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SOLAR AND EXTRASOLAR LIFE - A NEW HYPOTHESIS

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This Paper was presented at BUFORA's 3rd International Congress at High Wycombe, Buckinghamshire, in August, 1983.

THE POSSIBLE EXISTENCE OF LIFE ON THE SUN, AND ON SOME OTHER STARS, IS PRESENTED IN THIS ARTICLE. ADMITTEDLY, THE HYPOTHESIS SOUNDS BIZARRE AND NONSENSICAL. SUCH IS THE NATURE OF NEW DISCOVERIES IN THIS ARTICLE, I WILL TRY TO SHOW THAT THE PROPOSED POSSIBILITY GOES FAR BEYOND IDLE SPECULATION AND THAT IT IS A RATIONAL CONSEQUENCE OF THE PRESENT STATE-OF-KNOWLEDGE. THE HYPOTHESIS IS BASED ON CAREFUL AND LENGTHY STUDY OF DIVERSE SUBJECTS AND IT WILL CHALLENGE NOT ONLY OUR KNOWLEDGE ON THE SCIENCES AND THE ARTS; BUT ALSO THE ESTABLISHED COMMON SENSE OF OUR TIME. THE STATE-OF-KNOWLEDGE TODAY IS SUFFICIENTLY ADVANCED FOR US TO BE ABLE TO VERIFY THE FANTASTIC POSSIBILITY, TO COMPREHEND ITS REALITY, AND HOPEFULLY, TO COPE WITH IT; IF IT TURNS OUT TO BE TRUE. IF (AND WHAT ANOTHER BIG IF) THE HYPOTHESIS IS ON THE RIGHT TRACK, THEN THE IMPACT ON HUMANITY WILL BE PROFOUND.

1. HYPOTHESIS

It is generally accepted nowadays that terrestrial life developed on Earth from the inanimate elements of matter which were present in the primeval environment of our planet in the form of simple chemical mixtures. It is also considered equally likely that extraterrestrial life could develop and evolve on Earth-like planets orbiting, within temperate zones for terrestrial-like life, around Sun-like stars. Based on the present state-of-knowledge in the sciences and arts, I propose the following hypothesis:

- (1) That the development and evolution of life on our star, the Sun, and on some other stars, in our galaxy and other galaxies; are likely cosmic occurrences.
- (2) That the proposed solar and extrasolar life can be based on the neutral ele-

ments of matter, the atoms; as in the case of terrestrial and extraterrestrial life.

- (3) That the possible existence of the proposed life can be substantiated using known laws of science and the present state-of-knowledge.

The Sun, a medium size star, is very hot with temperatures in the corona and the core regions of one and 15M degrees, respectively. The minimum temperature recorded for the Sun has been found to be in the order of some four thousand degrees Kelvin. This temperature is very inhospitable to any form of life known to us. But, when considered in the presence of other prevailing solar conditions, a new picture emerges. The Sun and some stars become possible abodes

of life. Let us first note that the average conditions of pressure, temperature, and density at sea level on Earth specify a thermodynamic state-of-equilibrium. This state-of-equilibrium has been conducive to the development, evolution, and maintenance of life on Earth. The proposed hypothesis leads to the following corollary:

1.1. COROLLARY

- (1) Similar, but not identical states-of-equilibrium to that at sea level on Earth can exist on the Sun and on other heavenly bodies ranging in size between the two.
- (2) I call the line connecting the similar states-of-equilibrium, on a three-dimensional (pressure, temperature, density) surface, a Cosmic Life Line. The Cosmic Life Line can be used to predict possible abodes of life in the universe.

It is clear that substantiation of the proposed hypothesis requires that one of the following two conditions be satisfied:

- (1) That new scientific laws be discovered to account for the proposed life.
- (2) That the proposed life be fitted into known and verified laws of science.

Careful study, consideration, and reflection on these and other matters led me to the conclusion that the proposed life can be fitted into the known laws of nature as derived and verified by terrestrial science and technology. In this article I endeavour to show that what may, at first glance, appear to be the product of fanciful and wild imagination, is a rational and reasonable consequence of the present state-of-knowledge.

2. HISTORIC NOTE

That the Sun is inhabited is not a new concept. Human history is full of accounts which speak of solar beings and Sun-gods who had reportedly visited our planet and,

even interacted with humans in the past. Such mythological, theological, and historical records cannot be used in a modern scientific content to substantiate anything regarding the matter. Claims that the Sun is inhabited is generally attributed to mythology or human imagination. Of course, the essential role which the Sun plays in the maintenance of life on Earth is considered to be at the root of the anthropomorphism of the fiery globe. The rigours of the modern scientific method left no room for speculations about the inhabited Sun. Such speculations became rare in post-Renaissance life as advances in science and technology made such possibilities very unlikely cosmic occurrences. A serious scientist who proposed the possible existence of life on the Sun was the great astronomer, Sir William Herschel.

The Sun, said Herschel, "Is most probably also inhabitedby beings whose organs are adapted to the peculiar circumstances of that vast globe"(1). The peculiar circumstances on the Sun were not fully known, nor accurately measured in the days of Herschel. The concept of spontaneous generation of life from non-living matter was accepted in some scientific quarters of his time but on different grounds than the modern view. This, combined with Herschel's observation and study of the universe, particularly the solar sunspot cyclic phenomenon; may explain the basis of his views on the inhabited Sun. The sunspots gave early solar observers the appearance of clouds, or holes in the clouds(2). Herschel persisted until his death in 1822 that the Sun is inhabited by "intelligent beings living in warm, comfortable region below the surface of the sun"(3). His opinion was not shared by other scientists, and the subject

faded away as more data on the Sun became available.

The modern solar research era began with George Ellery Hale's work at Mount Wilson Observatory, towards the end of the last century, and culminated with the recent NASA's Sky Lab and Solar Max solar experiments in the last decade. Beginning with Hale's first spectroheliogram of the Sun in 1891, the present-day model of the Sun began to evolve. The process of energy generation accounting for the immense solar energy, was explained by physicists in the 1920s. The solar temperatures were found to be too hot for the formation of living organisms or, even, the formation of simple molecular structures.

Parallel advancements in the modern life sciences led to better understanding of life's initiation and development on Earth. The possible existence of extraterrestrial life has gained serious scientific consideration in the last two decades as witnessed by such programs as the Search for Extraterrestrial Intelligence (SETI) and Ozma, in the United States, Communications with Extraterrestrial Intelligence (CETI) in the Soviet Union and others.

Speculations about the possible existence of life on the stars have become rare. When such life is considered, it is inescapable to think of it as plasma-based. The thermal agitation of matter at solar temperatures is such that the atoms are in a partially or fully ionised state. Nevertheless, the possible existence of life on the Sun has not escaped the attention of modern day thinkers. Of these Dr. Isaac Asimov, having both the interdisciplinary knowledge and audacity, ventured the following speculation in the 1970s: "Why not a very rapid and evanescent gaseous life form literally exploding with thought and experiencing life-times in split seconds, existing on the Sun, for instance."(4).

Dr. Asimov's speculation varies greatly from that of Herschel. The latter spoke of long-lasting and advanced civilisations, while the former speaks of ephemeral and

fragile life. In view of the state-of-knowledge today, Dr. Asimov's speculation has logical and valid foundation. In the case of pure plasma, plasma based life may be a possibility. This will require the discovery and development of new laws in plasma physics, chemistry and biology, if these are possible. Here, the atomic sub-particles may play the role of "hooking" action which is usually played by the electrons at the atomic level. The basic problem with the sub-particles, the mesons, for example, as "hooks" for forming molecules is their extremely short life and high instability.

In the next section I will briefly present and discuss the present day view of the development and evolution of life from non-living matter, the irreducible requirements for the initiation of life, as we know them for the case of our planet, the prevailing conditions and circumstances on the Sun, and the role which these circumstances play in making solar life possible, long-lasting and resilient.

3. ON THE DEVELOPMENT AND EVOLUTION OF ANIMATE AND INANIMATE MATTER

The concept of the development of terrestrial life from the simple chemical mixtures which were present in the primeval planet environment constitutes a return to the pre-Pasteurian idea of spontaneous generation. The threshold from inanimate to animate matter is not yet fully understood. The general feeling today, however, is that life did spring from non-living matter. A NASA study group, like many modern scientists and scientific groups, noted: "That life evolved out of inanimate matter on the surface of the Earth some 3.5 billion years ago is now a generally accepted idea."(5)

The modern tools of science and technology have led to a new understanding of ourselves and the universe. A unified cosmic evolutionary process has recently emerged in our minds leading to new speculations about the origin and evolution of life on our planet. The evolution of life, on Earth, can be followed systematically from the simple organic molecules to the advanced and complex living structures. The organic molecules, which are at the roots of terrestrial life are found to be composed from the simple elements of matter, the atoms; with larger concentration of hydrogen, carbon, oxygen, and nitrogen atoms. These four elements make up some 99 per cent of living organisms on Earth.

The experiments of Miller and Urey in the 1950s and the more elaborate experiments that followed, synthesised the small molecular life-building-blocks (LBBs) from the simple chemical mixtures of the elements: water, ammonia, methane, and hydrogen molecules. The precursors of the LBBs are the atoms, and it has become axiomatic that the elements of matter, the atoms, are the basic blocks of life.

Equally axiomatic is the development of the atoms from the simple hydrogen atom, through nuclear fusion processes which occur within the stars. A unified cosmic evolutionary process can be followed from a simple primordial hydrogen cloud, to the formation of the other atoms, the formation of simple molecules and compounds, the development of the giant molecules and on to the formation of advanced and complex living organisms. There are missing links, apparent gaps, puzzles, and uncertainties in the evolutionary sequence from hydrogen to complex life forms. But the unified process, as noted by the authors of SETI - a NASA publication, is taking hold; "To be sure, the sequence from primordial fireball to matter to stars to planets to pre-biotic chemistry to life and to intelligence, is incomplete and even controversial in some of its details. However, a broad picture is emerging,

a picture that is both imaginative and illuminating." (6)

The development of life on Earth, as witnessed by the myriad of life forms discovered thus far has the mark of a random process. This process, though, was not haphazard. As the atoms met, they formed simple molecules and compounds in accordance with built-in tendencies. And so it was with the simple organic molecules which were constructed in ordered and organised crystalline structures. These organised processes constitute the underlying order in the work of nature, and are not confined to terrestrial events.

The elements of matter represent the seeds of life. These seeds were not made here, on Earth, but in the stars and the galaxies. The Earth, itself, has its origin in the Sun. Whether we accept the Kant-Laplace hypothesis, that the Sun and the planets were formed from the same cosmic cloud; or the collision hypothesis, that the planets' material were pulled from the Sun as a result of a chance near collision of another star with the Sun; it is inescapable to conclude that solar and planetary material share a common origin. The same analogy can be applied beyond our solar system to the other parts of our galaxy and the universe. Whether the Big Bang, or the steady state hypothesis is correct, all indications seem to point to the common origin of matter in the universe. This is confirmed by spectral analysis and studies of matter in the Sun, stars, planets, comets and meteorites, and interplanetary interstellar, and intergalactic space. All are constructed from the same elements, and the elements seem to form and construct similar structures.

The seeds of life are ubiquitous in the universe, and

there is no reason to think otherwise. The initiation of life requires more than just the seeds of life or, the elements of matter. Let us briefly review the irreducible requirements for the initiation of life, as we know them for terrestrial life forms.

