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#### A Pneumatic Skate.



The figure shows a novel road and rink skate, having two wheels three and a-half inches in diameter, with pneumatic tyres like those of bicycles. The wheels support metal clamps for the feet, and the skate is belted round the ankle with the help of a pad, which makes the fastening easy. The skates are noiseless in their

action and can be used on roads, lawns, sands, and pavements as well as skating-rinks. They only weigh three pounds, and according to the inventor, enable a skater to cover ten or twelve miles an hour.

#### Films of Gold.

Ordinary gold-leaf is notoriously thin, but Mr. J. Wilson Swan, the well-known electrician, has recently produced a foil, or rather film, of gold which is five to ten times thinner. He has done so by depositing gold on copper with the electric current, as in electro-plating, and then dissolving away the copper with a solution of perchloride of iron. The film of gold is left untouched by the solution. Should the process become an industry, it will be possible to gild objects with a much smaller quantity of gold than in using the ordinary gold-leaf.

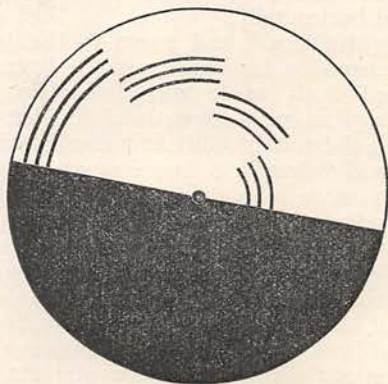
#### A Spectrum Top.

The little scientific toy which we illustrate is a modification of the chromoscope of Mr. B. W.

Bettas, recently made by Mr. C. E. Benham, of Colchester. When the disc is spun round like a tee-to-tum, coloured rings are seen, red, yellow, green, and blue, after the manner of the rainbow. The effect is something of a puzzle, as it is undecided whether the colours are subjective—that is to say, have no real existence outside our eyes—or not. It reminds us of Goethe's idea (now disregarded) that colours were due to the mixture of white light and darkness, and its performance would certainly have delighted the great poet.

#### Trees and Lightning.

According to experiments made in Germany, trees containing starch are more liable to be struck by lightning than those containing fatty matter. Of starchy trees the oak, poplar, plane, elm, ash, and willow may be mentioned, and of fatty trees, the lime, walnut, beech, and birch. Poplars are often struck with lightning, and, indeed, are planted near buildings to act as natural lightning-rods. One should be careful not to take shelter under a poplar in a



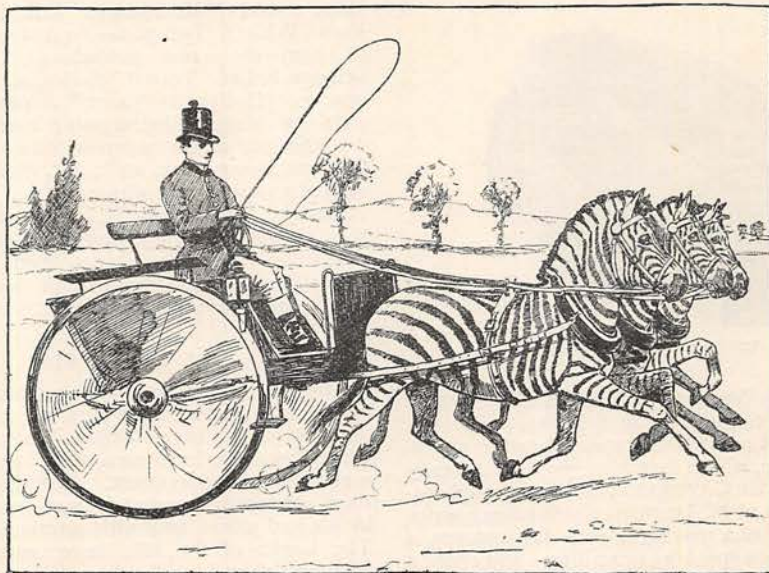
A SPECTRUM TOP.

thunderstorm, especially if there be water at its base and one is standing between the trunk and the water. This precaution, in fact, applies more or less to all trees, and even buildings. According to Franklin, it is safe enough to stand at some little distance, say forty to fifty feet from the tree. Fir-trees, which are starchy in summer and fatty in winter, are more likely to be struck in summer than in winter. Soft hairy leaves on a tree lessen the chances of its being struck, as the hairs act like the discharging points on a lightning-rod; hence, perhaps, red beeches are not often struck. While upon this subject, we may mention that whenever a person is found insensible, and apparently dead from lightning stroke, every effort

formerly attempted to tame these wild animals by accustoming females to wear the different parts of the harness in company with horses, a horse between each pair of zebras. They were put into a light vehicle and walked about before they were driven at a trot, but always with a man at their heads. Unfortunately, the process was interrupted at this stage by an offer from a horse-trainer, and the animals were handed over to him; but he employed more violent means, and the experiment proved a comparative failure.

