

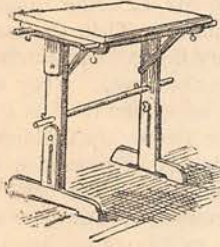
THE GATHERER :

AN ILLUSTRATED RECORD OF INVENTION, DISCOVERY, AND SCIENCE.

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An Embroidery Frame and Table.



A combined table and embroidery frame is shown in the accompanying figure. The two legs are slotted and extensible ; and the embroidery frame can be inclined at any angle to the worker. A table top fits above the frame when required, and it, too, can be inclined at any angle ; for example, as a desk.

The Japanese Ape.

Visitors who enter the Zoological Gardens by the main entrance will find a large cage outside the Monkey-house, corresponding to that in which "Jack" the Tcheli monkey dwells beyond the house on the other side. The occupant of this new cage, the Japanese Ape (*Macacus speciosus*) has a more northerly range than any other monkey. Indeed, both he and "Jack" would be incapable of supporting the high temperature of the monkey-house, most of the inhabitants of which come from tropical or sub-tropical regions. The Japanese Ape, in its wild state, lives in troops, and these commit great depredations in gardens and plantations, for they feed on acorns, nuts, oranges, date-plums, and any other fruit that fortune may throw in their way. Like its near relation, the Indian Bhunder, this monkey can be easily tamed and taught a variety of tricks—to dance the tight-rope, and to take part in acrobatic performances. It is a great favourite with the Japanese, and the constant companion of Japanese showmen, some of whom dwarf it to render it more valuable as a means of money-getting. The general hue is dull olive, with flesh-coloured face. Albinos

are known to occur, and are highly valued. Siebold, in 1826, saw one in the menagerie of the Shogun, or Generalissimo, of Japan.

Small Writing.

Small writing has become the mode in France, and the *Petit Journal* recently received a postcard containing more than 3,000 words. The journal *l'Éclair* has promised a prize to whomsoever will write the greatest number of words on the smallest space. The craze is by no means modern. Pliny mentions a copy of Homer's Iliad which was contained in a nutshell. A paper about a square centimètre in area, containing the Ten Commandments and other matters was presented to Elizabeth, queen of Charles IX. Not many months ago a Viennese, Herr Sofer, engraved a psalm of 391 letters on a grain of wheat. Typography has achieved similar triumphs. At the Paris Exhibition of 1889 there was a small printed copy of Dante, with pages about an inch square ; but it was said the compositor had become almost blind in setting the type.

Mars and other Planets.

During the recent approach of the planet Mars to a distance of 35 million miles from the earth, some new facts were added to our knowledge of this interesting body, which, with its polar snow-caps, cloudy atmosphere, and mixture of sea and land closely resembles the earth. The telescopic appearance of the planet with one polar icecap will be gathered from Fig. 1 ; and Fig. 2 illustrates a portion of its land surface as intersected by the water channels or "canals" discovered by Schiaparelli, the Italian astronomer, who in 1881-2 remarked that many of the latter were doubled as if they had been formed by intelligent beings. Skilled astronomers at the Lick Observatory in California, as well as Professor Pickering in the Peru Observatory, have of late scrutinised these double canals, but find them all or nearly all single. The doubling formerly observed occurred during the northern springtime in Mars, and as this season did not obtain during the recent observations it is inferred that the canals are watercourses which are



FIG. 1.

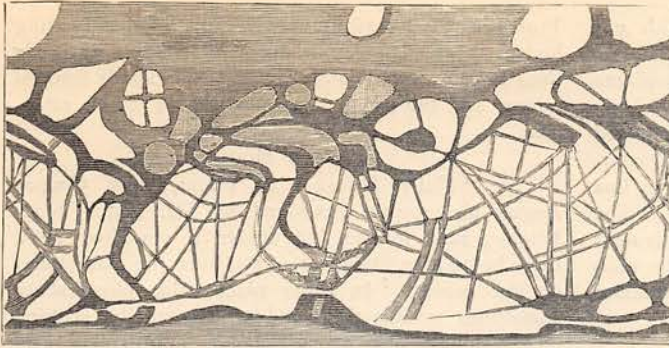


FIG. 2.

