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BUFFALO MUSEUM OF SCIENCE
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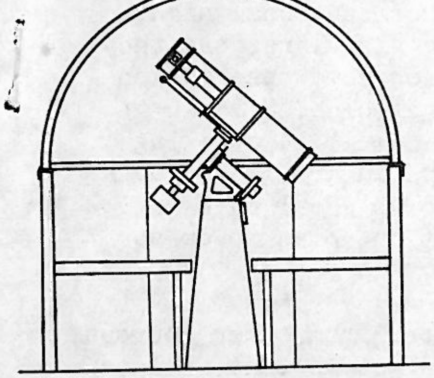

THE SPECTRUM

FEBRUARY 1968

FEBRUARY MEETING: Our guest speaker for the meeting on February 9, 1968 (8:00 PM at the Museum) will be our own Dr. Fred Price. By vocation a biochemist, but by avocation a selenographer, Fred Price certainly needs no introduction. His lucid lectures dealing with lunar matters have become annual favorites with our membership. Fred's topic for this meeting will be THE POSSIBILITY OF WATER AND LIFE ON THE MOON, wherein Fred will combine his vocation with his avocation and the result ought to be fascinating, to say the least. It is our pleasure to welcome to the speaker's rostrum our own Dr. PRICE!

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* LIFE IN A GLOBULAR CLUSTER.* By Darwin P. Christy, Jr.

When I started out in astronomy, I probably did like a lot of other people, namely, observe the constellations with the aid of books and maps. As time went by and telescope building became my main interest, I began to look at things which cannot be seen with the unaided eye. The Moon was studied and is still being studied, although my interest in it has dwindled. The planets fascinated me for a while and I observed them and showed them to others through the telescope. Double stars, too, were of great interest, intriguing me to the point where I went from star to star, cataloguing visual colors and apparent separations. Eventually though this grew uninteresting so that I turned to clusters, diffuse nebulae, and galaxies. These too became boring or only an item to show to others.

Of all the objects I observed I was most fascinated with the globular clusters. There is little to be found in books concerning them compared to all other objects mentioned. From the information I have gathered, I have come to some conclusions about them. But first a resume of the few things I have found on them. These globular clusters are remote in that they are not within our Galaxy but rather are on the outside looking in. Also, they are located nearer the hub of our Galaxy rather than to the edges or spiral arms. Because of the compactness of these objects it is hard to see if they contain any gaseous material. This would seem to indicate that their stars must be as close as one or two light years from one another. The globular cluster stars are generally red giants and super-giants, although a few hot blue stars have been found. Another star prominently found in these clusters is the RR Lyrae type variable which has enabled astronomers to measure their distance more accurately than in the past.

The main globular clusters I have observed are M 3 in Canes Venatici, which is very favorably placed in this latitude; M4 and M 80 in Scorpius, which are low and

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in the glare of city lights, although they may be picked up on exceptional nights. M 10 and M 12 in Ophiuchus are fairly good compared with other globulars, but they are small and faint. M 5 in Serpens is large and well-placed for good observation and it reveals a slight darkening toward the edge of the central blob. M 13 in Hercules is of course THE globular cluster of the northern skies; it is striking in that it contains three of these dark areas much like the one in M 5. These dark areas are not symmetrical as is revealed in the nearer neighbor M 92. I have not studied M 2 in Aquarius or M 15 in Pegasus to any great extent but plan to do so in the near future.

From these observations and the information I have gathered from other sources, let us take a trip to one of these remote star systems. Let us assume that we land on a planet similar to the one on which we are now living. What sort of a sky would we see in comparison to the star-studded vault we kNow? Undoubtedly the scene would be one of magnificence. Instead of a few brilliant stars, there would probably be hundreds with at least thirty of them as bright as Venus. There is a possibility that two or three could even rival our Moon, so that instead of appearing as twinkling points, they might actually show disks. There is a good chance that these stars would appear red because of the prominent members being red giants and super-giants. The glare of the stars would provide much more light than our full Moon, therefore very dark nights should be unknown there. Now let us be astronomers in this remote area. The closeness of the stars would show large proper motion, recognizable even without a telescope. A star approaching in its orb would become larger and then decrease in size as it receded from the observer. At the same time its brightness would change also. No constellation would retain its form for long, therefore the star maps would have to be re-drawn more often. Likewise, the magnitudes on such maps would have to be changed periodically.

