

# Orion Works Sonova Quark

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## Which is a better pet, a cat or a fish

### ChatGTP vs Bing - Diving Deeper into AI

#### INTRODUCTION:

I recently performed a follow-up analysis concerning the abilities of two popular AI platforms *ChatGTP* and *Bing*. I wanted to give both AIs something meatier and perhaps more subjective in nature to chew on. I also wanted to see if they would formulate, or make an independent decision (a “personal” choice) based on information I gave them to research. Since AI systems rely on sophisticated pattern-matching algorithms, which at this point have become so complex that the original programmers are no longer capable of following what their personal code is doing, I wanted to assess how much “subjective” digesting of my own statements would these AIs assimilate... perhaps to parrot back to me, before getting around to answering my questions.

I’m not so much interested in asking AI systems subjective questions like which would make a better pet, a cat or a fish. (I have **Andy Hooper’s** recent critique as inspiration for my title!) I am more interested in discovering whether an AI platform could help me *locate, and perhaps verify* what I speculated could turn out to be a tiny bit of historic interest concerning speculated dialogues that might have transpired between two famous 19<sup>th</sup> century researchers, *James Clerk Maxwell* and *William R. Hamilton*.

For some time now, I’ve wanted to find out if Maxwell, *alone*, came up with the idea of using the unused foci as the “origin point” of the “Circular Hodograph”. (A *circular hodograph* determines a planet’s velocity vectors in relation to its orbital position. ) Or, did Hamilton suggest the idea to Maxwell. It was Hamilton who initially developed the geometry of the “Circular Hodograph”. In my own research efforts, I

found no data, particularly images or diagrams, that suggests Hamilton realized it would be geometrically advanta-

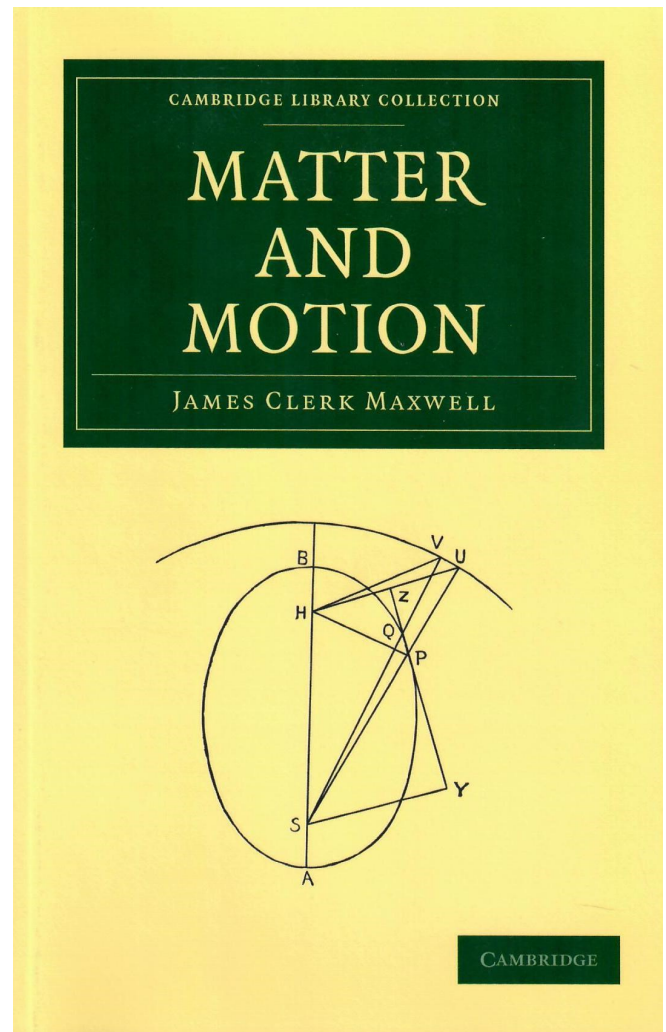
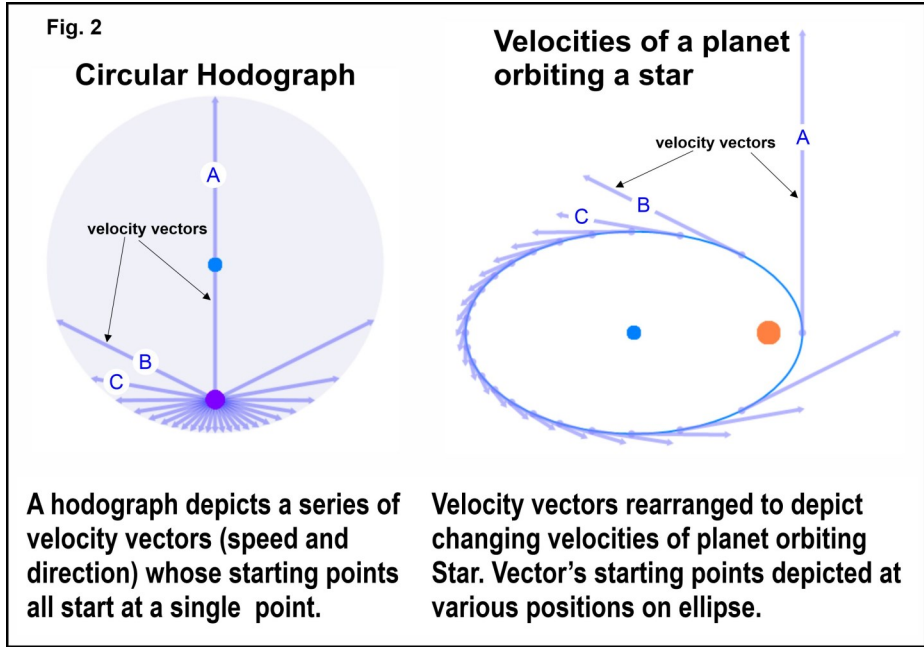


