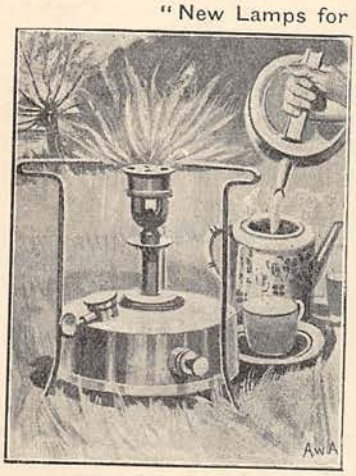
THE GATHERER:

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.

"New Lamps for Old."



A WICKLESS LAMP STOVE.

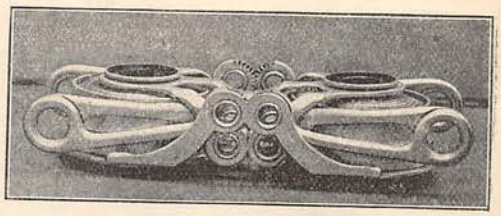
The Swedish stove which we illustrate herewith burns the gas from petroleum oil contained in the reservoir below and requires no wick. Once lighted, the burner vapourises the oil, and there is neither smoke, smell, nor disagreeable heat. The stove is inexplosible, and will be found useful both in summer and winter for cooking and boiling purposes. It is stated to boil a quart of water in three or four minutes, and cook a rump steak in five minutes. When the flame is at its maximum the consumption of oil is one-third of a pint per hour.—While upon this subject we may also mention the "Beehive" wick, intended for burning the heavy oil used in bicycle lamps. The wick has been introduced by a Manchester firm, and is chemically treated, so as to last much longer than the ordinary wicks.—We may also refer to the method of enriching oil gas by the hydro-oxy process, now in practical operation at Huddersfield. The oil is converted into gas in retorts, and oxygen gas, made by the Brin process, is commingled with it before it is cooled. The oxy-oil gas thus produced is ultimately mixed with the ordinary coal-gas, and serves to enrich it. Moreover, with the cheap oil of the United States, the oxy-gas alone can be used for illuminating purposes.

Transporting Liquid Air.

Professor Dewar has recently forwarded a considerable quantity of liquid air from the Royal Institution, London, to Cambridge, by taking special precautions to keep out heat. The precious liquid was carried in a glass flask with double walls. The air between the walls was pumped out and a small quantity of mercury put in its place. Under the extreme cold of the liquid air a film of solid mercury condensed on the outer surface of the inner wall, and formed a reflecting surface highly impervious to heat. This done, the whole flask was packed in solid carbonic acid, which froze the mercury and produced an almost perfect vacuum between the two walls. The protecting envelope of the liquid air had a temperature of 80° C. below zero; but it must be borne in mind that the temperature of the liquid air was nearly 180° C. below zero, so that the difference between the air and its protecting jacket was nearly that between ice and boiling water. Despite this discrepancy, and the jolting of the train, the liquid air reached its destination with only a slight loss of bulk.

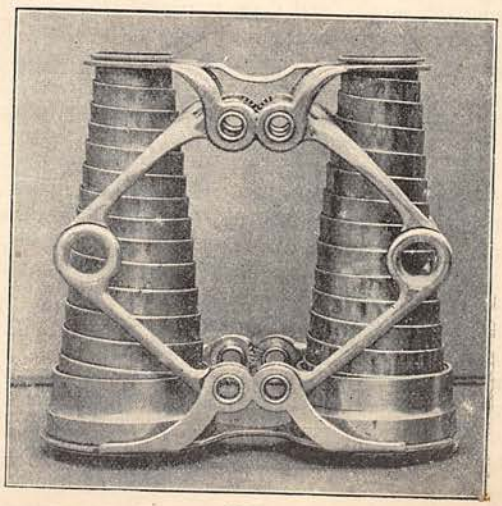
A Folding Binocular.

