

OTTAWA, Ontario, November 20, 1950.

Geo-Magnetics

(R.ST.)

MEMORANDUM TO THE CONTROLLER OF TELECOMMUNICATIONS:

For the past several years we have been engaged in the study of various aspects of radio wave propagation. The vagaries of this phenomenon have led us into the fields of aurora, cosmic radiation, atmospheric radio-activity and geo-magnetism. In the case of geo-magnetics our investigations have contributed little to our knowledge of radio wave propagation as yet, but nevertheless have indicated several avenues of investigation which may well be explored with profit. For example, we are on the track of a means whereby the potential energy of the earth's magnetic field may be abstracted and used.

On the basis of theoretical considerations a small and very crude experimental unit was constructed approximately a year ago and tested in our Standards Laboratory. The tests were essentially successful in that sufficient energy was abstracted from the earth's field to operate a voltmeter, approximately 50 milliwatts. Although this unit was far from being self-sustaining, it nevertheless demonstrated the soundness of the basic principles in a qualitative manner and provided useful data for the design of a better unit.

The design has now been completed for a unit which should be self-sustaining and in addition provide a small surplus of power. Such a unit, in addition to functioning as a 'pilot power plant' should be large enough to permit the study of the various reaction forces which are expected to develop.

We believe that we are on the track of something which may well prove to be the introduction to a new technology. The existence of a different technology is borne out by the investigations which are being carried on at the present time in relation to flying saucers.

While in Washington attending the NARB Conference, two books were released, one titled "Behind the Flying Saucer" by Frank Scully, and the other "The Flying Saucers are Real" by Donald Keyhoe. Both books dealt mostly with the sightings of unidentified objects and both books claim that flying objects were of extra-terrestrial origin and might well be space ships

from another planet. Scully claimed that the preliminary studies of one saucer which fall into the hands of the United States Government indicated that they operated on some hitherto unknown magnetic principles. It appeared to me that our own work in geo-magnetics might well be the linkage between our technology and the technology by which the saucers are designed and operated. If it is assumed that our geo-magnetic investigations are in the right direction, the theory of operation of the saucers becomes quite straightforward, with all observed features explained qualitatively and quantitatively.

I made discreet enquiries through the Canadian Embassy staff in Washington who were able to obtain for me the following information:

- a. The matter is the most highly classified subject in the United States Government, rating higher even than the H-bomb.
- b. Flying saucers exist.
- c. Their modus operandi is unknown but concentrated effort is being made by a small group headed by Doctor Vannevar Bush.
- d. The entire matter is considered by the United States authorities to be of tremendous significance.

I was further informed that the United States authorities are investigating along quite a number of lines which might possibly be related to the saucers such as mental phenomena and I gather that they are not doing too well since they indicated that if Canada is doing anything at all in geo-magnetics they would welcome a discussion with suitably accredited Canadians.

While I am not yet in a position to say that we have solved even the first problems in geo-magnetic energy release, I feel that the correlation between our basic theory and the available information on saucers checks too closely to be mere coincidence. It is my honest opinion that we are on the right track and are fairly close to at least some of the answers.

Mr. Wright, Defence Research Board liaison officer at the Canadian Embassy in Washington, was extremely anxious for me to get in touch with Doctor Solandt, Chairman of the Defence Research Board, to discuss with him future investigations along the line of geo-magnetic energy release.

I do not feel that we have as yet sufficient data to place before Defence Research Board which would enable a program to be initiated within that organization, but I do feel that further research is necessary and I would prefer to see it done within the frame work of our own organization with, of course, full co-operation and exchange of information with other interested bodies.

I discussed this matter fully with Doctor Solandt, Chairman of Defence Research Board, on November 20th and placed before him as much information as I have been able to gather to date. Doctor Solandt agreed that work on geo-magnetic energy should go forward as rapidly as possible and offered full co-operation of his Board in providing laboratory facilities, acquisition of necessary items of equipment, and specialized personnel for incidental work in the project. I indicated to Doctor Solandt that we would prefer to keep the project within the Department of Transport for the time being until we have obtained sufficient information to permit a complete assessment of the value of the work.

