A Study of the Mysterious 'Black Ray' of Antarctica

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Abstract

Four photographs of a striking atmospheric effect resembling "a black ray of light" have been described as showing "a unique meteorological phenomenon" or something even more mysterious. Analysis proves that the photographs are consistent with an unusual but well-understood atmospheric-optical phenomenon.

1. Background to the mystery

In 1982 author Paul Devereux published a book called *Earthlights* concerned with luminous aerial phenomena of possible geophysical origin. In it he published two photographs showing clearly an odd dark linear feature in the sky above a snowfield and distant snowy mountains (Fig 1). The dark feature appeared to emanate from a cloud. The photos were apparently taken from an expedition campsite in Antarctica. Devereux's caption read as follows:

> A 'unique meteorological phenomenon' observed on the Fuchs Ice Piedmont, Adelaide Island, Antarctica, by Ulster explorer Eric Wilkinson, late of the British Antarctic Survey, who commented 'the cloud emitted a thick black ray of light which hit the ice at an angle of 45 degrees and churned up a "snow devil"'. Totally inexplicable phenomena like this prove that scientists do not yet understand all the mechanisms occurring in our atmosphere. (Devereux 1982)

No further information was given. But some years later the newsstand magazine NEXUS published a multi-part article by James Roberts defending the startling claim that "At the end of World War II, Britain sent a covert mission to Antarctica to seek out and destroy a subterranean Nazi haven." In a postscript to the final part the author mentioned that he had been "inundated" with related information and singled out what he called the "1966 British Antarctic Survey Mystery":

> However, by far the most intriguing and exciting was an email sent to me by Miles Johnston who investigated a strange story about Antarctica with Danny Wilson whilst with the Irish UFO Research Centre. The centre was contacted by an Eric Wilkinson in 1975, who had reported a strange incident in 1966 when he was with the British Antarctic Survey. An even stranger photo backs up the story (see above). In Miles Johnston's own words, he explains: "In 1975 I investigated a UFO/Strange Black Ray Cloud formation, taken by a Belfast member of the British Antarctic Survey. He gave me some images of a pulsing cloud formation firing a black ray into the ice, which bounced off and reflected further away from him. Who knows...maybe someone down there is using negative energy beam weapons? Or was...since the images were taken in 1966." (Roberts 2005)[2]

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2 Issue contents and download available from Nexus Magazine

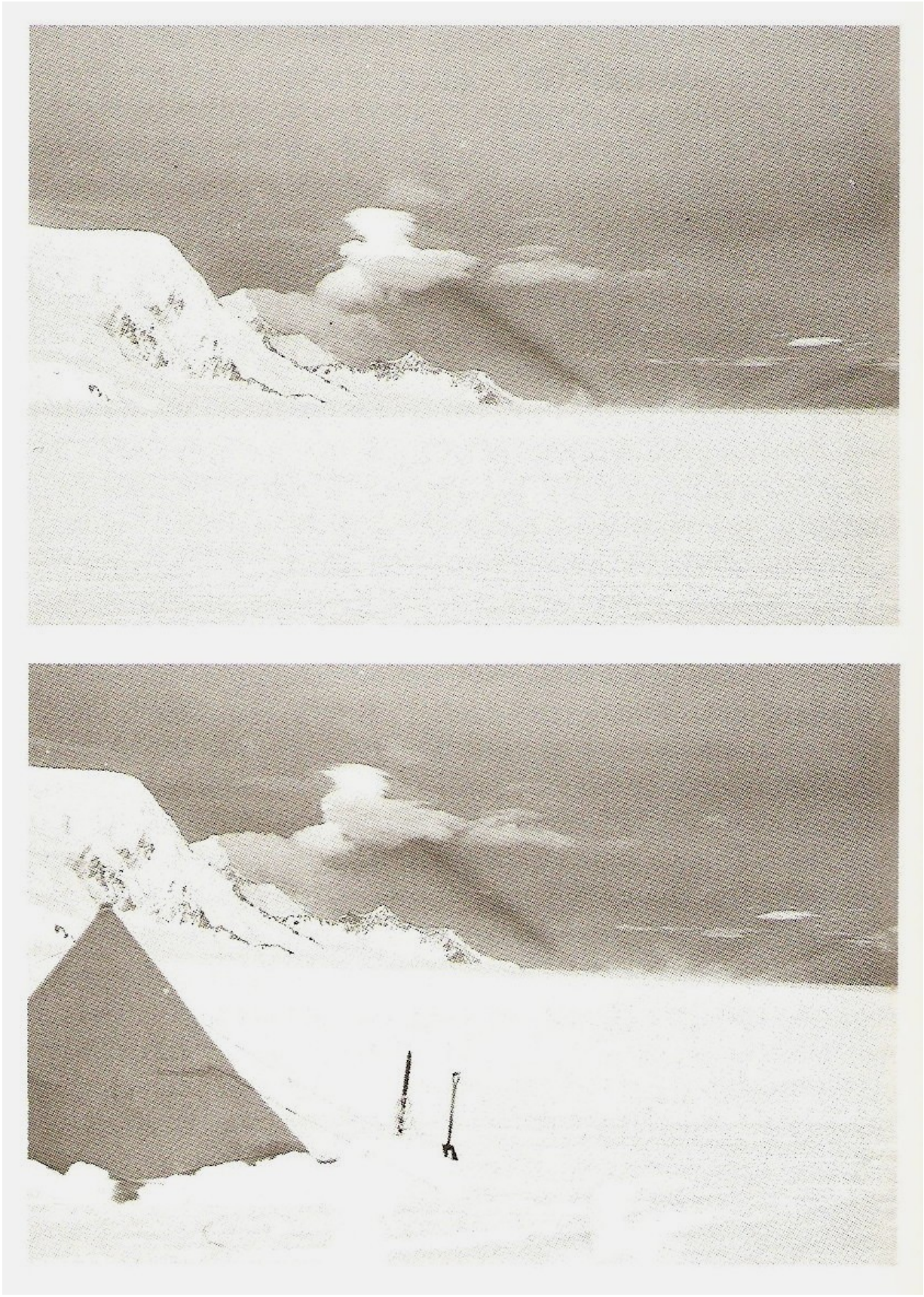


Fig.1 Two of the Wilkinson photographs from Paul Devereux's *Earthlights* (1982)

