The Trindade Island UFO:

A detailed study of Photos 1 and 2

by Martin J Powell

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Shortly after midday on 16 January 1958, a series of photographs were taken from a ship anchored off Trindade Island, about 650 miles from the coast of Brazil. The photographer, a Brazilian named Almiro Barauna, claimed to have seen a dark grey 'object' approach the island, fly behind a mountain peak and then turn around and head back the way it came, disappearing at high speed over the horizon. The object glittered and was surrounded by a green mist, and it displayed an undulating motion, changing to a 'tilted position' as it passed over the island. On board the ship with Barauna were some 300 other crew, and around 50 of them are claimed to have seen the object. The case is well documented and the reader is referred to several good reference books for a full account of events.

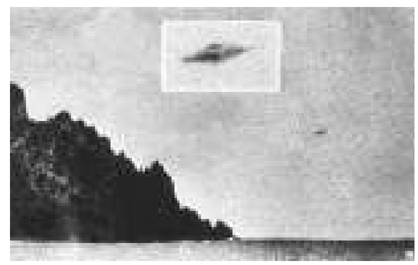

Photo 1. Barauna's first photo, taken from aboard the Brazilian Navy ship *NE Almirante Saldanha*. The object is seen a short distance out to sea, approaching the island *(click for larger image)*

The Trindade Island pictures were recently selected as one of 19 UFO cases in a report sent to various high-ranking government officials. The report seeks to draw their attention to the best available evidence for the existence of extra-terrestrial craft.[1] Indeed, the general consensus of researchers today is that the photographs may show a genuine alien craft.

Not all investigators of the case have believed the photos to be so convincing, however. In 1959 Harvard astronomer Donald Menzel thought the object in the photos was simply an aircraft seen through fog, though he later revised his opinion, claiming they were probably images of a model flying saucer which Barauna had super-imposed on plain photos of the island.[2] The US Naval Attaché's report on the case, submitted to Project Blue Book (the US Air Force investigation into the UFO phenomenon) also concluded that the photographs were faked, and the Blue Book panel subsequently sided with this conclusion.[3] An over-riding factor in many of these condemnations was the credibility of Barauna himself. He had been known to produce fake photographs (not exclusively of UFOs) and some years earlier he had even written an article howing how a famous UFO photograph taken some years earlier could have been faked.[4]

In this article I will examine in more detail the claims made by Menzel and the Preparing Officer of the US Naval Attaché's report, namely:

(a) to assess the likelihood that the object Barauna photographed was an aircraft, and attempt to identify the aircraft in question, and

(b) to assess the Preparing Officer's claim that one of Barauna's photographs showed an *inverted* image of the object shown in two of the other photographs (inferring that the images were double-exposed and hence faked).

Photo Descriptions

The photographs have been examined by numerous organisations over the years, and nearly all of them have concluded that the photographs were not faked.

Photo 2. The object passes over Galo Crest Peak on Trindade Island *(click for larger image)*

These include the Brazilian Navy's Photo Reconnaissance Laboratory, the *Cruzeiro do Sul Aerophotogrammetric Service* (a Brazilian civilian organisation), and the American organisations GSW, NICAP and APRO.[5] GSW believed the photographs showed 'no known aircraft or experimental balloon'. They estimated the object to be over 50 feet in diameter, and concluded that it was at 'a vast distance from the photographer'.

Barauna took six photographs in total, but the alleged saucer did not appear in two of them, apparently because of the jostling and general excitement of the sailors whilst witnessing the event. In order to examine the photographs methodically it would be wise to clarify the order in which Barauna took them. For the purposes of this study I will label them Photos 1 to 4 (abbreviated P1, P2, etc.). The first photograph (P1) shows the object approaching the island, a short distance out to sea. P2 shows the object over the island, and it is this image which the Preparing Officer claimed was inverted when compared to P1 and P3. The object then disappeared for a few seconds behind a mountain called Desejado Peak. P3 shows the object after its re-appearance and at its highest (apparent) point in the sky [illegible] elevation than it had previously been, [illegible]

do not bear this out). P3 is certainly the most intriguing image of the four. It shows an elliptical object with a dark 'ring' surrounding it (some writers have compared it to the planet Saturn). P4 shows the object as it heads out to sea, close to the horizon. Barauna snapped this final image, in his own words, when 'it appeared to stop in mid-air for a brief time'.