#### Cold and Life.

Lieutenant Peary, the Arctic traveller, reports that the thermometer fell on one occasion to 62 deg.



ZEBRAS IN HARNESS.

should be made to resuscitate him or her by artificial respiration and stimulating the circulation, as in cases of drowning, for the space of an hour at least. It has now been discovered that persons believed to be killed not only by lightning, but by a powerful shock of electricity, however produced, are often not really dead, but only in a state of suspended animation; and the fact cannot be too well-known, as many lives have probably been lost through ignorance of it in the past.

#### Zebras in Harness.

A merchant of the Transvaal, South Africa, has succeeded in breaking to harness a number of Dauws, better known as Burchell's Zebras (*Hippotigris Burchelli*). The animal is pretty and intelligent, and comes between the ass and horse in the scale of usefulness—that is to say, it is not unlike the Shetland pony. The method of breaking was based on a mixture of gentleness, patience, and firmness, but no particulars of it are forthcoming as yet. We may remind our readers, however, that M. Ménard, of the Jardin d'Acclimatation, Paris,

below zero Fahr., or 94 deg. below the freezing point, during last winter on the Greenland ice-cap, and he considers that the human frame can withstand any degree of natural cold to be experienced on earth. M. Pictet, the well-known chemist, has been trying the effect of extreme cold on the life of lower animals and organisms, by submitting them to an atmosphere cooled with liquefied air. A dog perished in one and a half hours on exposure to a temperature of 108 to 162 deg. Fahr. below the freezing point. Insects resisted the cold down to 63 deg. below the freezing point, myriapods to 92 deg., and snails to nearly 270 deg. Infusoria died at 162 deg., but bacteria remained active at 380 deg. Fahr. below the freezing point. We may add that M. Pictet is about to introduce a "stove," which maintains a cold of 180 deg. Fahr. below the freezing point.

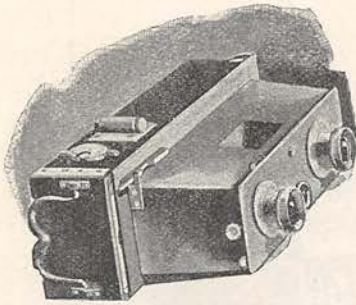
#### A Fever Bath.

An American doctor recommends the following device for giving fever patients a bath. An india-rubber blanket or sheet is passed under the patient in bed, and the corners raised so as to make a dish

into which the water of a suitable temperature is poured. A makeshift shower bath can also be given in the same way by means of a watering-pot with a rose on the spout. The bath can be emptied again with a syphon, sponge, or cup, and the rubber cloth withdrawn without incommoding the sufferer.

#### The Verascope.

This new apparatus, which we illustrate in Fig. 1, is virtually a stereoscopic camera, which enables the user to take two stereoscopic views of an object at once, and, after developing them, see them as in a stereoscope, with the illusion of reality. Space would fail us to explain the optical principle of the instrument, which, we may add, is light, compact, and portable. It is, moreover, a magazine



THE VERASCOPE.—FIG. 1.

camera, and far from costly; hence it is likely to be in demand by tourists. Fig. 2 shows the instrument employed as a stereoscope.—Another photographic novelty, whose inception we have already chronicled in THE GATHERER, is the chronophotographic camera of M. Dumény, which takes a series of photographs of a moving object—for instance, a human face when speaking or smiling—and enables them to be recombined in a zoetropic apparatus by the same inventor, thus producing a literal “speaking likeness.” M. Dumény’s apparatus is, in fact, similar to Edison’s kinetograph, which we formerly described, but it is simpler and more portable.