Roberts' article was accompanied by a fairly good quality scan of one of the same prints (Fig.2) which for a time was available online at the NEXUS website.[3]

Then in January 2007 the case was raised by Jenny Randles on a UK ufology mailing list, remarking that "the link between UFO reports and clouds is self evident to any study of the historical data" and citing "the very interesting cloud and dark light tube photographed during the 1966 Antarctic survey" as evidence of an extraordinary natural UAP. It was one of an "abundance" of cases, she said, that "suggests to me a significant clue as to the nature of the physical forces that happen when these things are encountered."[4] The present author responded with the suggestion that the dark streaks might be "some unusual but conventional shadow effect . . . the shadow of a dense cloud or a high contrail cast through a lower region of haze that is scattering sunlight."[5] Randles countered that "the dark light tube features in a number of interesting cloud/UFO cases. Moreover, there appears to be evidence on the photo for disturbance of the surface snow where the beam touches down."[6]

Fig.2

Closer examination of the images in Fig.1 and Fig 2 shows that the "reflected" ray is apparently composed of several different lines converging on a radiant point just below the horizon. An enlarged detail is shown at high contrast in Fig.3. Bearing in mind the basic optical principle that the angle of reflection from a plane reflector is simply equal to the angle of incidence, the variety of angles evident in Fig.3 seems to suggest that the reflection effect is an illusion, and the impression of a disturbance near the point of "impact" is probably due to fortuitous plumes of blown snow. If so, it remains to explain what could cause such a display of radiating dark and bright features.

3 http://www.nexusmagazine.com/articles/SecretWar3.html
4 Randles, J., Ufologyinuk list post, 12.01.2007
5 Shough, M., Ufologyinuk list post 12.01.2007
6 Randles, J., Ufologyinuk list 15.01.2007

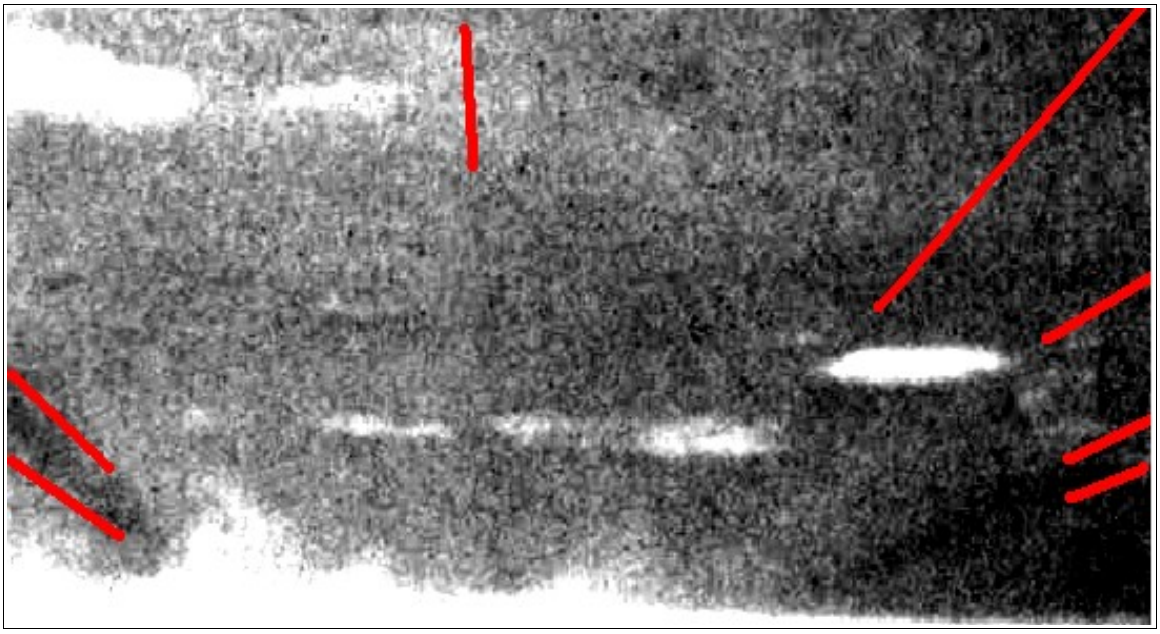


Fig.3

The second photo published by Devereux (1983) shows foreground detail including a tent and upright shovels. Obviously the sun elevation in Antarctica is always low, yet there are no visible shadows cast on the snow from the tent or the shovels although the high cloud above the mountain, in particular, appears to be brightly lit. This might indicate that any surface shadows are hidden because they are running away from the camera, cast by a sun low in the sky behind the photographer, and/or that there is insufficient direct sunlight falling on the foreground snow to cast discernable shadows.

In Fig.2 the camera-facing sides of ski furrows in the snow near the tent do appear to be lit from a direction roughly behind the camera. If the sun were located somewhere off to the left or right of shot, forward of the film plane, then shadowed vertical surfaces inside furrows and footprints might well be softened and lightened by indirect sunlight scattered back from the near faces of the depressions; but this light has to undergo two reflections. It seems unlikely that it would be as bright as sunlight scattered directly forward towards the lens off the surface of the unshadowed snow. But in fact these vertical surfaces are not merely as bright, they are notably *brighter* than the open snow in the photo, again suggesting a sun position behind the camera.

This position appears consistent with other features: The camera-facing side of the high cloud-tower near the middle of shot appears to be brightly and directly lit, as do the mountain slopes facing the camera. This last indicates that the sun is not just out of the frame to the left of shot - i.e., forward of the film plane and "behind" or "above" the mountains, because the solar elevation never exceeds 44º in Antarctica even at noon in high summer. The shadow detail on the slopes does not suggest illumination from the far right of shot either, but rather from somewhere behind the camera.

