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Community.

Editor-in-chief.

Craig Roberts B.Sc (Hons)
*TRUTH, UFO Studies, Department of
Psychology, Totton College, Water Lane,
Totton, Southampton, SO40 3ZX, United
Kingdom. E-mail: ejufoas@totton.ac.uk*

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Aims and Scope.

The *European Journal of UFO and Abduction
Studies* [EJUFOAS] is the journal of TRUTH
[Totton Researchers of Ufology Theory and
History] based in Southampton, United
Kingdom. The purpose of EJUFOAS is to
circulate ideas and contemporary issues
related to ufology (UFOs and the alien
abduction phenomena). The primary focus is
on European Ufological issues and debate but
non-European papers may be accepted
(limited to one per issue). It hopes to foster
much needed development in the field of
ufology by publishing diverse papers on
Historical Perspectives, Theoretical
Perspectives, Empirical Research and
European Issues involved in this field. Any
appropriate paper will be blind reviewed by at
least three members of the editorial board
and it is usual that the review process takes
4-6 weeks. Regular issues will include *Forum
Debate Articles* usually solicited by the
editor-in-chief covering a controversial topic in
ufology with the opportunity for peer
commentary in subsequent volumes, and
Special Editions that will focus on one area of
this diverse field. Finally, it is hoped that this
publication will be ground-breaking and bring
the European Ufological Community closer by
allowing publication of reviewed papers that
will generate debate and move the World
Ufological Community forward through
innovative and contemporary discussion.

Editorial

Welcome to Volume 2(1) of the European Journal of UFO and Abduction Studies. I am hoping this will be an even more fruitful year for the journal, allowing a medium for disseminating all the good work that ufology *is* producing currently. I have already conducted my first interview based solely on being the Editor-in-Chief for BBC Radio.

Please let me welcome new members to the Editorial Board. Four new members were elected onto the review board, namely David Clarke (UK), Massimo Teodorani (Italy), Paolo Toselli (Italy) and Maurizio Verga (Italy). They will review submissions up until at least September 2002. We have had to say goodbye to some of our Board members after the elections and I wish to thank them for their help since the Launch Issue. These are Marcus Allen (UK), David Kingston (UK), Antonio Carvalho (Portugal) and Joao Paulo Silva Rocha (Portugal).

This issue is predominantly publishing Italian research with the two main papers focusing on the reliability of eyewitnesses in the Trans-en-Provence case study and more information about the Hessdalen project. Both are well written accounts that show what excellent research is happening in ufology. I hope many more papers will be sent to the EJUFOAS office over the next year, again reporting sound research methodology.

We have another FORUM Debate article from Albert Budden, this time concerning the production of Ball Lightning in the laboratory. Again, any comments to be sent to the Editor please.

I am indebted to Edoardo Russo and colleagues for the creation of an EJUFOAS website. This can be visited at www.cisu.org/ejufoas.htm The last time I logged on (9th March), there had been over 100,000 hits on this page alone. This is very exciting and I hope that many more people will choose to find out about this publication via the Internet.

I am pleased to tell you that papers from EJUFOAS are to feature in a new Research Methods in Psychology book that I have co-written with my current Head of Department (Russell, J. & Roberts, C. (2001) *Angles on Psychological Research*. Nelson Thornes: Cheltenham, UK). Hopefully, this will increase our readership.

EJUFOAS is spreading its readership to places like Macau, Australia and the United States. Subscriptions are increasing and all prices have been held since the Launch Volume. I am hoping that this will continue to be the case for the next few years.

Finally, we are also getting submissions from outside Europe now, another indicator of the growing power of EJUFOAS. This is down to all of the editorial board and you as a reader of this journal. I thank everyone for the support that they have given EJUFOAS over our first few years of its life.

Craig Roberts.

Errata

The reference for the Susan Blackmore paper in Volume 1(2), should be:

Blackmore, S. & Cox, M. (2000) Alien Abductions, Sleep Paralysis and the Temporal Lobe. **European Journal of UFO and Abduction Studies** Vol 1(2), p.113-118.

Biographies

David Clarke

David received his Ph.D in English Cultural Tradition and Folklore in 1999 (University of Sheffield) and has a BA (Hons) Archaeology, Prehistory and Medieval History (University of Sheffield, 1990).

David has had seven published books and numerous magazine and newspaper articles relating to the supernatural, folklore and UFOs. He is currently teaching a folklore option, "Traditions of Supernatural Belief" to undergraduates at the school of English, University of Sheffield.

David also holds the post of Honorary Research Fellow, National Centre for English Cultural Tradition, University of Sheffield, and a British Academy award to research popular belief and rumour during the Great War.

His career as a journalist began in the late 1980s and he has worked full time as a news reporter for the Rotherham Advertiser, the Sheffield Star and shifts on news agencies and freelance for national newspapers, TV companies and radio. He is currently working as a freelance Press and PR advisor to a local authority Public Relations Unit.

Massimo Teodorani

Massimo Teodorani (born in October 31, 1956) is an astrophysicist from Emilia-Romagna (Padania-Italy). He owns a master degree in astronomy and a Ph.D. in stellar physics both obtained at the Bologna University. He worked at the Bologna and Napoli Observatories, as a specialist in the observational and interpretative research on the non-stationary behaviour of stars such as supernovae, novae, cataclysmic and symbiotic stars, high-mass close binary stars, black-hole candidates and eruptive T Tauri stars. He deeply experienced photometric and spectroscopic observations by using several optical telescopes and the IUE ultraviolet satellite. At present he is a scientific advisor of CNR (Consiglio Nazionale delle Ricerche) in astrophysical subjects and SETI. As a parallel research, since 10 years he actively carries out investigations on "anomalous luminous atmospheric phenomena", of which he planned the techniques for obtaining measurable physical parameters. Moreover, he analyzed multi-wavelength instrumental data in order to prove or reject canonical and non-canonical theories regarding such phenomena. As a scientific supervisor of the Italian Committee for Project Hessdalen, he is currently working on a geo-topographic map describing the world areas of recurrence of the luminous phenomenon by collaborating with various researchers in the world, in particular with "Project Hessdalen" in Norway. He published several peer-reviewed papers both in astrophysical journals and in UFO journals of scientific level, and he constantly gave presentations of the technical results of his research at recognized scientific institutions. He is a member of various scientific societies.

The EMBLA 2000 Mission in Hessdalen

Massimo Teodorani, PhD
Astrophysicist, Scientific Supervisor of ICPH
<http://www.itacomm.net/PH/>
Scientific Consultant of CNR-IRA
Via Catalani 45 - 47023 Cesena (FC) - ITALY
E-Mail: mteo@line.net

Stelio Montebugnoli, MScEE
CNR Leading Technologist and Director
Director of EMBLA 2000 Project
Stazione Radioastronomica CNR-IRA
Via Fiorentina - Medicina (BO) - ITALY
E-Mail: stelio@ira.bo.cnr.it

Jader Monari, MScEE
CNR Technologist - Contractor
Stazione Radioastronomica CNR-IRA
Via Fiorentina - Medicina (BO) - ITALY
E-Mail: jmonari@ira.bo.cnr.it

ABSTRACT. In August 2000 a team of Italian physical scientists, working in collaboration with Norwegian colleagues from Østfold College, carried out an instrumental expedition in Hessdalen (Norway), which was just the first of a series of future scientific missions planned by the joint Italian-Norwegian EMBLA Project. The expedition was aimed at studying unexplained anomalous atmospheric luminous phenomena occurring in the Hessdalen valley since about 20 years, and it was particularly focussed to the study of the radio spectrum in the UHF, VLF and ELF wavelength ranges. The employed radio spectrum analyzers, which were automatically in function all the time for 25 days, permitted to discover highly anomalous periodic signals which were characterized by a spike-like and a Doppler-like morphology and which were mostly detected in the VLF radio range. Moreover, during the many planned skywatching sessions, it was possible to sight repeatedly luminous atmospheric phenomena of both plasma-like and structured types in various points of the Hessdalen valley; some photographs were also taken and subsequently analyzed. This paper represents a preliminary report on this mission, in which both radio and visual phenomena are described. Some speculative physical models explaining some aspects of the recorded anomalous radio signals are discussed.

1. Introduction

The EMBLA Project was born in 1998 as a joint research initiative between Istituto di Radioastronomia (IRA) based in Medicina (Bologna - Italy) of CNR (Consiglio Nazionale delle Ricerche) and the Østfold College of Engineering based in Sarpsborg (Norway). The goal of EMBLA is of studying the electromagnetic behaviour of unexplained luminous phenomena occurring recurrently in Hessdalen (Norway), by using sophisticated radio receivers and spectrometers. After several meetings with Erling Strand and Bjørn Gitle Hauge, assistant professors of Østfold College and principal investigators of "Project Hessdalen", it was finally decided to install the CNR-IRA instrumentation in Hessdalen during the month of August 2000. Such instruments have been continuously operating for 25 days.

The Hessdalen phenomenology is officially well known since 1984 (refs. 10, 23, 24, 25, 29, 31, 32, 35, 37). Together with several other cases of recurrent luminous phenomena in the world (refs. 12, 13, 15, 19, 20, 26, 27), Hessdalen is the living proof that atmospheric light phenomena can be particularly concentrated in specific areas of the world. The reason why all this occurs is still unknown, even if several theories have been proposed (refs. 6, 21, 25, 34, 41). The phenomenon in Hessdalen was investigated for the first time with magnetometric, radiometric and radar instrumentation in 1984 by Erling Strand and his staff (ref. 23): such a pilot instrumental investigation was non-stop and lasted about 40 days during a period in which the Hessdalen phenomenon was crossing a "flap" phase. This first effort demonstrated that the light phenomenon is measurable indeed, being able to reflect radar waves, to produce local magnetic perturbances and to cause unexplained "spike-like" radio-signals in the HF-VHF range. The subsequent EMBLA project, which was put in practice for the first time in the year 2000, was just aimed at examining closely the radio characteristics of the Hessdalen phenomenon. Regarding the specific radio field, the main advantages of the EMBLA Project in comparison with former measurements carried out by Project Hessdalen in 1984 are the following ones: a) a much wider frequency range (in this case, expanded with the ELF, VLF and UHF radio windows) and resolution, b) a much higher sensitivity, c) a totally automated mode of data acquisition. As the Hessdalen phenomenon (HP) generates light which, according to the previously obtained data, is able to affect the Earth's magnetic field, the current aim of the EMBLA project is to map out radio emission from HP and thereby determine the spectral energy distribution, the emission mechanism and, in case, the chemical composition of plasmoids due to HP.

Since August 1998 Project Hessdalen is operating with optical automated instrumentation consisting of a very sophisticated video camera. Compared with the 1984 observational period, the monthly incidence of luminous phenomena in Hessdalen nowadays (1998-2000) has sensibly decreased. On the other hand, the possibility of a constant monitor by means of an automated video camera has highly increased the capability of recording the apparition of such phenomena all the time. A Panasonic solid-state video camera supplied with a wide-angle lens, which is connected with a video recorder and a Silicon Graphics Indy computer, is currently installed in the *Hessdalen Interactive Observatory* (see Figure 1, refs. 1, 2, 28). Such a system is able to perform every second a complete survey of an accurately chosen area of the Hessdalen valley and to record any target whose luminosity is greater than a threshold value; the recorded frames are immediately made available to researchers through the web site of Project Hessdalen (ref. 29). Each of the recorded optical phenomena is re-analyzed in a subsequent phase, in which case a selection of real "anomalous cases" is done by carefully distinguishing such cases from identified objects (such as airplanes or celestial objects). Uncertain cases for which only a preliminary analysis has been done, are considered as well: a consistent number of such cases are possibly destined to be regarded as real anomalous cases after a further analysis. The selected data furnished by the video camera which have been obtained so far are shown in Fig. 2. Interestingly, by overlapping all the video frames which were obtained during more than two years, it has been recently ascertained that the luminous phenomenon is not characterized by preferential directions but is uniformly and randomly distributed in the sky (see Fig. 3).

The data coming from the automatic video-camera may be well indicative of the realistic trend according to hour and month followed by the Hessdalen lights, but not of the real number of the appearing lights. The Hessdalen Interactive Observatory (HIO) is placed in the most probable position to see lights, but: a) the angle of sight is limited to a bit more than 100°, b) the employed sensor is not able to record very faint or very short-lasting lights, c) light phenomena which are very far from the HIO observatory or hidden by hills or occurring on the opposite side of HIO cannot be recorded. Therefore, the statistics which is deduced with the present observatory can be considered reliable in

order to show a "relative distribution" according to time, but the obtained numbers should be multiplied by a scale factor which so far cannot be easily evaluated. The HIO observatory is also supplied with a Fluxgate magnetometer which is able to furnish hour by hour the intensity of the local magnetic field [ref. 30]. At the present time, Project Hessdalen is going to expand soon the available instrumentation with: a) new optical CCD sensors, b) an advanced radar, c) a new magnetometer, d) a second observing station installed in a different point of the valley in order to furnish a three-dimensional and stereographic representation of the phenomenon.

In such a way the huge efforts which have been done so far by means of the presently working Norwegian Hessdalen Interactive Observatory, are strictly connected with the present efforts of the Italian/Norwegian EMBLA initiative in the radio field, which was born just thanks to the pioneering monitoring work carried out by Project Hessdalen in 1984.

As a first test of this scientific and technological joint international collaboration, in August 2000, in addition to the presently working automated video camera, the current Hessdalen Interactive Observatory has been equipped for about a month with a platform of automated radio instruments which were projected by the technologists of the Istituto di Radioastronomia (CNR). Such radio instruments (see Fig. 1), just representing the "EMBLA 2000" starting project, were the following ones:

- A. ELFO unit. A VLF-ELF Correlation Receiver and Spectrometer connected to loop antennas and then sensitive to a magnetic field in the 1KHz - 14KHz range.
- B. INSPIRE unit. A VLF Receiver and Spectrometer connected to a dipole antenna, and then sensitive to an electric field in the 1KHz - 100KHz range [refs. 7, 8, 39].
- C. SS-5 and SENTINEL-1 units. Two spectrometers connected to a 1420 MHz receiver with 5 and 10 MHz bandwidth at 10Hz and 10KHz resolution respectively [ref 17].
- D. A wide-band antenna connected to an HP spectrum analyzer scanning from 0.1 GHz - 1.8 GHz.

All these instruments were computer-controlled and data, which were recorded automatically and continuously, were stored on CD ROMs. This big amount of data [about 21 GBy, compressed] will be analyzed in detail as soon as the post-processing phase will be in progress.



Figure 1. *LEFT*. The Hessdalen Interactive Observatory (HIO). *RIGHT*. The EMBLA monitors inside the HIO.

The Italian/Norwegian group, which was mainly composed by electronic engineers Stelio Montebugnoli (director of the EMBLA 2000 Project) and Jader Monari,

astrophysicist Massimo Teodorani, electronic engineers Bjørn Gitle Hauge and Erling Strand, carried out also a very intense skywatching activity during night-time. Luminous and peculiar phenomena were repeatedly observed, and sometimes photographed, in different zones of the Hessdalen area.

An exhaustive photographic report of the EMBLA 2000 mission has been published on the web [ref. 16].