4. THE IRREDUCIBLE REQUIREMENTS FOR THE INITIATION OF LIFE

The Darwinian pond, in which the first terrestrial living organisms were born, required certain minimum conditions which allowed those first organisms to form, mix, mutate and grow. These conditions are not known with undisputed certainty. There is, however, general agreement regarding the necessary and sufficient elements and conditions which were needed to initiate life on Earth. These conditions, the irreducible requirements for the development of terrestrial life, consist of the following factors:

- (i) Organic compounds
- (ii) A source of energy
- (iii) A free liquid, preferably, water
- (iv) Time

As regards the organic compounds some scientists find it sufficient to list only the highly reduced molecular compounds of methane, water, ammonia and others. Others may insist on the presence of amino acids, fatty acids, carbohydrates, purines, pyrimidines, porphyrines and other small molecular building blocks used in the formation of living cells. These compounds and molecules, however, are reducible to the elements of matter, the atoms, "The state-of-the-art in genetic engineering and biochemistry indicates that if we are to proceed regressively from animals (including man) and plants; we must ultimately arrive at the basic elements of nature, such as hydrogen, carbon, oxygen and nitrogen." (7)

Modern instruments and techniques have allowed us to look into the structure and composition of the giant molecules of life. The chlorophyll molecule is found to be con-

structed from 55 carbon atoms, 72 hydrogen atoms, 50 oxygen atoms, and one magnesium atom (8). Also, "a protein molecule of cow's milk has 1,740 carbon atoms, 2,819 hydrogen atoms, 550 oxygen atoms, 440 nitrogen atoms and 19 sulfur...." (9)

It seems reasonable, then, that we can substitute the elements of matter for the organic compounds in item 1 above. In terms of abundance, hydrogen, oxygen, carbon and nitrogen atoms are the most important elements for the formation of life. These are followed by requirements for sufficient amounts of calcium, potassium, sodium, magnesium, iron, sulphur, and others. The presence of other elements is also important for life formation and, eventually, its maintenance. The exact proportion of each atom is not very important, or so it appears.

Left undisturbed and unmoved, neither the atoms nor the simple or complex molecules will produce life or, for that matter, anything else. A living organism will seek matter and energy for its continued survival. In the initial stages of life's formation, energy was needed to jostle and agitate the atoms and the simple molecules around. The main source of energy in the case of the Earth has been the radiation from the Sun. Solar radiations influenced the process of terrestrial life formation directly and indirectly. The highly energetic X-rays and UV radiations from the Sun directly influenced the early stages of life formation by breaking down the already formed simple molecules, thus, allowing these to be synthesised in varied forms and shapes. Indirect effects included the solar thermal energy, intercepted by the Earth, which set in motion and circulation the convection zones of oceans and atmosphere.

In addition to the ele-

ments of matter and energy, time is also an irreducible requirement for the initiation of terrestrial life and, other life forms in the universe, if these exist.

In the most general case, the irreducible requirements of the initiation of life in the universe, including Earth, may be listed as follows:

- (1) Matter
- (2) Energy
- (3) Time

As regards free liquid it is obvious that this can be obtained from the first two elements above, matter and energy. The role which the free liquid plays in the formation of simple living molecules is very important that it is invariably included in the list of the irreducible requirements for the initiation of life, free liquid must be formed in the early stages of life formation. It may be argued that simple molecules can form and develop in mediums other than water. Such arguments may be valid. There is, however, general agreement today that water, of all other possible mediums, is the most preferable; "Exobiologists are becoming increasingly disenchanted with ammonia and silicon chemistries as bases for life. Water-based life is almost certainly the most common form and well may be the only (naturally occurring) form"(10)

Water is indeed a unique liquid and must not be forsaken in the quest of the possible existence of life in the universe, including the Sun. How can water, the quencher of flame and fire, exist in the fiery globe will be discussed in a later section. Preserving water on the Sun will also preserve the fixed laws of nature, as we know them. This may indeed lead to truly universal biology. Water on the Sun requires the presence of hydrogen and oxygen atoms, then, reduction in their thermal agitation so as to allow the atoms to retain their electrons, to form the water molecule and, eventually, allow the formation of water in the liquid state.

When matter, energy and water are combined in the proper and chance proportion and in the proper and chance environment; simple molecules, the life-building-blocks and the acids and proteins can be formed. Once the life-building-blocks are formed mutation and growth continue under the influence of the energetic stirring action and radiation bombardment. The Darwin and Wallace principles of evolution take over. Adaptation and fitness begin the discrimination evolutionary process.

Much has been, and can be, written and said about the validity, or lack of it, of the concept of spontaneous generation of life from inanimate matter and the theory of evolution. The purpose of this article is to present a conceptual hypothesis concerning the possible development and evolution of life on the Sun. The scenario given above for the beginning and evolution of terrestrial life, is at best, superficial. Yet this brief description gives sufficient background for developing the fantastic possibility of solar life. There are many questions that remain to be answered, and many mysteries to be solved regarding life's appearance on Earth. This should not obviate the continued search for new universal truths.

Let us now look at our star, the Sun, as we know it today.

5. THE SUN

It is not my intent to restructure the existing models of the Sun to support the proposed hypothesis of solar life. In this section, general data and parameters of the Sun, as derived by modern science and technology, will be presented and briefly discussed.

We have come a long way from the early Greek view of the Sun as a fiery stone, to our present day view of the Sun as

an ordinary star orbiting at the outskirts of the Milky Way Galaxy. The Hale Mount Wilson Observatory era the quantum and relativistic mechanics era, and finally, the space exploration and computer era have combined to give us a new model of the Sun. This model is based on experiments, where possible, and theoretical considerations, where experiments were not possible.

The work of Hale and his associates at Mount Wilson Observatory and other observations led to the discovery of the intense magnetic fields associated with the sunspots, the temperature distribution in the corona, chromosphere, and the photosphere; the abundance of the elements of matter in the visible surface, and other solar parameters and activities. These discoveries led to reasonable models of the visible layers of the Sun by the middle of our century. Models of the Sun's interior had to await the discovery of energy generation in the Sun, and the stars. This was settled with Edington's proposal in 1924 that nuclear fusion processes are the prime source of energy in the Sun and the stars. Nuclear reactions are spared in the inner core of a typical star as a result of the gravitational and tremendous pressure forces acting on matter in the core region.

One of the major tasks of NASA's Sky Lab mission in the 1970s was the Apollo Telescope Mount (ATM) solar observations and study experiments. The ATM experiments allowed a clear view of the Sun, unobstructed by the terrestrial atmosphere. The Sky Lab mission confirmed many of the previously measured solar parameters, gave better approximation of others, and obtained excellent photographs and spectrographs of solar surfaces. The works described here are but a small sample of the extensive research in the 20th century, which has been conducted to better understand the Sun and the universe.

General data pertaining to the Sun are given. (11).

SOLAR PARAMETERS

Age: At least 4.5 billion years in the present state.
Distance: Mean distance from Earth is 1.5×10^8 km.
Diameter: 1.39×10^6 km (109 times the diameter of Earth).
Volume: 1.41×10^{33} cm³ (1.3 million times the volume of Earth)
Mass: 1.99×10^{30} kg (333,000 times the weight of Earth).
Gravity: 27 g's

Density:
 Average: 1.4 gm/cm³
 Core: 160 gm/cm³
 Atmosphere: Rarified
Magnetic field strengths (typical)
 Sunspots: 3000 gauss
 Polar field: 1 gauss (0.7 gauss at Earth's pole).

Temperature:
 Interior: 15 million degrees
 Surface (photosphere) = 6,050°K
 Sunspot umbra (typical) = 4,240°K
 Penumbra (typical) = 5,680°K
 Chromosphere: = 4,300°K to 50,000°K
 Corona: = 800,000°K to 3,000,000°K

A recent model of the Sun is shown in FIGURE 1. This model is derived from "The Quiet Sun" by astronaut-physicist E.G. Gibson published prior to his Sky Lab mission. The model agrees with other solar models which were developed earlier this century. As in the case of the Earth, the Sun, in this model, has been divided into different concentric inner and outer layers. The inner regions of the Sun are divided as follows:

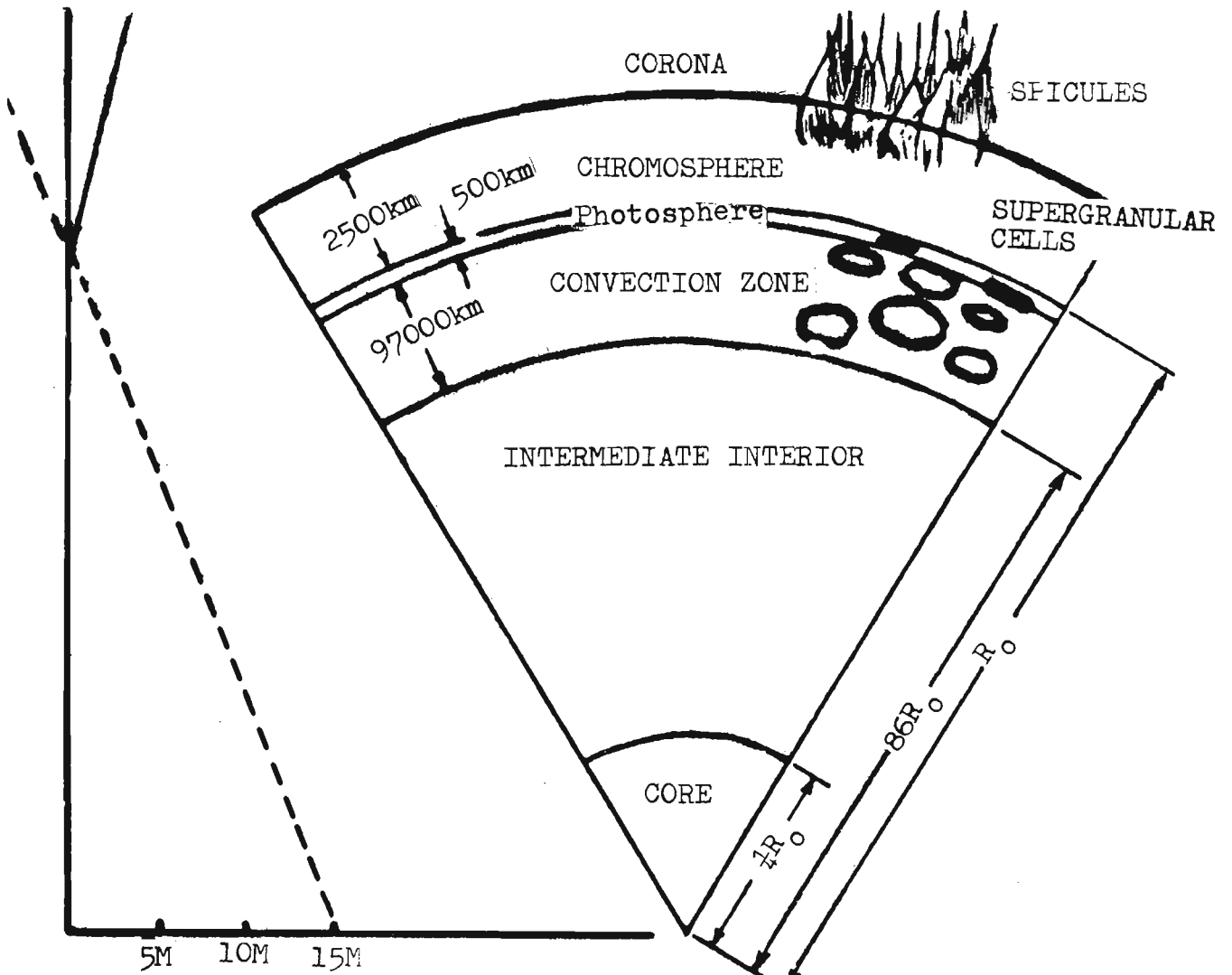


FIGURE 1. A modern-day model* of the sun (Not to scale).
 * Derived from "The Quiet Sun" by Edward G. Gibson. (NASA SP-303).

