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ASTRONOMY—SCIENTIFIC AND UNSCIENTIFIC.

BY G. W. TINSLEY, MECHANIC.

[First Paper.]

That this is to be a year of unusual activity and research in this field of science, no reader of scientific literature can be ignorant. This activity is due to the coming transit of Venus. While several nations are sending out expeditions to visit different parts of the world most favorable for taking observations, many of the lesser lights to this science, who remain at home, will be on the *qui vive* of expectancy, waiting the results of the labors of the favored few.

What is to be the result of these observations? Not the establishing of any one point on a sure and more correct basis, but many.

Orbits will be lengthened or shortened; distances increased or diminished; bodies grow larger or smaller, traveling with greater or less velocity; and everything pertaining to distance and bulk will be thoroughly overhauled and corrected.

The spectroscope, for the past few years, has added much to our knowledge of this science, in its legitimate field—the chemical or constituent department. Added to this, the mathematical corrections that the coming transit will give, will, to some, appear to make this science perfectly understood and faultless. And yet there is one department of it which neither the spectroscope nor the coming transit, will or can correct—its mechanical.

In this department, we have, what seems to be ridiculous assumptions taught for facts, entirely at variance with the common and well understood mechanical principles, as applied in our everyday pursuits.

The laws and principles of mechanics are pretty well understood in their general application to the minor affairs of life; but when we think or speak of the physical forces in the universe,

we seem to lose sight of some of the plainest and best understood facts. It is this department I wish to criticise, with the hope of calling attention to some of its most glaring inconsistencies.

The Nebular Hypothesis teaches that the entire amount of matter of our solar system was at one time in one incandescent mass. The spectroscopy and analogy seem to confirm this. Very well, my objections to this theory do not begin here.

After this system is restored to a nebulous mass and hung *motionless* in space, I wish to criticise the *manner* in which nebular theorists impart motion to it.

A few weeks since, I heard a lecturer of considerable note upon this subject, who, by a few well turned sentences, resolved the whole solar system, planet by planet, back to what he termed the original "parent mass," and for a moment stood admiring it, as he saw it in his imagination, a huge, grand mass that filled all space, even beyond the bounds circumscribed by Neptune's orbit. He admired not long. There was work to be done. That mass must be put in motion. For a moment, he seemed to appreciate the magnitude of the work, and to tremble and halt before it; but that we might view the task as a light one, and consider this part of world making of light importance, he told us this body was so nicely poised in space, that if a fly were to light upon its side it would begin to rotate; but there being no flies, motion must be obtained from some other source. His manner of obtaining it was simple and ingenious, if not plausible. He said that on account of the proximity of other bodies that were exerting gravitating influences upon this mass, protuberances were drawn out upon its surface, and they destroyed its equilibrium, and it began to rotate. And when motion was once begun, its radiation of heat into space would not only continue this motion but accelerate it.

The above theory requires the presence of one body in space that will draw a protuberance, and another that will *not*, situated in another quarter of the heavens at right angles with the first that will cause the protuberance, when drawn, to gravitate toward it, (the third body). Query—Why was body No. 3 passive until the protuberance was drawn out? Or, in other

words, why did not body No. 3 draw a protuberance of its own, and not wait to receive one second hand if it had this preponderating gravity?

Works on astronomy do not so far particularize as to the *how* motion was imparted to the parent mass, as did the gentleman above spoken of; but they say like this: "The entire mass was endowed with a movement of rotation."—*Laplace*.

Others simply say motion was "set up." Another more timid begins the process of world making with the mass already rotating.

I have just read an able article from the pen of Prof. Charles H. Hitchcock in the *Popular Science Monthly* on "The World before the Introduction of Life," in which the writer says, in speaking of the earth: "It first presents itself to view simply as a mass of inorganic material, a heterogeneous mixture of elements, inert and *motionless** the "chaos" of theological writers. But this material is *endowed** with activity; the atoms possess affinities for one another and the mass cannot remain motionless in space, surrounded by worlds and systems. *Gravitation** causes the mass to rotate upon its axis and to revolve about other bodies, and chemical affinities unite the atoms into compounds. Henceforth, there will be no cessation of activity till the mature condition, it may be of eternal desolation, has been attained."

Here we have *endowed* activity through "chemical affinity," and rotary and orbital motion by gravitation. Oh, gravitation! the grandeur of thy proportions when thy letters are formed into a word doth serve to deter many a timid eye from inquiring as to what may be behind thee, and by thy plastic nature thou art made to stop every crack and crevice that the curious might not peep through. I hope to live to see the day when so grand a word will be rescued from such prostitution. Even now, I think I see thy partial liberation from such thralldom. The spirit of inquiry peculiar to the nineteenth century is coming to the rescue, and thy liberation is sure.

*Italics, mine.

