

## A Note on the astronomical inspiration for Burchfield's "Orion and the Moon"

Long ago I published an article on astronomy in the works of Burchfield (Harrington 1990), in which I speculated on the date that would match the appearance of the sky in the painting "Orion and the Moon". The painting (Fig. 1) shows the eastern sky with a small house in the foreground. In my article, I assumed that the view was as if seen from ground level. Now the house east of the Burchfield family home on 4th St in Salem, Ohio, is so close that to an observer at ground level it would loom too high in the sky (Fig. 2), and would not match the house in the painting at all. Thus I suggested that the house in the painting might have been the nearby house on the south-east corner of 4th St and Rose Avenue, seen from the west side of Rose. I included the outline of this house in my computer generated plots of the sky for likely dates (Harrington 1990, Fig. 13 and 14). Since then, a more likely (and more obvious) possibility has been pointed out: the house *is* the one next door to Burchfield's house, but the view is from Burchfield's second story window (where he had his bedroom). In light of the note about August 24 mentioned in my Salem talk, I thought it worth while to revisit this topic.

The note is a scrap of paper in the Burchfield Penny archives on which Burchfield wrote:

about Aug. 24.

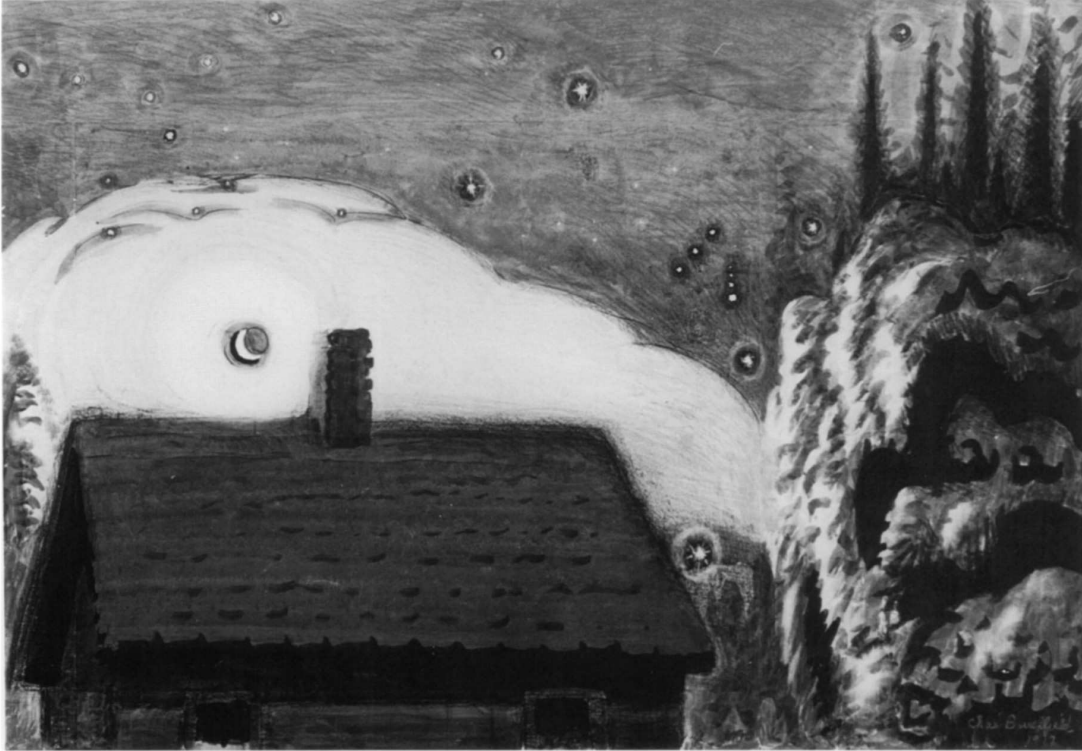
I always slept with my head by  
an open window – on this occasion I  
awoke from a bad dream about 4 a.m.  
The sight of the ghostly last quarter of  
the moon rising behind the shadowy form of  
the house next door was almost terrifying

The amazing thing is that the sky at 4:00 AM on August 24, 1916<sup>1</sup>, does in fact match the sky depicted in "Orion and the Moon". August 24, 1916 is one of several dates I mentioned in the 1990 article as possible dates for the inspiration of the painting. But how well would the house next door as seen from Burchfield's window fit the painting?

