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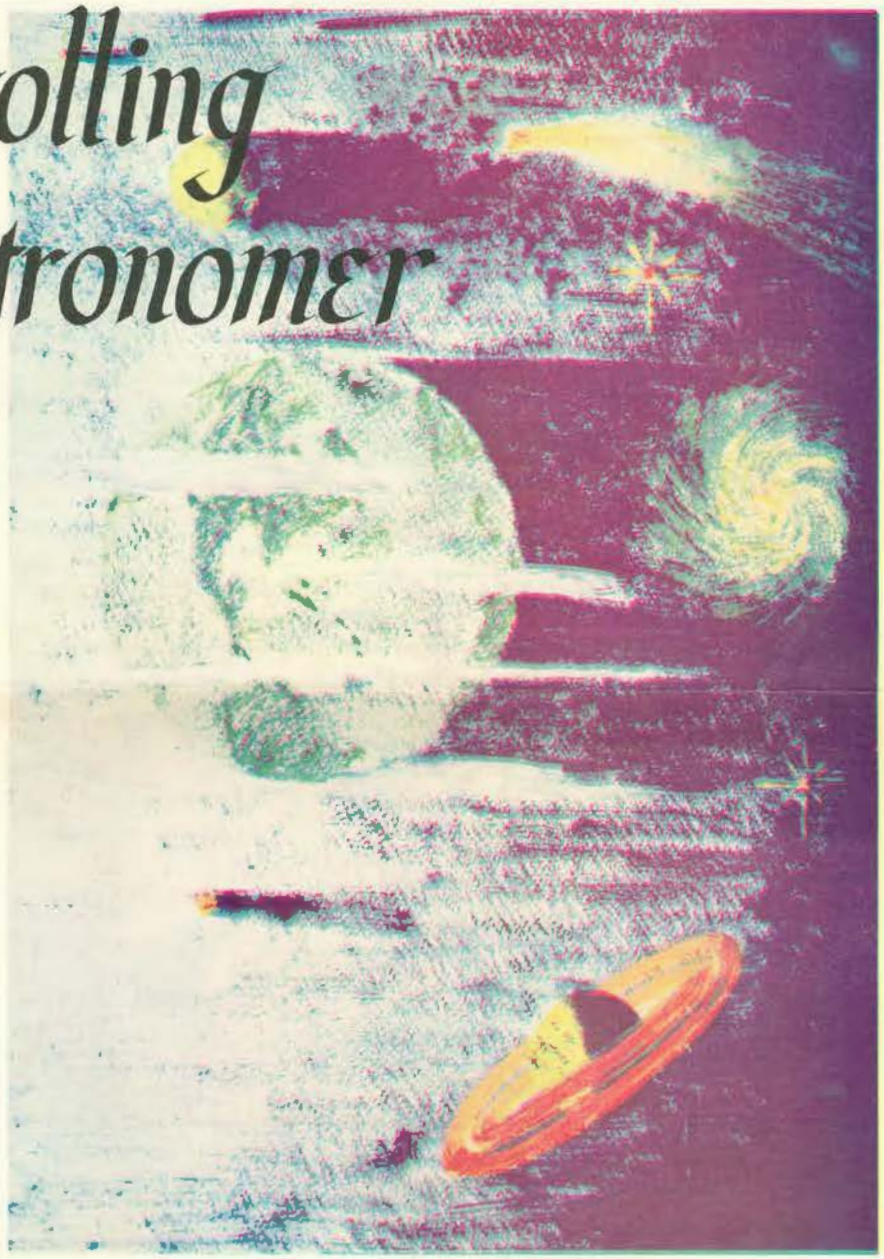
The Strolling Astronomer



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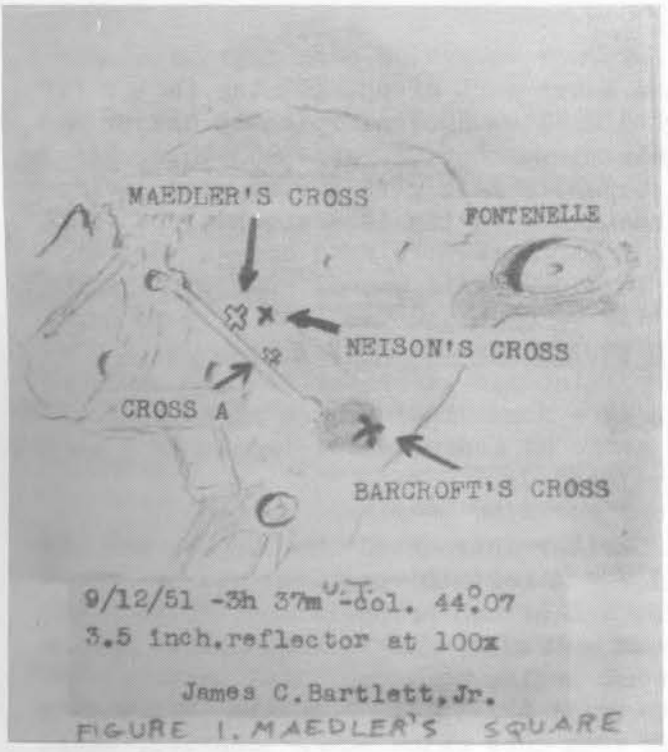

FIGURE 1. MAEDLER'S SQUARE

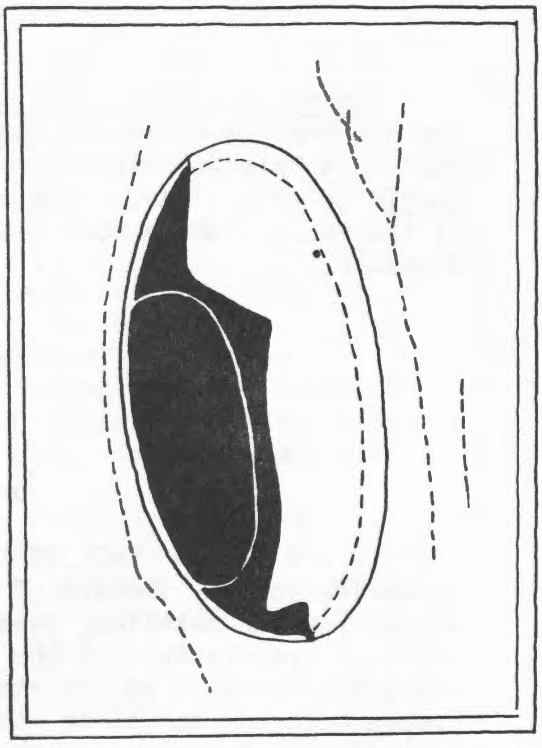

Figure 2. Crater Ingalls.
P. A. Moore.
33-inch refr. 250X.
April 8, 1952. 22^h18^m,UT
Colong. = 77°.7