sometimes doubled by melting snows. Professor Pickering has discovered two mountain ranges near the south pole of Mars, and he asserts that on August 5th last snow fell on the equatorial ranges, covering two summits, and disappearing after two days. He also observed eleven lakes connected by dark lines, probably rivers, with two large dark areas, like seas, but not blue. One of the green spots adjoining the polar areas was also photographed. There has been much disturbance in the clouds of Mars, which, he says, are yellowish and partially transparent. The question of communicating with the inhabitants of Mars by means of visible signals has been much

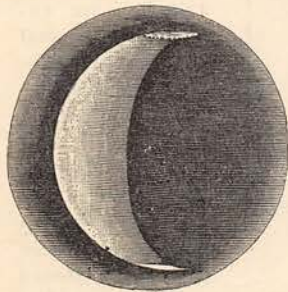


FIG. 3.

debated in the past summer; but nothing practical has been done, and as the planet is now receding from us, our chance of saluting the dwellers of another planet, which would have been the crowning triumph of nineteenth century science, is fast disappearing. Perhaps, however, the recent discussion will prepare the way for something being done on a future occasion. The first suggestion of signalling to Mars by means of powerful electric lamps occulting like a lighthouse appears to have come from Mr. J. Munro, C.E., our contributor, who published it some three years ago. Curiously enough, after that a French lady bequeathed a sum of money for effecting this very purpose by similar means. The same method has recently been proposed by Mr. Hawsis, who was doubtless ignorant of its lack of novelty. Mr. Galton has also suggested the use of sunlight flashed from mirrors, but the electric light is preferable, for several reasons. It is not improbable that a body of electric light formed by a group of arc lamps, and regularly occulted would attract the attention of the Marsian astronomers if there be any, and might be responded to in a similar way. Whilst Mars is leaving us, Jupiter is approaching, and both planets are brilliant objects in the evening sky. Jupiter has hitherto been supposed to have only four moons; but Professor Barnard of the Lick Observatory has

recently detected a fifth, which is only about 100 miles in diameter. It revolves round Jupiter in 11 hours 59 minutes, and is 112,400 miles distant from the centre of the planet. Fig. 3 illustrates the appearance of the planet Venus, as recently drawn by M. Trouvelot, the well-known French astronomer. The planet is partially illuminated by the sun after the manner of our moon in its quarters, and the white areas at the poles, which, like those of Mars, are thought to be snow fields and glaciers, are very clearly defined together with the penumbra

or shadow they appear to cast.

An Office Indicator.

An indicator which will meet a want often felt by professional men and others has just been patented by Mr. Jenkins. The dial, which is fixed outside the door, shows a clock-face with an opening at the top through which is seen one of the announcements carried on a revolving dial, controlled from inside the room by a very simple mechanism. The indicator may thus be made to show that the tenant of the room "will return" at any particular hour, or that he "is within," "is engaged," is "out of town," or that it is "mail day" (and that, therefore, he cannot see any strangers whose business can wait).

An Electrical Ore Finder.

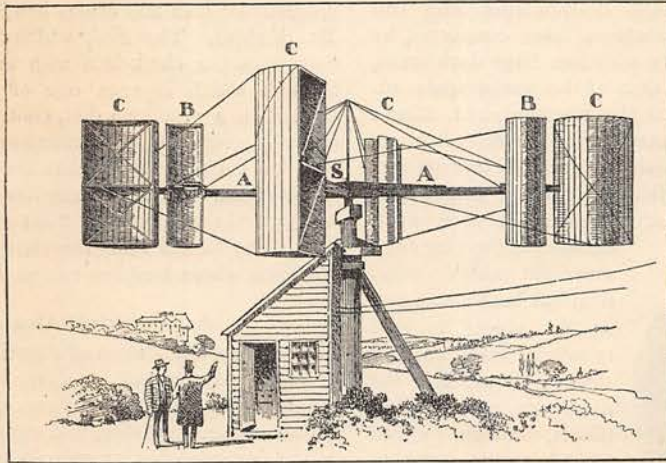
The latest application of electricity to the detection of ores underground is that of Mr. George M. Hopkins, a well-known American inventor. It is shown in our engraving, and consists essentially of a coil of insulated No. 18 wire in circuit with a battery and an interruptor. At an angle to this coil is another of fine No. 36 insulated wire, in circuit with



a telephone which the prospector applies to his ear while holding the coils over the ground. If there is no mass of metal or magnetic ore near, the telephone is silent; but if there is, the interruption of the current can be heard by the corresponding induced currents in the telephone. The battery and interruptor of the primary circuit are contained in a box slung from the shoulder of the prospector. The apparatus is especially useful when the mineral is near the surface, or crops out in cliffs; but when the coils are enclosed in a watertight case, it can be used under water.