I was in Salem on August 9, 2018, and I visited the Burchfield Homestead (the house where he then lived). Ms Janice Yareb was kind enough to open the house, and I was able to make measurements of the altitude and azimuth of the roof and the chimney of the house next door as seen from the upstairs windows. There are four windows in the second floor facing east (Fig. 3). Let's call them windows 1 thru 4, with window 1 being nearest the front of the house. There is a skylight in the roof over window 3. I made measurements from window 2, because the view from window 3 is obscured by a large tree between the houses (Fig. 4). (The tree would not have been there in 1916, over 100 years ago.) The measurements are approximate, made with a improvised transit instrument:

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<sup>1</sup>While "Orion and the Moon" is dated 1917, the note must refer to 1916. See the discussion in Appendix I.



*Fig. 1. Charles E. Burchfield. ORION AND THE MOON. 1917. Watercolor and crayon on paper, 23 3/8 x 34 3/4" (sight). Collection, Mr. and Mrs. C. A. Burchfield.*

Fig. 1.— The painting “Orion and the Moon”

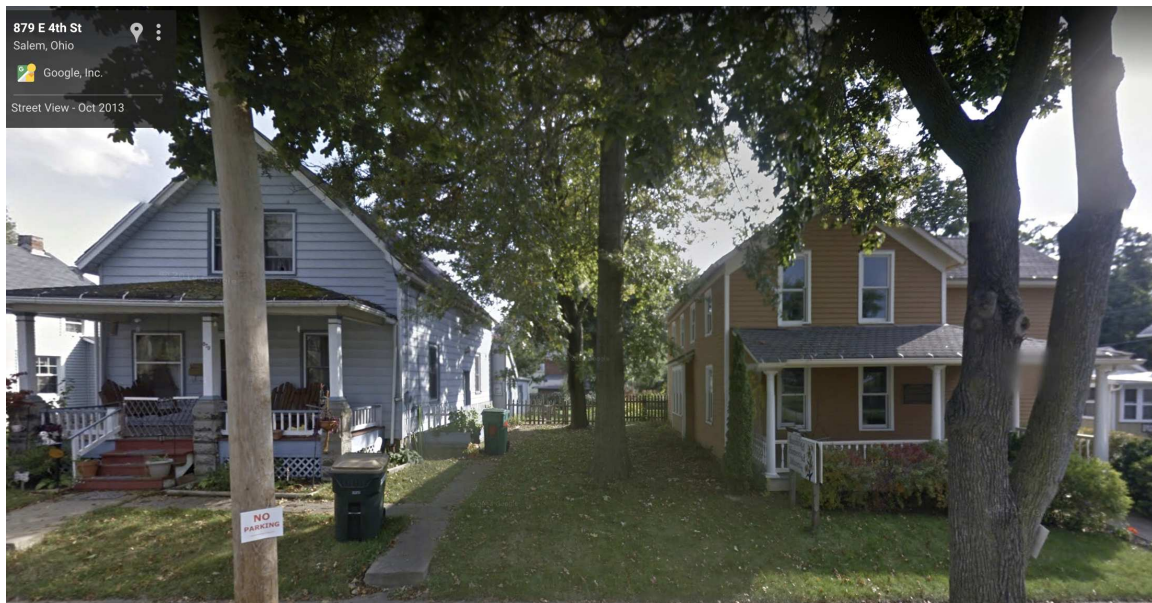


Fig. 2.— The house next door (left) and the Burchfield homestead (right). Screenshot from Google Earth.