Aircraft Theory – Initial Considerations

Despite the claim of GSW and other writers that the object in the pictures bears no relation to any known aircraft of the time, and their rejection of Menzel's hypothesis, I believe there are reasonable grounds to compare one of the images to an aircraft. Whilst researching the case I came across a computer-enhanced image of P1 (by GSW) which I thought bore some resemblance to a twin-engined light aircraft.[6] With a little concentration, one can see a light plane approaching the island, viewed slightly to the right of the nose. The aspect of the plane, as described, is consistent with the direction from which the object was seen to originate. Further examination of the GSW enhanced image (and, indeed, the original P1) reveals other details which could be interpreted as individual aircraft parts. The main fuselage can be seen, lit from above, so that the underside of the aircraft is in shadow. Two 'disturbances' in the line of the wings can be seen a short distance either side of the fuselage, i.e. in the approximate location of the aircraft's engines. What has been assumed to be the dome of the flying saucer (the dark section at the top) can now be seen as the cockpit windshield. Finally, a peculiar protrusion below the aircraft – which I have never seen any previous reference to – can be interpreted as an extending (or retracting) nose-wheel.

Aircraft Selection

In order to test out this concept, I needed to determine whether any aircraft in service at the time could match the features shown in Barauna's P1. I referred to a comprehensive publication listing the aircraft in service during 1957-58,[7] and I selected a number of them using the following criteria:

(a) Aircraft in service in January 1958,

(b) Light aircraft (for this purpose, having an empty weight of less than about 2000 kgs),

(c) Monoplane,

(d) Twin engines, and

(e) Tricycle retractable landing gear (i.e., not fixed or of the 'tail-sitter' type).

The search resulted in five aircraft, and these are listed in Table 1, together with their size and performance data. The ranges of the aircraft are included to provide an indication of whether the aircraft could reach the island from the nearest land point (the return journey to Trindade Island from the mainland is around 1300 statute miles – there is no landing strip on the island). Architect and science writer Steuart Campbell points out that the object in the photograph appeared/disappeared at an azimuth of around 259°, i.e. just south of west.[8] Campbell uses this azimuth to support his claim that the object was a mirage of the planet Jupiter, however it is also worth mentioning that this is very nearly the direction of Rio de Janeiro (the nearest city to the island). Table 1 shows that at least a few of the selected aircraft could have made the return journey to Trindade. This strengthens the possibility that the Trindade object was an aircraft, however for reasons I will explain later, the question of whether an aircraft could reach the island might well prove irrelevant to the case.

Analysis

Having drawn up a list of candidate aircraft, I would then attempt to identify the aircraft seen in Barauna's P1. Firstly I would need to identify the features in P1 that could be matched against those of the real aircraft, and label them for reference. Points A to F represent parts of the aircraft measured in the horizontal plane (Figure 1). They include the port and starboard engine hubs and the nose of the aircraft. Additional points H, W and N are measured in the vertical plane (Figure 2), and these are all measured relative to the fuselage height (F). H is the height of the engine hub above the base of the fuselage, N the height of the nose, and W the height of the windshield. The horizontal points A and D are not 'fixed' points and are critically dependent upon the angle from which the aircraft is viewed, so it was therefore important to establish this angle with reasonable accuracy. Clearly the angle was shallow, being slightly to the aircraft's port (left) side. I estimated the angle, using a model aircraft, to be between 11° and 13°. I then photocopied plans of the candidate aircraft from a comprehensive directory, enlarging them sufficiently so as to enable me to locate the points A to F with a high level of precision.[9] I super-imposed a 'grid' on the plans so that I could obtain x and y co-ordinates for each of the points. I then scanned the image of P1 at a high resolution and levelled it so that I could locate the pixel points in relation to their correct geometrical axes.[10]

