There are three well defined classes of stars, judged by the quality of light they yield. In the first class are the clear white and bluish white stars like Sirius and Vega. These are supposed to be the hottest stars and the most luminous in proportion to the extent of their surface. Then there are the golden yellow or pale orange stars, of which Arcturus and Capella are fine examples. These have begun to cool. Finally, we have the deep orange and red stars like Aldebaran and Antares. These have advanced still further in the cooling processs.

Now the spectroscope informs us that our sun belongs to the orange or Arcturus type, and if we could view it from distant space, we should see a lovely star of a pale golden yellow. The question arises, then, how far would our sun have to be removed in order to shine with a brightness no greater than that of Arcturus? According to Mr. Maunder, it would have to be removed to 140,000 times its present distance, or about half the distance between us and Alpha Centauri.

But Arcturus is 11½ million times as far away as the sun, and if our sun were placed at that enormous distance, its diameter would have to be 82 times as great in order to give a light equal to that received from Arcturus. I hesitate to present such figures, implying magnitudes far beyond any to which we have been accustomed, yet they are but the logical deductions of observed facts. In other words, upon Mr. Maunder's reasonable assumption, Arcturus must be a gigantic sphere, 550,000 times larger than our sun, with a diameter of seventy million miles, or more than large enough to fill the entire orbit of Mercury.

To make this contrast clearer, let us institute a simple comparison. Jupiter is larger than all the other planets and satellites of the solar system. The sun is a little more than 1,000 times larger than Jupiter. But Arcturus, if our inference is correct, is 550,000 times larger than the sun. By the side of such a majestic orb, our sun, grand and overwhelming as he is in our *own* system, would dwindle to an insignificant star.

Contemplating a world so vast, endowed with such mighty energies, and rushing with such resistless force through the great deeps of space, we cannot resist the questions: Whence came this blazing world? Whither is it bound? What is its mission and destiny? Is it simply a visitor to our sidereal galaxy, rushing furiously through it like a comet? Is it being constantly fed and enlarged by the worlds it encounters and the meteoric matter it gathers up in its wonderful journey? What would be the effect if it chanced to pass through a nebula or a star cluster? Was the new star which suddenly blazed forth in the nebula of Andromeda in 1876 due to a similar cause?

As this mighty aggregation of attractive energies sweeps along his celestial path, thickly bordered with stellar worlds, how many of those worlds will yield forever to his disturbing forces? How many will be swerved from their appointed courses by his irresistible power? How many will plunge into his fiery bosom and be swallowed up as a pebble is swallowed by the ocean?

Are there many great suns like Arcturus, flying on their special missions through space? The late Dr. Croll, in his work on "Stellar Evolution," published two years ago, conjectures that the original constituent bodies of the universe were endowed *ab initio* with high velocities, and that in their swift journeys through space each eventually comes into collision with one of his fellows.

The terrific impact of two bodies moving with a velocity of tens and even hundreds of miles per second transforms the energy of motion into heat, and both worlds are shattered into fragments, melted as in a furnace, and dissipated into luminous gas. And thus a nebula is formed which fills vast regions of space and is ultimately, in the lapse of untold ages, evolved into new systems of worlds.

Sublime as is our theme—a universe of mighty worlds, wonderful as is the complexity of their motions and influences, mysterious as is that power which pervades and rules the whole, more sublime, more wonderful, more mysterious is the human mind, which, from the standpoint of this little world, a mere speck in the great domain of creation, reaches out to the utmost bounds of the universe, formulates its laws, reconstructs its past, forecasts its future, and dauntlessly grapples with the varied problems of atoms and stars, matter and force, time and space, eternity and infinity.

The New Smithsonian Astro-Physical Observatory.

We learn from Dr. S. P. Langley, secretary, that there has been established as a department of the Smithsonian Institution a Physical Observatory, which has been furnished with specially designed apparatus for the prosecution of investigations in radiant energy and other departments of telluric and astrophysics. The communication of new memoirs bearing in any way on such researches is requested, and for them it is hoped that proper return can be made in due time.

POSITION OF THE PLANETS IN JULY.