If the sun is behind the camera then it is possible that that the lens is pointed approximately South in the direction of the antisolar point, which, with the sun close to the Northern horizon, would be close to the opposite, Southern, horizon.[7] So there is a *prima facie* likelihood that the antisolar point

7 The antisolar point on the celestial sphere lies on the projection of a line from the centre of the sun passing through the observer's eye.

is close to the perspective vanishing point of the "rays". If these two points coincide then the obvious conclusion would be that the rays are shadow lines cast through bright haze by parts of the clouds in the photo. Or, to put this another way, the brighter areas between the darker streaks are phenomena called anticrepuscular rays.

Admittedly the anticrepuscular ray theory was based purely on inference from the photographs. Circumstantial detail was lacking and certain assumptions needed to be made. As mentioned, some correspondents were sceptical of this interpretation, some still preferring to see a ray of "black light" emitted by a mysterious cloud and bouncing off the ice amid a cloud of snow. Yet this claim lacked force because the basic information needed to test alternative theories had apparently never been sought.

2. A first-hand narrative

The first step in rectifying this omission was to try to establish the provenance of the photos. To this end an appeal was made for further substantive information on the photographer and/or the circumstances. Initial responses were not promising.

An online search for information about 'Eric Wilkinson' also came up with nothing. It was not possible to find a meteorologist with this name in archived Bulletins of the British Antarctic Survey for the years around 1966.[8] Miles Johnston from the 'Irish UFO Research Centre', who was said to have been the original contact for Eric Wilkinson in 1975, was located but a request for specific information[9] was met with an uninformative and uncooperative response. "I've got a lot on," Mr Johnston explained.[10] A separate approach to author Paul Devereux [11] elicited the information that owing to the passage of years he was unable to recall anything useful about the story or the route by which it had come to his notice, and that although the prints reproduced in *Earthlights* were possibly still somewhere in his possession, he was unable to lay hands on them.[12]

Meanwhile a prelimary glance at an atlas established the position of Adelaide Island just South of the Antarctic Circle at about 68º latitude off the West coast of the Antarctic Peninsula (the mountainous spine of land snaking North towards Cape Horn and the Falkland Islands). Large scale maps of Antarctica (Fig.4) revealed the orientation of the tear-drop-shaped island's major geological features: A chain of mountains running roughly North-South down the East side of the island flanked on the West by an enormous expanse of low-level ice declining gently towards the sea over a distance of about 20km (12 miles). This feature is the Fuch's Ice Piedmont, a vast shelf which was indeed the main site of the British Antarctic Survey expedition during the relevant time frame.

At length some progress was also made in establishing the details of the observation thanks to correspondent Kevin Pace[13] who kindly passed on information about an early published source, an issue of the periodical *Journal of Transient Aerial Phenomena* which the author was then able to locate in his own files, finding therein the letter from Eric Wilkinson[14] which is reproduced here in part as Appendix A. The letter was accompanied by two more photos of the dark "rays", making four in all, adding significant information even though the reproduction quality is atrocious (see Fig.9)

8 http://www.antarctica.ac.uk/about_bas/publications/bas_bulletins/index.php
9 emails
10 email
11 email
12 email
13 Kevin Pace, email to the author Feb 11 2007
14 JTAP (BUFORA) Vol 2, no.1 May 1981

