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From the New York Tribune

Astronomy.

LECTURE IV.—BY J. P. NICHOL, L.L.D.

Reported for the Tribune by O. Dyer, the Phonographer.

Continuation of the history of the discovery of the planet Neptune. The discovery of the planet not the result of chance.

Ladies and Gentlemen.—I proceed with the great subject which occupied us the last evening. I confess, however, that some of the questions that are to engage us have to me less than their natural attraction, because I can hardly do what alone I wish, viz., declare my opinions and knowledge concerning them, without undergoing the hazard of being considered as if in controversy with men on this side of the Atlantic, who do not think as I do, and whose learned and professional inquiries may have led them to conclusions not in harmony with those toward which we are inclined in Europe.—Let me, then, at the outset, with all possible distinctness, utterly disavow the attitude of controversy, as unsuitable, ungraceful on this platform. So soon as the important inquiries of which we are speaking have reached their close, and the planet Neptune is received as a thoroughly understood element of our planetary system, with relations all fixed and definite, then whatever of speciality or incompleteness may have been in the views of any one during that period of imperfect knowledge or twilight, will doubtless be explained, reconciled and amplified by its authors; at least, it is far from necessary that I, whose business it now is simply to unfold in language fitting our opportunity, the manner in which my own reflections have, in the meantime, presented to me a difficult and remarkable subject, should place myself in conflict with others, especially when the occasion is wholly unfavorable to a critical analysis of the grand causes of our difference.

With these preliminary and protective explanations, then let us now pass freely and unembarrassed along our course. In my last lecture I endeavored to bring my audience down to that point in the history at which the telescope at Berlin verified the remarkable prediction of Leverrier—the point at which it was revealed that the simple power of thought—by carrying his fixed conviction in the perfectness of the harmonies of the universe to its logical conclusion, he had laid his finger on the spot occupied by the orb sought for with an error equivalent only to about one and two thirds the apparent diameter of the sun.

Leverrier's prediction was, that at a certain time the planet would occupy a space indicated by the numbers 326 31, and the position it actually occupied when discovered was as follows—327 24, constituting an error of less than one degree of space. (Applause.) Now, to give you an idea of the proximity with which the prediction corresponded with the fact, I will state that this space is just about one and two-thirds the apparent diameter of the sun. This space, however, although small in appearance, is yet undoubtedly very large in quantity. It will be found, when reduced to miles, to be about 40,000,000. A very small space indeed, when seen from this enormous distance, the remoteness being so vast.

I need not inform you that since the discovery of Neptune, it has been watched with every sedulousness, in order that by an accuracy of measurement which art now enables us to transport into these far spaces, its entire dimensions and the nature of its orbit might be known. I mentioned the last evening that from a small portion of any observed orbit the application of the law of gravity enabled astronomers to deduce the entire of it; and fortunately a happy discovery—made first, I believe, by an American astronomer, Mr. Leart C. Walker, and about the same time, or very soon after, also, by an observer of Germany—greatly accelerated the period when, on the ground of fact, the leading features of Neptune's orbit could be correctly deduced.

My hearers will remember that when exhibiting the extraordinary eccentricities of Herschel's orbit at the last lecture, I mentioned that the orb had been seen before it was discovered to be a planet, and that these old observations were of great assistance in determining its perturbations. Now a happy accident of this kind occurred with regard to the planet Neptune. The planet, it was found, had been seen twice by a Frenchman named Lalande, in May, 1795; and this astronomer so narrowly missed the honor of adding a fresh constituent to our system, that he rejected his observation of May 8, because it did not agree with that of May 10—thus losing the momentous truth he would have immediately reached, through inadequate *faith* in his observations. If, instead of doubting his observations, he had watched the orb, he would have discovered the planet; but instead of doing so, just in one of those moments of carelessness that will occasionally come upon the most accurate and careful persons, he said, "one of my observations must be wrong, and I will blot it out," and so he did, and with it he blotted his own name from the scroll of immortality.

Although the observation was not, under the circumstances, extremely creditable to Lalande, it has been, as I have said, of the very highest consequence to us, for by extending the observed portion of the orbit over a very considerable space, it has enabled us even so early to reach with much certainty the leading facts connected with the motions of Neptune—having revealed at once the true distance of the planet, and its period of revolution. And here it is that the strange intelligence came to us which seemed to impair the beauties of those labors of Adams and Leverrier, which, according to an impression that in this country has become most prevalent—not only withdrawing from them all pretensions to perfection, but even disentitling them to their assuredly just claim of having been the certain, the unerring means of discovering this new world, and indicating its place amid those remote infinitudes. The intelligence indeed was of a nature that could scarcely seem otherwise than startling, for it showed that in that part of their inquiries which attained the distance of Neptune, according to Bode's law, both of these great astronomers were in error, and not by a trifle—a number small in relation to the kind of numbers we use in pursuance of such inquiries, but even by a sixth part of the planet's entire distance from the sun—by the enormous space of six or seven hundred millions of miles!