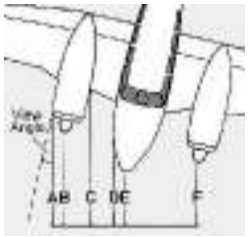

Fig 1. The horizontal points selected on the aircraft plans for comparison with the P1 object *(click for larger image)*

I needed to determine an approximate distance to the object, in order to minimise the effects of distortion. Campbell's research had provided me with the necessary altitude/azimuth scale to assess, with reasonable accuracy, the angular width of the object in the photograph, which in the case of P1 turned out to be 1°.54 ± 0.26. Knowing the aircraft's dimensions, simple trigonometry could then determine a distance to the object. Each aircraft was taken in turn, using its appropriate dimensions, so that each had its own computed distance in relation to the angular width of the P1 object. For example, the Twin Bonanza was calculated to have been 418 metres away from the photographer, and the Piper Apache 375 metres away.

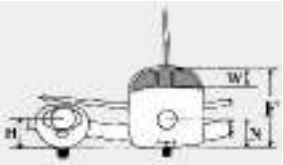

Fig 2. The vertical points selected on the aircraft for comparison with the P1 object *(click for larger image)*

I then wrote a computer program that would compare the positions of the points on the plan with those of the object in the photograph. Using a fixed point on the aircraft as a reference, the computer program would rotate the plan of the aircraft in small increments and measure the relative position of the points until they matched (or came closest to) their relative positions on the photograph. The most obvious reference point to use was that on the furthest left of the image, i.e. point A. This was therefore given a pixel value of zero, and the rightmost point (F) had a value of 208. The pixel values measured from P1 are shown in the top row of Table 2. Because of the poor resolution of the image in the photograph, each point has a range of possible values. The aircraft which best matched the one in the photograph would have its points A to F lying within the range of values in the top row. Table 2 gives the best calculated match of points for each aircraft, and also the viewing angle at which this was achieved. The table shows that the viewing angles of most of the aircraft lie close to the angles I had previously estimated. I have given the number of points which the aircraft matched (by definition, all of them matched the start and end points A and F). The final column, the total pixel error, takes the points which were *not* matched and sums the amounts by which the pixels fell outside the target value. For example, the Piper Apache satisfied all points except D, which fell outside the target range (64 to 81) by (85-81) = 4 pixels, hence this figure appears in the final column. The table indicates that the aircraft best matching the *horizontal* points of the Trindade object are the Beechcraft Twin Bonanza, the Piper Apache and the Cessna 310.

The results of the vertical point measures are shown in Table 3. Again, the top row gives the values for the Trindade object, with their associated error ranges. The table also gives two other measures; the dihedral angle and the nose wheel height. The dihedral is the angle, measured relative to the horizontal, of the upward cant of the wings. The Trindade object has 'wings' which clearly cant in an upward direction. Its dihedral angle compares favourably with that of a typical light aircraft, the results of which can be seen in the first column. The nose wheel height is only an approximate value (measured from photographs and not plans) which I have included for completeness. The aircraft best matching the *vertical* measures of the P1 object is the Twin Bonanza. This aircraft matches nine of the eleven measured features of the Trindade object – more than any of the other aircraft in the study. This aircraft must therefore be a favourite candidate for the object in Barauna's P1.