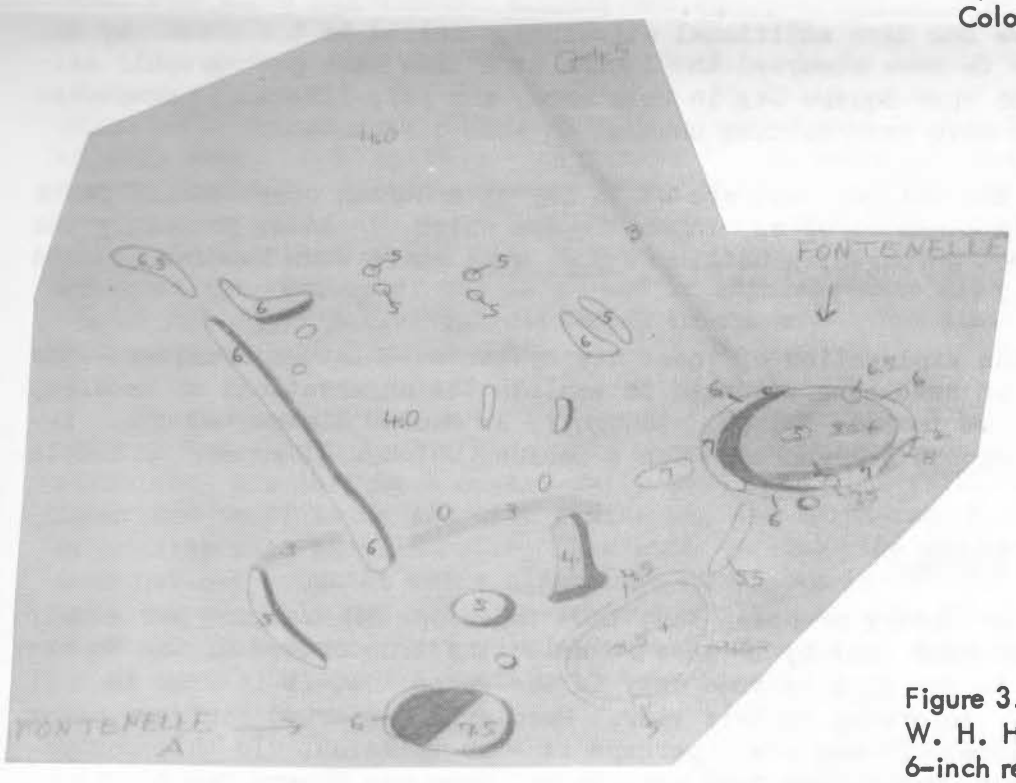

Figure 3. Maedler's Square.
W. H. Haas.
6-inch refl. 180X
May 16, 1951. 4^h15^m, UT
Colong. = 30°.6

Errors in August, 1952 Issue. In the lower part of pg. 109 the factor for the crescent Venus is 3/4, not 3. On pg. 112, line 30 read "planets nearer the sun", not "planets near the sun." At the extreme top of pg. 118 these lines should be added: "Equatorial Zones. The composite maps give a very good picture of the changes which took place in these zones during the last apparition. From August...."

MAEDLER'S SQUARE

An autopsy

by James C. Bartlett, Jr.

It was in the fall of 1950 that the writer introduced the Square and its mysteries to the readers of this journal.[1] A certain problem was presented which, for its solution, seemed to call for one of two propositions: Either the earliest observations of the Square had been at fault, or there had been a subsequent alteration in its structure. It now begins to appear that neither one proposition nor the other is necessarily true; and in the meantime there have been developed some astonishing facts, and even more astonishing theories, which it is the purpose of this paper to consider.

The additional facts which have come to light, thanks to the researches of P. A. Moore, D. P. Barcroft, W. H. Haas, et al, will, it is to be feared, hardly assist us to understand matters any more clearly.

For instance we now have additional witnesses, called to the stand by Mr. Barcroft, who appear to have observed the Square at a time when photographic evidence proves that no such Square was in existence; and yet, like their predecessors, who appear to have seen nothing unusual in this circumstance.

If this seems incredible, what are we to say of a German observation circa 1948, complete with a sketch of an intact Square which includes not only the missing S.E. wall but a rugged, mountainous S.W. Wall where even Maedler claimed only a light streak?

But whatever the explanation of these new mysteries, let us consider some of the theories which have been advanced to explain the observations of Maedler, Webb, and Neison. We include Neison, though P. A. Moore distrusted him, because his evidence cannot be ignored - for a reason which will appear a little later.

THE POOR TELESCOPE THEORY

In general this theory proposes that the telescope of Maedler was simply too small and of too poor quality to have revealed the true nature of the Square; and hence his text in Der Mond is true only in the sense that it is true to what he thought he saw. According to this view, Maedler's ramparted fortress never had any real existence. It was - and perhaps is - an illusion. In this connection, D. W. Rosebrugh has stated that were he to draw the Square as it exists today, the resulting figure would closely resemble Neison's map. He thinks that this would follow from small enough aperture, assisted by the disabilities of a vision not naturally acute. Moreover, on tracing a photograph of the Square from Goodacre's Moon, he finds that by a little judicious "forcing" here and there it

can be brought into tolerable conformity to Neison's sketch.

Thus if we were to suppose that Neison's aperture was too small, or his vision not too keen, or both, we might have a reasonable explanation of his map and text. It will be noticed, however, that this does nothing to explain why Neison was not challenged by other observers perhaps better endowed; especially when the map of Schmidt was totally at variance with Neison's neat, geometric Square - which looked like a work of lunar architects to him and resembled a Kunstprodukt of lunar Dagmonen to Maedler. It will be noticed too that we begin under a certain handicap. For in order to achieve even a tolerable resemblance it is necessary not only to doctor the tracing from the modern photograph, but to doctor it in such a way as we suppose Neison must have integrated the lineaments of the Square in order to account for his text and map.