MARS

is evening star until the 30th, and then morning star. He comes to the front on the July annals, for an important epoch in his course occurs during the month. He is in conjunction with the sun on the 30th, at 2 h. 41 m. A. M., being so near the sun as to be hidden in his rays, and also at his greatest distance from the earth. He passes at that time from the eastern to the western side of the sun and commences his course as morning star, slowly increasing in size and slowly approaching the earth, until his career as morning star culminates in the long anticipated opposition of August 4, 1892. Our ruddy neighbor is then nearer than he has been for fifteen years, or than he will be again for seventeen years. Months must pass before Mars becomes visible, but his movement though slow is sure, and the time is none too long to make a study of this interesting planet, the only member of the solar family whose real surface is revealed by the telescope.

The right ascension of Mars on the 1st is 7 h. 20 m., his declination is 23° 15′ north, his diameter is 3″.8, and he is in the constellation Gemini.

Mars sets on the 1st at 8 h. 5 m. P. M. On the 31st he sets at 7 h. 13 m.

MERCURY

is morning star until the 7th, and then evening star. He is in superior conjunction with the sun on the 7th, at 1 h. 18 m. A. M., when the smallest member of the solar brotherhood passes from the western to the eastern side of the sun and commences to oscillate eastward from the sun, in obedience to the law that regulates the movements of the inferior or inner planets. He meets Mars on the way, and the planets are in conjunction on the 11th, at 7 h. P. M., Mercury being 41′ north.

The right ascension of Mercury on the 1st is 6 h. 22 m., his declination is 24° 10′ north, his diameter is 5″.2, and he is in the constellation Gemini.

Mercury rises on the 1st at 4 h. 5 m. A. M. On the 31st he sets at 8 h. 13 m. P. M.

JUPITER

is morning star. He is by far the most distinguished member of the brotherhood on the July list. He passes no important epochs in his course, and he has no meetings or partings with other planets on the celestial road. He is simply a superb star, increasing in size, and rising earlier every evening, at 10 o'clock on the middle of the month and at 9 o'clock when the month closes. Observers who command a view of the southeast horizon should watch for the appearance of this regal planet, as he looms suddenly above the horizon, like a young moon, and shines the brightest of the radiant throng that cluster in the nightly sky.

The moon is in conjunction with Jupiter three days after the full on the 24th, at 2 h. P. M., being 3° 56′ south.

The right ascension of Jupiter on the 1st is 23 h. 18 m., his declination is 5° 53′ south, his diameter is 41″.6, and he is in the constellation Aquarius.

Jupiter rises on the 1st at 10 h. 54 m. P. M. On the 31st he rises at 8 h. 55 m. P. M.

VENUS

is morning star. The movements and position of Venus are in striking contrast with those of Jupiter. She is approaching and he is receding from the sun. She is nearly at her greatest, and he is nearly at his least distance from the earth. She is nearly at the minimum of her size and brilliancy, while he is approaching the culmination of his radiant career. Venus will be greatly missed in the summer evening sky.

The moon makes a close conjunction with Venus on the 4th, the day before her change, at 6 h. 2 m. A. M., being 2° 7′ north.

The right ascension of Venus on the 1st is 5 h. 14 m., her declination is 22° 20′ north, her diameter is 11″.0, and she is in the constellation Taurus.

Venus rises on the 1st at 3 h. 4 m. A. M. On the 31st she rises at 3 h. 49 m. A. M.

SATURN

is evening star. He is on the meridian on the 1st at 4 h. 20 m. P. M., so that he is well advanced on his western way when it is dark enough for him to be visible. He retains his position in regard to Jupiter, being nearly opposite to him, one planet setting as the other rises. The difference is seven minutes on the first of the month, and there is no difference on the last day of the month.

The moon is in conjunction with Saturn when five days old, on the 10th, at 4 h. 31 m. P. M., being 3° 25′ north.

The right ascension of Saturn on the 1st is 10 h. 58 m., his declination is 8° 44′ north, his diameter is 15″.8, and he is in the constellation Leo.

Saturn sets on the 1st at 10 h. 47 m. P. M. On the 31st he sets at 8 h. 55 m. P. M.

URANUS

is evening star. He is in quadrature with the sun on the 20th, at 5 h. A. M., being 90° east.