It is therefore recommended that a PROJECT be set up within the frame work of this Section to study this problem and that the work be carried on a part time basis until such time as sufficient tangible results can be seen to warrant more definitive action. Cost of the program in its initial stages are expected to be less than a few hundred dollars and can be carried by our Radio Standards Lab appropriation.

Attached hereto is a draft of terms of reference for such a project which, if authorized, will enable us to proceed with this research work within our own organization.

(W.B. Smith)
Senior Radio Engineer

WBS/CC

PROJECT MAGNET

PURPOSE

This project is for the purpose of studying magnetic phenomena, particularly those phenomena resulting from unusual boundary conditions in the basic electromagnetic theory. There is reason to believe that such phenomena exist and that their discovery will open up a new and useful technology.

ORGANIZATION

The initial organization shall be as small as practical and composed of personnel who are used to working together, including so far as possible a variety of research abilities. Laboratory facilities are to be drawn from existing facilities so far as possible. Overall responsibility for the project shall rest with the engineer-in-charge, who shall delegate such responsibility to subordinates as may be required to carry out the project.

PROGRAM

The initial program shall include the following avenues of investigations, to which others may be added from time to time as may appear expedient.

1. Theoretical study of electromagnetic radiation assuming boundary conditions different from those upon which the conventional theory was developed.
2. Laboratory study of the mechanical forces associated with electron drift and electric currents in metallic masses.
3. Theoretical and laboratory study of magnetic domain resonance conditions in magnetic materials.
4. Investigation of the propagation of magnetic wave motion in magnetic materials.
5. Investigate the possibility of producing, in effect, a "sink" in a magnetic field.
6. Investigate the possibility of producing, in effect, single isolated magnetic poles.
7. Investigate the effects of a magnetic field on a rotating curvilinear metallic object.

COORDINATION

Full coordination is to be maintained, within security regulations, with other groups working on parallel or associated problems. Project reports will be available on a classified basis to suitably accredited groups or individuals.

SECURITY

As in the case with most fields of research, it is impossible to assess the results in advance which may be obtained through this project. However, there exist certain suspicions that the lesser known and little explored aspects of magnetism may hold the key to a new and significant technology. Consequently, it is intended to classify this work in its entirety until such time as it can be assessed for its impact on our civilization.

PROJECT MAGNET REPORT

During the past five years there has been accumulating in the files of the United States Air Force, Royal Canadian Air Force, Department of Transport, and various other agencies, an impressive number of reports on sightings of unidentified flying objects popularly known as "Flying Saucers". These files contain reports by creditable people on things which they have seen in the sky, tracked by radar, or photographed. They are reports made in good faith by normal, honest people, and there is little if any reason to doubt their veracity. Many sightings undoubtedly are due to unusual views of common objects or phenomena, and are quite normal, but there are many sightings which cannot be explained so easily.

Project Magnet was authorized in December, 1950, by Commander C. P. Edwards, then Deputy Minister of Transport for Air Services, for the purpose of making as detailed a study of the saucer phenomena as could be made within the framework of existing establishments. The Broadcast and Measurements Section of the Telecommunications Division were given the directive to go ahead with this work with whatever assistance could be obtained informally from outside sources such as Defence Research Board and National Research Council.

It is perfectly natural in the human thinking mechanism to try and fit observations into an established pattern. It is only when observations stubbornly refuse to be so fitted that we become disturbed. When this happens we may, and usually do, take one of three courses. First, we may deny completely the validity of the observations; or second, we may pass the whole subject off as something of no consequence; or third, we may accept the discrepancies as real and go to work on them. In the matter of Saucer Sightings all three of these reactions have been strikingly apparent. The first two approaches are obviously negative and from which a definite conclusion can never be reached. It is the third approach, acceptance of the data and subsequent research that is dealt with in this report.

