Philosophical Magazine Series 5

ISSN: 1941-5982 (Print) 1941-5990 (Online) Journal homepage: <http://www.tandfonline.com/loi/tphm16>

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To cite this article: Pliny Earle Chase LL.D. (1882) The photodynamic paraboloid, Philosophical Magazine Series 5, 13:78, 74-75, DOI: [10.1080/14786448208627147](https://doi.org/10.1080/14786448208627147)

To link to this article: <http://dx.doi.org/10.1080/14786448208627147>

Published online: 28 Apr 2009.

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THE PHOTODYNAMIC PARABOLOID.

BY PLINY EARLE CHASE, LL.D.

In the Philosophical Magazine for September 1876 I referred to evidences of parabolic influence between α Centauri and Sun. The entire series of paraboloidal abscissas may be found in the Proceedings of the American Philosophical Society for June 17, 1881*.

Newcomb gives estimates of the parallax of α Centauri, which range between $0''.48$ and $1''.96$. The mean of Henderson's observations in 1832-33, as deduced by himself, was $1''.16 \pm .11$. Peters, from the same observations, found $1''.14 \pm .11$. Henderson obtained $0''.913$ from Maclear's observations in 1839-40; Peters, $0''.967 \pm .064$ from the same; Maclear, $0''.919 \pm .034$ from declinations in 1842, 1844, and 1848; Moesta, $0''.880 \pm .068$ from declinations in 1860-64. There is therefore an uncertainty as to the actual distance, of the same order of magnitude as planetary eccentricities. If this fact should be thought to diminish the probability of a kinetic bond between the photodynamic paraboloid and the fixed stars, it will be well to bear in mind the following considerations :—

1. If there is an all-pervading interstellar medium, which is both material and elastic, all its persistent oscillations *must be* cyclically harmonic in some shape or other.

2. All such permanent rhythmical oscillations must be dependent upon or associated with permanent masses and velocities.

3. The mass and velocity from which the paraboloidal abscissas were deduced are Sun's mass and the velocity of light.

4. The coordinates indicate a solar motion in space which accords closely with Herschel's estimated velocity †.

5. The abscissas touch regions of incipient subsidence, which explain the formation of the several planetary belts, in accordance with Herschel's interpretation of the nebular hypothesis.

6. The abscissas are manifoldly grouped in ways that are phyllotactically and otherwise harmonically symmetrical, as might be looked for in a medium like the supposed luminiferous ether.

7. The last phyllotactic abscissa, A_{381} , is a fourth proportional to Sun's semidiameter, Laplace's limit of synchronous solar rotation and revolution, and the modulus of light at Sun's surface.

8. The paraboloid fixes Sun's position relatively to some other important stars in the Milky Way.

9. These are the most far-reaching indications of an unbroken chain of kinetic influences that have ever been published.

10. Being based upon the greatest mass and the greatest intercosmical velocity of which we have any measurable knowledge, the law of parsimony gives an *à priori* presumption that the chain may extend to other masses of a like order of magnitude with Sun.

11. The next abscissa to the solar phyllotactic series, A_{381} , is in

* Vol. xix. pp. 447, 448.

† Proc. Amer. Phil. Soc., Nov. 4, 1881.

the region of the fixed stars, its locus being (within the limits of probable error) the same as that of α Centauri.

12. The accordance of the terminal locus with that of α Centauri *may be exact*; it is almost impossible that the deviation from precise accordance can be so great as 8 per cent.; and such a deviation could be easily explained by stellar orbital motions.

13. The second stellar abscissa, A_{40} , indicates a distance corresponding to Bessel's estimate of the parallax of 61 Cygni.

14. Whatever may be thought of the last three indications, the first ten are clear, unmistakable, and incontrovertible.

Haverford College, Nov. 15, 1881.

ON THE ACTION OF COLD UPON THE GALVANIC ARC.

BY D. TOMMASI.

When the galvanic arc springs between two metallic rheophores, of copper for instance, formed each of a tube bent in the shape of a U, through which a rapid stream of cold water flows, and placed horizontally one opposite to the other, the following facts are observed:—

(1) The illuminating-power of the arc is considerably weakened; it is reduced, so to say, to a mere luminous point, even when a very intense electric current is employed (50–75 Bunsen elements, large size).

(2) The arc, if it can be called so, is very unstable; the slightest breath suffices to extinguish it*.

(3) If a sheet of paper be placed over the arc, at a distance of 4 or 5 millim., after a few moments a black point is seen to be produced, which extends and is at last perforated; but the paper does not take fire.

(4) The arc is constituted by a luminous globule moving up and down between the two rheophores. The form of this globule, as well as its extreme mobility, causes it to resemble very much a drop of liquid in the spheroidal state.

(5) If the south pole of a magnetized bar be brought near to the galvanic arc, the arc is attracted and approaches the magnet so that at length it leaves the rheophores and is extinguished. The same phenomenon is observed, but in a contrary direction, on bringing the north pole of a magnet towards the arc.

(6) The amount of ozone seems to be greater than when the arc is not cooled.

It is to be remarked that, in spite of the cooling of the rheophores, the flame of the arc is slightly green, proving that a portion of the copper burns. Hence one is entitled to ask if the arc would be produced by taking as rheophores two platinum tubes in which alcohol cooled to 30° C., for example, was caused to circulate.—*Comptes Rendus de l'Académie des Sciences*, Nov. 7, 1881, t. xciii. p. 716.

* The instability is such that it cannot ignite a match without being extinguished itself.