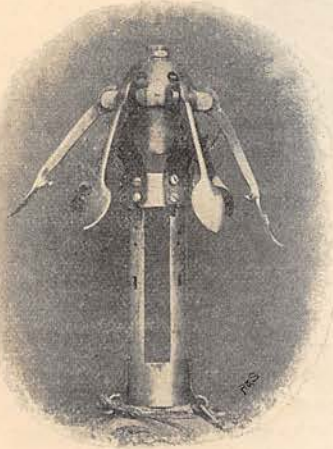


THE GATHERER :

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.

The Rocket Grapnel.



THE GRAPNEL OPEN.

when it reaches the land strikes its flukes into the ground.

A Knife for New Bread.

The "Christy" bread knife, which has achieved a considerable measure of popularity in the United States, has lately been introduced to this country. The edge is not ground in one straight line, like an ordinary table-knife, but in a series of reflex curves ground on one side only. This has the effect of producing a set of tooth-like corrugations; but in this knife the whole of the cutting edge, and not the teeth alone, is sharpened. For soft bread and for cake these new knives should be very popular.

How the Sun grew Hot.

Lord Kelvin, P.R.S., our great mathematical physicist, has been considering the question of the origin of the solar heat, and has adopted the theory of La Place, namely, that the sun and its system was formed from a gaseous nebula. Such a nebula could, he calculates, be produced by an enormous number of small bodies, such as asteroids and meteorites, or by a small number of large bodies, such as planets and their satellites falling together by gravitation. To give some idea of the requirements he imagines twenty-nine millions of cold solid globes, each as massy as the moon, dotted over the surface of a sphere having a radius equal to the diameter of the earth's orbit. If these fell together in one mass the heat

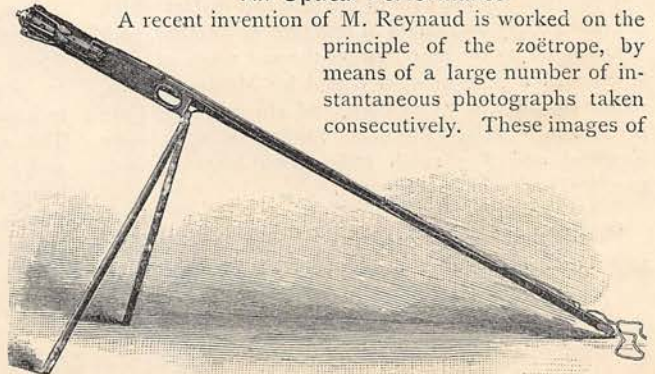
generated by the shock would dissipate them in the form of a gaseous nebula, whose diameter would measure twenty times the diameter of the earth's orbit. If the globes originally had certain movements, equivalent to a rotation round a central axis, this nebula would be similar to the nebula from which La Place hypothetically derived the solar system. Lord Kelvin considers that La Place was a seer of science, and that his nebular hypothesis has now been proved by thermodynamics, the modern science of heat. This investigation seems to throw some light on the "process of the suns," and the economy of creation. Science tells us that our earth and the other planets will some time be old and exhausted, in short, dead. What becomes of the defunct planets? Apparently they fall together by gravity, and generate a nebula from which develops a new system of worlds. In the case of the solar system, perhaps the centrifugal force which keeps the planets in their orbits round the sun by counteracting its gravitation, will gradually become weaker, owing, it may be, to ethereal friction, and when they have become aged will be drawn into the sun, which by then may have become aged too, as sung by Ossian :—

"But thou art perhaps like me for a season,
And thy years shall have an end,
Thou shalt sleep in sky clouds
Careless of the voice of the morning."

