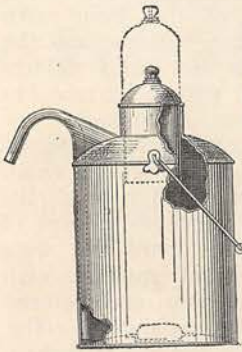


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A Siphon Oil-Can.



The internal arrangement of this handy oil-can is shown by dotted lines. The spout, in form of a siphon, runs to the bottom, and there is a hollow cylinder in the lid which can slide up or down. A knob on the cylinder is a vent-hole for the air. Now, when the vent-hole is closed and the cylinder is pressed down, the pressure of the air forces the oil up the spout.

A Curious Lake.

Russian explorers have found a curious lake in the island of Kildine, in the North Sea. It is separated from the sea by a narrow strip of land, and contains salt water under the surface, in which codfish, sponges, and other marine animals flourish. The surface water is, however, fresh, and supports daphnias and other fresh-water creatures. There is also a literal zone of brackish water, sustaining many seaweeds. The bottom of the lake consists of mud, emitting an odour of sulphur, and the level of the water rises and falls a few inches during the day.

Iron in Food.

Professor Bunge advises people to take their tonics in the form of food rather than medicine, and, by way of helping them, he has found experimentally that asparagus contains more iron than yolk of egg, and the latter more than beef. The vegetables in the following list have more iron in proportion to their height in the scale:—Apples,

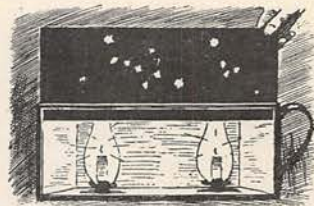
lentils, strawberries, white beans, peas, potatoes, and wheat. Milk has still less than these, and the professor recommends that wheat food should be given with it to infants. Young animals, it seems, have a higher proportion of iron in the system than adults.

A Flying Dormouse.

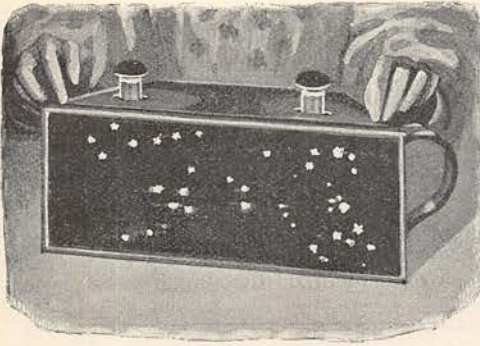
This curious little animal, discovered by Herr Zeuker in the Cameroons, has a fringe of membrane round his body which acts as a parachute, and enables him to jump, if not fly, from branch to branch of trees. He is related to the jerboa on the one hand and the flying squirrel on the other. The pitecheir of Java and Sumatra—a tree-climbing night-rat—has been observed lately, and found to live on the sweet potato and the fruits of certain trees which, owing to the formation of its claws, it is able to climb with the agility of a monkey.

A Simple Astronomical Lantern.

The little device which we illustrate is a home-made lantern for studying the stars. It consists of a box of tin metal or wood with chimneys for ventilation, and slide-ways in front to hold a star map. Two candles in sockets inside afford the necessary light to illuminate the charts behind, and enable



the observer to study their grouping and identify the stars in the heavens. The star maps need only be



A SIMPLE ASTRONOMICAL LANTERN.

simple blue prints, but prepared slides are, of course, preferable if they can be obtained from some optician.

The Brontornis.

Recent geological explorations in Southern Patagonia by Señors Carlos and Ameghino have revealed the existence of a large deposit of fossil birds and herb-eating mammals. These are found in gravelly beds which belong to the Eocene age of the earth's history—the period of gigantic reptiles and flying dragons. More than fifteen species of extinct birds have so far been discovered in these gravels, and amongst them the largest bird yet known. Hitherto the *Dinornis*, an extinct bird of Madagascar, has been regarded as the largest bird that ever lived, but the *Brontornis Burmeisteri*, which we illustrate, was not only taller but thicker. This "ungainly fowl" must have been a good deal more formidable in appearance than the celebrated "raven" of Edgar Allan Poe. It stood over thirteen feet in height, and was of massive build. Its beak was armed with two teeth near the hook, and its scaly feet with powerful claws. Its wings, however, were too small to allow it to fly. The *Dinornis* and his congeners lived on vegetables, but the *Brontornis* probably fed on molluscs and reptiles, such as the dinosaurian lizards which were so rife at the close of the Chalk period. The picture shows a *Brontornis* attacking a *Hadrosaurus* on the edge of a marsh, and the bird in the distance is a *Phororhacos longissimus*, another extinct bird of Patagonia, which resembled the *Aphanapterix*, an extinct bird of the Mauritius, but was about one-third larger. There is nothing singular in the *Brontornis* preying on reptiles. The *baeniceps* of the present epoch have destroyed numberless young crocodiles on the White Nile, and the *Serpentaria* of South Africa is a deadly foe to snakes.