Fig.1 Reprint (cover) of *James Clerk Maxwell's* landmark book on classical physics, “**Matter and Motion**”. Original publication: 1888.

geous to “center” the Origin of his *Circular Hodograph* at the unused foci of an orbital ellipse. This implies that it was James Clerk Maxwell, alone, who made the historic leap of conceptual integration.

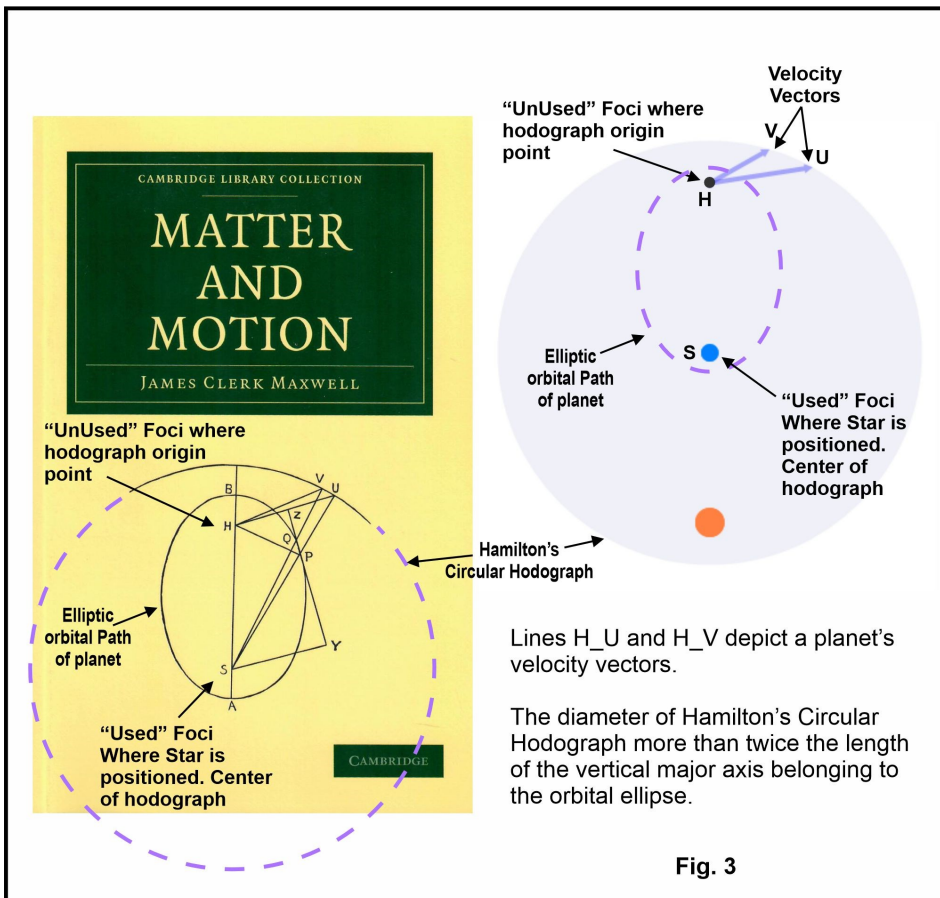
So far, I have been unsuccessful in uncovering which of them thought up the idea. Both were well acquainted with each other and had corresponded throughout their lives. I learned that both researchers wrote personal diaries. Maxwell’s diary contains entries on his scientific research, personal reflections, and *correspondence*. Hamilton’s personal writings contain a range of topics, including his mathematical and scientific ideas, as well as personal reflections and observations. Maxwell’s diary is located in the *Maxwell Foundation*, at 14 India Street, Edinburgh.