#### “British Butterflies and Moths.”

Any of the young collectors who were enlisted in the ranks of naturalists by Mr. Furneaux’s “Outdoor World” during the last year, and who have devoted their attention to butterflies and moths, should see the handsome volume under the above title which Messrs. Longmans have just published. It is illustrated by twelve beautifully coloured plates and upwards of two hundred woodcuts in the body of the work; and Mr. Furneaux’s directions to the young collector are at once full and clear, and easily comprehended.

#### The Falling Cat.

According to Marcy, the cat makes a half-turn in the air so as to bring the feet undermost, and keeps them so during the remainder of the drop. He has proved this by taking 60 photographs of a falling cat in a second. Provided the animal has three feet of descent to enable it to make the half-turn, it always lands on its feet. Seeing that the

body acquires a rotary motion in this three feet, it is not easy to understand how the cat stops it and falls straight down.

#### Some Christmas Books

Which ought to be popular all the year round, and are only called “Christmas books” because of the season of their publication, are sent us by Messrs. A. D. Innes & Co. There is a healthy, natural ring about “The Satellite,” by the Hon. Eva Knatchbull-Hugessen, that must commend the volume to all who are in search of a good gift-book for young readers. Then the new “Dainty Books” well deserve their name and their place in the series. There are three of them—“Messire,” by Frances E. Crompton; “Toby,” by Ascott R. Hope; and “Moonbeams and Brownies,” by Roma White. Two pairs of volumes are also sent us from the same publishers. The first pair belongs to the “Tip-cat” Series, and of these the one is “Hollyberry Janet,” a capital story for girls by Maggie Symington; and the other is “Catherine,” a story more suited for older readers than its sister work, by F. M. Peard. With the second pair, children who were not pleased would indeed be hard to satisfy. They are included in the “Roseleaf Library,” and are “The Real Princess,” by Blanche Atkinson, and “Happy-go-Lucky,” by Ismay Thorn. Both books are fresh, bright, and attractive throughout.

#### A Lake of Fire.

The level of the great lake of lava in the crater of Kilauea, of which Miss Bird has given us a vivid description, has been steadily rising since the last great discharge in March, 1891, and overflows of molten lava are frequent. In fact, the lake has risen 447 feet in 19 months, not continuously, but by fits and starts, and with intermediate sinkings. The banks of the lake have undergone many changes, elevations here, and depressions there, with the formation of new blow-holes and cones. When the lava sinks, the solid bank or rim of the lake, being deprived of the support of the molten lava, is apt to fall in. Enormous masses of rock, cold or partially red-hot, thus break away like icebergs from the end of a glacier, and plunge headlong into the molten lake, making columns of fire



THE VERASCOPE.—FIG. 2.

shoot into the air, and waves roll over its glowing surface to dash on the opposite cliffs in red-hot surge and spray. Sometimes, according to a recent observer, the mass of falling rock would be 500 feet long by 200 feet wide, and 20 to 30 feet thick. It would fall with an awful crash, and float away like an island or an iceberg for a time. The smaller pieces usually sank at first, then rose to the surface streaming with lava. The red-hot walls of the crater, exposed by the sinking of the lake, were seen to be caverned and tunnelled with passages leading to other parts of the volcano, and the sinking of the lake was doubtless due to a discharge of the lava through one of these. As the colours of the rocks and glowing lava run through all shades of red and black, the spectacle was most magnificent, especially as night came on.