The night skies would be glary enough to make an astronomer begin to talk to himself if he wanted to study deep sky objects. But then he probably would not even know that such objects existed. Generally his interests would be confined to the stars and other objects of his own system. It is interesting to speculate as to the theories which might be held by the Cluster Dwellers. They probably would imagine their own star system to be the only one and they might well believe that the universe is very limited in extent. They might suspect that other systems could exist beyond their own globular system, but proof would be hard to obtain. *
NOTE: For additional information on the life of Cluster Dwellers, etc. see Anatole Boyko, INSIDE A GLOBULAR STAR CLUSTER, Sky and Telescope, November 1964, 269-271.

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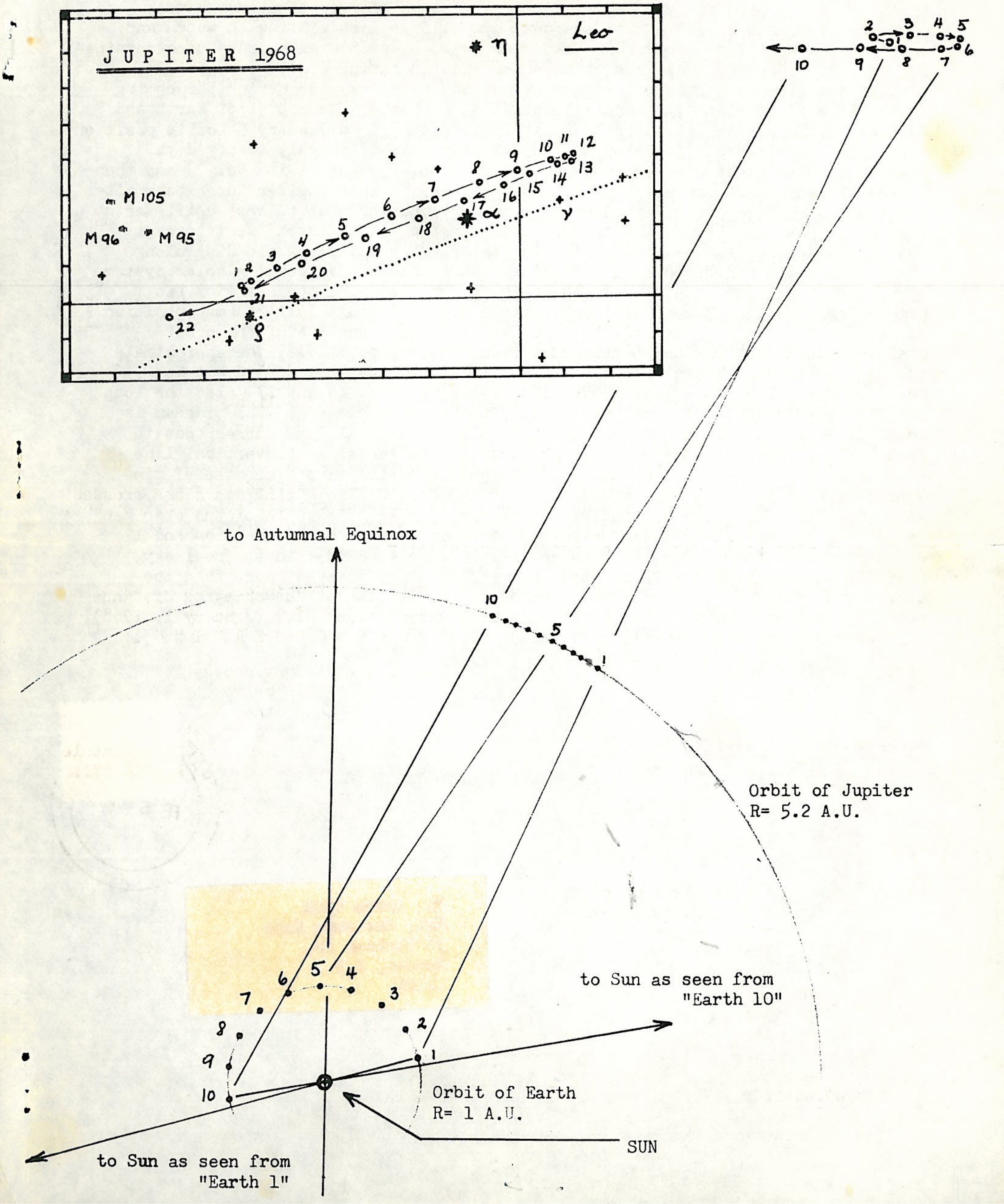
* OBSERVING JUPITER IN 1968. * By Kurt Erland.

