

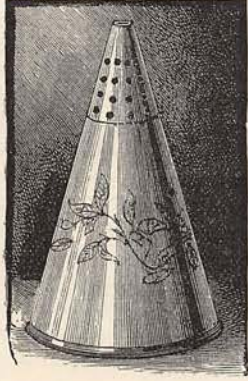
THE GATHERER:

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 New Pepper-box.

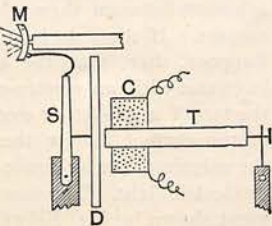
Pepper is so easily adulterated that it is difficult to get it pure and at the same time pungent, for it is apt to lose its piquancy in the ordinary castor. The little pepper-holder which we illustrate is designed to keep the spice in good flavour. It is known as the "Pepperette," and consists of a conical canister or castor, with an airtight chamber inside, which holds the pepper, and thus preserves its natural strength. A valve in the chamber allows the pepper to drop out through the holes in the castor



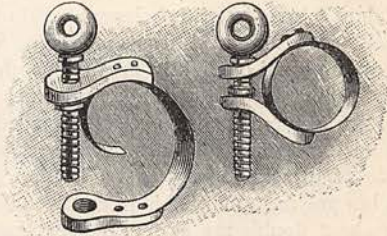
when desired. The valve is worked by pressing a small knob or key in the bottom of the canister. The pepper supplied with this holder for domestic use is simply and solely the powdered berry of the pepper plant, without bleaching or impurity, and, thanks to the hermetic cell confining it, it will keep its virtue for years. The pepperette can be obtained in gold, silver, or electroplate, for the use of the table, as well as in plain white-metal; and it can be used for holding other spices or condiments.

A Microphone Seismograph.

Signor Batarro, an Italian physicist, has devised a sensitive Seismograph, or earthquake recorder, which is based on the well-known principle of the microphone. The microphone, when used as a telephone transmitter, changes the mechanical vibrations of the voice into electrical vibrations, which in traversing the telephone receiver set the iron diaphragm into corresponding vibrations, that are communicated through the air and appeal to the ear as an epitome of the original sounds. In this new apparatus the vibrations of the ground, or earthquake tremors, take the place of the voice in the transmitter, and instead of being transformed into sound by the receiver, they are recorded on photographic paper. The figure illustrates his arrangement, where T is the telephone receiver, with its coil, C, through which the vibratory current from the microphone trans-



mitter passes, thereby setting the iron diaphragm, D, into corresponding vibrations. This diaphragm is connected at its centre to a light spring or tongue, S, which, by a curving piece projecting from its free end, bears lightly on a small curved mirror, M, mounted so as to oscillate. The consequence is that the mirror is put into oscillation by the vibrating diaphragm, and a beam of light reflected from it to the sensitised surface of a travelling band of paper is caused to move across the paper, tracing a line or curve, which is an amplified delineation of the earthquake tremors. The trace is developed and preserved for further study. Obviously the microphone transmitter can be placed at a distance from the registering part of the instrument, if the circuit between them is maintained by suitable conductors. Clearly, too, this apparatus is applicable to the registration of vibrations other than earthquakes—for example, those caused by passing trains upon structures.



A Tube Clip.

A useful clip for securing india-rubber tubing to gas-pipes, but which may be handy for other purposes, is shown in the figure, both open and closed. When the end of the india-rubber tube is forced on the end of the pipe, the steel spring of the clip catches it round and holds it fast, thus dispensing with a lap of twine or wire. The screw fastens the clip and makes the joint quite air-tight.

A Gold-extracting Fungus.