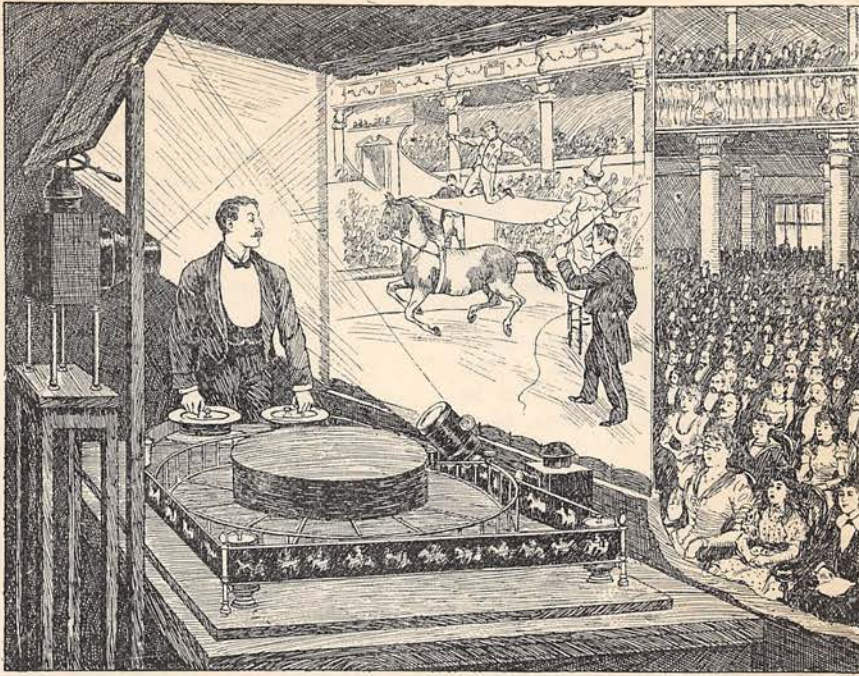
Thus from the decrepit system a new one will arise and this process of birth and death may go on to the end of time, unless Lord Kelvin's theory of the "dissipation of energy" be true, and there is a "universal tendency in Nature" to run down like a clock. In this case the cosmical process must come to an end at last, and the universe to a standstill, until an act of creative power gives it a fresh start.

An Optical Performance.

A recent invention of M. Reynaud is worked on the principle of the zoëtrope, by means of a large number of instantaneous photographs taken consecutively. These images of



THE GRAPNEL CLOSED.



AN OPTICAL PERFORMANCE.

an actual performance by living actors, are impressed on a long strip of photographic transparency, and their number is such that every successive posture of the actor is shown. When such a strip is run through a zoëtrope, and the successive images projected on the screen one after another so quickly that the eye cannot detect any interval between them, the successive images blend in one, and give an appearance of animation to the figures. Thus all the action of the play can be represented by the magic lantern after the manner shown in our illustration, where the operator is visible working the apparatus behind the screen.

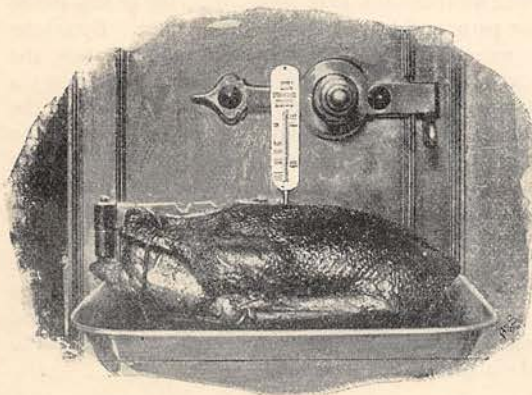
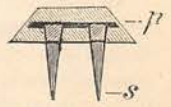
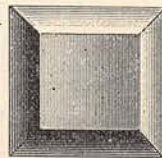
mercury, and surmounted by an indicator with a brass front. On the brass is marked the point which experience has shown, should be reached by the mercury if the meat or bread is properly cooked. The skewer is pushed into the centre of the joint or dish in question, directly it is taken from the oven or fire, and in about forty-five seconds—if the food has been adequately cooked throughout—the mercury will rise to the given mark. So delicate is this test that if one side of a joint is not so well done as the other, the column of mercury will be appreciably lower when the skewer is thrust into the former, than when it is placed in the latter.

Rolling Stones.

If Australia has its travelling stones so has Nevada. The latter are about the size of a walnut, but are quite round, and appear to be nodules containing magnetic iron ore. When sprinkled over a smooth surface they begin to roll together and form a cluster.

A Rubber Stud.

Our engraving shows two forms of a new stud or nail which can be used for boot soles or fixing carpets, matting, and so on. The stud consists of an iron plate, *p*, with projecting spikes, *s*, and the plate is surrounded with vulcanised india-rubber.