The basic data with which we have to work consist largely of sightings reported as they are observed throughout Canada in a purely random manner. Many of the reports are from the extensive field organization of the Department of Transport whose job it is to watch the sky and whose observers are trained in precisely this sort of observation. Also, there are in operation a number of instrumental arrangements such as the ionospheric observatories from which useful data have been obtained. However, we must not expect too much from these field stations because of the very sporadic nature of the sightings. As the analysis progresses and we know more about what

to look for we may be able to obtain and make much better use of field data. Up to the present we have been prevented from using conventional laboratory methods owing to the complete lack of any sort of specimens with which to experiment, and our prospects of obtaining any in the immediate future are not very good. Consequently, a large part of the analysis in these early stages will have to be based on deductive reasoning, at least until we are able to work out a procedure more in line with conventional experimental methods.

The starting point of the investigation is essentially the interview with an observer. A questionnaire form and an instructional guide for the interrogator were worked out by the Project Second Storey Committee, which is a Committee sponsored by the Defence Research Board to collect, catalogue and correlate data on sightings of unidentified flying objects. This questionnaire and guide are included as Appendix I, and are intended to get the maximum useful information from the observer and present it in a manner in which it can be used to advantage. This form has been used so far as possible in connection with the sightings investigated by the Department of Transport.

A weighting factor is assigned to each sighting according to a system intended to minimize the personal equation. This weighting system is described in Appendix II. The weighting

factor may be considered as the probability that the report contains the truth, the whole truth and nothing but the truth, so far as the observer and interrogator are aware. It has nothing to do with the nature of the object claimed to be seen. It is in a sense analagous to the order of precision with which a measurement may be made, and for the purpose of this analysis this is precisely the manner in which it is used.

Sightings may be grouped according to certain salient features, and the combined weight of all pertinent observations with respect to these features may be determined by applying Peter's formula, which is a standard mathematical technique for determining probable error.

$$r_0 = \frac{.8455}{n \sqrt{n - 1}} (v_1 + v_2 + v_3 + \dots + v_n)$$

where r_0 is the probable error of the mean, n is the number of observations and v is the probable error of each observation, that is, unity minus the weighting factor. This method has the advantage of being simple and easy to use and enables a number of mediocre observations to be combined effectively into the equivalent of one good one.

The next step is to sort out the observations according to some pattern. The particular pattern is not so important as the fact that it should take account of all contingencies

however improbable they may appear at first sight. In other words, there must be a compartment somewhere in the scheme of things into which each sighting may be placed, comfortably, and with nothing left over. Furthermore, it must be possible to arrive at each appropriate compartment by a sequence of logical reasoning taking account of all the facts presented. If this can be done, then the probability for the real existence of the contents of any compartment will be the single or combined weighting factor pertinent to that single or group of sightings. The charts shown in Appendix III were evolved as a means for sorting out the various sightings and provide the pattern which was used in the analysis of those sightings reported to and analysed by the Department of Transport.

Most sightings fit readily into one of the classifications shown, which are of two general types; those about which we know something and those about which we know very little. When the sightings can be classified as something we know about, we need not concern ourselves too much with them, but when they fit into classifications which we don't understand we are back to our original position of whether to deny the evidence, dismiss it as of no consequence, or to accept it and go to work on it. The process of sorting out observations according to these charts and fitting them into compartments can hardly be considered an

end in itself. Rather, it is a convenience to clarify thinking and direct activity along profitable channels. It shows at once which aspects are of significance and which may be bypassed. Merely placing a sighting under a certain heading does not explain it; it only indicates where we may start looking for an explanation.

Appendix IV contains summaries of the 1952 sightings as investigated by the Department of Transport. Considerably more data exists in the files of other agencies, and more is being collected as the investigations proceed. While it is not intended to make any reference to an analysis of the records of other agencies, it may be said that the Department of Transport sightings are quite representative of the sightings reported throughout the world. The following is a table of the breakdown of the 25 proper sightings reported during 1952.