The right ascension of Uranus on the 1st is 13 h. 42 m., his declination is 10° 1′ south, his diameter is 3″.6, and he is in the constellation Virgo.

Uranus sets on the 1st at 0 h. 25 m. A. M. On the 31st he sets at 10 h. 28 m. P. M.

NEPTUNE

is morning star. His right ascension on the 1st is 4 h. 25 m., his declination is 20° 4′ north, his diameter is 2″.6, and he is in the constellation Taurus.

Neptune rises on the 1st at 2 h. 26 m. A. M. On the 31st he rises at 0 h. 31 m. A. M.

Mars, Mercury, Saturn, and Uranus are evening stars at the close of the month. Venus, Jupiter and Neptune are morning stars.

THE POISONOUS SNAKE OF FLORIDA.

A workman at Oakland, Orange Co., Florida, recently died from the effects of a bite received from a supposed harmless snake. The man had captured a small snake and handled it for ten or fifteen minutes, during which time he received a bite on one hand, giving him no pain at the time. Finally killing the snake, the man returned to his work.

About half an hour later pains came on in his hand and arm, followed by drowsiness and a dull pain in the head. The man quit work, saying he would lie down, and probably be at work again in a short time. He continued to feel drowsy, and a fullness of the eyelids, with a partial loss of control of muscular action of the same, was noticed.

At this point a doctor was called, who did all he could to counteract the effects of the poison, but his every effort proved unsuccessful, and the unfortunate man finally died eighteen hours after receiving the bite.

The snake was called a harmless garter or king snake. It was small and its body was circled with bright-colored bands. But an examination of its mouth disclosed two small fangs in the upper jaw. Our informant says: "Thus it seems this bright-colored, sluggish, meek little snake that we have regarded as harmless as a tadpole is one of the most dangerous of our reptile foes."

From the description received, and a residence of over twelve years in Florida, during which time I devoted much attention to herpetology, I can state positively that the snake in question was the coral snake, *Elaps distans*, also called the "Florida harlequin snake."

Its habitat is the Gulf States and Mexico. It is different from all other North American poisonous snakes in that it has not a well-defined neck, and that its tail tapers to a fine point. All other poisonous snakes in this country have large angular heads and blunt tails. The coral snake also lacks the "poison pit" of the rattlesnake, moccasin, and copperhead—a small orifice about midway between the eye and nostril on either side. This "pit" is connected with the poison sac, but its use has never been satisfactorily explained. As in the case of the coral snake, all poisonous snakes do not have the "pit," but every snake possessing it is armed with deadly fangs.

The color of the coral snake is varied with bright bands of black, white or yellowish white, and coppery red. It is rarely over eighteen inches in length (usually much less), and one-half or three-fourths of an inch in diameter. It is not common in Florida or the Gulf States.

There is another quite common snake in Florida which very closely resembles the coral snake, both in color and size. It is marked with brilliant bands of red, yellow, and black. It is called a garter snake, band snake, etc., by the natives, and by some it is thought to be poisonous. It is entirely harmless, however, and without fangs, as repeated examinations by myself and others clearly proved.

S. Weir Mitchell, in an article on "The Poison of Serpents," appearing in the *Century Magazine* of August, 1889, incidentally refers to the coral snake as "the beautiful coral snake, the little *Elaps* of Florida, too small with us to be dangerous to man."

That it *is* dangerous, under certain circumstances, the above instance—one of two or three cases known in which the coral snake of the United States has destroyed human life— proves beyond dispute. Owing to its scarcity, however, it is seldom met with, and its small size prevents it from inflicting a wound after the usual manner, but if one exposes bare feet and ankles or hands within striking distance, especially after irritating it, a hypodermatic injection of its venom is quite apt to be received, and is as much to be dreaded as a bite from the rattlesnake. CHARLES H. COE.

Banana Flour.

Referring to an article in the SCIENTIFIC AMERICAN of June 6, a correspondent says: The flour is made from green bananas—not ripe ones. They are peeled, sliced, and sundried, afterward pounded in a mortar and passed through a coarse sieve.

To preserve the ripe bananas they are dipped in lye and dried in the sun, shriveling up under this operation, and tasting somewhat like figs. The color of the banana flour is dirty gray, like ashes.