An Indicating Cooking-Skewer.

A most ingenious device is shown in the accompanying illustration, and has recently been patented. It consists of a skewer, enclosing a column of

The Microphone in Medicine.

The microphone of Professor Hughes, for detecting sounds too feeble for the unaided ear, has been applied to the stethoscope by more than one physician; but, probably owing to its delicacy and want of electrical knowledge or of perseverance on the part of the doctors, its use in auscultation has not become general. Lately, however, there have been renewed attempts to adopt the microphone for this purpose. Not long ago a Russian lady was saved from premature burial by means of a microphone placed over the region of her heart, which could be heard beating, although she had been considered quite dead. More recently Doctor Bleydell, of New York, has invented a micro-stethoscope, by which he can distinguish sounds of the heart, lungs, blood vessels, and other parts of the body, which are wholly inaudible to the ear alone.

The African Pratincole.



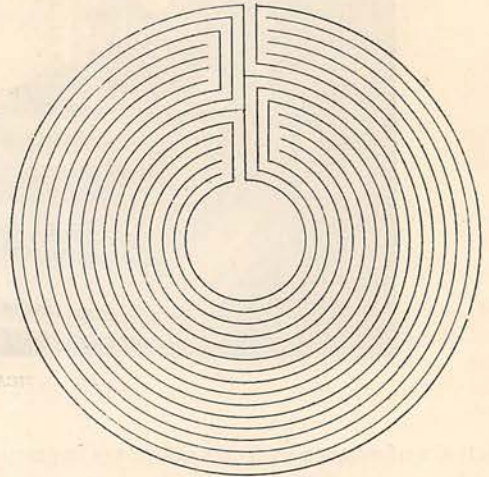
Among the many specimens brought home by Mr. Frank Finn from his African expedition, one of the most interesting is the African Pratincole (*Glareola ocularis*), now in a cage in the Insect House in the Zoological Gardens. It is one of several that were shot near Mombasa, in Eastern Africa, and as it was only winged careful treatment enabled it to be brought home alive, and it is the first specimen ever exhibited. The pratincoles are sometimes called swallow plovers. There are eight or nine species, all small birds, of slender build, with short stout bill, wide gape, long pointed wings, and forked tail. Like the swallows they feed on the wing, and like the plovers they run very swiftly, nest on the ground, and the young are



MIDDLE CLAW
OF AFRICAN
PRATINCOLE.
(Twice the
natural size.)

clothed with down and able to run about as soon as hatched. The middle claw is furnished with comb-like teeth, as is that of a heron or a goatsucker. The general plumage is greenish-grey, mixed with white; there is a white stripe extending backwards from the eye, and the base of the bill is reddish. The European species (*G. torquata*) breeds in the southern parts of the Continent, and is an occasional visitor to Britain.

The Cretan Labyrinth.



The existence of a maze or labyrinth at Gnossus, Crete, is borne out by the legend of Theseus slaying the Minotaur in its heart by the help of Ariadne, who gave him a thread to pay out behind him as a clue in penetrating its recesses, and also by the fact that old coins of Crete exhibit the figure of a labyrinth. Some of the mazes on these coins are circular, others rectangular, but the internal arrangement is the same in all, and consists of a roundabout path which leaves the traveller no choice of route or chance of error. Hence Mr. Richard Inwards has surmised that the device on the coins only shows the clue or key to the right path, and leaves out the wrong ones. By taking the maze as shown on the coins and treating the circular dividing walls as *double*, each containing a passage of the same width as the road shown on the coins, he obtains the genuine labyrinth, as seen in the accompanying figure, which is difficult to explore to the centre even when seen at a glance on paper. The coin device is simply each alternate circle of this one. To give the key in brief—avoid every alternate circle or path. Such a labyrinth helps us to understand how useful the coloured thread of Ariadne might be to Theseus, because on returning to any place he had passed he would find his own thread, and be able to make a better start next time.

A Spurting Lizard.

The "horned toad" of Texas and California, a species of lizard (*Phrynosoma coronatum*) has the singular gift of squirting a red fluid resembling blood

from its eye when it is irritated or excited. One of these animals was recently captured by Mr. Meriam's exploring party and examined by Mr. O. P. Hay, of the National Museum, Washington, who found the liquid to be real blood. One day, while holding the lizard in his hands and stroking its horns, he saw the jet of blood suddenly spurt from its right eye over his fingers.