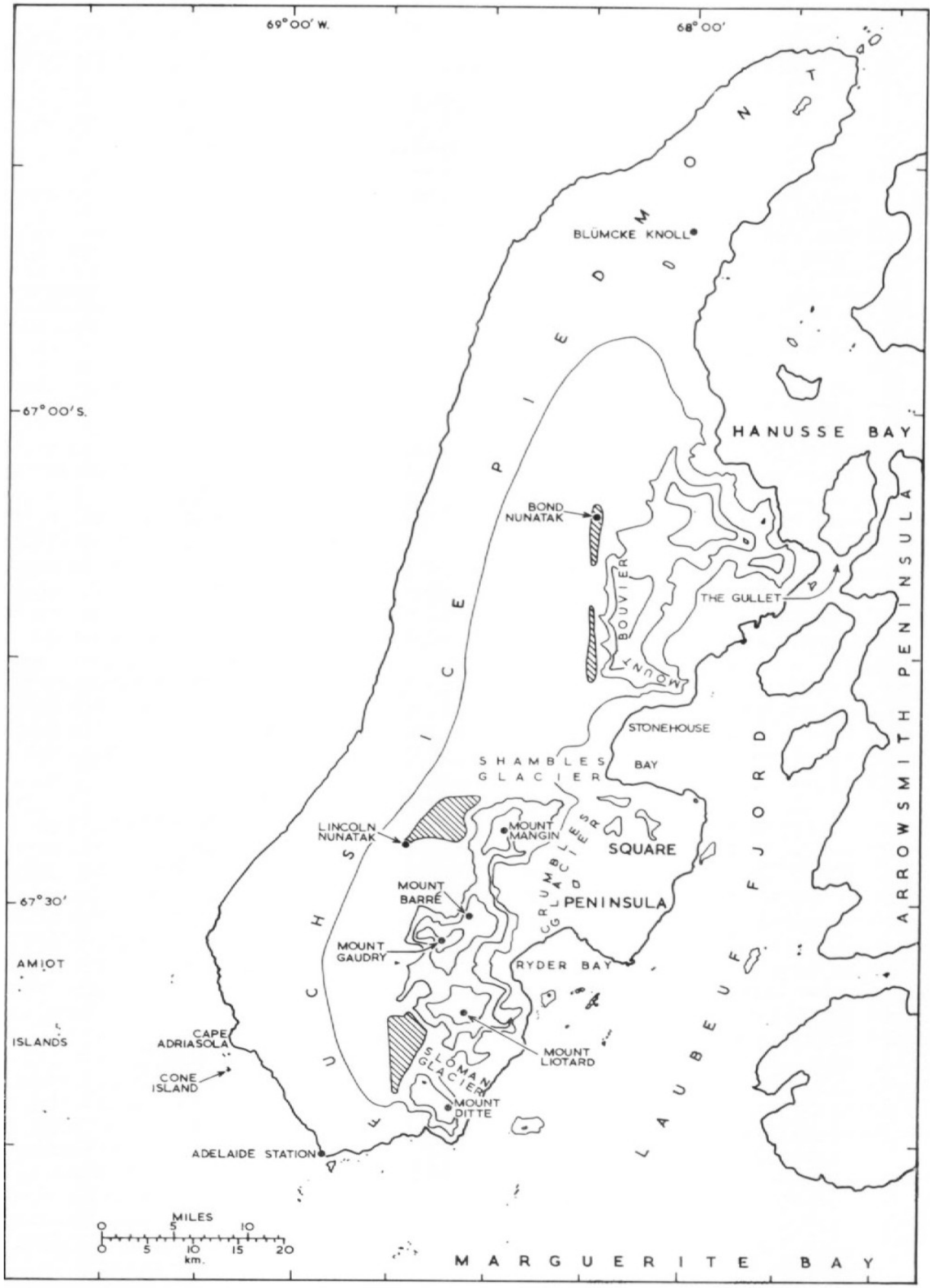


Fig.4. Adelaide Island and the Fuchs Ice Piedmont, showing 500m (1640ft) contours.

(from Dewar, G.J., 'Some Aspects of the Topography and Glacierization of Adelaide Island', Bulletin of the British Antarctic Survey, No.11, 1967, p.37 - 47. http://www.antarctica.ac.uk/about_bas/publications/bas_bulletins/index.php)

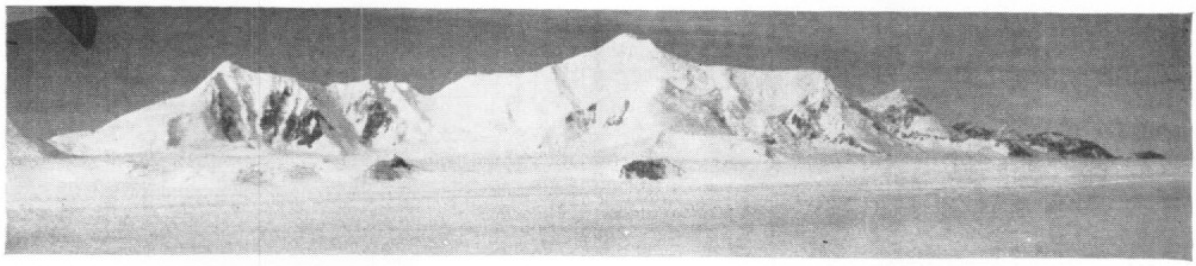
The first important thing we learn from this letter is that that Eric Wilkinson apparently did indeed exist.[15] There are one or two things to note regarding provenance: The letter, published in the JTAP "Correspondence" pages in 1981, is not itself dated, but was evidently written in 1976, since Wilkinson ends with the comment that he still finds the event puzzling "ten years later". However, Vol.1, #1 of JTAP was not published until 1979 so this letter was not written to the editor of JTAP. Where did it come from? That date seems to correspond roughly to the date that we are told Miles Johnston first obtained the story from Eric Wilkinson in Belfast, so one might infer that this letter was written to Johnston and later passed on to somebody at BUFORA.

A second point of note is that whilst the letter appears to confirm that the photos were taken in Antarctica, more or less as advertised, the story told by Wilkinson contains some features that would not be guessed from the photographs and which cast the observation in a rather more remarkable light. He says the sled dogs seemed upset by the phenomenon. He also describes hearing a "low buzzing sound like bees" at the time and compares the sound to an experience with mountain-top electricity in Switzerland, adding that the white cloud was visible for 15 minutes and was "alternately expanding and contracting" whilst rising vertically at a rate of about 10 ft/sec. It was about 5 miles away near Mt.Gaudrey, at 500-800ft altitude and about 100 ft by 100 ft in size.

On the face of it such details throw the atmospheric-optical explanation into doubt. Unfortunately these descriptions date from 10 years after the event, and unlike certain other controversial observations[16] we don't have any contemporary written record that can be used to callibrate the witness's recollection. On the other hand Wilkinson, a professional meteorologist, could reasonably be regarded as an "expert witness" and we do have a photographic record. So we should be able to do something with this.

3. Geography, topography and photogrammetry

It proved easy to establish beyond doubt that the photographs were taken on Adelaide Island from the approximate position claimed, and in a location which is consistent with the British Antarctic Survey presence on Adelaide Island around the date in question.



7. Oblique air photograph of Mount Gaudry (centre) and Mount Barré (upper left), showing the high platforms on Mount Gaudry. The scarp west of Mount Mangin (nunataks, centre) separates the uniform surface of the Fuchs Ice Piedmont (foreground) from a similar higher surface close to the mountains. The line of the scarp continues southwards in the collinear ends of the western ridges of the mountains, and it extends to the scarp west of Sloman Glacier (extreme right).

Fig.5 Mount Gaudry, Adelaide Island, photographed from the west(http://www.antarctica.ac.uk/about_bas/publications/bas_bulletins/index.php)

15 Some doubt about this would not be unreasonable given the null result of earlier inquiries. Wilkinson describes himself as "senior meteorologist with the British Antarctic Survey from 1965 to 1968" so one would expect to find his name recorded in the BAS Adelaide Island records. But so far the author has not found it listed in available BAS Bulletins for the years around 1966.

16 E.g., the RAF Lakenheath-Bentwaters radar-visual observations of August 1956 where twelve-year-old witness testimony was impressively corroborated by secret documents released later.