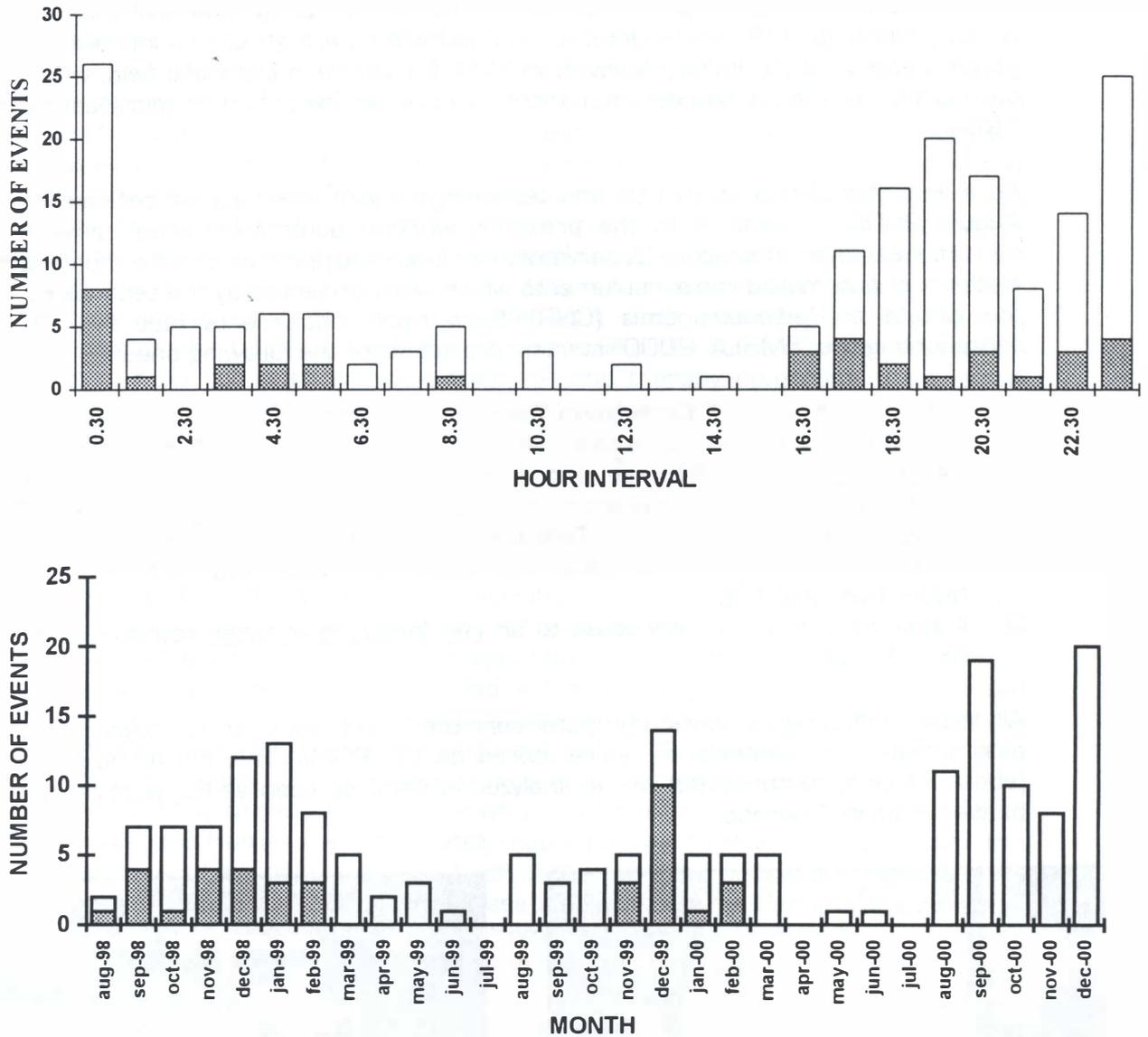


Figure 2. *ABOVE*. Hourly number of luminous events reported in the period August 1998 - December 2000 (lower dark bar: ascertained anomalous cases, upper clear bar: still uncertain cases). *BELOW*. Monthly number of luminous events reported in the period August 1998 - October 2000 (lower dark bar: ascertained anomalous cases, upper clear bar: still uncertain cases).

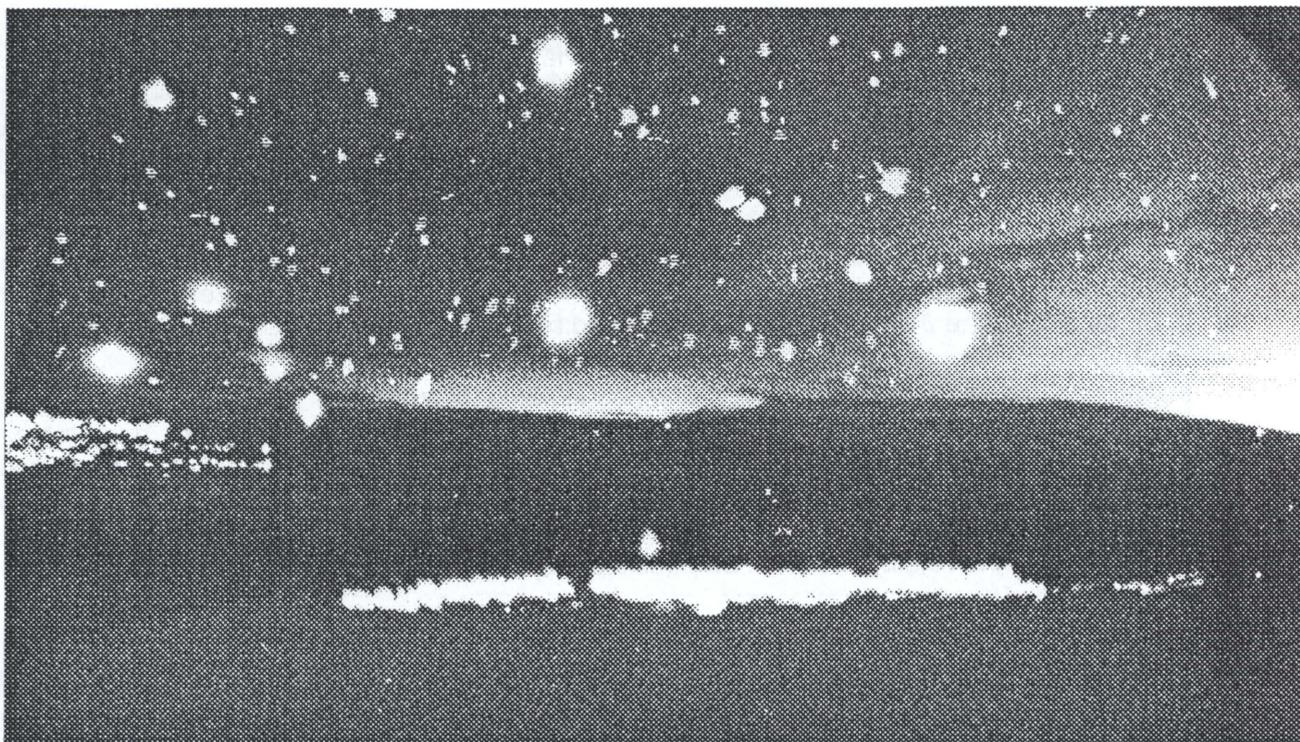


Figure 3. Spatial distribution of luminous events (only yellow lights) reported in the period August 1998 - December 2000. Big white lights in the sky are due to several positions of the moon during different periods, which are overlapped in this frame. White lights on the ground are due to illuminated houses. Single frames were acquired by the E.P. Strand's Hessdalen Interactive Observatory, final cumulative frame was obtained by M. Teodorani by using the "lightening" technique in the processing phase.

2. Radio spectrometric measurements

During almost all the month of August 2000 very anomalous signals were often recorded. With the VLF "Inspire" receiver in particular, it was also possible to record "screen snapshots" at any time in which, during the monitor by the personnel, it was possible to detect such signals.

The anomalous signals which immediately attracted the personnel's attention were the following two ones:

- I. SPIKE signals. Spike-like signals appeared in the range 3-7kHz (see Fig. 4) just as very sharp and straight "narrow lines". Spikes behaved in a strictly periodic way by showing regularly "On" and "Off" phases.
- II. DOPPLER signals. Doppler-like signals, which sometimes accompanied the spike-like ones, appeared intermittently in the range 1-2kHz as more or less inclined "broad lines", and covered a narrower frequency interval (see Fig. 5) than the spike-like signals. From the measured frequency shift it was possible to determine a velocity of the emitting source which was changing in a very short time (of the order of some seconds) from 10.000 up to 100.000 km/sec. The inclination of "broad lines" was occasionally changing from "negative" to "positive": this clearly indicated that the Doppler shift was both red-wards and blue-wards.

Such anomalous signals, which occurred both at day-time and at night-time were also accompanied and/or overlapped with several other types of signals, mostly irregular

and asymmetrical, many of which are suspected to be due to "natural noise" of solar or atmospheric origin. No luminous phenomena could be reported while the personnel was controlling the monitors of the radio spectrometers. Any kind of possible time synchronicity of anomalous radio signals and anomalous light phenomena which were reported during the skywatching activity, will be ascertained after all the radio data will be processed, as a precise timetable of the luminous events which were sighted is available. During the EMBLA operations, it was possible to exclude any possible interference due to other electronic instruments or electric connections which were just near the used spectrometers. For instance, although everything else was turned off as a test, the *INSPIRE* receiver continued to register exactly the same signals.

A much more detailed behaviour of both kinds of signals has been recorded by the *ELFO* receiver, by means of which it is possible to perform Fourier transforms. Analogously, the *SS-5* and *SENTINEL-1* spectrometers showed anomalous signals too. As the signals recorded with these 3 spectrometers didn't allow an immediate and on-line check also because of the practical impossibility of extracting snap-shots in these cases, a definitive diagnosis will be possible only when the post-processing phase will be over.

Anyone of the 4 employed spectrometers acquired continuously data during one month, for a total amount of 21 GBy (compressed) stored in CD ROMs. The main post-processing procedures which are currently carried out by the EMBLA team, are described in a final technical note at the end of this chapter. Such planned measurements (including "WAV" signals) must allow to build up a quantitative picture of the recorded radio phenomena, regarding the whole period (about one month) in which spectrometers were in function.

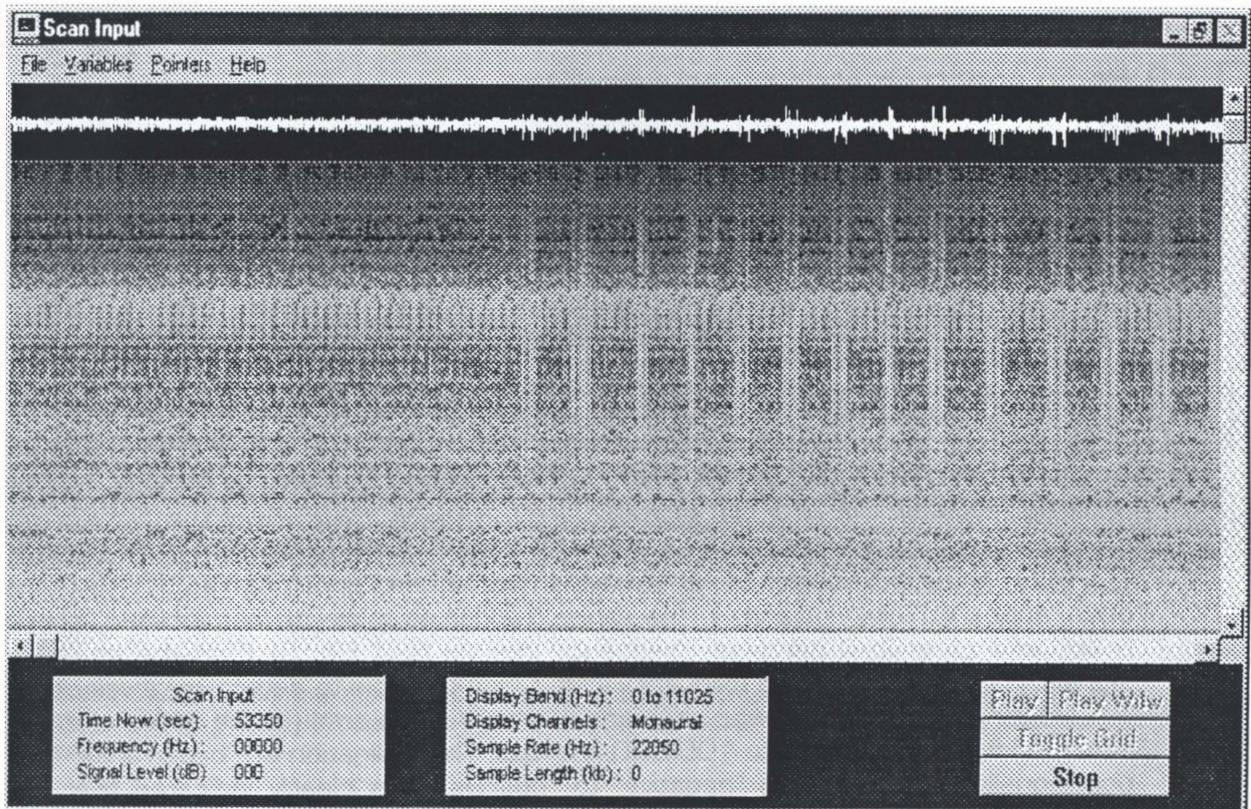


Figure 4. Spike signals recorded with the *INSPIRE* receiver (Y axis: frequency, X axis: time)

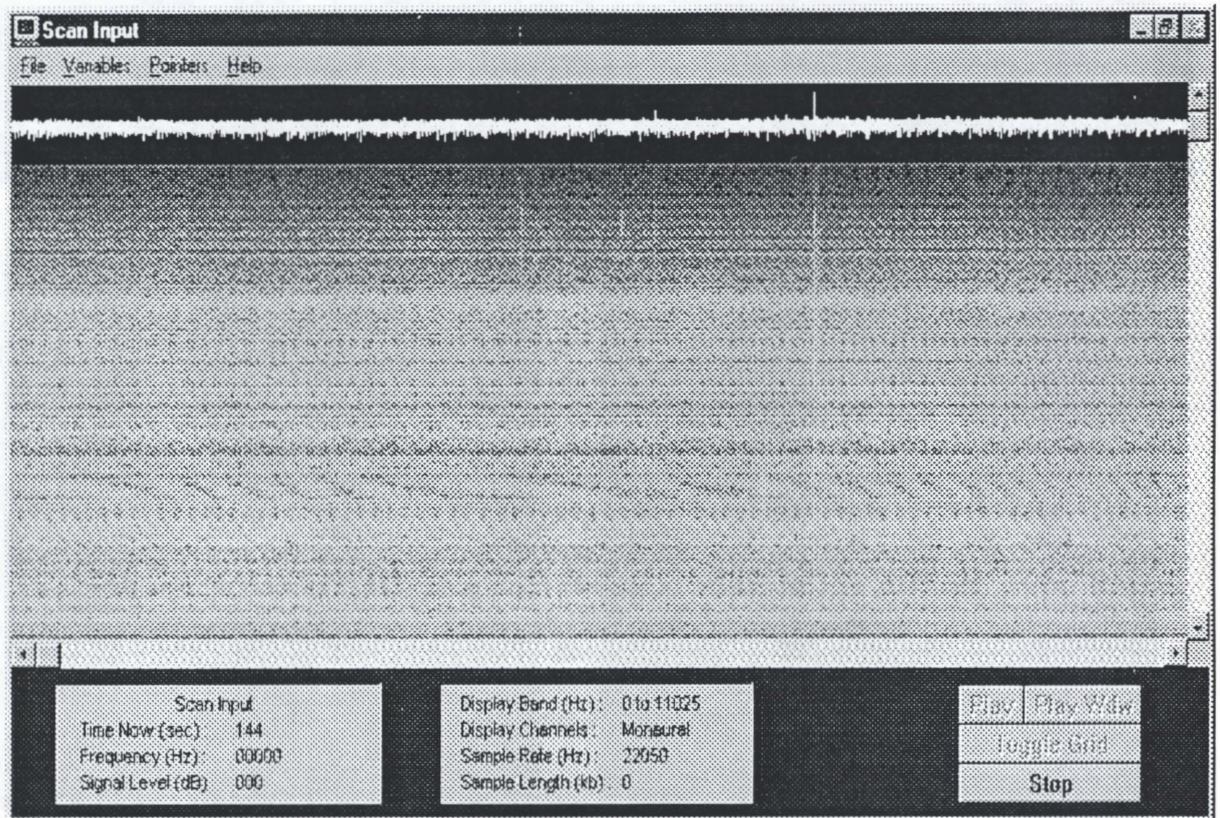
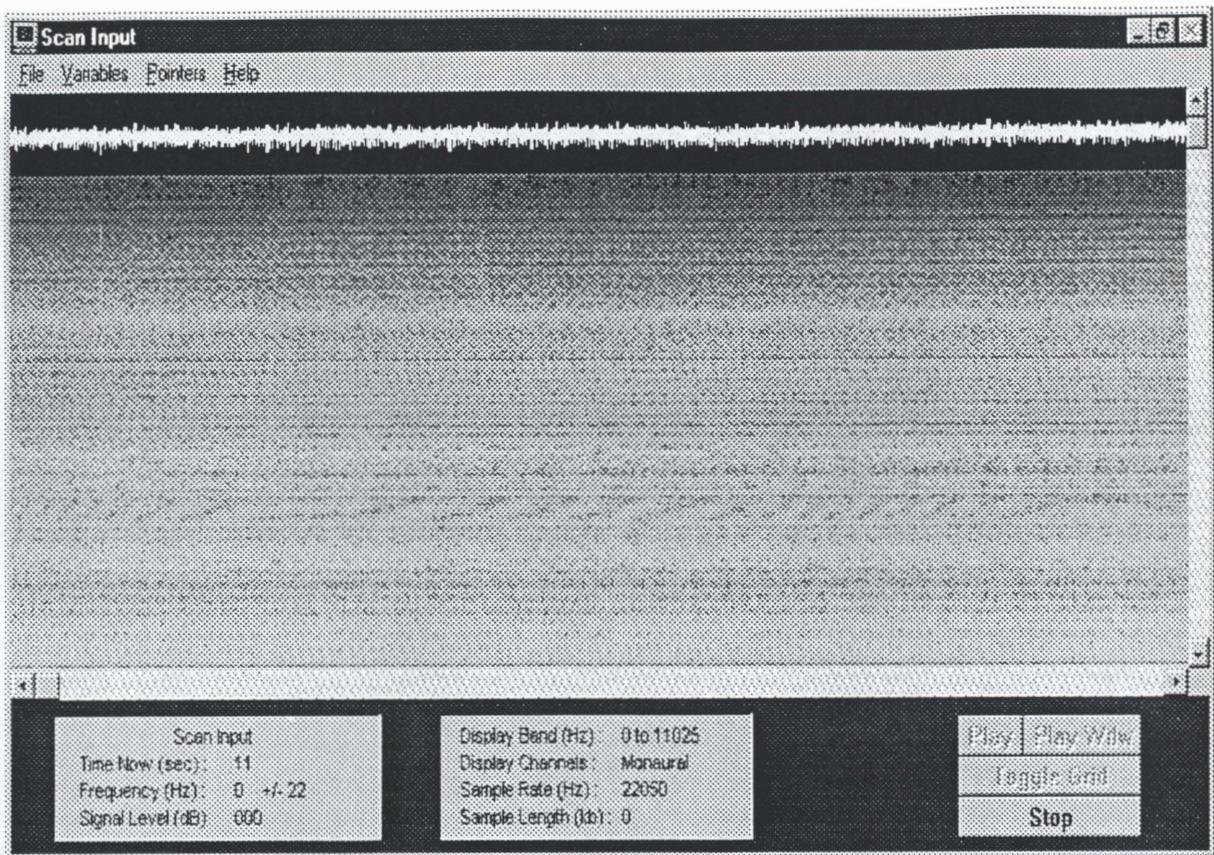


Figure 5. Doppler signals recorded with the INSPIRE receiver (Y axis: frequency, X axis: time). *ABOVE*: Blue-shifted signals. *BELOW*: Red-shifted signals.