NATURE OF SIGHTING	NUMBER	WEIGHT
Probably meteor.....	4.....	91%
Probably aircraft.....	1.....	69%
Probably balloons.....	1.....	74%
Probably marker light.....	1.....	64%
Bright speck at night, not star or planet.....	3.....	75%
Bright speck daylight, not star or planet.....	1.....	68%
Luminous ring.....	1.....	68%
Shiny cone.....	1.....	53%
Circular or elliptical body, shiny day.....	5.....	88%

NATURE OF SIGHTING	NUMBER	WEIGHT
Circular or elliptical body luminous night.....	5.....	90%
Unidentified lights of various kinds.....	2.....	77%
TOTAL NUMBER OF PROPER SIGHTINGS.....	25.....	96%

With reference to the above table, of the four cases identified as probably meteors, their weight works out at 91%, which is the probability that the observers actually did see meteors which appeared as they described them. Considering the circular or elliptical bodies together, their weight works out at 91% for the ten sightings, from which we may conclude that SOMETHING answering this description was actually observed. Similarly we may consider each of the other groups of sightings, taking account of the probability that the observations are reliable.

It is not intended to describe here in detail the intricate and tedious processes by which the sightings are evaluated, beyond the fact that the pattern set forth in the charts in Appendix III is followed. The cardinal rule is that a sighting must fit completely under one or more of the chart headings, with nothing left over and without postulating any additions, deletions, or changes in the facts as reported. Should there be no suitable heading, then obviously the charts must be expanded to provide one, in fact this was the evolution of these charts. Where a sighting may be fitted under more than one heading an arbitrary division of the probability of finding it under each applicable heading is assigned. The sum of such

probability figures must of course be unity, and the probability for the real existence under any particular heading is the product of this probability figure and the reliability or weighting factor for the sighting concerned.

It is apparent that the judgement of the people doing the evaluating is bound to enter the picture and may produce substantial numerical differences with reference to sightings listed under certain headings. However, since many headings are automatically eliminated by the nature of the facts available, the discrepancies are confined to the probability figures for the distribution under the remaining headings which are considered eligible, and we end up with definite classifications for the sightings with SOME probability figure for the reality of each group. This has the effect of forcing those who are doing the evaluating to face the reported facts squarely, pay meticulous attention to them, and place each sighting honestly under the only headings where it will fit.

In working through the analysis of the proper sightings listed, we find that the majority of them appear to be of some material body. Of these, seven are classed as probably normal objects, and eleven are classed as strange objects. Of the remainder, four have a substantial probability of being material, strange, objects, with three having a substantial probability of being immaterial, electrical, phenomenae. Of the eleven strange objects the probability definitely favours the alien

vehicle class, with the secret missile included with a much lower probability.

The next step is to follow this line of reasoning as far as possible so as to deduce what we can from the observed data. Vehicles or missiles can be of only two general kinds, terrestrial and extra-terrestrial, and in either case the analysis enquires into the source and technology. If the vehicles originate outside the iron curtain we may assume that the matter is in good hands, but if they originate inside the iron curtain it could be a matter of grave concern to us.

In the matter of technology, the points of interest are: - the energy source; means of support, propulsion and manipulation; structure; and biology. So far as energy is concerned we know about mechanical energy and chemical energy, and a little about energy of fission, and we can appreciate the possibility of direct conversion of mass to energy. Beyond this we have no knowledge, and unless we are prepared to postulate a completely unknown source of energy of which we do not know even the rudiments, we must conclude that the vehicles use one of the four listed energy sources. Unless something we do not understand can be done with gravitation, mechanical energy has little use beyond driving model aircraft. We use chemical energy to quite an extent, but we realize its limitations, so if the energy demands of the vehicles exceed what we consider to be the reason-

able capabilities of chemical fuels, we are forced to the conclusion that such vehicles must get their energy from either fission or mass conversion.

With reference to the means for support, propulsion and manipulation, unless we are prepared to postulate something else quite beyond our knowledge, there are only the two groups of possibilities, namely the known means and the speculative means. Of the known means there is only physical support through the use of buoyancy or airfoils, the reaction of rockets and jets, and centrifugal force, which is what holds the moon in position. Of the speculative means we know only of the possibility of gravity waves, field interaction and radiation pressure. If the observed behaviour of the vehicles is such as to be beyond the limitations which we know apply to the known means of support, then we are forced to the conclusion that one of the speculative means must have been developed to do the job.