- (1) Core
- (2) Intermediate interior, or radiative zone
- (3) Convection zone.

The outer layers of the Sun, the solar atmosphere, include:

- (1) Photosphere
- (2) Chromosphere
- (3) Corona

The general conditions in the inner core and intermediate interior regions are very extreme. The same is true of the outer chromosphere and the corona. The core contains extremely dense material

while the solar atmosphere is extremely rarified. These regions are also extremely hot, and are very suspect as possible abodes of neutral-atoms-based-life, as matter in them is highly ionised.

Energy is, thought to be generated by nuclear fusion in the inner core region of the Sun. The fusing process, of hydrogen into helium, for example, produces powerful radioactive gamma rays. On their way to the surface of the Sun, the high-energy gamma rays undergo a sequence of changes

to powerful X-rays, extreme ultraviolet (XUV) rays, ultraviolet (UV) rays, and eventually, the lower energy visible light. It is natural to expect that the radiation process would continue outward to the solar atmosphere and, eventually, to surrounding space. As it turns out something else happens to the radiation process on the way out from the core. Something which turns the transport of energy from radiation to convection. Convection heat transfer is characterised by the transport of energy by matter. As matter heats, it expands and rises in the zone in parcels. As the parcels release their energy, they cool, condense and rain back down as a result of gravity action. The thin photosphere layer is inextricably tied to the layer below it, the convection zone. As Gibbon notes: "In reality, the photosphere is the top layer of the seething, bubbling convection zone." (12).

In light of the method of energy generation postulated earlier this century for the Sun, the presence of a convection zone is considered peculiar. The presence of such a zone on the Sun is important to the subject in hand. Another factor, which is also important to the "Solar and Extrasolar Life" hypothesis is that of temperature distribution in the Sun. To support the proton-proton fusion process in the Sun, the temperature in the core region is estimated at about 15 million degrees. Proceeding outward in the Sun, the temperature decreases reaching a minimum of about 6000°K at the top of the convection zone and in the photosphere. Unexpectedly, "In the photosphere, a surprising phenomenon occurs. One would expect that, because the layers above the photosphere absorb only a small amount of energy by radiation, the temperature would continue to decrease as we move outward. However, at the top of the photosphere the temperature reaches a minimum and then actually increases outward to a coronal value of approximately 10^6K (one million degrees) a temperature approaching that found in the core." (13). This has important conse-

quences, "...a significant number of the free electrons in the gas are moving slowly enough that they can be captured into bound energy states by hydrogen and other nuclei to form atoms...." (14).

The solar system, as briefly described here, represents the accepted model of the Sun in the 1970s. The models and concepts that we develop must always remain fluid as new findings alter these; at times, minimally, and at others drastically. Discoveries made during the last decade may alter the established models of the Sun significantly. It will take time before a new model of the Sun is generated, a model which will integrate the recent findings of missing neutrinos, the shrinking Sun, the oscillating Sun, and other peculiarities which are being discovered by solar researchers and the space programs. These discoveries do not have adverse effects on the proposed possibility of solar life. Actually, in some cases, the new findings seem to lend further support to the hypothesis.

The terrestrial thin crust and the convection (the oceans and lower atmosphere) layers represent the life-support-system on Earth, the terrestrial biosphere. The biosphere layers provided the ideal mixture of conditions of temperature, pressure, density and dynamic activity which allowed the seeds of life to prosper and grow. If Nature is to prove consistent in her works and there is no reason to think otherwise, then, a life-support-system containing the ideal mixture of conditions (similar, but not identical to those of Earth) may exist on the Sun. The ideal mixture of conditions for solar life may be found in the convection zone. Let us take a closer look at this zone.

(TO BE CONTINUED IN THE
OCTOBER AND SUBSEQUENT J-TAPS)

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BOB DIGBY RESIGNS

Bob Digby, Chairman of BUFORA Ltd since December, 1982, and Editor-in-Chief of J-TAP has resigned. Bob has taken up an appointment in the field of data communication in Saudi Arabia.

He left England on March 15th, 1984 and has, initially, signed a year's contract.

EDITOR-IN-CHIEF
WANTED

Bob Digby's departure for Saudi Arabia means that BUFORA's Council is looking for a new Editor-in-Chief for J-TAP.

Are you that person?

The applicant should have good journalistic and writing ability, and will be required to help with the preparation, production and selection of papers for this bi-annual journal.

The post is a voluntary one, and there will be no payment for services given. The work, however, is not too onerous or time-consuming and the post should certainly be of interest to anyone wishing to be involved more closely in the scientific and technical study of the UFO phenomena.

Those interested should write to the Chairman, Arnold West, 16 Southway, Burgess Hill, Sussex, enclosing a brief cv.

INSIDE THE WINDOW

ALEXANDER G. KEUL

In my Austrian field investigations I used to take photographs into the direction of the phenomenon from the original place of observation. When I had a second investigator with me, it was easy to get the profile of the witness into the frame. I just stepped backwards. When I was alone, it got more difficult. When I moved back, the witness did the same. Perhaps it was this detail that eventually led to the symbol I am using for my paper.

For the past 30 years researchers have mostly been looking out of an imaginary window, together with UFO witnesses. We should turn our heads to take a close look at the people who have made us look out of their windows - and at ourselves.

The French philosopher Rene Descartes created a dualism with considerable consequence for his followers. He split the world into a "res cogitans", an immaterial being, psyche or soul and a "res extensa", something physical, extended, the region of things. 300 years have passed and Western science is in trouble with the dualistic view of the cosmos (PIETSCHMANN). So when I use Descartes' distinction, it is only with hesitation, but it certainly has some implications on contemporary research into UFOs. There are, accepted by established scientific disciplines, a number of phenomena where no problems are seen to which part of the world they "really" belong. For instance, for most intellectuals except some materialists, human dreams will belong to the psychic region and are no subjects for a physicist or electrical engineer. On the other hand, a distant galaxy will be part of the physical region and constitute an astronomical problem, but no subject for psychology or psychiatry.

There is a clean philosophical distinction.

But what about the so-called "UFO experience"? Here a witness is telling his story and, in some cases, physical alterations appear on the ground, on the film etc... Technically trained scientists have concentrated on their areas of qualification and narrowed the UFO field treating the eye-witness similar to a magnetic tape which has registered a strange event and plays it back again after rewinding. The subjectivity of the event and social contacts of the witnesses were seen as "noise" around a fascinating "signal". The same experts who constructed a computer-readable UFO problem were disturbed by the inconsistency of the result, by the "ghost in the machine." Some "bolts-and-nuts-researchers" dropped into paranoid reactions - UFOs are doing their best to disinform us, to feed false information into us thus trying to influence the whole world. More flexible specialists of the physical world admit that technological interpretation of physiological and psychosomatic effects are only one possibility (SCHNEIDER).

Let us follow the other branch of the cross-roads. To the human sciences, the UFO experience is more than the simple perception of "something in the air." It is a complex inter-active system of perception, imagination, emotion and social processes with hundreds of "variables."

When amateur astronomers take a look at the moon on a clear night, it is seldom a cool perception. The irregular shapes on the moon's surface stimulate imagery, they will experience an emotional side of the process and social interaction at the time of the observation cannot be neglected either. The conscious exper-

ience is only one part of the moon watch. The larger part runs through unconscious channels and is never consciously examined at all. What is seen and what may be remembered later on follows the rules of our formal education, of our belief systems and of the socio-cultural background. Paolo Toselli has noticed that the differences between UFO and IFO cases are minimal in that respect.

The thresholds are - to enumerate them again - the physiological and neurological system (eye and brain), emotional parameters, the cognitive filter (what is identified and seen as shapes) and the social sphere (influences from other human beings). Even this short outline should be enough to show the absurdity of a "human engineering" - approach. It is possible to reduce the automatic driving of a car to a flow-chart, but not a personal experience loaded with emotion even after years!

To reconstruct the true profile of a UFO experience, we must have information on the life history and education of the witness as well as a precise account of the conscious and unconscious factors operating in his mind and from the surrounding society. This is a lot of work, but it has to be done. A naive interpretation of UFO reports leads back in a circle to the beliefs of the investigator. Richard Haines has pointed out the road to follow: "Every attempt should be made to uncover the motives one has in reporting a sighting (fully considering the witness's right to privacy). UFO investigators should be far more cautious than previously about accepting UFO reports from people about whom virtually nothing is known concerning their credibility prior to the sighting."

What are the scientific disciplines dealing with psycho-social processes that are helpful to a final study of the UFO complex? Basically, it will be psychology with its branches of cognitive psychology, test psychology and the forensic sector of witness reliability examination (LOFTUS).

Psychoanalysis allows us to deal with the unconscious aspects of the subject. It was interesting to notice that the late Salzburg analyst Igor Caruso examined the ETH challenge in a science fiction story in 1979. Pre-natal psychology - represented by the International Society for Pre-natal Psychology and its President, Sepp Schindler of Salzburg, Austria - may contribute valuable information for the interpretation of so called "Close Encounters of the Third Kind" as indicated by the US results presented at this meeting by Alvin Lawson. I consider it important to get into interdisciplinary contact with mythology, the arts and theology to study from varying viewpoints the creation and effect of symbols on the human mind. What is a symbol? "Symballein" is the Greek expression for "throwing together" and means a certain sign or abbreviation throwing together cognitive/conscious and unconscious elements.

The Swiss psychiatrist Carl Gustav Jung, founder of Analytical Psychology, will appear in several papers at this meeting because he published the earliest and up to date most advanced psychological hypothesis on the UFO phenomenon. He suggested "that UFOs are real material phenomena of an unknown nature, presumably coming from outer space, which perhaps have long been visible to mankind, but otherwise have no recognisable connection with the earth or its inhabitants. In recent times, however, and just at the moment when the eyes of mankind are turned towards the heavens, partly on account of their fantasies about possible space-ships, and partly in a figurative sense because their earthly existence feels threatened, unconscious contents have

projected themselves on these inexplicable heavenly phenomena and given them a significance they in no way deserve." To Jung, the round UFO shape has a special archetypal meaning that is common to all human beings.

Moving further, other fields of interest are sociology (WESTRUM), ethnology, politology and mass media research to cover interactions of human societies. The continuous stream of UFO tales into society via childrens' books, toys, sensational book dust jackets, comics, LP covers, science fiction films (SIMON) newspaper and magazine stories are likely to close a feedback circle. I am unhappy about the speculative treatment of the "wave" and "flap" phenomena lacking detailed mass media studies on the amplification processes (e.g. rumours) started by publicity. Working part-time in a Vienna news agency I know that whenever you ask people from the press to report things, they will report more things whatsoever than before and afterwards. The "independent reporter" is an illusion.