TECHNICAL NOTE: The following post-processing procedures are currently executed:

- a) *Internal Noise Extraction*. In order to eliminate any possible source of instrumental noise in the data.

- b) *External Noise Evaluation and Extraction.* In order to evaluate or eliminate any source of noise due to well-known natural sources such as solar activity, atmospheric and ionospheric activity, earth or rocks activity and human artificial causes (refs. 34, 35, 37, 39, 41).
- c) *Micro Periodicity.* In order to measure the exact time intervals during which spike events occurred.
- d) *Periodicity of Doppler Reversal.* In order to establish the length of the cycle between redshifts and blueshifts in the Doppler signals.
- e) *Period Variability.* In order to verify if, when and how the duration of spike-to-spike intervals vary with time.
- f) *Macro Periodicity.* In order to evaluate how long is the duration of any period of time in which spike and Doppler events are continuously present, and to verify if such periods occur with a precise order or logic or if they occur erratically.
- g) *Signal Intensity.* In order to measure the exact amplitude of any interesting signal (spike or Doppler) and verify with which mode the signal is appearing (smoothly or sharply) and/or disappearing.
- h) *Signal Morphology.* In order to verify if, when and how there are different types of spike or Doppler signals.
- i) *Frequency Bandwidth or Shifts.* In order to verify if, when and how the frequency window in which spikes or Dopplers are present gets narrower or broader, or if some bandwidth shift occurs in such events.
- j) *Radio-Optical Synchronicity.* In order to deduce what was the radio behaviour around the time in which light phenomena were sighted.

3. Optical Sightings and Typology

The operating team was also devoted to the visual observation of luminous phenomena. Such kind of skywatching was carried out mostly at the *Aspåskjölen* site (also called "Vista Point"), but also near the *Finnsåhögda* mountain and in *Elgsjøen* (*The Mouse Lake*) not far from the Öyungen lake. Different types of visual observations were done and only in two cases it was possible to take photographs of the phenomenon. The personnel was equipped with the following portable facilities: a video camera, a reflex camera mounted on tripod, an image intensifier / IR viewer, binoculars, a fast optical detector, a mini X-ray detector and a Geiger counter; moreover powerful torches (krypton and xenon types), mini-lasers and compass, were used in order to signal the positions of different groups of skywatchers. Not all the facilities could be used in order to monitor the light phenomena: the video camera, the reflex camera, the binoculars and the image intensifier, were the mostly employed facilities.

During the observations which were carried out, it was possible to ascertain that the so called "Hessdalen phenomenon" is really multiform. The phenomenon showed to be characterized both by pulsating lights and by approximately constant or slowly variable lights, both by plasma-like lights without a defined contour and by lights with a very defined contour or by lights which were co-moving following a precise geometric shape, both by short-lasting and by long-lasting lights, both by lights on the ground and by lights in the sky. Moreover, videos of pulsating lights at their maximum showed a saturated core (see Fig. 6), which was indicating that during the maximum the luminous intensity reached extremely high values. The observed phenomena (see Figs. 6, 7) are schematically described as follows.

TYPE 1. Strong irregularly pulsating white lights.

Distance: 20-25 Km, Direction: south, Position: between two mountains, Color: white, Duration: 10-30 seconds for each pulsating event, Regime of motion: approximately standing still, Number of Events: several events during 3 nights, Luminosity: very high with drastic change of radiating surface and with an occasionally saturated nucleus, Shape: approximately spherical, Height above the ground: probably few meters, Dimensions: from 1 to 10 meters, Time: 23.00 - 01.00, Witnesses: 4-6, Sighting Location: Aspåskjölen, Report type: visual, video (see Fig. 6), intensified/IR, binocular and photographic (photos underexposed).

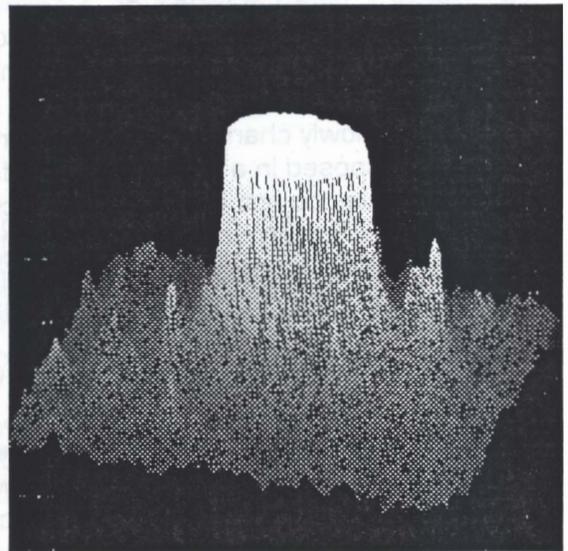
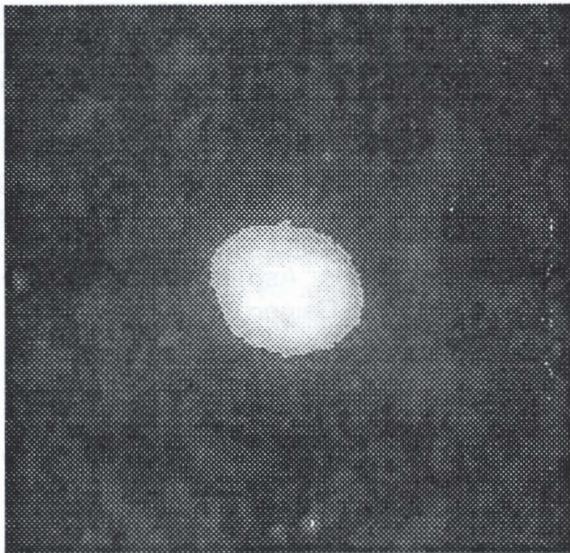
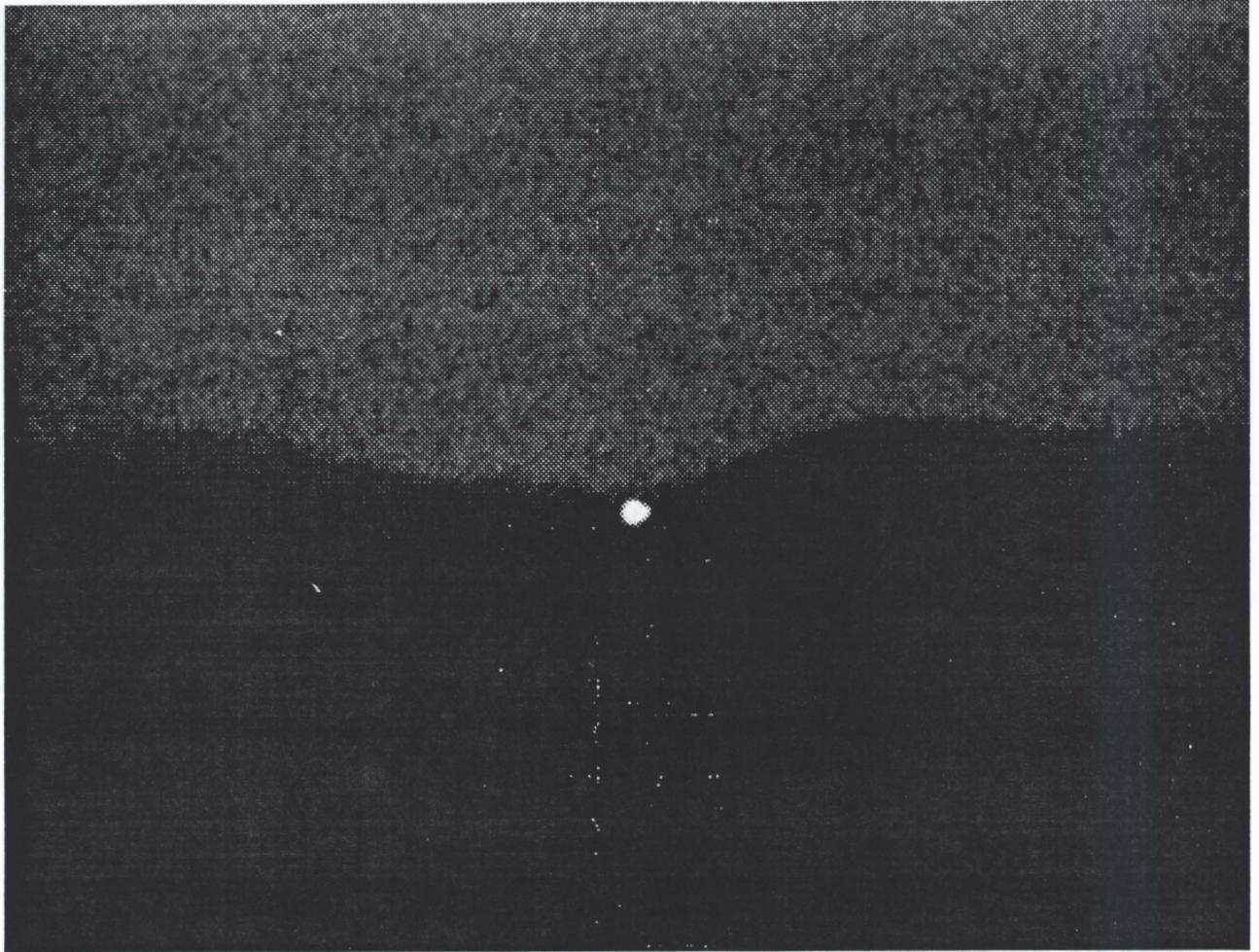


Figure 6. Pulsating light sighted from Aspåskjölen (TYPE 1). *ABOVE*. The present image is the result of summation of 15 (1/25 sec) close video frames (video acquired by J. Monari and processed by M. Teodorani). *BELOW LEFT*. This frame was obtained when the light, which shows a saturated core, was at the maximum intensity (video acquired by J. Monari and processed by J. Monari and M. Teodorani). *BELOW RIGHT*. 3-D Point Spread Function of the same light at maximum.

TYPE 2. Faint regularly pulsating light with color change ment.

Distance: 6-7 Km, Direction: north, Position: very low in the sky (about 10°). Color: white, red, green, blue, Luminosity: more or less faint - changing from star-like to planet-like, Color, Surface and Luminosity Change Rate: 1-2 seconds, Duration: 40 minutes, Number of Events: 1, Regime of motion: standing still, Shape: approximately spherical, Height above the ground: probably 500-800 meters, Dimensions: unvaluable, Time: 00.43 - 01.25, Witnesses: 3, Sighting Location: Elgsjøen - The Mouse Lake (not far from Öyungen lake), Report type: visual, binocular and photographic (photo very faint).

TYPE 3. Point-like flashes.

Distance: 300 meters - 3 Km, Directions: all, Position: low in the sky just over the top of the hills, or on the ground. Color: white-blue and orange (one case), Luminosity: normally strong, Duration: ½ seconds, Number of Events: many, Regime of motion: standing still or erratically moving, Shape: point-like or, more seldom, line-like, Time: at any hour of the night, Witnesses: 2-3, Sighting Location: everywhere in the valley, Report type: visual.

TYPE 4. Diffuse flashes in the valley

Distance: 1-2 Km, Direction: west, Position: low in the valley or on the ground. Color: white, Luminosity: very strong, sudden illumination of all the valley, Duration: ½ - 1 seconds, Number of Events: 2, Time: 23.30 - 24.00, Witnesses: 1, Sighting Location: hillside up to Finnsåhögda south, Report type: visual.

TYPE 5. Three co-moving lights in the sky: the "Triangle"

Distance: undetermined, Direction: from south to north, Position: moving in the sky from 20° (low over horizon) up to 80° along a maximum circle which was close to the zenith, Speed: about 30°/min, Color: white-yellow, Noise: none, Duration: 2-3 minutes, Regime of motion: complex of 3 co-moving lights in an exact triangular disposition, which first moved linearly and slowly towards the observers, then stopped for 5-10 seconds at an height of about 80° while doing a 90° rotation around its axis, lastly slowly disappeared (about over the observers' vertical), Number of Events: 1, Luminosity: slowly changing from Jupiter-like intensity to star-like intensity, Shape: point-like lights disposed in a geometrical configuration (exact equilateral triangle) - underlying dark triangular object visible with binoculars, Radioactivity: normal level, Height above the ground: undetermined, Angular Dimensions of the Triangular Complex: 3-5°, Time: 24.00 - 24.15, Witnesses: 4 (2 groups), Sighting Locations: Aspåskjölen and near Finnsåhögda, Report type: visual, binocular, intensified/IR and Geiger.

TYPE 6. Small stationary light in the wood

Distance: about 100 meters, Direction: east, Position: standing still behind the first row of trees and just in front of the meadow in Aspåskjölen, Color: white-yellow "neon-like", Noise: a whistle while its light was slowly turning on, Duration: about 10 minutes, Number of Events: 1, Luminosity: constant and at low level (100 W bulb-like), Shape: elliptical (with very defined contours clearly distinguished by binocular sight), point-spread-function not resembling a plasma-like object, Height above ground: about 2 meters, Dimensions: 30-40 cm, Time: 23.00 - 23.30, Witnesses: 3, Sighting Location: just in Aspåskjölen, Report type: visual, binocular and photographic (see Fig. 7).

