## THE EVENING NEWS GEORGE Q. CANAON. March, 18, 1971.

ISITY LECTURES ASTRONOMY. 1001.0V

ROF. ORSON PRATI, SEN.

LECTURE VIII.

Saturn .- Its Rings .- Belts of Suturn.-Rotation of the Planet and Rings .- Stability of the Rings dependent on these Causes .- Variety of Saturnian Seasons. When the Rings are Invisible. - Phases of the Rings .- Scenery from the Surface of Saturn. -- Fifteen Years Total Eclipse.-+ Eight Moons. - Their Periods and Phases. Uranus.-Its Characteristics.-Satellites of Uranus. - Their Anomalous Orbitual Mations. - Seasons on Uranus. - Poeuliar Adaptations.

SATURN.

Or all the grand objects of the solar system, Saturn is truly the most wonderful. This magnificent orb, encircled by a system This magnificent orb, encircled by sight moons, performs a revolution around the sun si the mean disance of 906,000,000 of miles in 10,750) of our days, or in about 25 years When nearest the earth, it is \$11,000,000 of miles distant, an interval which could not be traveneed by a cannon ball, flying with a velocity of 500 miles an hour, in less than about 134 years. The circumterance of 1 horbit is 6,000,000,000 of miles a near in the sum at the sliphest derangement, speedily desirey itself. To construct an equilibrium of stability, it is for the signest derangement, speedily the sum about 134 years. The circumterance of 1 horbit is 6,000,000 of miles a hour, in less than about 134 years. The circumterance of 1 horbit is 6,000,000 of miles a distance so great that a steam carriage, moving at the rate of 20 miles an hour, would require above 32,500 years to complete the journey, Saturn rolls in allent grandetr stround this whole circuit at an average rate of 22,000 miles every hour. Saturn is userly as large as Jupiter, being situated in the plane of the equator, and nearly concentric with the planes and with each other. The inner edge of the interior ring is average in denoted with the planest, and it is further observed that the common centre of severed that the common centre of severe around the common centre of the interime stable of the interime severed that the common centre of severe around the common centre of severe around the common centre of severe around the common centre of the interime around a the state for severe around the common centre of severe around th of rings, and accompanied by eight moons,

pendous globe are two magnificent rings, situated in the plane of the equator, and nearly concentric with the planet and with each other. The inner edge of the interior ring is several thousand miles distant from the surface of the planet, and consequently has no contact or connection with it. From the inner to the outer edge of the interior ring, or its breadth, is nearly equal to its distance from the planet. The interval be-tween the interior and esterior rings is 1,791 miles. From the inner to the outer These rings a or contact with each understood, that these to the planet in the form olt or some extending several nary jappendage, as calculated

The quantity of matter towards which the matte

inner ring must move a very small degree slower than is otherwise would. I have not made the necessary allowance in the foregoing calculations. Although the great centrifugal force of rotation is calculated to preserve the rings from contracting until they finally coalesce with the surface of the planet, providing that the centres of gravity of the rings and planet exactly coincide,—yet if these cen-tres, from any external causes whatsoever, become separated by over so small an become separated by ever so small an amount, it can be demonstrated that the de-rangement will go on increasing more and more, until the edge of the ring merest to the centre of the planet will finally come in contact with its surface. At equilibrium of instability is the name given to this kind of methanical conditions. It may be the of instability is the name given to this kind of mechanical conditions; it may be exem-plified by balancing a rod upon the tip of the finger. While the rod stands in an exact vertical position, it maintains likely in a state of equilibrium, and has no ten-dency to fall, but this equilibrium is unsta-ble; for the alightest deviation from the vertical will constantly be increased until the rod falls, and the equilibrium is des-troved.

While in one hemisphere they are enjoy-ing the beautiful and sublime scenery of this gorgeous ring. In part of the other hemisphere they will be suffering a fifteen years total eclipse, occasioned by the inter-position of the ring between them and the

the root fails, and the equilibrium is der There is another species of equilibrium of statif forence, for instance, les root be supended to any descent of gravity upon an axis, if it be turned in any position in a vertical plane, to supended, be the plane of the fing bitweet them and the sum is seening of instance, les root be supended to supended, be the plane of the fing bitweet them and the sum is seening of the supended to supended, it will have no landency to restore itself to the root is a vertical plane, to any descent. If this rest be supended to supended, it is original position of the fing bitweet the plane of the fing bitweet to supended, it is original position of a supended to supended, it is original position of supended the root is original position of supended to supended, it is original position of supended the supended by the constant tempered to supended by the constant tempered the supended by the constant tempered to constant excellence the supended by the constant tempered the supended by the constant tempered the supended by the constant tempered to constant excellence the supended by the constant tempered the supended by the constant tempered the supended tempered by the constant tempered to constant excellence to constante de tempered by the constant tempered to consta

Ld. Sh. S m. 5.7 a The distance from the surface of the lanet to Tethys is 171,761 miles; its period

Dione is 231,139 miles from the planet, and revolves around it in 2 d. 17 h. 41m.