Hamilton’s personal notes, unfortunately, seem to have been spread over various archives, libraries and research institutions specializing in preserving historical documents related to Irish History, mathematics, or physics. I suspect

reviewing Maxwell’s personal accounts is probably the easiest and preferred place to initiate such a search. But Hamilton’s personal musings might hold the key as well. I would need to acquire special permission in order to view either Maxwell’s or Hamilton’s work. For now, both inquiries are not very high on my bucket list. I would have to travel across the Atlantic Ocean, which I will grant you, would certainly be fun. (Don’t tell Darlene!). The problem is I just don’t know how long and how expensive such a research project would take. For now, the \$\$\$ issue pretty much makes such an endeavor way above my pay grade.

Before I get any more into the details, I’ve assembled some



illustrations. Much of the imagery has been generated from my own computer programs. I hope that doing so will give those still interested in reading this intellectually-saturated article to its conclusion will appreciate having a better visual & intellectual comprehension. Much of the following information has been discussed in previous TURBO articles. IOW, if by perchance, you may start feeling some deja vu... now you know why.

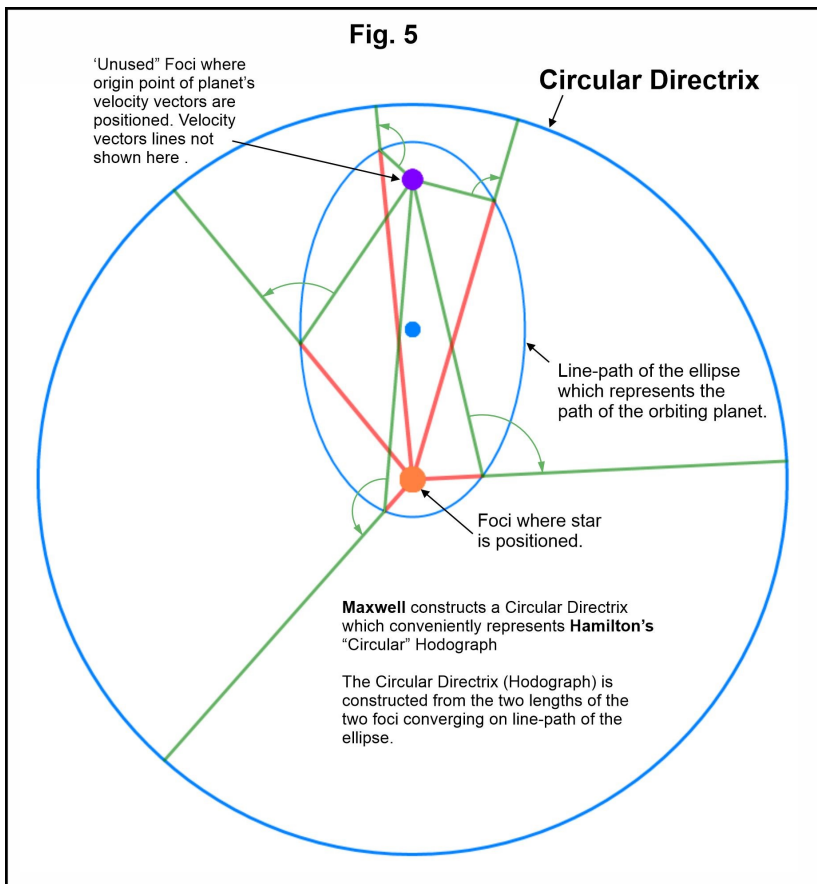
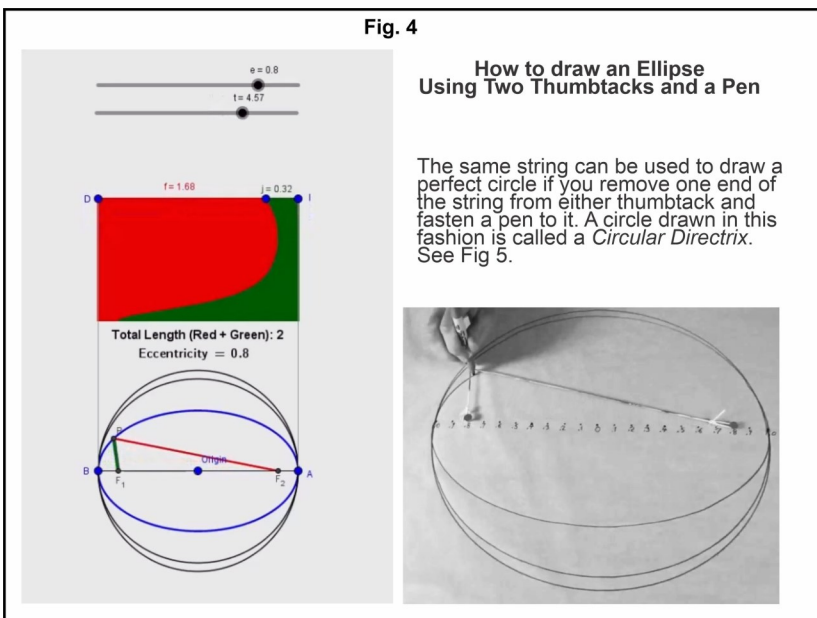
**REGARDING FIG 4:**

