

knew of no formal studies going on overseas, [in a reply to the *Daily Mail*—published on May 25—British Minister of Defence Denis Healey said all flying saucers reported are investigated.] He also said that although no competent scientist believes extraterrestrial intelligence is involved, the possibility should be kept open as a possible hypothesis : we should not close our minds to it.

Later in the proceedings Congressman Price spoke of satellite tracking systems, and asked if there would be a record of them (UFOs) somewhere. To which Dr. Hynek replied : " I would certainly think so, and this . . . is one of the most potent arguments against extraterrestrial visitation by intelligences, unless they were so superin-

telligent they knew how to evade completely our surveillances. I think this would be pretty difficult." He also agreed that they could be tracked if they left orbit.

Questions and answers followed concerning the UFO photographs published in *Life* magazine (April 1,—*Life International* April 18) and Chairman Rivers instructed that the negatives were to be obtained for examination by Dr. Hynek. Towards the end of the deliberations, Major Quintanilla denied that any cases involving radar sightings were unsolved. Also the point was made that many people (as was the case in the Beaver County sightings) were afraid to hand over to the Air Force negatives of photographs of alleged UFOs, for fear of confiscation.

UFOs & ELECTROMAGNETIC WEAPONS

by C. Maxwell Cade

DR. BERNARD FINCH, in the January-February issue of the *FLYING SAUCER REVIEW*, gave a most interesting account of the electromagnetic effects which have frequently been reported in association with UFOs, and states that in his view the effects are merely incidental to the presence of the UFO. There have, however, been numerous reports of "energy beams", producing tingling sensations or partial paralysis, and these, combined with the generally "stand-offish" behaviour of the visitants suggests, to my mind, a deliberate use of electromagnetic energy as a deterrent. I do not for one moment intend to suggest anything like "Death Ray", but something more like an electrified "cow-fence".

It might be informative if these reports were critically studied after reviewing (so far as Security permits) the present state of Radiation Weapons on earth ; it is not generally realised that not only have Military Death Rays become a horrible reality, but that milder versions have ready found civil applications. The first serious attempts to produce a death ray used radio waves, but until the development of very high frequency waves (microwaves) for radar in World War II, there were no sources sufficiently intense to be of any practical use at ranges of more than a few yards. In recent years, many doctors have drawn attention to the dangers from high-intensity microwaves, such as employed in the Distant Early Warning radar chains. Intense radar waves can literally cook a man's internal organs whilst externally he appears to be unharmed ; it seems, in fact, that many deaths may have occurred due to the fields associated with those rare phenomena known as thunderbolts, or lightning balls. These

fields can exist even in the absence of any visible "ball", and probably account for cases of the following type : Dr. B. Hartwell, of Ayer, near Lowell, Massachusetts, reported to the Massachusetts Medico-Legal Society that on May 12, 1890, while driving through a wood near Ayer, he saw in a clearing the crouched form of a woman. "She was in flames at the shoulders, both sides of the abdomen and legs . . ." In April 1961, the Reverend Winogene Savage reported in *Fate Magazine* a similar case in Fulham. The brother of one of his friends was awakened in the early hours of the morning by the sound of his wife's screams. In the living room, he found her lying on a rug on the floor, burning furiously, with a scintillating lightning ball hovering over her. The man was badly burned trying to put out the flames, and neighbours who answered his cries for help assisted by throwing buckets of water over the poor woman. They were rewarded with electric shocks, and it was all in vain. She died in hospital shortly afterwards. One more case (I have collected scores) will suffice : in January 1930, at Kingston, New York State, Mrs. Stanley Lake was found burned to death, her body terribly charred. Her clothing was not even scorched.

There is nothing mysterious about a mechanism which can cook a body inside its undamaged clothing ; most hospitals possess one. It is called a diathermy apparatus. It is just a short-wave radio generator arranged so that the output is absorbed by a human body. The patient sits or stands between electrodes (which do not make actual contact with him) and the radio energy is absorbed by his tissues. Since the interior of the body is moist, and thus a better electrical conductor, it

receives the most heat. Similar in principle is the "microwave oven" used in the U.S.A. for cooking. It works the reverse way to ordinary ovens, and cooks meat from the inside out. If the oven is set too high, it is possible to char the *inside* of a steak while the *outside* remains raw. According to the theory of Professor Peter Kapitza, a lightning stroke can, under certain conditions, set up a "standing wave" of microwaves, and where this standing wave is most intense a lightning ball will be formed. And if a human being is standing at that particular point? Bearing in mind the enormous energy associated with ball lightning, it is evident that the victim will be in much the same position as if he were standing between the electrodes of a giant diathermy apparatus, giving out not just few watts, but tens of megawatts.

Plasma Guns

About twelve years ago, Professor Kapitza suggested that laboratory experiments should be carried out to evaluate his theory, and considered that an electrodeless discharge should form a spherical plasmoid under suitable conditions. He proposed that powerful microwaves should be focused into a confined space, and suggested that the resultant artificial lightning ball would have a diameter equal to one quarter of the wavelength of the microwave field. About eight years ago, a study of magnetically controlled plasmas was made at the University of California Radiation Laboratory. A plasma gun was constructed: two electrodes made of titanium with absorbed deuterium were used to strike an arc of several thousand amperes, with a pulse duration of about half a microsecond. The heat of the arc evaporated electrons and ions from the electrodes, and the magnetic field associated with the current-pulse pinched the plasma into a slender column. The doughnut-shaped plasmoids were magnetically expelled from the gun with a speed of about 120 miles per second.