But let us continue with the theory that Maedler's aperture was too small to have shown the Square correctly. It is true that Maedler used an aperture, namely 3.75 inches, which today would be considered somewhat inadequate to the task. Moreover, he occasionally charged it with fantastically high powers in order to obtain as large an image as possible and thereby ran into the law of diminishing returns. We may also concede that his instrument, perhaps excellent in its day, was not the equal of a modern refractor of the same size. Yet we notice that Maedler seems to have had no difficulty with objects inside the Square, which were far smaller than the Square itself, e.g. the Latin cross. Thus we would have the remarkable proposition that his telescope was simultaneously good enough to show a minute detail and bad enough to convert an irregular area of some 4,000 square miles into an astonishingly perfect, ramparted fortress complete with battlements, peaks, towers, and other such accessories. Does that sound plausible? I think not.

Let us next consider the case of Webb. It is likely that the good Vicar of Hardwick used his 3.7-inch refractor by Tully when he observed the Square, since he tells us that "The original observations in the following pages were chiefly made....." by this instrument.[2] It seems to have been "of fair defining quality", which probably means that it was inferior to his later 5.5-inch o.g. by Alvan Clark. Yet, in 1855, in was quite good enough to show that the eastern crater of the pair Messier, Messier A (now Messier and Pickering), appeared the larger of the two; and in 1856 the same glass showed the western crater not only smaller but different in shape.[3] The diameters of Messier and Pickering average 9 or 10 miles.

There remains the case of Neison. Neison himself tells us that his observations "were principally made with an excellent six-inch equatorial of fine definition; but they have occasionally been made with refractors of smaller aperture, and towards the end with a nine and one-third-inch With-Browning reflector of considerable excellence".[4] How much smaller the smaller apertures were he does not say: but it seems clear that on the whole Neison employed ample aperture and probably had superior instruments compared to those of Maedler and Webb. I submit, therefore, that we must reject any hope of explaining Maedler's Square by an appeal to poor or inadequate telescopes.

THE POOR EYESIGHT THEORY

The theory that poor vision produced the illusion of an unusually perfect, intact Square from the materials of a hillock-strewn plain, a curving ridge, and a single discernible wall is even more dubious. For then we must suppose not only that Maedler, Webb, and Neison all suffered from poor eyesight but that all suffered from the same defect - since all made identical errors. I leave to the statisticians the calculation of the probability.

Fortunately this question is capable of historical solution in relation to one of the three observers. The Rev. T. E. Espin has this to say of Webb's vision: "His sight, though latterly slightly astigmatic, was remarkably good, especially for planetary detail".[5] We must, it would seem, dismiss the patron of all amateur observers from our black list of optical suspects. Of Maedler's vision I know nothing, and the same is true of Neison's.

But let us concede that Maedler may have been extremely myopic, after the manner of so many German savants. Would this have rendered him unreliable as an observer? By no means! For the telescope automatically corrects all visual defects arising from focus. Hence the most myopic Doktor ever heard of would enjoy as keen a vision as anyone - when at the telescope. However, the telescope does not correct for astigmatism, and we remember that Webb was slightly astigmatic...but then so too must have been Maedler and Neison if astigmatism is to be the explanation. We may here point out that a slight astigmatism may be so slight as to have no practical consequences; but a critical astigmatism requires for its correction lenses of very special conic sections. The point is this; Without such lenses a pronounced astigmatic could not observe at all. Ipso facto, if he does observe then he must wear his special corrections; in which case his telescopic vision is as good as yours or mine or anybody's.

Whatever may be the explanation for Maedler's "astonishment" and Neison's remarks about the seeming work of lunar masons, poor eyesight is not it.

THE FAULTY OBSERVATION THEORY

Webb apparently left us no sketch of the Square, which is a pity. P. A. Moore distrusts Neison;[6] D. W. Rosebrugh suspects that the latter may have "prettied it up a bit", though not necessarily with malice aforethought: D. P. Barcroft at one time doubted that Neison had ever seen the formation! The writer cannot indorse these views; but let us interrogate Maedler and see how he fares.

That "the senior master of lunar research" was not an infallible draughtsman is pointed out by Moore, who says that in Der Mond "The whole area of Wilhelm I is inaccurate...." Perhaps so; but the area of Wilhelm I is uncommonly rugged and therefore is well suited to the production of cartographic errors. This is not true of the site of the Square. But granting that Maedler made a botch of Wilhelm I, we wish to know how he stands with the Square. To that end let us compare the present remains to his description of a perfect quadrangle here.

He claims that the N.W. wall is the highest - and so it is. He claims that it has "two prominent peaks at each end; between them is a series of small peaks like towers on a wall". They may be verified. He adds that "at the west corner ...is a short, rill-like cross valley". This has been seen by Reese and incidentally is shown by Neison. Was Maedler's description so far accurate or was it not?

According to Maedler, "The northeast side has no common association, but the position and direction of all the mountains are exactly congruent with the side of a Square".[7] Precisely what is meant by "no common association" is not entirely clear. [The German text is keinen allgemeinen jusammenhang.] At the present time a N.E. wall does not exist as such - but if such a wall ever did exist here, it would have been more or less "exactly congruent with the side of a Square".

Of the S.W. boundary, Maedler says that it is not a wall at all but only "a broad light streak". This was confirmed by Webb, though Neison claimed a

very low ridge here. To me, as to Maedler and Webb, the S.W. boundary is merely a streak. Be all that as it may, I think we must concede that Maedler was accurate for three walls out of four.

Yet, if we would be consistent, we must now believe that for the S.E. wall he suddenly becomes entirely unreliable! This S.E. wall, principal cause of the present uproar, is described by Maedler as "a low, straight, very narrow mountain wall, exactly parallel to the high wall on the opposite side of the Square and of the same length as it". Does such a wall exist? I have never been able to find it. Nor has E. J. Reese. Nor does it appear on any photograph known to me - and I have examined not a few.