The medical sciences can be useful in some cases to ascertain the perceptual abilities and possible disturbances of the witness. Psychopathology may not be the final solution to the UFO mystery, but provides a warning light. Following the witness with blind faith leads out onto thin ice, when a psychotic way of thinking is involved. "The UFO investigator as healer" is a good intention, but without an idea what to do and how to deal with the phenomena one encounters, it is more likely to end as "The UFO investigator as a victim."

Last, but not least, the field of parapsychology is a close neighbour to UFO studies. In his short paper Wilhelm Peter Mulacz presents methodological parallels and contrasts.

Progress in the UFO field will be no break-through by one researcher. A gradual shift of attention with the help of many specialists leading to some inter-disciplinary projects could be the right way. As a

student of psychology I like to propose to future investigators of difficult cases, particularly of "close encounters", that they first acquire some knowledge of their own personality, e.g. by an analytical group, to be able to make out where the report ends and their own phantasy begins.

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EXTRAORDINARY GENERAL MEETING

An Extraordinary General Meeting of BUFORA LIMITED will be held at the LONDON BUSINESS SCHOOL, Regents Park, London, NW1 in the LECTURE THEATRE at 6.30pm on SATURDAY, 2nd JUNE, 1984 to receive the accounts of the Treasurer to 31st August, 1983 as published in the November, 1983 issue of BUFORA BULLETIN.

Signed on behalf of the Council of Management

CHAIRMAN



27th February, 1984.

PROXY - Please note that a member entitled to attend and vote at this meeting is entitled to appoint a proxy who need not be a member of the Company to attend and vote in his or her stead. Instruments of proxy must be lodged at the Company's registered address: 40 Jones Drove, Whittlesey, Peterborough, PE7 1UE, not less than forty-eight hours before the time appointed for the meeting.

AGENDA

1. Notice convening the meeting
2. Treasurer's Accounts.

To allow time for the above meeting the lecture by Colonel Jenkins will commence at approximately 7.00pm. Any inconvenience to members and their guests is regretted.

INVESTIGATOR TRAINING

Serious UFO research and investigation calls for some formal training if significant data is to be collected. UFO enquiries to date have been based to varying degrees, on the old, rather suspect USAF Sighting Report Questionnaire.

With this in mind some European researchers have concentrated on a witness-based study culminating in a test questionnaire devised by Dr. A.G. Keul, called "The UFO Anamnesis Test." This test gives important indicators to the direction UFO research and investigation should be heading. The onus is on investigators to be aware of this radical shift in thinking.

To enhance awareness BUFORA's research and investigation sub-committee has sanctioned a series of Workshops in three centres Liverpool, Birmingham and London (dates and venues in the June BULLETIN). There will be no correspondence course attached to the Workshop, no formal examination and no specialist knowledge or entry qualifications. The Workshops will be open to all members over 18 whose thinking is flexible enough to consider a non-physical approach to the UFO enigma.

The Workshops will be run jointly by ASSAP/BUFORA and this should benefit both since the UFO Anamnesis Test appraises the way we view reality when influenced by powerful and unusual stimuli. Although the Test is simple to administer, it calls for delicacy and a great measure of witness empathy.

ASSAP/BUFORA members wishing to join a course should contact their respective Training Officer in order that the course(s) can be seen to be viable. BUFORA's Training Officer is: KEN PHILLIPS, 13 Falcon Avenue, Springfield, Milton Keynes MK6 3HG (Tel: 0908 678870). Meanwhile, would-be investigators might care to ponder the UFO-related question: Where Are We Going?

REVISING THE GEOGRAPHICAL DISTRIBUTION OF UFO EVENTS

MAURIZIO VERGA

THIS IS A SUMMARY OF A 38 PAGE PAPER PREPARED BY THE AUTHOR IN MAY, 1981, ON WHAT IS TERMED "GEOGRAPHICAL DISTRIBUTION" OF UFO EVENTS. THE AUTHOR DEVELOPS A CRITICAL ANALYSIS OF SUCH A "UFO STUDY" AND ITS IMPORTANCE IN THE CONTEXT OF GENERAL RESEARCH. THE OLD PARAMETER "DENSITY OF POPULATION" HAS BEEN FOUND UNSATISFACTORY FOR THIS SURVEY BECAUSE OF THE PROBLEMS WHICH ARE INHERENT WITHIN ITS VARIABLES: INSTEAD THE AUTHOR PRESENTS A NEW KIND OF ANALYSIS, BASED ON THE WITNESS DESCRIPTION OF THE INDIVIDUAL SIGHTING LOCATION. UNFORTUNATELY, SUCH AN ANALYSIS ALSO HAS SEVERAL LIMITATIONS. ANOTHER ASPECT OF THE "GEOGRAPHICAL DISTRIBUTION", DEFINED AS THE "ENVIRONMENTAL CONDITIONS" IS EXPLAINED WITH SIMPLE ARGUMENTS, INCLUDING SERIOUS CRITICISM OF WITNESS AND INVESTIGATOR REPORTS.

INTRODUCTION

In the old, physically-orientated UFO research one of the studies to achieve considerable attention among ufologists is that devoted to the "geographical distribution" of the recorded sightings. This had always been taken into consideration in a specific way, as it has proved very simple to develop and interpret - a clear mark of the superficiality and hastiness (on both the technical/scientific plane and the humanistic level) which certain ufologists are wont to display. But above all this factor shows their refusal to consider themes which are intimately related to the manifestation of the phenomena and its links with witness perception and psychology (as well as its sociological component). These should be the fundamental basis of the UFO phenomenon. This reluctance would seem to be because a wide section of our students have not, and do not, wish to question the objective reality or physical existence of a phenomenon which (they believe) must be the product of an alien, or at least an unknown, stimulus. The result has been the placing of very excessive and unjustified values onto such

work, even though this is probably quite understandable in terms of the general climate of belief in the ETH.

MATERIAL AND METHODS

In my opinion, one could (and this is but an idea) take the nature of individual sighting locations into consideration and then ascertain whether the phenomenon tends or does not tend to show itself to potential witnesses according to "geographical distribution." (This term, incidentally, I consider restricted to the witness description of the area, or environment, where the phenomenon is perceived). I have examined two types of sighting location:

- (1) "With witness presence" all those sites where there is, in general, the probability of potential witnesses, i.e. places where people stop or pass through (urban areas, roads of all kinds, isolated houses, railways etc).

- (2) "Without witness presence" all those areas where there is very little probability of potential witnesses, e.g. regions of open country distant from cultivated fields and lines of communication.

Basing my own work on two samples of Italian Type 1 (Vallee classification) sighting reports, one containing 366 entries, the other 63 medium/high strangeness selected reports, I have discovered that there is a ratio of about nine to one between cases occurring in locations "with witness presence" and those occurring in locations "without witness presence"

(1) Now many interpretative hypotheses could be formulated to explain this result, all of them with roughly the same degree of validity, despite being founded on mutually exclusive subjective or objective bases. We have no certain data about the real nature of the UFO phenomenon.

RESULTS

The aim of studying "geographical distribution" (a name now useless for such analysis because it is founded on extremely variable and vague parameters) is to ascertain by practical means whether the phenomenon tends to show itself openly (i.e. "attract attention") or if it tends to avoid potential observers (i.e. "to hide itself"). The various studies so far conducted, besides giving a certain amount of discrepancy between results (probably as a result of mistaken methodology), have usually been developed in search of a hypothetical link between the number of sightings and the size of population in an area where a phenomenon has been perceived. At least two fundamental errors affect the validity of these works, inspiring little confidence in them.

- (1) The discovery of a very small "inverse proportionality." There is no strict correspondence between the two basic quantities, only a very rough indication that the behaviour of the depen-

dent variable (the number of cases) relates to the independent variable (population density). But the results have always produced the categorical assertion: "UFOs tend to avoid inhabited places." The fact that the phenomenon tends to occur, on the whole, in locations that are not densely populated does not necessarily mean that these "apparitions" wish to avoid people. The aforementioned affirmation is but a loose generalisation.

- (2) The density of population is not a completely suitable parameter for the study of "geographical distribution." The chief limitations being:
- (a) people have migratory tendencies
 - (b) there is a choice of territorial units which can be made (regions, counties states etc.)
 - (c) the percentage of population truly resident in a sighting location may not be representative
 - (d) it is impossible to formulate, on a concrete basis, any hypothetical link between phenomenon and witness on the quantitative/qualitative level.
 - (e) the incidence of unknown cases is quantitatively suspect.
 - (f) there is an uncorrectable influence from the presence/absence of investigators and/or mass media in a given location.

In my paper some basic distributions and simple analyses of population density were pre-

sented merely for the sake of demonstrating their serious (even absurd) drawbacks. It is not opportune to discuss them here. I wish only to mention three hypotheses I have considered to explain the existence of "clusters" (i.e. sighting concentrations within restricted areas). It must be remembered that unselected cases have been utilised in the discovery of these "clusters" and they are actually absent in my small sample of selected high-strangeness reports.

"Clusters" could be produced by:

- A. The presence of active investigators. The amount of well known cases would depend exclusively on the witness tendency to report them and on the local presence of inquiring investigators to attract them.
- B. An effective concentration of the phenomenon in such areas. These could be two possible causes:
 - (1) UFO interest in certain particulars of the environment, although this would not seem to be verified at the quantitative level.
 - (2) Importance of such regions for the display activities of the phenomenon. I should refer to Keel's speculation according to which a "cluster" is a sort of "window area", where UFOs pass from other dimensions of reality into our own. But the very small number of registered cases (and these always of uncertain origin: e.g. how many IFOs or psychologically explicable cases are there amongst these data?) would seem to decidedly weaken speculation.
- C. The development of brief localised "flaps" with three potential causes:
 - (1) The presence of unusual, but conventional, objective stimuli which could be continuously and uncon-

ciously misinterpreted, owing to the psychological state of the population.

- (2) Arising from peculiarities within the environment which could represent a sort of "homing signal" for the phenomenon: the subsequent disappearance of this "signal" thus leading to the removal of the phenomenon. (This is an improbable hypothesis which is closely linked with the belief in the importance of "environmental conditions")
- (3) The occurrence of unusual psychotic states within the local population, owing to the subjective observation of "apparitions", classified as UFOs a form of collective suggestion or hysteria.

Another aspect of the "geographical distribution" is this search for "environmental conditions", already referred to. This means the possible link between the number of recorded cases and certain "peculiarities" within the environment where the phenomenon is perceived. Ufologists have proposed many such "peculiarities", which have become a source of unsupported belief in both research and investigation, with all manner of consequences. Such "environmental conditions" do not even have valid quantitative support: they have merely been erroneously recorded in a few cases and at once projected on a general scale. I have said "erroneously" as nearly all of these claimed "peculiarities" (e.g. water, high tension cables, military installations, cemeteries etc.) are in fact already present at the sites where the phenomenon is perceived most

often, in that they are inevitably close to houses and lines of communications. There may not be any link between the UFO observation (or rather experience) and the presence of these "peculiarities", particularly in view of the random spatial distribution of the whole phenomenon. The search for these non-existent links is associated with a biased technological interpretation of the whole UFO phenomenon (the ETH). With regards to the hypothetical link between earthquakes and UFO sightings this is readily explainable by natural phenomena taking place in conjunction with the telluric movements (in fact several different phenomena, probably having a piezoelectric and/or gaseous origin, although still not well known but whose existence does seem accepted) The supposed link between fault lines and UFO sightings, besides being extremely sensitive to many factors (e.g. the exact location of the recorded case) is almost certainly produced by the (apparently) aleatory spatial distribution of the phenomenon.