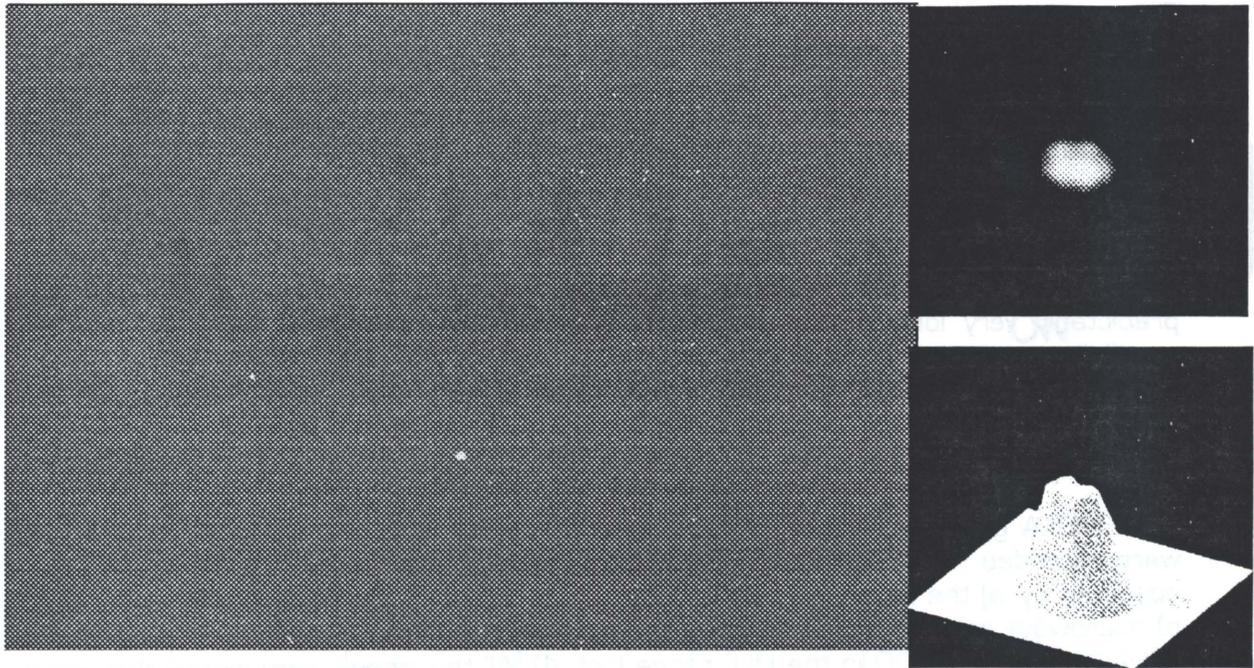


Figure 7. *RIGHT*. Small light sighted near the trees in Aspåskjölen (TYPE 6). Photograph was obtained with a 200 ASA film, zoom-lens set at 70 mm and an exposure-time of 10 sec (photograph and processing by M. Teodorani). *LEFT*. Processing of the enlarged image (above) and 3-D Point Spread Function (below).

A delegation of the Hessdalen inhabitants was met, thanks to writer Peder Skogaas' initiative. Without telling them what the EMBLA team saw during the previous nights, their own stories and sketches regarding the period 1981-2000 were just listened and carefully evaluated. They had the occasion to report very often many of the same phenomena which the EMBLA personnel saw in August 2000. These persons hope that scientists and their equipment can furnish a definitive answer to what they repeatedly saw in Hessdalen.

4. Discussion

The EMBLA staff came back to Italy with a big amount of radio data, also having had repeatedly the opportunity of sighting anomalous light phenomena. The sighting of light phenomena has a value of a pure "witness report", as unfortunately this year it was not possible to bring sophisticated instrumentation aimed at taking optical measurements such as CCD frames and spectra: this specific procedure has been planned for a further phase of the EMBLA Project (refs. 34, 36, 38, Appendix A). Anyway it must be recognized that the extraordinary match between the sightings by the EMBLA team and the ones reported over and over again by the Hessdalen inhabitants plays in favour of the existence of the visual phenomenon in the bi-modal form with which it has been reported since at least 20 years: without any sort of doubt unstructured and plasma-like lights often co-exist with "structured objects" for a reason that is not possible to explain by now, except when the EMBLA Project will be in a condition to couple current radio measurements with sophisticated radar-assisted optical astronomy-like measurements (ref. 36). On the basis of the multiple witnesses and of the critical weight that was given to the stories which were expressly told by a delegation from Hessdalen, it has been possible, at least, to be able to form a more correct idea of the Hessdalen phenomenon as it appears since a long time in that Norwegian valley. The sightings of type 1 up to 4 match very well the first accurate technical report by

Project Hessdalen (ref. 10, 23, 24). The sightings of type 1 up to 2 are also very similar to phenomena observed elsewhere in the world (refs. 3, 9, 10, 12, 13, 15, 19, 20, 26, 27). Moreover, the sightings of type 5 up to 6 are extremely similar to previous reports in other world areas (refs. 3, 9, 11, 18, 40, 47) and partly similar to what is reported also by Project Hessdalen itself (refs. 10, 31, 32).

What is of scientific importance in this EMBLA 2000 mission, the first one of a series, is the fact that it was possible to monitor accurately for an entire month and without interruption the radio range of the electromagnetic spectrum and that, after the predictably very long post-processing phase will be completed, there will be the possibility to map precisely the electromagnetic field in the Hessdalen area. Moreover, it will be soon possible to check which radio signals have been recorded at the moments of optical sightings: this check could emphasise the value of visual reports even more.

The EMBLA group is already in a condition to declare that the "spike signals" which were recorded in the VLF range resemble almost exactly similar signals which were observed by: a) the Norwegian spectrometers in 1984 in the HF-VHF range (ref. 23), b) microwave astrophysicists in Antarctica in 1991 in the UHF range (ref. 22), c) the "Elfrad group" in 2000 in the ULF range (ref. 4). All this shows very clearly that spike signals may be recorded in a hugely broad frequency range. What is not known yet is if such signals are simultaneously received at all the frequency windows or if there is a temporal shift from one frequency window to another. In order to ascertain this it will be necessary to check what the other EMBLA spectrometers (ELF and UHF) have recorded all together. Next year the installation of an ULF spectrometer has been planned too.

According to the highly peculiar signals which were occasionally extracted from snapshot frames (spike and Doppler signals) coming from the *INSPIRE* receiver, it is already possible to sketch logical-speculative physical models which could explain both the spike and the Doppler signal morphology. Such models, by now, can be deduced by purely geometrical and intuitive considerations.

A) What could cause Spike Signals ?

1. Spike signals could be caused by an uniformly emitting possibly spherical source which is periodically turning on and off with a pulsational mode and with a rate of the order of some fraction of second for any spike event (see Fig. 8).
2. Spike signals could be caused by a rotating spherical, cylindrical or disk-like source with an emitting spot on its surface. In such a case the observer could detect the signal only when the emitting spot is directed towards him (during intervals of the order of some fraction of second). The width of any recorded spike signal could depend on the surface area of such an hypothesized emitting spot (see Fig. 8).

In some cases it was possible to verify that the intensity of spike signals was slowly increasing or decreasing: this observational evidence could be interpreted as the gradual approaching or receding of a pulsating or rotating optically invisible radio-emitting source. In some other cases it was possible to observe that the spike signals were appearing or disappearing abruptly (see Fig. 4): this evidence could be explained by very fast velocities of the moving source or by the sudden onset of pulsation or rotation of an invisible source which was standing still nearby. There are not elements yet to ascertain if such a source is of natural origin (ref. 6, 21, 33, 34, 35, 37, 39, 41) or not (ref. 3, 9, 10, 11, 32, 33, 34, 38, 40, 46, 47) and no elements to verify if the perturbing region is located in the local atmosphere, on the ground, or underground.

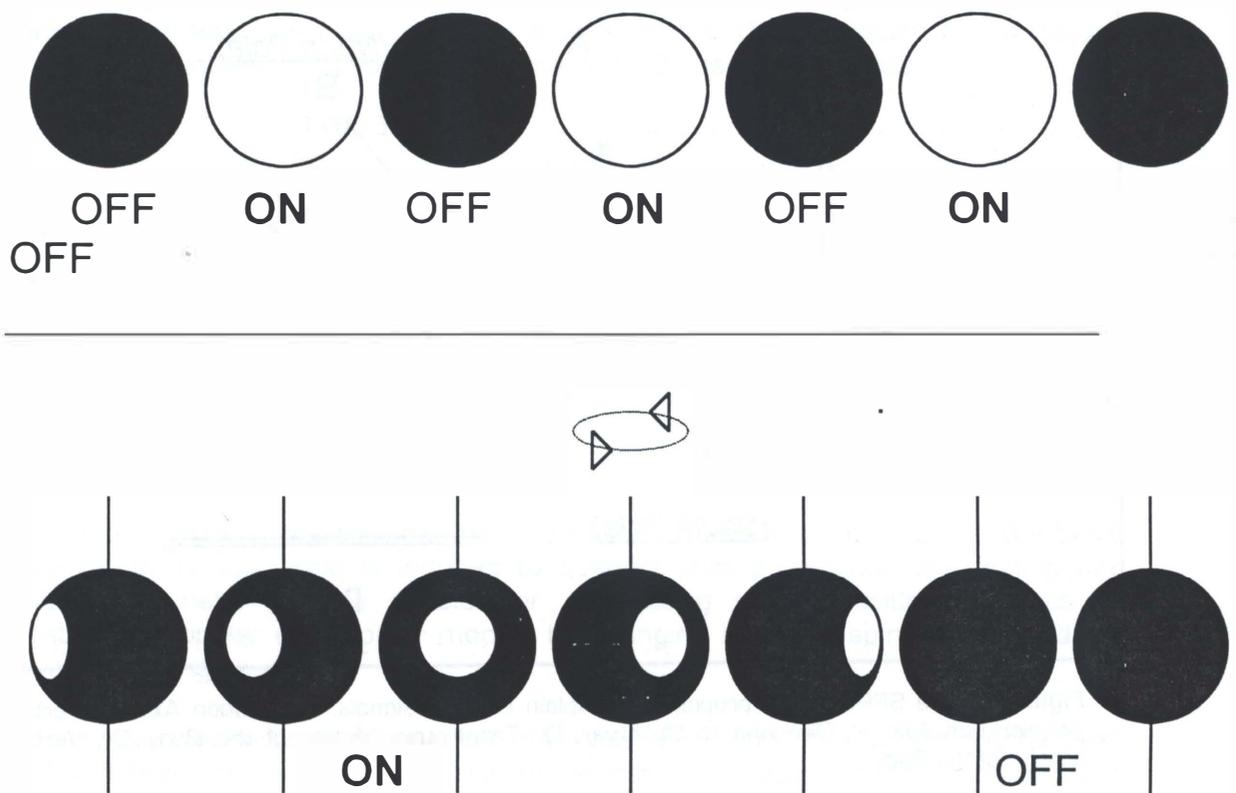


Figure 8. A sketch of two alternative ways to explain spike signals. *ABOVE*. The pulsating model. *BELOW*. The rotating model.

B) What could cause Doppler Signals ?

The very high measured velocities (10.000 up to 100.000 km/sec) cannot be produced by a physical body in fast motion. The only realistic possibility according to the accepted physics theory is that such a velocity is due to particles which are accelerated to semi-relativistic velocities by an unidentified rotating spheroidal body and that the particle acceleration occurs along a more or less collimated magnetic axis (see Fig. 9, already cited in an interview [ref. 5]). In order that the Doppler signal appears as such and with a periodical mode, it is necessary that the magnetic acceleration axis B is misaligned in comparison with the rotation axis A: in such a way a "lighthouse effect" would be observed. It is possible to obtain different Doppler configurations according to: a) the angle between axes A and B, b) the angle between the rotation plane and the line of sight C, c) the opening angle of the beam of accelerated particles. Let's assume that rotation occurs in the same plane as the line of sight. If the angle between A and B is zero no signal should be observed (velocity relative to observer = 0) unless the opening angle of the particle beam is very wide. If the angle between A and B is non-zero it could be possible for the observer to receive a periodic signal with a moderate Doppler velocity (velocity relative to observer > 0). If the angle between B and C is zero, then it is possible to receive periodically an highly Doppler-shifted signal (velocity relative to observer >> 0): in such a geometric configuration the maximum Doppler (blue-shifted) velocity could be reached.

SPPE: SPINNING AND PRECESSING PARTICLE ACCELERATOR

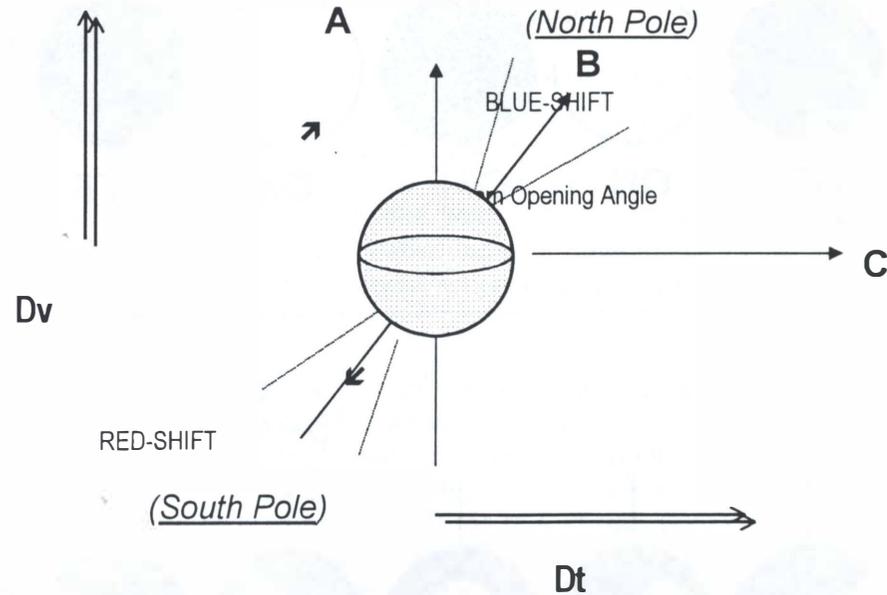


Figure 9. The SPPE model proposed to explain Doppler signals. A: Rotation Axis, B: Particle Acceleration Axis, C: Direction to Observer, Dt: Translatory Motion of the Body, Dv: Vertical Motion of the Body.

In order to explain signals characterized by a rapid change of the doppler effect amplitude (see Fig. 5) it is necessary to invoke the following three possibilities: i) the angle between A and B changes, being the angle between A and C fixed, ii) the opposite situation as i), iii) the velocity of the accelerated particles is intrinsically changing.

Assuming the SPPE model, in order to explain the observed "Doppler reversal" (from blueshift to redshift, or vice versa) which can be noticed in Figures 5 and 10, it is necessary to hypothesize that particle injection, which is modulated by rotation, is mono-polar: I) blueshifts are due to particles which are injected when the beam is aimed at the observer, II) redshifts are due to particles which are injected when the beam is opposite to the observer. This can happen or from the north pole or from the south pole of the magnetic axis B (see Fig. 9), but not from both of them.

Anyway a mono-polar behaviour seems not to be the rule, as some other signal features coming from our *INSPIRE* snap-shots show that the inclined Doppler shifted lines are sometimes substituted by a continuous "band" which is almost always interrupted by periodic voids (see Fig. 10). Such a broadened "band" could be the result of the "melting down effect" due to the co-existence of both blue and red-shifts which would work simultaneously. In such a case one would be induced to invoke the onset of a bi-polar mode for particle outflow, in which both approaching and receding beams would be observed together (see Fig. 9). The periodic appearance of voids would occur at the instants in which the bipolar beam is neither approaching nor receding the observer: this happens only when the bipolar magnetic axis lays on a plane which is perpendicular to the line of sight, in which case the relative velocity of the particles ejected from the north and the south poles of the magnetic accelerating tube, becomes zero. The instants in which a zero relative velocity is reached (twice in a single

rotation cycle] are very short because it is assumed that the bipolar outflow is rotating more or less fast. All this means that the time-duration of the voids is linearly dependent on the velocity of the spinning body. In such a way we have two extreme cases: a) very fast rotation causing an almost continuous band, b) very slow rotation causing a band which is interrupted by large voids. All these specific configurations have been encountered in several of the obtained 38 snap-shot frames.

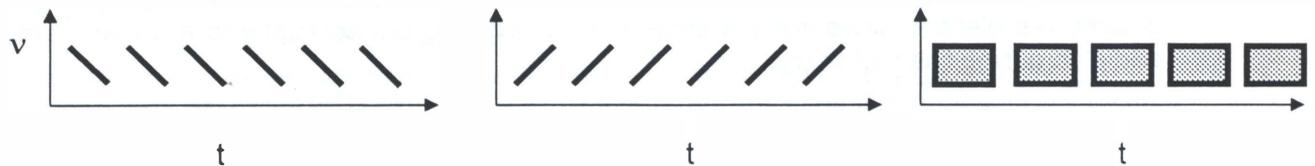


Figure 10. LEFT. Red-shifted signal. CENTER. Blue-shifted signal. RIGHT. Mixture of blue and red-shifted signals, resulting in a continuous "band" interrupted periodically by voids.

In conclusion, by taking the obtained data into account and by assuming that the SPPE intuitive model is valid, one is induced to suspect that an inclined precessing and collimated magnetic particle accelerator is ejecting semi-relativistic particles by alternating monopolar and bipolar modes, by changing both the spin velocity and the beam opening angle.