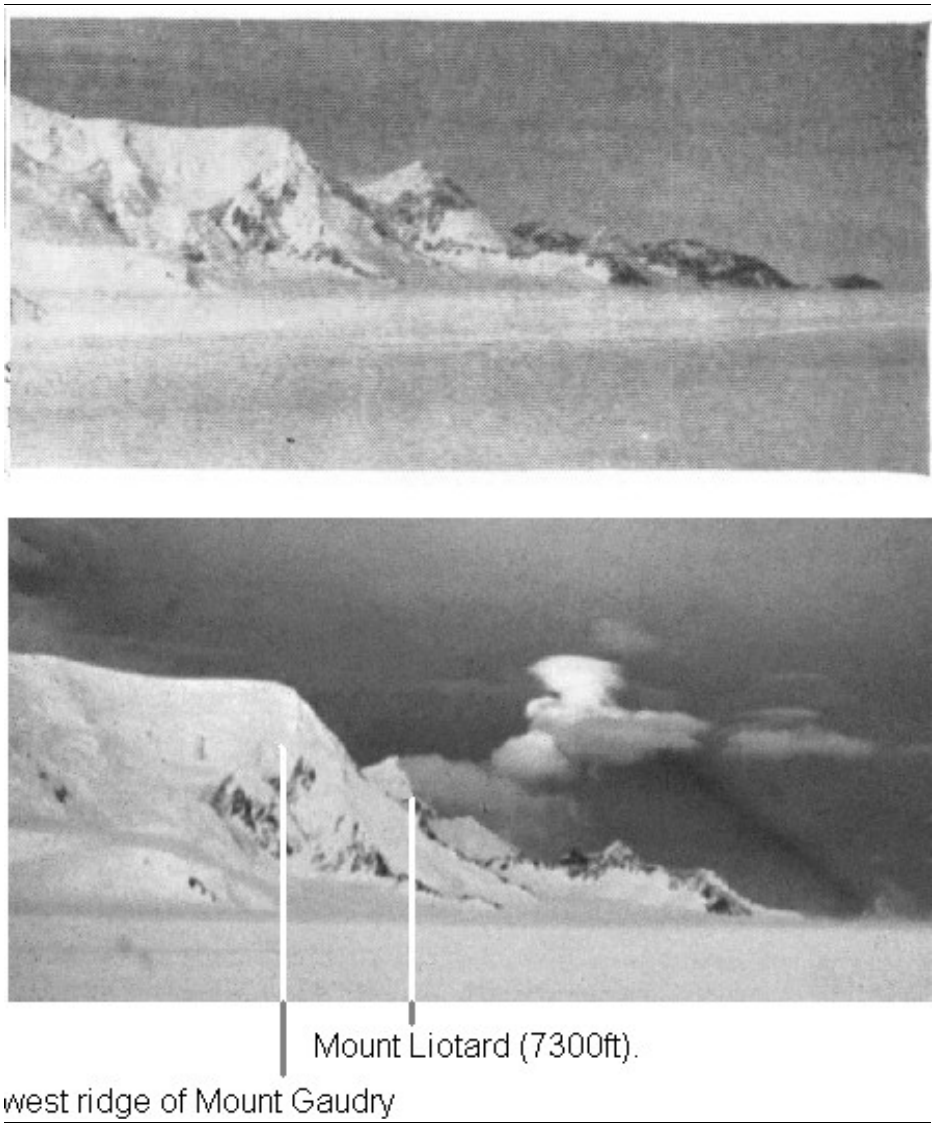


Fig.6. Topography in the Wilkinson photo (Fig.2) compared with a British Antarctic Survey photo (Dewar, 1967)

Fig.6 shows one of the Wilkinson photographs (lower photo) compared with a detail from a photograph in an article from the British Antarctic Survey Bulletin (Dewar, 1967). The Dewar photo is an aerial shot and the compass bearing of the line of sight is evidently somewhat different, but the landscape features are clearly identifiable, in particular the Mount Gaudrey spur and the sharp 7300ft (2225m) peak of Mount Liotard partly obscured by a plume of cloud (the latter perhaps a mountain wave cloud caused by adiabatic uplift of moist east winds in the lee of the peak).

The topographical match proves that the photo direction must be roughly south, consistent with the inference initially made in Section 1 from lighting conditions and reinforced by Wilkinson's letter stating that the white cloud was "to the south" of his position on the Fuchs Ice Piedmont. Wilkinson's identification of Mt Gaudry appears to be approximately accurate, although the white cloud is probably somewhat further south than Mount Gaudry proper, nearer to the sharp peak of Mount Liotard and the Sloman Glacier beyond.

An attempt was made to match the exact camera position of the Wilkinson photographs. They were evidently taken from somewhat South and/or West of the aerial photo location in Fig.5. The estimated 5-mile distance to the mountains appears to be an underestimate. The best match achievable by trial and error on Google Earth indicated a position near

67º 33' 28.26" S 68º 42' 28.8" W

A view from these coordinates is shown in Fig.7. A perfect match proved impossible, presumably owing to smoothing approximations in the GE digital elevation model. (A vertical exaggeration has been applied to Fig.7 in order to emphasise the features.) Hence it was not possible to determine a unique compass direction for the line of sight. The best approximation seemed to be to bracket the LOS somewhere within a ~20º pencil of bearings as shown in blue in Fig.8.

Fig.7 Google Earth rendering of the view towards Mt Liotard.

Next some simple photogrammetry was used to determine the approximate angular scale of the photographs: Having identified Mt Liotard, known to have a height of 7300ft AMSL, the typical height AMSL of the inland areas of the ice shelf (~1000') was subtracted to yield an approximate height above local ground level of 6300ft, 14 mi from the determined camera position, from which we find that the peak is approximately Tan 1.193/14 = 4.9º above the level ice shelf and the angular FOV of the image in Fig.2 is about 37º by 24º, which seems reasonable for a slightly-cropped print of a neg from a typical camera with a standard lens.