Professor Liversidge, F.R.S., of the University of Sydney, Australia, has found that certain fungoid growths have the property of extracting gold from water containing it in solution or suspension. Bottles of distilled water, holding finely divided gold reduced from a weak solution of the chloride by phosphorus dissolved in ether, were allowed to stand for years, and it was found that some of them lost the ruby or purple tint which is characteristic of gold powder. Such bottles contained a blue mould or fungus which under the microscope resembled a mat of filaments. When dried over a spirit lamp, or rubbed

in a mortar, they exchanged their purple hue for the yellow lustre of gold. Ether or alcohol is food for such growths, and phosphorus is favourable to them. The mould from cheese or banana skins will remove gold from water in this way, while acquiring a blue colour.

An Intermediate Form.

The Zoological Society of London has recently acquired a very rare carnivorous animal (*Cryptoprocta ferox*) from Madagascar. It has no English name,



but is generally known as Bennett's *Cryptoprocta*, from the first secretary to the Zoological Society, who named a specimen sent to England more than fifty years ago. Since then specimens have been exhibited in Rotterdam and Paris, but till now we have had no opportunity of seeing this animal in London. The Rev. James Sibree, late a missionary in Madagascar, says that "when full-grown it is about three feet long, with a tail of equal or slightly greater length. It resembles a small leopard in shape, with thick fur of a uniform warm brown. It is greatly dreaded by the natives for its ferocity and destructiveness, and from its mode of attack appears to be like an immense weasel, but preying upon wild hogs and even buffaloes." This is about double the size of the specimen in the Gardens, which, though incessantly in motion, does not give the visitor an idea of such terrible ferocity; and its canine teeth, which it displays freely enough, are scarcely larger than those of a full-grown domestic cat. This animal is extremely interesting from the fact that it forms a link between the family containing the cats and that containing the civets. Like the cats it can draw back its claws into protecting sheaths, though, unlike them, it does not walk on its toes, but puts nearly the whole surface of the foot on the ground. In the character of the skull also it occupies a position between the two families. It agrees with the civets in having a pouch just under the tail, and when violently enraged is said to emit a most disagreeable smell, like that of the skunk.

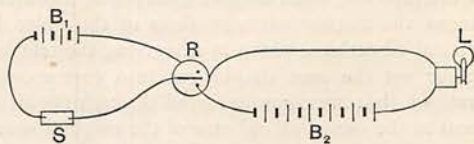
The Diamond Shafts.

The diamond mines of South Africa are a curious geological problem. The gems were first discovered in hillocks or "kopjes" rising above the plain; but as the diggings have been carried on, the diamond-bearing earth, a conglomeration of broken fragments of silicated and magnesian rocks, has been found to fill up

cylindrical vents or chimneys running down through the surrounding strata to an unknown depth. There are seventeen of these vents, each with its "kopje," and they are situated in a row extending for 120 miles across the country. M. Daubrée, a well-known French geologist, has recently promulgated a theory of their origin which he has supported by some very convincing experiments. He contends that the vents have been formed and filled by eruptive gases from the bowels of the earth, or at least from some deep-seated reservoir. The gases have escaped at points of least resistance along a great fissure or fault in the strata, and at these points, by their intense pressure, they have blown and worn the solid rocks into wide vents or escape-pipes, which were ultimately filled up with fragments of the rock, mingled with diamonds. The gems are probably a present from Pluto, although a German chemist not long since declared they were a "gift from heaven," having come to the earth in meteoric stones. M. Daubrée's theory is very plausible, and at the Laboratoire Centrale des Poudres et Salpêtres, in Paris, he has proved by experiment that the imprisoned gases from explosions of gun-cotton and dynamite in mortars are capable of rending and boring the hardest rocks in their escape; for example, limestone, slate, and granite. The sides of the bore-hole or vent are moreover grooved by the blast, and this feature is noticeable in the walls of the diamond vents, which are scored and striated.

A Self-acting Lamp lighter.