From a study of the sighting reports (Appendix IV), it can be deduced that the vehicles have the following significant characteristics. They are a hundred feet or more in diameter; they can travel at speeds of several thousand miles per hour; they can reach altitudes well above those which would support conventional aircraft or balloons; and ample power and force seem to be available for all required manoeuvres. Taking these factors into account, it is difficult to reconcile this performance

with the capabilities of our technology, and unless the technology of some terrestrial nation is much more advanced than is generally known, we are forced to the conclusion that the vehicles are probably extra-terrestrial, in spite of our prejudices to the contrary.

It has been suggested that the sightings might be due to some sort of optical phenomenon which gives the appearance of the objects reported, and this aspect was thoroughly investigated. Charts are shown in Appendix III showing the various optical considerations. Enticing as this theory is, there are some serious objections to its actual application, in the form of some rather definite and quite immutable optical laws. These are the geometrical laws dealing with optics generally and which we have never yet found cause to doubt, plus the wide discrepancies in the order of magnitude of the light values which must be involved in any sightings so far studied. Furthermore, introducing an optical system might explain an image in terms of an object, but the object still requires explaining. A particular effort was made to find an optical explanation for the sightings listed in this report, but in no case could one be worked out. It was not possible to find so much as a partial optical explanation for even one sighting. Consequently, it was felt that optical theories generally should not be taken too seriously until such time as at least one sighting can be satisfactorily explained in such a manner.

It appears then, that we are faced with a substantial probability of the real existence of extra-terrestrial vehicles, regardless of whether or not they fit into our scheme of things. Such vehicles of necessity must use a technology considerably in advance of what we have. It is therefore submitted that the next step in this investigation should be a substantial effort towards the acquisition of as much as possible of this technology, which would without doubt be of great value to us.

A handwritten signature in dark ink, appearing to read 'W. B. Smith', written in a cursive style.

W. B. Smith,
Engineer-in-Charge,
Project Magnet.

PROJECT MAGNET REPORT

Project Magnet was established November 21, 1950 by authority of Commander C.P. Edwards then Deputy Minister of Transport for Air Services. Prior to this date a certain amount of research in magnetic phenomena had been carried out in this Department in connection with Radio Wave Propagation studies and an indication obtained that the subject comprised a promising field of investigation. The project was set up for the purpose of studying various phenomena and concepts with particular reference to those aspects which may have received only casual investigation while our present electrical technology was developing.

The large number of sightings of unidentified objects, generally called "flying saucers", raised the question as to whether such objects could be emissaries of some other civilization having a technology somewhat different than ours, and possibly more advanced in magnetics. The limited amount of information available regarding the flying saucers has proven a serious handicap in evaluating the characteristics and salient features of this possible other technology.

THEORETICAL CONSIDERATIONS

As a starting point in the investigations by the Project Magnet group it was assumed that Maxwell's field equations might be only a special case of a more general set of equations and a good deal of theoretical work was done, mostly on a trial and error basis, to determine if any other terms could be included in Maxwell's equations and justified from a physical point of view, which would give solutions more embracing than the conventional solutions. What was in mind particularly was an investigation into the possibility of producing in effect a "magnetic sink". Investigations, to date, however, have indicated that so far as Maxwell's equations are concerned, they appear to be absolute. Justifiable assumptions to provide for additional terms merely alter the characteristics of the resultant wave functions without introducing anything substantially new. These studies of Maxwell's equations did, however, raise certain questions regarding the nature of the various fields involved and the manner in which such fields come into being. The generally accepted hypotheses were scrutinized carefully and a number of inconsistencies were detected. These inconsistencies and their experimental investigations form the subject matter of this report,

ESTABLISHMENT OF MAGNETIC FIELDS

Maxwell's equations imply that a magnetic field would move into position through lateral movement only. Longitudinal movement of the magnetic field would either be non-existent or meaningless if it did

exist. Mr. Robson, of the project magnet group, devised experimental means ~~which is described in Appendix 1~~ to determine whether or not longitudinal propagation of a magnetic field could be brought about. The experiment was performed in a number of different ways and the result was completely negative in every case. This experimental evidence pointed to lateral movement only as a means by which the magnetic field became established.