In my paper each of the matters I have mentioned here has been exclusively developed and integrated by personal consideration and interpretation. Unfortunately a brief summary can only give an idea of this work, which remains in its experimental stages. It will not be resumed in the future, in view of the results and the attendant problems which these raise.

DISCUSSION

I would like to present a summary of the more important conclusions discussed in this study:

- (A) A geographical distribution founded on the density of population has no value, owing to the wide range of variables connected with its parameters.
- (B) In my own opinion, most studies carried out on the subject are unsuitable for serious examination of the secondary manifestation features of the UFO phen-

omenon, because of both their errors of premise and, in large part, the conclusions drawn. This is illustrative of a very superficial reflection by most ufologists on this question.

- (C) Within the limits associated with it, research founded on the witness description of every individual sighting location seems more suitable to the phenomenon under consideration.
- (D) One must consider the fact that even this analysis - founded on the divisions suggested in (C) - has many limitations. The most obvious one is concerned with the strict definition of "locations" either with or without "witness presence. There is also the problem of the analyst's subjectivity in classifying the sighting location of individual cases (which is often not helped by the lack of information). Furthermore, this proposed subdivision is extremely empiric and founded on very flexible quantitative bases, since I have not adopted (perhaps wrongly) any statistical calculation for the determination of population size within locations or the probability that potential witnesses will be there. But I think all of this is irrelevant in view of the basic problems regarding the nature of the UFO experience, which the subject in general sets us.
- (E) It has been noticed that the greater part (some 90 per cent) both of sightings and of selected reports, happen in places where there is a strong probability of potential witnesses to perceive the phenomenon. We must re-

alise that such a situation could be solely the result of the total mass of people (far greater than that normally recordable in areas which are normally without witness presence) just circulating around such locations. The quantitative ratio found in my study could well have arisen for this factor. The basis of this hypothesis (which does, after all seem very plausible) can have both an objective and a subjective relevance to the phenomenon.

- (F) Stating that, with relation to these results, the phenomenon tends to show itself to witnesses deliberately, is only a hypothesis based on an objective interpretation of the facts. Other hypotheses can be put forward, both on subjective bases and other objective ones.
- (G) What I have said does not mean that sightings occurring in locations "without witness presence" represent a sort of "out of programme" event, i.e. some fortuitous incident which is independent of the intentions of the phenomenon itself. I am quite able to formulate other explanatory hypotheses with different interpretations regarding this kind of sighting.
- (H) I have found also a type of "inflation" or "escalation" of interpretative hypotheses, resulting from a complete ignorance of very basic aspects of UFO phenomenology. But such an "inflation" could be produced - at least partially - by passing over, or rejecting, simpler hypotheses, which may be less exciting or provocative, or merely less obvious, than others. This is common procedure for certain researchers (such as myself) despite it being in contravention of the famous rules of "Occam's Razor."
- (I) Transferring ITACAT (2) cases

onto a map of Italy shows that a remarkable number of them are concentrated in central and northern parts. I think that there are at least four reasons for this:

- (1) the number of investigators.
- (2) the spread of mass media.
- (3) the number of people there
- (4) socio-cultural characteristics of the population all found within this region.

You must remember that ITACAT is essentially a "mixed" sample, with a large number of identifiable, or doubtful cases.

- (J) The "geographical distribution" as a function of territorial units (zones, regions provinces etc) has no aim, except pure curiosity and this has to be considered in the context of those factors which clearly taint it and whose real importance is often not understood.
- (K) It has been discovered that there is no significant link, at a quantitative level, between the phenomenon and certain "environmental conditions" found at the sites where an experience is reported. The link does not even hold water qualitatively, except within the confines of a special interpretation of the enigma (the ETH). Also certain elements clearly weaken the supposed validity of these "environmental conditions," which in truth may be explicable by:
- (1) their diffuse presence within the region, close to locations where witnesses tend to be.
 - (2) the small numbers of recorded cases invol-

- ving them
- (3) witness and investigator subjectivity in pointing them out in a report.
 - (4) the practical random spatial distribution of the phenomenon.

No link seems to exist in any significant sense between UFO sightings and seismic disturbance.

My aim has been to shed light on a subject known and considered in only a vague and superficial manner, trying to discredit what are dangerous and deep-rooted, but common, misconceptions.

A study of the so-called "geographical distribution" is, without any doubt, useless for the purpose of global interpretation of the phenomenon, as indeed are many other "studies" carried out on certain manifestational aspects of the phenomenon to date. These research works would be of use only (if developed to certain criteria of seriousness and objectivity) in order to discover information which might be helpful in the creation of conceptual models, which in turn would be able to reproduce the characteristics and behaviour of what we presently call the "UFO phenomenon" or "UFO phenomena" (according to our personal point of view). This is always providing, of course, that it was possible to elaborate such a model, for in truth all researchers' theories may prove to be an illusive chimera.

Unfortunately, studies such as mine are unable to supply any real information, due to the many difficulties in the interpretation of the results! I think it is pointless to devote ourselves to works of this nature, because of their unknown elements and the qualitative scarceness of the data. On the other hand, I think the time is right for a thorough development of certain topics which are directly concerned with the

real base of the phenomenon, i.e. the witness factor (topics such as perception psychology, the processes of verbal transmission of the UFO experience from witness to investigator, mass psychology, the socio-cultural aspects of the whole phenomenon and many others).

Only in this way, I believe, can one hope to shed just a little light on the whole question; and I hope that I will not deceive myself again!

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- (1) The "degree of strangeness" has been calculated according to the standards adopted by Ballester-Olmos and Guasp. See Ballester-Olmos, V.J. and Guasp, M. (1980) Standards en la evaluacion de les informes OVNI. STENDEK 11, no 39, 25-28 and personal communication from the authors.
- (2) ITACAT is a general catalogue of Italian Type 1 events (Vallee classification) created by the author of this article for an overall survey of this kind of sighting report.

CORRECTION

It is regretted that the wrong volume/number was quoted on the title page of the July, 1983 issue of J-TAP.

This should have read Volume 3 No.2.

BALL LIGHTNING UPDATE

STEUART CAMPBELL

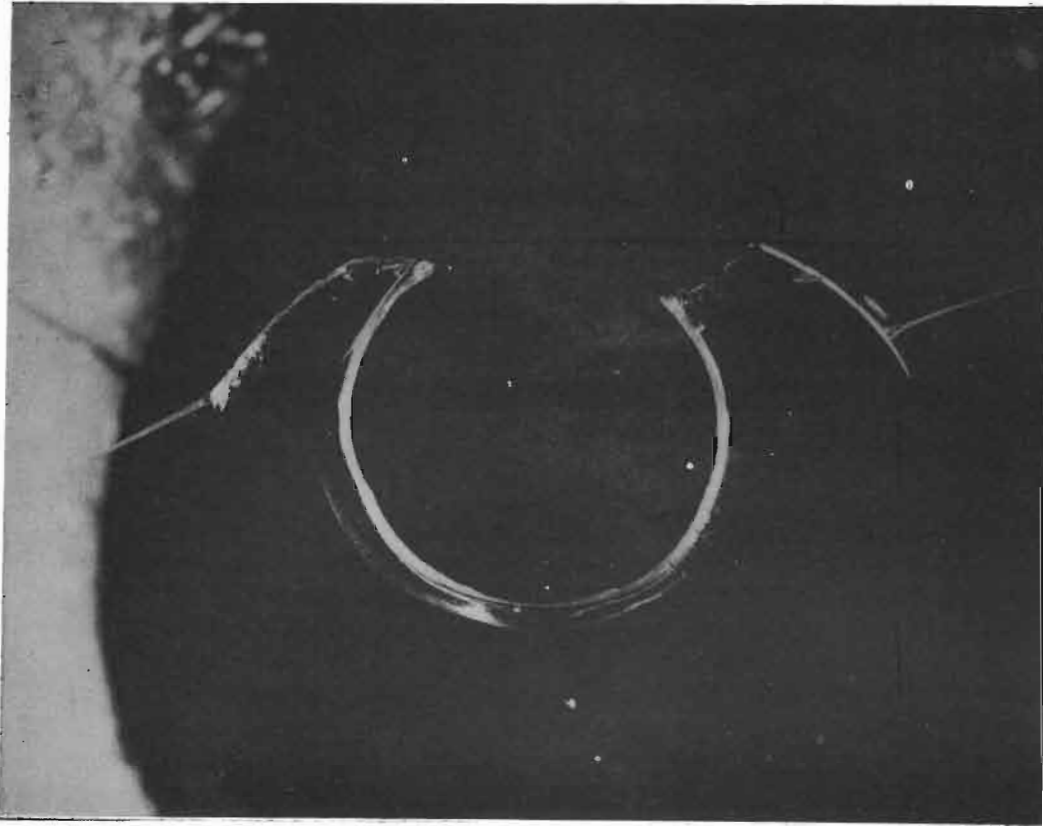


FIGURE 1

A picture of most of the hole found by McIntosh in his Department window (the pane broke on being removed). The glass "cutout" broke on falling, but was a perfect match to the hole.

(Photograph: P. Tuffy).

There have been many reports that Ball Lightning has perforated window panes, but it has not been easy to assess the accuracy of these reports. Many authors have referred to the report by Dr. McIntosh that Ball Lightning perforated the window of his Department (of Meteorology) at Edinburgh University (1) FIGURE 1. His note included a copy of a photograph from Geddes which showed a similar hole, alleged to have been made by (unspecified) lightning (2). However, I have shown that McIntosh's hole was probably caused by a small missile (3). Such mechanical damage is known to occur and I found several examples.

Muller-Hillebrand, who showed several illustrations of holes in windows, alleged that pressure or heat from ordinary lightning strokes can cause such holes (4). One of his illustrations was of a hole which

appeared in the window of a Stockholm apartment after a severe thunderstorm in 1944. An almost circular piece of the outer window about 160mm in diameter was found between the inner and outer pane. No Ball Lightning had been reported.

Kohn reported that Ball Lightning went through a closed window pane without damage to the glass (5) and Powell and Finkelstein have described a process by which this could happen (6). On the other hand, the latter reported receipt of an account from Manwaring that Ball Lightning had "melted an almost perfect circular hole 280mm in diameter through a closed glass window." (6). Without adequate evidence it should not be assumed that holes in windows are caused by BL.

A more reliable report, in which Ball Lightning was seen to cause a hole, has recently come from Russia. Ball Lightning was observed in the summer of 1977 (exact date not given) in the city of Fryazino in Moskovskaya Oblast. The witnesses were a teacher and his class on the second floor of a school. The Ball Lightning was a "hairy" red sphere about 50mm in diameter. It approached the outer window pane and a small circular red patch, about 30 to 40mm in diameter, appeared in the glass. The edges of the patch glowed hot, but after five seconds the Ball Lightning disappeared with a loud noise. At the moment the Ball Lightning vanished, the teacher, who was holding an epidiascope connected to the electricity supply (it would also have been earthed), felt an electric shock. The incident left a 50mm hole in the outer pane, but there was no mention of what happened to the circle of glass. No further details were given of the weather conditions.