Fig. 3.— The east side of Burchfield's house. Photo by JPH.



Fig. 4.— The house next door, seen from window 2 of Burchfield's house. Photo by JPH.

	From window 2		From window 3	
	Altitude	Azimuth	Altitude	Azimuth
North end of roof ridge	18.9	69.3	18.9	61
Top of chimney	23.4	94.9	23.4	86.6
South end of roof ridge	18.9	119.3	18.9	111
Gutter at bottom of roof	5.0		5.0	

Since the fit to the position of the rising moon is better when seen from window 3, we adjusted the azimuth 8.3 degrees east. This shift was calculated based on the ratio of the distance between windows 2 and 3 to the distance to the roof-line of the house next door. With these values we can add the outline of the house to the calculated appearance of the sky on 24 August 1916, at 4:00 as seen from Salem, Ohio. The result is shown in Fig. 5. There is a remarkable resemblance to the painting (Fig. 1). This lends credence to the idea that the “almost terrifying” image of the rising moon over the house next door was the original inspiration for “Orion and the Moon”.

One element of uncertainty is that the house next door seems to have been enlarged at some point. The house shown in the painting is not as long, and the present windows are further from the ends of the house. Also, the edge of the roof seems higher above the windows. It may be that the house has been extended in front and back, and perhaps the roof has been raised so that the slope of the roof is now less steep than the house shown in the painting. But this might not have affected the altitude of the top ridge of the roof or the altitude and azimuth of the chimney.

The fit of the computed scene to the painting is not, however, perfect. While the position of the moon is fine, Orion is a bit too low: the moon is at the same altitude as Orion’s belt, while in the painting, the moon is more nearly aligned with the lower left star in the rectangle making up the body of Orion. Further, in the computer plot, the bright star just above the horizon at the south edge of the house (at azimuth 113 degrees) is Sirius, the brightest star in the sky. In the painting, Sirius is no doubt the star shown higher up, to the right edge of the roof. Later in the night, say at 4:45, Sirius and Orion would be situated relative to the house as in the painting, but then the moon would be too high, up over the chimney. By then Venus would have risen above the chimney as well.

If we consider the next day, 25 August 1916, (Burchfield’s note does say “about 24 Aug.”), we have to wait until 4:55 AM for the moon to reach the right altitude (Fig. 6). The sun would still be 10 degrees below the horizon, so it would still be quite dark. The moon’s shape does not fit so well, as it is a rather thin crescent. The main problem is that the time is nearly an hour later than in the note.

The next opportunity to see this configuration is one of the other dates I considered in 1990. That date and time would be 21 September 1916 at 2:45, as shown in Fig. 7. The fit is very nice, both the position of the moon and of Orion and Sirius. But why consider this date and such an early hour? It turns out, as I pointed out in my article, that there