Under this concept it at once became evident that there must be some underlying relationship existing throughout the various regions in which magnetic fields may be found to determine their distribution in these regions. If magnetic fields always integrate by vectorial addition into a single resultant field it is conceivable that this field could reach a condition of equilibrium in its surroundings, but this concept is open to a serious objection in the mechanism by which it could reach equilibrium if Maxwell's equations are to hold inviolate. If, on the other hand, magnetic fields do not integrate into a single resultant but exist independently, the foregoing objection is removed but another objection is substituted in that a rather special mechanism is required to tie the movement of the charge to the resulting magnetic field.

INDEPENDENCE OF MAGNETIC FIELDS

An experiment was devised ~~and is described in Appendix 2~~ to determine whether or not fields integrate by vectorial addition. The results of this experiment indicated that the fields appeared to exist quite independently of each other and furthermore that the energy normally considered to be located in the magnetic field more appropriately should be considered to reside in the movement of the charged particles responsible for the field. In considering the independence of fields in relationship to known physical and engineering phenomena the concept does not appear to be at all contradictory. In most cases it makes no difference whatsoever whether fields themselves are considered to add vectorially, or whether the results of the effects of the fields are considered to add vectorially. There are, however, certain aspects involving the mechanics of small charged particles where it is conceivable that a substantial difference will result from the application of this basic concept.

ELECTRON DRIFT FORCES

One of the phenomena in connection with the saucers was a report that the rims rotated. There is some doubt as to whether such rotation would be a necessity for the operation of the craft or merely a by-product of its operation. If the support of the craft were due to some inflow of magnetic field, or an equivalent effect, a direct current could be induced in the rim which, by Lenz's Law, could provide a lift. Such direct current might be of very large magnitude and it was

reasoned that the drag due to electron drift could produce a substantial torque, thereby causing the rim to rotate unless measures were taken to prevent it. Preliminary experiments were set up to determine the magnitude of electron drift but the measured results were small and not too satisfactory. ~~However, a later experiment was devised which is described in Appendix 3 which gave very satisfactory numerical results for this electron drift force. The numerical values appear to be of the right order of magnitude.~~ This work is continuing with more refined apparatus.

MAGNET SINK EXPERIMENTS

The original concept of this program of magnetic research was that some sort of magnetic sink, or region into which magnetic flux could be induced to flow, could exist in nature. As indicated in the paragraphs above on theoretical analysis, this concept does not appear to be entirely consistent with Maxwell's equations, nor does it appear possible that terms could be included in these equations to allow for the existence of such a sink. However, consideration of the behaviour of primary charged particles and their relationship with surrounding fields indicates that something of this nature may be possible but through a different mechanism than originally conceived. Experimental work is now under way to determine the validity of some of these concepts but it is still too early to report on any results. These experiments were delayed for several months due to slow delivery of certain materials. The amount of mechanical work necessary for setting up the experiment appears to indicate that a further six months at least will be required before any tangible answers are obtained.

CONCLUSIONS

The project magnet program has been in operation for approximately one year. The initial group was quite small to start with and was further depleted during the year by two resignations in favour of more lucrative positions elsewhere. The results to date have hardly been spectacular and may even be claimed to confirm only what could be expected in the behaviour of fields. However, the work to date has more than confirmed the original belief that there is a great deal of unexplored territory in the field of magnetics and that research work along these lines most certainly will be fruitful.

A careful survey has been conducted of the past and current literature on the general subject of magnetics, and a substantial file of pertinent references has been built up. This file promises to be very useful in directing future lines of investigation.

CONCLUSIONS
PROJECT MAGNET

March 1952

OBSERVATIONS

Saucers are real —
Strong magnetic fields —
Rims rotate —
Rims not airfoil —
Rims get hot —
Corona at high altitude —
Consistent geometry —

Magnetic
"Sink"

Large
Gap

Gap

PHYSICS

Fundamental Electromagnetic Laws
Maxwells Equations
Quantum & Wave Mechanics

Independendence of Fields
Lateral Establishment of Fields
Molecular, Electron, Proton Resonance
Electron Drift Forces.

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(R.ST.)

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On the basis of theoretical considerations a small and very crude experimental unit was constructed approximately a year ago and tested in our Standards Laboratory. The tests were essentially successful in that sufficient energy was abstracted from the earth's field to operate a voltmeter, approximately 50 milliwatts. Although this unit was far from being self-sustaining, it nevertheless demonstrated the soundness of the basic principles in a qualitative manner and provided useful data for the design of a better unit.