First, let's construct an ellipse the old fashion way, with string, thumbtacks, and a pen. Take a string and tie the ends of a string around two thumbtacks stuck to a board. Hold the string taught against the two thumbtacks and you will draw an ellipse. The position of the two thumbtacks represent the positions of the two *foci* belonging to the ellipse.

**REGARDING FIG 5 and 3:**

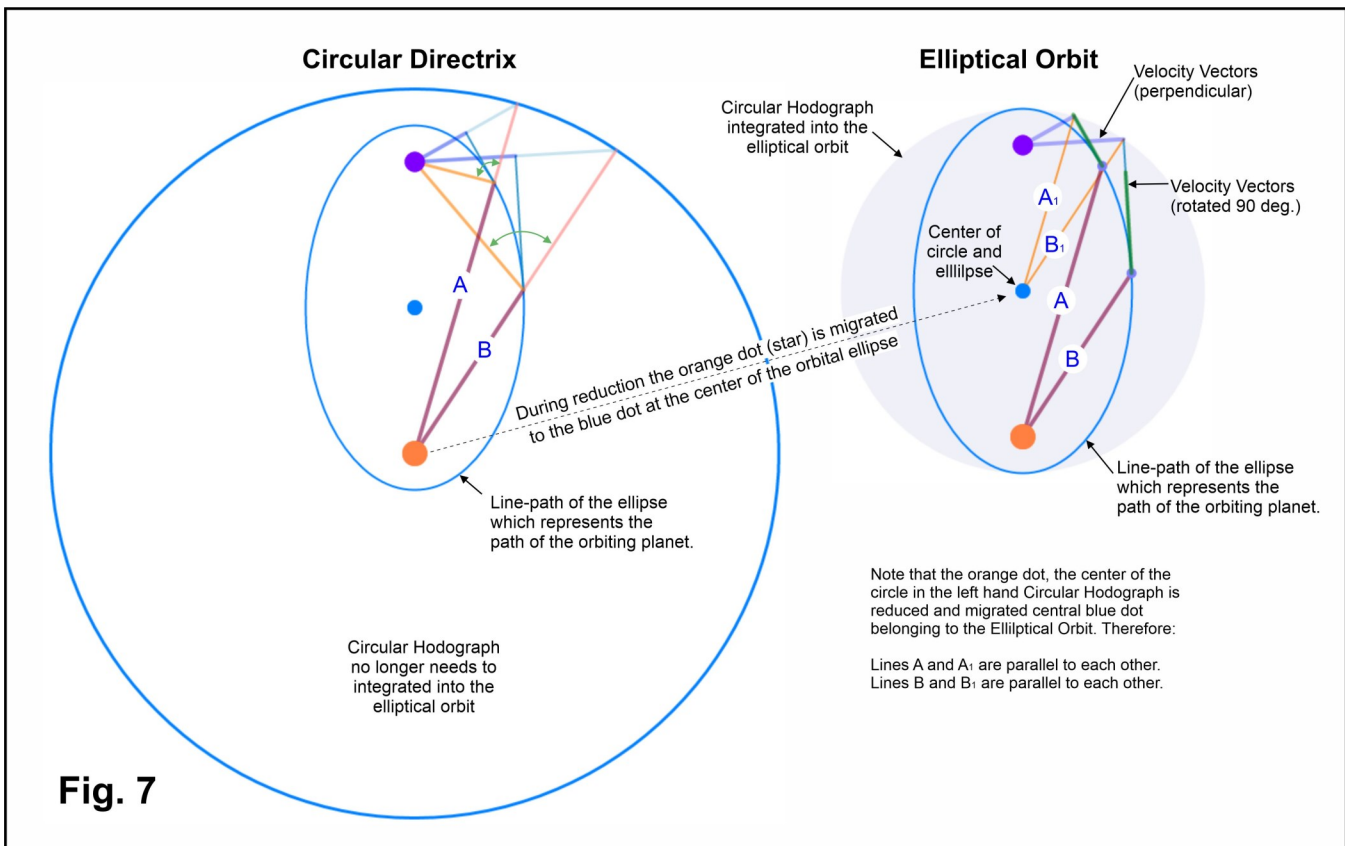
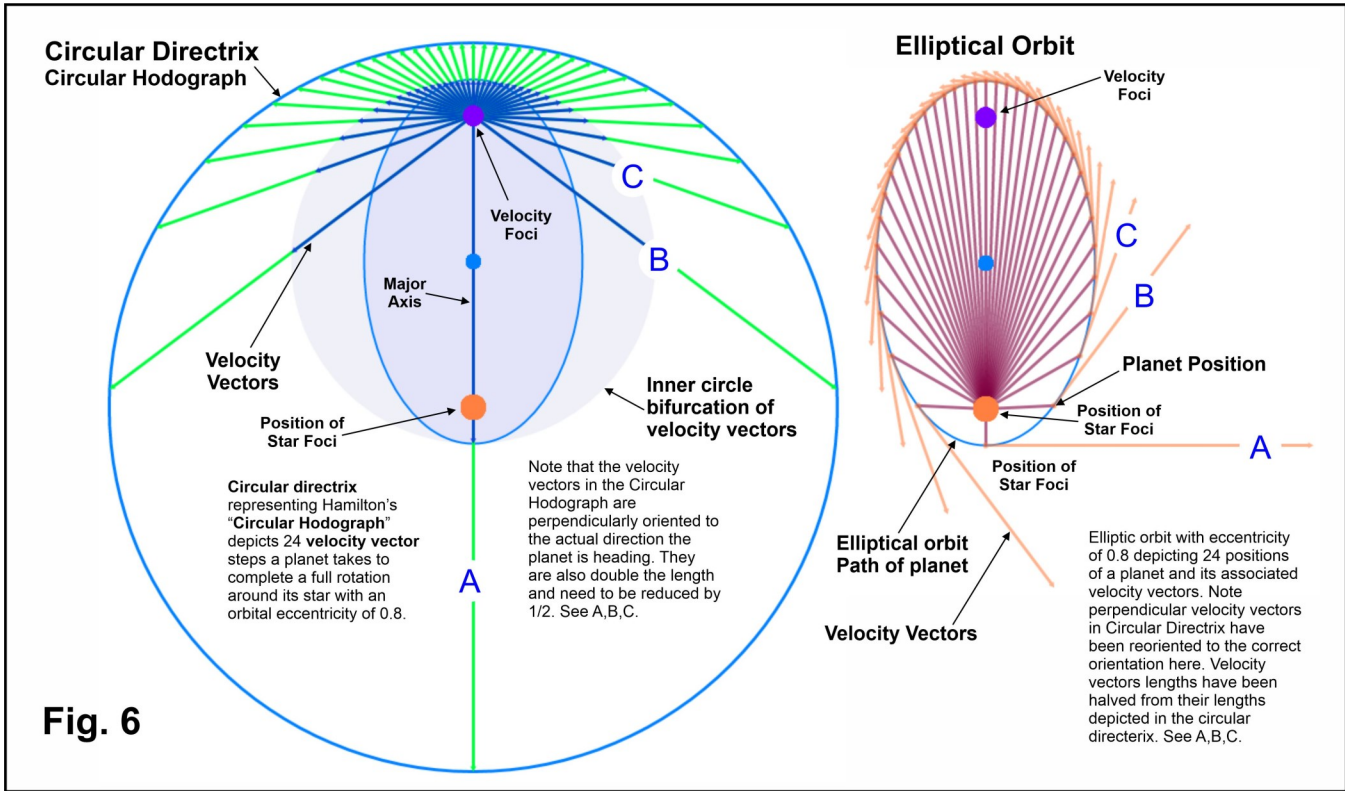
Detach one end of the string and replace it with a pencil. Hold the string taught and you will trace out a large circle. The circumference of the circle is much bigger than the previously created ellipse. Even though you have just drawn what is just a plain circle, you've also created something called a "Circular Directrix". It's centered origin point is positioned at the still-attached thumbtack. It's also the foci position of where the star is placed belonging to the planet's elliptical path. *The position where the removed thumbtack once existed becomes the origin point position of planet's velocity vectors belonging to the orbital ellipse.* The velocity vectors "ray" outwards from the unused foci position and end where they meet up with linear perimeter of the circular directrix.