Kolosovskii (who reported the incident) conducted some experiments (with Leschchenko and Myagkov) with a 500W laser aimed at similar glass. They wanted to simulate the damage. The results led to the conclusion that the Ball Lightning had heated the glass to about 1000°C (melting point is about 1500°C), but that the opening was formed by subsequent rapid cooling causing a circumferential crack. The edge of the hole had not been fused. It was estimated that the glass had absorbed about 20 kJ of energy, at the rate of 4KW, equivalent to a laser power density of 400W/cm². Kolosovskii noted that these are high values(7). However, the energy density in the glass (8.3 kJ/cm³), falls within the range of values accepted for the energy density in BL (1 kJ - 10 MJ/cm³) (8). The shock felt by the teacher indicates the collapse of a strong magnetic field.

Clearly Ball Lightning can perforate windows, but it may also go through without causing a hole. If a hole is formed it may be the

result of thermal stress and not melting of the glass. But not all holes in windows are caused by Ball Lightning.

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- (2) Geddes, A.E.M. Meteorology. (1921)
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- (4) Coroniti, S.C. (ed) Problems of atmospheric and space electricity (1965). Chap. "Lightning Protection." pp 407-429.
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- (7) Kolosovskii, O.A. "Investigation of traces left by ball lightning on a window pane." in Sov. Phys Tech Phys. 26(4) 510-511.
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TOWARDS A PSI/UFO INTERFACE

MANFRED CASSIRER

THE PRESENT THESIS PRESENTS AN ATTEMPT TO INTEGRATE TWO SETS OF DATA: THOSE OF PARAPSYCHOLOGY (PHYSICAL RESEARCH) AND OF UFOLOGY, ON A MORE PRECISE AND COMPREHENSIVE SCALE THAN HAS HITHERTO BEEN ESSAYED. THE AUTHOR IS A FORMER CHAIRMAN OF THE PHYSICAL PHENOMENA COMMITTEE OF THE SOCIETY FOR PSYCHICAL RESEARCH, AS WELL AS A MEMBER OF THE (PROFESSIONAL) PARAPSYCHOLOGICAL ASSOCIATION. HE HAS UNDERTAKEN THIS TASK WITH THE HELP OF A GRANT FROM THE RESEARCH ENDOWMENT FUND OF THE SPR., WHICH HAS RECENTLY (1979) ADMITTED UFOLOGICAL STUDIES AS FALLING WITHIN THE PERVIEW OF ITS OBJECTS AND STUDIES. AFTER A BRIEF DISCUSSION OF THE MAIN THEORIES WHICH HAVE BEEN ADVANCED IN VARIOUS QUARTERS, SOME TWO DOZEN OR MORE SPECIFIC ASPECTS HAVE BEEN INTERRELATED WITH A VIEW TO THROWING LIGHT ON THE UFO ENIGMA. IT IS NOT PROPOSED, HOWEVER, TO OFFER A "SOLUTION" OF ITS WHOLE SPECTRUM BY THE WHOLESALE APPLICATION OF INTER-FACIAL COMPARISON. RATHER WE SHOULD AIM AT ENCOURAGING A PROCESS OF VIGOROUS CROSS-FERTILISATION AND EXCHANGE OF IDEAS BETWEEN TWO DISPARATE AND LARGELY INDIFFERENT GROUPS. POINTS OF CONTACT ARE ALMOST INEXHAUSTIBLE. THESE ARE ONLY SCRAPPED AT THE SURFACE OF WHAT MAY BE REGARDED AS VIRGIN SOIL IN THE PRESENT PIONEER WORK. NOT ONLY IS THERE AN OVERLAP IN METHODOLOGY AND TAXONOMY, BUT THE VERY PHENOMENA (ANOMALIES IN THE WIDEST SENSE OF THE WORD) BEAR STRIKING RESEMBLANCES - WITH OCCASIONAL EQUALLY STRIKING DIFFERENCES!

"I am very much afraid that UFOs are related to certain psychic phenomena." Allen Hynek.

INTRODUCTION

The present study examines the many points of contact between an older discipline (Psychical Research; Parapsychology) and a relatively new one, Ufology. Ufology is defined as the study of Unidentified Flying Objects or UFOs, formerly known as Flying Saucers. The basic affinity, which is the subject-matter of the present thesis, lies in the undisputed fact that both disciplines are concerned with anomalous phenomena as yet more or less unrecognised by conventional science. Comparative study of their respective literatures, which are considerable in sheer bulk, reveals an almost complete absence of adequately informed monographs evaluating common parameters. Of the two discrete groups of investigators, ufologists have been the more

adventurous. Their efforts, such as they are, are frequently marred by superficial acquaintance with parapsychology. A less than helpful additional element is the entrenched position of some protagonists. Thus it is asserted that UFOs are of no interest to outsiders because they constitute a "new" dimension (historically unconnected with Spiritualism). This overlooks the fact that the two disciplines raise identical methodological and conceptual problems, involving numerous points of contact. Perhaps this state of affairs is only what is to be expected, as there is "an implicit tendency to regard forms of knowledge and the disciplines associated with them as demarcated from one another by divisions that are somehow natural and intrinsic to the structure of knowledge itself", when in fact there are "very good reasons

for doubting such an assumption." (WALLIS 1979). However, that may be, both subjects are seriously fragmented through mere ignorance, whereas integration and sharing of data and know-how promises mutual fertilisation and progress.

By way of illustration one may cite the spectra of our twin Societies for Psychical Research (SPR: ASPR) and of the Parapsychological Association (PA). Neither of these regard UFOs as a pertinent subject for investigation. The Parapsychology Foundation in New York has also so far been reluctant to fund such research. A paper on the inter interface by the writer was rejected by the PA in 1980 as of insufficient interest. By contrast, Freiburg University has been more open-minded (BENDER 1973). Our own society has authorised occasional lectures on the subject (including a joint meeting with BUFORA) admitting it as falling in principle within the general competence and perview of the fold (CASSIRER 1979 .57). Both subjects are bedevilled with a counter-productive polarity neatly dividing the "believers" from the "unbelievers", which vitiates meaningful dialogue.

1. THREE THEORIES IN SEARCH OF A UFO

While there is no lack of aetiological hypotheses, many cannot be said to amount to more than wild, or even absurd speculation. It has been postulated, e.g. that UFOs originate from polar caps or from inside the hollow earth; that they are attributable to the spirits of the dead or to hypothetical entities as "elementals"; or that they must be guarded against as outright diabolical. The latter view is favoured by fundamentalists reacting to cultist beliefs in them as would-be Saviours of mankind (STORY 1980 .360ff). This is a game that anyone can play allowing for a sufficiently fertile imagination.

Three theories may be considered as being to some extent "scientific" (i.e. capable of being falsified).

Regarded merely from this point of view, priority must be ceded to (1) the so-called Terrestrial Theory, according to which UFOs are secret weapons. It enjoyed popularity at the time of the Arnold sightings of 1947, when the western allies assumed that they were up against Russian devices, whereas the Soviets themselves suspected that they were of American origin! This farcical situation was bound to explode sooner or later. At least it is now known that whatever they may or may not be, UFOs are not man-made artifacts or products of terrestrial technology, and this totally erroneous concept has at last been generally abandoned.

2. The Extra-Terrestrial Hypothesis.

This is too familiar to require formal definition: no silly season is entirely complete without media reports lampooning "little green men from Mars," accompanied by appropriate cartoons. While it has generated great popular interest, it has also done most to discredit the subject as a whole with the scientific establishment. Apart from that, it has tended to cause fear, alarm and suspicion mingled with ridicule. In the late 1960s Great Britain suffered a full-scale invasion. It was not so much from outer space as from across the Atlantic, where paper-back writers had launched an avalanche of books "proving" that "Flying Saucers" are not of this earth. One particularly remembers the well-reasoned arguments advanced by authors such as Frank Edwards (1966-1967) which seemed to leave little doubt in one's mind that space-ships had indeed landed "here and now." By comparing step by step the NASA progress with ufological data his conclusions appeared cogent. First the space craft had been "improved" by their originators, then indirect and direct contact had been cautiously made.

In the final (?) stages astronauts from other planets had furtively landed in selected, isolated locations coincident with a saturation of sightings. This excessive "saturation" was to prove the hypothesis's undoing. (DELAIR 1980.3). "Close Encounters" of the Third Kind typically run on the following lines. You are driving along a deserted country road (47.6 per cent of cases according to BANCHS 1980.63). Around a bend it is blocked by a weird-looking saucer-shaped craft which you interpret in terms of a conventional object (another car; a crashed plane). Little men are busy carrying out emergency repairs, and yet as soon as you are sighted their "emergency" is forgotten, and the little men rush for cover into their vehicle to take off at breath-taking speed; alternatively the ship "dematerialises" into thin air. Obviously then, its occupants are primarily motivated by fear of being surprised by hostile natives; but are they? Or are we, on the contrary, deliberately deceived? Are incidents of this nature in fact staged for our benefit by way of a "decoy" such as are employed by ethologists dealing with "inferior" forms of life? (ZURCHER 1979.275ff). Is Tyrrell's mythological "stage-carpenter" (p.11) at work?

Of even greater strangeness if that were possible, and ostensibly even more devoid of credibility, are alleged cases of abduction of human beings, of which some 200 are listed. As if it were not a sufficient strain on our critical faculties to have to accept "landings" involving astronauts who communicate by "telepathy", one is also called upon to face the fact, corroborative of the ET hypothesis, that people have actually been abducted. Now it appears that "abductees" tend to have several such experiences and to be "rewarded" with psychic gifts by their captors; these are said to include ESP, precognition, and PK (including metal-bending: HENDRY 1980.36). Morphologically, the alleged ufonauts

differ substantially from story to story; in this respect they resemble sea-serpents reported throughout the ages only to be ignored in the final analysis, where there is also scant agreement on morphology (WALLIS 1979.307). On the other hand, the "general train of events" in humanoid accounts being basically invariant, it has been assumed (HENDRY) that the solution of the problem presented by "abductions" is "intercranial" (? psychogenetic) rather than "extraterrestrial." There remains one set of data which if firmly established would be irrefutable proof of extraterrestrial aetiology: hardware. Unfortunately the evidence is as usual inconclusive. The substance known as Angel Hair (see Chapter 11) turns out to be gossamer though with a few notable exceptions. The Ubatuba "UFO fragments" are far less mysterious on close inspection than sometimes presented (STORY 1980.374). Finally, crashed UFOs in cold storage, including their occupants, so far provide an intriguing rather than cogent argument for exobiologic life (STRINGFELLOW in STORY 1980.353).

3. The Paranormal Theory

Others having been found wanting, and not for lack of trying, the preferred theory at this time is that the phenomena are akin to, or strongly suggestive of, certain aspects of psi. At the same time it is true that the coverage of this topic by ufo-ologists leaves much to be desired; neither Hendry's Handbook (1979 .144) nor Story's Encyclopedia (1980.288) is satisfactory in this respect. The tentative assumption of a paranormal aspect and background to the phenomenon serves at least as a useful starting-point for a number of fruitful comparisons and speculations, familiar to us as parapsychologists, to replace much woolly thinking.

