

**Paper by Rev. Andrew Graham, of Wynberg,  
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## **"AN EVENING IN A PRIVATE OBSERVATORY."**

The evening was spent in the Observatory of the Rev. Mr. Reynecke, Dutch Reformed Minister of Cradock, a man who is keenly interested in Astronomy, not following specially any particular line of observation, but usually wandering around at will and revelling in the glories of the heavens. The Observatory is compact and business-like, built of brick and cement by a local man. The revolving roof Mr. Reynecke designed himself, after a brief visit to the Cape Observatory. The roof is too heavy really to pull round, but it answers Mr. Reynecke's purposes, and visitors are always ready with a hand at the ropes. There is a home-made telephone from the Observatory to the house, so that his good wife may keep in touch to know from hour to hour that her husband is still on "terra firma." It also serves the delightful purpose on cold nights, and others too, of announcing that hot coffee awaits the star-gazers in the Manse if they are disposed to take it; they are generally so disposed. The instrument is a fine 6 in. Watson Conrady refractor of the very finest quality, and the eye pieces are all by Watson. It is mounted equatorially, and worked by a driving-clock. Some of the Members of the Association will remember the mounting: it stood for a few years in the doorway of Messrs. Cook & Sons, Strand Street. Mr. Reynecke bought it, and had it properly fixed by one of their own men. Mr. Reynecke also possesses a fine 2½ in. Zeiss telescope, which he had specially made to carry about with him on his long country pastoral visitations, and then in the evening, when the seab and drought and crops and politics are all disposed of, the telescope is produced, and the old enthusiast gives a reverently admiring folk their first lessons in Astronomy. The moon and planets, clusters, and double stars that can be easily divided are revealed and expounded.

In this connection I may relate an amusing incident:—

Some time ago I was travelling in the country, and called at a farm-house. I noticed an old ship's telescope in the corner of the room, and saw that it was a good instrument. I asked

the lady of the house whether she had ever looked at the stars through the instrument. She said she had never thought of doing so. I then told her of some of the marvels to be seen on a clear night, and left to continue my journey. Some three months afterwards I was passing through the same district, and called again at the farm. Almost the first words the lady said were: "Oh! Mr. Graham, I am so glad you suggested the use of my telescope at night, for I have been very much interested in looking at the stars through the instrument. It is wonderful! The stars look as big as moons!" Of course, I told her that she must have been looking through the instrument very much out of focus, as the most powerful telescope in the world showed the stars as mere points of light without any appreciable disc. I explained the reason for this, and, after carefully listening to my explanation why the stars only appeared as points, and no telescope would show them as discs as large as the moon, she said: "Well, at any rate, mine does!"

As the sunlight died out of the heavens there were three of us met for the evening in Mr. Reynecke's Observatory, Rev. Mr. Reynecke, Rev. Mr. McAllister (then living at Cradock) and myself, three "sky pilots" according to sailors a very risky crew, but proving on that night an ideal combination for a memorable journey. Our luck was in, the weather conditions were perfect, a cloudless night, air steady, definition clear and sharp. I can perhaps describe the advantages of Cradock air by using a note I had from Mr. McAllister from Port Elizabeth: "So clear is the Cradock air that several times there with my 3 in. Cook's lens I have seen easily and held steadily the Companion to Antares, and I could also see its decided greenish colour. I have often tried with the same 3 in. glass to do that in Port Elizabeth, and have not yet succeeded in seeing the Companion. I have tried also to see it with Mr. William Reeves' 12½ in. reflector at Walmer, and have not caught it." So much for the Cradock air. In an atmosphere like that very fine results are obtained by an instrument like Mr. Reynecke's.

We had no definite programme for the night, each had something to contribute, and I being the guest, the others were generously anxious that in my one night in Cradock I should see all that they counted most worth seeing. I had been used to a 3 in. near the coast, and this 6 in. was till then the biggest telescope I had used, so that it was literally a stepping into a new universe. I had often looked at 47 Tucani and Omega Centauri with my 3 inch, both showing like "candles in horn lamps," and envied those who could see these clusters broken up into their component splendours. There are some good substitutes for these clusters, for a 3 inch, in the clusters that

