POSITION OF THE PLANETS IN MARCH.

SATURN

is morning star until the 16th, and then evening star. His opposition with the sun occurs on the 16th, at 4 h. 30 m. P. M. He then rises at sunset, is on the meridian at midnight, and sets at sunrise, being visible the entire night. He may be easily found in the eastern sky, as soon as it is dark enough for the stars to come out. He shines with a serene light and a leaden tint as he makes his way between Beta and Eta Virginis, two third-magnitude stars in Virgo. His motion is retrograde or westward, and, though he moves at a slow pace, careful observers will see that, at the close of the month, he is perceptibly nearer to Beta Virginis. The best period for the observation of Saturn extends from February to July. He is an interesting object when seen by the unaided eye, but in the telescope he is an object of surpassing loveliness even in his present aspect, for his rings are beginning to reappear, and his satellites gleam like points of gold as they circle around their great primary.

The moon is in conjunction with Saturn six hours after full moon, on the 13th, at 1 h. 48 m. P. M., being 1° 38′ north. The full-orbed moon and the radiant planet, not far away, will form a lovely celestial picture when they rise, soon after sunset, at nearly the same time.

The right ascension of Saturn on the 1st is 11 h. 56 m., his declination is 3° 6′ north, his diameter is 18″.4, and he is in the constellation Virgo.

Saturn rises on the 1st at 7 h. 1 m. P. M. On the 31st he sets at 5 h. 18 m. A. M.

MERCURY

is morning star until the 6th, and then evening star. He is in superior conjunction with the sun on the 6th, at 1 h. 18 m. A. M., when, appearing on the eastern side of the sun as evening star, he commences to oscillate eastward from the sun. On the way he meets Jupiter, apparently bound westward toward the sun. The planets meet on the 12th, at 3 h. 53 m. P. M., Mercury being 14 north of Jupiter. The conjunction is a close one, but will be invisible, both planets being so near the sun as to be entirely hidden in his light.

Mercury reaches his greatest eastern elongation on the 31st, at 7 h. 8 m. A. M., being 19° 3′ east of the sun. The conditions are favorable for a good view of the planet with the unaided eye, when at elongation and for nearly two weeks before. The observer must command a view of the western horizon, and note the point where the sun went down. He must commence the search about three-quarters of an hour after sunset, and, with the aid of an opera glass, sweep the sky about 9½° northeast of the sunset point. If he make diligent quest, he will surely be rewarded by finding the planet shining with a peculiar brilliancy on the still bright sky. This is his position at elongation when he sets an hour and a half later than the sun. Before that time, he is farther south, but shines with his greatest brilliancy. The present is the most favorable opportunity that the year affords for a view of Mercury as evening star.

The new moon of the 28th is in conjunction with Mercury on the 29th, at 1 h. 11 m. P. M., being 4° 25′ south.

The right ascension of Mercury on the 1st is 22 h. 40 m., his declination is 10° 33′ south, his diameter is 4″.8, and he is in the constellation Aquarius.

Mercury rises on the 1st at 6 h. 33 m. A. M. On the 31st he sets at 7 h. 57 m. P. M.

MARS

is morning star. He is in quadrature with the sun on the 29th, at 8 h. 28 m. A. M., being 90° west of him. His great southern declination, apparently slow progress toward the earth, and the inconvenient hour at which he makes his appearance above the horizon are difficulties in the way of northern observers. It is not until May that his movements begin to be of absorbing interest, but from that time until November he will be a target for all the telescopes in the civilized world, and no effort will be spared to increase our knowledge of what is going on in the comparatively small domain of our ruddy celestial neighbor.

The moon on the day of her last quarter is in conjunction with Mars on the 21st, at 6 h. 19 m. P. M., being 3° 32′ south.

The right ascension of Mars on the 1st is 17 h. 28 m., his declination is 23° 5′ south, his diameter is 7″.2, and he is in the constellation Ophiuchus.

Mars rises on the 1st at 2 h. 10 m. A. M. On the 31st he rises at 1 h. 31 m. A. M.

