A LETTER ADDRESSED WITHOUT PERMISSION TO THE ASTRONOMER-ROYAL EXPLAINING A NEW THEORY OF THE SOLAR SYSTEM AND PLACING NEWTON'S THEORIES ON A PHYSICAL BASIS

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G. T. CARRUTHERS

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LETTER

TO

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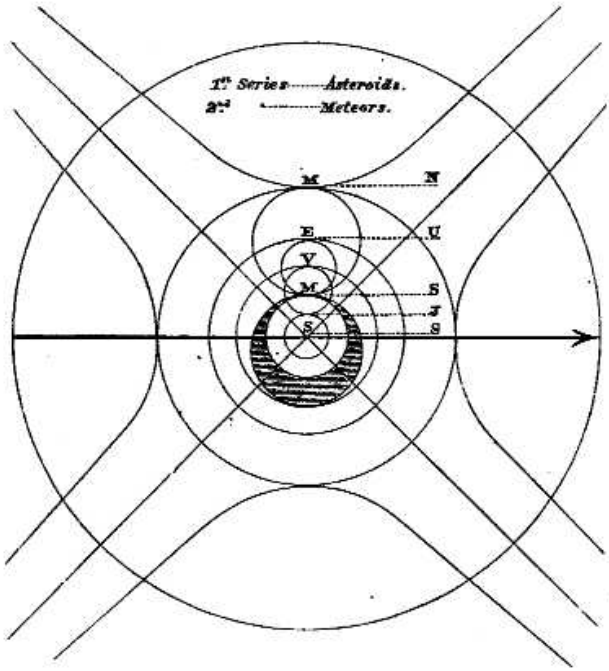

THE SOLAR SYSTEM.

A SERIES OF CONES OR THE PARALLELOGRAM INSCRIBED IN AN HYPERBOLA.

A LETTER

ADDRESSED WITHOUT PERMISSION TO THE

ASTRONOMER-ROYAL

EXPLAINING A

NEW THEORY OF THE SOLAR SYSTEM

AND PLACING NEWTON'S THEORIES ON A PHYSICAL BASIS

BY

G. T. CARRUTHERS, M.A.

CHAPLAIN IN THE EAST INDIES

LONDON
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1875

To Sir George Biddell Airy, K.C.B., &c., Astronomer Royal, Royal Observatory, Greenwich. From the Rev. G. T. Carruthers, Inverness, Scotland.

October 29, 1874.

SIR,—I am so much engaged during my visit to England in advocating the cause of missions in Central India that I cannot pursue scientific researches. I beg, therefore, to send you a few remarks which I have made upon the solar system, which may incline learned men to elaborate the subject.

1. The Earth and other heavenly bodies are sustained in their orbits by steam of such tenuity that 1 lb. is only able to sustain 3 lbs. The steam is at its maximum density for the temperature applied to it and for the pressure of the heavenly bodies which it sustains. Whatever formation, therefore, may be going on within its own volume, so far as other bodies are concerned, its power is the same as a bar of iron in supporting 3 lbs. to every one of its own. It is necessarily produced from the great cold of the polar regions, and 1 lb. occupies about 21,000 cubic feet. It issues from the poles, where there is little rotation, like water from the bottom of a cask.

The result of this issue is the production of a spiral motion of the air towards the poles, and a constant current of wind from the south-west towards the north-east in the northern regions, such as we find to exist on the Earth.

2. When a mass of vapour is under no other force than that of pressing equally in all directions, it will assume a conical form. A square or parallelogram wastes a good deal of its power of pressure against the sides of its resultant, but a

cone's effect is to exercise the greatest power with the least expenditure of matter. The matter on each side of the central force hastens on the course of the diagonals, which the force has taken within the body it is pressing against, so as to bring the force in a line with the point where the blow was struck as soon as possible. It cuts off, in fact, a part of the other's height, and so reduces its opposition. A solid wastes a great deal of velocity, though not of power. It has only a single line of force, but the atoms are congregated together as if they were so many resultant forces, and thus the blow is carried forward slowly; and, if the solid is large, it drives obstacles before it instead of allowing them the choice of an edgeway escape, which would also hurry its own passage. It loses in power of piercing also, for the blow it gives is distributed over a large area instead of being intensified in a minute atom. I need not say that it has its own advantages. A cone of vapour, or rather two cones with bases together, gets the advantage, therefore, in a mass of other vapour; and as its pressure or volume varies according to the cube of its height, there is a thrusting down of other vapour with greatly increasing strength, till most of the vapour arrives at the point where the pressure is equal on all sides—that is, at the centre of gravity of the cone—but in this cone there is room for circular formations, and these have the power of pressing outwardly, each hemisphere with a power of three pounds' to two pounds' weight.

3. I look upon vapour as simply water of rarer density and obeying hydrostatical principles in its own way. In treating of cones of vapour, therefore, I shall assume what I write as regards pressure; but others more skilful than I in such things may suppose each cone to be immersed within another cone of fluid of density equal to the first cone, and with all the properties of water—the inner cone occupying the space of the outer cone within a hair's breadth. In a cone of height 4R and radius of base $R\sqrt{2}$ there is a volume equal to twice a sphere with radius R. The surface of the base of the cone (its minute

outside atoms being looked upon as the surface of a vessel containing vapour) is $2\pi R^2$, and 1R being its centre of gravity, the pressure upon the lower hemisphere (D F E, p. 4) immersed within it, is $2\pi R^3 g\rho$. Now, the surface of the lower hemisphere is $2\pi R^2$, and its pressure outwardly is $g\rho\pi R^3$;[1] but if its density were doubled in any way, as by its pressure from above, its pressure would be that of the base; but as such equilibrium could not exist with matter falling from 4R, final equilibrium would be obtained by a cone being formed behind it (p. 6, fig.), and itself pressing downward till the two cones became commingled in their lower parts in a globe of mixed density so encompassed by the rest of the vapour that the globe's bursting pressure of three times its weight would be prevented, and the whole pressure upon the base of $2\pi R^2 g\rho$ be preserved, when considered from the point of view of either cone—the attraction of gravity not being supposed to act. It should be noticed also that within the sphere, if it were of great expanse, central masses might be placed of great density, so long as the due density of the whole was preserved by attenuating the other vapour and providing it with such pressing power as to sustain the masses when they came against the vapour and condensed it, and with such velocity as to give back as many impacts as it received.

4. The origin of these masses would be due to crystallisation.

Let A B C represent the cone when there is momentary equilibrium. As the parts are not solid, and the minute resultant atoms of the cone have great power, C D E presses towards A B as a cone of wood presses base downwards upon water. A B D E presses down also upon the line D E. Supposing the density of F D E to be that of the Sun, and the other parts to be of an average density of $\frac{1}{21000}$, there would be a very slight entrance of the cone into the trapezium, but this slight pressure produces crystallisation.

Crystallisation can only take place on the Earth in large

[1] Besant's *Hydromechanics*, p. 26.