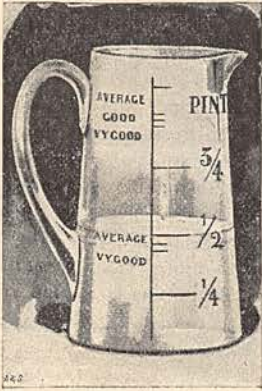


## THE GATHERER:

AN ILLUSTRATED RECORD OF INVENTION, DISCOVERY, 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.

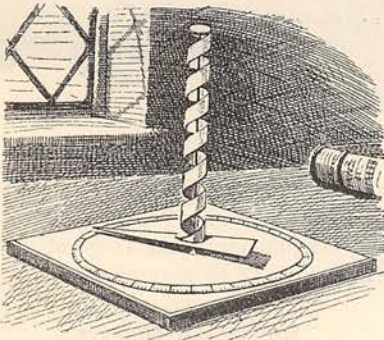
### A Tell-tale Milk Jug.



The glass jug shown in our engraving is marked like a medicine glass, to indicate at a glance the quantity of milk received from the milkman; and, by means of three graduations, it also determines the quality of the milk—"very good," "good," or "average"—by the thickness of the cream. The jug is therefore a means of selecting a good dairy.

### A Simple Hygroscope.

Hot or cold weather is more bearable when the atmosphere is dry, and in order to study the influence of humidity on the health a very good hygroscope is necessary. The simple device which we illustrate can



easily be made. It consists of a helical strip of Bristol board  $6\frac{1}{2}$  inches long and  $\frac{1}{4}$  inch wide, made impervious to moisture on the outer side by two coats of shellac varnish. The upper end of the helix is rigidly fixed to a stout wire support planted in a base-board, and the lower end is attached to a movable pointer, which is free to move over a scale marked on the base-board as shown. The helix can be made by twining the cardboard round a pencil. The positions of the index when the cardboard is as dry as possible and when it is breathed upon are taken for zero and 100, and a scale is drawn between them.

### The Condition of Jupiter.

Professor Pickering, of the Harvard Astronomical Station, Arequipa, Peru, has come to the conclusion that the planet Jupiter is not self-luminous, but is nevertheless very hot. The ball is surrounded by a dense envelope of clouds, but outside this envelope the atmosphere of the planet extends to a distance of at least 1,900 miles, for even there it is capable of refracting light.

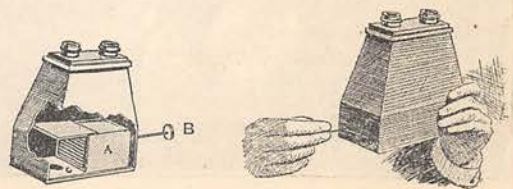
### An Opera-Glass Camera.

M. Carpentier has introduced an opera-glass camera which we illustrate herewith. It contains twelve plates, and is operated by holding it to the eyes and looking away from the object. The plates are held in a drawer, A, and are manipulated by a finger piece, B, without the case. The image on the ground-glass plate is seen through the aperture, C, provided with a red glass. An enlarging apparatus forms part of the equipment.



### Frost Pennons.

The name of "frost-weed" was given in the first edition of Gray's Manual, 1848, to the *helianthemum canadense*, because in the late autumn crystals of ice shoot from the cracked bark near its root. A similar, but still more wonderful, phenomenon has been observed of the  *Cunila mariana*, and is illustrated herewith. The dry stem of the plant is sometimes decorated with thin scrolls of ice, curling gracefully and striped like a flag. The curves of the foils, of which there are four in this case, are all in the same direction, like those of a turbine wheel. The ice is very light, resembling congealed froth, and the stripes are caused by a difference in the white colour, which



AN OPERA-GLASS CAMERA.



varies from alabaster to silvery white. Ordinary hoar-frost is pretty enough, but these fairy pennons are truly exquisite. They are rooted in cracks of the bark, but whether the vapour from which they are formed has emanated from the stem, as has been



FROST PENNONS.

suggested, is at least doubtful. Hoar-frost crystals are built up of water vapour carried in the air, and hence they are usually turned in the direction of the breeze. It may be that moisture rising up the stem from the soil and escaping at the cracks has given rise to these exfoliations, but in our opinion the phenomenon requires further investigation.

