POSITION OF THE PLANETS FOR SEPTEMBER.

JUPITER

is evening star, and once more wins the place of honor on the planetary annals, but, after September closes, his best period of visibility has passed. The prince of planets may be easily found in the southwest, setting on the 1st about 3 h. after the sun. He is in conjunction with Mars on the 11th, at 9 h A. M., being 2° 12′ north. The planets will be near neighbors on the evening of the 10th. He is in conjunction—for the third time during the present year—with Beta Scorpii on the 22d, at 8 h. P. M., being 28′ south, planet and star setting about 30 m. after the conjunction. Jupiter sets on the 1st at 9 h. 45 m. P. M. On the 30th, he sets at 8 h. 4 m. P. M. His diameter on the 1st is 34″.8, and he is in the constellation Scorpio.

MARS

is evening star and his course through the month is one of special interest. Moving at a more rapid pace, the ruddy planet overtakes and passes his more lordly neighbor on the 11th, as already stated. He is in conjunction with Beta Scorpii on the 13th, being 2° 34′ south, and in conjunction with Antares on the 22d, being 3° north. A good opera glass will be a valuable aid in the observation of these celestial meetings and partings. Mars sets on the 1st at 9 h. 19 m. P. M. On the 30th, he sets at 8 h. 31 m. P. M. His diameter on the 1st is 7″.6, and he is in the constellation Libra.

MERCURY

is evening star, and takes an active part in the proceedings of the solar community during the month. Moving eastward in his rapid course, he overtakes Venus on the 18th, at 10 h. P. M., being 1° 39′ south. He is in conjunction with Uranus on the 19th at noonday, being 1° 28′ south. On the 22d, at 2 h. P. M., he is in conjunction with Spica, being 55′ north. Mercury sets on the 1st at 6 h. 49 m. P. M. On the 30th, he sets at 6 h. 20 m P. M. His diameter on the 1st is 4″.8, and he is in the constellation Leo.

VENUS

is evening star, and sets at the close of the month more than an hour after the sun. Observers will find the beautiful evening star in the southwest soon after the sun has disappeared. She makes a close conjunction with Uranus on the 19th, at 3 h. P. M., being 14′ north. Venus sets on the 1st at 7 h. 3 m. P. M. On the 30th, she sets at 6 h. 28 m. P. M. Her diameter on the 1st is 10″.4, and she is in the constellation Virgo.

URANUS

is evening star and is near Venus and Mercury on the 19th. Uranus sets on the 1st at 7 h. 49 m. P. M. On the 30th, he sets at 5 h. 59 m. P. M. His diameter on the 1st is 3″.4, and he is in the constellation Virgo.

SATURN

is morning star and the only visible planet in the morning sky. He is easily found in the northeast, rising 2 h. before the sun at the beginning of the month, and 4 h. before him at the close. Saturn rises on the 1st at 3 h. 10 m. A. M. On the 30th, he rises at 1 h. 32 m. A. M. His diameter on the 1st is 15″.6, and he is in the constellation Cancer.

NEPTUNE

is morning star. He rises on the 1st at 9 h. 58 m. P. M. On the 30th, he rises at 8 h. 4 m. P. M. His diameter on the 1st is 2″.6, and he is in the constellation Taurus.

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

Gas for Locomotives.

The Philadelphia *Record* says that the problem of obtaining a cheaper fuel than coal for locomotives, which has long bothered railroad men, seems likely to be solved soon by experiments now being made with gas. A very good test of the new fuel has been made at the works of the Electric Light Company, in West Chester, which, since the fire that destroyed the old plant several months ago, have been dependent for their motive power upon the Shaw locomotive. This is the engine that made such a good record in some trial trips two or three years ago, but which has never done much road service.