JUPITER

is evening star until the 20th, and then morning star. He closes his brilliant career as evening star on the 20th, at 11 h. 3 m. P. M., when he is in conjunction with the sun, passing beyond him and reappearing on his western side to play his part as morning star. He will be too near the sun to be visible for a few weeks, but will then become the radiant star in the east, attracting the attention of observers of the heavens when the morning light is breaking. This princely star will continue to increase in size and brilliancy as he treads his path across the celestial sphere until his opposition on October 12, when he will be visible under nearly the best conditions, not long after perihelion, and in northern declination. The lustrous light and majestic grace of Jupiter since his opposition last September have drawn forth tributes of admiration from all lovers of the stars. He will be larger and brighter at the coming opposition in October, and it is not impossible that something may be found out concerning the great red spot which is again deepening in color and becoming more distinct in outline. The close conjunction of Jupiter and Mercury, on the 12th, has been referred to.

The moon is in conjunction with Jupiter the day before new moon on the 27th, at 9 h. 36 m. P. M., being 2° 52′ south.

The right ascension of Jupiter on the 1st is 23 h. 48 m., his declination is 2° 29′ south, his diameter is 32″.0, and he is in the constellation Pisces.

Jupiter sets on the 1st at 6 h. 56 m. P. M. On the 31st he rises at 5 h. 28 m. A. M.

VENUS

is evening star. Words are powerless to give expression to the fascinating grace with which she wields her starry scepter, and, holding her court in the west, shines with peerless luster on the twilight sky, and then among the myriad hosts that spangle the firmament. She reigns alone, for Jupiter, her rival, has disappeared, eclipsed in the sunlight, and, on moonless nights, she is the glory of the evening sky. Her greatest elongation from the sun is the first goal in her path, as she advances rejoicing in her course, and when the month closes she sets nearly four hours later than the sun.

The moon makes two conjunctions with Venus during the month. The three-days-old moon is in conjunction with the bright planet, on the 1st, at 2 h. 41 m. P. M., being 2° 54′ south. She makes a closer conjunction on the 31st, at 9 h. 30 m. A. M., being 1° 27′ south.

The right ascension of Venus on the 1st is 1 h. 14 m., her declination is 7° 58′ north, her diameter is 14″.8, and she is in the constellation Pisces.

Venus sets on the 1st at 8 h. 58 m. P. M. On the 31st she sets at 10 h. 3 m. P. M.

URANUS

is morning star. He is visible to the naked eye, and may be easily found not far from Lambda Virginis, a star of the fourth magnitude in Virgo.

The moon makes a close conjunction with Uranus on the 16th at 8 h. 53 m. P. M., being 35′ north of the planet and serving as a guide to point out his position.

The right ascension of Uranus on the 1st is 14 h. 15 m., his declination is 13°.0 south, his diameter is 3″.8, and he is in the constellation Virgo.

Uranus rises on the 1st at 10 h. 14 m. P. M. On the 31st he rises at 8 h. 12 m. P. M.

NEPTUNE

is evening star. His right ascension on the 1st is 4 h. 19 m., his declination is 19° 49′ north, his diameter is 2″.5, and he is in the constellation Taurus.

Neptune sets on the 1st at 0 h. 47 m. A. M. On the 31st he sets at 10 h. 53 m. P. M.

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

Speech in the Lower Animals.

A meeting of the Nineteenth Century Club was held in the assembly rooms of the Madison Square Garden on Tuesday, February 16. The occasion of the meeting was an address by Mr. R. L. Garner on "Speech in the Lower Animals."

The president, Mr. Brander Matthews, in introducing the lecturer of the evening, made some brief references to Darwinism, in which he said that Darwin's "Descent of Man" was the most important scientific work since the "Principia" of Newton, and that Mr. Garner's brilliant researches were well calculated to sustain the views introduced by Darwin.

Mr. Garner in opening his address gave an interesting account of his early experiments which commenced some eight or nine years ago. His experiments have been to a large extent among the monkeys, though other classes of animals were also experimented on. The first principle to be understood in beginning the study of the speech of animals is to associate the act with the sound, when the notes indicating anger, desire and fear may be understood. All researches of this nature must necessarily be crude, but about two years ago Mr. Garner conceived the idea of using the phonograph to record and analyze the sounds. The phonograph affords an unquestionable proof that certain sounds are accompanied by a definite act or gesture, as when the phonograph gives the note of fear, the monkey gives unmistakable signs of fear. The phonograph thus relieves the difficulty of having no standard or phonetic base upon which to work. The analysis of sounds on the phonograph is accomplished by the differences in speed of rotation of the cylinder, which may be increased or decreased from 40 or 50 to 225 revolutions per minute. Human laughter on the phonograph cylinder by proper manipulation easily deceives animals.

