POSITION OF THE PLANETS IN FEBRUARY.

JUPITER

is morning star, and is perhaps the most interesting member of the sun's family during the month, rising earlier and growing brighter as he approaches the earth, a superb object in the sky from the small hours of the morning till dawn. He is in quadrature with the sun on the 24th. An observer commanding a view of the southeastern sky will recognize him at a glance. Jupiter rises on the 1st at 2 h. 28 m. A.M. On the 29th, he rises at 12 h. 51 m. A.M. His diameter on the 1st is 33·4″, and he is in the constellation Scorpio.

VENUS

is morning star. Her luster diminishes as she approaches the sun, but she is still fair to see in the morning dawn. Observers will note the rapidly increasing distance between Venus and Jupiter, the former rising on the 1st 2 h. 10 m. before the sun, and the latter rising 4 h. 30 m. before the sun. Venus rises on the 1st at 4 h. 48 m. A.M. On the 29th, she rises at 5 h. 8 m. A.M. Her diameter on the 1st is 15·2″, and she is in the constellation Sagittarius.

MARS

is morning star. He may easily be recognized as a bright, ruddy star northeast of Spica, rising on the 1st an hour before midnight, and remaining near his bright neighbor during the month. Mars rises on the 1st at 11 h. 11 m. P.M. On the 29th, he rises at 9 h. 48 m. P. M. His diameter on the 1st is 9·4″, and he is in the constellation Virgo.

URANUS

is morning star. He is near Spica, on the northwest. A telescope will bring him to view as a small sphere of a delicate green color. Uranus rises on the 1st at 10 h. 35 m. P.M. On the 29th, he rises at 8 h. 43 m. P.M. His diameter on the 1st is 3·8″, and he is in the constellation Virgo.

SATURN

is evening star. He is now in fine condition for observation, having just passed opposition. Any one can find him who knows Pollux and Procyon, for he is east of them, and forms a triangle with them. He is visible in the northeast as soon as it is dark enough for the stars to come out. Saturn sets on the 1st at 6 h. 44 m. A.M. On the 29th, he sets at 4 h. 48 m. A.M. His diameter on the 1st is 19·2″, and he is in the constellation Cancer.

MERCURY

is evening star. He reaches his greatest eastern elongation on the 17th, and is at that time, and for a few days before and after, plainly visible to the naked eye. He sets on the 17th an hour and three-quarters after the sun, and must be looked for in the west, three-quarters of an hour after sunset, about 8° north of the sunset point. Mercury sets on the 1st at 5 h. 53 m. P.M. On the 29th, he sets at 6 h. 18 m. P.M. His diameter on the 1st is 5·2″, and he is in the constellation Capricornus.

NEPTUNE

is evening star. He is in quadrature with the sun on the 16th. Neptune sets on the 1st at 2 h. A.M. On the 29th, he sets at 12 h. 10 m. A.M. His diameter on the 1st is 2·6″, and he is in the constellation Taurus.

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

Cardiff Water Works.

About two years ago the work of laying down thirty-one miles of large water pipes between Llanishen and Cwmtaff, as a necessary means of water passage from the Breconshire watershed for the supply of Cardiff, was commenced. The whole line of conduit is now nearly completed. A supply of water could now be sent to Llanishen for use at Cardiff. This water could be taken from the river after proper allowances are made for Cyfarthfa Steel Works and other establishments. The balancing reservoir at Rhubina, the nearest of its kind to Llanishen, is practically complete. It is at high level, and is intended for the future high level service of Cardiff, Penarth, Llandaff, and Whitchurch. Blackbrook balancing reservoir is nearly finished, and that at Cefn will be ready in about a month. These three balancing reservoirs are arched over. The upper section of the pipes where the No. 2—or Cantreff—reservoir is being constructed is 1,000 ft. above the Cardiff level; Llanishen is 150 ft. above Cardiff, and Rhubina is about 100 ft. above Llanishen.

The Cantreff reservoir will be completed in about two years, and its capacity will be about 300,000,000 gallons. Two others are contemplated—Nos. 1 and 3—one of which will be located above and the other below the No. 2 works, which are being constructed at the root of the upper portion of a drainage area of 4,000 acres. The pipes have been obtained at an aggregate cost of about $600,000, and the laying of the pipes in three sections has been carried out at a cost of above $150,000. As to the pipes, it may be observed that they are usually about 12 ft. in length. They vary in thickness according to the pressure resistance required at various points. They are 2 ft. in diameter and weigh about 1½ tons each.

