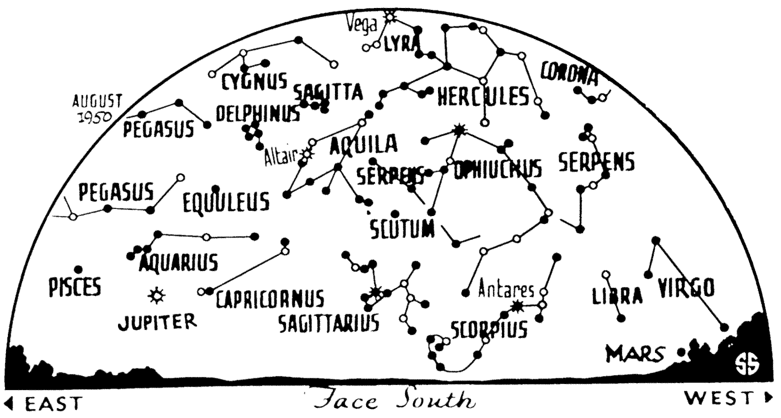

SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

From the way that Jupiter pulls on the tiny planets called asteroids, as well as on its satellites, it is possible to determine its mass with considerable accuracy. It turns out to have about 318 times the amount of material making up the earth.

Knowing Jupiter's mass, and how fast it spins, astronomers can calculate the centrifugal force at the equator, and how much it would bulge if its material were distributed uniformly throughout its globe. On this basis, however, it turns out that it should bulge even more than it does, proving, therefore, that the material is not uniformly distributed. Instead, the bulk of the mass must be concentrated at the center core, with lighter kinds of stuff in the outer layers, so light in fact that they must be largely gaseous.

Jupiter Gaseous

Moreover, the gaseous character of the outer layers of Jupiter is confirmed by the remarkable changes that occur in its surface features. Most conspicuous of these, when it is viewed through a telescope, are the red and brown belts which cross its surface parallel to the equator. These are continually changing their details, with spots appearing and vanishing. The surface at the equator turns more rapidly than the parts nearer the planet's poles, additional evidence that we are not looking at a solid surface.

Analyzing, by means of a spectroscope, sunlight reflected by Jupiter, we find dark bands at certain wavelengths which have been absorbed by some material in the planet's atmosphere. These have been shown to be due to the gases we know as methane, or "marsh gas," and ammonia. Hydrogen, also, is probably most abundant in the atmosphere, but it causes no bands that can be observed. Nitrogen is the chief element in our atmosphere, but what there has been in that of Jupiter has probably combined with the hydrogen to form ammonia, which contains both these elements. Oxygen, that may once have been present, has likewise probably combined with the hydrogen to form water. At the low temperature prevailing there, because of its great distance from the sun, this would doubtless have frozen and fallen far out of sight.

Structure of Jupiter

According to Dr. Rupert Wildt of Yale University, who first showed the presence of ammonia and methane on Jupiter, the planet's structure is something like this: At the center is a rocky-metallic core, about six times as dense as water and about 34,000 miles in diameter. Over this is a frozen ocean—a layer of ice some 20,000 miles deep. On the outside, some 6,000 miles in thickness, is a layer of frozen ammonia crystals in an atmosphere of hydrogen and methane. There must also be some unfrozen, gaseous ammonia to cause the observed absorption bands.

Possibly, as Dr. Fred Whipple, of Harvard College Observatory, has suggested, there is no sharp transition between the atmosphere and the ice layer. The clouds may become thicker and thicker with depth, finally turning into a layer of ammonia slush, which becomes solid still farther down. A further suggestion is that since there are brown and red compounds of ammonia in combination with potassium and sodium, these may account for the coloration observed in the surface of Jupiter.

Time Table for August

Aug.	EST	
5	2:56 p. m.	Moon in last quarter
6	10:00 a. m.	Moon farthest, distance 251,200 miles
11	9:46 a. m.	Moon passes Venus
12	early morning	Meteors of Perseid shower visible
13	11:48 a. m.	New moon
15	3:01 p. m.	Moon passes Saturn
18	11:01 p. m.	Moon passes Mars
19	midnight	Moon nearest, distance 229,800 miles
	10:35 a. m.	Moon in first quarter
21	6:00 a. m.	Mercury farthest east of sun
26	2:00 a. m.	Jupiter opposite sun and nearest earth; distance 371,200,000 miles
27	6:31 a. m.	Moon passes Jupiter
	9:51 a. m.	Full moon

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, July 22, 1950

CHEMISTRY

Mercuric Chloride for Better Watered Farms

➤ MORE water in U. S. farming areas where irrigation means the difference between prosperity and drought—that is the promise of the chemical mercuric chloride and a trick known as "water spreading."

In areas such as California's San Joaquin Valley, irrigation pumping is threatened by lowering water tables. More water is being pumped from wells than is being replaced each year. Yet in the spring as mountain snows melt—or during infrequent cloud bursts—there is so much water that local floods result.

Irrigation engineers are experimenting with "water spreading" to conserve this occasional heavy run-off of water. The idea is to divert it to shallow dike-enclosed reservoirs, where it will stand still long enough to soak into the subsoil.

But when soil is continuously submerged for a few weeks, micro-organisms in the earth multiply, choking the tiny channels through which the water can filter downward.

Mercuric chloride may be the answer. A very small amount of the disinfectant chemical added to water will kill the obstructionist microorganisms, and keep the water percolating into the subsoil storage layers.

Science News Letter, July 22, 1950