Moore's surprising recovery of a low wall in its apparent position is at first blush truly confounding; though it may be slyly pointed out that if this object is indeed Maedler's missing S.E. wall, then his accuracy in relation to the Square is established beyond any reasonable doubt. But acceptance of this wall as the S.E. wall of Maedler would solve one mystery only by introducing another even more formidable. Consider what is implied. Maedler said that his S.E. wall was "low", which would be agreeable to Moore's findings - except for one enormously important fact. Moore found his wall so very low that it was difficult to an 8.5-inch modern reflector at some 200X! Moreover, even with this aperture, it would appear that the lighting must be exactly right for it to been seen at all.[8] Which perhaps explains why it does not appear on a plate taken by the 36-inch Lick refractor. Now if this is Maedler's S.E. wall, then we must be prepared to believe that he found no difficulty in seeing it - and even in measuring it! - with a 19th Century refractor of only 3.75 inches! We must suppose that his little glass discovered a mere wisp of a line which the Lick instrument, some nine times larger and incomparably better, failed to reveal under conditions of lighting which show quite minute asperities of the contiguous surface.

Such considerations, it seems to me, compel us to one of two explanations. The object discovered by Moore is not Maedler's S.E. wall; or, if it is, then its prominence has greatly declined since Maedler's day. I see no alternative to this difficulty. We shall return to this wall a little later, when we consider the meaning of Otto M. Bluhm's remarkable 1948 observation; but for the nonce let us consider some dther things hardly less interesting.

THE CROSSES

In the early spring of 1951, the writer received a communication from D. P. Barcroft announcing what the latter considered to be a recovery of Maedler's cross. However, it was clear from Mr. Barcroft's drawing, and from his description, that this object was not Maedler's cross at all but something else. I therefore propose that this object shall be known as Barcroft's cross.

In April, 1951, with Mr. Barcroft's sketch in hand, I undertook another survey of the Square; and one of the very first objects seen was a conspicuous, black, St. Andrews' cross in the position indicated by our California colleague. E. J. Reese also observed this object, and it was also seen by W. H. Haas. I was, I must confess, somewhat astounded. For notwithstanding that Barcroft's cross is a very coarse and conspicuous object, I had not seen it in 1949 when I paid very close attention to the Square; not had E. J. Reese.

Yet it is extremely easy - at least at present - and moreover has been seen in the past. A communication to the English Mechanic for August 5th, 1870,

signed by "Foreigner", announces his discovery of a cross which he found "very apparent and striking".[9] A rather rough accompanying sketch leaves no doubt that what he saw was Barcroft's cross. It is in the same position and has the same shape. Interestingly enough, "Foreigner", like Mr. Barcroft, at first supposed that he might have recovered Maedler's cross; though he recognized that it was not in the proper position, and for this reason solicited advice of W. R. Birt. Birt pointed out in reply that Maedler's cross lay some distance to the west of this "new" object.

How is it that a striking cross, black as shadow, and "very apparent" in 1870 and in 1951 should have been totally invisible to two observers in 1949? Perhaps this means only that an object once pointed out is easy to see thereafter - and perhaps not. Looking at Barcroft's cross it is a little hard to accept such an explanation.

Stimulated by this unexpected event, I undertook yet another observation of the Square on the evening of May 16th, 1951, at $2^h\ 30^m$, U.T. col. 29°68, with a 3.5-inch mirror at only 100x. Barcroft's cross was easily visible - but so was something even more interesting. Under the foot of the N.W. wall, exactly where Maedler had placed it, I was startled to find a dull white and small but perfect cross, which obviously was Maedler's missing cross. Why had I not seen it in 1949 when I had carefully and especially looked for it? Why had Webb never been able to find it? Why should it be so accessible now to only 3.5-inches aperture at 100x? Finally, why had Maedler thought it so difficult that "years" might pass before it could be seen?

Letters were dispatched to E. J. Reese and W. H. Haas, announcing the recovery of Maedler's cross, and both observers subsequently confirmed it. Reese's observations are worthy of special note. In a letter to the writer, he remarked that to his larger aperture and superior power (6 inches at 240x), the Cross was by no means as perfect as it had seemed to us. Now this wonderfully establishes Maedler's accuracy. Not only does his cross exist; not only is it where he placed it; but in all probability it would have seemed a perfect cross to his aperture - which was only 0.25 of an inch larger than mine. Have we any further reason to doubt that Maedler had faithfully depicted the Square he had discovered?

In passing it may be remarked that when P. A. Moore wrote his recent paper, in which he doubted the existence of Maedler's cross, he did not, of course, know of my recovery of the object.

But there was more to come. On the night of September 12th, 1951, at $3^h\ 37^m$, col. 44°07, Maedler's cross being plainly visible, a somewhat smaller cross was seen a little to the south and east of it (Figure 1 on pg. 122). In shape it closely resembled the former, but otherwise differed materially. Whereas Maedler's cross was a dull, whitish cross, this new object was rather a dark oxford gray, which caused it so to blend with the background as to make it a much more difficult object. But there could be no questions of its existence. By September 13th it had become very hard to see, and by the 14th it was invisible.

With the recovery of this formation, all hope of explaining Neison's map and text by supposing that he had merely rehashed Beer and Maedler goes glimmering. For unquestionably this was Neison's cross. It is just where he said it was. "..And beside the cross (Maedler's) south is a smaller one..."[10] We may recall that it was a cross "not mentioned by Maedler". Neison therefore claims to have seen a cross which Maedler had not - and it is there.

We have now come full circle, and our second state is worse than our first. There can now be no question, it seems to me, of Neison's personal and rather close examination of the Square. Maedler's Cross is difficult though; Neison's cross is much more difficult. Can we now believe that Neison was able to detect such an inconspicuous feature and yet construct 65 mile long walls out of a few disjointed ruins? The evidence is all against it. We may remember too that Neison entered a correction to Maedler's estimate of the angle of repose of the N.W. wall. If Neison had <u>not</u> examined the Square, what is the source of the correction?

Though Neison's impressive description of an artificial-appearing Square strikingly confirms Maedler, there is yet other evidence of his independent examination - and of a rather curious sort. Maedler described the S.E. wall as "low". Neison, however, says that it was "of considerable steepness". How are we to understand this apparent contradiction? Neison's language here is not precise, and I suppose that a given wall might seem low to one observer and yet relatively high to another. But there is an independence of judgement evidenced. Incidentally this would indicate that the S.E. wall must have been fairly <u>prominent</u> to Neison, which hardly agrees with Moore's very low S.E. wall.