I think the audience must remember that I said that when these two astronomers began their investigations, they assumed two things—first, that the new orb would lie in the same plane with the other planets; and secondly, that according to Bode's law, it would be lying about twice as far away from the sun as Uranus, which would make it thirty-eight times farther away from the sun than the earth is. Now it has been found to be only thirty times as far from the sun as the earth. This shows us that throughout the whole of their calculations, this enormous error of distance extended. It is a very remarkable fact, certainly, that a law which prevails in so many instances should be found to fail in this particular instance. But it often happens when laws whose principles we do not understand are extended over a considerable space that they fail. Now the origin of Bode's law is entirely unknown; it is what is called an empirical law, because we do not understand the principle upon which it acts. The failure of Bode's law, however, was not the remarkable circumstance; the remarkable, the extraordinary circumstance was that, with this great error in their calculations, these astronomers should have come to a true conclusion! The audience will observe that this error in the distance of the planet involved also an error in its revolution, for the revolution of an orb depends upon its distance from the sun. While Leverrier and Adams supposed Neptune revolved round the sun in 217 years it actually goes round it in about 166 years—making a difference of 51 years!

I cannot marvel that the announcement of this extraordinary and certainly unlooked for discrepancy threw over the whole inquiry an exceeding doubtfulness; and this not merely in the current of popular opinion; for the more thorough our knowledge of the perfection of the celestial mechanism, the more perfectly we see that in the mighty sphere around us, where every atom is fixed and adjusted by eternal laws, and cannot in any way be altered in position without a corresponding change of its relations with whatever else exists, even the less likely did it appear that the supposed relations of a false planet with Uranus should have sufficed to conduct us so unerringly to the discovery of the actual orb.

[The lecturer here drew several diagrams upon the blackboard for the purpose of illustrating the impossibilities of mere chance having aught to do with the discovery of Neptune. The succeeding passage of the lecture contains a full statement of all the ideas illustrated upon the blackboard.]

The case is, no doubt, a strange one; but as nothing can happen within this scheme of ours without full and adequate cause, we proceed without desponding to endeavor to unravel the mystery. At the outset I would reiterate it, as a truth beyond the reach of question—one which we must hold constantly in our thought, that two planets cannot possibly explain the same thing. The perturbations of Uranus, which conducted to this great discovery, flow from one orb alone—the *true Neptune*, and not the false one; and the latter cannot personate the former in regard to its actions within our system. The laws of the universe are too fixed and definite to permit these personations and exchanges. Each atom in this immense fabric has its unchangeable and incommunicable place and functions; nor can any individual put off or exchange his duties for the responsibilities of another.

[The speaker here drew another diagram on the blackboard, for the purpose of enforcing still more strongly the ideas contained in the above section of his discourse, after which he continued.]

I am now done with preliminaries. You will perhaps excuse their tediousness, for I think you will see that we are dealing with what lies much out of the direction of ordinary thought, and which therefore it is not easy to clothe with a customary garb. My sole object is to accomplish this, and therefore I have hazarded apparent repetition, and have not regarded scientific forms of exposition and speech. (Applause.)

Let me now remind my audience of the essential aim alike of Adams and Leverrier. It was, *to lead to the discovery of the disturbing planet—to lead I say to its discovery*, to point to that part of the heavens where the telescope ought to find it—an aim grand and adventurous indeed—but which was essentially limited—(a fact, by-the-by, to which sufficient attention has not been drawn)—for they did not undertake wholly to produce Neptune—to unfold through calculation, what afterward would be deduced from fact; they sought for nothing except to indicate that part of the sky where the planet was lurking, and where the telescope might detect it.

In beginning the solution of this remarkable problem, they assumed Neptune's distance, reposing with confidence on Bode's law. Now it appeared to many astronomers, English as well as foreign—looking at the question in an *a priori* manner—that this law might be inaccurate, and therefore that the solution had little chance of being a true one; and doubtless this very fear must have occurred alike to Adams and Leverrier; but ere they had proceeded far with their work, the most important truth came out—that, at an epoch the most momentous of all, the two planets, Neptune and Uranus, held that precise relative position in regard of the sun which rendered error in distance of no moment in respect of the new planet's place—the position where it affected their estimate of the planet's mass only.