Such assumptions, as the above, are entirely unsatisfactory to a mechanical mind. The cry will soon be raised, *demonstrate how* a body by the cooling and contracting of its particles (conditions being equal on all sides) will cause it to begin to rotate upon its axis. And *how* by the attraction exerted by one body upon another in space, body No. 1 is caused to traverse a certain part of its orbit by the attraction of body No. 2, and then be delivered over to the greater attraction of No. 3, then to No. 4, and so on, until its orbit is complete, and body No. 1 is again under control of No. 2, to again begin or continue its orbit. Think of such a condition of things! The mind of man fails to complete the arrangement. But a truce as to the *how* motion was imparted, and let us examine the teachings of the Nebular Hypothesis concerning the birth of the first planet.

For the sake of an argument, let us admit that such a nebulous mass did once exist. The first planet is ready to be born. The first nebulous ring is ready to be thrown off or shrunk away from, that is to eventually roll up into a globe and form the grand old planet Neptune. What velocity will be imparted to this ring? I know not what the answer of scientists will be, but I *do* know if I were to ask a mechanic what would be the velocity of a particle thrown from a rotating body, he would say that the rate of motion would correspond very nearly to that of the parent body from which it was thrown. Probably, something less, certainly *not greater*. If this is a correct law, as it seems to be generally understood, when Neptune was thrown off, the sun or parent mass was rotating at a velocity not less than 12,500 miles per hour—the velocity with which Neptune now traverses his orbit, granting that the old planet has met with no retardation since it first parted company with the parent mass.

When Uranus was left, this velocity had increased to 15,600 miles per hour.

At the birth of Saturn, we still have an increase in rotating velocity up to 22,000 miles per hour.

When Jupiter was left to himself, the velocity had increased to 30,000 miles per hour.

When the war god Mars was launched, this rotating body had truly assumed an annihilating gait. He was sent on his mission at the rate of 54,000 miles per hour, or 16 miles in one second of time.

Our little body was dropped when this central body was rotating 68,000 miles per hour, Venus, at the rate of 80,000 miles per hour, and Mercury—the last which we are sure was left out in the cold—going at the good round pace of 100,000 miles per hour, or 28 miles in a second of time. According to this showing, the sun must now be rotating on its axis at a rate not less than 100,000 miles per hour, even conceding that it has not been accelerated since Mercury was thrown off.

Now, what do we find to be the facts in the case. Let us appeal to one of the authorities, Guilleman, and I will here say there is very little disagreement on the subject between standard authorities.

Guilleman tells us the sun is rotating upon its axis at the rate of 4,500 miles per hour, or $1\frac{1}{4}$ miles per second.

Now nebular theorists, please tell us why it is (after you get your motion in the questionable manner in which you do,) that we find the parent mass to-day rotating only about *one-third* fast enough to have imparted velocity to our slowest moving planet; and why Mercury is moving over twenty times too fast to have received orbital velocity from such a source. From the above increasing rate of velocities as we approach the parent mass, acceleration seems to have been in order, up to the birth of the last planet, but the old residual mass seems to be sadly run down.

If our satellite—the moon—was thrown from our planet, it, too, received double the velocity our earth would now impart to it.

Can we longer look to this theory for motion for our planetary system? Is here not a well observed fact that this theory fails to account for, and by failing to do so, is not this department of the theory fairly questioned?

Beside failing to account for the motions of our Solar System, are there not many well observed phenomena, the explanation of which the theory does not even attempt to

account for, such as the elliptical form of the orbits of the planets, their departure from the plane of the same orbit at each revolution, passing above and below this plane; above, when in aphelion, and below when in perihelion, the acceleration and retardation of the planets in their orbits—slowest in aphelion, fastest in perihelion. If a body is moving in its orbit by "projectile velocity," how is it that a body moves faster in one part of its orbit and slower in another? Here you will refer me to Kepler's second law for an *explanation* of this phenomenon, which is no law, nor even an explanation; nor do I believe he ever intended it for a law. It is simply an enunciation of a *fact*, as $3+3+3=9$. Read it, and blush that you ever deemed it an *explanation* of the phenomenon:

"The areas described or passed over by the radii vectores of a planet round the solar focus, are proportionate to the time taken in describing them."

Another objection I would raise, is: all particles thrown from rotating bodies, *rotate in the opposite direction from the parent body*, rotary motion being imparted by the last point of contact. The opposite is true in the Solar System.

Is it not time that astronomers should cease to depend upon "projectile velocity," bodies thrown into vacuum and moving ever on by the *once* imparted velocity? Failing to find sufficient motion in this theory, is it not time to look elsewhere for a solution of these most vexatious problems?