Rhes is 335,530 miles distant, and revolves

in 4 d, 12 h. 25 m. 10.8s. Titan is \$35,915 miles from the surface of the planet, and revolves around it in 15 d, 22 h. 41 m. 25.2 s.

loent system!

Hyperion is 1,068,660 miles from the planet and revolves around it in 22 d. 12 h. Ispetus is 2,607,740 miles from the planet's surface, and revolves around it in 72 d. 7 h. 53 m. 40 d. The first four satellites are nearer to

Saturn than the moon is to our earth; and if we suppose them to be as large as our moon, the apparent disc of the first will be about eight times larger than that of our moon's; that of the second, four times larger; that of the third, over twice as arge; that of the fourth will appear about the same size. The first will pass from new to full moon in one of Saturn's days, and the next day it will pass from full to new moon. The second will pass through all the phases from new to full and full to

URANUS.

in Ovation to Jefferson Davis !

A European War Possible !

**Reverend** Appropriates

Church Funds and Ab-

sconds!

CONGRESSIONAL.

SENATE.

Several Bills.

Representatives and in other respects



ed yesterday, charged with embezzle-ment. He is held to bail at ten thousand dollars. Henry W. Pitman, late Tel-ler of the North National Bank is also arrested on the same charge, and held to answer.

BOSTON .- Dandell, late cashier of

## ALABAMA.

dillo tf

Jeff. Davis serenaded. MONTGOMERY.-Jefferson Davis is here, on business connected with his Insurance company. To-night he has been called upon by an immense num-ber of ladies and gentlemen. In ans-wer to a serenade, he returned thanks, but made no allusion to any public matters.

FOREIGN NEWS

**CREAT BRITAIN.** 

An Eminent Publisher Dead.-A War Possible.

LONDON .-- Robert Chambers, the wellnown publisher of Edinburgh, died to-

LONDON, 17.-In the House of Lords, to-night, Earl Cardigan related that, of a right to sell only as it comes through us, this three hundred thousand barrels of pow- has and will induce unprincipled persons to counterfeit and misrepresent the genuine, in der, stored in the government arsenals, der, stored in the government arsenals, all but eight hundred barrels were worthless; and that government had been paying for pebble powder, twice its cost, in its own shops. He deplored the apathy of Government at a time when the state of Europe made war more than possible. Lord Northbrook, Under Secretary of War, explained that barrels of the Danforth Fiuld, and then sell and advertise quite extensively some of its merits, but do not tell the people it is the Banthe new prismatic powder was super-ceding all other kinds, and had enga-ged the attention of Government. The resolution of Anthony, for a joint committee to investigate the Southern affairs, provides for a joint committee, consisting of five Senators and seven

PRUSSIA.



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the rings.

It will be perceived that the thickness of by six n, then there must be five, and in, rings concentrie with such

of Saturn appears striped with bright balls, resuling paralle untor. These belts are broads of Jupiter, but the alternation at and shade are less strongly marked is are, no doubt, p the swift retation of that p JULINITY IC

The axis of rotation is perpendicular to a plane of the rings, and also to the belts. and 15 second as son and distance. het the the system may be maintaine

-Carlowers Endel

the rings or would alter its relative po on by its own mutual gravitation but one zing, in the course of a very short time might be precipitated upon the other by the operation of some external force, unless prevented by the three conditions which we have already specified as mean mary to their stability. The velocity of the rotation of the rings is much greater than their orbitual velo-

The velocity of the rotation of the rings is much greater than their orbitual velo-city scound the sun. The circumfer-ance of the exterior edge of the outer ring is over 35,000 miles it must revolve, there-fure, over 53,000 miles every hour; while the velocity in the orbit around the sun is only about 22,000 miles per hour. During their midnight, the absolute velocity of that point of the ring the most distant from the sun, resulting from both of these mentions, will be 76,000 miles per hour to the east; while that point of the ring sear-est the sun, will be moving with an abso-lute velocity of 30,000 miles per hour to the west. From their noon till their midnight, —a period of only about 51 hours, there must be an average change of absolute