In general, such an emission mechanism is very similar both to the "pulsar mechanism" (refs. 14, 43) and to the "relativistic outflow mechanism" in astrophysics (refs. 44, 45), which in the present case are combined in a very specific framework. In such a configuration it is not known if relativistic particles are accelerated continuously or intermittently; in the second case we would have a more complicated signal morphology.

As in some cases spike and Doppler signals were present together, one is induced to think that the "mystery source" is characterized both by a purely pulsing radio emitting behaviour (maybe due to a rotating spot) and by a particle acceleration mechanism which produces in some way radio waves too. The second aspect is really very interesting: astrophysical mechanisms of particle acceleration, which can be found in particular in the "extragalactic jets" (ref. 44) and in some high-energy stars such as SS433 (ref. 45) produce radio radiation indeed, whose emission mechanism - the well-known "synchrotron" - is due to relativistic electrons which are accelerated by highly intense and collimated magnetic fields. Maybe something in a much smaller scale is imitating what is normally happening in a much larger scale: are they unknown high-energy mechanisms of our atmosphere, or the consequence of some propulsion mechanism of unknown origin? Does it exist in nature some kind of atmospheric mechanism which is able to extract particles (electrons and/or nucleons) from the interior of an optically invisible "plasma ball" and eject them outside through a channelled magnetic rail at semi-relativistic velocities?

Such qualitative interpretative models are not certainly the last word in order to explain the way in which the emission mechanism works effectively, but it is a first stimulation to think of what may be happening with some of the radio signals in Hessdalen, in order that after the post-processing phase will be over it could be possible to carry out a numerical simulation which could favour or reject the present models.

Finally, it is very probable that when all the 21 GBy total amount of (uncompressed) data will be fully processed, many radio signals due to the solar activity, which just on

August 2000 was at the maximum of its 11-year cycle (ref. 42), will be repeatedly found. Some irregularly oscillating signals were found indeed: they could be due to enhanced solar activity, and it will be ascertained in a further phase. Nevertheless, differently from what was deduced during a previous analysis of the Hessdalen phenomenon (refs. 25, 35, 37), at the present time strong doubts exist that the extremely regular signals which were detected this year have something to do with solar activity. Anyway the EMBLA team will try to ascertain even more if spike signals in particular are caused by an unidentified transmitter due maybe to some electric machinery working in Hessdalen, even if already now there are also doubts that such devices like electric saws, for instance, can be working uninterruptedly for a so long time and also during the night-time.

5. Conclusion

Doing science means mainly applying two concepts: "exploration" and "understanding". A third concept, "formal representation", is also important, but it is a mean, not the goal. What is happening in some places in the world seems to teach us that we certainly know much of physics but not all of it. The very fortunate circumstance of having at our disposal very sophisticated technology for the measurement of radiation at any wavelength, is the best chance for us to carry out a quantitative analysis of what is still unknown. In such a way we are in a condition to build up new models for a more complete description of our physical world. Our main goal is to know which relation exist between the Hessdalen-like lights and the detected peculiar radio signals. This task can be reached only if the luminous component of the Hessdalen phenomenon can be accurately studied by means of portable astronomy-like sensors and analyzers such as CCD imagers and spectrographs: we can obtain such kind of data simply by joining together a mini-telescope, a multi-filtered CCD camera, a TV camera, a diffraction grating, a polarimetric filter and a Pentium notebook, all at the cost of the order of \$ 10000 or less, and apply them to the study of anomalous lights (see Appendix A). This technique, which can be applied more successfully to the study of lights of the "stable" types 1 and 2, is really very naive but the predicted scientific results would be huge. Much more sophisticated optical instrumentation has been projected indeed (refs. 34, 36). The philosophy of this exciting research is extremely similar to the one which we use to study celestial objects, where we are able to deduce physical mechanisms at work by analyzing the entire spectrum of the electromagnetic radiation. Only a difference: the Hessdalen-like phenomena (refs. 10, 12, 13, 15, 19, 20, 23, 26, 27) are just here and the emitted radiation is so intense that we can say that we have at our disposal a very good laboratory, with which, by obtaining very high S/N ratios, we are in a condition to do a much more accurate physics than in the case of faint celestial sources.

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Final Note

This paper, which has already been published on the ICPH web site <http://www.itacomm.net/PH/> (basic version) and on the NIDS web site <http://www.nidsci.org> (expanded version), is a further updated version.

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APPENDIX A. Optical Portable System

The next expeditions to Hessdalen and to other possible areas of the world where the luminous phenomenon occurs more often, will be characterized by the use of optical equipment by means of which it is possible to obtain a full scientific treatment of the acquired data. The following CCD cameras are a suitable choice:

- LISÄÄ *Megapixel* CCD Camera

(see: <http://www.ozemail.com.au/~atsscope/lisaa.html> and http://63.169.124.2/apogee/lisaa/lisaa_full_description.htm)

- LISÄÄ *Guider* TV CCD VideoCamera

(see: http://209.35.233.35/apogee/lisaa/lisaa_full_description.htm)

A possible scientific goal in the optical range is intended to be reached in the following way:

A) Connecting the LISAA *Megapixel* with:

I - MEADE *LX200* 8" Telescope

(see: <http://www-personal.umich.edu/~jstys/articles/lx90.html>)

This kind of altazimuth mounted telescope offers the possibility to have an automatic scanning and pointing, via telecommander, which permits one to choose any velocity and to aim at the target in a stable way. The telescope can be also programmed to scan automatically specific fields of sky. It is also possible to write down in a further phase a software which tells the telescope to point automatically when a light appears, just as a sort of alarm-triggered shutter. The alarm would come from a wide-field video-monitor system (see B)).

II - Filter-Carrier Wheel

It incorporates: 1) the U, B, V, R, I bandpass filters 2) a polarimetric filter, and 3) a RAINBOW OPTICS (ROS) diffraction grating (see: <http://redshift.home.pipeline.com/spectroscope.htm>). In such a way it is possible to shift in a matter of few seconds to the following modes: i) photometry in different bandpasses (U ultraviolet, B blue, V visual, R red, I near-infrared), ii) photo-polarimetry by means of a polarimetric filter, iii) spectroscopy by means of a diffraction grating.

Equipment A) is just the "analytic instrument" for the scientific study of the photons emitted by luminous phenomena.

B) Connecting the LISAA *Guider* with:

I - Zoom Lens

(of any good type, such as TAMRON).

II - TV Monitor

(see also: http://www.sbig.com/sbwhtmls/stv_announcement.htm)

The *Guider* and the Zoom Lens are intended to be attached to the body of the MEADE telescope, by using the "piggy back" mode. This system, which can also work autonomously, can be used both to get a movie of a luminous phenomenon, and as a guider for the telescope or as a target searcher. The system B) can trigger the system A), and the TV monitor can be placed many meters far from the equipment, or also very far away if one uses data link from a remote station.

In such a way it is possible to change the field of view by switching the Zoom Lens, and to monitor the chosen field by taking a movie at the same time. The CCD *Guider* takes a continuous movie of the target, while the CCD *Megapixel* takes scientific frames whenever it is necessary. The search for the field is carried out by starting with the zoom lens in wide-angle mode and immediately later by narrowing the field centered on the target. When the field is chosen and narrowed, then the telescope plus its attached camera starts to work. This operation could last few seconds.

On the basis of the EMBLA 2000 experience in Hessdalen, in some cases it is objectively possible to aim quite easily the telescope at the lights without any need of tracking, as sometimes they stand still for a long time (see paragraph 3). An exposure of few seconds or less is sufficient to obtain CCD frames of photometric, polarimetric and spectroscopic kind. And it is possible to shift from one mode to another in 1-2 seconds.

C) Connecting the LISAA *Guider* and *Megapixel* CCD cameras to a Pentium computer

The instruments are intended to be connected with a powerful computer (of the Pentium III class) to be chosen between the best types of the notebook type.

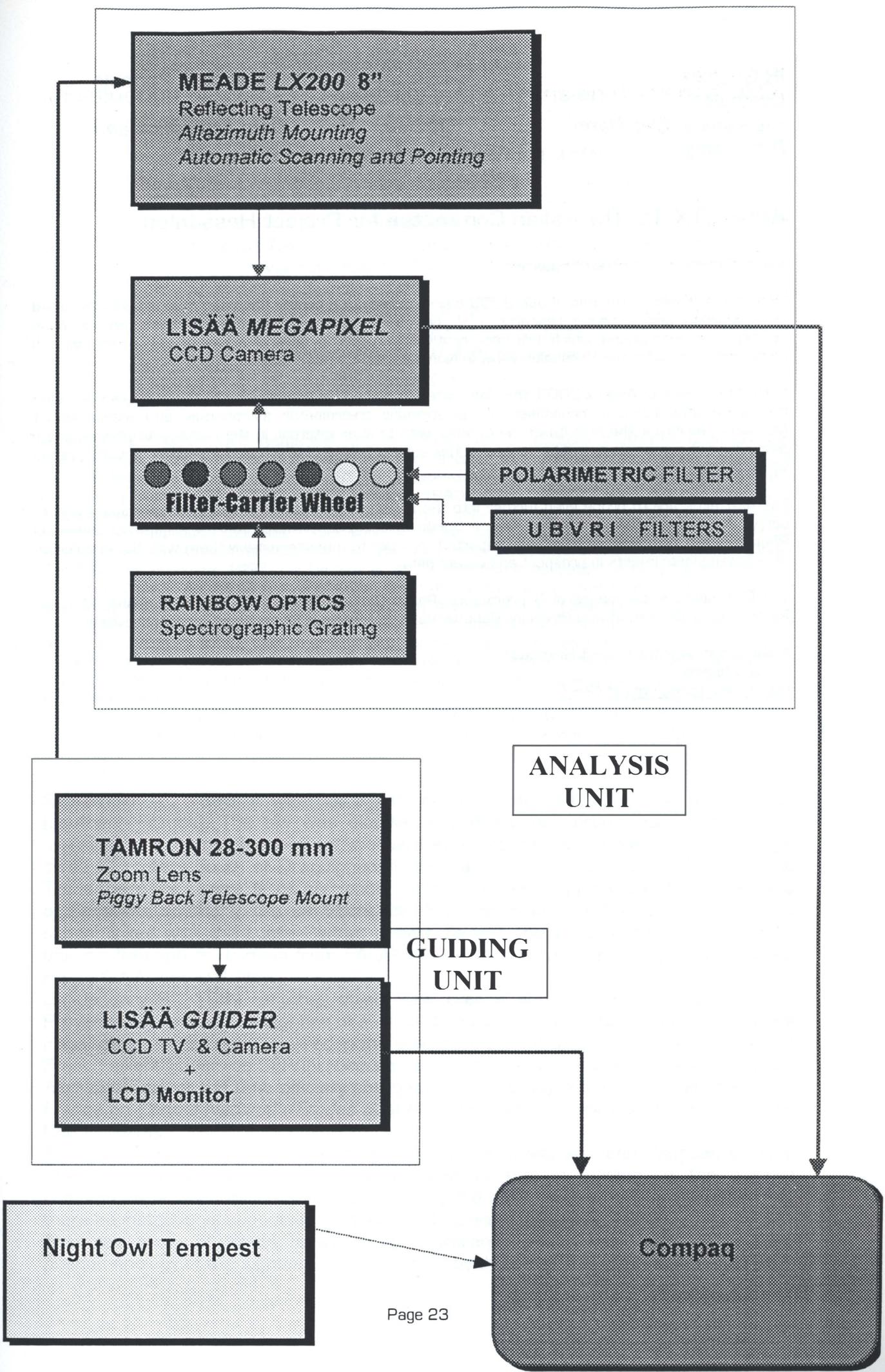
In conclusion, the complete optical portable platform comprises two CCD cameras (one for taking scientific frames like in astronomy, and one for taking movies and for guiding), one 8" reflecting telescope which can be quickly automatically aimed at the target, 5 bandpass filters for photometry, one polarimetric filter for photo-polarimetry, one diffraction grating for spectroscopy, one zoom lens attached to the body of the telescope, and one Pentium computer that controls all the data acquisition

operations. Such operations are intended to be preceded by a preliminary sky survey by using individual IR goggles in order to promptly locate any luminous object, also the faintest, in the area. The computer is also equipped with specific software which allows one to process and analyze professionally all the data in a subsequent phase.

The frames obtained by using the analytic system described above can furnish a photon-collecting capability, a spatial resolution, a quantum efficiency and a dynamic range which are much greater than the ones of a camcorder, so that many surface details can be recorded also in the faintest sources. In such a way it is possible to answer several questions of scientific interest. How is the light precisely distributed on the radiating surface? Which is the exact form of possible morphological anomalies such as protrusions, tubes, beams or spots? How much energy is emitted from a given light-surface point? Are there dark shadows inside the luminous objects? How does the light change if one changes filter or polarization angle? Is there a solid-like structure or dark surface, on or close to the luminous object? Is the spectrum a continuum or line spectrum and which is the emission mechanism of the luminous source? Is the source temporally variable photometrically and/or spectroscopically, by assuming that many sequential frames can be obtained of the same target?

The chosen strategy is just to bring and use such a portable optical equipment in different "hot points" of the Hessdalen valley, in the ambit of a "scientific skywatching".

The flow-chart which illustrates schematically the described equipment is shown below.



MEADE LX200 8"
 Reflecting Telescope
Altazimuth Mounting
Automatic Scanning and Pointing

LISÄÄ MEGAPIXEL
 CCD Camera

Filter-Carrier Wheel

POLARIMETRIC FILTER

UBVRI FILTERS

RAINBOW OPTICS
 Spectrographic Grating

ANALYSIS UNIT

TAMRON 28-300 mm
 Zoom Lens
Piggy Back Telescope Mount

GUIDING UNIT

LISÄÄ GUIDER
 CCD TV & Camera
 +
 LCD Monitor

Night Owl Tempest

Compaq

IR Goggles
Computer
Preliminary "Eye Alarm"
Processing



Pentium III Portable
Data Acquisition and

APPENDIX B. The Italian Committee for Project Hessdalen

Italian Committee for Project Hessdalen.

With this definition at the end of July 2000 a private research center has been founded, initially aimed at supporting and divulging researches to be carried out with a scientific basis on luminous atmospheric phenomena which are recurrently observable in several areas of our planet, with a particular interest for the Hessdalen valley in Norway.

In the first weeks of August 2000, the Committee furnished his contribution to these researches with the active attendance in Hessdalen of his scientific co-ordinator astronomer and astrophysicist Massimo Teodorani, the first Italian researcher who took an interest in the Norwegian phenomenon, and author of numerous scientific papers on this subject (some of which at the section "reports" of the web site <http://www.ufodatanet.org>).

The next aims are to probe even further into the investigation of the Hessdalen phenomenon and to carry out a reconnaissance in other sites of Earth, including Italy, where recurrent signals of Luminous Phenomena in Atmosphere have been reported, in order to monitor suitably them with the installation of recording instruments in prospect and collect data.

The Committee is composed of 9 promoters: Renzo Cabassi, Nico Conti, Roberto Labanti, Maurizio Morini, Marco Orlandi, Marco Piraccini, Roberto Raffaelli, Massimo Silvestri and Alessandro Zabini.

Italian Committee for Project Hessdalen.

Renzo Cabassi

<http://www.itacomm.net/PH/>

Evaluation of Witness Reliability in the Trans-en-Provence UFO Event: The Results of an Italian Enquiry

PAOLO FIORINO

*Progetto Italia 3 - Cisu - Centro Italiano Studi Ufologici
Via Buriasco 5, I-10135 Torino, Italia*

MATTEO LEONE

*Cisu - Centro Italiano Studi Ufologici
Via Barbera 66/B, I-10135 Torino, Italia
matteo.leone@usa.net*

Abstract - Among the UFO events with ground traces (Close Encounters of 2th kind in the so-called Hynek classification) a particular attention has been devoted to a single-witness sighting happened in Trans-en-Provence (France) on January 8th, 1981. Extensive investigation reports had been published in the past (Julien, 1981; CNES, 1983; Velasco, 1990; Vallée, 1990; Figuet, 1995). Analysis of biochemical properties of samples collected upon the landing site were carried on in a French Biochemical Laboratory (Bounias, 1990; Bounias, 1994). Apart from the physical evidence correlated with the trace, the witness reliability had been called into question by several French researchers (Figuet, 1995; Maillot, Scornaux, 1997). On September 4th, 1998, a field investigation had been accomplished at the witness' place. As the witness is of Italian origin and doesn't speak French well, a special attention was devoted to the linguistic and psychological sides. It was discovered that the contradictions in what the witness told to the enquirers along the years are due to lack of care and misinterpretations on the part of the ufologists rather than to real internal contradictions of the witness in itself. Further, it came afloat that alleged witness half-confessions of hoax were mere witty remarks turned in worrying bad faith hints due to linguistic and psychological misunderstandings. An other sighting explanation - based on a hypothetical altered state of consciousness triggered by a specific drug - turned out to be a rumor entirely without foundation. As our field investigation didn't give rise to item of proof such as to call in question witness trustworthiness and frankness, we conclude that the witness is a reliable one.