This angular scale was then used to further test the antiscrepuscular ray theory which, if correct, would allow us to predict the sun azimuth and elevation from the fact that, given level ground, the negative or depression angle of the antisolar point below the geometric horizon equals the positive horizon angle of the sun. *Ex hypothesi*, this point would be the radiant point of the several beams indicated in Fig.3 whose angular distance below the apparent horizon can be read off the photo. The approximate value is 1.7º.

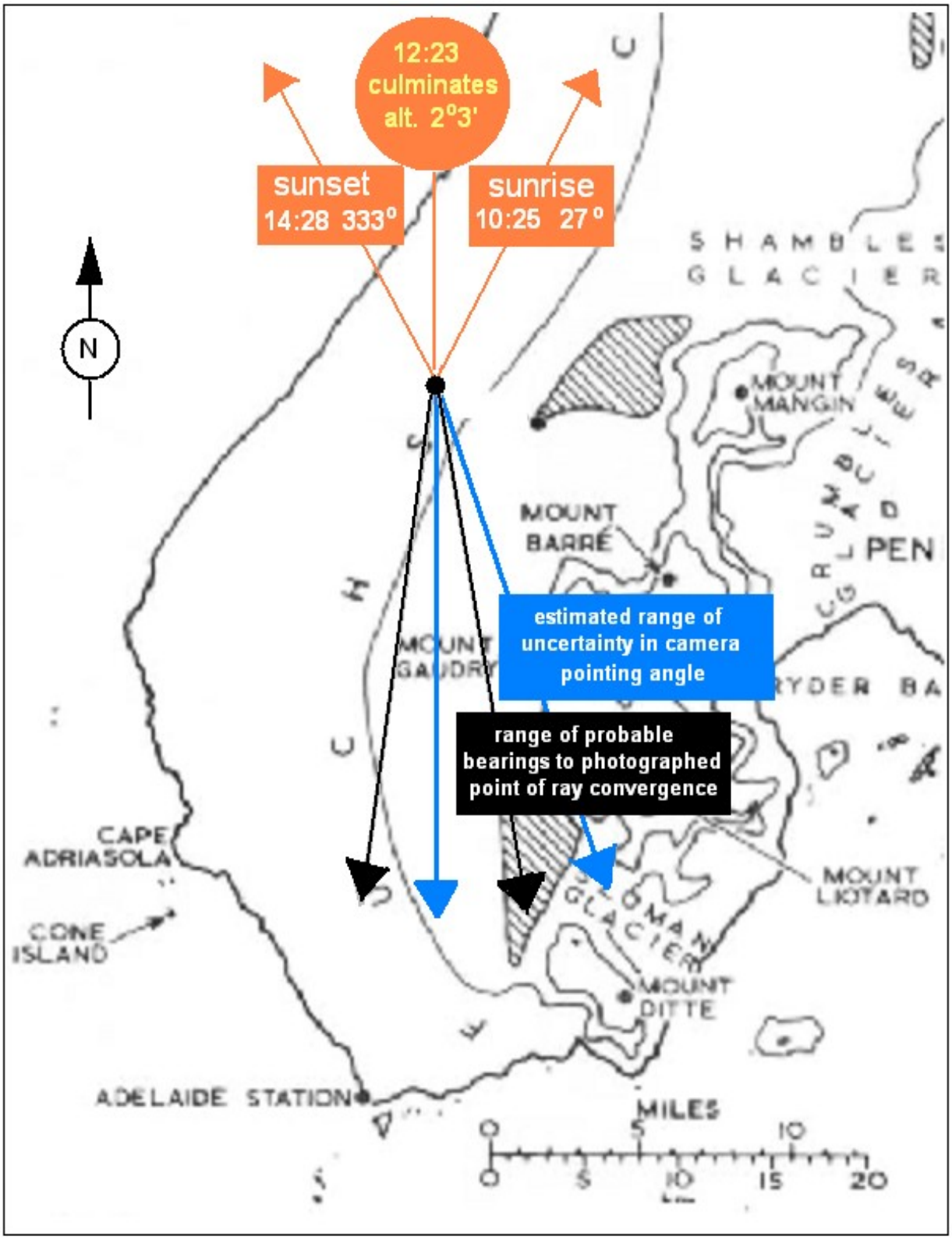


Fig.8. Estimated camera position and pointing angle in relation to sun position May 22 1966

Taking detailed account of topography is of course not possible without knowing a precise position. Although the location is on a generally flat ice sheet, elevation apparently rises somewhat away from the camera position in the direction of the mountains, although less so in the antisolar direction the more westerly the bearing one selects from the range in Fig.8. There may also be slight local prominences associated with sub-ice features such as the relatively nearby Bond Nunatuk

(Fig.4). So -1.7º ± 1.0º was taken to be a reasonable bracketed approximation. A mean azimuth was estimated from the range or pencil of possible orientations of the camera axis, as in Fig.8, offset by the off-centre angle of the hypothetical radiant point also measurable from Fig.2 as approximately 10º W.

Thus the predicted approximate azimuth and elevation values of the sun would be 360º ± 10º and 1.7º ± 1.0º respectively. When these values are compared in a digital planetarium program with solar positions seen from the estimated coordinates "early in the morning of May 22 1966" we find the result shown in Fig.8. The sun is just above the north horizon for 4 hours, rising at about 10:25 local and setting at 14:28 local, culminating at 12:23 at only 2º3' elevation almost exactly due north. In the context of so short a day, "early morning" is difficult to define, but might be taken to mean that the sun should be "up" yet more than an hour or so away from culmination, i.e. a little to the East of North and a little below ~2º above the horizon. Thus the predicted and actual values appear to be comfortably in the same range.

The consistency of these results strongly supports the antecrepuscular ray hypothesis but is at odds with certain aspects of the observation described by the photographer, EricWilkinson.