The idea that Neison's work was merely a repeat, more or less verbatim, of <u>Der Mond</u> appears to have been derived from an uncritical reading of Neison's own remarks. In <u>The Moon</u> we find the following: "The 'Mond' of Beer and Maedler having been universally accepted as the standard work on Selenography, it has of necessity been taken as the basis of this Neison's own book , as it must for long years of all future works on the subject; for no treatise can be complete unless it incorporates the results of the seven years' observations of Maedler recorded in 'Der Mond'."[11] But this is not to say that <u>The Moon</u> is simply an English tranlation of <u>Der Mond</u>. Neison was simply expressing a truism; namely that every work in science must necessarily incorporate the basic work of the pioneers. Biologists still quote Darwin, though his basic postulates are no longer accepted without modification.

Finally, Neison himself claims a larger measure of originality for his book in the following words: "The greater portion of the material forming the present work is, however, new and has been mainly derived from eight years' constant selenographical observations."[12]

Therefore, unless we are prepared to charge Neison with deliberate fraud, we must admit that he did much personal work on the moon in preparation for his book. Thanks also to the silent witness of Neison's cross, we must also admit that he did see Maedler's Square; and that he saw it <u>essentially as Maedler had seen it</u>.

All of this seems simple enough - until we arrive at another mystery truly inexplicable. P. A. Moore points out that Neison did most of his observing between 1866 and 1876. Yet our British colleague has turned up a Draper photograph of 1863 which shows the Square "unmistakably in its modern form". In other words, <u>three years before Neison had even begun his work</u> the Square wore its present look! Yet Neison describes it as Maedler had seen it in 1837 or thereabouts. Notice particularly that if the 1863 Draper photograph shows the modern aspect of the Square, then it does <u>not</u> show Moore's S.E. wall nor <u>any</u> S.E. wall. Yet Neison not only claims a wall here but apparently found it prominent!

Must we conclude after all that Neison was merely writing fiction? Let us first consider the implications of even more surprising evidence furnished by Mr. Moore.

THE RIDGE

In the original paper of this series, the writer pointed out that the low, curving ridge on the S.E. side of the Square cannot be Maedler's S.E. wall.[13] Moore concurs; but he has also discovered an 1809 drawing by Schroeter in which this ridge appears.[14] Yet it does not appear in the Mappa Selenographica nor in Neison's section - nor is it mentioned.

We now have the following proposition. An object, conspicuous enough even to a 3-inch glass, is unaccountably missed by two competent observers armed with larger apertures; notwithstanding that it lay immediately adjacent to a low, straight wall which - if we concede identity with Moore's wall-is so inconspicuous that it is difficult to a modern 8.5-inch mirror! Yet Maedler and Neison see this wall, and apparently do not see the much easier ridge which lay immediately adjacent to it!

We now turn to Schroeter. There is the ridge right enough. But where is the Square? Are we now to believe that Schroeter could see this low, winding ridge and yet completely miss a huge, ramparted Square of some 4,000 square miles area? And this when the ridge formed the S.E. boundary of the formation? But let us consider a subtler fact. Schroeter was very receptive to the idea of lunar habitability, and indeed had discovered a large lunar "city" near to Marius.[15] His lunar studies, one is tempted to say, were chiefly designed to uncover evidence of lunar life and of lunar changes. A few parallel ridges here, a peculiarly shaped object there, and he was quite prepared to accept them as evidence of artificiality. In the huge Square he had an example made to order. Here was a veritable fortress laid out with military precision; each side exactly congruent with each opposite side; and each side exactly the same length as all the others. The N.W. wall was even furnished with conspicuous towers and battlements. On the floor is a perfect cross. Even the cautious Maedler, whose lunar bias ran in the opposite direction, is moved to "astonishment". Even he conceded that here was a formation which had the appearance of "a work of art".

What then should we expect to hear from an observer whose fondest wish was to discover traces of intelligence on the face of the moon? What do we hear from the discoverer of a lunar metropolis? Just this - nothing.

We hear nothing because it is obvious from Schroeter's sketch that he saw nothing. He did not even see the high and conspicuous N.W. wall which probably is visible to a good 2-inch objective. Yet he did see something of a N.E. boundary; which, incidentally, he represents as curving and far from being "exactly congruent with the side of a Square".

Now if one examines this area today, even very casually, one of the first and most striking objects seen - indeed the only striking object at first visible is the high N.W. wall which throws a prominent shadow. Schroeter shows nothing here; which surely must mean that when he examined the area in 1809 the ridge, which he sketched, was relatively much more conspicuous - as indubitably it is not at the present time. Certainly this feature caught his eye, while the high N.W. wall - if there was a high N.W. wall at that time - did not. I see no other alternative.

Some three decades later, Maedler discovered in this same area a geometrical formation of such remarkable appearance that he was moved to caution future observers against interpreting it as "a work of art". Moreover, the most conspicuous element of this strange object was precisely that N.W. wall of which Schroeter apparently saw not a trace.

Is this circumstance any easier to explain than Neison's detailed description of a formation which apparently did not exist at the time? I think not. Indeed, I think that the difficulties are of the same order.

For a rather fantastic and daring suggestion begins to emerge from our researches. It begins to look very much like a case of "Now you see it, now you don't". Let us survey the evidence for such a suprising conclusion.

THE PHANTOM SQUARE

Circa 1643, Hevelius apparently saw something of a Square hereabout; for while his map is devoid of detail it nevertheless plainly shows an angular indentation of the Mare Frigoris into the northern highlands. The two sides of the angle would correspond to the N.E. and the N.W. walls of Maedler's Square.

Yet Riccioli, 1651 apparently saw nothing worthy of note here.

Cassini's map, we learn from Moore, "is inaccurate in the Fontenelle area but does not show the Square at all". Rather suggestively, Moore remarks that perhaps "the formation was not then conspicuous enough to catch Cassini's attention". This is what we must think in relation to Schroeter. One wonders why.

Tobias Mayer, 1775, also saw nothing unusual between Fontenelle and Birmingham. Nor did Schroeter in 1809 - the tireless searcher for the extraordinary on the moon.