#### Born in Captivity.

It is not often that the rarer antelopes breed in confinement, and not till quite recently had the Water Buck (*Cobus ellipsiprymnus*) done so. The Zoological Society is fortunate in possessing in its Gardens at Regent's Park the single specimen born out of Africa. It saw the light on the 4th of May, and when photographed was about nine weeks old. The parents came from the territories of the East African Company. These antelopes are plentiful all over Nyassaland,



THE WATER BUCK.

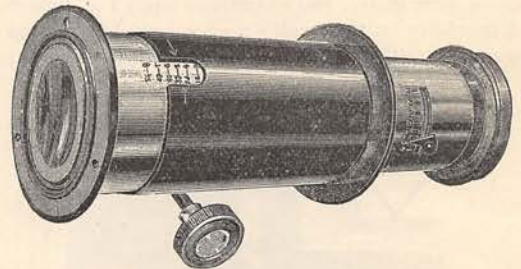
ranging southward to the Limpopo River, and are found in the greatest numbers on large swampy plains overgrown with coarse grass, tall reeds and papyrus. Their build is stout, the legs are short and thick, and the hair coarse and greyish-brown in colour, with a white recognition mark on the flanks. The adult male stands about four feet at the shoulders and bears large ringed horns, some thirty inches in length. The female is smaller than her mate and hornless. Both sire and dam will come to the railings of their stalls to be fed by visitors to the Gardens, and in a little while the young one will trot up when he sees a biscuit bag as readily as his parents do now. [Since the above was written the sire has, unfortunately, died.]

#### A Giant Toad.

In his ascent of Mount Dulit in Borneo, Mr. Charles Hose discovered a cave 4,000 feet high, in the mouth of which some remarkable ferns were found, one having fronds 14 feet long. The summit of the mountain is 5,090 feet high, and covered with thick mosses. While here some of his native companions heard a tiger roaring in the neighbourhood, but upon investigation the supposed "tiger" turned out to be a gigantic toad measuring 14½ inches round the body.

#### A Telephotographic Lens.

The new telescopic lens for cameras which we illustrate will magnify up to eight times by means of



the sliding tube adjusted by the milled head. One advantage of the appliance is that buildings or other distant objects quite out of the range of the ordinary rectilinear lens can be photographed with ease.

#### Babies and Colours.

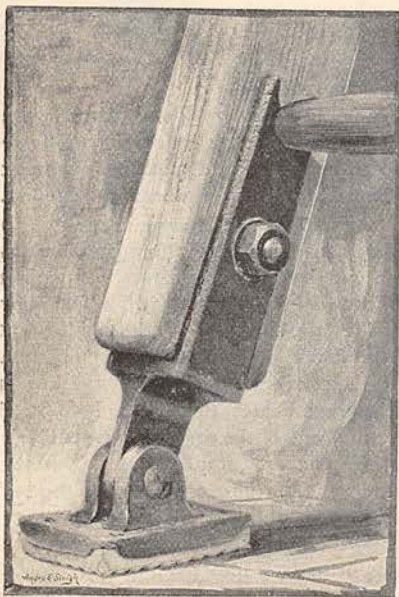
Professor J. M. Baldwin, the well-known psychologist of Princetown, New Jersey, has been experimenting with a girl of his about nine months old, in order to test her perception of colour and distance. The baby took part in the research with commendable zeal; in fact, according to her father's testimony, the whole procedure gave her intense gratification, and the experiments became her most pleasant daily occupation. This cradle philosopher, who is, perhaps, a type of the coming infant, showed a partiality for colours in the following order: blue, red, white, green, and brown. The difference of attractiveness between blue and red was, however, very slight as compared with that



between these and the other hues. It is, perhaps, creditable to the sagacity of the child that she sternly resisted the temptations of an American newspaper held before her. As regards her power of judging distances it was found that with an arm-length of 10 inches she reached out for every object placed within or at this distance from her, and at greater distances made fewer attempts to grasp the thing. At 15 inches, for example, she only reached for 10 per cent. of the objects presented.