#### The Kite in Meteorology.

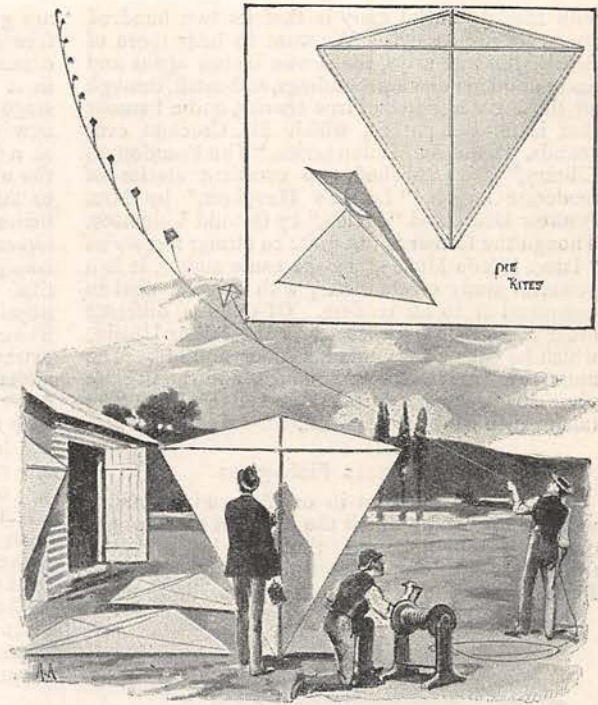
Balloons are now in regular use for observing the condition of the higher atmosphere, and kites are being adapted to the same purpose. If the balloon is a free one, it is provided with a small aluminium anchor to catch the ground when it sinks low enough. Our illustration shows a tandem of Malay tailless kites, made by Mr. W. A. Eddy, of Bergen Point, New Jersey, U.S.A., and sent up from the Blue Hill Observatory, near Boston, Mass., with aerial thermographs, to observe the temperature at various heights. The thermographs were of Richard's type, made with aluminium parts, and weighing 2 lbs. The kites varied in length up to 9 feet, and carried the thermograph to a height of 1,400 feet, where the temperature was found to be 6 deg. lower than at the surface. Without the thermograph, heights over 3,500 feet have been attained.

#### A Buttermaker.

A neat machine for making small quantities of butter has been brought out. On turning the handle, a small clear glass churn containing the cream is oscillated by a simple mechanism, and the formation of the butter is readily seen inside.

#### What is an Earthquake?

Recent earthquakes have attracted the attention of M. Meunier, the well-known geologist, who has made experiments as to the cause of earthquakes in general, and actually experienced one at Nice. He declares that in spite of Humboldt's and other fine descriptions, nothing short of an apprenticeship to earthquakes will enable a man to encounter one without emotion. At first vague rumblings are heard, then distinct noises under the ground, which culminate in a series of irregular and indefinite shocks. At Nice only three shocks running were felt, but in Atlanta, in Greece, lately, as many as 365 shocks occurred one day. Earthquakes are not isolated phenomena; but associated, as a rule, and shocks are felt over vast areas. The Atlanta earthquake was connected with those of Zante last year, and of Syracuse, Legonegro, and Constantinople



THE KITE IN METEOROLOGY.

this year. The shocks wreck houses, bridges, and other engineering works, and produce fissures in the soil, or circular pits, which soon fill with water. At Seville, in 1884, a crack opened so suddenly as to split a large tree from the root to the branches, leaving one half growing on each brink. When the shock occurs beside the sea a flood-wave overwhelms the land, strewing fish and vessels on the shore, as at Lisbon in 1755. The moral effect of the shock is even worse than the physical, for a panic often occurs, and a disposition to doubt everything, as well as bodily sickness and loss of equilibrium. The motion of the soil is compounded of a horizontal and vertical impulse, which at Charleston, in 1886, threw a train off the line, and at Rio Bamba, in 1797, ejected the remains of the dead from their graves near the city, to a height of several hundred feet.

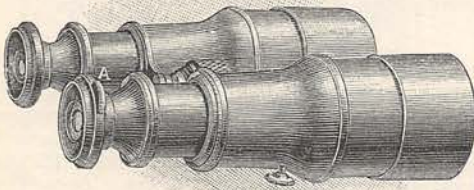
#### Stories that are not too Long.

Happy the writer of whose works complaint is never made that they are too long! There are not many such favoured ones, but Mr. Stanley Weyman must surely be reckoned among the number, and no one who has read "The Story of Francis Cludde" or "The Man in Black," to say nothing of this author's later works, would say that these excellent stories are a line too long. With Mr. Dolman's article fresh in mind, it is natural to think of Mr. Weyman as one of the newer writers whose work is never too long. Then there is Mr. S. R. Crockett, whose latest story is "The Playactress," which Mr. Fisher Unwin sends us as a volume of his "Autonym Library." The only fault to be found

with this delightful story is that its two hundred pages are not enough. We want to hear more of Ailie's winsome ways, see Bessie Upton again and again amid her new surroundings, and catch, through all, those grand notes of true charity, and a humour that is all but pathos, which Mr. Crockett ever sounds. In the companion series, "The Pseudonym Library," are published two excellent stories of moderate length, "Lesser's Daughter," by Mrs. Andrew Dean, and "Helen," by Oswald Valentine. Though the former is not quite so strong a story as "Isaac Eller's Money," by the same author, it is a powerful study of character, with a good deal to commend it to all readers. Of quite a different order is another work issued by Mr. Fisher Unwin, which he calls a fairy tale for young and old. The author is Mr. Herbert S. Squance, and the title he gives his story is "Miss Mackerell Skye." The tale is both fresh and fanciful.