Mr. Garner's description of his method of obtaining a record of the sounds was very interesting. A mirror was hung on the horn of the phonograph, which induced the monkey to believe that another monkey was present, when the phonograph began to utter sounds. When anything suspicious occurred, the monkey warned his friend in the mirror, of whom he seemed very fond, lavishing caresses upon him, monkey fashion. A point of great value in Mr. Garner's researches is that monkeys have three or four inflections of the same sound, each with a meaning of its own. If the value of the sounds are considered as Mr. Garner states, it is true speech. Mr. Garner makes no claim that monkeys or other animals have definite sounds for the kinds of food, as bananas, but that they divide food into sweet food, etc. This speech of animals is a marked contrast to the redundancy of human speech. Monkeys speak, if the term may be allowed, in syllables, the word for food having five or six syllables.

Mr. Garner states on the authority of Frank Cushing, the celebrated white Zuni chief, that the Zuni Indians not only know the language of animals, but put this knowledge to practical use. In conclusion the lecturer gave a brief outline of his projected trip to Africa. Special cages are being made, which will not only afford protection for the impedimenta, but serve also to carry home the captured monkeys. An ingenious arrow has been devised by Mr. Garner, which is fired from an air gun. The tip of the arrow on striking the animal drops the shaft, and being charged with anhydrous prussic acid, produces instant death. The cages are provided with electrical fittings, which will give shocks to the thief whether animal or human. A fine phonograph with telephone attachment is being constructed specially by Mr. Edison for Mr. Garner. Some specimens of the monkey speech were given on the phonograph, including a love duet, which, though interesting, did not entirely resemble the love duet of Tristan and Isolde.

The paper was ably discussed by Dr. Daniel G. Brinton, of the University of Pennsylvania, who took the view of an anthropologist, and Prof. E. D. Perry, of Columbia, who viewed the subject from a philological point of view.

Electrotechnics.

Examples are not wanting of the scientific isolation that is caused by not possessing that familiarity with foreign languages which is a characteristic of diplomatists and hotel waiters. Take, for instance, the fact that, whereas manganin was manufactured on a commercial scale in Germany, and German resistance coils have for the last three years been constructed of this material with a temperature coefficient of nearly zero, the very existence of this alloy was unknown to many English electrical instrument makers a few weeks ago; and even now most of them are still unacquainted with the composition of manganin, and its peculiar properties, as well as with the results of the extensive and striking experiments that have been carried out at the Reichsanstalt at Charlottenburg on the temperature coefficient and specific resistance of all sorts of manganin-copper-zinc-nickel-iron alloys.

This Physikalisch-Technischen Reichsanstalt, I may mention, is an establishment totally distinct from the Technical High School in Charlottenburg, some photographs of which I showed you this evening. The Reichsanstalt is not an institution with students, but a vast series of imperial laboratories, presided over by Prof. Von Helmholtz, solely used for carrying out researches in pure and technical physics. The investigations are conducted under the direction of Dr. Loewenherz, aided by forty-six assistants.

We have no establishment in Great Britain at all comparable with this Reichsanstalt. The original work turned out there in electrotechnics alone is considerable. Here are some of the published accounts of researches immediately bearing on your profession which Dr. St. Lindeck has been so kind as to send me: "Hardening Steel Magnets," "Standard Resistance Coils for Large Currents," "Tests of Commercial Ammeters and Voltmeters," "Mercury Standard of Resistance," "Photometric Investigations," "Compensation Apparatus for Use in P. D. Measurements," "Alloys for Resistance Coils," and so on.

Surely it is part of the technical education of the electrical engineer to be taught how to read such pamphlets as these with comparative ease?

A working knowledge of French and German can be obtained without the necessity of learning to express oneself fluently in epigrammatic French, or to imitate with facility the word-building of a native German; and with such a working knowledge the average technical student may rest content. But as regards his own language he should aim at something higher, and, therefore, the electrical engineering students of our country should be, I urge, practiced in writing—yes, and also speaking—vigorous English.—*Prof. W. E. Ayrton.*

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