#### A Safety Shoe for Ladders.

The slipping of ladders, either at the top or bottom, has been a fruitful source of accident, and we therefore



welcome the Sutcliffe safety shoe, which is intended to prevent these. The illustration will explain this ingenious and simple device, which can be readily attached to the feet or top of any ladder by means of a screw bolt and pin, as shown, or as readily detached. The sole of the bed plate or shoe is covered with corrugated india-rubber, and this can be renewed at will. It has a holding surface of seven square inches, which, of course, means fourteen square inches for the two feet of the ladder. The joint allows the ladder to slope at any angle. These shoes are made in three sizes, and are rapidly coming into use. They obviate the necessity of having to hold the bottom of a ladder, and when applied to the top they further increase the safety of the ladder, though this additional precaution is only required in certain circumstances.

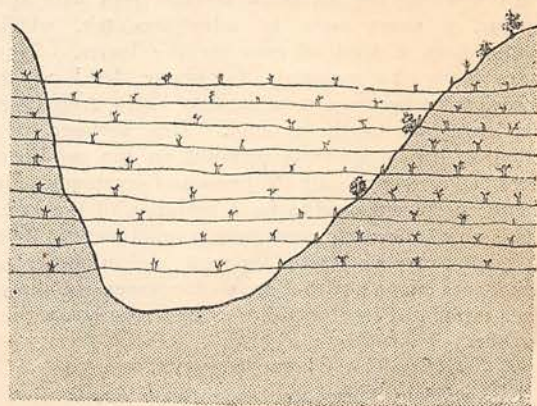
#### Sounding Without a Line.

The late Sir William Siemens invented an instrument called the bathymeter, for the purpose of sounding the deep sea without employing a lead line. It was based on the principle that the gravitation of the earth acting on a plumb-line would vary with the depth

of water under the plumb as water is about  $\frac{1}{8}$  the density of solid rock. Instead of an ordinary plumb he used a mass of mercury; but the instrument was too sensitive to the surface waves and failed in practice. Quite recently Mr. J. Munro, C.E., has devised another mode of solving this problem. It consists essentially in dropping a sinker containing a cartridge which explodes on striking the bottom, and the report is observed in a submerged microphone apparatus communicating with the ship. The depth is estimated by the time taken for the sinker to reach the bottom.

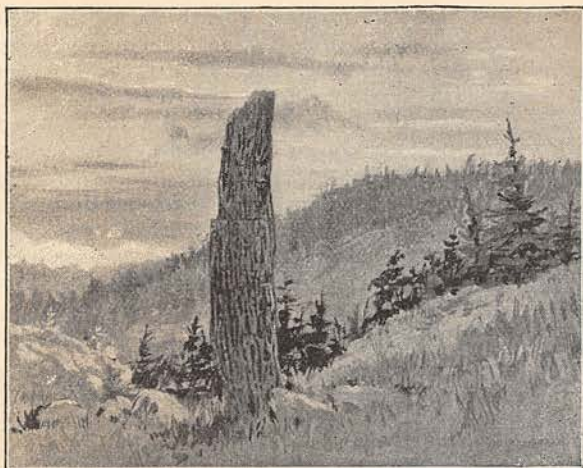
#### The Petrified Trees of the Yellowstone.

The Fossil Forests of the Yellowstone are not yet accessible to tourists, and as little is known about them the following particulars, given by Professor S. E. Tillman, may be of interest. The principal forest lies on the west rim of the Lamar River Valley or East Fork of the Yellowstone, opposite the Soda Butte Creek. Other forests of the kind are, however, scattered over this district; for instance, at Specimen Ridge, about six miles east of the junction of the Lamar and Yellowstone Rivers, where the fossil trunks occur on the upper slope of the south wall of the Lamar Valley. The slope, which makes an angle of  $33^\circ$  to the horizon, is about 900 feet long, and the petrified trunks are interspersed with growing firs and pines of the ordinary species. It might be supposed that fossil trees grew on the slope as the living trees grow now, but that would be a mistake. Professor Tillman shows that they grew on old level land surfaces made by nine successive layers of volcanic material, one above the other, which, in course of time, built up the land through which the river valley has been excavated. The fossil trunks straggling up the slope therefore mark the successive levels of the old ground. At least nine, and probably twelve, forests have been destroyed by successive eruptions and the trees petrified. Fig. 1 shows a section of the river valley, with the nine hypothetical layers of volcanic soil in horizontal lines. The diameters of the petrified trunks (see Fig. 2) vary from one to seven feet, and the rings of annual growth can be seen on making a section. One 3 ft. 5 in. in diameter showed 243 rings, not



THE PETRIFIED TREES OF THE YELLOWSTONE.—FIG. 1.