The following illustration will perhaps enable you more readily to grasp this idea. Suppose the Sun, Uranus and Neptune to be situated with respect to each other as represented below—

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                    1     2
 •        ‡         ‖     ¶
Sun.    Uranus.   Neptune.
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which were their relative positions in 1820. It will be apparent at once, that it matters not what the distance of Neptune may be, whether it is situated at 1 or 2; the kind of influence it will exert over Uranus will be the same, whatever its distance. To exercise a given degree of influence, however, the mass of the planet must increase as its distance increases, and vice versa. But farther, in a few years these orbs, 1 and 2, owing to the difference in their velocities, would be scattered—would occupy different positions in respect to Uranus; and, of course, their influence upon him would cease to be similar in kind, that is, they would not be pulling Uranus in the same direction.

This fact however, (the conjunction of the two planets in 1820,) although perfectly adequate to explain the conformity of the two orbs, within the period bordering either side of 1820 will not, it is evident, extend much beyond that neighborhood—the different velocities of bodies at so very different distances would cause them soon to diverge—so that in 1846, when the discovery was actually made, their positions in the sky would hold with each other no tolerable degree of proximity.

[The lecturer here had recourse again to the blackboard, on which he exhibited and illustrated in various ways the conjunctions, accelerations, and retardations of Uranus occasioned by the *true* and *false* planets—the orbit of the true planet being represented in fig. 2, while that of the false planet is represented in fig. 1; he also represented the difference between two classes of perturbations, the first class called periodic inequalities, which refer exclusively to direction—the second class called secular inequalities, which relate exclusively to distance. All these things he made to appear very simple by means of his diagram, but we cannot present them to our readers inasmuch as we are unable to report the professor's *blackboard*. In conclusion he said—]

It seemed to me to require this additional explanation to give to the view of the subject I desired to address to you its due completeness, and to entitle me to assert that in all respects the labors of the illustrious men whose footsteps we have been tracing, come forth rounded and beautiful, characterized by the loftiest powers, for which are yet in store even nobler triumphs. Neither, perhaps, was it wholly unmerciful in vindication of man's existing knowledge of our system's mechanism. Facts—the facts requisite to enable us to apply theories, cannot of course be hastened on—we must wait and watch as the ages unroll themselves; but in respect of our ability to understand them when attained—I cannot now discern a term. It is not possible that in this place I can demonstrate or confirm it, but yet in confidence I alledge that a time is not far distant when we shall be able to extend, as it were, a great chart through our system, on which every orb belonging to it will leave an impress of its relations as clear to the skilled eye, as the fine mechanism of a leaf to the microscope of the botanist; ay, building on these proud labors of ours—it may be, as time shall pass, that with hand as firm among those grand stellar systems, having unrolled their order, we shall stretch there too even such a plan and chart—to which the throbbings of these entire starry universes shall report themselves, and where they will impress their harmonies for the inspection of man! (Great applause.)

Public Meeting.

At a meeting of the citizens of Lewis county, held at Newmarket on the 5th day of November, 1848, the following proceedings were had.

The meeting was called to order by M. T. Simmons, whereupon William Packwood was chosen chairman, and Samuel B. Crockett secretary. The object of the meeting having been explained in a satisfactory manner, on motion of A. B. Robinson, a committee of three were appointed to draft a preamble and resolutions expressive of the sense of the meeting.

The chairman appointed A. B. Robinson, Samuel B. Crockett, and J. N. Ebey on said committee, who made the following report, to wit:—

Whereas it has been reported that the stock belonging to the Hudsons Bay Company are being sent on the west side of Nisqually river, in numbers so great that but a short time must elapse ere the vegetation will be consumed by said stock, to the great detriment of actual settlers on said side of said stream: and whereas a great portion of said cattle belonging to said society are what are generally termed Spanish cattle, known to be but little more domesticated than the herds of buffalo that range the plains; and that if suffered to mix and herd with domestic cattle belonging to settlers, great loss will inevitably result to said settlers, by suffering the grievances above-stated to remain unredressed.

Therefore, be it resolved—

1st. That when the American citizens first determined on locating themselves at Puget's Sound as permanent settlers, many obstacles of a discouraging nature were thrown in their way by said society or H. B. C., in order to induce them to abandon their cherished object; at times using misrepresentation and fraud, and when this failed to answer their end, force was spoken of with impunity.