A device which would light a lamp when dusk comes on, and extinguish it at daybreak, without personal aid, would be very useful, and it is interesting to learn that some approach has been made to this end. Mr. Shelford Bidwell, F.R.S., recently showed an arrangement before the members of the Physical Society, which was an experimental solution of the problem. We have on several occasions described the electrical device known as the "selenium cell." It is based on the property possessed by crystalline selenium of allowing a stronger current of electricity to pass through it when it is exposed to light than when kept in the dark; and it is usually made by melting crystalline selenium between two wires or electrodes



of copper. These electrodes convey the current from a battery to the selenium, and when light falls on the selenium between them the current traversing it increases. If the light is cut off the current diminishes. Suppose, then, that the selenium cell is connected in circuit with an electro-magnetic device for turning the tap of a gas-jet or electric lamp; the rise or fall of the current due to the degree of illumination on the selenium can be made to turn on or off the gas or electric light. The diagram represents the arrangement shown by Mr. Bidwell, where s is the selenium

cell in circuit with the battery, or other source of electric current, B_1 , and with a delicate relay, R , such as is used for relaying telegraph messages on long lines. The relay in turn is connected in circuit with another and stronger battery, or source of current, B_2 , and with the electro-magnetic device for turning the tap of an electric lamp, L . Now let the selenium cell be exposed to the daylight of a room, so that when the dusk reaches a certain intensity the current in the cell falls and actuates the relay. The latter will bring the current of B_2 into play and turn on the lamp. Similarly, the lamp can be turned off when the returning daylight gathers sufficient strength. The device is also applicable to signal lamps at railway stations, or on board ship: for if a selenium cell be exposed to their rays it can thus be made to announce the fact of their having been put out by accident or design, through actuating an alarm in the room of the station-master or the captain's cabin. In the same way, too, Mr. Bidwell thinks the cell might be used to announce the presence of a burglar at a safe by the light of his bull's-eye lantern. But the ingenuity of burglars is preternatural, and as the yellow rays do not forcibly affect the selenium, it is probable that by employing yellow glass with their lanterns the tell-tale selenium would be outwitted by them.

A Long Pneumatic Tube.

A double line of pneumatic tube for the despatch of small parcels is being laid from New York to Philadelphia, with stations at intermediate points. Letters, newspapers, and other articles will be forwarded through it at a speed of four miles a minute. The inventor of the system is Mr. S. F. Leake, of Philadelphia, and among the points of novelty are a carrier which runs on rails inside the tube, and a block system, with switches, actuated by compressed air.

Hot-Water Machines.

Hot water is now automatically supplied in Paris by penny-in-the-slot machines. Nine quarts are delivered for this sum, and the water is found useful by the poor, and by cabmen for their foot-pans or *bouillottes*. A coil of copper pipe inside the machine communicates with the street main, and is heated by gas-burners; the penny allows the tap to be opened on pushing in a "button." A glass of hot wine is also sold by similar machines in Paris.

A Plastic Tube.

The advantages of a flexible pipe which will be stiff enough to keep its last position are obvious, and luckily

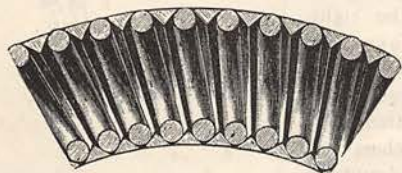


FIG. 1.

an American inventor has hit upon an effective device, partly by accident. A section of the pipe is shown in

Fig. 1, from which it will be seen to consist of a tube made of a spiral coil of round wire, with a spiral of triangular wire forced between the spires. Such a tube applied to feed a gas-jet is shown in Fig. 2, and

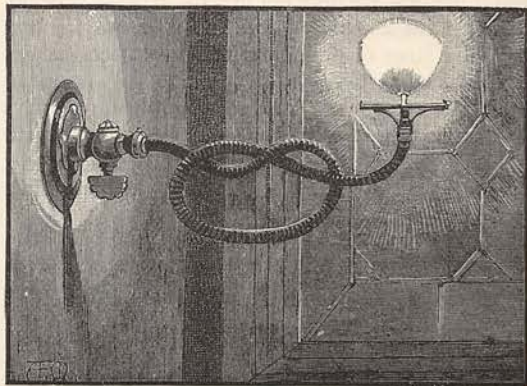


FIG. 2.

it will be seen that the pipe retains the last position to which it has been bent. This is certainly an improvement on the old method of jointed arms applied to lamps and candelabra to allow the light to be shifted from one point to another.