Electricity from Wind.

In 1887 Professor James Blyth, of Glasgow, constructed at Marykirk a windmill so arranged as to drive a dynamo which charged an accumulator for electric light and power purposes. This motor had, however, only some of the requisites for utilising wind-power in generating electricity, namely, being always ready to go, without attendance, and in the wildest gale. He was, therefore, led to consider the revolving cups of the Robinson anemometer, and has recently set up a windmill on the same principle. It is illustrated in the figure, where the "cups," C C C C, are semi-cylindrical boxes attached to four strong arms, A A, each 26 feet long, revolving. Blyth further augments the power of the machine by adding a smaller auxiliary box, B B, to each arm behind the larger one. As to the electrical connections required, the dynamo circuit should be automatically interrupted when the dynamo is running at less than storage speed. This is accomplished by a governor attached to the dynamo shaft, which makes and breaks contact in a mercury pool at the required speed. Another form of governor merely regulates the number of storage cells to suit the current, and in this way the machine is always doing some work. The round and vertical iron shaft, S, carries at its lower end a massive pit wheel actuating a train of gearing, and driving a fly wheel six feet in diameter. From this fly wheel the dynamo is driven by belting, and charges the accumulator. The opening of each box is 10 feet long by 6 feet wide, and the machine going with a fair wind at ordinary speed gives about 2 electrical horse-power. It runs well in a strong gale, and is well adapted for small domestic installations; but, of course, the size can be increased, and more than one installed on windy sites.



ELECTRICITY FROM WIND.

Professor Blyth's plant is well adapted for lighting houses in the country, where wind is more available than coals or water-power. Wind is a cleanly form of power, and the motor does not require much attention.

A Pict's House.

The "Pict's House" at Pitcur, near Coupar Angus, as recently examined by Mr. David MacRitchie, runs for 20 feet under a ploughed field, there being about two feet of soil over the flat stones of the ceiling. In other places the ploughshare sometimes reveals these hidden retreats by striking on the stones. The ground plan is approximately of the shape of a horse shoe, and there is a shorter gallery parallel to the exterior curve of one side. The medial length of the shoe gallery is 130 feet, its breadth 6 feet, and its depth 6 to 7 feet. The shorter gallery is 55 feet long and as roomy as the shoe gallery, but it broadens into a kind of bulb at the inmost end. This terminal hall or cave is a common feature of such buildings. The galleries are entered by several doorways resembling burrow holes. Their sides have been carefully built with large unhewn, unmortared stones, and they approach at the top where the ceiling stones

are laid across. One of the largest slabs is 74 inches long by 58 inches broad, and 11 to 13 inches thick. Such stones are sometimes brought from a great distance, and many of them have been utilised in building operations. In one of the galleries there is a small niche in the wall formed by two upright slabs. It is 23 inches wide at the floor, but narrows to 14 inches at the top 33 inches above the floor, and is 21 inches deep. Mr. MacRitchie estimates that a man 5 feet 10 inches high could squat in this recess, which is similar to the "guard cells" found in Pictish brochs. According to the popular tradition in Scotland the Picts were small men, and may have belonged to the same race as the small dark dolichocephalic people whose remains are so common in the British Isles.

Lac Insects.

Lac insects have been discovered on the "stink weed" and other plants of Utah, northern Mexico, Colorado, and Texas; and it is now a question of cultivating them and rendering the United States independent of foreign supplies of lac. Lac is a resin produced by the puncture of certain trees by insects.

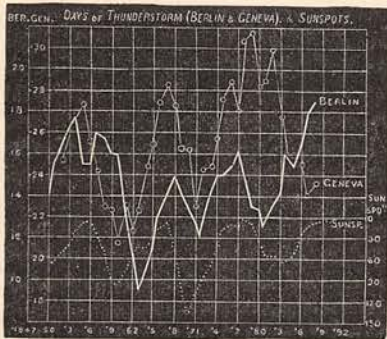
The female insect covers herself with lac as a kind of cocoon, then lays her eggs and dies. The young, on being hatched, make their way out, and feed on the green spots of the bark. The crude lac is stripped from the twigs and ground, washed, dried, and roasted. The melted gum is spread over a metal cylinder, and when cooled is the well-known shellac of commerce. Any new source of supply for so important a product is of interest.