A New Ruler.

The ruler which we illustrate is formed so that the pen does not ink its side and so smear the paper. Moreover it allows plenty of room for the fingers, and does not constrain the freedom of the pen in ruling a line.

Breathing Exercise.

The "athemgymnastic" of Dr. P. Niemeyer is an exercise in breathing, performed twice or thrice a day, taking each time some fifty or sixty breaths. The inhalation is made slowly, deliberately, pleasantly, and with the fullest attention and intention, through the nose. In this way the air is forced into the smaller air passages and the blood thoroughly oxygenated. The practice is strongly recommended by German doctors, especially for brain-workers and persons of sedentary habits, who are apt to form habits of incomplete breathing, and stint their bodies of oxygen.

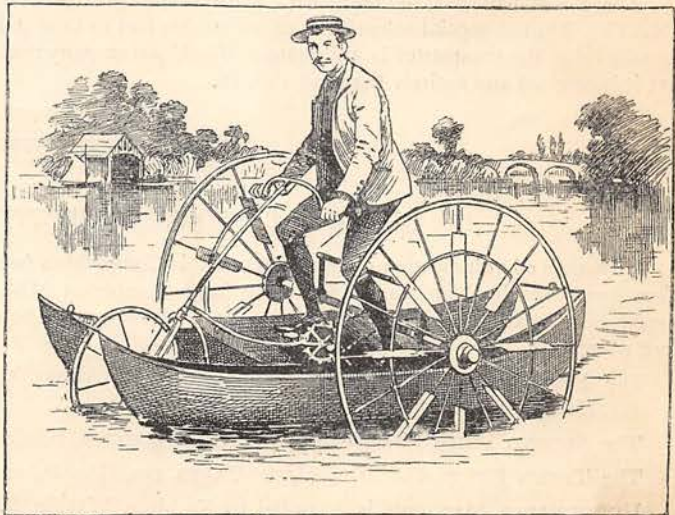
Chinese Silkworm Gut.

Some attention has recently been drawn in a report to the Foreign Office by the British Consul at Kiungchow to a substance known as silkworm gut. It may not be generally known that the so-called gut line used by anglers is the produce of the ordinary silkworm and is prepared in Spain; it is evenly round, almost like wire, and very strong, retaining its tenacity and strength for a very long period. Whether this substance could be substituted or even supplemented by the Chinese product was the question lately raised by the British Consul at Kiungchow as well as by an English resident at Foochow. The identification of the insect furnishing this gut has never been accurately determined, though in

the *Kew Bulletin* for October, where the subject was discussed, it is suggested that it may possibly be *Attacus Pernyi*. The insect, however, feeds on a tree known as the Fung or Feng tree (*Liquidambon Formosana*), and the mode of obtaining the gut is thus described:—Near the end of June small boys are set to watch under the trees for the worms to descend, lowering themselves on their own threads. They do not come down till they are ready to spin. As soon as a worm descends it is at once caught and broken and the silk gut there and then extracted, steeped in vinegar, washed, and drawn out. The small boys are always provided with vinegar and water when in the capture, as the operation brooks of no delay. If the worms are kept at all, the gut is useless and will not draw. Each gut, if properly managed, will draw out to twenty or thirty feet. The gut is dried in a shady place, and is then rolled up and considered ready for use. This gut is used for fishing lines in China, where it is said to cost from 6s. 6d. to 7s. per pound. In the form in which samples of this gut have been sent to England it does not appear to have been favourably received, but it is possible that it might be better prepared if the subject were more fully persevered in, and the substance might become a valuable commodity. The samples received at Kew are now shown in the museum of that establishment.

A Road and River Cycle.

The combined tricycle and boats shown in the figure is an American invention for road and river travel. Twin boats are fastened to a tricycle having wheels fitted with paddles, and when in the water they can be guided by the steering wheel, which is made as a circular disc. The boats can be disconnected from the tricycle at will, and serve to hold luggage, fishing tackle, and other paraphernalia.



THE CYCLE IN USE ON THE WATER.