September 4th, 1998. It was not a very good day for making a tour of Provence (southern France). The sky was clouded and didn't look promising. However, our "mission" was too much important: we were aimed at Trans-en-Provence, a little village, three kilometers south of Draguignan, in the Var department. In the country around Trans there are several large garrisons: northerly, an artillery-park and the military field of *Camjvers*, southerly, the *La Motte Ste. Roseline* military post and the paratroops school linked with the Luc-le Cannet airport. At last, the area is often flown over by training helicopters, coming from EALAT of Canets des Maures, Draguignan artillery, Frejus B.A.N. and U.S. Navy.

On January 8th, 1981, another object flew over - and landed in - the Trans-en-Provence commune. The sighting of such a UFO with ground traces - CE2 in the Hynek classification - has been inquired in the past by private ufologists and, above all, by the French scientific service GEPAN (*Groupement d'Etudes des Phénomènes Aérospatiaux Non-identifiés*), at the time officially charged with the study of the UFO phenomenon in France on *Centre National d'Etudes Spatiales* (the French space agency) account (see CNES, 1983).

The methodology and results of trace analysis had been, via Jean Jacques Velasco (then director of GEPAN, now SEPRA), instrumental in leading to the positive conclusions of Pocantico workshop regarding the UFO research: "it is desirable that there be institutional support for research in this area" (Sturrock, 1998).

The relevance of trace analysis of Trans-en-Provence, as opposed to the phenomenology of the sighting, was supported by the never forgotten father of French

ufology, Aimé Michel: "what it is noteworthy in this case are the people who studied it (...). It is the way of acquiring data that is more interesting than others. There are thousands of sightings that, while richer than Trans, had not been studied in the same manner" (Bosson, 1993).

A doubt may arise from this in the reader's mind: if the main interest into the Trans case rests on traces disappeared 18 years ago, why to take now the trouble to cross the border with France?

It is already ten years since some French ufologists began occasionally urging us to go interviewing the (sole) witness of the most celebrated French UFO case. The final push came from the friend and ufologist Perry Petrakis, leader of UFO association SOS-OVNI, during his brief holiday in Italy on August 1998. Until then no Italian UFO researcher had spoken with the witness, Renato N., of Italian origin. There were several doubts regarding his witness, due to his bad mastery of French language (someone joked that his language was a sort of "French with Tuscan accent"!). During the last years, among the others, the French ufologist Michel Figuet - main private inquirer of the case - raised doubts regarding the witness, the nature of the object seen and the ground markings (Figuet, 1995).

At last, we took the decision of going to France. One of us (M.L.) read all what have been published about the incident, so to be updated as regards the main issues at stake. The other one (P.F.), intentionally didn't read nothing about witness and case, as a way of not pollute himself with preconceived ideas. What follows is a brief synthesis of what we discovered during and after the Trans-en-Provence expedition. A full report is available in Italian language only (Fiorino and Leone, 1998).

Previous Enquiries into UFO Sighting and Ground Marking

Before going into the results of our inquiry, let summarize what we knew about the incident following *Gendarmerie* (local police authorities), GEPAN and civilian research groups involvement.

January, 8th, 1981: Renato N., of Tuscan (central Italy) origin, saw around 5.00pm (local time) an object falling fast to the ground, following a straight path. After some seconds the object left again, in a similar straight and fast way, toward the sky. The landing site was a raised level ("*restanque*") close to the witness home. This is how the witness summarized the sighting to the *Gendarmerie* (excerpt from the English translation published in Velasco, 1990, p. 31):

I was building a concrete shelter for a water pump. (...) My attention was attracted by a slight noise, a sort of faint whistling. I turned around and I saw a device in the air at the height of a big pine tree on the edge of the property. This device, which was not spinning, was coming lower towards the ground. (...) While it was continuing, I went closer by walking towards the stone cabin above my house. (...) I clearly saw the device resting on the ground. Right away it lifted off, still emitting a slight whistling sound. Reaching a point above the trees it left at high speed towards the forest of Trans, that is towards the northeast.

When the device lifted off I saw four openings below, through which neither flame nor smoke were escaping. The device kicked off a little dust when it left the ground. At that instant I was about 30m away from the landing site. Later I went to the spot and I noticed a circle about 2m in diameter. At certain places along the circumference of the circle were traces like abrasions.

When my wife came home in the evening I told her what I had seen. My wife thought I was joking. This morning [January 9. NdA] in full daylight I have shown her the trace of the circle. My wife called our neighbor Mr. X on the telephone. He came over with his

wife. I showed them the trace, too. It is then that they advised us to call the Gendarmerie.

The device had the shape of two saucers, one inverted on top of the other. It must have measured about 1.5m in height. It was the color of lead. This device had a ridge all the way around its circumference. Under the machine I saw two kinds of round pieces as it was lifting off, they could be reactors or feet. There were also two other circles which looked like trapdoors. The two reactors, or feet, extended about 20cm below the body of the machine. I have not felt any disturbance of the sense of vision or hearing.

The site of the sighting was visited by the Draguignan Gendarmerie on January 9th. The Gendarmerie listened the witness and, as stated by Renato, made the following discovery (Gendarmerie, 1981):

Behind the home there is a flat area of ground, 31m long and 11m wide. Of these 11m, 3m are taken up by a beaten path, and 8m are grassy.

Upon the 3m beaten path we observe the presence of two concentric circles, the first one 2.20m in diameter, the second one 2.40m in diameter. These two circles leave a crown 10cm wide. On this crown two diametrically opposed sections are visible, about 80cm long. These two sections present black striations similar to abrasion traces.

The Gendarmerie collected four samples: three samples of soil above and under the surface of trace, and one alfalfa (*Medicago minima*) sample. The process verbal was ended at 4.15pm and the telex to GEPAN was sent at 4.53pm.

In the afternoon came to the witness place several journalists of local newspapers (*Nice Matin*, *Var Matin République*). The first private ufologists arrived at the site on Saturday January 10th (Mr. Savelli and Monier from the group IMSA, then become CEOSE). The inquiry by Henri Julien (local representative of UFO magazine *Lumières dans La Nuit - LDLN*), one of the most detailed while not free from faults, dates back to January 13th (Julien, 1981).

Upon request of the biological analysis laboratory contacted by GEPAN, on January 23rd, the Gendarmerie collected new samples about 20m away from the trace. On February 17th, Jean Jacques Velasco, leader of GEPAN, came to the place. As stated by Velasco, "given the fact that this is a single-witness case (no additional witness was discovered at a later date) the GEPAN investigation (...) centered on the gathering of additional samples, especially vegetal samples" (Velasco, 1990, p. 33). It was collected 8 vegetal samples at various increasing distances of the trace, and one soil sample gathered outside of the trace area, 3 or 4 meters away. An additional batch of similar samples was collected 730 days after the observation as an posteriori control of the natural variability on the same area (Bounias, 1990).

The soil samples were subjected to visual and microscope analysis at CNES - Toulouse (where is located the GEPAN headquarter), physical-chemical analysis at the SNEAP laboratory in Boussen, electronic diffraction studies at the Paul Sabatier University in Toulouse, mass spectrometry by ion bombardment at LAMMA analysis laboratory at Metz University, and spark mass spectrometry at the Laboratoire d'Analyses Physiques (LAP) based in Pau. According to the Note Technique N. 16 (Velasco, 1990, p. 46) the various analysis showed the following alterations:

In summary we find that a strong mechanical pressure, probably due to a shock, was exerted at the surface of the ground. Superficial modification of the structure (striations and erosion) took place. A heating effect which may have been caused by this shock, but which did not exceed 600 degrees, was subsequently observed. Foreign elements consisting in small quantity of iron (or iron oxide) over a limestone grain, and a small but detectable amount of phosphate and zinc were deposited at the site.

The alfalfa samples analyzed at the Biochemistry Laboratory at University and INRA - Avignon, made Prof. Michel Bounias to conclude (Bounias, 1990, p. 15):

The level of photosynthetic pigments decreased in all samples collected 1 and 40 days after the incident near the epicenter of the trace. Then, in samples collected 40 days after only, glucose contents increased. These observations, strengthened by the significant increase of variability in samples collected 40 days after by contrast with samples collected 730 days after, are characteristics of an early alteration of the photosynthetic apparatus, maintained and followed by a decrease in glucose utilization. (...) The significant correlations obtained by plotting the results with distances from the trace epicenter, suggest that the "thing" that happened globally elicited biochemical effects as a reciprocal function of the distance from the source. It is noteworthy that in some cases, such as for glucose, a d^2 dependent relation was evidenced, consistent with a radiative energy emission.

Upon the enterprise of Jacques Vallée, a pair of soil samples, that had been gathered at the same time as the main samples but that had not been used in CNES analysis, were subjected during 1988 "to a number of analysis at a large, well-equipped California laboratory with the capability to process both biological specimens and physical substances" (Vallée, 1990, pp. 22, 25). The analysis via optical microscopy, scanning electron microscopy and energy dispersive X-Ray lead Vallée to conclude that

The results of our analysis of the soil samples from Trans-en-Provence are consistent with the statements by the witness and his wife regarding the history of the soil. In particular, careful microscopic and physical analysis failed to detect any of the substances, such as cement or other construction and drilling materials, that have been proposed to "explain" the traces.

The modality of sample collections and the biophysical analysis carried on behalf of GEPAN had been harshly criticized by several French researchers. Among the objections raised: scarce number of collected samples (mining a conclusion of statistical significance), doubts about the storage procedures used in Gendarmerie collections and in GEPAN stockings (on this point see Mancusi, 1991), excessive lapse of time between the event and the GEPAN sample collection, gathering of samples restricted to a single linear axis. As an example of these, the Bounias analysis had been subjected to criticism by an anonymous Belgian phytopatologist (see "Critique de l'étude de monsieur Bounias" in Figuet, 1995, pp. 43-49).

As regards an assessment of the witness, Renato N. is deemed reliable by Velasco: "his own subjectivity does not seem to have impacted his testimony either on the affective scale (expectations) or on the cognitive scale (existing hypotheses)" (Velasco, 1990, p. 38). According to Vallée, "The hypothesis that the witness had engineered a hoax in an attempt to gain publicity was not supported by observation of his behavior, either at the time of the event, or in subsequent years" (Vallée, 1990, p. 21).

Of different opinion it was the French ufologist Michel Monnerie, who stated that Renato N. engineered a joke "to make a fool of upper classes people"; a joke that slipped out of hands with the Gendarmerie involvement (Monnerie, 1984).

Basing himself on the description of the noise listened by the witness during the sighting - described by Michel Figuet "alike to a helicopter one" (Figuet, 1995, p. 16) - and upon the fact that around 4.30 p.m. a military helicopter, took-off from EALAT at Canet-des-Maures, flew over the Trans area at a height of 200 m, French ufologist Eric Maillot expressed two hypotheses (Maillot and Scornaux, 1997):

- 1) Renato N., surprised at the helicopter fly, engineers a joke centered around a UFO and several traces left by the transit of vehicles upon his land, or

- 2) Under effect of drugs taken because of a heart disease, the witness doesn't identify the helicopter and its oblong shadow for what they are. After the disappearance of the transient vision, he discovers a mysterious trace that persuades himself of the object landing.

Maillot reported also two statements of Renato N., susceptible of being interpreted as implicit confessions of a joke. During the first of them, in the course of a installment of a TV show - *Ciel mon mardi*, broadcast on September 1989 by TF1 - the witness allegedly said: "The little word I wish to say in concluding, it's... Maybe I saw something, maybe it is a story. The proof, one can find it there on the ground...people, scientists may find something there, that's something else. I say, too, during the night, I dream." On another occasion Renato allegedly told to Figuet, with the presence of Henri Julien, that "There are so many silly people in the world. On some future day, I shall tell you the whole truth". (Maillot, 1995, p. 71; English translation in Maillot, Scornaux, 1997, p. 159).

"I look forward to that day with confidence" is the ending comment by Maillot.

The Sighting Site Today

The sighting site appears today as numerous raised levels of, more or less, uncultivated land, surrounded by a thick oaks and conifers wood. The raised level ("*restanque*") where took place the sighting, at the time presenting a 3 m wide beaten path, is now completely uncultivated and covered up by weeds, nettles and several small trees grown up in the meantime. While at present wholly impassable, in 1981 the level land was, according to the witness, often used as parking by vehicles owned by the tenants of a cabin placed in the upper level. At the entrance of the dwelling place is present a still working well, drilled, jointly with the home, in the years 1966-68. A second well (whose opening is still visible whereas covered up by a thick wild vegetation) was drilled to a depth of 32 m, almost 15 m away from the landing site, on August 24th, 1982 (more than 17 months *after* the sighting).

The Witness

The witness and his wife Jeanne, born in Tuscany (Italy) and emigrated in France for job reasons, looks a happily married couple. Both of them receive a pension (Renato, previously an employee of the S.C.N.I. company, receives now a disability pension due to a heart problem since 1973), and are carrying on a dignified life, devoid of economical worries. Although they have an outspoken dislike for the French people, they became a part of the social tissue without any problem of socialization.

Between them they speak Italian. Renato, in particular, has a very difficult mastery of the French language. He often does build sentences of difficult understanding due to vivid as well as ironical periods. His forming periods is made difficult by reasonings rich in often quite complex parenthetical clauses, and by an often lacking *consecutio temporis*. The witness does appear a sober person, time and space oriented. He does not make excessive use of alcoholic drinks. He does not use neither psychotropic substances nor narcotics.

He still uses drugs due to the past heart attack: Nifedipina and a xantinic derivative. It didn't surface the use of other drugs, like the Cimetidina (Tagamet), suggested by Figuet due to its possible collateral effects. The witness told us (and this was confirmed by the wife) that the sighting day he was in excellent psychophysical health, and he resolutely reject the allegations about a possible altered state of consciousness due to drug reasons.

UFO Sighting as Reported into the Diary

We discovered, during our meeting with Renato N., a formerly undisclosed piece of information dating the day of sighting, as he (still) keeps a diary, written late in the evening, before going to bed. From our partial look over the diary, it does appear that it hold the most important events of each day. It is an empirical collection, in chronological sequence, of phone calls (made and received), visits, carried out works, and so on. The events are reported in a detached as well as factual way. It is written in a common note-book. The language used is Italian.

For the date January 8th, 1981, jointly with annotations about several phone calls made and received along the day, it is reported the following verbatim quotation: "*Visto verso ore 17 atterrare un disco volante sul terreno qui davanti al capanno. Atterrato e ripartito quasi subito. Ero dietro a fare capanno per pompa dell'acqua*" (translation: "Seen around 5 p.m. a flying disc landing above the land here in front of the shelter. Landed and left again almost at once. I was behind doing the shelter for the water pump").

The event doesn't receive on the diary neither a particular emphasis nor a particular room. There is no mention of the trace. As regards the expression "flying disc" the witness, almost reading our minds, came earlier than ourselves by specifying that he didn't know how to call otherwise the object sighted. He told us that if he had spoken about green men, extraterrestrials, flying discs, this should not come as a surprise: "It is a language invented by you [as representatives of the community of ufologists. NdA] and I merely used it".

On the date January 9th he wrote: "*Venuto signor M. a vedere e chiamato gendarmeria*" (translation: "Came Mr. M. for seeing. He called the gendarmerie"). On February 17th there is the quotation regarding the arrival of GEPAN, or as wrote by Renato, the coming of "*Centro spaziale per il soucoupes volantes ovni*" (it is a miscellaneous of Italian and French: "Space agency for the flying saucer UFO").

Analysis of Controversial Issues Regarding the Structure of Sighting Report

Figuet (1995) raised several allegedly contradictory remarks made by Renato N. regarding dynamics of the sighting, witness' behavior and object's features. In what follows we examine such controversial issues in the light of what surfaced during our investigation.

- At the moment of the sighting Renato was building a concrete shelter for a water pump. This does support the results of inquiries by Gendarmerie (Gendarmerie, 1981), GEPAN (Velasco, 1990) and Figuet (1995). According to the other versions published, the witness was making a brickwork upon a raised level (Julien, 1981), building a wall (Guerbois, 1981; Caietti, 1981), or repairing a water pump (Petit, 1990, p. 120). These discrepancies are secondary or trifling, and very likely due to lack of care on the part of the investigators. About a different matter, it is possible that the version published in Petit (1990) is due to a misunderstanding of the Italian verb "*riparare*", which has a double meaning: "to shelter" and "to repair".