An Inclined Lift.

The Reno inclined lift is designed for moderate heights and a continuous traffic. It consists of an endless inclined platform moving at a uniform speed, upon which the passengers step while it is in motion, and are transferred from one landing to the other. The travelling platform is made up of a series of cast iron lags $3\frac{1}{2}$ inches wide and 1 foot 10 inches long, supported on cast-iron rollers, $2\frac{1}{4}$ inches in diameter, linked together and running on trucks. The platform is put in motion by means of two pairs of Sprocket wheels, whose teeth engage with projections on the lags. When going at a speed of 70 feet a minute passengers have no difficulty in stepping on or off. The lift can be operated by any convenient motor of sufficient power.

Thunderstorms and Sunspots.

In 1874 and subsequently Professor Von Bezold, arguing from statistics of lightning stroke in Bavaria has concluded that hot weather and a spotless condition of the solar surface give years abounding in thunderstorms. Professor Fritz arrived at a similar

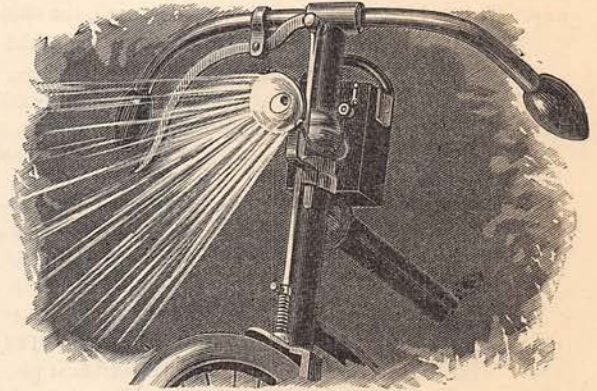


result from a study of thunderstorms in the Indian Ocean, and quite lately Mr. A. B. MacDowall, M.A., an investigator of the weather by means of curves drawn from statistics of observations extending over a long period, has found a similar correspondence in thunderstorms at Berlin and Geneva. His curves are reproduced in the figure, and are derived from results obtained at these places since 1850 and 1852 respectively. The numbers of days of thunder were grouped in averages and each yearly point of the curve represents an average of 5 years. The scale figures are shown in vertical columns on the left. The dotted curve below is that of minimum numbers of sun-spots,

with figures to the right; and it will be noticed that the heights of the thunderstorm curves coincide fairly well with the other curves which represent the scarcity of sun-spots.

A New Cycle Lamp.

The cycle lamp as shown in our illustration is a detachable bull's eye lantern containing an incandescent lamp, supplied with current from an



accumulator in a leather bag which is fixed by means of straps behind the handle, or underneath the saddle if preferred. The lantern is only 2 inches in diameter and weighs 5 ounces.

Chalcedony Park.

The remarkable "forest" of petrified trees, called Chalcedony Park, can be reached in a few hours from the Holbrook or Corizzo stations, Arizona, on the Santa Fé Railway. The area of the "park" is estimated at hundreds of square miles, and it contains hundreds of tons of agatised wood. Mr. Hovey, a recent visitor, likens it to a "vast logging camp," where the lumbermen have tossed the huge logs at random from their sleds, and gone away, leaving them to become rain-soaked and moss-grown. Some of the trunks are 150 feet long, and they break up in sections as if sawn through at intervals. Their skins are dark red as a rule, but the chips and interior exhibit kaleidoscopic colours. Amethysts, red and yellow Jasper, chalcedony of every tint, topaz, onyx, cornelian, and other stones abound. The logs, in fact, are a blend of these stones. One of them, 100 feet long and 3 to 5 feet in diameter, spans a narrow cañon, and is called the Agate Bridge. It is chiefly composed of jaspers and agates. As to the origin of the petrifications it is supposed that in past times the trees were overwhelmed with volcanic ashes and hot silicious waters from geysers. The timber is analogous to pine or cedar, and as it decayed, the silica, dyed with various salts of iron and manganese in solution, took its place. The fossil wood is cut and polished by the Drake Company, of Sioux Falls, Dakota, who exhibit specimens at Tiffany's, New York. One of these is about 3 feet square and weighs over two tons.