The folding binocular which we illustrate is the invention of a London optician, Mr. Aitchison, and supplies an instrument which is available for use either as an opera or field glass. As will be seen from our



CLOSED.

illustrations, the opening and closing of the glass are effected by side-pieces of aluminium, which act as levers, and secure, by means of toothed ends, a perfect parallel movement between the lenses. When closed, the instrument is barely an inch in thickness, so its compactness and portability are assured. The tubes



OPEN.

are formed of volute coils of aluminium, wound on a taper mandrel, the grooving of the inner edge forming

ENTRANCE TO THE NOURAGHE OF SANTA BARBARA.

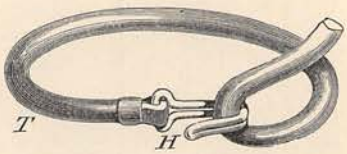
a complete series of diaphragms, that adds greatly to the definition of the lenses. Although the new glass is so strong as to be practically indestructible, it weighs, with its case, less than six ounces, and may be carried in the pocket with no greater inconvenience to the wearer than is caused by an ordinary pocket-book. The consequent gain to all sight-seers, travellers, and naval or military officers is apparent.

The Nouraghes of Sardinia.

On the plateaux of Sardinia there are many singular ruins, called "nouraghes," whose origin is something of a mystery. They have been considered as temples, and tombs, towers of silence, and watch towers. Built of large hewn stones, and enclosed by walls, they are formidable works, and there is one at Domus-Novas which is a real citadel, with sixteen chambers, and walls 500 feet in circumference and eight feet thick. It is supposed by a recent explorer that the nouraghes were really refuges for the cattle and people in times of war or plunder, and this is probably the right explanation of the mystery. They may be compared to the old Gaulish underground refuges to which we referred in a former GATHERER. The Sards who colonised Sardinia in early times came from Lybia, on the other side of the Mediterranean, and were a pastoral people. They were probably the builders of these nouraghes, which, we may add, are also found in North Africa, the Balearic Islands, Southern Italy, and the Caucasus. While upon this subject we may mention that a curious case of optical illusion has been found in a wall of a ruined Gallo-Roman temple of the third century on the summit of the Puy-de-Dôme in Auvergne, France. The wall is built of black and white stones, laid so as to produce zig-zags down the wall, black and white by turns. Standing at a distance the horizontal layers of stone appear to converge, an optical illusion known as "Zöllner's figure," and published by him about forty years ago, but which we now know to be much older. The use of the illusion in the rites of the temple is still a matter of conjecture.

A Simple Tourniquet.

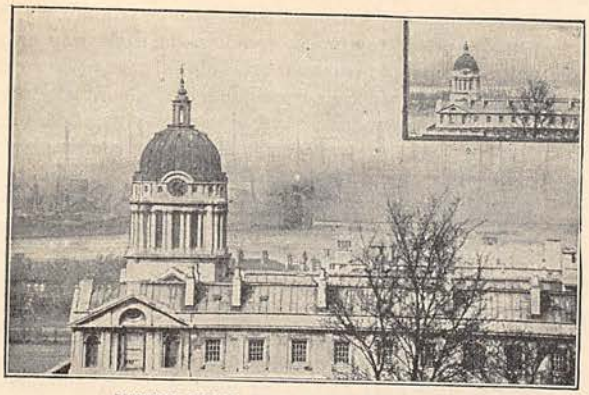
A tourniquet is, of course, a ligature for arresting the flow of blood by compressing the limb above the wound, that is, between it and the heart. One of a very simple and convenient nature is illustrated herewith. It is simply a length of indiarubber tubing, T, with an open metal hook, H, fastened to one end with leather, and in a moment the rubber band can be turned round the limb once or twice as the case may require, and slipped into the hook. where it is firmly held by the expansion of the rubber through the openings of the metal, so that the more it is pulled the faster it holds. Every household and every traveller by rail or otherwise might reasonably be provided with such a tourniquet. It costs a mere trifle, and is warranted to keep sound for any time in this country, and for two years in India.



Advances in Photography.