Then we come to 1837 and Maedler - the man who did not believe either in mondvolk or in their constructions. And what does this pronounced skeptic have to say of the area which conveyed nothing to Schroeter? As Otto M. Bluhm remarked (I give a free translation); "The senior master of lunar research wrote with a tinge of astonishment".[16] He did indeed. He said that "only with difficulty one guards against the thought that there is here to be seen a product of the art of selenites". Again one wonders why. W. H. Haas concluded a series of observations of the Square with these significant words: "I certainly could not imagine from the aspect what could justify the glowing descriptions of Maedler.. .."[17]

There is a subtle point here which should be carefully noted. Maedler, of course, did not believe, nor did he say, that his ramparted Square was unnatural. Yet he seems to have been concerned, as a sort of afterthought, lest his florid remarks be so understood by others. Accordingly he was at some pains to point out that unnatural-looking walls, dikes, etc., were to be found upon the earth; and that it was unnecessary to invoke supernatural explanations for them. He even warned future observers not to jump to hasty conclusions about possible changes here if, thanks to libratory effects, some feature or other might not be found immediately (my blushes!).

Yet the fact that Maedler felt it necessary to issue such warnings is perhaps the best evidence we have, not only for the very novel appearance of the Square but for its existence as he described it. And apparently at least one contemporary agreed. Between 1847 and 1856 Webb made many observations, which

included his "frequent searches" for the Latin cross-which he was never able to recover. And, like Maedler,he found the walls of the Square so unusually regular that he found it "scarcely possible to imagine them natural".[18] And again, like Maedler, Webb pointed out that their great size really indicated a work of Nature rather than a work of art.

Circa 1863 Draper made one of his excellent moon pictures; and on the site of this fortress-like Square, this psuedo work of selenites, his camera revealed only a rough and open area, consisting of one straight wall - the N.W. - a ruinous, disassociated N.E. side; nothing on the S.W., and on the S.E. only the low ridge curving gently out into the Mare.

In 1870, as we further learn from Moore, Celoria saw the same uninspiring ruin.

In 1876 Neison published his Moon, in which once again we find a detailed description of a preternatural-looking Square. Not only is it obviously the Square described by Maedler;not only does it affect Neison in the same inexplicable way; but he adds another detail - a second cross.

Two years later appeared Schmidt's work; in which we find no Square at all, but only the ruin photographed by Draper and figured by Celoria.

Then in 1889 we hear once more of "a square enclosure" here. Our new witness is A.B. Depuy. The Square he tells us, "is bounded on two sides by high ridges, on the other side by those which are very much lower, one of which is barely visible".[19] Let us analyze this description. We are somewhat surprised to find that there are two high ridges bounding the Square; for Maedler claimed only one, the N.W. The S.E. wall, according to the German, was low-not high. The S.W. side was marked only by a streak, and the N.E. side had "no common association", which seems to refer to congruent but disassociated mountain masses. On which side was this second high wall? Unfortunately, Depuy does not tell us. But we must wonder. Is this an echo of Neison's "steep" S.E. wall? Neison also claimed a very low ridge on the S.W., which is probably the wall "barely visible" to Depuy. The N.E. side, at least at present, is certainly "very much lower". The second high wall of Depuy, therefore, would probably be on the S.E. - where Neison also seems to have been a prominent structure. Depuy writes as if he is describing a personal observation, and describes Maedler's cross in some detail. And this was twenty-six years after the Draper photograph showed only one wall, the ruinous N.E. boundary, and the curving pressure ridge on the S.E., the whole combining to form an area which is anything but "a square enclosure".

Finally, in 1948, Otto M. Bluhm gives us a picture and a description of an intact Square, which included "a low straight S.E. wall". The S.W. side, he tells us,"is not a rampart but only a broad light streak". Nevertheless, his drawing indicates a solid mountain wall here complete with shadow![20]

However this discrepancy is to be explained, it points up an important fact, namely that we do not depend merely upon maps and drawings in our study of the Square. It is well known that the graphic representation of an object is affected by many factors, including the artistic ability of the observer. The oral or written description is much more to be trusted in most cases. The point of our study is that the careful, detailed textual statements of Maedler and Neison, and, I would think, of Depuy cannot be reconciled to the present appearance of this formation - nor to its appearance at other times in its history.

Bluhm's 1948 observation is marked by another anomaly. For his straight S.E. wall, according to his drawing, is really a series of widely separated mountainous masses, one of which is almost certainly the mountain mass associated with the pressure ridge. Yet Maedler's wall must either have intersected this mountain- which makes his silence about it even more difficult to understand - or it must have lain farther to the north. Moore's wall, at least, is definitely north of the ridge and mountain. I do not see, therefore, that Bluhm's observation is compatible with the original description of the Square.

Is it possible to reconcile the amazing contradictions in the known history of the Square? I know of no theory that will hold water. In the summer of 1951 I observed the Square minutely and carefully, from sunrise to sunset, through two lunations and saw many changes of appearance, after the manner of lunar formations, but nothing which at any time would convert this irregular space into a preter-naturally perfect Square.[21] I have never seen anything which would even remotely suggest a work of art.

Yet the stubborn fact remains that others have seen a formation here which greatly impressed them by its highly unnatural appearance. And yet again it has seemed commonplace. What are we to make of Saheki's drawing in the July, 1951, issue of The Strolling Astronomer? Let us compare it to the composite drawing by Reese in the same manner. Does that look much like a perfect Square, the walls of which are "exactly congruent" and of exactly the same length? Where is the straight S.E. wall shown by Saheki? Where indeed is it on the Lick or Mt. Wilson pictures? For that matter, where is it on the 1863 Draper photograph? Yet we must remember that Moore has also glimpsed a wall here, extremely low- and Neison (and presumably Depuy) saw a relatively high wall hereabout.

But all of these fantasies pale into insignificance, compared to what is surely the greatest mystery of all. How is it that in all these seeming changes of aspect no one appears to have noticed anything even worthy of mention?

