movement of an instrument they can take from us all recollection of the past, and yet leave us physically and mentally fit for the future? Medical science has, no doubt, made rapid strides of late, but it has hardly reached this point yet.

PICTURES OF THE MONTHS.



APRIL.

SOFT and warm are the wafts of the breeze,
There are nesting songs thro' the woodland wide;
'Neath moist blue skies, o'er the flowery leas,
A youth and a maiden walk side by side;
And tenderly sweet are the thoughts that come,
Though glances meet not, or words be dumb.