What is Inspiration?

The inspiration of genius has long been a mystery; but we live in a scientific age, and psychologists aim at elucidating all the processes of the mind. It is not

surprising that they have now turned their attention to that noblest endowment of the human race. Goethe, who was imbued with the scientific spirit, expressed the opinion that "no productiveness of the highest kind, no remarkable discovery, no great thought which bears fruit and has results, is in the power of anyone; but such things are elevated above all earthly control. Man must consider them," said he to Eckermann, "as an unexpected gift from above, as pure children of God, which he must receive and venerate with joyful thanks. They are akin to the 'dæmon,' which does with him what it pleases and to which he unconsciously resigns himself, while he believes he is acting from his own impulse. In such cases man may often be considered as an instrument in a higher government of the world—as a vessel found worthy for the reception of a divine influence. . . . There is, however, a productiveness of

another kind which man has more in his power, although he here also finds cause to bow before something divine. Under this category I place all that appertains to the execution of a plan, all the links of a chain of thought, the ends of which already shine forth; I also place there all that constitutes the visible body of a work of art." On the other hand, MM. Passy and Binet, two French psychologists, have been questioning the most eminent French writers and dramatists of the day—including Daudet, Dumas, Sardou, Coppée, Meilhac, and Edmond de Goncourt—as to their experiences, and have arrived at the following results. Literary



THE BRONTORNIS.



A SELF-INFLATING LIFE-BUOY.—FIG. 1.

composition does not manifest itself in an exceptional physical and mental condition which distinguishes it from other mental occupations. The belief in an "artistic hallucination," as well as the influence of the seasons, environment, and artificial excitants, is in their opinion unfounded. The work of artistic creation demands full self-possession, and depends not only on the imagination but also on the reason and common sense. The sole effective excitation to work is of a psychological nature, the author finding himself in a particular emotional state which arises directly from the subject treated. Dramatic composition most frequently takes the form of crises or periods during which production is easy. An author may either give his own ideas to a character, or he may seek to forget his own personality and try to enter into that of the character, or he may be in a state—which might be called inspiration—in which he seems to listen passively to the conversation of his characters. Mental images are, in the view of Messrs. Passy and Binet, of little or no importance in composition. These conclusions are interesting so far as they go, but they do not go very far, because they are based on the experience of a very few authors, and these not of the first rank. It is well known that where genius fails mere art and practice supplement it; and although most, if not all, the writers examined are consummate artists, probably none have the highest order of genius—that of a Shakespeare or a Goethe, for example. They are, therefore, likely to fail in the diviner species of inspiration which Goethe has described, and to work rather by the earthlier species, which does not necessitate self-surrender, and relies on common sense. As to "artistic hallucination," there is evidence to show that some authors have experienced it. Flaubert, the greatest French novelist since Balzac, and an amateur psychologist, has written to Henri Taine:—"In hallucination" (pathological or nervous hallucination he means) "there is always terror. You feel your personality escape you, and believe you are going to die. In the

poetic vision, on the contrary, there is joy: it is something which enters into you. It is none the less true that one no longer knows where one is." Flaubert in his own person was subject to both species of hallucination, and his testimony is therefore of the best. Touching mental images, Dickens and other authors have told us that they actually saw the scenes they so vividly described. With regard to environment and the influence of the seasons, we need only say that the biographies of great men are full of evidence which shows that their productivity was much affected by the weather and their surroundings. Certainly the conclusions of Messrs. Passy and Binet cannot be considered to settle the matter.

A Self-inflating Life-Buoy.

Our engravings show an ingenious new life-buoy which has been invented by M. De Ropp, a Swiss engineer, and tried recently at Geneva. The buoy contains an air-cell, which is automatically inflated by means of the vapour of chloride of methyl as soon as it enters the water. It is also supplied with a sea-light of the Holmes description—that is, a capsule containing phosphide of calcium, which, when wetted by the water, yields a bright torch-like flame, lasting for three-quarters of an hour. The principle of the buoy is also applied to a life-saving dress, as seen in our second illustration. The buoy itself, however, has the appearance of an air-pillow, and is simply bound across the chest.

Frozen Milk.

The Danes and Swedes are now sending frozen milk to England, where it is thawed and sold. The milk is frozen in cans, after being heated to a temperature near the boiling-point (75° C.), and then packed in wooden casks containing some fresh milk for transport. The fresh milk enables the cask to be completely filled, and the frozen milk keeps it fresh. Each barrel holds 1,000 lbs. of milk, and the industry is likely to extend over the world. We may add that the officers of the experimental station of Wisconsin have recently drawn attention to the desirability of pasteurising or sterilising all milk sold and used. The process kills over 99 per cent. of the bacteria, including the bacilli of typhoid and diphtheria. Pasteurised milk has recently been served to the poor of New York, and the rate of infant mortality has been greatly reduced. The intestinal troubles of infants, especially in summer-time, are largely due to bacteria in their milk.

The Cost of Electric Heat.