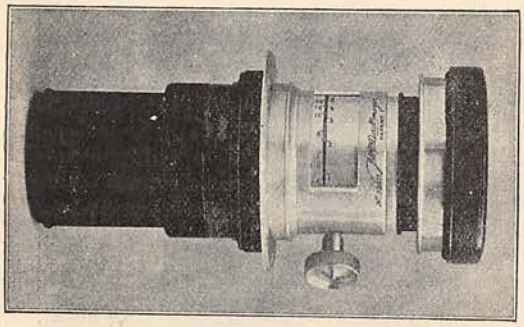
Our illustrations show an advance in photography which we owe to Mr. Dallmeyer. In Fig. 1 (on p. 239) the small picture in the corner shows the picture resulting from the use of an ordinary lens, the large one shows the result with Mr. Dallmeyer's teleobjective

NOURAGHE AT SANTA BARBARA.



PHOTOGRAPHING FROM A DISTANCE.—FIG. 1.

from the same point. We should explain that the two pictures in Fig. 1 are cut out of large plates, but are here reproduced in their original size. In Fig. 2 the attachment by means of which the long distance photographs are secured is shown.—While upon this subject we may mention that Mr. G. W. Morgan, of Aberdeen, has brought out an ingenious method of taking photographs after dark by the magnesium light. The sitter is not exposed to the long glare of the ordinary magnesium or the electric light; but a travelling frame quickly gleams the light over him in such a way as to allow the photograph to be taken



PHOTOGRAPHING FROM A DISTANCE.—FIG. 2.

—Amateur photographers will welcome a simplified meter for calculating the necessary exposure, recently brought out under the name of the "Junior Watkins." Having only two movable rings, it is simpler than the older form, and a blue-tinted glass greatly facilitates the reading of the tints of the sensitive paper. It is so portable that it may be carried in the waistcoat pocket.

The Highest Observatory.

M. Janssen, the well-known French astronomer, has now completed his observatory on the summit of Mont Blanc, and personally made the first observations. A good idea of the structure will be gathered from the illustration we published in THE GATHERER in March of last year. M. Janssen has already confirmed his previous observation to the effect that the so-called "oxygen lines in the solar spectrum are really due to the atmosphere of the earth and not to the presence of that element in the corona or outer layer of the photosphere. The corona, in fact, is mainly composed of two light elements: hydrogen and "helium" (which is yet unknown on the earth); but occasionally iron, calcium, magnesium, and other heavy elements are projected into it from below. This envelope of hydrogen allows the solar heat to radiate freely into space. Were oxygen to mingle and combine with it forming water, the radiation would be seriously impaired.

The Electrical Wizard.

An interesting and instructive toy is the "Electrical Wizard," which has been introduced into London from abroad. It consists of a flat box containing a small electric bell, a battery to work the bell, and two metal contact makers connected by flexible wires, one with the battery and the other with the bell. A number of metal points are also joined by wires in such a way as to complete the circuit of the electric bell when corresponding pairs of them are touched by the contact makers. Each of these points projects upward through a square in a card marked with the questions and their answers. The questions may be on historical, scientific, or, indeed, any instructive subject, and further, any user of the box can make a card for himself with his own questions and answers. The questions occupy the left half of the card, the answers the right. Now, suppose the question is asked, "Who discovered America?" To find the answer, one contact maker is held against the metal point corresponding to the question, and all the points in the right half of the card are touched one after another. When the child reaches the point at the answer "Columbus," the bell will ring.

Heating Iron in Cold Water.

A curious experiment shown at the Chicago Exhibition will be understood from our illustration. It is due to MM. Lagrange and Hobo, of Brussels, and consists in heating a bar of iron white hot in cold water. The bar is plunged into a bucket of acidulated water as shown, and an electric current is sent through the water by connecting the bar to the negative (—) pole of the dynamo through the tongs, while the water is connected to the positive (+) pole by means of a leaded plate (L) about 16 inches long and 9 inches wide. When

HEATING IRON IN COLD WATER.

a current of 150 ampères is used the iron immersed in the water immediately becomes red-hot. Wrought iron and steel actually melt in the water after a time, and even carbon becomes amorphous. The temperature, in fact, reaches 4,000° C., and with a current of 220 ampères it is raised to 8,000° C. A flame of burning hydrogen surrounds the metal in the water, and it is believed that as the electric current decomposes the water into its constituent gases—oxygen and hydrogen—the hydrogen collects round the iron and offers such a resistance to the electricity that a high temperature is produced. For the same reason an electric arc lamp burns brightly under water.