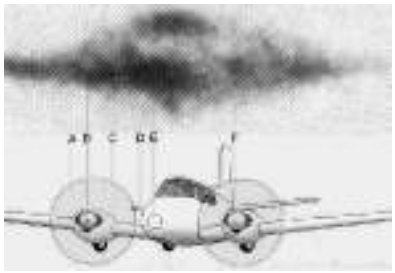

Fig 3. The P1 image shown above a reconstruction drawing of the Twin Bonanza *(click for larger image)*

Figure 3 shows an untreated image of the P1 object against my reconstruction drawing of a Twin Bonanza, viewed at the (calculated) angle of 13°.6 to port. To emphasise the similarities I have connected both images by vertical lines showing the location of each of the horizontal points (my reconstruction drawing is based purely on the Bonanza plans, and it does not show the aircraft in precisely the correct aspect. In order to match the P1 image more closely, the aircraft would need a slightly more nose-up attitude). The reader might try de-focusing the vision and standing back when looking at the P1 image. The image of an aircraft in P1 can appear more vivid using this technique.

Fig 4. Diagram showing why the tail-plane of the aircraft cannot be seen in the P1 image *(click for larger image)*

However, if we are to assume that the P1 object is a Twin Bonanza, it is clear from Figure 3 that the wingspan of the object in the photograph is much shorter than it should be. In fact, about half of the starboard wing and a third of the port wing appear to be missing from the P1 image. There are two possible explanations for this: over-exposure or double-exposure. Whichever was the case, the dark and narrow outer section of the wings were 'washed out' by the bright sky background. In fact, Barauna stated that he had used a shutter speed of 1/125 sec at an aperture of f/8. This had, by his own admission, resulted in a slight over-exposure of the picture.

If the P1 object is examined closely, one can see that the object is asymmetrical about the central 'dome' – a peculiar geometry for a supposedly saucer-shaped craft. The port wing fades away gradually, implying that the real object extends much further out than the picture indicates.

Comparison of Photos 1 and 2

I next examined the Preparing Officer's claim that the P2 object was inverted when compared to that in P1 and P3. The P3 object bears little obvious relation to P1, but P2 certainly resembles P1 in general size and form (P2 measures about 1°.3 across compared to 1°.5 for P1).

If any duplication of the images was done at all, it is reasonable to assume that P2 was copied from P1. When compared to P1, P2 is notably degraded. The 'nose-wheel' has become obscured by 'noise' around the body of the object, and there is less definition of the features within it. This is consistent with an image having been copied, much as an image becomes increasingly degraded when copied several times over on a photocopier.

I inverted the P1 image and adjusted it using computer software, in an attempt to bring its general appearance in line with that of P2. The result of this is shown in Figure 5, in which both images have been sized so that their features match as best as possible. By increasing the contrast and gamma properties of the image, P1 began to show a great deal more 'noise' around it, and after a while the similarities between the two images became quite clear. Most of the features are quite individual in shape and would not be expected to occur in another image, in the same relative position, by chance. And yet they are seen to occur in both photographs. As the edge of one image is followed around and compared with the other, notable similarities are found. For example, the 'dome' of the saucer (or the windshield of the aircraft) and the light area below and to the right of it are very similar in both images. The area around the nose-wheel (which is enveloped in the 'noise') and the left half of the image are also similar in both pictures. The reader should try viewing these images at an oblique angle; the similarities may appear more obvious this way. As a result of this experiment, I would say there is a strong case for P2 having been an inverted copy of P1, as the Preparing Officer had claimed.

Fig 5. The object in P1 (top) shown against the object in P2 which has been inverted *(click for larger image)*

Discussion

It follows from the above assessment that the Trindade Island photos might involve both an aircraft *and* a double-exposure process. The question remains as to whether an aircraft really was at the island in order to produce the first picture. I have shown that it was possible for a twin-engined light aircraft to reach the island and return to the mainland, although what the likely purpose of such a flight would be – and who would fly it - is unclear. Navigation

across 650 miles of sea would be difficult to say the least, and mostly out of the range of navigational radio beacons. Certainly, there is not (and presumably there never has been) any navigational guidance beacon on Trindade Island. With a round-trip journey time of over six hours it would have been a demanding task for any light aircraft pilot. Allowing for these factors, I conclude that there was *no* aircraft at Trindade Island. More likely, the aeroplane was photographed elsewhere and then super-imposed on the island background. This would help to explain why, as the Preparing Officer had noted, the island appears sharply focused in the photographs but the object itself is blurred.