Although seemingly unrelated, this work was one of the vital links in the chain of research projects which now seems likely to lead to the systematic production of artificial lightning balls as a weapon of war. One apparatus for making ball plasmoids has been developed by the Bendix Research Laboratories; another equipment, developed in Russia, is stated to use a quartz tube with a special profile, and with a core of extremely refractory material which carries electric arcs. When thermal dissociation within the gases in the tube are judged to be complete, it is suddenly cooled, causing a luminous lightning ball about the size of a grape to be formed. Natural lightning balls vary in size from tiny beads like pearls to

enormous globes of several yards in diameter. It has been calculated that a ball of five feet in diameter could contain energy equivalent to the explosion of 400 pounds of T.N.T. From all of this it is very clear that when it becomes feasible to produce large synthetic lightning balls, and to "shoot" them in the same way as small toroids have already been propelled, then the synthetic thunderbolt will offer a weapon of unparalleled potential.

Laser weapons

Lasers offer another practicable weapon, although at present the power densities available are inadequate except for anti-personnel applications at short ranges. In America, Maser Optics Incorporated produced a "laser rifle" for the U.S. Army two or three years ago. This rifle is capable of blinding a man or setting his clothes on fire at a range of just under one mile. It weighs 25 lbs., and is powered by a battery which stores enough energy for 10,000 flashes. The maximum firing rate is once every ten seconds.

With a view to producing laser weapons capable of setting fire to whole cities at ranges of hundreds of miles, military authorities have been investigating explosive-driven magnetohydrodynamic (MHD) generators to replace the high-voltage capacitor banks which drive conventional lasers. Under a U.S.A.F. Contract, MHD Research Incorporated, and Hercules Powder Company, have recently tried out a 6-inch by 8-inch MHD generator driven by 450 grams of "C4" explosive, seeded with caesium nitrate for greater electrical conductivity. This generator produced a peak power pulse of 300 million watts, lasting for 200 microseconds, or 60,000 joules of energy. Powers of 1,000 million watts, at durations of a millisecond (total energy = one million joules) are expected to be achieved shortly.

Civil use of rays

Turning to the civil applications which I mentioned earlier, radar is now being used as a means of reducing the menace of birds near airports. Experiments on chickens in cages have been made by the National Council of Canada, and the experiments are being extended to seagulls, pigeons, and other birds known to be dangerous to aircraft taking off or landing. The chickens were irradiated at 16,000 megacycles with field intensities of 10 to 30 milliwatts per square centimetre. On exposure, a chicken immediately becomes agitated and after a few seconds collapses. On removal of the radar beam, the bird at once regains its normal posture.

But there is much we do not know about the

effects of radio waves. A Johns Hopkins University medical team has recently found an association between mongoloid children and fathers who work with powerful radar sets. Mongolism is a chromosomal disorder which causes mental retardation as well as facial and other physical abnormalities.

In recent years, Government funded research in the U.S.A. under the specific heading of "Radiation Weapons" has run at more than 2 million dollars per annum, out of a total laser research budget of about 20 million dollars per annum. Lasers to operate in the ultraviolet, visible and infra-red regions of the spectrum are all under development, and the feasibility of a gamma-ray

generator is to be studied. A gamma-ray would be undetectable without instruments, and victims who were not killed outright might die of cancer or leukemia months or even years later. It is a small consolation, faced with the prospects of such a horrible weapon, that except in outer space its range would be sharply limited by atmospheric absorption.

I have only touched on the fringe of present-day "Death Ray" researches. Within a few years, so great is the pace of technological advance, the potentialities of these weapons will have increased to an unimaginable extent. UFOs clearly are the product of such an advanced technology: their weapon capacity must already be immense.

Image Orthicon Photographs of Martian Canals

by Gordon H. Evans

Mr. Evans, a business management consultant with a degree in political science at Columbia University, has several articles on Strategic Studies to his name. Another of his articles on the Martian Canal photographs appeared recently in SAUCER NEWS of New Jersey.

FOR many years astronomers have seen the canals of Mars, or rather, *some* astronomers have seen them. We might even say that there are two groups of planetary observers: the "canal seers" and the "non-canal seers". Those who have seen the canals describe them, in words or in drawings, as a delicate web of interconnecting lines covering the entire surface of the planet, exclusive of the poles.

The most famous of the canal seers was Percival Lowell, who founded an observatory in Arizona in the late 19th century dedicated largely to the study of Mars. Many people have read Lowell's popular books *Mars and its Canals* (1906) and *Mars as the Abode of Life* (1909). His wonderful maps and sketches show the canal system as strongly resembling a terrestrial transportation system. Lowell was convinced that the canals were waterways constructed by a Martian race dying of drought, to transport annually its small remaining store of water from the polar caps to centres of equatorial agriculture.

Yet many astronomers who have looked for the canals have seen nothing. Through the years a debate has raged in astronomical circles over their existence. In recent years it is fair to say that the balance of opinion has turned against the intelligently constructed canal theory, holding that what has been seen are either optical illusions

or else, perhaps, cracks in the Martian surface. Very few astronomers believe the canals are the gigantic engineering works of an advanced Martian civilisation.

The trouble with proving the reality of the canals is that they are most difficult to photograph; they are very fine detail of the Martian surface. As a light ray enters the earth's atmosphere, differences in gas density cause refraction. This in turn causes slight, but very rapid movements of the telescopic image upon the photographic plate. Since Mars is a weak light source, time exposures must be used. Fast photographic film has a coarse grain, not well suited to catch the faint tracery of the canals. Fine grain film has a slow exposure time, and thus integrates the light messages coming to it through the earth's turbulent atmosphere. As a result, the canals of Mars have never been satisfactorily photographed, at least by conventional methods. Again and again the Mars specialists have said that they have photographed the canals, but when their evidence is produced, very little may be seen, at least to the layman's eye.

However, a few years ago a new family of techniques was used which allowed really satisfactory photography of the Martian canal system for the first time. The techniques are called image intensification. They employ a simple principle.