A Wooden Fireproof Door.

Fireproof doors are usually made of iron, but these are objectionable in several ways; and it is satisfactory

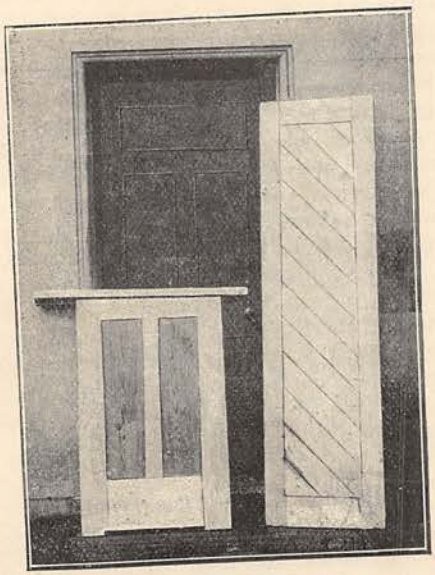
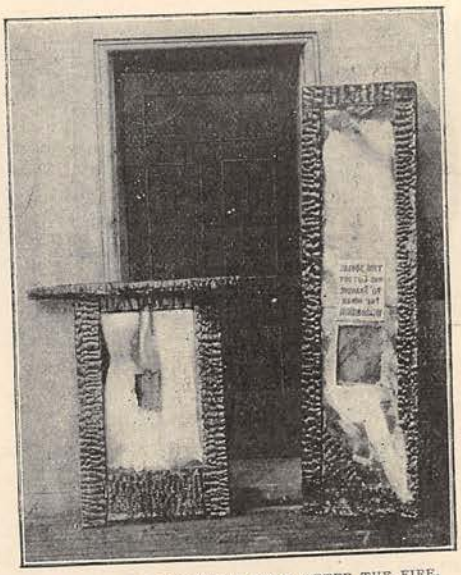


FIG 1.—BEFORE THE FIRE.

to learn that a wooden door, resembling the ordinary kind, but fireproof, has been brought out. The door, as shown in Fig. 1, is hollow and filled with sheet asbestos. Recent trials at Nottingham have shown that, after twenty-five minutes' exposure to fire, the wooden frame is charred, but the interior or mass of the door remains sound, as will be seen from Fig. 2. For ordinary houses and public buildings these doors have some advantages over the heavy and unsightly iron ones.

Experimental Criticism.

Literary criticism has, until now, been left to the intuitive appreciation of the critic; but Dr. L. A. Sherman, an American, has taken a new departure in applying the methods of science to literary works. Great things are expected from this new science, which would investigate a poem much in the same way as a naturalist would dissect and classify a new bird. Nevertheless, we are somewhat sceptical of its future. Among other results arrived at we may mention that the length of the sentence in English prose has been contracting since the days of Elizabeth. Sir Thomas More, Sidney, Spenser, and others, employed from 40 to 60 words to the sentence, whereas Macaulay, Emerson and others only use from 20 to 30. There are exceptions: for example, Bacon who used 22, and Matthew Arnold, whose average was 37, or about the same as Addison's. Again, the English sentence has become more simple and predicative. Spenser and Sidney have only 4 to 10 per cent. of simple sentences, while Macaulay and Lowell have 20 to 40 per cent. There is also a growing tendency in poetic writers to express their ideas with fewer words, which is owing, as Dr. Sherman thinks, to the "association value," or in plain English, the suggestiveness of the words having increased. A child, in learning to speak, advances through a similar phase of development, according to Dr. Sherman. These results are interesting, and the pursuit of "experimental criticism" may lead to some valuable facts and principles as regards form and style; but, after all, this mechanical literary anatomy has very little to do with the real life and soul of prose and poetry.



A WOODEN FIRE-PROOF DOOR AFTER THE FIRE.

PRIZE COMPETITIONS.

Intending competitors are reminded that in the Puzzle Maze Competition, February 1st, 1894, is the latest date for receiving entries, and in the Debate Competition, February 15th, is the latest day. The rules under which these and other prizes are offered are published in our December number.