Perhaps *all* of the images were derived from the *same* original - this having been a photograph of a Twin Bonanza, it seems. Barauna might have experimented with a picture of this aircraft, perhaps having noted - quite by accident - how it appeared like a flying saucer from the particular angle it had been photographed. He might then have re-photographed successive images of the aircraft, at different exposure and shutter settings, and perhaps de-focussing the camera, in an attempt to see how its saucer shape could be refined.

Since P2 is likely to have been copied from P1, there is no reason why P3 and P4 could not have been derived from P1 or P2. Clues to the image manipulation process might be evident in the photographs. If they are examined in turn, the objects seem to become faded and less sharp as they progress. The dark region forming the 'dome' of the saucer in the original photograph mutates and migrates erratically across the object in each successive image. It is at the *top* of the image in P1, but at the *bottom* of the other three images. The wings also become shorter and stubbier. However Barauna achieved this, the end product was far removed from the original, and it looked much more like an alien craft.

Some might argue that this apparent mutation simply reinforces the possibility that the object was one and the same alien craft. I would claim, however, that the erratic placement of the 'black spot', the sudden inversion of the object in P2 and its changing shape across the pictures demonstrates a lack of consistency in the behaviour and appearance of the object. None of the claimed witnesses made any reference to a change in shape or a sudden inversion whilst they were watching it.[11]

Other aspects of the case have in the past called into question the integrity of the pictures. Ronald Story points to the failure of the Brazilian Navy to obtain statements from the witnesses immediately after the event.[12] Consequently the actual number of witnesses is not known and has become the product of speculation rather than established fact. Peter Brookesmith explains how Barauna had retained the negatives for two days before the Navy obtained them from him for analysis, by which time he had already cut them away from the rest of the film.[13] It appears he had plenty of opportunity to doctor the negatives. Above all, given Barauna's proven ability to produce fake photographs, it is a remarkable coincidence that he should later witness and photograph a UFO himself. Perhaps Barauna was attempting to create his own version of the Barra da Tijuca photographs (1952), also in Brazil, to which the Trindade pictures bear a resemblance in both UFO appearance and scenic setting. In this study I have drawn attention to key aspects of Photos 1 and 2 which, I believe, provide good reason to doubt the authenticity of the Trindade Island pictures – considered for over 40 years to be one of the irrefutable cases of the UFO photo archive.

THE TRINDADE UFO PHOTOS: RECENT RESEARCH

- Kentaro Mori assesses the Trindade photos following his own independent study using scans of first generation prints. Includes *Flash* animations showing the image in Photos 1 and 2, where the similarities are seen to good effect (*Flash* plug-in required). For the first time, similarities are shown between *all four* UFO images (with contributions from Spanish researcher Manuel Borraz). Mori's ongoing research considers several other factors including: a comparison of first print scans from differing sources, thoughts on the possible double-exposure method, the position of the ship at the island, cloud formations seen in the photos, a mysterious 'retouched' print and technical considerations on Barauna's camera. With contributions from various sources.
- Tim Printy discusses Barauna's likely process of developing the negatives and addresses the issue of the over-exposure. Printy suggests that the Trindade photos could have been produced by a technique involving an 'internal mask'. He gives his own estimate of the ship's position and approximates the angular sizes of the UFO from the print scans. Printy's experience as an astrophotographer provides valuable insights not only into the Trindade photos, but also other UFO cases.
- Martin Shough responds to Printy's proposed technique and the image-inversion hoax hypothesis. He also studies cloud displacements between the photos, ocean current and wave motions around the island and the likely ship and camera positions. In his article 'The *Tracer* Hypothesis', Shough considers another, larger candidate aircraft for the Trindade UFO - a Grumman WF2 anti-submarine warfare plane, which was equipped with a dorsal radome.
- Alexandre de Carvalho Borges responds to the image-inversion hoax hypothesis and other issues (translated from an article which was originally published in *Revista Brasileira de Ufologia* (Brazilian UFO Magazine)).
- Since the above article was written, science writer Steuart Campbell has rejected his Jupiter mirage hypothesis (see Reference 8 below) and is now considering the idea that the Trindade UFO was a mirage of a distant aircraft, possibly departing from one of Rio de Janeiro's airports (personal communication).
- *Magonia* editor John Rimmer assesses the Trindade case from the perspective of the controversy surrounding the reported number of witnesses.
- The **magazine article featuring Baraúna's photos of a fake UFO**, entitled '*Um Disco Voador estêve em minha casa*' ("A Flying Saucer was in my house") has long been sought after by researchers into this case and was only recently traced by Brazilian researcher/historian Rodolpho Gauthier. A photo of the article, together with an English translation, appears at Kentaro Mori's site *Forgetomori*.