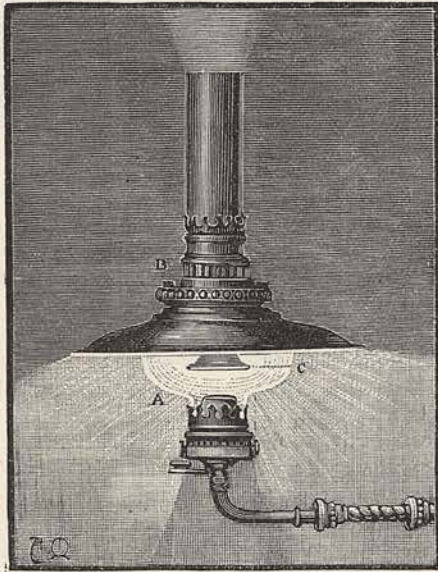
Eggs and Lightning.

At a recent meeting of the Royal Meteorological Society, Mr. R. H. Scott, F.R.S., drew attention to a curious case of lightning-stroke which had occurred at Ballyglass, County Mayo. The eggs were in a basket on the floor of a room when the house was struck by the discharge. It was found that their shells fell off when they were put into hot water, leaving the inner membrane unbroken. On being cooked they tasted quite well.

Electrical Mummies.

The idea of making casts in metal of the form and features of the dead by galvano-plasty has been revived by Drs. Variot and Gartaz. It is well known that the most delicate tissues, such as ferns, grasses, and the skins of animals, can be coated with a layer of metal which will reproduce their texture with marvellous fidelity, as the design of a medal or engraving is copied by electro-plating. The skin has first to be transformed into a conducting cathode, which in the electrolytic bath will receive the coat of metal deposited on it by the electric current. This can be done in more ways than one. That recommended by the above experimenters is to deposit a film of silver on it from a bath of nitrate of silver by the action of phosphorus. The couch of silver is the delicate electrode on which a thicker and more durable coat of silver, copper, gold, or other metal is deposited by the current so as to preserve the finest lineaments and the expression of the dead. These human *clichés* would be almost as true to life as the photograph, and more faithful than the best work of the sculptor. They would be strong enough to withstand shocks, and could be preserved in homes or mausoleums to future generations, like the mummies of the Egyptians and the ancestral portrait

or statue. Moreover, as Dr. Variot suggests, the body within might be cremated, leaving the ashes in the metal case, which would thus become a cinerary urn and reliquary, a mummy and a statue, all in one. Even if the practice does not become general, it seems likely to have a certain vogue. Plaster casts of the heads and faces of great men have long been taken, and metal casts by electro-deposition will probably follow. They might be taken either direct from the body by the above process, or from the hollow plaster cast. People able to afford the expense may also desire to have a gold or silver memorial of some child or friend.



The Deimel Lamp.

In the new Deimel gas-lamp the air feeding the flame is heated by the regenerative process, and delivered on the edge of the flame. The lamp is shown in our illustration, and consists of an argand burner, A, enclosed in glass, and provided with a metal cap and chimney, B. The flame from the burner is supplied with air from below in the ordinary way, and impinges on a button of porcelain, C, placed over it. The flame is thus spread out into a circular sheet, casting no shadow, and the other supply of air for the outside and edge of the flame descends from above, being heated in its passage by the funnel which carries off the products of combustion. It is stated that a consumption of 10 cubic feet of gas per hour gives in this lamp a light of 85 candle-power. A smaller size of lamp than this is also made, but its efficiency is not so high. The lamp is arranged to burn well at a gas pressure of 0.6 inch, and if desired a pipe can be fitted to the chimney, so as to carry the fumes out of the building.

The Colours of Tempering.