Even so, caution is required. It might, e.g. be argued that all effects making up the UFO syndrome (including the indisputably physical ones) could be paranormally simulated on a more gigantic scale than that often seen in Poltergeist cases or with the more powerful physical mediums on record. I do not, however, wish to underwrite such an extension of our knowledge; we have even been warned, and rightly so, against Rhine's assumption that PK and Poltergeist activity can be simply equated (GAULD 1979.320). It might further appear to some almost as if a higher "power" or "powers" were mocking us in our endeavour to arrive at an acceptable solution. The simultaneous obtrusiveness and elusiveness, the teasing nature of the phenomena which seem to escape our grasp at the last moment and prevent the repeatable experiment, are only too familiar to us qua psychical researchers. A case in point (RUPPELT, 1956) happened at Mitchel, Long Island. An experienced pilot chased an unidentified flying object - or was it a balloon? Some fairly decisive counter-arguments against the latter assumption were produced by Ruppelt, the chief investigator, The pilot in question was aware that a balloon had been launched, and his careful record refutes it. The case remained officially "unsolved" as far as the American Air Force, with its known prolixity in debunking, was concerned, in spite of the undisputed fact that the UFO was "almost exactly in line with the spot where (the balloon) was first seen." Ruppelt believed the pilot's evidence. There are psychic cases such as the Dieppe Raid (EADES 1968.355) which are equally intractable and resist final conviction one way or another in their evidential ambivalence.

2. DUPLICATION

Ufologists and parapsychologists are notoriously ignorant both of each others work and of the respective problems involved. At a study-day organised by the Society

for Physical Research in 1980 to discuss the moral implications associated with investigations of the Poltergeist there was little if any awareness of the fact that UFO journals contained articles dealing with very similar topics relating to their own spontaneous cases (cp. Chapter 20).

Beloff (WALLIS 1979.238) defines psychical research as concerned with "...phenomena which ... conflict with accepted scientific opinion as to what is physically possible ...". This definition describes the UFO experience in its strangest aspects. Our long experience qua psychical researchers in the investigation and evaluation of spontaneous cases, however seemingly bizarre and outrageous to common-sense, cannot fail to prove pertinent when applied to UFO reports also. It stands to reason that investigators must benefit by pooling their expertise and resources and generally in establishing the closest links, thus avoiding wasteful duplication of labour in the tackling of anomalies regarded as "physically impossible" by certain hitmen for the orthodox scientific establishment. (Taylor "demolishes" both subjects; TAYLOR 1980 and HANSEL 1980).

Basically, there are two discrete points of view. According to the more conservative approach the phenomena in question, however, astronomical in sheer numbers and however well-established by careful research, are too way-out for any data to be accepted individually without the most thorough enquiry into their validity. On the other side, it is argued that the time is now (?) ripe for data to be received at face value, and to be accepted without further ado, and that priority is to be given to the search for patterns by computer and other analysis. We shall not make any comment on this dilemma except to suggest that these approaches are not nec-

essarily incompatible. There is moreover, a third venue, favoured by some American parapsychologists, which is to amass data without verification on the grounds that they are of such limited usefulness that they can at best suggest laboratory experiments (L. RHINE, 1967). This further alternative may be dismissed as inapplicable to ufology, which cannot be carried into the laboratory to any appreciable extent.

Project Blue Book (RUPPLET 1956 .152f), faced with these problems, knew nothing of the history of psychical research. One group within the Air Force thought that it was high time to stop questioning the phenomenon per se and to concentrate on its "scientific investigation", while another (which ultimately prevailed) preferred the status quo and insisted on checking out each individual report as it came in.

It need hardly be said that a basic essential of any valid study in so controversial a field is the elimination of all possible normal explanations, regardless of whether or not they run counter to cherished beliefs, wishful thinking, and similar preconceptions. To quote Beloff once more (WALLIS 1979.247), "Parapsychology" (and it not alone) "has throughout its history suffered from its fatal attraction for persons of unbalanced mind who seek in it their personal salvation ..." To take hypothetical examples derived from the sceptic's postulated, believers in revenants vortices, whereas the cultist convinced of extra-terrestrial Big Brother may consider himself to be under a surveillance by what is merely a Klassian fireball pulling his car. We have personally encountered Spiritualists who ascribed a dripping water-tap to the activities of "Spirit-children." There seems to be no limit to the credulity of "believers" such as UFO cultists who embrace the "Kids Comic Hypothesis" of alleged ET superiority lock stock and barrel. Credulity, however, works both ways, and experienced pilots have been "persuaded" that their sighting of a "large fiery orange-coloured sphere" was merely the

"excited" observations of ordinary celestial bodies (RUPPLET 1956.169), just as Brewster's disingenious and belated conjectures were in blatant contradiction of his own contemporary notes on a remarkable seance with D.D. Home (PODMORE 1902.144). To use Saunder's felicitous phrase, we must beware of throwing out the "space ship" with the meteor!

3. "UFO - PRONE = PSI CONDUCTIVE?"

"UFO-prone" people are referred to by ufologists as "repeaters". This rather inelegant horological term describes those who had more than one experience, whether of simple sightings, close encounters, or abduction. As many of us survive without so much as a single incident of this kind, or again, without even a solitary occurrence of psi in their personal lives, this state of affairs requires elucidation, the more so as it has lately been shown (HARDER 1980.97) that there is a large proportion of "repeaters"; statistics show that having had one such experience they are likely to have others. We are all familiar with the claims of the purported "psychic," to say nothing of professional mediums, fortune-tellers etc. Often those who lay claim to excessive exposure to psi are found to be mentally unstable. However, the assumption that UFO repeaters, even in reporting the most bizarre abductions, are either lacking in education, skill or psychological stability is unfounded. UFO-sighters and psi-conductive persons are not necessarily to be regarded as discrete groups. On the contrary, it has been suggested by Schwarz (1979.129) that contactees may qualify as physical mediums a la Geller. Geller, though suspect as a stage performer, seems to possess genuine powers (PANATI 1976). The wayout claims by his biographer (PUHARICH,

1974) involving him with the contactee syndrome are strictly non-evidential. The "UFO connexion" of the psychic presents a new dimension in mediumship. Among the allegedly favoured with CE experiences in our own country is Mrs Bowles, who features prominently in British UFO literature (RANGLES 1979.39.156) Joyce Bowles lived in a "haunted" house in Winchester where the writer and others experienced an ostensibly paranormal effect. She came to our attention by reporting massive apparitions and psychokinesis in her home, and eventually graduated to the UFO scene where she is now part of its folklore.

4. A PHOTOGRAPH: WORTH A HUNDRED WORDS?

UFOs have been repeatedly photographed and filmed. On the face of it the evidence for the ET hypothesis seems to be strongly supported. But how strongly? Usually the image is ill-defined, and where the reverse is the case, the evidence is usually weak or suspect. Convincing "ghost" photographs are equally rare. Crookes took 44 exposures of the materialised "Katie King" in his own house, some of which survive to the present day. Although they are surrounded by an air of secretiveness (MEDHURST 1964 149) the conditions under which they were taken effectively rule out chicanery. Elsewhere, photographs of "ghosts" and "spirit extras" are legion, and a whole minor industry was dedicated to their production in Victorian times (GETTINGS 1981). A consideration of some importance might be thought to be whether the image of the UFO, apparition or materialisation tallies with its oral description. Thus Richet's account of his observation of the materialised form known as "Bien Boa" (RICHET 1905) could be criticised on the grounds that it does not altogether support the accompanying plates. In the field of Ufology there was a supposedly good case (CHAPMAN 1969.90.cp.RANGLES 1979.90) where the photographer's visual impression of the object

showed variations from the snapshot submitted by him, to say nothing of the mysterious Lubbock Lights (RUPPELT 1956.106) where the photographic data are ambiguous, the phenomenon itself having a possibly quite prosaic explanation. In the Kaikoura (NZ) sightings, observation by the naked eye did not totally jibe with the image on film (BERRY 1980.2). To confound confusion, photographic material can be paranormally affected and distorted (EISENBUD 1979.145), giving the lie to the old adage about the camera's trustworthiness, and casting serious doubts on the implied superiority of picture over word. UFOs tend to produce vague, blurred images at their best; the majority are anyhow suspect. Adamski's notorious "scoutship" is as ill-defined photographically as Voirrey Irving's snapshot of the "talking mongoose" (PRICE 1946.152). Genuine photographs of ufonauts (humanoids) there appear to be none now that the Falkville case is in doubt (ZURCHER 1979.134). Confession and exposure are traditionally unacceptable as evidence of wrongdoing by some Spiritualists; a manufactured UFO photograph is equally likely to retain a hard core of "believers" in spite of its dubious credentials (KLASS 1968.136).

The claim that a thousand words are worth a photograph seems applicable to our subject-matter, especially if one were to conjecture that paranormal optic phenomena, "at once the most immediately appealing and the most elusive of all paranormal physical effects," force us to admit that "there are two (my italics) sorts of origin of the photographic image" (HASTED 1981.213;206).

5. MALFUNCTIONING: A HALLMARK OF ANOMALIES

This has become part and parcel of the folklore of all paranormal incidents, whether of

spontaneous events (hauntings) or laboratory work on psi. The media are full of it; typically, in a Physic News report, a professional photographer or other technician complains that his trusty, expensive equipment, such as a flash-gun or tape-recorder, temporarily malfunctioned on location when up to date it had been in perfect order. Moreover, once the assignment is over, there is no more trouble with it. At Enfield (PLAYFAIR 1980.47) professional flash equipment failed the expert. Even in a dramatised reconstruction of a psychic episode by Bristol TV ("Leap in the Dark") there was this kind of interference. At a haunted squash-court attached to a wartime aerodrome in Lincolnshire a BBC reporter's tape-recorder jammed at the critical time, but again only temporarily. At Rosenheim, scene of the best-investigated poltergeist case on record (CASSIRER 1975), the apparatus of the Max Planck Institute at Munich significantly malfunctioned; previously there had been a remarkable series of interferences with the telephones, lights etc. Traditionally, clocks and watches stop at the time of death of their owners or their friends and relatives (SCHWARZ 1980.264). All these instances are likely to suggest PK effects to the parapsychologist.

With UFOs, a parallel situation arises when EM effects occur coincident with sightings and close encounters. They are said to have been seen over New York during the Great Blackout, but sceptics are always at hand with pat "explanations" of every kind of anomaly. A woman whose car was stalled by a "saucer" which was buzzing her was subjected to ridicule subsequently; it was alleged that she had panicked at the sight of the moon shining into her car window: this had caused her to lose control of the vehicle. Though this "explanation" may seem forced, and is unlikely to be correct, it is nonetheless an unfortunate fact that the Moon, Venus and other bright planets have been

mistakenly reported as UFOs not only by the general public, but by members of the Police Force. However, an incredible but well-attested case of temporary malfunctioning is on official record from the USA (BRAY 1967). "As the plane came closer," the report says, "its radar was suddenly jammed by a strong interference.....For 10 secs., this eliminated the mysterious interference pulses, then they began again ... Immediately after the pilot landed and made his report (of a large UFO) the jet was tested by another Air Force pilot. All equipment including the rader, operated correctly. The aircraft was thoroughly checked by ground personnel; again all systems were satisfactory according to the Intelligence report."

To revert briefly to Parapsychology, a recent study of metal bending (HASTED 1981.101) showed interference with instruments (strain gauges) essentially similar to that experienced by Karger and Zicha at Rosenheim (KARGER 1969) with their pen-recorder. The German scientists concluded that the events recorded by them were not explicable by theoretical Physics, and were mechanically induced by "intelligently controlled forces" that tended to "evade investigation."