YouTube videos

- An interview with Almiro Baraúna, in Portuguese, conducted by Marco Petit in 1997 (Baraúna died three years later). This is a clip from a commercially-available DVD. No English translation is available at the present time.

- '*El Ovni de la Isla Trinidad*' (The Trindade Island UFO): a film in eight parts by Marcianitos Verdes, set to music:
  - Clip 1: The ship *Almirante Saldanha*, from which the alleged UFO was photographed,
  - Clip 2: Photographs of Trindade Island itself,
  - Clip 3: Maps, diagrams and photos of the island,
  - Clip 4: Newspaper articles, maps of the island and various documentation,
  - Clip 5: Almiro Baraúna, the *Icarai Underwater Fishing Club* & various UFO researchers,
  - Clip 6: Artists' impressions, etc.,
  - Clip 7: Baraúna's UFO Photos
  - Finale

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REFERENCES

1. *UFO Magazine*, July/August 1996, pgs. 34-38.

2. *UFO: The Government Files* by Peter Brookesmith, Brown Packaging Books Ltd., London, 1996, pgs. 131-135.

3. The report is reproduced in full in *The Hynek UFO Report* by Dr J. Allen Hynek, Sphere Books Ltd., London, 1978, pgs. 246-251.

4. The article was entitled 'A Flying Saucer Hunted Me At Home' and was published in a popular Brazilian magazine in 1953. It referred to a series of photographs taken by magazine writers Ed Keffel and Joao Martins at Barra da Tijuca in Brazil in May 1952. The Preparing Officer also referred to the article in his report [***Note Added January 2008:*** *see note in 'Recent Research' section above*].

5. The GSW analysis was performed by William Spaulding in 1978 and the APRO analysis by John Hopf in 1960. NICAP's results were published in *The UFO Evidence*, ed. by Richard Hall, NICAP, 1964, pgs. 90-91.

6. *UFOs and the Limits of Science* by Ronald Story, New English Library, London, 1981, Plate 6.

7. *Jane's All the World's Aircraft* edition 1957-58, ed. by Leonard Bridgman, Jane's Publishing Co. Ltd., London, 1958.

8. *The UFO Mystery Solved* by Steuart Campbell, Explicit Books, Edinburgh, 1994, pgs. 109-117. Campbell claimed that what Barauna had photographed was a daylight mirage of Jupiter, which was thrown about the sky by a weather phenomenon called a thermocline. Campbell's excellent research into the case unearthed many interesting details, much of which I have drawn upon for this study.

9. *The Observer's Basic Civil Aircraft Directory* by William Green and Gordon Swanborough, Frederick Warne and Co. Ltd., London, 1974.

10. The best quality image for the scan of Photos 1 and 2 was found in Story (ref. 6), Plate 7.

11. Story (ref. 6), pg. 110.

12. Story (ref. 6), pg. 111.

13. Brookesmith (ref. 2), pg. 134.

Aenigmatis UFOs

The Hawaii UFO Photo of 1989

The Nellis UFO Video Footage of 1994

The Rouen UFO Photo of 1954

Identified Flying Objects

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