Was it because the formation was not much observed? No, because, as we learn from Depuy, it had a popular name and was sometimes called "The Battlements". It was, therefore, not entirely neglected. And, as Barcroft has pointed out, in the 1870's there seem to have been quite a few searches for Maedler's cross. Was it because no one was aware of negative photographic evidence. No, because W. R. Birt, in answer to a query, consulted "Rutherford's photogram of March 6th, 1865"; which, among other things, showed a certain mountain range "very plain", apparently not seen by Beer and Maedler, and which, strangely, lay "parallel with the S.W. side of B. and M's lozenge".[22] Did the 1856 "photogram" also show the steep S.E. wall of Neison? Or the low S.E. wall of Maedler? If it did - as probably it did not - how is it that Birt saw nothing remarkable in this circumstance? Why should he have thought such an omission to be of no consequence, and yet have devoted attention to the suspected changes in tiny Linné?

Would the apparent conversion of an unnaturally perfect, ramparted Square into an imperfect, loosely bounded, irregular area have been considered so trifling as not to merit attention? Then how are we to understand the care exercised on the scarcely visible crater pits west of Copernicus, simply because some observers fancied them to be on the increase? Had it simply been recognized that Maedler had erred in his choice of words? That his florid description, his careful warnings and so forth, actually were meant to apply only to the undistinguished ruin presently visible? If that was so, how is it that Neison was not challenged when he fell into the same error?

We have no satisfactory answers. And I think it may be said with some confidence that on the basis of the presently known evidence, no solution to the problem is possible.

But because of the inexplicable and very suggestive facts of the Square's known history, it would appear to merit constant and rather close attention. After all, a formation which may at one time appear as a work of art, and at another as an ordinary natural ruin; an area in which cruciform objects appear and disappear; in which a S.E. wall is invisible to a 36-inch refractor, yet plain enough to 3.75 inches, and again barely visible to 8.5 inches; a formation of such sort, I say, may be exhibiting phenomena of novel and quite unknown nature.

In conclusion, I would express my sincere appreciation to all those who have contributed so much to this discussion. To Professor Haas for his liberal grant of space in which these fantasies have been explored. To E. J. Reese for his invaluable supporting observations. To D. W. Rosebrugh for much good counsel and fruitful interest. To D. P. Barcroft, who kindly furnished a translation from Maedler by Haas; and to whom I am also much indebted for material from The English Mechanic and for the observation of Depuy. And especially to P. A. Moore, whose energetic researches in England uncovered the 1809 drawing by Schroeter and the 1863 photograph by Draper, and who have given us a most interesting paper on the Square.

Belatedly - but none the less gratefully - my gratitude and my blushes to Messrs. Moore and Wilkins; who, between them, have brought about a transformation in the Square perhaps as remarkable as any in its strange history. I here refer to my apotheosis, whereby Das Maedler-Quadrant has recently become Bartlett. This was first and very generously proposed by P.A. Moore; and just as generously consented to by H. P. Wilkins.

As to the various theories proposed to explain the history of the Square - including those of the writer - perhaps we had better say of them - Requiescat in pace.

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1. Bartlett, J.C.; Maedler's Square, A Study in Lunar Paradox; Vol. 4, No. 12, The Strolling Astronomer.

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3. Ibid; p. 145.

4. Neison, Edmund; The Moon; 1876; Longmans, Green and Co. London, p. vi.

5. Espin, T.E.; T. W. Webb, a Reminiscense; in Celestial Objects; 1917; Longmans Green and Co., London; p. xviii.

6. Moore, P. A.; Maedler's Square, An Alternate Interpretation; Vol. 5, No. 7, The Strolling Astronomer; p. 6

7. Beer and Maedler; Der Mond; pp. 287-288; translation from the German by W. H. Haas, courtesy of D. P. Barcroft.

8. Moore, P. A.; Maedler's Square, An Alternate Interpretation; Vol. 5, No. 7, The Strolling Astronomer; p. 6.

9. "Foreigner"; The Crater Fontenelle in The English Mechanic and Mirror of Science and Art; August 5th, 1870; p. 468.

10. Neison, Edmund; The Moon; 1876; Longmans, Green and Co., London; p. 252.

11. Ibid; pp. v and vi.

12. Ibid; p. vi.

13. Bartlett, J.C.; Maedler's Square, A Study in Lunar Paradox; Vol. 4, No. 12, The Strolling Astronomer; p. 4.

14. Moore, P.A.; Maedler's Square, An Alternate Interpretation; Vol. 5, No. 7, The Strolling Astronomer; Fig. 1, p. 5.

15. Burritt, E. H.; The Geography of the Heavens; 1856; Mason Brothers, New York; p. 214.

16. Bluhm, Otto M.; Das Maedler-Quadrat in Sternfreund, September, 1948; p. 13.

17. Haas, W. H.; letter to the author.

18. Webb, T.W.; Celestial Objects for Common Telescopes; 1917; Longmans, Green and Co., London; p. 130.

19. A.B.D. (A.B. Depuy); Lunar Study near Plato; in The Sidereal Messenger; June, 1889; p. 275.

20. Bluhm, Otto M.; Das Maedler-Quadrat in Sternfreund, September, 1948; p. 13.

21. Observations and Comments; The Strolling Astronomer; Vol. 5, No. 11, p. 8.

22. Birt, W. R.; The Crater Fontenelle and Lunar Cosmology in The English Mechanic and Mirror of Science and Art; August 19th, 1870; p. 519.

Remarks by Editor. Readers will notice that Dr. Bartlett's drawing published as Figure 1 on pg. 122 shows no less than four cross-shaped objects- Maedler's, Neison's, Barcroft's, and a "new" cross seemingly first noticed by Bartlett when he made this drawing. It is surprising to find so many crosses in such a limited area. Perhaps, however, larger telescopes would resolve these crosses into separate peaks and ridges.