THIS PAPER WILL BE CONTINUED
IN THE OCTOBER AND SUBSEQUENT
ISSUES OF J-TAP.

UFO STUDY COURSE

A short five week UFO STUDY COURSE is to be held in an outstation of the Putney and Wandsworth Institute during June-July, 1984. The course tutor will be LIONEL BEER a founding member and Past Chairman of the British UFO Research Association (BUFORA).

The course will run on Monday evenings commencing at 7.15pm on Monday, 4th June at the Mayfield Adult Centre, West Hill, Putney, London, SW15.

It is intended for people who would like to learn more about this intriguing phenomena, and who are willing to treat the subject objectively and critically. Prior knowledge is not important and sessions will be extensively illustrated with colour slides.

Public lectures tend to alight upon particular and sometimes esoteric aspects of ufology often calling for prior knowledge. This course will take a structural approach, and there will be ample time for students to discuss points without embarrassment as it proceeds.

TIME: 7.15-9.15pm. Monday evenings commencing Monday, 4th June, 1984 (lasting 5 weeks).

COST: £3.50 for five lectures (ILEA area), £5.50 (non ILEA area); UB40s/OAPs £1.00.

VENUE: Mayfield Adult Centre, West Hill, Putney, London, SW15.

TRAVEL: East Putney (District line from Earls Court). Buses 37 and 170.

The first UFO course to be held at an academic establishment in London was run by Lionel Beer in 1979 and resulted in 40 students becoming members of BUFORA.

UFO CONGRESS - 1984

July 21st-27th, 1984

To be held at Mellerup Centre, Mellerup, Denmark a city 30km north of the German border.

Among the speakers will be: Bertil Kuhlemann of UFO Sweden, Hans Jurgen Kohler of Germany and Robin Lindsey of UK who will look at the British UFO scene.

Cost for accommodation and meals will be approximately £75 with a £6 admission fee to the lectures.

Details from Lars K. Lassen, Lyshojgardavej 97, St.tv 2500, Valby, Denmark.

ASSAP GARDEN PARTY

ASSAP's 1984 Garden Party and Fair will be held on SATURDAY, 23rd JUNE 1984.

The venue will be the home of David Christie-Murray at Imber Court Cottage, East Molesey, Surrey.

COME ALONG AND HELP
MAKE IT A GREAT SUCCESS.

Letters to the Editor

Sir - I recently purchased a UFO book called "THE ENCYCLOPEDIA OF UFOs" by Ronald Story. I have not read all the book but two cases caught my eye as I was looking through it. The first is a case of a scoutmaster in Florida and the second the Flynn Encounter others in the book include one in Essex, England, and they all are good evidence to support my Photon Rocket theory. All three indicate microwave activity underneath a disc shaped object which had a marked effect on the witness and the ground. In the first case the roots of grass were charred by great heat and in the Essex case soil animals were similarly affected.

My Photon Rocket theory which I doubt if you are familiar with requires a thousand gigawatts of microwave power per tonne of craft to support it in the earth's gravitational field and to provide propulsion in interstellar space. A craft using this means of propulsion can reach relativistic velocities with modest mass ratios if matter can be converted to radiation with very high efficiency. (A mass ratio of three gives a velocity of 0.8C).

The energy density of the radiation is reduced by an annular reflector around the craft and this gives rise to the inverted saucer shape in these sightings. The main problem with my theory is the generation and control of such an enormous energy source. Many would say the craft would be instantly vapourised. The motor itself where the matter is being annihilated must be plasma but the reflector could be metal of very high reflectance and has to handle around 150 Kw per sq. cm. and if it only absorbs one thousandth of this then it has to dissipate 150W per sq.cm. this is not impossible I think.

The soil under the craft can dissipate the energy over a greater

depth and thus will heat up only slowly it also has to get rid of its water before rising above 100°C so a great temperature rise will be delayed somewhat.

I may say that the annular burn mark is well known and this is good evidence that many of these objects may be Photon rockets, another shred of evidence is the coloured glow under the craft, according to my Photon rocket theory this is due to the air being ionised by microwave radiation passing through it - a glow discharge in fact - also accounting for sulphurous smells associated with some of them - this being ozone from the passage of electricity through the air. So one would expect a column of light under the craft - which has been observed in many cases. Radio interference and glowing lamps come under this heading also.

I don't know how readers might feel about this theory, but I feel that the evidence needs further study. It is only those cases where there are definite physical effects that are worthy of further investigation and these should be tackled vigorously.

CHRIS
STREVENS

London
SW19 3JJ

SIR - I am obliged to Jenny Randles for pointing out my error in accepting the Innerleithen report as ball lightning. I was misled by the witness, who initiated the interpretation, but I have no excuse for not looking for other explanations. The object was a bright fragmenting fireball (bolide) and an account of it by Howard Miles may be found in the Journal of British Astronomical Association, 1983 93,4 (p.153).

However I am not the only one to "presume in labelling events BL with little forethought"; see my letter "Not Ball Lightning" in J-TAP 2(i) p.19!

STEUART
CAMPBELL

Edinburgh
Scotland.

SIR - Reference Miss Randles' assertion in J-TAP (2.5. 1983 p.87) that the so-called Code of Practice (for ufologists) was "first mooted by Geoff. Bird" and herself. This is incorrect. The idea for such a code, albeit rather different from that which eventually emerged, was first suggested by Les Hall of NUFOIS who also drew up the first draft.

Although NUFOIS pioneered the notion of an informal code the society found it could not accede to the "legally vetted" object which Miss Randles now so vigorously promotes, and we have instructed, on a unanimous vote at our AGM, not to adopt it, or require any of our investigators to sign it.

ROBERT
MORRELL

NUFOIS
Nottingham.

JENNY RANGLES REPLIES: I respect Bob Morrell, NUFOIS and their stance on UFOs, but disagree with their view on the Code.

I am not aware that NUFOIS "pioneered the notion of an informal Code", quite a few people considered it necessary including Dr. Berthold Schwarz and myself.

I recollect that during 1980 Geoff Bird (then of PROBE) met me, as co-ordinator of NUFON, Rosalind and Peter Warrington of MUFORA to move for and organise the first joint meeting between northern and southern local groups. PROBE were similarly involved with an alliance to NUFON concerning southern groups. This team - MAUFOG - did not survive but it led to a PROBE/SCUFORI link in the west country which generated much good ufology.

Our concern to have a focus for the planned joint meeting decided us that there was a requirement for a mutually agreed

code governing the behaviour of UFO investigators. There had been a background of interest by NUFOIS but nothing had been done. Geoff agreed to put the idea of MAUFOG and I to NUFON.

In January, 1981, under UFOSIS and with the Code as a theme, a working party was formed and a further meeting planned with NUFOIS as host. At this meeting Les Hall suggested the Code's outline and he deserves all credit for it.

BUFORA was involved from the outset and the drafting meetings, both in the north and south were attended by NUFOIS up to the final, legally vetted draft in April, 1982. NUFOIS did not express dissatisfaction with the Code until after its publication. Of course they are entitled not to adopt it if it is a bad Code, but, as draftees, they must share part blame for its "badness." However I do not believe it is bad. There is room for improvement, certainly, and to this end the original draftees (and other interested parties) will be invited to discuss the Code now it has been operative for just two years and to suggest changes. NUFOIS is welcome to attend.

The Code was the first serious attempt to get independent UFO groups to resolve their differences and work for a common aim. Its successful outcome is much more important than who first thought of the Code.

Despite NUFOIS's views the Code has been adopted by many groups, both here and overseas; a modified version is used by ASSAP for investigation into paranormal/psychic phenomena.

The Code's general acceptance is a tribute to all the dedicated people who helped formulate it.

THIS CORRESPONDENCE IS NOW
CLOSED.

Aims and scope of the Journal

Research and investigation into unidentified flying object (UFO) phenomena has progressed from the early days of wild speculation into an area where scientific analysis and evaluation methods can be applied to a number of specified areas.

It is realised that ufological research is subject to a great deal of speculative comment, much of which lies on the boundaries of current scientific thought. Many existing scientific institutions accept limited discussion of UFOs and related phenomena where it has some bearing on their discipline. The Journal of Transient Aerial Phenomena (Journal TAP) offers a forum for scientists and researchers to present ideas for further discussion, results of investigations and analysis of statistics and other pertinent information.

Journal TAP aims to meet a wide range of discussion by incorporating an approach with breadth of scope, clear and topical comment conducted with scientific rigour. It intends to offer a truly international forum enabling researchers throughout the world to publish results in an authoritative publication which should serve to further knowledge of the cosmos and benefit mankind in so doing.

Notes for contributors

The Editorial Board will be pleased to receive contributions from all parts of the world. Manuscripts, preferably in English, should be submitted in the first instance, to the Editor-in-chief, 40 Jones Drove, Whittlesey, Peterborough, PE7 1UE, United Kingdom.

Manuscripts should be typed double-spaced on one side of A4 size paper with wide margins and submitted in duplicate. While no maximum length of contributions is prescribed, authors are encouraged to write concisely.

The author's name should be typed on the line below the title. The affiliation (if any) and address should follow on the next line. The body of the manuscript should be preceded by an abstract of around 100 words giving the main conclusions drawn.

All mathematical symbols may be either hand-written or typewritten, but no ambiguities should arise.

Illustrations should be restricted to the minimum necessary. They should accompany the script and should be included in manuscript pages. Line drawings should include all relevant details and should be drawn in black ink on plain white drawing paper. Good photoprints are acceptable but blueprints or dyeline prints cannot be used. Drawings and diagrams should allow for a 20 per cent reduction. Lettering should be clear, open, and sufficiently large to permit the necessary reduction of size for publication. Photographs should be sent as glossy prints, preferably full or half plate size. Captions to any submitted photograph or illustration should be appended and clearly marked.

In the interests of economy and to reduce errors, tables will, where possible, be reproduced by photo-offset using the author's typed manuscript. Tables should therefore be submitted in a form suitable for direct reproduction. Page size used should be A4 and width of table should be either 10.5 cm or 22 cm. Large or long tables should be typed on continuing sheets but identifying numbers should be placed on the upper right-hand corner of each sheet of tabular material.

Reference to published literature should be quoted in the text in brackets and grouped together at the end of the paper in numerical order. A separate sheet of paper should be used. Double spacing must be used throughout. Journal TAP references should be arranged thus :

- (1) Jacques Vallee: 1965. *Anatomy of a Phenomenon*, vii, Henry Regnery, Chicago.
- (2) David Haisell: 1980. Working Party Report, *Journal TAP* 1/2, pp36-40

With the exception of dates which should be presented in the astronomical convention viz : 1977 August 06, no rigid rules concerning notation or abbreviation need be observed by authors, but each paper should be self-consistent as to symbols and units, which should all be properly defined. Times however should be presented in astronomical form using the 24 hour clock and Universal Time (UT) where possible. If local time is used, this should be specified viz 19h 15 GMT.

The Editorial Board shall have the right to seek advice from referees on suitability for publication and may, on their recommendation, accept, seek revision of or reject manuscripts. If considered unsuitable for Journal TAP, the Editor-in-chief reserves the right to forward manuscripts to the Editor of *Bufora Journal* for consideration. The Editor-in-chief's decision will be final.

Book reviews and letters for publication will also be considered.

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C O N T E N T S

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