2d. That we hold the conduct of Wm. F. Tolmie, chief servant of the Hudson's Bay Company at Nisqually, [illegible] culpable, in attempting to prevent American settlers from locating their claims on certain lands that he, the said Tolmie, pretended to claim by certain reservations made in the treaty of boundary between the United States and Great Britain, in favor of the Puget's Sound Agricultural Society—when he well knows that no such reservation exists; and these direct acts or assumptions of power are only equalled by the base subterfuge in attempting to hold other large tracts of land by an apparent acquescence in the provisions of the Organic Law of this territory, by having claims of land recorded in the office of the Territorial recorder, in the names of servants of said company, when in fact, in a great number of cases, said servants were ignorant of said locations, and afterwards, either by force or fraud, have procured an obligation from those servants, for a conveyance of said lands to said society or company, so soon as a title for the same was acquired from the United States;—thus using the power they can exert over these creatures of their will, to the manifest injury of the country, and for the advancement of their own aggrandizement.

3d. That while we, as American citizens, feel every tie that binds citizens in common to respect the laws and treaty stipulations of our government, yet, at the same time, we feel jealous of any infringement on the same by individuals who have no common interest or feeling in the national honor, glory and prosperity of our government: and least of all by persons who acknowledge allegiance to foreign—to monarchical government, and hold places of profit and [illegible] under a corporation whose charter emanated from the government of Great Britain, and who are to them accountable for their acts.

4th. That as it has never been the policy of the Federal Government in enacting laws granting the right of preemption, and other conformable laws to induce the speedy settlement of wild tracts within the United States, to grant said benefits to any other than American citizens, or those who had declared their intention to become such in a legal form: that such will be the provisions of the anticipated grants of land to settlers in this territory we have not the slightest doubt—in fact, a departure from the long established policy of the government would eventuate in no good.

5th. That we view the claims and improvements made by the Puget's Sound Agricultural Society since the ratification of the treaty, [illegible] as a liability; as that society can give nothing for any contemplated grants of land to American citizens, or for improvements made by the same, as said society only [illegible] the possessory rights which [illegible] that the United States has [illegible] with the usual right in fee to [illegible] and that all such claims and improvements are subject to any American citizen who may choose to appropriate the same.

6th. That [illegible] by the chief factor of the Hudson's Bay Company, or Puget's Sound Agricultural Society, for the servants in the employ of said society, as amounting to a nullity, unless said persons for whom said lands were located are out of the employment of said society, or company, and have settled on and continue to occupy the same.

7th. That the American settlers at Puget's Sound are under no obligations to said company or society, to suffer the grievances above stated to remain unredressed, as a favor.

8th. That William F. Tolmie, chief servant of the said company or society, at Fort Nisqually, be requested forthwith to remove any stock of said society that are now on the west side of said river Nisqually, to the east side of said stream, and continue to keep them there—as we are determined that any such grievance shall not be suffered by the American settlers.

9th. That as said society has uniformly refused to furnish Americans with sheep, at any price, until quite recently, and now when those are offered for sale they prove to be the most inferior of the flock, and those at an exhorbitant price: That in this, as in all other acts of said society, we know that their aim is only their own interest, while it is an insult to the common sense of any community.

10th. That a copy of the proceedings of this meeting be sent to Wm. F. Tolmie, chief servant of the Hudson's Bay Company at Fort Nisqually.

[illegible]

S. B. Crockett, Secretary.

Almanacs.

As our readers are not likely to be supplied for the present year with almanacs published here, for want of printers, we publish a Counting House Almanac, as the best that the SPECTATOR OFFICE can do in this respect.

The people of Oregon, ladies and all, "must take the weather as it comes,"—until they obtain enlightenment from "almanac makers" abroad.

COUNTING HOUSE

ALMANAC, FOR 1849.

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Jan.		1	2	3	4	5	6
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Dec.							1
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PRESERVING EGGS.—At one of the farmers' meetings in Boston last winter, Col. Thayer gave his mode of preserving eggs, as follows:—Take a quart of salt and three quarts of lime, and add water till the whole, stirred up and dissolved, is of the consistency of cream; then put in the eggs.

The Mass. Ploughman gives the following from a Sherburne correspondent:—

To one peck of lime put one pound of alum, and make a solution as for white-washing. Put the tip end of the egg down to prevent the yolk adhering to the side, then fill up the vessel that contains the eggs with the solution to cover them completely. In a few days the lime will become dry, then fill the vessel with cold water, or brine of the same strength, to be kept moist.—Cultivator.