



the ball. No other planet is so equipped. With an outside diameter of 171,000 miles, the innermost ring is about 6,000 miles above the planet. Yet the thickness of the system is very small, perhaps not more than ten miles. They are much thinner, relatively, than would be a disk ten inches in diameter cut of thinnest tissue paper.

**Rings Not Solid**

However, the rings are not solid—and if they were they would not hold together. Actually they consist of a swarm of myriads of tiny moonlets, no larger than good-sized rocks, but all going around Saturn together.

The pieces are so small that from the earth we cannot separate them with the most powerful telescope, and the rings look solid, at least until they happen to pass in front of a distant star. Then the star shines through them, giving a clue to their nature.

No one knows exactly what caused the rings, but astronomical theory has demonstrated that within a certain distance of a planet, known as Roche's limit, a satellite could not hold together. The rings are well within this limit of Saturn while the closest of its nine large moons is outside it.

Some have supposed that a tenth moon once ventured too close and was broken to bits to form the rings. Indeed, it is believed that in the remote future our moon will get too close to the earth and suffer a similar fate. However, it seems more likely that the rings of Saturn represent material which, had it been farther out, might have gathered together to form a satellite.

In any event the rings, which are visible with a moderate-sized telescope, make Saturn one of the most beautiful objects to be seen in the heavens.

**Celestial Time Table for April**

April EST

6	11:58 p.m.	Moon in last quarter.
12	2:00 a.m.	Moon nearest, distance 224,100 miles.
13	3:00 a.m.	Venus between earth and sun.
	3:09 p.m.	New moon.
	12:00 mid-night	Saturn opposite sun and nearest earth, distance 808,800,000 miles.

15	5:00 a.m.	Mercury farthest west of sun, rises before sunrise.
	11:03 a.m.	Moon passes Mars.
	8:37 p.m.	Moon passes Jupiter.
20	7:40 p.m.	Moon in first quarter.
24	3:00 a.m.	Moon farthest, distance 251,800 miles.
27	11:00 a.m.	Mars passes Jupiter.
	11:00 p.m.	Moon passes Saturn.
28	11:20 p.m.	Full moon.
		Subtract one hour for CST, two hours for MST, and three for PST.

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CHEMISTRY

**Rum Taste Told By Chemical Tests**

➤ RUM RESEARCH in Puerto Rico has turned up eight "chemical methods" for tasting rum that supplement the personal opinions of tasting panels.

The chemical methods were developed over the last eight years at the University of Puerto Rico's Agricultural Experiment Station, which is expanding the facilities there with the addition of a distilling unit designed by Arthur D. Little, Inc., Cambridge, Mass.

The methods will be used to determine the quality of a test run of rum, advises Victor Rodriguez-Benitez, technical director of the pilot plant. Other tests will be conducted to reveal the suitability of waste products for other purposes, such as making cattle feed or fertilizer from the fermentation mash after the rum has been distilled from it.

Rum making is a multi-million dollar business in Puerto Rico. During a recent four-year period, rum revenues and taxes to the Puerto Rican government amounted to about \$215,000,000. This sum was split into funds for education, health services, hospitals, hydro-electric power, agricultural agencies, road building, aqueduct service, coffee crops, public works and social services.

The pilot plant at the University's experiment station aims to help Puerto Rican distillers build up the rum business even more.

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CHEMISTRY

**Fundamental Structure For Protein Materials**

➤ ONE FUNDAMENTAL pattern repeated with variations makes up most protein materials from gelatine to blood.

The pattern is that of a coiled spring, and the variations are found in whether the spring coils in the right-hand or left-hand direction and in how many fibers, themselves twisted, curl around one another to form the fibrous threads that make up the protein substance.

Reporting on two years of work on protein structure, Dr. Linus Pauling of the California Institute of Technology, told members of the American Chemical Society meeting in Los Angeles that hemoglobin, serum albumin from blood, an enzyme from egg white, and insulin, body chemical whose lack causes diabetes, have the same coiled form he had previously identified in horn, hair and skin. (See SNL, March 7, p. 150.)

Gelatine and collagen are simpler proteins whose structure also seems to follow the pattern. Three twisted chains appear to make up their fibers, although Dr. Pauling believes some modification of this structure will appear as his studies progress.

Silk fibers have a somewhat different structure, more like a pleated sheet than a twisted rope, the California experiments show.

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