**REGARDING FIG 6 and 7:** Looking at the cover of Maxwell's book (Fig. 1) a small wrinkle with using Hamil-



ton's Circular Hodograph is the fact that the it is essentially twice the size of the orbital ellipse. Relatively speaking it implies that the calculated velocity vector values will be double the value they should be in relation to orbital ellipse. Maxwell deals with this kind of





inequality by halving the velocity value in one fell swoop when writing out the mathematical formula. BTW, This is perfectly legal, particularly if you are upfront about what you are doing. Following the actual geometry might be a tad complicated, but I think it's doable. We will need to reorient (rotate) the velocity vectors, which are perpendicular to the correct orientation they need to be within the elliptical orbit. See Fig. 6 and 7 for a visualization of the size differences and how to reintegrate and reorient the geometry.

I bring a rash of these annoying fiddly bits up primarily to give you some idea as to an unexpected epiphany of simple geometry I blundered into all on my own when

one reduces the size of the circular hodograph to one-half the diameter length of its original size. The reduced-in-size circle diameter turns out to *also* be the same length/diameter as the elliptical orbit's vertically oriented *major axis*. This is depicted by the grey filled circle which neatly *bifurcates all of the circular directrix's velocity vectors exactly in one-half*. I eventually realized that Maxwell didn't need to rely solely on the use of the large circular directrix in its original size.

**BACK TO CHATGPT AND BING:** Oh dear! I wandered off the original subject I wanted to discuss... AIs! It's time to reveal the IA systems responded to my queries.

#### **BING's response:**

That's a very interesting and detailed question. From what I can gather from the web sources, it seems that Hamilton was the one who first discovered the Law of the Circular Hodograph and its relation to the Newtonian law of gravity. He published his findings in 1846 in a paper titled "The hodograph, or a new method of expressing in symbolical language the Newtonian law of attraction" **1**. He showed that if the force of gravity varies inversely with the square of the distance, as shown by Newton, the tips of the velocity vectors trace out a circular curve **2**. He also remarked that "the Newtonian law may be characterized as being the Law of the Circular Hodograph"

Maxwell, who was a student and admirer of Hamilton, used his hodograph method in his book "Matter and Motion" to illustrate how to precisely determine a planet's ever-changing orbiting velocity. He also added a "Circular Directrix" which is the result of adding the two lengths derived from the two foci as they converge on the position of the planet **3**. Maxwell acknowledged Hamilton's contribution by saying that "the angular motion of a body in its orbit is exactly represented, with all its variations, by the circular motion on the hodograph"

So, it seems that Hamilton figured out that the origin point of his velocity vectors should be placed over the so-called unused foci, and Maxwell used this idea to explain Kepler's laws of planetary motion in a geometrical way. I hope this answers your question.