Herr Stein, a German investigator, confirms the general belief that the colours of metals at different

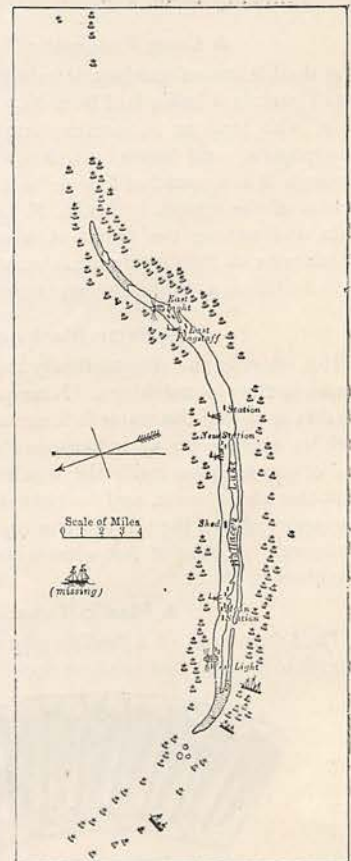
degrees of temper are due to a film of oxide on the surface of the metal. Specimens of steel tempered in an atmosphere of nitrogen do not exhibit these colours. Other German chemists have shown that the colouration is not an accurate test of the temper, as the same colours are not always produced at the same temperatures. The harder the steel is, the higher the temperature must be to give it a certain tint. The composition of the steel and the duration of the heating also influence the result.

A Jelly Accumulator.

The ordinary storage battery or accumulator is not very portable, owing to the dilute sulphuric acid with which it is filled; and quite recently Mr. Schoop, an electrician, has hit upon a plan of jellifying the liquid, so as to prevent the evil effect of jolting the cells. A little sodium silicate is added to the liquid, and the acid by decomposing it frees the silica in the form of a jelly. The result is a slight increase of the internal resistance of the cell to the current, and a small diminution of its capacity for containing a charge, but a gain in fitness for transport in launches and trams propelled by electricity.

The Graveyard of the Atlantic.

Sable Island, surnamed as above from the number of wrecks which take place there, is a strip of sand dunes covered with bent, about 85 miles from White Head, and 150 miles from Halifax, Nova Scotia. It is illustrated herewith, and is about 22 miles long and one wide at the middle, where a salt lake 14 miles long can be seen. At each end there are dangerous sand-bars, and the island is very rapidly wasting away at the west end, but gaining at the right. There are two lighthouses on it, and several life-boat stations, for, as the chart will show, the number of wrecks there is



Walker & Bowtell sc.

very great; vessels run aground and break up without ever being heard of at all. A large amount of

treasure must be buried in these shifting sands. Mr. F. N. Gisborne, head of the Canadian Telegraph Department, has started a movement for connecting the island with Nova Scotia by a submarine cable, which is estimated to cost £20,000.

The Maskelyne Type-writer.

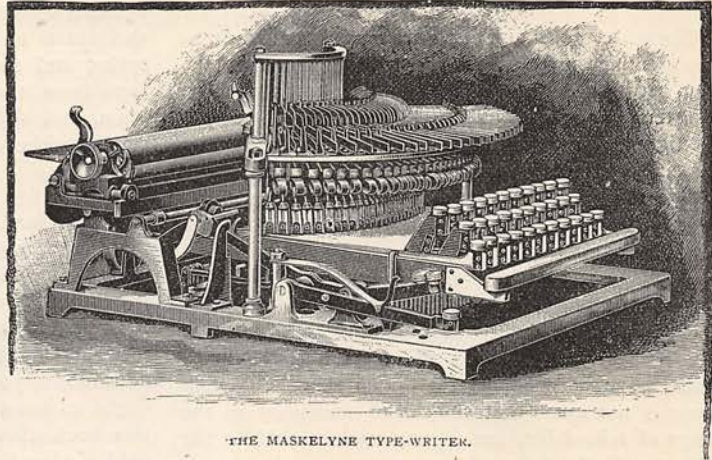
Mr. Maskelyne has applied his mechanical gifts to the production of a new type-writer, for which several advantages are claimed. We need not enter into the details of this apparatus, of which a general view is given in the figure. One advantage it offers is that each letter can be seen as soon as it has been printed, without the operator having to crane his neck over the instrument. It also possesses the merit of requiring a very light touch of the keys, and a short travel over them. But an important though not new feature consists in an improvement of the spacing, whereby each letter has a space allowed for it on the paper correspondent to its length, so that a long letter, say "m," is not cramped into the same space as a short letter like "i" or "t." There are thirty-four keys on the board, and these are capable of recording ninety-six different characters. The types are inked by resting on a pad, and the usual ink-ribbon is in this manner superseded. The machine is practically noiseless in its action.