-s period of only about 51 hours, there must be an average change of absolute velocity of about 20,000 miles per hour. The inclination of the orbit of Saturn to the plane of the colliptic is equal to 2 deg. 29 m. 35.7 s. The inclination of the sequator and ring to the plane of its orbit is equal to 28 deg. 11m. The plane of the ring in the year 1871 intersects the plane of the colliptic in two points, namely, 167 deg. 47 m. 57.7 a. and 367 deg. 67 m. 57.7 a. of longi-tude. The nodes of the ring are not quite stationary, but solvance on the soliptic

tude. The nodes of the ring are not quite stationary, but sdvance on the coliptic about 46, 402 a per annumn. The variety of seasons upon Saturn and his rings will be somewhat more striking than with us, because the inclination of his squator to his orbit is greater than ours. rill each be about 7 1-2 se will each be about 7 1-2 years long. Every 15 of our years the sun will apparently pass through the equinoxes of Salars, at which time is will be vertical to the outer heavier than the earth. Therefore its denwhich time is will be vertical to the outer edge of the ring. The cun will apparently recode to the south aide of the rings as far as the southern tropic or shout 30 deg. south, and then return beck again crossing the equator or plane of the ring, and con-tinue 30 deg. north, or to the northern tropic; therefore the sun shines 15 years on the southern side of the rings, and then the minis length of time on the northern. Each side of the rings, therefore has alternately 15 years day and 15 years night. Setars's rings are not always visible in consequences of their relative positions in regard to the sun and carits. There are three causes for their disappearaces. First, when the sun is vertical to the edge of the ring, the sun is vertical to the edge of the ring, the sun is vertical to the edge of the ring, the sun is vertical to the edge of the ring, the sun is vertical to the edge of the ring, the sun is vertical to the edge of the ring, the sun is vertical to the edge of the ring the sun is reacting the sub reaction ated part; the sum is vertical to the edge of the ring the sun as the edge is so very thin, is will also be invisible to all talescopes but these of the most extraordinary power.

either side of the planet as a p

triant with theirs of a de The ring of 8

The third will pass through all the same

aspects in a little over four of Saturn's lays; and the fourth will undergo the same changes in a little over 6 of Sathrin's days. The four most distant satellities will prebably appear somewhat smaller than our moon and each will exhibit all of its as proposed by the House. The Sen-ators on both sides of the Chamber haves during the period of its revolution. How spiendid must be the firmament of Saturn! New moons, hair moons, full moons, rings, all revolving—all changing —ail exhibiting the handy work—the wis-dom and glory of the great Architect of would, of course, be represented on the

ommittee. At the suggestion of Trumbull, Anthony modified the resolution by innature who erected this superb and magnicreasing the number of Senators on the

in the former number the present Sen-ate committee to investigate Southern affairs. The resolution was then ad-The planet Uranus revolves around the sun at the mean distance of 1,822,000,000 of miles; the circumference of its orbit being 1,448,000,000 of miles. A steam carriage, opted.

11,448,000,000 of miles. A steam carriage, moving at the rate of 20 miles an hour without intermission, would require 65,295 years to complete the circuit. The planet moves in this orbit at the rate of about 15,000 miles every hour, accomplishing the journey in 30,697 mean solar days, or in-about 64 years. The diameter of this planet is 34,500 miles; its circumforance is over 100,000 Patterson offered a resolution reviving the joint committee on retrenchment. Stewart objected to the present con-sideration of the resolution and it went

about 64 years. The diameter of this planet is 34,500 miles; its circumference is over 108,000 miles. Whether it has a rotation upon an axis, has not been accertained by observa-tion; but it is extremely probable, from theoretical considerations, that it has a ro-tation from west to east, like the other all political disabilities imposed by the lith amendment to the Constitution. Rice, from the committee on mines tation from west to east, like the other planets; it is also probable that the period of its rotation is about 9 hours and 80 min-uies, or nearly the same as that of Jupiter and Saturn. This planet is too far from us and mining, reported, without amend-ment, the bill to define and protect the to discover any marks upon the surface under the present power of the telescope; and therefore, observation has not been able to detect a rotation.

development of mines. Corbett, from the committee of commerce, reported, without amend ment, the bill, incorporating the Asia bulk of Uranus is over 81 times ment, the bill, incorporate the tic Commercial Company.

