

Correspondence.

Our Youngest Old Subscriber.

To the Editor of the SCIENTIFIC AMERICAN:

I notice under the head of "Correspondence" in this week's issue of the SCIENTIFIC AMERICAN that A. C. L. takes great credit to himself for having been a reader of the SCIENTIFIC AMERICAN from the time when he was seven years old to the present, when he is thirty-five. The writer of this has been a reader of your paper under the same conditions mentioned in A. C. L.'s article from the time he was six years to the present, when he is forty-three. J. R. F.

Dayton, Ohio, February 20, 1904.

Artificial Cooling and a New System of Heating.
To the Editor of the SCIENTIFIC AMERICAN.

The subject of artificial cooling is one of those that each summer arises anew and figures among the few that are felt as an incongruity in our age of high technical advancement. That an electric desk or ceiling fan does not only not cool the atmosphere of an interior, but helps to heat it through its rapid motion, is well enough known, but strong artificial draft continuously interchanges the hot air, immediately surrounding the human body, for cooler air and accelerates the evaporation taking place, especially on surfaces, thus creating the sensation of cooling with which we satisfy ourselves.

Why are interiors not cooled effectively and in the same way as in heating? Cold, in the shape of ice, is a market article, very common and very cheap, and which is brought daily to everybody's house. A hundred pounds of it cost 20 cents, and with that amount 57,000 cubic feet of air can be cooled from 90 deg. F. down to 70 deg. Such an expense apparently would be no hindrance to the practical introduction and general use of ice for cooling restaurants, residences, or any other interiors. But what has prevented up to the present time the utilization of ice for that purpose is the lack of the proper means for transferring the cold from the ice to the air. Experiments on a large scale conducted during last summer in cooling a store at 553 River Street, Paterson, N. J., have enabled the writer to convince himself and others of the perfect feasibility of the plan to cool any premises by the use of ice. An apparatus of extreme compactness, consisting of one or more segments, each of which represents an actual cooling (radiating) surface of 275 square feet with but 6 cubic feet of space-displacement, cools the air driven therethrough by a blower, before delivering it to the locality to be cooled; where cold spring water is at disposal this will be sufficient to assure satisfactory results.

Any premises provided with such a cooling plant may with advantage be heated in winter by the very same means, i. e., the same apparatus and the same ducts, adding only a simple hot water heater and omitting the use of a fan. Such a system of heating would then coincide in principle with the well known hot air furnace heating, however, without the latter's drawbacks of possibly overheating the air or deteriorating it in consequence of a leak in the furnace.

Paterson, N. J.

G. EPPRECHT.

The Sportsmen's Show.

The annual New York Sportsmen's Show opened in Madison Square Garden on the evening of February 19, and will be kept open till 11 P. M. on that of March 5. The great attraction this year is a large rectangular tank in the center of the garden, moored to the sides of which are the launches and automobile boats of the various exhibitors. No less than five high-speed launches or automobile boats are exhibited, besides an equal number of small launches. Numerous launch motors are also on view. Exhibits of various birds and animals are located on the ground floor, besides a most interesting exhibit of salmon and trout eggs and fry. On the arena platform is a tank of water over which the fly-casting contests are held, while the exhibits of several sporting goods firms are also displayed there in rustic booths. The concert hall contains an exhibit of motor bicycles, one of which, with its motor cut in half longitudinally, is shown operated by an electric motor. An operating sectional model of a two-cycle launch motor is also shown in the main hall.

The armor manufacturers of the United States, in accordance with promise, have added to their facilities, and deliveries amounting to 11,493 tons have been made—a marked increase over any previous year. We learn from the Iron Age that armor plates are now tested with capped projectiles. The acceptance tests for armor-piercing projectiles have been made more rigorous, it being now required that they shall, at a prescribed velocity, perforate unbroken a plate of hard-faced armor equal in thickness to the diameter of the projectile, and then be in a condition for bursting.

THE HEAVENS IN MARCH.

BY HENRY NORRIS RUSSELL, PH.D.