PHOTOGRAPHIC NOTES.

Intensifying Lantern Slides.—Sometimes, by quick and too short development, the image of a lantern slide will fix out too weak. Various methods for intensification have been recommended, but the latest and simplest is that detailed by Mr. A. R. Dresser in the *Amateur Photographer*, as follows: If any negatives or lantern slides are too thin, they can be brought up to nearly any density by first bleaching with mercury (as usual) and then redevelop them with the hydroquinone developer (in place of ammonia). I find that you can redevelop to nearly any extent. One need not use new developer (unless the image is very thin), as the used developer does very well and saves having to throw it away. I always use this developer for lantern slides, and find it all that can be wished, but for ordinary use it is very slow.

I am not aware that any one has used hydroquinone for intensifying before. For under-exposed negatives it works very well, and so far I have found no stain from using it.

To Obtain Black Prints on Bromide Paper.—Mr. Dresser, in the same journal, says: Develop with ferrous oxalate as usual. Give a short exposure and use a strong developer.

After developing wash with acetic acid water, then well wash and pour over the print a solution of mercury (sat. sol. bichloride mercury 1 part, water 3 parts). The image will gradually fade away. When it has nearly done so, wash it carefully, and pour over a saturated solution of sulphite of soda. When it has reappeared, wash for one minute and then put in the hypo. solution (half saturated), leaving it there for ten minutes. Wash thoroughly. The print, when looked at by daylight, will be a rich brown, but it will dry black and white.

Improved Method of Burning Magnesium Powder.—In the SCIENTIFIC AMERICAN for May 3, 1884, page 275, we give an illustration of a method of burning magnesium powder, in which an alcohol lamp projecting a horizontal flame is held underneath a funnel into which is poured, at the time when it is desired to make the picture, magnesium powder mixed with fine sand. Quite recently this method appears to have been reversed by Mr. William Bishop, who demonstrated the working of his apparatus before a meeting of the North London Photographic Society.

We take from the *Br. Jour. of Photo.* the following description of his lamp:

"A square metallic spirit lamp, having a flat top, is fitted with two wicks, one in front of the other, and separated by two or three inches. Immediately behind this lamp is a short wide-mouthed bottle containing magnesium in powder. Dipping into this powder is a glass tube, the other end being carried up through the cork and bent toward the flames of the spirit lamp, which are in a line with the direction of the blowpipe. A second short piece of tube is passed through the cork, its outer end being connected with the rubber tube of a pneumatic ball. On giving this ball a quick, sharp squeeze, a small quantity of the powder is suddenly ejected from the blowpipe nozzle against the flames, this being attended by a dazzling flash. This is capable of being repeated as long as any of the magnesium powder remains in the bottle.

"Two spirit flames are employed instead of one in order to insure the complete combustion of all of the metallic powder that is ejected.

"From a knowledge of and practical acquaintance with all the systems previously employed for producing the flashing light under the most comfortable and effective conditions, we place this, the latest, at the head of them all. It is free from association with either pyrotechnic compounds or gun cotton. Its portability is such as to leave nothing to be desired. Methylated spirit is so cheap as to amount practically to nothing when being occasionally used, and a pinch of a small rubber ball forms the whole means by which the light is started into action over and over again."

It will be noticed from the above description that the appearance of this apparatus is somewhat like the ordinary atomizers which are now in use. Pressure on the bulb forces a fine horizontal stream of magnesium powder directly through two flames of alcohol placed one behind the other. The apparatus is very simple, and undoubtedly will be of much service in photographing interiors and in making portraits by night.

Improved Pyro Developer for Lantern Slides.—Mr. John G. Cassebaum, in the *American Journal of Photography*, relates his experience with an improved pyro. developer, which is particularly recommended for its excellent keeping qualities and for the remarkable clearness of the shadows and brilliancy of high lights it produces in a transparency or lantern slide.

The formula stands as follows:

a	Hydroxylamine	60 grains.
	Pyrogallol	1 ounces.
	Water	6 "
b	Carbonate of soda	1½ ounces.
	Sulphite of soda (crystals)	4½ "
	Water	60 "

For negatives add 2 to 4 drachms of *a* to 8 ounces of *b*, according to the nature of the subject.