The space allotted me in this journal being very nearly exhausted in criticising what, to my mind, are vital objections reference to what may be a solution of some of the problems must necessarily be brief, with but a single reference as to the manner or course of reasoning pursued, to arrive at conclusions here enunciated.

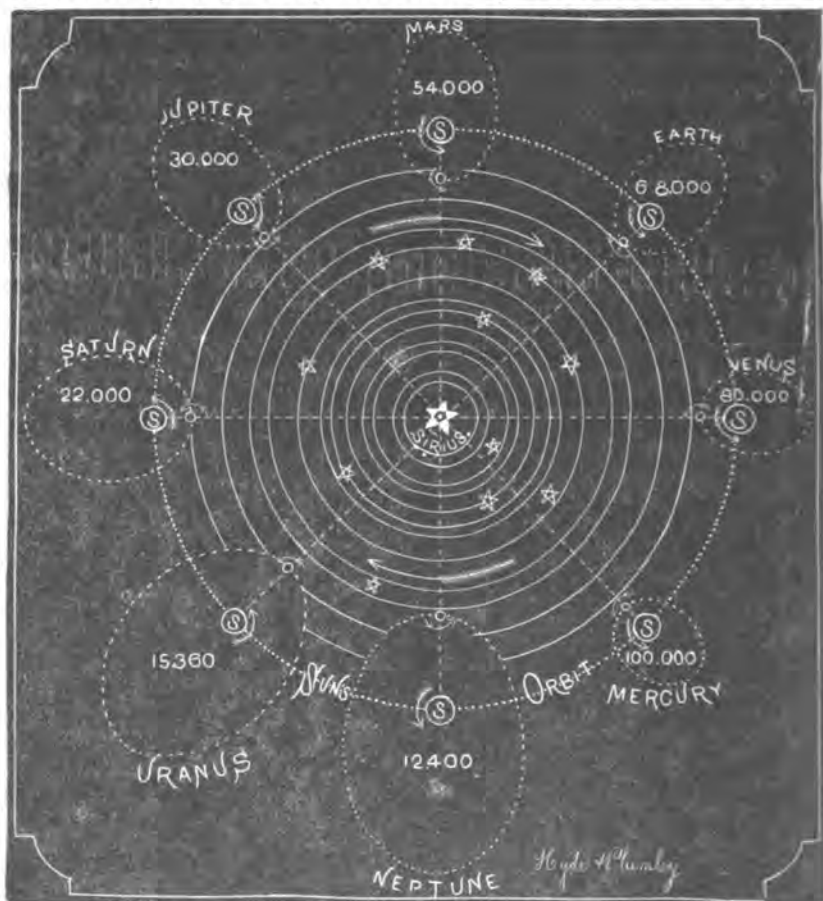
I will state this simple proposition as a basis for all my reasoning upon this subject: *Every particle of inorganic matter in this universe is in motion; and every particle is seeking rest from that motion.*

Let us see if we cannot find that which, in space, astronomers have striven so hard *not to find*—*a medium instead of a vacuum, and that medium in motion, and all bodies moved by virtue of that motion.*

The planet Neptune was discovered by the peculiar motion of Uranus. Every peculiar motion of any body in space is an effect of a cause. If this proposition is correct, what is the cause of the many peculiar motions we recognize in our planetary system? I claim the answer has not been yet given.

If there is a medium in space that is in motion, what is the direction of this motion? It is gyratory, around a common center. That center, the grandest body in the universe, the Star Sirius.

If this medium does exist, and is flowing in gyratory curves around a common center, increasing in velocity as we approach that center, and Sirius is that center, and the above proposition correct, every planet will be in perihelion when in a plane perpendicular to the plane of the Sun's orbit and passing through the centers of the Sun and Sirius, as



represented in the diagram. Some slight corrections will probably be necessary in the tables of some of the planets, but when attention is once drawn to this subject, with proper observation, the changes will be made with alacrity.

If I am correct in my conclusion, when the earth is in perihelion, Sirius will be on the meridian at midnight.

If correct observations are taken, perihelion with our planet will be found to occur when our day is the shortest, or about Dec. 21st, instead of a few days later. At this time, we are below the plane of the Sun's orbit, in this latitude (Minnesota) receiving the oblique rays of the sun, which gives us our winter. We get our seasons by passing below and above the Sun's orbit, the axis of the earth remaining constantly parallel to the axis of the sun.

Contrary to the teachings of astronomical works and mechanical apparatus (globes included), I assume that we should be represented on the bottom of our globe instead of top. In other words, our hemisphere is the lower instead of the upper.

Sirius is below us in space when we are in perihelion, and the plane of the Sun's orbit around Sirius is above us.

I claim that there is motion in space independent of that exerted by body upon body (molar motion), such as we call gravitation; that this motion is imparted to bodies by a medium that is in motion, in gyratory curves around a common center; that Sirius is the center of absolute motion.