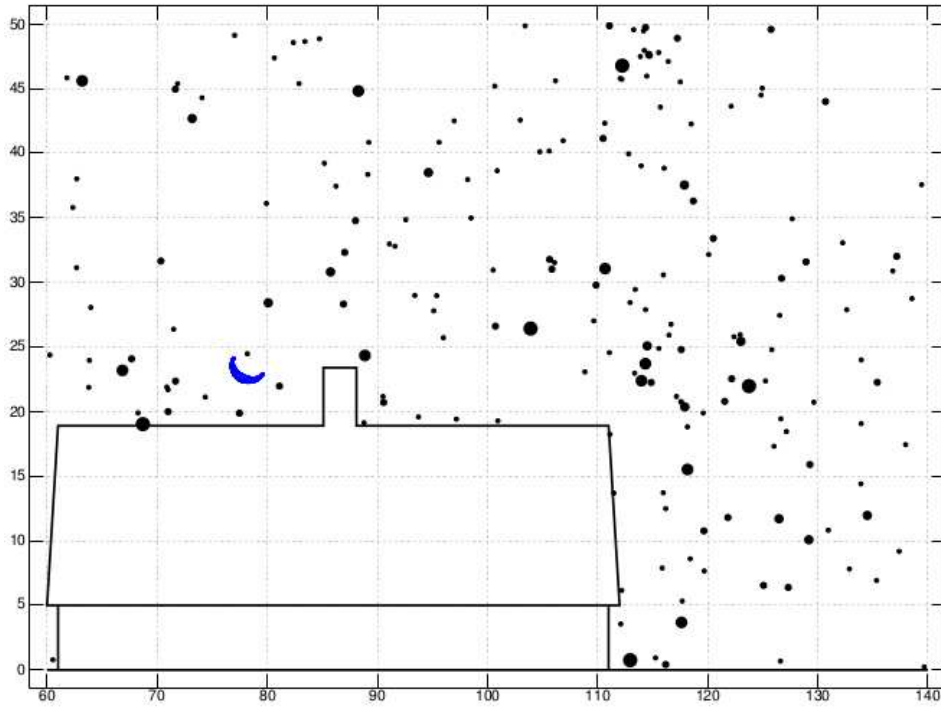


Fig. 5.— The sky at 4:00 AM on August 24, 1916

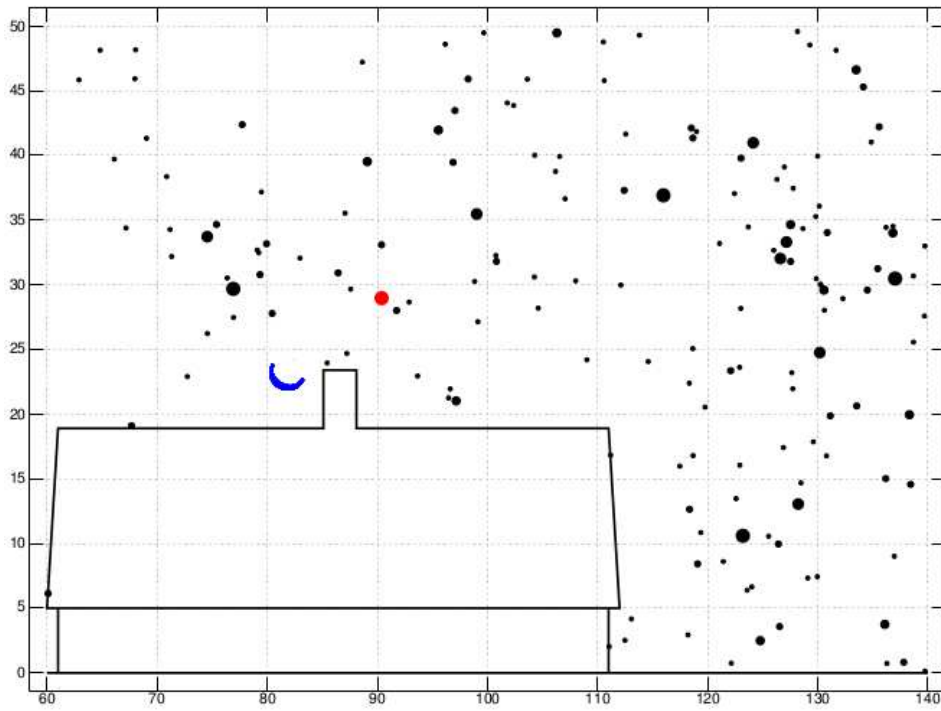


Fig. 6.— The sky at 4:55 AM on August 25, 1916. The red dot is the planet Venus.

is evidence that Burchfield was up and working very late that night. Trovato (1970) lists a work (No. 227, p 52) called “Moonrise Beyond Sunflowers” which Burchfield described as “Looking east in back alley” Salem. This piece is dated 21 September 1916. Now on this date the rising moon would not have been visible before about 1:30 AM in the morning. So if we may indulge in pure speculation, we could imagine that Burchfield was up after 2:00 on the 21st and that when he returned to his room, he stayed up to see the moon rise behind the house next door, a scene that had so impressed him a month earlier. He could then have noted the presence of Sirius and the exact position of Orion.