For lantern slides, in which too much density should be avoided, 1½ drachms of *a* or the pyro. will be sufficient.

The use of hydroxylamine, as far as my experience goes, communicates virtues which are greatly to be desired.

There is obtained by its use a depth of bluish black tones, rich in gradations, soft and pleasing to the eye, which are not lost when the image is projected upon the screen.

I prefer the hydroxylamine and pyro. development to the ferrous oxalate, not only for the increased beauty of the tones, but also for the degree of intensity obtained without danger of clogging the shadows or making too dense the high lights. The process of development can be watched more readily and the proper degree of strength determined much better than with oxalate. I have a mixture of the hydroxylamine and pyro. which I have kept for more than two months without the slightest indication of discoloration.

Prevention of Blisters on Albumen Paper.—Mr. Ellerslie Wallace, in the same journal, says that the chief cause of blisters is the extreme dryness of the paper at the time it is silvered. The paper, prior to silvering, should be stored in a damp place, like a cellar, or in a dampened room, so that the albumenized sheets will become somewhat limp, or will refuse to curl up when laid out flat on a table. After fixing, the prints should be at once immersed in a solution of common salt, about the same strength as the fixing bath. It is also advisable to gradually dilute the salt solution after the prints have been soaking some minutes.

The Great Bear Valley Dam.

Leaving the small settlement of Crafton, we wind through the Mill Creek canon, and then climb over the San Bernardino Mountain at an elevation of 5,600 feet above the sea, or 4,100 feet above Redlands. Then we go down and through the Santa Anna Valley and cross the next ridge at an elevation of 7,600 feet. Then we descend 1,200 feet and ride three miles further, when we come to the great Bear Valley Dam, which backs up the Bear Valley Lake or great reservoir, as it may now be called. One is spellbound when he examines this stupendous piece of work and realizes the labor that it cost. All of the cement and other materials, excepting the granite, which was quarried near by, was carried by teams and pack mules 100 miles, and each barrel of cement cost $13 when delivered at the dam. It took a team two weeks to reach the Colton Railroad station, and the engineers and laborers lived in rudely constructed log huts for six months. From Colton the route was up the Cajou Pass, thence over the Mojave Desert, then through "Lucky" Baldwin's silver mine trail to the end of the dam. The dam is built of big blocks of granite, ranging from a half ton to ten tons in weight, the majority being about four tons weight each. Its base rests upon a solid rock foundation and its present height is about sixty feet, though it may be increased twenty feet without any risk of weakness. It is a curved dam, its length of arc being 300 feet and its radius 345 feet. Its base is twenty feet wide, and from this it slopes to three feet wide at the top. Its average coefficient of safety is 25, and it would stand twenty times its present pressnre. The engineer was F. E. Brown, a graduate of Yale College and of Yale Scientific School, and one of the largest property owners in the county. The State engineer of California has pronounced the work not only efficient, but a remarkable piece of engineering.

The lake or reservoir receives the drainage of 200 square miles. It covers an area of 4,000 acres, three fourths of which around the old lake was used as a sheep ranch until purchased by the Bear Valley Company. At the present height of water, fifty-three feet, at the dam there is a supply of nearly 10,000,000,000 gallons, covering an area five miles in length and a half mile in width an average depth of fifteen feet. With the dam at its full contemplated height the lake will hold 40,000,000,000 gallons, and at sixty-five feet 21,000,000,000 gallons. Before the dam was built this water was allowed to flow in winter torrents to the sea. It is now capable of irrigating 50,000 acres of land in the frostless foothills, once supposed to be beyond the pale of irrigation, and to supply a population of 500,000 for domestic purposes. It at present irrigates the lands included in the towns of Redlands, Lugonia, Crafton, and Highlands, and is to be extended to San Bernardino.

THE Travelers Insurance Company, of Hartford, has just issued its twenty-fourth statement, which shows a gratifying increase in the amount of business, both in the life and accident departments. Nearly $7,500,000 of new life insurance was written, or double the amount it was doing four years ago. Its claim payments amounted to $1,392,000, the greatest in any year since its organization. The accident department shows an increase of over 3,000 policies over 1886, and the increase in volume of premiums much heavier still. This company has the reputation of liberal dealing that entitles it to the large share of public confidence it possesses.