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THE CELESTIAL WORLD.

A STARRY LOZENGE.

An interesting geometrical figure may now be traced in the heavens on starlit nights. It is an irregular lozenge formed by four stars of the first magnitude. Sirius, which is on the meridian about 8 o'clock on the last of February, may be taken as the starting point, occupying the southeast corner of the figure. A line drawn northwest from Sirius will lead the eye to Betelgeuse in the shoulder of Orion. Rigel, in the foot of the mighty hunter, is opposite Betelgeuse, and a line extending from Sirius through the belt of Orion will reach Aldebaran in the constellation Taurus. These four stars—Sirius, Betelgeuse, Rigel, and Aldebaran—form the corners of the celestial lozenge, a figure which once traced will never be forgotten, and whenever on winter nights the eye is turned toward the sky, the superb combination will be recognized.

Each star of the shining quartet has a history. Sirius shines with a transcendent luster, so far exceeding all other stars of the first magnitude that it seems to belong to a class of its own. It is a white star, rejoicing in the glory of its highest period of development, its grande jeunesse. It is made specially interesting by the discovery, in 1862, of a dark companion star. Betelgeuse, the leading brilliant in Orion, is a singularly beautiful star, in color a rich topaz with a reddish tinge. It shines with an irregular light, for, like our sun, it is a variable. Rigel is a brilliant star, its light in striking contrast with that of Betelgeuse. It is a noted double, the companions being pale yellow and sapphire blue.

Aldebaran is the brightest star in the constellation Taurus, and resembles Betelgeuse in color. It is a double star, with a minute companion. It is frequently occulted by the moon, for its position in the heavens is in or near her path.

This geometrical figure is not only interesting for the brilliants that form its corners, but also for the charming collection of stars contained within the boundary lines. The whole constellation of Orion, first in rank among all the clusters of stars, here finds place. The observer will perceive with the unaided eye the belt symmetrically placed in the center, the sword slanting downward from the belt with its nebulous star, and the irregular parallelogram made up of the four brightest stars—Betelgeuse, Bellatrix, Rigel, and Saiph.

The telescopic observer has a rich field for study in this marvelously beautiful constellation, abounding in double, triple, and quadruple stars, variables and nebulae. A powerful instrument transforms the nebulous star in the sword into the Great Nebula of Orion, the most impressive and awe-inspiring vision of celestial loveliness that the boundless star depths reveal to mortal sight.

It is sometimes difficult to trace stars by triangulation or alignment, the surest way of impressing them upon the memory; but the stars forming the combination here described come into view at a glance without exertion on the part of the observer, with the radiant gems they inclose, draw forth a spontaneous tribute of admiration for the exceeding beauty of this portion of the star-spangled firmament.

PROGRESS OF NEW ARMAMENTS.

The Secretary of War has awarded a contract to the Pneumatic Dynamite Gun Company for seven guns for coast defense. Five are destined for the defense of the harbor of New York.

The contract calls for three guns for Sandy Hook, two for Fort Schuyler, and two for Fort Warren, Mass. All the peculiarities presented by the 15-inch gun now mounted at Fort Lafayette are virtually specified. The guns must be capable of elevation and depression by either pneumatic or hydraulic power, and have an extreme elevation of at least 35 degrees. They must be capable of an all-around fire, or through 360 degrees, the training and elevating to be wholly under the control of the gunner in charge. The range of fire is also specified, the extreme demanded being a mile. Rapidity of fire is also called for, being a requirement not demanded in the recent tests of the stationary gun. The delivery of the guns ready for mounting must be made within eight months of the time of execution of contract. The sum of money as bid by the Pneumatic Dynamite Gun Company is \$395,500.

The guns will be able to deliver upon an enemy projectiles that contain 500 pounds of dynamite, the explosion of which, on or close to the strongest ironclad ship now afloat, would knock down every man on deck, and probably sink the vessel. Our new torpedo boat Vesuvius, 725 tons, is armed with these guns, and, speaking of her recently, the Engineer, London, says: "We may allow something for pardonable exaggeration, and still we have enough left to induce the belief that Uncle Sam has got hold of a craft which an ironclad would not care to fight for the fun of the thing."