#### A Compass Field-glass.

The field-glass shown in our figures is provided with a compass by which the distance of an object can be found, and will therefore be useful to travellers, naval or military men, and tourists. Fig. 2 is a section through the glass showing the



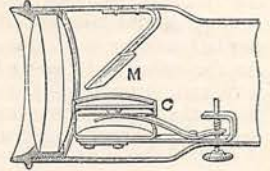
A COMPASS FIELD-GLASS.—FIG. 1.

compass C, with a mirror M inclined over it to enable the observer to read it while looking through the glass at the object. By shifting his point of view, two angles are measured by the compass, from which the distance can be readily found by plotting them on paper or by calculation.

#### Milk and Bacteria.

Experiments made at the Stovers Agricultural Station, America, and described in the Sixth Annual Report of the institution, show that bacteria promise to be very useful in making butter. The cream is warmed to a temperature of 70 deg. Centigrade (158 deg. Fahrenheit), and inoculated with bacteria from sour milk, which should be obtained at a good dairy. The preliminary heating tends to kill the germs of disease and useless bacteria. The inoculated bacteria ripen the cream and produce a butter of excellent flavour, if they are of the right sort. The experiments are still in progress, and will, no doubt, lead to very useful results. We may add that Dr. A. Bernstein, of Berlin, has discovered a bacterium which rapidly makes sterilised milk transparent and, what is still more important, peptonises it, that is to say, renders it easily digestible. The fresh milk is inoculated with the milk in which the bacteria

are growing, and the action spreads from the surface downwards, the milk growing clear, while the casein, or principle of cheese, and other proteids in it are converted into peptone. Milk in this stage is prepared as an article of food by mixing new skim milk with it and keeping the mixture at a temperature favourable to the bacteria until the whole is transparent. It should then be boiled to sterilise it and coagulate any casein that remains. The product is a slightly reddish acid liquor, having a pleasant aroma, and is both nourishing and digestible. We may mention here, that an American physician recommends a small quantity of extract of malt to be added to fresh milk in order to peptonise it, and the whole should be boiled to destroy any noxious germs, or, in other words, to sterilise it. Dr. Bernstein is of opinion that a bacterium similar to the above is instrumental in ripening cheese. Bacteria which have so long been regarded as inimical to the life of man, are now demonstrated to be essential to his very existence, and in the hands of science are being turned more and more to his advantage.



A COMPASS FIELD-GLASS.—FIG. 2.

#### Books for the Household.

Readers of CASSELL'S MAGAZINE need no introduction to Miss Lizzie Heritage as a writer on cookery. In "Cassell's New Universal Cookery Book" she has just completed a larger and more important work than any she has previously essayed. When we say that the volume contains more than thirteen hundred pages, and is accompanied by twelve coloured plates in addition to the numerous illustrations scattered about the work, we have said enough to show the comprehensive character of the book. But it is more than that, for it is thoroughly "up to date" in every respect, is well and clearly arranged, and pays special attention to the economical and artistic preparation of the dishes it suggests.—Messrs. Ward, Lock & Bowden have just published "The Profession of Cookery: from a French Point of View," by Miss Lucy H. Yates, in which some excellent and appetising French dishes are popularly and concisely explained for the benefit of English cooks.—At the same time we may notice a handy and practical little text-book on "Personal Hygiene," by Mrs. Ada S. Ballin, which is published by Mr. F. J. Rebman.

#### "Pomona's Travels."

Who among readers of "Rudder Grange" would have expected to meet the "Pomona" of those days travelling in Europe, putting up at the best hotels, and seeing our country from north to south as comfortably and conveniently as possible? But Mr. Frank Stockton has brought her to life again; and the story of her stay in England, the sights she saw, and the people she met, is pleasantly told in the handsome volume published by Messrs. Cassell, and illustrated so effectively by Mr. A. B. Frost.