4. The eyewitness description

Wilkinson describes the bright cloud above the mountains as "100ft x 100ft" in size and at a range he judged to be 5 miles (see Appendix A). But a 100ft cloud at 5 miles range would subtend only about 10 mins of arc, a mere dot several times smaller than the moon and unlikely even to be noticed (and would be several times smaller still at the likely true distance of ~15 miles; see Fig.8). This implied angular scale would also require that the FOV of the entire image is not much over 1.5º in width, possible only with a very, very long telephoto lens situated far north of the tent out of which the witness tells us he had stepped just moments before. And of course the mountain heights would be reduced to only a few hundred feet, a factor 10 smaller than the known heights of conclusively identifiable summits. So clearly this 100 ft figure is wildly inaccurate by at least an order of magnitude.

One understands that observers are not equipped to make accurate judgments of size in the absence of useful distance cues, but this gross internal inconsistency between coupled values for range and size is discouraging for our confidence in other subjective impressions recalled by the witness after 10 years.

The claimed rate of ascent of this cloud also makes little sense. At a rate of 10 ft/sec it would rise 9000 ft during the reported 15 min duration of the observation, which corresponds to an angular elevation nearly half again as high as the mountain below (had the cloud been only 100 ft across, then it would have climbed through an altitude 90 times its own apparent diameter!). Yet although the photos show considerable change in the appearance of the cloud, which is breaking up and almost dissipating by the fourth shot (Fig.9; note also the significant change in the background cloudscape), it has gained no measurable elevation at all.

So there seems to be much less real action than Wilkinson describes and there is little doubt that the main culprit cloud was relatively large and some thousands of feet high. The story of an abnormally compact little cloud only 100ft across, expanding and contracting, and rising rapidly, is inconsistent with various measured and reported quantities.

The witness's description of the bright white tower of cloud as "like a rough pile of plates" is a classic description of orographic or mountain wave cloud, also known as standing wave *altocumulus lenticularis*, and inspection of Figs.1 & 2 shows also the characteristic chain of

lenticular clouds forming in the wave crests downwind of the forcing barrier (the mountain slope), decreasing in density and definition with the number of wavelengths. As a meteorologist Wilkinson ought to be familiar with orographic clouds, and indeed his letter acknowledges the similarity but dismisses it because this cloud was "so low, away from the mountains, and so small in stature". In fact it was clearly at some thousands of feet altitude, closely associated with the flow of air over the mountains, and at least 10 times as large as he supposed.

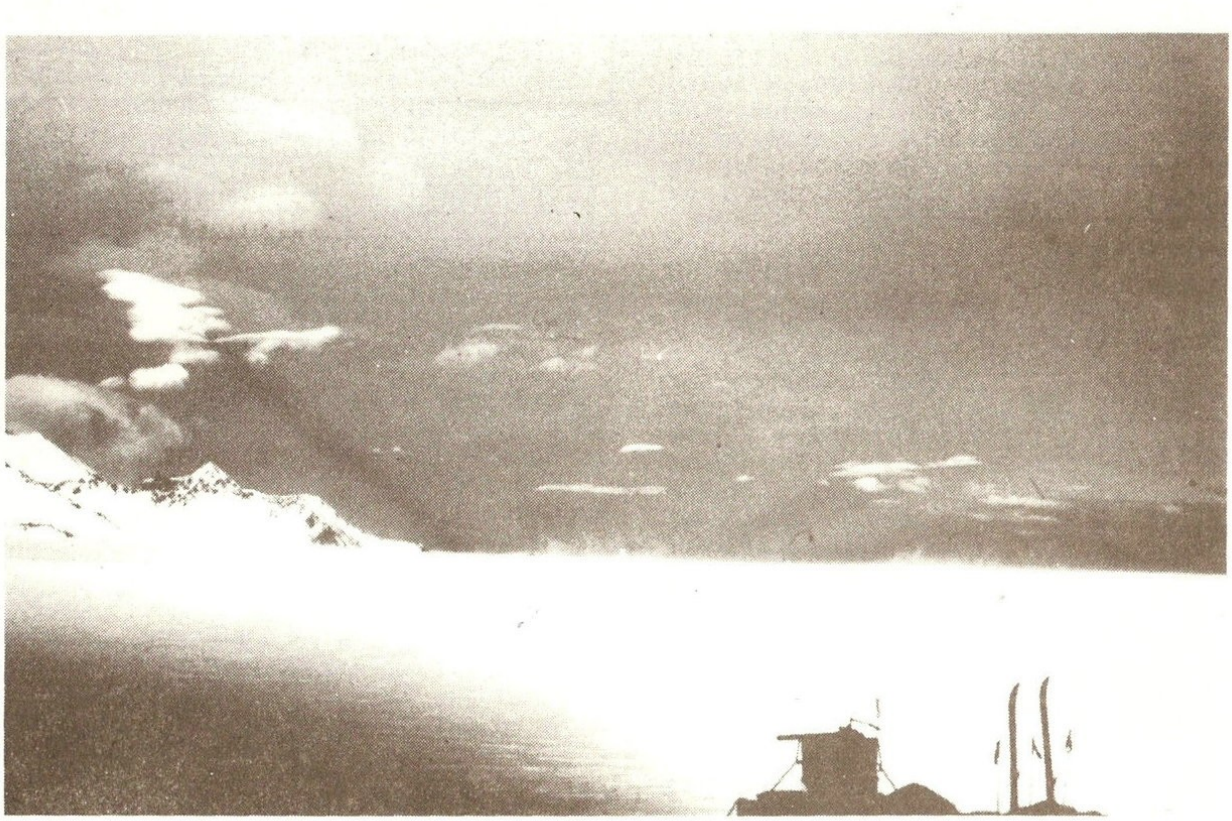


Fig.9. The fourth of the Wilkinson photographs

One might wonder why some other clouds in the photos are not so brightly illuminated as the tower casting the principal shadow. There are two main reasons for this.

Firstly not all types of clouds are equally reflective, their albedos vary dramatically from just a few percent to 80-90% or more. Some clouds are highly reflective, especially those with a high density of small droplets such as towering cumulus, and, because light scattered back is obviously light that doesn't penetrate, these bright clouds are those most likely to intercept enough light to cast a prominent shadow. Others are very poorly reflective and will not cast distinct shadows.