THE PETRIFIED TREES OF THE YELLOWSTONE.—FIG. 2.

allowing for missing rings at the centre and the bark. Hence about 250 years may be taken as an average of the intervals between successive eruptions. The trees were all supported by shallow, wide-spreading roots, as though the soil in which they grew was shallow. Besides the standing trunks, many are lying on the ground, some of which have petrified as they lay, others before they fell. Only one standing stump has branches, perhaps because the volcanic mud did not reach high enough to preserve them from decay. Specimens of rotten wood, petrified bark, the borings of insects, impressions of the leaves of conifers, and two kinds of extinct deciduous trees have been observed in the petrifications. The fossil trees are also found along Soda Butte Creek and on the left bank of the Yellowstone, opposite the mouth of a creek with a very sinister name. Their height is there 6,100 feet; but the highest are found opposite the mouth of Soda Butte Creek, at an altitude of 8,180 feet. The volcanic matter consists of a conglomerate of stones and mud, with occasional beds of lava, and water seems to have played a part in depositing or rearranging it.

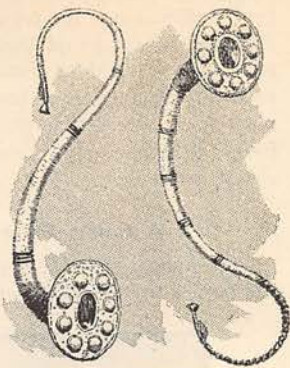
#### Honey Dew.

In touching the leaves of certain trees with the tongue, a sweet taste is sometimes felt, which comes from a kind of gum on the leaves. This is evidently the material of "honey dew," which occasionally becomes so abundant as to drop from the leaves on to the ground. This summer, for example, honey dew was plentiful on the suburban trees of Paris, especially the limes and sycamores. It was formerly supposed to be a secretion of the tree, but is now believed to come from a small insect. The dew is not very wholesome for cattle, and in particular oak leaves charged with it are so dangerous as to have been prohibited for the food of cattle in the Dordogne, France.

#### The Oldest Trumpet.

Our woodcut represents the old Scandinavian "lur," a trumpet dating from the Bronze Age, which is found

in some of the bogs of Sweden and the Baltic coasts of North Germany. It is 6 to 7 feet long, and twisted, as shown, in two planes at right angles to each other. The cast-bronze is about  $1\frac{1}{2}$  millimetres thick, and the tube is made in sections joined together. The lur was held in front of the player, at military or religious festivals, and it is interesting to record that some of these

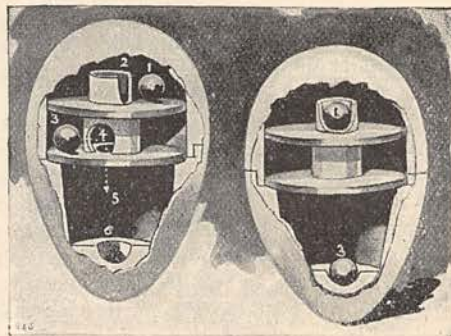


THE OLDEST TRUMPET.

instruments, which are two or three thousand years old, were played at a concert given by Dr. Angul Hammerich in the Royal Chapel, Copenhagen. They were borrowed from the National Museum in that city.

#### The Columbian Egg.

The feat attributed to Columbus of making an egg stand on end has given rise to the ingenious puzzle which is shown in our woodcut. A partition of two floors divides the larger from the smaller end of the egg. The floors are joined by a hollow cylinder, having an aperture in its side, and the interior of the cylinder communicates through a hole in the floor with the small end of the egg. A little ball, 1, is placed in the upper chamber, and another, 3, in the middle compartment. The puzzle is to move the ball, 1, into the enclosure, 2, of the larger end of the egg, and the ball, 3, into the hole, 4, of the middle compartment, so as to allow it to drop into the pit or hollow, 6, at the smaller end of the egg. When this has been achieved the egg will stand upright on its smaller end, thanks, in a measure, to a slight cavity in the end.



THE COLUMBIAN EGG.

#### PRIZE COMPETITIONS.

A large number of manuscripts have been received for the Short Story Competition, and we hope to be able to publish the award in our next number.

We would remind our readers that the Cookery Recipe Competition closes on Sept. 1, and that the MSS. for the Holiday Competition are due on October 3.