Instead of coal, gas mixed with air has been used in the locomotive with entire success in generating sufficient power to drive the dynamos. With larger machines for producing and mixing the gas, it is believed that power enough can be obtained for driving locomotives with trains, and a special car is now being built at New York to hold a large machine of the kind used in mixing the gas and the storage receivers. This will be attached to a locomotive, and tests will be made soon, probably on the main line of the Pennsylvania Railroad, or the short branch line from West Chester to Phœnixville. The experiments at West Chester have been made under the direction of Jackson Richards, who has recently been restored to his old position of master mechanic of the Reading Railroad's Norristown, Germantown, North Pennsylvania, and Bound Brook lines, and Mr. Richards is sanguine of the success of the new fuel. The gas and air are mixed in a machine called the Caloric King, the invention of Rev. Ballard S. Dunn. In a report upon its workings Mr. Richards says:

I am satisfied in my own mind that if machines large enough for locomotives are built, with a reserve power, it will be a great advantage and saving to burn gas as fuel for railroad purposes. Having some 30 odd years' experience in the construction and management of locomotives, I can speak with confidence on the subject. I claim, in the first place, that the saving in burning gas instead of coal will be very great; for with the present system but about 45 per cent of the fuel is used, 55 per cent going to waste, while with Caloric King to commingle the gas and air the combustion is so perfect that nothing is lost. To illustrate my meaning it is only necessary to state the fact—well known to gas manufacturers—that one ton of coal will make about 11,000 feet of gas, which gas commingled with air and burnt through the Caloric King will do more railroad work than any two tons of coal, besides giving the company an additional profit from the sale of coke.

The next saving, resulting from taking off the back pressure, amounts to 20 per cent, while doing away with the disagreeable noise of the exhaust, adding this strength to the engine. Another advantage to railroad companies is the doing away with all smoke, soot and cinders, thus saving the heavy damages that companies annually pay for property destroyed along their lines.

Lobsters in the Pacific.

The United States Fish Commission lately sent off to California 600 live lobsters, 350 of which arrived safely at Sacramento. Several attempts had previously been made to send live lobsters across the North American continent, but had failed. In the present instance, as we learn from *Science*, Colonel McDonald, Fish Commissioner, personally superintended the packing of the lobsters. A crate or box devised by the late Captain Chester was used. This was placed within another larger box, the intervening space being filled with pounded ice. In the inner box the lobsters were placed between layers of rock weed, which at times was moistened with sea water. Each box had an independent drain, so that the fresh water from the melting ice could not enter the lobster box. The temperature of the latter was kept at 45° F.

A Fish Commission car was used, the boxes along the side of it serving as the outer box of the combination described above; one hundred crates, each containing six lobsters, being placed in them, and surrounded with ice. Each morning before sunrise a careful inspection of the lobsters was made, and those that had died were removed. The first day 45 died; the second day, 55. After that the mortality was much less. All of those that died were in an advanced state of shedding, and were in poor condition when they started. One-half of the 350 lobsters that arrived safely on the Pacific coast were placed in the ocean north of San Francisco, and the other half south. The condition of the water in that region is similar to that of the Atlantic off the Massachusetts coast. The temperature is about the same, but is more constant. The lobster on the Massachusetts coast crawls out into deep water in the summer, where the temperature is low, but it is thought that the equable temperature of the Pacific will enable the lobster in those waters to spend the whole year in one spot.

The Eggs of the Gnat.

In some notes on the development of the gnat, contributed by Mr. Harry Thomas to *Science Gossip*, the writer says: "The female gnat lays her eggs arranged spirally, in a sausage shaped colorless jelly, varying from one quarter inch to one inch in length, beneath the surface of still waters. I obtained specimens during the months of August, September, and the early part of October. They were found usually attached to the side of the vessel, by an adherent disk terminating a prolongation of their upper extremity just beneath the water, but sometimes unattached, suspended several inches beneath the water, when the disk reaches to and floats upon the surface. When first deposited, the eggs are closely packed together, forming a short, brown string. In a very short time the connecting envelope absorbs the surrounding water till it has increased to many times its original bulk. The eggs then become separated and form an inner spiral chain. Slightly magnified, the egg case appears divided into many equal segments by narrow transparent rings, and two transparent threads, twisted with each other, may be traced from the neighborhood of the lower to the upper extremity, where they unite and are continued beyond as a single thread terminating in an adhesive disk. The eggs appear somewhat oval in form, and are arranged in a spiral which shirks a complete turn, and when all but round, makes a loop and goes back again. The nearly completed rings thus formed lie each within a separate segment."