- While working around the shelter he side-glanced at the object descent from the sky. This makes the pair with the CEOSE (1981) investigation (glance attracted by an oval-shaped object). In Julien (1981) there is no mention of this fact, while both Velasco (1990) and Figuet (1995) concur that the attention of the witness was drawn by a sort of slight whistling sound ("*une sorte de sifflement léger*") similar to what we

may hear inside a car when the window is open. Renato described the sound with the words "*piccolo soffiettino*", rendered by him in French with the expression "*petit sifflement*". In English this may be translated with "slight whistling". He openly remarked to us that the sound was associated to the movement of the object: it was heard both in the landing phase and in the took-off one, but it was not heard when the object was stationary above the ground. To the deliberate leading question "how did you become aware of the object? Did you turn the glance owing to a sound, or...?", he openly answered, "No! (...) I saw something, side-glancing..." It would be interesting to read the transcription of interviews carried on by GEPAN and Figuet. We suspect the drawing of attention because of the "*sifflement*" is only a inquirer's inference.

- The object descended without any sound apart from the above-mentioned "*sifflement*". This is paralleled by the Julien and Figuet inquiries, but it is in glaring contradiction with the result of GEPAN (descent associated with a sound similar to a falling stone's one) and Petit investigation (object knocking against the ground and giving rise to a dull sound). These discrepancies are likely due to the verbs used by the witness. One of the first things he told to us was that on the famed afternoon "*è caduto un caso*" indicative of a sudden movement rather than a knocking of the ground ensuing from a free fall. As a confirmation of this, during our interview with the witness, at a certain moment he pointed with the finger at the landing site and used the sentence: "*è lì che è cascato*". Many times he described the landing with the verb "*cascare*". In Italian language the verbs "*cadere*" and "*cascare*" mean "to fall" or "to go down". However "*cascare*", above all in the dialectal Italian used by Renato has a meaning of "going down" that does not imply necessarily a knocking the ground. The parallel with a "*pietra tombant au sol*" (translated in Velasco, 1990, p. 36 as "it fell like a stone") does refer to the movement of the object rather than to the sound produced in the impact (for other examples of this misinterpretations see Figuet, 1995, p. 16).

- As regards the stationary phase our findings concur with what discovered by other researchers: it seems that the object did land. The only anomalous datum is the synthetic Gendarmerie telex (January 9th), where there is a quotation of an object hovering at a 1 m height. On the contrary, the *proces verbal* reports about a landing.

- The object did land without emitting noise apart from the slight whistling sound described by Renato in the *proces verbal*. The object took-off all of a sudden after about 30 seconds, while emitting "*il solito fischio*" ("the same whistling sound"). This is paralleled by all other investigations, apart from the CEOSE's where the sound is likened to a bee swarm one. However, as correctly remarked by Figuet, this is the result of a bad conceived leading question. The CEOSE investigators asked to the witness: "Was the sound similar to a bee swarm one?".

- Differently from what reported by Julien and Velasco, during the took-off phase, according to the witness, the object didn't rise dust.

- The object came from 120° ESE and took-off toward 70° ENE. Landing and took-off phase had similar dynamics (straight movements). This is confirmed by the whole body of reports.

- The disc-shaped object had "*un affarino*" ("a thin thing": he was referring to the ridge all the way around its circumference) 10-15cm wide between the two saucers. According to the witness the object was 2.5 or 3m in diameter and 1.5m in height. An identical estimate was reported by French newspaper *France Soir* (1984). In Julien the object is estimated as 2 or 2.5m in height thank to a comparison to the stone wall close to the landing site. There is no reference to a diameter estimate. In the *proces verbal* too there is only a height estimate: 1.5m. As a matter of curiosity, the telex reports about a base estimate only: around 3m. From the GEPAN inquiry it appears a greater uncertainty, on the part of the witness, as regards the height estimate: 1.7/1.8m. Estimated base diameter: 2.5m. Petit reports only a base estimate (2.5m). CEOSE estimate: diameter = 2.5m; height = 1.5m. According to Julien the object was

asymmetrical as more swollen in the upper portion. In the underside portion there were four "secchi" ("buckets"), or "aggegetti" ("small devices") two of them longer than the other two. According the Gendarmerie report they were 20cm in height. The color of the object was lead. The object description stayed unchanged in the whole body of journalistic and ufological enquiries. The sole exception would be the presence, reported by CEOSE investigators, of something like a bolt belt ("*comme una ceinture de gros rivets*"). When we informed him about such an allegation he joked with us about the presence of a forged iron - UFO, and he remembered to us a childhood recollection about a fellow villager who worked as forger...

- Following the object disappearance, the witness went in a sudden to the landing site, where he saw the trace. Late in the evening, the wife came back home and Renato told her about the event with an ironical notation: some little green men had carried back home their cat Bigoudi. By a coincidence the cat, missing for some days, reappeared at the very sighting evening. Next morning Jeanne told about the event to a neighbor who called the Gendarmerie. This is concordant with the other enquiries, with the sole exception of Petit who states that Renato showed to Jeanne the trace on the evening (unlikely due to the darkness of 9.00pm).

- Renato told to us of not having put, in the days following the event, any shelter for avoiding the people tramped upon the trace. When questioned "did others put something?", he answered "it seems to me that they made some marks as helps for finding again the trace". Anyway, the trace site was right on an approaching path of a (inhabited at the time) cabin close to his home. According to the witness the eventual presence of car tracks would not come as a surprise. However he told us being in disagreement with the hypothesis of a car origin of the trace (supposition held by Figuet). Renato reported to us that Figuet asked him why are present tire marks on the trace. The witness quoted to us his ironical answer: "How should I know? Perhaps the object had the wheels!"

In the end, as regards the several phases of the sighting, the (few) contradictions in what Renato told to the enquirers along the years seem to be due to lack of care and misinterpretations on the part of the ufologists rather than to real internal contradictions of the witness in itself. This is consistent with what surfaced from GEPAN investigation (Velasco, 1990, p. 38).

Analysis of Drawings

An examination of the witness' drawings based upon the measurements of geometrical ratios shows some interesting results. We asked the witness to draw for us a sketch of the object seen. In Tab. 1 are reported the measurements of ratio base/height inferred from the sketches realized by Renato upon request of several investigators. As ratio error estimates was used the Gauss propagation law:

$$\sigma_z = \sqrt{\left(\frac{\partial f}{\partial x}\right)^2 \sigma_x^2 + \left(\frac{\partial f}{\partial y}\right)^2 \sigma_y^2}$$

where x = base diameter, y = height. By replacing to z = f(x,y) the function x/y, we obtain the value reported in table.

INVESTIGATORS (DATE)	SOURCE	BASE/HEIGHT
Savelli-Monier (10/01/81)	"Bulletin du CEOSE" 1, p.12	2,43 ± 0,02

Julien (13/01/81)	"Lumières dans la Nuit" 207, p.13	2,25 ± 0,08
Velasco (17/02/81)	<i>Note technique 16</i> , (GEPAN), p.23	5,75 ± 0,36
Corre (??/01/84)	"France Soir", 04/01/84	2,55 ± 0,06
Figuet (??/06/93)	<i>L'affaire de Trans</i> , p. 72	5,14 ± 0,19
Fiorino-Leone (04/09/98)	Report (CISU)	4,19 ± 0,21

Tab. 1 – Base/height ratio of several sketches realized by the witness

If the witness' estimates of diameter and height are correct, the base/height ratio should be around 1.7 – 2.0 (as his base estimate varies from 2.5 to 3 m). GEPAN obtained a ratio of 1.4 – 1.5. By analyzing the ratio set it is possible to split the values in two distinct subsets:

- a) on the one hand there are the drawings reported by Fiorino-Leone, Figuet and Velasco, where the ratio is between 4 and 6, and the sketched object looks fairly thin;
- b) on the other hand there are drawings reported by CEOSE and LDLN, where the ratio is not much higher than 2. (To these we should add the France Soir sketch. However, as its ratio is largely due to an unusually wide ridge along the circumference of the object, we hesitate to classify this sketch as CEOSE and LDLN ones).

The drawings of subset b) are much closer to the witness numerical estimate. As witness estimates do not show a large variability, differently from the sketch ratios, a doubt may arise regarding the witness reliability. Is this array of base/height ratio a hint of hoax on the part of the witness? Is it due to the "fog of time" (presumably thicker in a) subset)? Or, has the answer to be looked for elsewhere?

By comparing the witness' sketches another peculiarity catches one's eye: it is possible to split the set into two distinct subsets according to the sketches outline. This second pair of subsets tallies with the first one!

- i) The drawing realized on behalf of Fiorino-Leone, Figuet and Velasco are somewhat rough, devoid of fineries and details. These drawings represent a disc-shaped object, sometimes equipped with a median ridge, featuring two upside-down "buckets" in the underside. The buckets lower end is placed about at the same height as the object lower bilge. To these edge perspectives the witness used to add an underside view: a circle holding four small rings at angles of 90 degrees;
- ii) Both of the drawings published by CEOSE and LDLN show a skilled outline. The CEOSE one shows an unusual wealth of fictitious details (like the double bolt belt), while the LDLN one displays four appendages instead of two. This sketch depicts a swollen upper portion and looks as drawn from a frame of reference centered upon the witness. As the witness place of sighting was higher than the object's one, this could explain why the perspective drawing published by LDLN shows a vertical asymmetry.

Having seen the graphical skills of Renato, and by keeping in mind that it does exist among the UFO witness a bent to represent the object from an hypothetical edge (or lower or upper) perspective, we are inclined to think that sketches of subset b) – or ii) – owe their close agreement with witness numerical estimates to the "active collaboration" of the ufologists involved. Disagreements between sketches and estimates, far from being hints of hoax, are almost unavoidable due to the subjective nature of perception and memory.

Knowledge of the UFO Problem

As regards this issue, Figuet remarked that the cat episode shows that Renato did know the meaning of word "extraterrestrial". Similar words were used by the witness during our interview (like "little green men"). The sighting day he openly wrote "flying disc" (without giving to the episode an extraordinary emphasis). On diary page corresponding to February 17th he used the hybrid expression "soucoupes volantes ovni". These witness quotations are far from surprising.

According to a public opinion poll commissioned by the Italian civil research group CISU (*Centro Italiano Studi Ufologici*, Italian Center for UFO Studies) to the Doxa organization (sample of 1850 people, representative of the whole Italian population), less than 5 persons out of 100 have never heard speaking of UFO (Russo, 1987). Analogous data coming from foreign surveys extends this results to the word "flying saucers" (Durant, 1997).

This knowledge does not imply that the witness ascribes to the word an ETH tone. An ETH explanation meets the witness favor (as do other explanations, like those involving military remotely piloted vehicles), however he is careful in pointing out that it was not him who said having seen a UFO *as an extraterrestrial device*, but were the ufologists. His keeping of distance from equation UFO = extraterrestrial object had been repeated by him again and again during our conversations. As an example of this, at the beginning of our inquiry, he told to us a factual and far from theory-laden: "I saw a thing falling down".

A Case For Witness Reliability

Renato N. revealed himself a careful observer, aware of the faults of perception and memory when confronted with quick as well as old phenomena. Such awareness led him to show a moderate skepticism toward a UFO sighting recollection reported by Figuet. According to Renato, that recollection was exceedingly rich in details and quantitative evaluations.

As regards the Trans sighting, here follows a meaningful excerpt from our interview with him:

Question: Have you seen rising dust?

Answer: No, nothing.

Q: You have not seen dust. How it was the ground over there? Earthy? Grassy? (We were referring to the landing site.)

A: There was...soil...

Q: Therefore you didn't see dust. And...(pause)...Ok, that's ok.

A: *Anyway if you wish something more...*(ironical tone).

It is just the sense of irony one of the salient points of Renato's psychology. An irony rarely (or hardly ever) tracked by the investigators of Trans-en-Provence. An irony that passed unnoticed by Figuet and Julien when Niccolai told them "ci sono un mucchio di *couillions* nel mondo. *Un giorno vi dirò tutta la verità*" ("there so many silly people in the world. On some future day, I shall tell you the whole truth"). That same irony escaped Figuet's notice when Renato told to him, "*un giorno scriveremo un libro che conterrà tutta la verità*" ("one day we will write a book for telling the whole truth"). These sentences, far from hinting at an hidden truth, were merely expressing the witness' wish to lead astray *French* people who take themselves too much seriously. Renato N. told us this with a burst of hilarity, incredulous of what some people believed at face value. The "*couillions*" ("silly people") Renato was speaking about were not only *contactees* (who tried to pick up his "energy" following the close encounter) and

reporters who came to Trans. Those *couillons* were chiefly the ufologists themselves who, in the attempt at finding ultimate certainties and answers, eventually turned witty remarks in worrying bad faith hints.

The Altered State of Consciousness Hypothesis

In Figuet (1995, p. 15) it is reported that as of 1995 the French researchers *were not acquainted* with the eventual witness use of drugs. At the same time Figuet conjectured about possible secondary effects of some drugs - like the *Cimetidina* [*Tagamet*] - that could have put the witness into an altered states of consciousness. Such a reference to the hallucinatory properties of *Tagamet* linked to UFO events was not new. In a GEPAN's *Note Technique* it is possible to find the (witness') suggestion that a drug spurred hallucination could have caused a UFO phenomenon (CNES, 1981). As a result of our investigation we have discovered that the witness have never been a user neither of *Cimetidina* [*Tagamet*] nor of *Ranitidina* (*Zantac*; *Ranidil*; *UlceX* etc.). He never made use of psychoactive substances. On the contrary we checked the drugs actually used by him upon medical prescription following the 1973 heart attack. Drugs used by Renato N. are *Nifedipina* [*Tenordate*] and an anhydrous *Teofillina* [*Xanthium*]. As regards *Nifedipina*, among its secondary effects doesn't appear hallucination or other similar states (this was confirmed to us by several cardiologists). Usually, the secondary effects are temporary, mild and brief, and they are mainly due to its vessel dilator power (Giroud, Mathé, Meynid, 1978). Secondary effect comparisons between *Nifedipina* and other analogous drugs are discussed in Hurst, Schlant (1991). For what concern *Teofillina*, it is likewise not a source of secondary effects of hallucinatory kind. While at central nervous system level *Teofillina* may cause delirium and sensorial troubles like buzzing in the ears and flashes of light, such displays seldom happen and, moreover, these effects are simple by nature and negligible in comparison with events like headache, nausea, vomiting, insomnia, irritation, or restlessness. The reported effects are usually ascribable either to exceedingly quick venous infusion or to intolerance (Fiorino, Leone, 1998, pp. 133-150).

Evaluation of Hypotheses

In our fallible opinion Renato N. is a reliable witness. Our Trans-en-Provence field investigation didn't give rise to item of proof such as to call in question witness trustworthiness and frankness. He didn't contradict himself in spite of our attempts to pose him leading questions or to focus to marginal issues. While his ironical and humorous temper is as a central psychological issue as it was an unnoticed one, there are not well-grounded suspicions to regard his close encounter as a by-product of his fertile imagination. Those who suggested this hypothesis based themselves on what turned out to be linguistic and psychological misunderstandings.

Secondly, what did come afloat about the drugs used by the witness, do not corroborate the hallucinatory hypothesis.

As regards the "objective" side of this incident, some considerations are deserved. Among suggested hypotheses for identifying the sighted object there is the military helicopter (Maillot, Scornaux, 1997) and the remotely piloted vehicle (Rocher, 1995). The helicopter hypothesis does not stand without adding further hypotheses (hallucination or bad faith). None of these additional hypotheses are corroborated by available facts.

Sturrock (1973) suggested a procedure for evaluating astrophysical hypotheses with the help of Bayes's rule. Extending his analysis to the study of anomalous phenomena,

Sturrock (1994) found that "extraordinary evidence can be built from many (but not very many) items of unspectacular evidence, provided the items are truly independent". We tested - against the nil hypothesis - two hypotheses for Trans-en-Provence UFO event by means of such a procedure: remotely piloted vehicle (RPV) and aerostatic object (balloon). We have chosen as relevant witness items the following ones: physical appearance, movement shape, speed, sound, sighting site. The presence of trace was not considered among the parameters due to its controversial interpretation and its doubtful link with the UFO sighting. Evaluation of each item's post probabilities was carried on by a science communication writer specialized in aeronautical matters (Sgarlato, 2000).