**BING:** The first two paragraphs, in blue, is basically BING parroting back to me the information I originally gave it to digest, but rephrased. While it is parroting, this is how the programmers try to verify to the *user* that their AI system "understood" what was being asked of it. Philosophically it still debatable as to whether BING "understood" the *user*, but it's a good practice of feedback communication that's definitely worth maintaining.

The third and final paragraph, in green, unfortunately generates an extrapolation, that Hamilton probably figured out what Maxwell should do. BING should not have done this.

I give it a **C-**. I would have given it a **D**, but BING did cite its references, not shown here.



**ChatGTP's response:**

The relationship between James Clerk Maxwell and William R. Hamilton is indeed significant in the context of their contributions to physics and mathematics. However, it is important to note that the specific details of their collaboration regarding the application of the "Law of the Circular Hodograph" to planetary orbits are not extensively documented.

Maxwell and Hamilton were contemporaries who lived during the 19th century. Maxwell, a Scottish physicist and mathematician, is well-known for his groundbreaking work in electromagnetism, while Hamilton, an Irish mathematician, made significant contributions to mechanics and optics. Both individuals were highly respected in their respective fields.

In his book "Matter and Motion," Maxwell does credit Kepler's laws and explains how one of the laws describes planets as orbiting the sun in elliptical paths with the sun positioned at one of the two foci. He also introduces the concept of the "Hodograph" and the "Law of the Circular Hodograph" as tools to study the changing velocities of planets in their elliptical orbits.

As for whether Hamilton specifically informed Maxwell about the use of the unused foci or if Maxwell figured it out on his own, the available historical records do not provide a definitive answer. It is possible that they discussed their ideas and findings with each other, as they were both prominent figures in the scientific community of their time. However, without further evidence, it is challenging to determine the exact nature of their collaboration in this particular aspect.

What we do know is that Maxwell was an exceptionally brilliant and innovative scientist who made significant contributions to various fields of physics and mathematics. His insights and understanding of the principles of physics allowed him to develop the mathematical framework required to describe the changing velocities of planets in their elliptical orbits accurately.

In summary, while the connection between Maxwell and Hamilton is noteworthy, the specific details of their collaboration regarding the use of the unused foci in Maxwell's determination of changing velocities in planetary orbits are not extensively documented.

**ChatGTP** The first five paragraphs, in blue, is basically ChatGTP parroting back to me the information I originally gave it to digest, but re-phrased. Same as BING. While this *is* parroting, it shows how the programmers try to verify to the *user* that their AI system "understood" what was being asked of it. Philosophically it is still debatable as to whether ChatGTP "understood" the *user*, but it's a good practice of feedback communication that's definitely worth maintaining.

The final paragraph, in green, tells me the fact that ChatGTP did not uncover any information (correspondence, etc...) that could verify my speculations on Hamilton suggesting to Maxwell that he use the unused FOCI. This a far more accurate conclusion to make.

I give ChagGTP a **B**. I would have given it a **B+**, maybe even an **A-**, but ChatGTP did not cite its references... perhaps due to how the experimental system's DataSet is currently organized. That might change in the future.



**IN CONCLUSION:** At present I currently find **ChatGTP** to be a potential worthwhile personal "assistant" by possibly freeing up some of my workload by generating basic computer programming functions in the languages of **C#** and **Python**. It could also serve as a worthwhile tool for giving me what I might consider to be reasonably objective "feedback" on my speculative & subjective queries. OTOH, **BING** "chose" to generate a speculated conclusion without actual proof that such speculations are warranted. It would be detrimental for me (as a researcher) to go down that rabbit hole. Pres. Reagan sed it best: "Trust, but verify."





# Tag Along

By

**Darlene P. Coltrain**



Self portrait in my yarn nest

Tropical Sea in progress







**Done!...**

So many colors, so little time...

**But there is always  
another one to work on**



**So many colors, so little time...**

*Or*