With the departure westward of the bright winter constellations, the skies are becoming duller, especially as there are no conspicuous planets now visible in the evening; but the western half of the visible heavens is still very fine.

At 9 o'clock in the evening in the middle of March, Orion is still in sight, fairly well up in the southeast. The line of his belt is nearly horizontal, and points to Aldebaran on the right and Sirius on the left. The Milky Way, strong with bright groups of stars, lies above these constellations.

Starting almost below the Pole-star, we come first to the zigzag line of Cassiopeia. Next is Perseus, whose configuration is familiar to many who watched the fading of the new star of 1901. Auriga, with the brilliant Capella, follows, and then comes Gemini, whose two brightest stars, Castor and Pollux, lie considerably above the galaxy.

The still brighter star farther south is Procyon, in Canis Minor. South of this is a vacant region, beyond which appear some stars of Argo—a fine constellation, which can only be seen to advantage in the southern hemisphere.

The contrast is great when we turn to the eastern sky. The Dipper in Ursa Major and the Sickle in Leo are the only conspicuous groups near the meridian. Below the latter lies Hydra, a long irregular line of stars extending from a small group east of Procyon clear to the southeastern horizon. The small quadrangle of brightish stars low in the southeast is Corvus, which certainly bears no resemblance to the Raven it is supposed to represent, while Hydra is a pretty fair serpent.

Above this, and south and east of Leo, is Virgo, with one bright star, Spica, and a wide curve of five pretty bright ones between the latter and Leo. Farther north is Bootes, with the brilliant Arcturus, and several second and third magnitude stars. Draco, which is on the right of the pole, and Ursa Minor, inclosed in its coils, are the only other notable constellations in sight.

THE PLANETS.

Mercury is evening star until the 26th, when he passes through superior conjunction—behind the sun—and becomes a morning star. He is invisible to the naked eye throughout the month, as he is very near the sun, and also south of him for most of the time.

Venus is morning star in Capricornus, Aquarius and Pisces. She is much less conspicuous than at the first of the year, being farther south and less than half as bright. However, she is still easily visible before sunrise, as she rises at about 5 A. M. in the middle of the month.

Mars is evening star in Pisces, and can still be seen after sunset rather to the south of west, as he sets more than an hour later than the sun. His brightness is greater than that of the Pole star, and he is much the most conspicuous object in that part of the sky, next to Jupiter, which in the early part of the month is a few degrees below him.

Jupiter is also in Pisces, and is evening star until the 27th, when he is in conjunction with the sun, and becomes a morning star, just as Mercury does a few hours earlier. The two planets are in conjunction about the same time, but they are so near the sun that they are quite invisible.

Saturn is morning star in Capricornus, and is once more fairly visible. At the end of the month he rises about two hours before the sun.

On the night of the 7th he is in conjunction with Venus, which is one-third of a degree to the north of him. The pair of planets should be easily visible in the southeast before sunrise.

Uranus is in Sagittarius, and is in quadrature with the sun on the 20th, coming to the meridian at 6 A. M.

Neptune is evening star in Gemini. He is also in quadrature, on the 23d, but, being east of the sun, is due south at 6 P. M.

THE MOON.

Full moon occurs at 10 P. M. on the 1st, last quarter at 8 P. M. on the 8th, new moon at 1 A. M. on the 17th, first quarter at 4 P. M. on the 24th, and full moon again at 8 A. M. on the 31st. The moon is nearest the earth on the 1st and 29th, and farthest away on the 14th. She is in conjunction with Uranus on the 9th, Saturn on the 13th, Venus on the 14th, Mercury on the 16th, Jupiter on the 17th, Mars on the 18th, and Neptune on the 24th.

At 3 P. M. on the 20th the sun crosses the celestial equator, and enters the sign of Aries, and in the phrase of the almanacs, "Spring begins."

On what is for us the night of March 16, but in Asia daytime on the 17th, there is an annular eclipse of the sun. It is of course invisible in America, but is an important eclipse in Madagascar, India, China, the Philippines, and the Malay Archipelago. The track of central eclipse passes just north of Madagascar, touches the north end of Sumatra, crosses part of

Siam, and the extreme northern end of the Philippine group.