While the numerical values of probabilities should not be taken too seriously (as correctly remarked in Sturrock, 1973), the results are unequivocal: if the hypotheses to be considered involve RPV and balloon, we can conclude that, on the ground of the present state of knowledge, those are *bad hypotheses*. None of the two hypotheses indeed fare better than the nil one (both of them give post probabilities based on all items lower than 10^2).

Statistical correlation between trace and ground biochemical properties, while not necessarily linked to the UFO sighting, does represent a still unsolved problem (see Appendix).

In conclusion, even if single witness UFO cases deserve to be considered with caution, the Trans-en-Provence event has to be regarded as a UFO phenomenon in the literal acronym sense: "*Unidentified Flying Object*".

Appendix: The Bounias Analysis

As a check of biochemical analysis results (Bounias, 1990; 1994) we carried on a linear fit of concentration vs. distance from epicenter data. We estimated both linear fit parameters and parameter errors (standard deviations). Our aim was to try and falsifying the following "nil hypothesis": it does not exist a linear correlation between concentration measurements and distances from epicenter (or, the two quantities are mutually independent). We also repeated the linear correlation coefficient estimates. Because of greater statistical relevance, we focused only on concentration measurements upon the vegetal samples collected 40 and 730 days after the incident (Fiorino, Leone, 1998, pp. 55-69).

We have found the following results: some biochemical indicators from samples collected 40 days after the incident show a statically meaningful correlation with distance from epicenter. This concerns β Carotene, Chlorophyll A, Chlorophyll A / Pheophytins, Lutein, Proline and Isoleucine; β Carotene is the only substance who keeps showing a correlation with distance in samples collected 730 days later.

We may conclude, with a certain margin of safety, that it does exist a correlation between trace and soil biochemical properties. Of course, the connection between UFO phenomenon and trace is a whole another matter as it rests on witness claims only.

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Making Ball Lightning in the Laboratory - a New Breakthrough

by
Albert Budden

Introduction

The phenomenon of ball lightning has fascinated many but has remained a mysterious riddle to scientists for decades. partly due to its transient and elusive nature. Typically although not exclusively, occurring during thundery weather, this electrical artifact can take various forms, most commonly appearing as a globe of light about the size of a grapefruit which fades out harmlessly after a few minutes. However, historical records also report metre-wide fireballs which, explode like a bomb, wrecking houses and tearing off limbs from those caught in the blast. Archaically referring to the phenomenon as a 'thunderbolt', consider for example, the following 19th century report from France:

"On July 11, 1809, at Chateauneuf-les-Moustiers, at about eleven o'clock in the morning, a thunderbolt entered the church just as the bell was ringing and a large congregation had taken their seats. The thunderbolt exploded with great force, wounding eighty-two people and killing nine outright ... There were several dogs in the church at the time of the explosion, and all of them were killed."

Another 19th century case, provides examples of the weird effects that can occur during close encounters with ball lightning:

"On August 24, 1895, about ten o'clock in the morning, several people saw a whitish globe of about one and a half inches in diameter descend out of a violent rainstorm and, on touching the ground, break up into two smaller globes. These "lightning beads" immediately rose to the height of the chimneys on the nearby houses. One went down a chimney and exploded in the kitchen, causing great damage. The other ball descended another chimney, passed through a room in which were a man and a child, without harming either of them, and went through the floor, perforating a brick with a clean round hole about half an inch in diameter."

Speculations as to the true nature of ball lightning abound, and over the past 156 years a remarkable family of theoretical models for these mysterious electric fireballs has appeared in the scientific literature. Some of these have been quite bizarre, such as the proposal that ball lightning is the result of nuclear fission, the active process of atomic bombs. However, the number of actual experiments in the laboratory has been minimal, and armchair theorizing based on second and third-hand reports has been the commonest way of tackling the enigma of ball lightning. Attempts at its reproduction have been disappointing, and has eluded physicists worldwide, although success in this would of course be a giant step forward, as it could then be made to order and experimented upon in the laboratory. *It is then, of the greatest significance that recently, two electrical engineers, Kenneth and James Corum in Ohio, USA, have actually succeeded in producing such electric fireballs in many beautiful colours, to order.* However, just as startling, is their revelation that the instructions to accomplish this *has been publicly available for over a hundred years*, tucked away in the notebooks of the legendary turn of the century physicist, Nikola Tesla. It is the Corums' unique reinterpretation of Tesla's 1899 Colorado Springs Notes that has brought what amounts to a long overlooked secret, back into the public domain. As if this was not enough. another surprise is the revelation by the Corum brothers, *that laboratory ball lightning is actually fairly simple and easy to produce*, and that the inexpensive apparatus needed already exists in many amateur enthusiasts' workshops and in countless college science departments around the world. Predictably perhaps, this

is the Tesla coil, and James Corum really puts this previously thought of technological impasse into perspective when he comments how making ball lightning in the laboratory would make an interesting high-school science project!

Making Your Ball Lightning...

Whilst such fireball production would be beyond the layperson, students and amateur physicists who have specialised in exploring the intriguing inventions of the legendary Nikola Tesla, should certainly have enough technological information to put the required hardware together, given average electrical workshop resources. The apparatus used, the Tesla coil, many of which have been built at home by electrical hobbyists in their garage workshops, is a common feature of the physics departments of many colleges and universities. For even the uninitiated, a basic description of what the Tesla coil is and does is fairly easy to comprehend, and provides enough information to appreciate what is involved in the laboratory production of ball lightning.

The Tesla Coil - The Basics

A glance at the illustration shows that the Tesla coil consists of two coils of copper wire wound around cylinders, one wide squat one called the primary, and a taller narrow one which sits inside it called the secondary. At the top of the secondary is a brass or copper ball, joined to the coil, and as can be seen from the drawing, this is also the terminal from which spectacular high-frequency electrical streamers are emitted when the device is in operation. In fact, the Tesla coil was specifically constructed to produce such high voltage discharges of microwaves, and *it is within these long streamers that the electric fireballs appear*, and remain even when the power has been switched off. These primary and secondary coils, which are not physically connected to each other, are set within circuitry which also includes various electrical units (termed a spark gap and a capacitor) designed to pump up the power output to very high levels extremely quickly (for those with technical knowledge, peak power of 100kW in ten microseconds is typical). A popular demonstration is also depicted in the drawing, where a vacuum tube or a fluorescent strip light glows by itself when held near to the terminal due to the high levels of free electricity discharged in the air around it.

So if the Tesla coil has been so freely available around the world since it was patented by Tesla in 1897, why has nobody used it to produce ball lightning before now? This issue is even more puzzling when it is realized that Tesla himself was producing fireballs during his experiments, and seemed to regard them as an intriguing but unwanted side-effect. He is quoted as saying "The most curious feature is the appearance of fireballs ..." (Colorado Springs Notes, 1899) In fact, the way he described them, they just seemed to bubble from his machine. The answer to this puzzle lays in the incredible fact that despite being studied by countless highly qualified physicists over the past hundred years, *Tesla's published notes have simply been misunderstood!* The Corums relate that after taking part in an International Tesla Symposium at Colorado Springs where Tesla's laboratory remains, they were on the plane flying home to Cleveland:

"It was a puzzle to us ... we continued to compare chapter 34 with the photographs in Tesla's published notes. And then it struck us. We just weren't using the circuit configuration which Tesla shows us. When we got back, we rearranged our apparatus ..."

The Corums go on to report:

"We observed multitudes of fireballs with diameters ranging up to several centimetres ...

lifetimes typically ranged from one and a half to several seconds ... A wide range of colours were produced ... in a manner similar to the presence of flare compounds in pyrotechnics. The demise of some fireballs were often accompanied by loud reports, while others appeared to just fade out ... We were able to produce other interesting features. Often we had pulsating fireballs. These would appear and then shrink. When they were hit by RF streamers (produced by the Tesla coil) they would grow in size and shrink again. This would occur a number of times and then they would fade away. In one sequence the ball is struck by six separate streamer discharges, growing in size each time. One fireball grew from an initial 6mm sphere into a 5cm diameter fiery-red globule within a one second time interval. The streamers often appear to have bright fluid matter being visibly ejected and moving along their length, this matter apparently adding to the size of the fireball.

Another feature was that some had the appearance of a doughnut; bright circles with darkened centres. Others appeared as deep red, bright white, green, yellow, blue-white and purple. Some fireballs can be seen to spin, with moving dark patches like sunspots. Some appear to be transparent with electrical discharges darting through them. Several are observed to change colour as they evolve and eventually explode like Novae.

Recording the phenomenon on photographic film was sometimes difficult and in some cases video proved to be superior as time durations could be estimated from the video frame rate. However, in a remarkable sequence of photographs, we were able to record the apparent effect of fireballs passing through a glass window-pane ...

Archive photographs of the ball lightning that Tesla produced show fireballs several inches in diameter, but he was running at about 100 times the power used by the Corums, and with an outer primary coil thirty feet across!

In fact, two simultaneously operating Tesla coils were involved, where an electromagnetic wave of extremely high frequency from one coil apparatus is imposed upon another at a lower frequency. This set-up acts as a trigger where the total energy produced is discharged in an infinitely small interval of time and at a tremendously great rate of energy movement which cannot confine itself to the metal circuitry of the coil, so that it is released into the air with inconceivable violence. It is this electrical violence which mimics that of natural lightning strikes, which vaporises carbon particles produced by the intense heat, which in turn form a bubble around super-heated air. This electro-thermally produced charged bubble is the basic sphere of ball lightning, within which a variety of highly dynamic chemical and electrical activities take place.

The Interrupted Explosion ...

The process could be visualised as an interrupted explosion where the outgoing expelled particles, instead of being thrown out in all directions, are held frozen in space to form a container-bubble, inside which the explosion slowly continues as unstable smouldering electro-chemical discharges. Eventually, after this electric fireball may have floated several feet through the air, its internal energies reach a critical instability, and the initial explosion continues, resulting either in a harmless burn-out or destructive force, depending upon at which stage in its energy release it was curtailed as the ball lightning form.

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The following papers are available direct from the author. Please contact him at the address or phone number above (there will be costs for the references)

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FORUM

Dear Editor,

I note that Jenny Randles is still implying that her "OZ factor" effect is unidentified and mysterious in the various articles and columns she writes. This is despite the fact that this perceptual phenomenon (sometimes called 'the bell jar effect') was identified years ago in two of my books, "Allergies and Aliens - The Visitation Experience: An Environmental Health Issue" (ISBN 1-899071-00-8) Discovery Times Press 1994.

And:

"Psychic Close Encounters - The Electromagnetic Indictment" (ISBN: 07137-2779-3) Blandford Press 1999.

as a neurological effect, i.e. a focal seizure in the brain, and even credit Randles for introducing the term.

On page 61 of the earlier 1994 "Allergies and Aliens" I state:

" Such experiences are almost always accompanied by the perception of an eerie silence, stillness and timelessness (desynchronization) producing an acute sense of isolation. This effect is due to the stimulation of the reticular portion of the mid and fore brain by fields in combination with temporal lobe activation...This effect is known as the "OZ factor" (Randles) in ufology".

And in the latter volume the identification is linked with the neurological reference book concerned i.e. Progress in Psycho-Biology. Thompson. pub. Freeman 1976. Alternatively, I am wondering if Ms Randles is actually aware of this identification of the phenomenon she has brought to our attention through her many books, and still describes today as being an unknown. If this is the case, it is odd, as she reviewed both of my books when they first appeared and should have seen the conclusions I drew on the "OZ factor" effect. Even if she disagrees with my conclusions, they have to be reckoned with and mentioned, and should not be just ignored because they demystify something she hold dear.

If we are to have any sort of 'growing point' to our understanding in ufology and related subjects, identifications such as this should register in our ufological mental notebooks, and accumulate as part of our stock of knowledge, to be used at later times. It is not in the interest of a better understanding of these fascinating and intriguing phenomena, to continue with outmoded and redundant references to them as being unknowns when in fact an identification has been made. And incidently, if Ms Randles is really interested in her "OZ factor" effect, I would be willing to argue my case with other evidence to support my neurological conclusions on this phenomenon.

Albert Budden. Spring 2001

SUBMISSION GUIDELINES FOR POTENTIAL CONTRIBUTORS.

The European Journal of UFO and Abduction Studies is the journal of TRUTH [The Totton Researchers of Ufology Theory and History]. The journal has been initially set up to bring the European UFO community closer and is primarily, but not exclusively aimed at these organisations. The journal is objective in nature, allowing an outlet for the broad spectrum of issues related to UFO and Abduction phenomena. This includes all academic based subjects (e.g. astronomy, biology, psychology etc.) as well as spiritual aspects, scepticism and new theoretical issues. Therefore, the European Journal of UFO and Abduction Studies wants to publish ufological papers and ideas from a wide range of individuals, organisations and stand points.

Types of papers and articles we are looking for

In reality, there are no papers that we will not consider. However, to help potential contributors, below are broad areas you may wish to write about:

Theoretical issues. These articles may assess the validity of existing theories, expand on existing theories or present new theoretical ideas.

Historical issues. These articles may look at the historical progression of UFO and Abduction phenomena or describe ancient accounts and issues.

Empirical studies. These articles may be a report on primary research and data collection/analysis. Analysis of attitudes towards the UFO and Abduction phenomena may be an avenue of thought for instance.

Methodological and Investigation issues. These articles may assess the methods and investigative techniques that ufology employs. They may also suggest particular methods that could be useful in the field of ufology.

Cultural issues. These articles may look at whether particular aspects of ufology are culturally unique or non-culture bound.

Commentaries. These articles can assess the notions published by authors in the European Journal of UFO and Abduction Studies.

Case Studies / Reports of enhanced sightings (e.g. 'flaps'). These articles can give details of interesting cases or 'flaps' which may not have got a wider audience before. These will still be reviewed to ensure that the reports are ethically sound (see the notes on ethics within these submission guidelines).

Authors of papers accepted in the above categories will receive a free copy of the journal that their paper appears in (if a paper has more than one author, the lead author will get the free copy). For articles accepted in the categories below, no free copy will be sent.

Research Noticeboard. This section will allow researchers to communicate with one another in order to collaborate and discuss work. This will be an essential section for ufology researchers. Calls for help with research will be included.

Reviews. Publishers and broadcasting companies may send books and videos for review. This section will give an objective view of the items sent.

Ethical Considerations

For articles that describe research using human participants, ethical guidelines must have been adhered to or the article will be returned without review. Research, therefore, should adhere to the ethical guidelines of the British Psychological Society or the American Psychological Association (or other recognised National Guidelines in your home nation - please supply us with details). Work with individuals who you feel are 'abductees' must also meet the guidelines described in "Ethics Code for Abduction Experience Investigation and Treatment," *Journal of UFO Studies*, Vol 5 (1994).

Research that is seen as being ethically dubious will not be reviewed or published in this journal. If names are to be mentioned, consent for this in written form must be sent to the Editor along with the article submitted which involves the individuals in question. Pseudonyms can be used as long as it is clear that the name provided is one.

Submission of papers

Papers should be sent to the following address: Craig Roberts, Editor of EJUFOAS, UFO Studies, Totton College, Water Lane, Totton, Southampton, SO40 3ZX, England. Alternatively, authors can submit articles via electronic mail to: ejfoas@totton.ac.uk

Papers sent via postal mail. Submissions should arrive in triplicate on A4 sized paper. A front sheet should be provided with the title of the paper along with the author(s) address(es) [postal and e-mail if applicable]. Then, the paper will be peer reviewed (blind) by three members of the editorial board.

Papers sent via electronic mail. Two electronic mails have to be sent. One must have the title of the paper along with the author(s) address(es) [postal and e-mail if applicable]. The second must contain the paper along with any images and figures as attachments that are either in text form or Microsoft Word compatible. Then, the paper will be peer reviewed (blind) by three members of the editorial board.

All papers must include a full reference section where authors of papers and books, the title of the book/article, the volume (if applicable) and year of publication are clearly visible. The following style is preferred:

For citing articles.

Hickman, J.C., McConkey III, E.D. and Barrett, M.A. (1995/6) 'Fewer Sightings in the National Press: A Content Analysis of UFO News Coverage in the New York Times, 1947-1995,' *Journal of UFO Studies*, Vol 6 (new series), p.213-226.

For citing books.

Nagaitis, C. and Mantle, P. (1994) *Without Consent: A Comprehensive Survey of Missing-Time and Abduction Phenomena in the UK*. Ringpull Press Limited, Cheshire, UK.

For citing chapters from books.

Wagstaff, G.F. (1986) 'Hypnosis as Compliance and Belief: A Socio-Cognitive View,' in P.L.N. Naish (ed.) *What is Hypnosis? Current Theories and Research* Open University Press, Milton Keynes, UK, p.59-84.