Secondly, solar illumination will not be constant over all altitudes and azimuths due to horizon obstruction, variations in other intervening clouds, haze extinction etc., and obviously two cloud masses that look in the same area of a photograph are not necessarily at the same positions in space. The white cloud in these photos, possibly towering up to 15,000 or more and casting its long shadow cone for many miles through a high veil of cirrus, is evidently of much greater intrinsic reflectance than other lower and/or more distant clouds, which may be in the shadow of the earth and/or in the shadow of one another.

The reported "buzzing" sound and the apparent disturbance of the sled dogs remain unexplained, but given the nature of the inconsistencies in the rest of Wilkinson's description we would be wise to rest our case on the physical evidence.

5. Conclusions

Rather than a UFO, or a "negative energy beam weapon" from a subterranean Nazi base, the photos almost certainly show anticrepuscular rays. These are long shadows cast, probably through thin cirrus, by denser clouds. Light scatters inside the thin cirrus and is faintly visible as a milky illumination, penetrated by long tunnels of shadow cast by the nearer clouds.

The perspective can seem puzzling. If the camera were turned 180 degrees the sun would be at the perspective origination point, and any crepuscular rays shining through cloud in that part of the sky would of course appear to radiate from the sun like the spokes of a wheel (or, inverting figure and ground, the shadows between them would radiate similarly) even though we know that light rays from the sun reach us nearly parallel because the sun is very distant. In just the same way the dark anticrepuscular "rays" are near-parallel because the low sun, behind the camera, is effectively at infinity; but they appear to converge at the far horizon (like railway lines) because this is the perspective vanishing point.[17]

The rays (there are in fact several rays visible associated with different clouds, not just one ray "fired" from the big cloud and seeming to "reflect" from the ice) actually converge on the antisolar point, which is the position on the sky defined by a straight line passing from the sun directly through the lens of the camera.

The theory assumes that the position of the antisolar point is just below the far horizon and therefore also predicts that the elevation of the sun would be very low on the horizon almost due North and directly behind the photographer. When checked (as far as is possible in the absence of very complete data) these predictions turn out to be consistent with the photographer's account of the compass direction, with the geography and topography of Adelaide Island, with the illumination in the photos, and with the azimuth and elevation of the sun from the best-fit camera position at the claimed date and time of the photo.

The plumes of snow on the horizon - only one of which is close to the apparent "reflection" point - are probably windblown and are coincidental. The photographer's description years later of anomalously rapid cloud movement appears not to be consistent with very small angular displacements measurable from the photographs. His recollection of a "buzzing" sound that appeared to spook the dogs is not explained, but this soft evidence is over-ruled by the hard contemporaneous evidence of the photographs.

17 This isn't necessarily easy to visualise. Imagine yourself on top of the mountain with a laser theodolite. Imagine the sun near the North horizon (behind the camera in the photos). You point the laser beam at the sun. Another laser points in the exact opposite direction. You then have a straight line running through your position from the solar point to the antisolar point, and the axis of your shadow cone lies along the path of the second laser. Suppose that the laser beams are visible by scattered light. Now put yourself back down on the ground by the tent and imagine where the beam appears. Now turn around to face the sun - the beam emerges from its perspective generating point (the sun) and rises away to your right, gaining angular elevation, arcs across the Western sky and then descends, passing through your surveying site on the mountain top and along the axis of your shadow cone, towards the perspective vanishing point below the Southern horizon.

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Journal of Transient Aerial Phenomena (BUFORA), Vol 2, no.1, May 1981, pp.10-11, 20

http://www.antarctica.ac.uk/about_bas/publications/bas_bulletins/index.php

Appendix A. Extract from the photographer's narrative

. . . Early on the morning of 22nd May 1966, I emerged from a tent on the call of Sgt. Major geirge Green R.E.M.E. and late of the Uganda rifles. The dogs had picked up something and were causing a commotion. We observed a small dense cloud to the south at about five miles, near to Mount Gaudrey above the Fuchs Ice Piedmont, Adelaide Island, Lat. 68º South. The white cloud was like a rough pile of plates and was rising vertically at about 10' per second. It began at about 10º - 15º from the ice and seemed rise up internally as a pillar with successive broken hoops of cloud. Its altitude was about 500' to 800' and its size 100' x 100'. The cloud was alternately expanding and contracting. A low buzzing sound like bees was perceptible. The cloud was visible for about 15 minutes before dissolving, although I cannot remember how it dissolved. At one point during the sighting the cloud emitted a thick black ray of light which hit the ice at an angle of 45º and churned up a "snow devil" . . . . A second ray was visible from the point of impact at about 110º to the first ray and seemed to be reflected upwards at about 30º to the horizontal. The light conditions were dull daylight, no sun; weather conditions were moderate, definitely not thundery as this phenomenon is not witnessed often in Antarctica, if ever. There was about 5kt of wind.

At the time, I rushed my camera into action and took several slides at 100th of a second at f11 in Kodachrome II 25 ASA film.

The phenomenon was not bright although I feel that one part of the cloud was reflecting a yellowish colour.

Since the sdighting I have been puzzled as to what kind of a phenomenon it was. I reported it in my meteorological report but no explanation was forthcoming. I personally doubt that it was anything more than a unique meteorological phenomenon but I am open to any offers. The noise reminded me of an electrical storm I experienced at 15,000' on the Dom in Switzerland, as static electrocity ran up and down my rope. I have also experienced orographic clouds piled up like plates, but not so low, away from the mountains and so small in stature. You can see from the photograph that it existed, but as to its origin or what it was, it is anyone's educated guess at the moment. I have an open mind still puzzling after 10 years.

Eric Wilkinson
Belfast
N. Ireland

[from Journal of Transient Aerial Phenomena (BUFORA), Vol 2, no.1, May 1981, pp.10-11, 20]