To the ancient astronomer, any celestial appearance in the night sky was a "star." Thus, a star-like object with a tail was known as a "hairy star" or a comet; a star-like object moving slowly with respect to the "fixed stars" was a "wandering star" or a planet. Planets do seem to move in "wandering" ways when one compares their motion with that of other celestial objects: for the most part they seem to move from west to east (=direct motion) but periodically they seem to reverse their motion, going east to west (=retrograde motion), eventually turning and moving again west to east. The explanation of this looping motion caused considerable argument and although the version of Copernicus (1543) was a vast improvement over that of his predecessors, an entirely correct explanation was not offered until Kepler analyzed the motion of Mars (1609 and later).

Have you ever followed a planet among the stars? If not, give yourself a


JUPITER 1968
Leo
M 105
M96
M95
to Autumnal Equinox
Orbit of Jupiter
R= 5.2 A.U.
to Sun as seen from
"Earth 10"
Orbit of Earth
R= 1 A.U.
SUN
to Sun as seen from
"Earth 1"

treat - all you need are your eyes and a few minutes of your time once a week (or once every other week if you are that busy).If you are willing to watch and observe, yours will be a rewarding experience. To make this experience more meaningful, we have prepared a diagram which shows what is taking place (see page 3). Jupiter has already begun its retrograde motion in the sky and during the coming months it will complete its annual loop. We have charted the course of Earth and Jupiter in their respective orbits (exactly to scale) from January 5 (orbit position No. 1) to July 3 (orbit position No. 10) at intervals of roughly twenty days. Note that Earth first approaches Jupiter (orbit No. 1), passes it (No. 2) and then leaves it behind. The observable effect in the sky is that Jupiter turns back after position No. 2 (loop in upper right hand corner), moving east to west until Earth arrives at position No. 5; thereafter Jupiter resumes its direct (west to east) motion. Of course, the "real" Jupiter in its "real" orbit keeps plodding along counterclockwise (in the diagram the viewer is stationed "above" the solar system looking "down"). The insert shows the path of Jupiter among the stars of Leo (α = Regulus) from January 1 (map position No. 1) through July 29 (map position No. 22) at intervals of exactly 10 days. Note that the numbers of the orbit positions do not correspond to the numbers of the map positions; the approximate correlation is as follows: orbit No. 1 = between map Nos. 1 and 2; orbit No. 5 = between map Nos. 9 and 10; orbit No. 10 between map Nos. 16 and 17. Also the loop as derived from the orbit positions in the upper right corner of the diagram is somewhat schematic. In the insert map the solid horizontal line corresponds to declination + 10° with the declination tics at 1° intervals; the vertical line represents right ascension 10 hours with right ascension tics 5 minutes of time appart. The ecliptic is indicated as a slanting dotted line; faint stars are crosses while the brighter stars are indicated by star symbols. The scale of the star map is that of A. Becvar's "Atlas Coeli 1950.0"; notice that in map position No. 17 Jupiter appears to be very close to Regulus (= June 9, 1968); in the real sky, however, the separation will be more than $\frac{1}{2}^{\circ}$, that is, somewhat more than the apparent diameter of the full Moon. Incidentally, because of the changing distance between Earth and Jupiter, its brightness will vary between -1.9 (January 1, 1968), -2.1 (during February) and -1.3 (July 29, 1968). G O O D   O B S E R V I N G !!

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