The design has now been completed for a unit which should be self-sustaining and in addition provide a small surplus of power. Such a unit, in addition to functioning as a 'pilot power plant' should be large enough to permit the study of the various reaction forces which are expected to develop.

We believe that we are on the track of something which may well prove to be the introduction to a new technology. The existence of a different technology is borne out by the investigations which are being carried on at the present time in relation to flying saucers.

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I do not feel that we have as yet sufficient data to place before Defence Research Board which would enable a program to be initiated within that organization, but I do feel that further research is necessary and I would prefer to see it done within the frame work of our own organization with, of course, full co-operation and exchange of information with other interested bodies.

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Attached hereto is a draft of terms of reference for such a project which, if authorized, will enable us to proceed with this research work within our own organization.

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Senior Radio Engineer

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Full coordination is to be maintained, within security regulations, with other groups working on parallel or associated problems. Project reports will be available on a classified basis to suitably accredited groups or individuals.

SECURITY

As in the case with most fields of research, it is impossible to assess the results in advance which may be obtained through this project. However, there exist certain suspicions that the lesser known and little explored aspects of magnetism may hold the key to a new and significant technology. Consequently, it is intended to classify this work in its entirety until such time as it can be assessed for its impact on our civilization.

TO THE DIRECTOR, CIVIL AVIATION:

I am offering the following for whatever help it might provide. Our knowledge of basic science is, to say the least, inadequate and some of our ideas about the structure of matter are actually erroneous.

The reality of matter as it manifests to our awareness consists of the derived fields of basic spin, among which are the density, gradient, divergence and curl. These are only partially recognized at present. We are familiar with the effects of these fields but not to any extent with the fields themselves, or with how they interact to form matter as we know it.

The scientific aspects and how I came into possession of this information are not particularly relevant at the moment. The important matter is the bearing which this information has on the structural failures of aircraft and various other objects.

The inverse square law for the forces between material particles is approximately valid only for the intermediate range of distances within our experience. It does not apply at extremely large or extremely small distances. Furthermore, the forces which we observe are resultants, not basic forces. The basic forces are the consequences of the distribution of the fields comprising the reality of matter. This distribution is sinusoidal, and the resultant forces are the consequences of the harmonic combination of all the fields present.

Matter is held together by the equilibrium of all the forces acting within it, and the alteration of any of the fields reflects in the binding forces within the matter.

Not all the fields within matter are due to that particular chunk of matter, or even to matter itself, as the field structure within which matter is immersed may be altered by many outside influences.

This all means that the binding forces within matter are not the fixed and immutable quantities we have believed them to be.

On this earth, and reasonably close to its surface, the field structure is predominantly constant, except for certain regions, and matter displays reasonably stable characteristics throughout the world.

However, there do exist certain regions which may be termed Vortices, in which one or more of the fields are different from the values generally prevailing elsewhere. Within these regions there may be substantial changes in the binding forces of matter, depending upon the nature and extent of the field differences.

Based upon this understanding of the nature of matter I devised and constructed several instruments to detect changes in the binding forces of matter. These instruments were given to friends in various parts of the world who have reported changes in binding forces in some regions.

The instruments consist of a nylon fiber stressed to $\frac{1}{2}$ its breaking strength by a metal spring stressed well below its ultimate strength. Alteration of the binding force affects the nylon and metal differently and one or the other elongates. This motion is transferred to a spindle and pointer.

While I can give no indication of the magnitude of the changes in binding force in these various regions, I do know that they exist and that the changes are appreciable. I am convinced that at least some of the structure failures of aircraft are due to the machines flying through regions where the reduction in binding force brought the strength of a highly stressed part below the load level it was expected to carry.

I do not know whether these regions of reduced binding force are fixed in position or move about but I expect that they do both.

I would therefore recommend that:

- (a) A larger factor of safety in the stressing of aircraft components be used until this phenomenon is better understood
- (b) The regions of reduced binding be searched out, mapped and studied, looking towards their eventual compensation.

(W. B. Smith).