Mr. R. E. Crompton, the well-known electrical engineer, in



A SELF-INFLATING LIFE-BUOY.—FIG. 2.

a paper read before the Institution of Electrical Engineers, has estimated that an electrical oven is twice as economical as any other heated by gas or solid fuel. Only 10 per cent. of the electric heat is wasted, as against 80 per cent. in the other case. In grilling a chop on a coal fire 2 per cent. of the total heat is utilised, and 65 per cent. in the case of electricity. Moreover, there is no loss of time in getting up the heat with electricity, and neither smoke nor soot.

Oxygen in Drinks.

Beverages are now aerated with oxygen in Germany, and sold in bottles or siphons like lemonade. Oxygen gas is, of course, a medicine of considerable value in cases of diabetes, anæmia, and some diseases of the respiratory organs. It may not be out of place to mention here that helium, the new gas, long recognised in the sun, has been found in the mineral waters of Wildbad, in the Black Forest, and also in another spa near Carterets in the Pyrenees.

A Golden Bicycle.



The little bicycle, which we illustrate full size, is a new article of jewelry which has been introduced by a Parisian maker. The saddle and handles are of silver and the tyre of

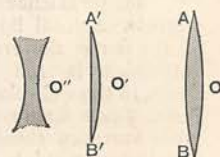
indiarubber, but all the rest of the machine is of gold. It weighs about 60 grains, the big wheel having 30 grains of itself. As will be seen, it is a perfect little machine in every detail.

Breathable Air.

There is an old notion that if a candle goes out in the atmosphere of a confined space the air is unfit for breathing, and will suffocate whoever ventures into it. According to the recent experiments of Professor Frank Clowes, however, the flames of candles and oil lamps produce an atmosphere in confined places which is practically identical with that expired from the lungs, and both atmospheres are respirable with safety, although a candle may go out in them. The popular notion is, therefore, not necessarily true, although, of course, it might sometimes be true. We may also mention that Dr. John Haldane has been investigating the properties of "black, or choke damp"—a gas which comes from coal in mines and is apt to suffocate the miners. It consists of nitrogen mixed with one-seventh or one-eighth of its volume of carbonic acid gas. A mixture of 84 per cent. of air and 16 per cent. of black damp puts out a flame, but it requires a mixture of 60 per cent. of black damp and 40 per cent. of air to produce any immediate danger to life. The bad physiological effect of black damp is due to a deficiency of oxygen. "White damp" is poisonous to breathe, but supports combustion; and "after damp" is the carbonic acid resulting from an explosion in the mine.

A Powerful Field-Glass.

The Jumelle hyperdioptrique is a field and opera-glass which has the clearness and definition of the long, collapsing marine telescope. This result is obtained by an arrangement of the lenses in which the ordinary single object-glass is replaced by two convergent lenses, $A O B$ and $A' O' B'$. The eye-glass, or ocular, O'' , is a simple divergent lens, as in ordinary field-glasses.



This combination enables the ocular to have a short focus, without producing aberration of the light and blurring of the view. It is due to Captain Daubresse, of the French artillery.

Telling the Poles.

M. Flammarion, the well-known writer on astronomy, has devised a photographic method of telling the position of the pole. At the poles the stars will seem to describe circles round the zenith, or point immediately overhead; and, therefore, by exposing sensitive photographs to the night sky, the true position of the poles can be found by the curves which the stars trace upon them.

A Book of True Stories.

"The Red True Story Book" (Longmans) is to be Mr. Andrew Lang's Christmas present for his young friends this year. The range of subjects is surely wide enough to satisfy the most exacting reader, for it includes tales from the Sagas, Mr. Lang's own account of Joan of Arc, and Mr. Rider Haggard's recital of Wilson's last stand against Lobengula's braves. No healthy boy or girl but must appreciate these well-selected and brightly told stories of real life and adventure. The excellent illustrations are by Mr. H. J. Ford.

Natural History for Young Folk.

Messrs. Cassell have just published an excellent and abundantly illustrated work, entitled "Popular History of Animals for Young People," by Mr. Henry Scherren, F.Z.S., which supplies a want, long felt, of a non-technical but yet accurate and attractive work upon natural history, for beginners. Mr. Scherren freely illustrates his descriptions of the animals he is dealing with by telling anecdotes, and these and the frequent pictures make light work of study.

More New Books.

Mr. J. F. Rowbotham is well known as a writer on musical history, but we were hardly prepared for a work upon "How to Vamp" from his hands. The art is not one that we are anxious to see widely practised, but if any of our readers feel that they *must* pursue it, they cannot do better than get Mr. Rowbotham's book, which is published by Mr. Upcott Gill. From the same publisher we have received a practical little "Handbook of Millinery," which we can, with a clear conscience, commend to our lady readers.—Messrs. Longmans send us the second volume in their series of manuals on "Climbing in the British Isles," devoted to climbs in Wales and Ireland. Like its predecessor it is concise and workmanlike, fitted to be a useful holiday companion.