A New Antelope.

Africa has once more sent us something new—this time an antelope from the country near Lake



Ngami. Speke's Antelope (*Tragelaphus Spekii*) was named in 1864 by Dr. Sclater, from the skin and horns of a male brought home by the great explorer whom its name commemorates. The specimen now in the Zoological Gardens—the first one ever brought alive to England—is a female, and stands some three and a half feet high at the shoulder, with long, coarse, mouse-coloured fur on the body, the front of the head reddish, very large ears, and extremely long, slender legs. The hoofs are excessively elongated, and adapted for traversing the reedy swamps in



THE MASKELYNE TYPE-WRITER.

which it lives. When these antelopes are met with in their native haunts, they do not attempt to run, but sink down in the water and submerge their whole bodies, leaving only their nostrils above the surface, so that they may escape the notice of their enemies; the natives then paddle close alongside and spear them from the canoes. Selous, the African hunter, says that the females are hornless; but Major Serpa Pinto, the Portuguese explorer, maintains that they have horns like the male. The animal we have described has none.

Lost Cities.

The city under the sea, which has been discovered between Grado and Pola in Istria, is believed to be the ruins of Cissa, mentioned by Pliny as situated on an island of that name. A diver reports having seen the streets, walls, and quays, but the doors and windows of the houses appear to be choked with silt and seaweed. While on this subject, we may mention that the remarkable ruins of Zimbabwe, which have been discovered in Mashonaland, are to be explored by Mr. Theodore Bent, with the aid of the Royal Geographical Society. Great progress has been made in unearthing the Romano-British town of Silchester, near Reading. The site covers a hundred acres, and is situated on the Strathfieldsaye estate of the Duke of Wellington. Walls, gates, streets, baths, and private houses have been laid bare, and a rich collection of pottery, implements, and coins has been made. Among these are an iron carpenter's plane and blacksmith's tools. Some of the edge-tools are still keen enough to work with. A piece of tile retains the imprint of a baby's foot, and another that of a shoe or sandal with springs in the sole. The pottery ranges from coarse cooking-vessels to artistic ware; the ironwork shows ornamentation, and the needles or other household articles bear witness to a fairly high degree of civilisation among the Ibero-Celtic population, who, to the best of our knowledge, made up the ancient Britons. It is a mistake to speak of these, our early forefathers, as Celts. They were probably more Iberian than Celtic, at least in England proper.

Sound in Cold Air.

The velocity of sound in air at very low temperatures has been measured by Mr. Greely, from observing the time between the flash of a distant gun and its report. For temperatures of 10·9, 25·7, 37·8, and 45·6 degrees Centigrade below the freezing point, the corresponding velocities of sound were respectively 326·1, 317·1, 309·7, and 305·6 metres per second. Hence it appears that the velocity of sound diminishes by 0·603 metres per second per degree Centigrade.

Songs for Colleges and Schools.

Under the title of "Gaudemus," Mr. John Farmer, late of Harrow, has collected a number of songs which have been popular at public schools. Often there is not much that smacks of pedagogy in the songs of school life, but it may well be that, as the "Harrow Football Song" says—

"When you look back and forgetfully wonder
What you were like in your work and your play—
Then it may be there will often come o'er you
Glimpses of notes, like the catch of a song."