Evaporated Fruit.

Rochester is the recognized center of the evaporated and dried fruit industry of the United States, which during recent years has assumed very large proportions, the goods being shipped in large quantities to all of the leading markets of the world. No finer fruit is produced on this continent than is grown in the territory embraced under the name of Western New York, comprising some twelve of the most fertile and richest counties of the Empire State. The cultivation of fruit, especially apples, has superseded all other agricultural products, and has proved the most remunerative to the growers. The orchards of the farming community are the chief sources of their wealth, and the industry is prosecuted with unabated vigor, largely aided by the experience, skill, and resources of the great nurseries of Rochester, famed throughout the world. Whether due to this proximity, the favorite climate and soil, or the superior and skillful cultivation of the orchardists, one thing is certain, that the apples of Western New York are sought with avidity, and bring relatively higher prices than those grown in any other portion of the country.

The success and magnitude of the evaporation industry is due largely to the fine quality of the fruit, easily and cheaply procurable in abundant quantities, and also to the enterprise of the producers in adopting new and improved evaporators and machinery in place of the crude process in vogue years ago, producing thereby a quality of fruit fully as good and palatable to the sight and taste as though it were in the fresh or uninjured state. Thousands of tons of apples are produced every season from a quality of fruit heretofore wasted and allowed to rot on the ground, and which now forms a nice income to the grower. It is in the utilization of these waste products that the desiccation of fruit becomes a valuable and indispensable adjunct to every fruit grower, and the business may be considered as yet in its infancy.

Within a radius of forty miles of Rochester there are more than 1,500 evaporators, from the small farm house drier, of a capacity of twenty-five bushels a day, to the large steam evaporators, drying 800 to 1,000 bushels of apples each twenty-four hours. These evaporators give employment during the autumn and early winter months to at least 30,000 hands, who average from $5 to $12 a week, according to experience and usefulness. New factories are erected every season, proving that the business is profitable when properly and economically conducted. Constant care and scrupulous cleanliness are the first elements of success in evaporating good fruit. The production during the past season, 1887, may be well considered the largest since the inception of the business, some fifteen years ago. A careful estimate places the total quantity at about 30,000,000 pounds, worth at first cost some $2,000,000. To produce this quantity of apples is required 5,000,000 bushels of apples, 15,000 tons of anthracite coal, and the constant attendance, night and day, of an army of men, women, and children, numbering 25,000 to 30,000 The water eliminated in the process of evaporation amounted to 225,000 tons, reducing the bulk of the green fruit to about one-eighth of its original weight, each 100 pounds yielding when properly evaporated twelve pounds on an average. The fruit is usually packed in cases of two cubic feet measurement, holding fifty pounds net, the product of say eight and one-half bushels of green apples.

The advantages in freight alone will be apparent from the following comparison, showing the cost of shipping one case to Liverpool, England, which at existing freight rates will cost a little less than thirty cents, while in the green or fresh state in barrels the same quantity would cost $2.25, and in the canned state almost $2.10, without considering the deterioration of the green fruit and the dangers of fermentation to the canned article, the apple in the evaporated state being transported without any danger of deterioration or decay. The refuse of the apples, such as the parings and cores, are dried and form the base of all the cheap jellies manufactured at present. The quantity produced last season will aggregate some 12,000,000 pounds, so that not a particle of the fruit is wasted.

The principal consuming countries abroad are Germany, England, Belgium, Holland, and France, in which the new product has entirely displaced the old-fashioned sun-dried fruit. There were shipped alone to France during 1887 some 18,000 barrels of a quality known as chopped or sliced apple, which is dried without being either pared or cored, and is used chiefly for the production of cider, cheap wines, and distillation when the vineyards of France suffer from the phylloxera. Some 4,000,000 pounds were exported during the season, of which more than one-half were shipped from Rochester. New York State evaporated fruits have secured a very favorable reputation and strong foothold abroad, and can be had in almost any town or city of importance on the European continent. The goods are also taken in considerable and increasing quantities by the West African and Australian trade every season, and with the popularity and growing demand at home the success of the business is more than assured. —*Bradstreet's.*