The New York Times says: "The success of the Vesuvius has contributed to the success of the dynamite gun, inasmuch as vessel and gun appear inseparable. This dual success is looked upon by foreign governments as a matter of the very greatest importance, and military men in this country feel sure, from

the number of emissaries of foreign governments now in this country inquiring into the features of gun and vessel, that Italians, Russians, Spaniards, and French will have dynamite guns in their coast defense system before many months have passed."

A successful trial of a new cast steel gun was made at Annapolis, Md., on the 7th inst. Two rounds were fired with a charge of thirty-six pounds of powder to set the gas checks and warm the gun. At 2:15 P. M. the first round with a full charge was fired. The shell struck the butt with great force, throwing up much mud, but the gun was uninjured. After sponging, the gun was loaded again, and in two minutes the second round was fired; the gun was still as solid as ever. Eight other rounds were fired at intervals of about two minutes, with complete success. This is the first high-powered American cast steel gun that has successfully passed the test of ten rounds with full charge delivered rapidly.

It will be remembered the first gun of this character burst on its trial. Both guns were made of open hearth steel and were cast by the Standard Steel Casting Company, of Thurlow, Pa. The gun tested on the 7th is 195 inches in length; diameter at breech, 22 2 inches; diameter of chamber, 4 5 inches; diameter of bore, 6 inches; weight of gun, 13,125 pounds; weight of shell, 100 pounds; weight of charge, 48 1/4 pounds.

MEETING OF ELECTRIC LIGHT MEN.

The National Electric Light Association meets at Chicago, in the Exposition Building, on the 19th, 20th, and 21st instants, and, from what can be learned, is likely to be more than usually interesting. There will be at the same time a large exhibit of electrical and kindred apparatus, the most interesting of all, perhaps, a 900 foot track, with curves of 90 feet radii, on which it is expected the various types of electric motors will be tried. The principal magnet—we speak figuratively—to attract the electrical men will be the papers to be read and the discussions following them; notably, "Current Meters," "Static Charge in the Puncturing of Underground Cables," "Relation of the Material of Conduits to the Insulation of Cables."

These discussions are unique in their way, and, perhaps, it is not going too far to say that the manner of conducting them is quite as novel as the apparatus which is their inciting cause. At the meeting of scientific associations—there are exceptions, of course—one must needs listen to much which, though often good and sometimes true, is not always new, and again to what is new, but neither instructive nor entertaining; for, as in a society of artists, there is the old academician, who is hors concours, and whose pictures must be accepted and hung "below the line," whether good or bad, so in the long established scientific association there are those who have the right to talk, to occupy the time of a meeting, whether or no they have any information to impart. But, in the electrical field of to-day, apparatus and methods change so quickly that a new device or idea is scarcely arrived when that which is still more novel is treading upon its heels.

The electrical men come from all parts of the country at stated intervals to compare notes concerning these; it being of vital importance, and by no means an easy task, to keep abreast of all that is going on in a particular line. There is no time for idle talk, for oratory, for ancient history, for dissertations on things in general, with an occasional remark on the subject under discussion. The chairman has no traditions to follow, and no mercy; the committee, to whom all papers must be submitted, rarely pass one that does not treat of a live issue. When it is remembered that many of the best practical minds of the country gather at these conventions, and that in their line they are, it is conceded, leading the world, it is not, perhaps, going too far to say that to attend these conventions is to get a liberal education in applied electrics.

ELECTRIC WIRES IN GAS MAINS.

The Consolidated Gas Light Co., of this city, some years ago, in laying a gas main, took advantage of the opportunity to introduce a telephone line in it, suspending it from insulators within the main. Excellent results were attained. On recently opening the main the wire was found to be coated with naphthalene, but the line as such was intact. Such a line is proof against the severest blizzards, and insures communication under all conditions. Recently they have extended the system, and have laid about five miles of three-conductor lead-covered lines within some new mains, so as to act as a basis for quite a complete system of telephonic intercommunication between the different offices. The wires are supported by short boards laid across the interior of the main at intervals of twelve feet, or one for every length of pipe. The wires enter and leave the main through stuffing boxes, plaster of Paris being used as packing and glass as insulating material. It forms an interesting instance of subway work—one which is of a class that will necessarily always be limited in application.

An objection, possessing some force, has recently been made against the use of overhead trolley lines for electric railways. It is to the effect that these lines,