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30 October 2018

#### REFERENCES

- Harrington, J. P. 1990, *The American Art Journal*, vol. 22, pp 33-59.  
Trovato, J. S. 1970, Charles Burchfield, Munson-Williams-Proctor Institute, Utica, New York.

#### Appendix I: 1916 vs. 1917

While the year assigned to “Orion and the Moon” in the Trovato catalogue is 1917, Burchfield’s note cannot refer to August 24, 1917, because the moon was simply not visible in the morning sky on the 24th, or for many days before or after that date. In fact, on August 24, 1917, the moon was in the first quarter. It set in the west at about 10:00 PM, and would not rise again until about 1:30 PM the next day.

#### Appendix II: The computer generated plots

The computer generated plots given here (Figs. 5, 6 and 7) show the positions of the stars (with the size of the dots indicating their magnitude). The horizontal scale is the azimuth in degrees, measured from north towards east (90 is due east). The vertical scale is the altitude in degrees. Such a plot produces some distortion, since lines of constant azimuth are parallel in these plots, while in reality they converge toward the zenith, just as lines of constant longitude converge toward the north pole. This is the same effect seen in a Mercator projection, where Greenland is stretched out. To check this in these plots, I computed maps where the positions were projected onto a plane tangent to the celestial sphere at the center of the map (the so-called Gnomonic projection). There was little difference, since our plots do not extend higher than 50 degrees altitude.

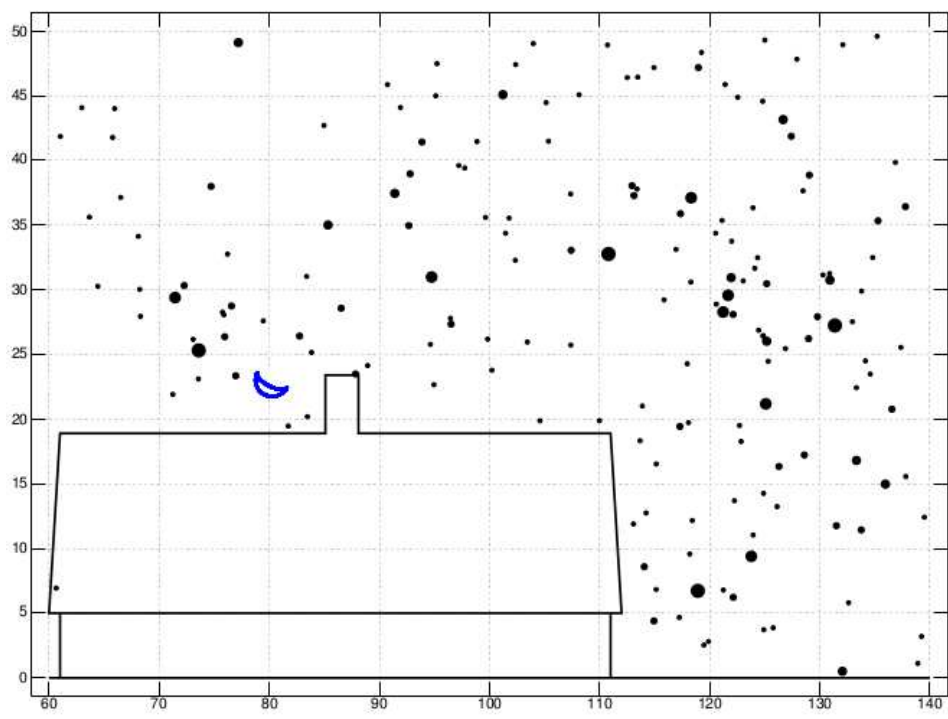


Fig. 7.— The sky at 2:45 AM on September 21, 1916