The excess of the sun's apparent diameter over the moon's is unusually great, so that the annular phase of the eclipse lasts at maximum for more than eight minutes. An eclipse of the sun is frequently accompanied by one of the moon, a fortnight earlier or later, but this is not the case now, for at the previous full moon the moon passes just south of the edge of the earth's shadow, and at the subsequent one just north of it. At the time of the present solar eclipse, however, the moon is almost exactly between the earth and sun, so that her shadow falls on the earth's equatorial regions. If she was farther north, so that her shadow fell in the Arctic regions, she would be farther south at the ensuing full moon, and would enter the earth's shadow and be eclipsed (partially at least). In general, we may expect that a solar eclipse which is central in the equatorial regions will not be accompanied by a lunar eclipse, while if one is visible near one of the poles, there will be a lunar eclipse at the preceding or following full moon (which one depends on whether the moon is moving north or south at the time).

An exceptionally good chance of observing an occultation of a star by the moon is afforded on the evening of March 22, when the bright star Aldebaran is occulted. As seen from Washington, the star disappears behind the moon's dark limb at 8 o'clock, and reappears on the other side at six minutes past 9. The exact times of the immersion and emersion will be different at each place of observation.

As the moon is in her first quarter, her dark limb will be sufficiently illuminated by the "earth-shine" to make it visible, and one will have fair warning of the star's disappearance. The disappearance of such a bright star can be observed even with the naked eye, but a field-glass is a valuable aid, and a telescope still better. The reappearance is much harder to observe, for unless one knows just where the star will reappear, it is hard to pick it up when it first comes out.

The most striking feature of the star's disappearance is its absolute suddenness. It vanishes instantly. As is well known, this is the strongest proof that the moon has practically no atmosphere, for the refraction of an atmosphere would delay the star's disappearance, and make it gradual. Such gradual disappearances of a star's light have been observed, but many cases have later been explained by the discovery that the occulted star was double.

Cambridge University, England.

The British International Cup Race for Motor Boats.

The Automobile Club of Great Britain and Ireland has extended the time for receiving entries for the international cup race to June 30, 1904, and the Automobile Club of America will receive entries up to June 1. If the entries are so numerous as to make it necessary to hold eliminating trials, in order to determine which three boats shall represent America, these trials will be held shortly after the latter date. The race will take place in the Solent on July 30.

This race is to be held annually for a trophy presented by Mr. Alfred Harmsworth. Not more than three competing boats can represent each country, and each competing boat must be constructed wholly, in every particular, in the country which it represents. The boat must not be longer than 40 feet over all, but there is no restriction as to the number, size, or horse power of its motors. These must be sufficiently powerful to drive the boat astern at four knots an hour in still water, and to drive it over the entire course at an average speed of at least 12 knots. The course must be in sheltered waters of the country holding the cup, and it must be from 6 to 12 nautical miles in length.

In addition to the two Napier boats entered in the English eliminating trials, J. E. Hutton, Ltd. has entered three 40-foot racers fitted with six-cylinder motors having a bore and stroke of 6.889 and 6.299 inches respectively and said to develop 170 brake horse power at 1,200 revolutions per minute. The total weight of the motor is 1,500 pounds. The Messrs. Thornycroft and Lord Howard de Walden have also entered boats in these trials.

France will also be represented by a strong team. Among the entries already made in that country are A. Clement's and Pitre & Co.'s gasoline boats, and a Gardner-Serpellet steam launch. It is hoped that Germany and America will also be well represented.

The estimated capacity of the new blast furnace plants to be started in the United States in 1904 is about 2,000,000 tons, and of this quantity it is computed that 905,000 tons will be for sale in the general market, which may mean increased competition in Europe. A further increase of capacity, equaling 2,425,000 tons, is credited to the year 1904, of which 405,000 tons will be thrown on the general market, so that a total of 1,310,000 tons is likely to be thus dealt with.