throng the Milky Way, especially about Argo, Scorpio and Sagitarius, but even these hardly prepared one for these globular splendours. Well says Gore: "The beauty and sublimity of the spectacle presented by these globular clusters is such as cannot be adequately described, and it has been said that, when seen for the first time, few can refrain from a shout of rapture." There was quite a lot of shouting that night, as you may guess if you know anything of the foregathering of "sky pilots"; but I confess on seeing 47 Toucani, my first globular cluster, I was of the few who refrained; for some the highest ecstasy of wonder can only be expressed in silence. When later in the evening Omega Centauri was in the field one could not help but feel that one was looking upon perhaps the most impressive spectacles in the heavens in these two sublime groups of stars. I have often seen them since, but never to such advantage with such clearness and sparkle. Every star was a gem, every gem clear and radiant. I was particularly struck with the way colour was brought out in this telescope. Kappa Crucis was a jewel casket indeed, of richly contrasted colours, and when I got the red star near Beta Crucis in the field, I kept it there for a long time, sometimes with Beta Crucis in the field, and sometimes out. I have often felt that the colours of stars are exaggerated, the deep oranges and ruby reds, and sea greens and lilac blues, I mean, exaggerated in the intense names given to the finer shades. I had seen Herschel quoted about this particular star, and his words are very strong: "The fullest and deepest maroon, red the most intense blood-red of any star I have seen. It is like a drop of blood when contrasted with the whiteness of Beta Crucis." That night in Cradock I most heartily agreed with Herschel; the colour had not been exaggerated; I have not seen it so glowingly red since. We looked at many of the clusters in and about the Milky Way, then at some of the multiples and doubles. We had a very interesting time with Rigel; the companion was clearly seen by both my friends. I thought I saw it too, but when I said 2 o'clock, I was answered—"a ghost—its 7 o'clock." We spent some time in touring Orion; Sigma Orionis is a particularly pretty double triple for a 3 inch telescope, but a double quadruple for a telescope like this, and showing a striking variety of colour. Though here again it is difficult to follow Smythe and Chambers. "A1 bright white, A2 ash colour, B bluish, C grape red, D dusky, E white, F pale grey." The variety, however, is decided, and gives a charming object for the telescope.

The great Nebula is of perpetual interest to observers, and though here the reflector comes to its own, yet in a 6 inch refractor the Nebula is a most imposing object.

The fifth star of the Trapezium in the Nebula is an easy object for such an instrument. It was round the sixth star our interest for a time centred. Both the other observers declared they could glimpse it occasionally. I was not so fortunate.

The planets came in for a large share of our attention during the night, and there we were particularly fortunate. Jupiter in clearness of definition reminded me of some of the best photographs to be seen of that planet. The cloud belts were exceedingly clear, and here and there the irregular edges were very distinct.

Uranus gave us a clear disc of greenish hue. Saturn was superb. I have never, before or since, seen the planet so clearly. Dim markings were discernable on the globe, but the rings chained our attention. Cassini's Division was clear cut and black, seen so markedly it adds greatly to the beauty of the planet. The night was so clear that a fairly high power could be used without spoiling the definition, and the excitement was great when, as we looked steadily and at leisure, each of us could see the crepe ring distinctly at the point of disappearance round the globe, and faintly farther from the globe.

Mars has a way of rousing more discussion than any object in the heavens, and, personally, I was eager to get Mars in the field of the telescope. It was a disappointing object—too far away for satisfactory observation—the markings seen were dim and smudgy—the talk however, was neither. The interest of Mars, of course, arises from the amount one may read into the little we can see, following, as we may, Professor Percival Lowell's observations. We heard in one of our meetings of "the personal equation" that has to be taken into account in studying the transit of stars. That personal equation bulks more largely perhaps in the study of Mars than elsewhere. Mr. Lowell, with keen eyes and splendid instrument, a 24 inch. Alvan Clark, and almost unique conditions at Flagstaff Arizona, 7,300 feet, has produced brilliant and fascinating studies of Mars. His sketches of its markings are works of art. His reasoning is almost convincing—almost, but not quite—and it is the "not quite," if I may so say, that has roused a very vigorous opposition that often shades off into the playful or contemptuous. Of course Lowell is not alone in his ideas. Schiaparelli wrote before Lowell: "Mars is no desert of barren rock; it is alive. The statement that people exist on Mars may sound fantastic to some, but it is probably far less so than many a bold proclamation sent forth under the cover of science and debated at the Universities." Mr. Lowell states his conclusions very clearly: "Mars is most decidedly inhabited by a race of intelligent beings. This may meet with opposition from other astronomers whose

observations, not being so well placed, did not allow them to see all I have been able to recognize on the planet, *but the future will bear out my statements.*" The imaginative Flammarion has no doubt of the truth of the findings, and the more staid German astronomer, H. J. Klein, says: "We are forced to assume that Mars possesses a most highly civilized people, and that their culture is of older date than ours." A graceful concession one expects will be revised. If Shakespeare is German, these Martians must have some discoverable relationship, and absorbed their "kultur" on some unknown telepathic principle.