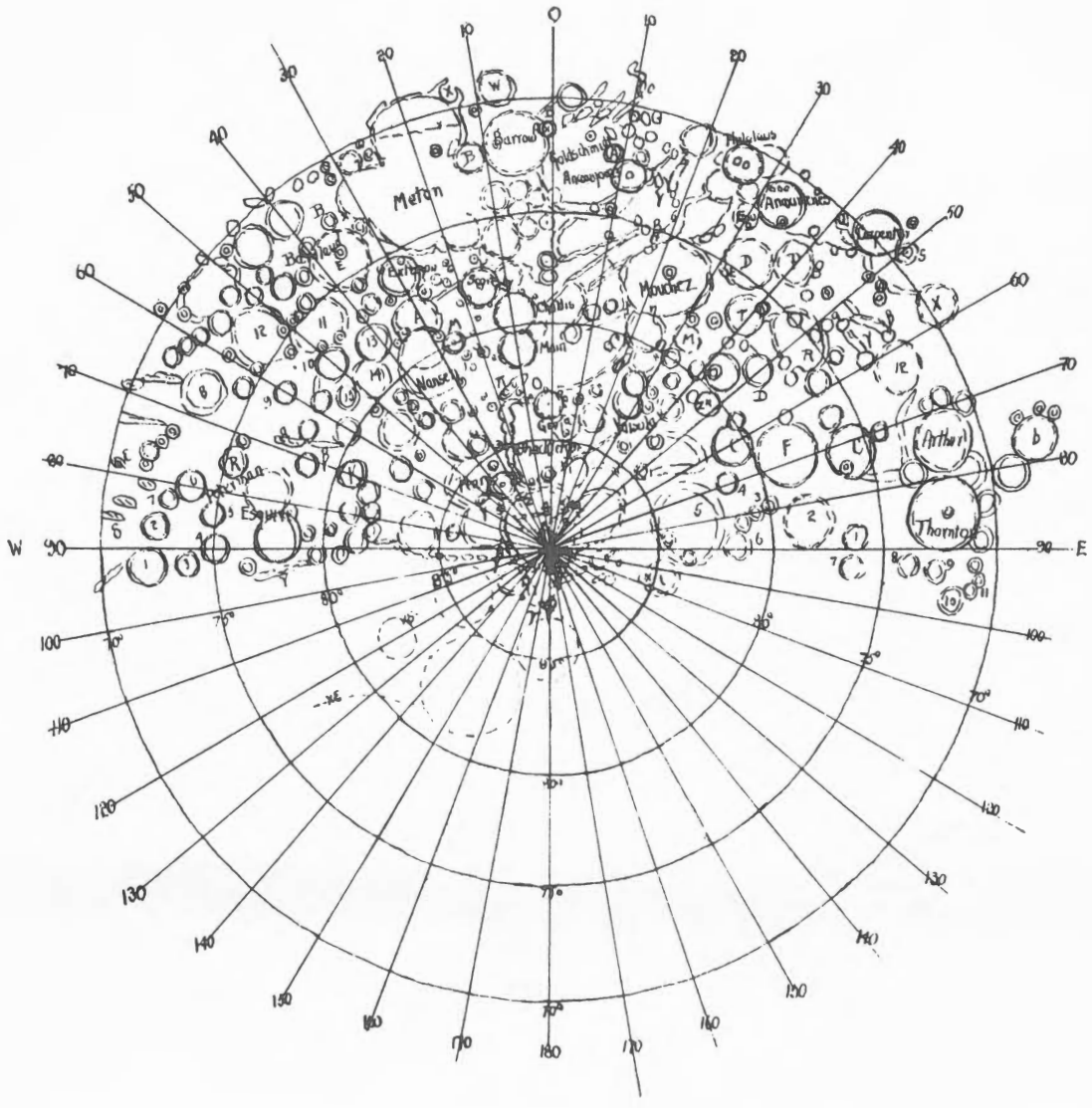
We fear that the mysteries of Bartlett, the old Maedler's Square, indeed admit of no solution with evidence now available. Barcroft urges that small changes in solar lighting and libration cause great changes in the appearance, and naturally the effects of libration in latitude are near maximum for an object so near the north limb of the moon. Reese, Bartlett, and Haas, however, have observed only expected minor effects from small changes in lighting and libration; and none of them has ever seen anything even to suggest remotely how the poorly bounded enclosure can be seen as a strikingly geometric Square. Photo-

graphs which the Editor has examined, the oldest in 1863 and 1865, all show only the "modern" very unremarkable poorly outlined enclosure, not the "classic" Square. It may be that assiduous searching will eventually produce two simultaneous observations of the Square, the one showing the "modern" ruin and the other showing the "classic" Square. If so, we shall have strong presumptive evidence that some of the observers have truly bungled badly here. Meanwhile, the region deserves to be carefully observed by our members with Dr. Bartlett's discussion in mind. Even better would be a prolonged photographic study.

OBSERVATIONS AND COMMENTS

Figure 2 on pg. 122 is a drawing of the lunar carter Ingalls by Mr. P. A. Moore with the 33-inch refractor at the Meudon Observatory. This crater has been named in honor of Mr. Albert Ingalls of The Scientific American, the longtime friend of all amateur astronomers and the winner of the Astronomical League Award in 1951. Crater Ingalls is of interest because it contains a large interior crater, whose rim is seen on Figure 2 as a white line within the large interior shadow. Mr. Moore thinks that his drawing shows this internal crater as it really is and that it is shown too small and too nearly circular on lunar maps. Crater Ingalls lies a little north of Riccioli and is seen best about a day before full moon.

E. E. Hare observed the lunar crater Conon at colongitude 18°.4 on June 1, 1952 with his 12-inch reflector. He compares his view to the Meudon drawing by H. P. Wilkins at colongitude 16°.2, Figure 5 on pg. 83 of The Strolling Astronomer for June, 1952. Two of the white spots drawn by Wilkins were seen by Hare to lie on Streak Z. Hare saw Cleft V and a deep ravine between Hills P and R. The south end of Cleft V made a noticeable dent into the foot of Spur J forming a crater pocket not far from the depiction of a crater in Wilkins' drawing. The nomenclature for Conon is given on Figure 1 on pg. 83 of the June issue.



NORTH POLAR.

Altitude:- Gioja 1.- 9000ft.
" 2- 8000.
" 3+4 - 3500.
" γ - 7000. (Long 174°47'; Lat. 86°44'N)
" α - 9500.
" β - 9800.
" β - 8000.
Malapert α - 25,500 ft. (Long 35°E. Lat. 87°30'S.)
" β - 26.000.
Leibnitz ε - 30.000. (Long 37°W. Lat. 79°S).
" δ - 26.000.
" γ - 27.100.

The Northern portion:-
Based on Observations by H.P. Wilkins & P.A. Moore.

SPECIAL SECTION OF THE H. P. WILKINS MAP OF THE MOON

SHOWING THE NORTH POLAR REGIONS

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