It may be dear old "John Peel" that you hear and follow again, many miles from the school halls where first you heard its ring; or "Sigh no more, Ladies," that the tenor in the sixth form used to sing; or "The Bay of Biscay"—there is nothing of *school* in them, but they are "school songs" to many a man for all that, and we are glad Mr. Farmer has included all these with such as "Dulce Domum" and the "Harrow Football Song" ("Follow Up!") to which we have already alluded. The songs are well-chosen, and have been beautifully printed by Messrs. Cassell, who are the publishers of this pleasant work.

In a New Dress.

At the first sight of the four pretty volumes, we hardly knew Mr. Froude's "Short Studies on Great Subjects," which Messrs. Longmans have just re-issued in their daintily dressed "Silver Library." In this attractive form we hope Mr. Froude's essays may be even more widely read than ever. It would be presumption to commend work of Mr. Froude's at this time of day, but there may be readers who do not know him apart from his great historical works, and to them we would commend this collection of some of the finest essays of our day, on some of its most important subjects. In the same series Messrs. Longmans have included Mr. Rider Haggard's "Cleopatra," a somewhat weird story republished with the illustrations that accompanied it in its more expensive form. Messrs. Cassell have added to their "Red Library" Mrs. Gaskell's "Mary Barton," which was a household favourite forty years ago, but which is almost unknown to the readers of this present day. Let us hope it will prove as popular in this new dress as in its well-worn old one. The fourth volume of the same publishers' "New Popular Educator" serves well to mark the advance which has been made since the last issue of this work. The maps and plates are a great feature of this edition. A new issue of "Cassell's National Library" is commenced with

Dickens's last special story, "The Haunted Man," and this is to be followed by other works new to the series, and some of the most popular books which have been already included in it, but all in a new, plain, and strong binding, which makes them very suitable either for pocket use or for the library.

Education in 1891.

Parents and teachers will find very comprehensive information regarding our national education in all its grades in "The Educational Annual for 1891" (G. Philip & Son), which has been carefully edited by Mr. Edward Johnson. The new code is very fully set forth, and much that is said about our public elementary education is just what all members of School Boards ought to know. So to them we specially commend this book, though its survey of the rest of the wide field of education in this country is such as to make it useful as a work of reference in every household.

Studies of Insect Life.

Under the title of "Nature's Wonder-Workers" (Cassell), Miss Kate R. Lovell presents a striking series of pictures of insect life and work, which makes a capital open-sesame to the marvels of entomology. The book is fully illustrated, and is written in so simple a strain that it cannot fail to attract the attention of any reader, however new to its subject. And if it lead, as it ought to do, to a better understanding of the part our insect neighbours play in the economy of nature, it will not have failed of its purpose.

The Use of the Lantern.

This is the subject of Mr. Lewis Wright's "Optical Projection," which has just been published by Messrs. Longmans. Thoroughly as the book treats its wide subject, it does so in language devoid, for the most part, of tiresome technicalities or irritating formulæ, and with an abundance of excellent illustrations. The work is thus rendered intelligible and useful to the general reader, while its value to the scientific worker is not in the slightest degree impaired. The chapter on the lantern microscope is very full, and the admirable series of experiments for showing, by means of a "magic lantern," the refraction, reflection, and polarisation of light, would be sufficient to secure a high place for the work that sets them forth. As a practical matter of interest to lantern-workers, we may say that the chapters on the various forms of radiants, and the manufacture and uses of gases, are very complete. Messrs. Longmans are also the publishers of a series of "Elementary Science Lessons," by Mr. W. Hewitt, B.Sc., and the volume for Standard II. is now before us. The lessons are practical object lessons, capable of easy illustration by means of the ordinary things of everyday life. Perhaps the highest compliment we can pay such a book is to say we wish *our* first science lessons had been such as are given here, instead of the dreary disquisitions to which we used to look forward with dismay, and on which we look back with disgust.