Mr. C. E. Housden, an engineer and amateur astronomer, gave a remarkable paper before the British Astronomical Association in 1913, and, drawing from his own experiences as an engineer, showed how, by a series of pumping stations, the planet might be supplied with the water necessary to its life. The reception, however, was not encouraging. In the report we have sentences like these:—

"Dr. Leeson asked if they were to take Mr. Housden seriously, or was he having a huge joke with them all."

Mr. G. F. Chambers, caustic barrister and keen astronomer, it seemed to him a most ridiculous and extraordinary idea; he would almost say a waste of time for them to be seriously listening to such stuff.

Mr. E. W. Maunder produced a drawing of the moon, 170 years old, on which several bright canals were very prominent. It was an experience, he said, of how small irregular markings, when viewed from a distance too great to actually define the details appeared to run into straight lines and round dots.

Mr. Russell Wallace devotes a book to the answering of Lowell, and with the vigour of a Berserker, goes slashing through every argument, and reaches the triumphant conclusion: "So Mars is not inhabited by intelligent beings such as Mr. Lowell postulates, but is absolutely uninhabitable." And then we remember that Mr. Wallace has made our little planet the centre of the Universe, and the only abode of life amid the teeming millions of the suns. His conclusions are not always convincing.

In a letter of Sir D. Gill to Dr. Elkin, he says: "Percival Lowell is over here (in England) just now. He held forth one afternoon at the Royal Astronomical Society. Showed us photographs of Mars on the screen, and pointed out canals—which none of us could see. On the same evening he lectured at the Royal Institution—there again failed to see them. Later at leisure saw a few quite unmistakable lines, but not in the profuse abundance that Mr. Lowell did.

"I no longer doubt there are markings on Mars of the kind,

but I cannot agree with the interpretation Lowell puts on them. I cannot speak too highly of the order of work and the beauty of the photographs."

Here, of course, there is little for the amateurs to do, except to read with interest the discussions of experts with their sketches and photographs, and then his own personal equation will tell in his conclusions.

I picked up a book on Spiritualism at a bookstall recently, in which certain messages from a supposed philosophical spirit of one who had gone over to the "Other Side" were given. One was, "I am just off to Jupiter, so have no more time at present." I picture members of this Association meeting under like circumstances, and saying, "Let us go off to Mars and test the theories of Lowell."

As one wanders hour after hour about the heavens, the general impression becomes overwhelming, the vastness, the complexity, and the grandeur baffle expression; the mind almost ceases to think; it can only feel:—

"But number every grain of sand  
Wherever salt wave touches land;  
Number in single drops the sea,  
Number the leaves on every tree.  
Number Earth's living creatures all  
That run, that fly, that swim, that crawl;  
Of sands, drops, leaves and lives the count  
Add up into one vast amount,  
And then for every separate one  
Of all these let a flaming Sun  
Whirl in the boundless skies, with each  
Its massy planets, to outreach  
All sight, all thought-for, all we see  
Encircled with Infinity, is but an Island."

The poet anticipates the existence of Universe on Universe that is now being hinted at in the structure of spectra of Spiral Nebulæ, and there the mind pauses as though waiting for further flight beyond. And then the mind assures herself of certain facts, *e.g.* the spectra of the most distant stars reveal constituents that we know. Binaries, Multiples and Nebulæ show the same laws of gravity that hold us in allegiance to our sun. The meteors that wander into our atmosphere from whatever distance bourne they may have come are composed of familiar materials. It becomes simply inconceivable to us that anywhere, hidden within the bewildering splendour there may lurk other beings in other worlds for whom 2 and 2 make 5, or that what to us is morally wrong and ugly will be for them morally beautiful and right. There seems sufficient evidence

for certainty that the whole is of a piece, woven on the one loom, and within and at the back of it the One Infinite Mind. One is reminded of the familiar quotation from Emanuel Kant: "Two things there are that ever fill me with new and growing admiration—the starry heavens above us and the moral law within us."

I don't think we said all this in the Observatory that night. Like Lowell's "Martians," it was implied. But remember we were "sky pilots," and such men are supposed to have the lust of talk, and we talked; talked at length, and then before we were aware we were caught by the dawn. The whole night had gone in an orgy of wonder on wonder. As we came to the door of the Observatory the Eastern heavens were flushing pink, and the dying moon hung low down in the sky like a wasting lamp. All the stars had gone except the few lusty stragglers that watch the dawn, when suddenly, as we looked, the dark of the moon seemed to be agitated at a point near the centre of the dark limb—so perfect was the illusion, it looked as though one of the giant craters was flashing into brilliant activity, crowned with leaping, dazzling flame, and then—Spica gracefully loosed herself from her temporary imprisonment. We had been fortunate in witnessing the finish of her occultation! It was a splendid finish to a glorious night.