Nye introduced a bill to reinstate. without pay, officers of the army who were mustered out under the provisions of Uranus than on the surface of the earth; that is, a body weighing one pound here, would, if transported to that planet, weigh only 131 ounces. The inclination of the orbit to the plane of the seliptic is 66 m. 28.4 s.; its deviation from the seliptic interfore, never much 62. without pay, officers of the army who of the act of Congress, appored July 15th, 1870: referred. Lewis introduced a bill to promote the collection of internal revenue, pro-

eds # of a degree. Uranus was discovered by Sir Wm. Her-bel on the 13th of March, 1781. For more lection district, at the discretion of the

ner of internal reve

than a century previous to this period, astronomers conjectured that there must be some planetary body beyond Saturn, in consequence of the disturbances mani-ested in the deviations of Saturn and The unfinished business being the appropriation bill for the payment of additional clarks and messengers in the pension office, it was proceeded with. The amendment by Morrill, provid-ing for a public park, in the City of are was accidently confirmed by Her-Washington, which was omitted from the Sunday divid merrice bill, inst semion, by the conference committee was adopted, as was also an amondment at its orbit, was nearly droular; and unfor the payment of sundry per like a comst, no tail or nebulous appear-ance could be detected. Every doubt was soon removed, and this body was deterthe South during the year 1867. Hamilton moved an amend to be one of the great planets of our

saling the law for the meeting of the th of March Instant of In Dec aut the most powerful telescopes ar

> Cote. Chairman of the committee on ap propriations objected to the smeadment as a part of the bill, preferring to have it acted upon separately. He moved to lay it on the table ; rejected. Are 7, nays 44. The amendment was adopt-The bill was then laid aside and

the Senate took up Anthony's resolu-tion, to limit the business of the pre-sent session to legislation upon the a continued

South. Anthony submitted his resolution in a modified form, as follows: That the Senate will consider that the present ness. The other two, if they should ever the re-discovered, will probably be found to read the concurrent resolution for a than the deficiency appropriation bill and the concurrent resolution for a foint computities on states in the fourth, and the resolution now pending, for boot i days. Will be presented, FOR THE LAST TIME the Great Semantion Specialty, entitled,

Montmartre quiet, PARIS.—The situation in Montmartre is unchanged. No sets of violence are committed. Demonstrations at the Place de Bastile continue.

The council of ministers are occupied committee to seven and the number of Representatives to nine, and including in the former number the present Sen-ste committee to investigate Southern bankers offered an advance to France

of two milliards of francs after the raising of the siege.

The Rappel thinks that France should maintain military posts only at Brest, Toulon and Cherbourg. General Venery has addressed a severe circular to the generals command-

ing the army of Paris. Six hundred pork shops have re-open-

ed since Monday. The Journal Oficial, commenting on the treaty concluded by the London conference, on the eastern question says, all the powers displayed a willing-ness to solve the Eurine question and all must rejoice at this act of diplomacy, which has violated no rights, sacrificed no one, but has restored rights, removrights of miners and to encourage the ed mistrust and consolidated good re-

lations. The act is one of peace and right.

ST. PETERSBURG, 17.—The Invalide Rune publishes a latter recently sent to the Case, by the Emperer William, who says: To-day, at the review near Paris, I remembered our united armies ap-proaching Paris, after bard fighting, under the Emperor Alexander and the King of Prussia. The letter also expresses the pleasure of his majesty at the ac-ceptance, by the Czar, of the colonelcy of the first Prussian guards.

W. H. POWER

widay Eve, March 181



DBOF, A. FARINI PA

be Pi

o of Sait Lake City and viets

PPICE HOURS from 10 mm. to 4 p.m

AN OWNER WANTED!

Anthony explained that his resolu-tion would provide for a joint investi-fating committee, upon which both Houses would be represented, instead of a special committee of one branch, as proposed by the House. The Sec. every person that has sense enough to keep out of the fire is safe; and the fact is patent to every one that fame cannot get in any lamp filled with any article that will burn, for the burning material will force itself out-not draw fame in; but high test oil will not burn unti it is heated to a certain point, and when it reaches that point, a spark will explode it the same as gunpowder. It is not to be supposed because this material is non-explosive, that no are is required in its use. It will burn, or it would not be good for the purpose for which it ts intended. Fill your lamps by daylight as far COMMISSION MERCHANTS as possible; and in case you over-run a lamp, be sure an i wipe it off before lighting it. If you use the chimney burners, keep them clean and well trimmed, air tube open, and no dead flies, cleaned wick, and dust on the performed tin or sauze inside the burner. If your lamp fails to give as good light as usual, it is because the inside of the burner needs cleaning. A toothwith some of the fuld, is the bes thing to clean them with. All the burners ope on a hloge, which makes them easy to clean









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