

attitude towards minimizing this source of pollution.

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References

Fleury, W. (ed.), 1988. *The Report of the ESA Space Debris Working Group*, ESA SP-1109.
Malina, R.F., 1991. "In defence of Space Art: the role of the Artist in Space Exploration",

in *Light Pollution, Radio Interference and Space Debris*, David, L. Crawford (ed).
Murdin, P., 1991. "The threat to Astronomy by Space Art", in *Light Pollution, Radio Interference and Space Debris*, David, L. Crawford (ed).
Shara, M.M. and Johnston, M.D., 1986. "Artificial Earth satellites crossing the fields of view of and colliding with orbiting Space Telescopes", *Pub. Astr. Soc. Pacific*, **98**, 814–820.

Unidentified Object Over Chile

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During the night between January 23 and 24, 1992, a very uncommon object, in public terminology denoted as "Un-identified Flying Object (UFO)" passed over Chile. It was seen by thousands of people, from Villa O'Higgins (2100 km south of Santiago) to Copiapo (700 km north of Santiago and 200 km from La Silla).

Journalists of *El Mercurio* (the major Chilean newspaper) described the phenomenon as "a luminous cloud moving northward, from which suddenly grew a mushroom, like the one of an atomic explosion", and "similar to a spaceship with a tail, like the one of a comet"!

The object flew right over La Silla around local time 23^h20^m, and was seen by many of the observers and night assistants. The following description was compiled from the testimonies of several of them; all times are in the morning of January 24, 1992:

2^h15^m UT: (i.e. 23^h15^m local time): A small luminous ring with diameter about 0.5° is seen at west-south-west, 25 degrees over the horizon, moving slowly northward.

2^h15^m–2^h20^m UT: A small, sharp and bright object moves slowly, the ring expands to 5° in diameter, and a huge cone (40° long, 20° wide) follows the object.

2^h20^m–2^h21^m UT: it suddenly accelerates and moves rapidly to the west-north-west, 45° above the horizon. The main object becomes very bright (brighter than Venus!), remains sharp, and is surrounded by a small (1/4°–1/3°) ring (as seen with binoculars). It then becomes more and more diffuse and finally very quickly fades away.

Eric Aubourg, observer at the GPO (Brown Dwarf Experiment), had the good sense to take pictures of the phenomenon. The two exposures are shown in Figure 1 and 2. Even though we have until now no "official" confirma-



Figure 1: 10-second exposure around 23^h18^m (LT), on a TMax 400 film with a Leica camera, 35-mm lens, by E. Aubourg. This is an enlarged part of the negative. The object is seen, surrounded by the ring which is elongated by the motion during the exposure, and is followed by the cone.



Figure 2: 1-minute exposure from 23^h20^m–21^m (LT) with the same technical parameters. This, however, is a print of the entire negative. To the left the remains of the cone are seen. To the right, the object is fading away and finally disappears.

tion, this really looks like a satellite or the upper stage of a rocket re-entering the atmosphere. From the trajectory, it would appear that it was the re-entry of the 3rd stage of a rocket launched from the Baikonur Space Center.

Such an event has been seen several

times before in Chile, even though it was never watched by so many people. The rocket is launched towards south-east, in order to benefit from the Earth's rotation. The satellite is then released, and the upper rocket stage continues south. It then reaches the southernmost point

of its orbit and moves back northward, and finally burns when it re-enters the upper layers of the atmosphere. Because of the relative geographical positions of Baikonur and Chile, this last part of the trajectory may be close to the Chilean shores.

A Near Miss?

In the early morning of January 26, after a night of observations at the ESO 50-cm telescope, we left the dome and stopped to have a look at the beautiful dawn in the eastern sky over the Andean mountains. We were trying to find all the planets visible in that part of the sky. It was indeed a very nice constellation: the Moon, Venus, Mars, Ceres, Uranus and Neptune were all within a few degrees of each other; the technical term for this is a *syzygy*. Mercury and Saturn were also in that region, but they were too close to the Sun to be visible.

It was Alain who first noticed a bright, diffuse object in the south-east direction. It was moving towards north, about 15° over the horizon. We could follow it during about three minutes, then it was no longer visible as the morning sky became brighter and brighter. During that short time, it had moved over an arc of $\sim 20^\circ$ in the sky!

We checked the appearance of the object through 7×50 binoculars; it had a bright condensation of magnitude ~ 1 , surrounded by a 2° wide, circular nebulosity. Indeed, it looked completely different from a satellite or an airplane: it was much more like a comet. We took some photos of the object and one of them is reproduced here; due to its quite fast motion, it appears like a long trail.

From the observed form and brightness, we feel rather sure that this was not a usual artificial object, like a high-flying aircraft plane or a satellite (it was too bright and diffuse), nor a meteor (for this it was much too slow). From time to time there are some Barium and Lithium release experiments in the magnetosphere which may have this comet-like aspect (IAUC 5154, 5179), but they are normally even brighter. We checked with the coordination office for these experiments and learned that no release was planned for that period.

Even though the most reasonable explanation is that this was a man-made phenomenon, say, a satellite re-entering the upper atmosphere, it cannot be excluded that it had a natural origin. For instance, if a very small cometary nucleus passed very close to the Earth, it

might have this appearance. In 1916 – long before there were any airplanes and experiments in the high atmosphere, a comet-like object moving around 10° during one night was observed by Perrine and Glancy (private communication from Brian Marsden). Maybe this was the same kind of object. There may have been other similar events of which we are not aware. We are of course also reminded about the Tunguska event in 1908, which may possibly have been caused by a small

cometary nucleus entering the atmosphere, and exploding before it reached the ground.

Weighing all the facts, we are most inclined to believe that what we observed was actually a natural object, passing very near the Earth, although we would not entirely exclude that it may have had an artificial origin. But whatever it was, this experience was certainly interesting and unusual!

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Figure 1: The fast-moving "comet-like" object, seen from La Silla in the morning of January 26, 1992 ($9^{\text{h}}05^{\text{m}}$ UT), photographed with a 200-mm objective on 35-mm Fuji 400 ASA colour negative film. Its very diffuse, faint trail is seen passing just above the planet Mars, above the eastern horizon. The motion during the 20-second exposure was about 2° . Reproduction and contrast enhancement by H.-H. Heyer, ESO-Garching.