TIME CORRELATIONS BETWEEN GEO-MAGNETIC DISTURBANCES AND EYE WITNESS ACCOUNTS OF UFOs

A summary of a recent study

C. Poher

Our contributor is Doctor-Engineer, Head of Sounding Rockets Division at Centre National d'Etudes Spatiales, Toulouse, France. The article was prepared in English.

A USEFUL, objective method for approaching a study of the "UFO phenomenon" would be the setting up of entirely automatic observation stations equipped with measuring instruments, which would begin, if necessary, a thorough study of the phenomenon and would, in any case, render it incontestable. The crucial problem is that there is a very low probability of associated observations from such stations, even the most accurate, perfected ones. Several statistical methods (the application of which is very debatable in this case) lead us to suppose that such a station could record the phenomenon once every 'n' years, 'n' being comprised between 7 and 100 years, according to an optimistic or pessimistic choice of criteria. A study so dispersed and so badly justified cannot be used to support a convincing argument for the necessity of setting up expensive equipment.

The aim here has thus been to find a way of defining more precisely the probability of automatic station observations by the use of correlations between UFO observations and existing recordings of the earth magnetic field.

Geophysical research workers can already use an existing world-wide network of stations, which record, night and day, the fluctuations of the earth's magnetic field. In France, such a station exists at Chambon-la-Forêt, about 30 kilometres north-east of Orleans. This station has been recording the three components of the field since 1886, with about 1 gamma* accuracy and a band-width of a few hertz. We have therefore analysed the UFO eye-witness accounts emanating from an area round Chambon-la-Forêt since 1886 and have tried to determine if, on the same date, at about the same time, an abnormal fluctuation of the field was recorded.

Available eye-witness accounts

Chambon-la-Forêt is situated in an area where few UFO observations have been made. We have been able to find, with the help of private specialized organizations, several accounts coming from different places situated at less than 100 kilometres round the station. No observations have been made inside a radius of 30 kilometres round the station, which is easily explained by the fact that the station itself is situated in the middle of a forest 50 kilometres wide where there are very few inhabitants.

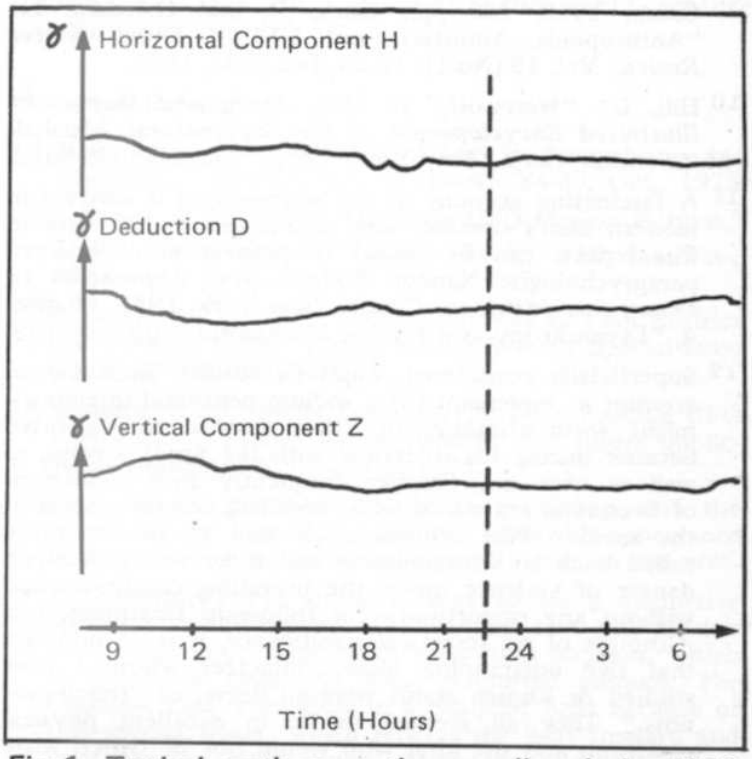

Fig. 1. Typical earth-magnetic recording during UFO observation. The vertical broken line represents time of observation, which was 58 kms distant, and occurred on May 24, 1954 at 22.15 hrs.

Study of Geomagnetic recordings

Three components are recorded by the geomagnetic stations:

- the field vertical component (Z),
- the field horizontal component (H),
- the magnetic declination (D), that is, the angle of the horizontal component of the field with the local meridian.

* 1 gamma = 10^{-5} oersted = $7{,}958.10^{-4}$ ampere-turns per metre.

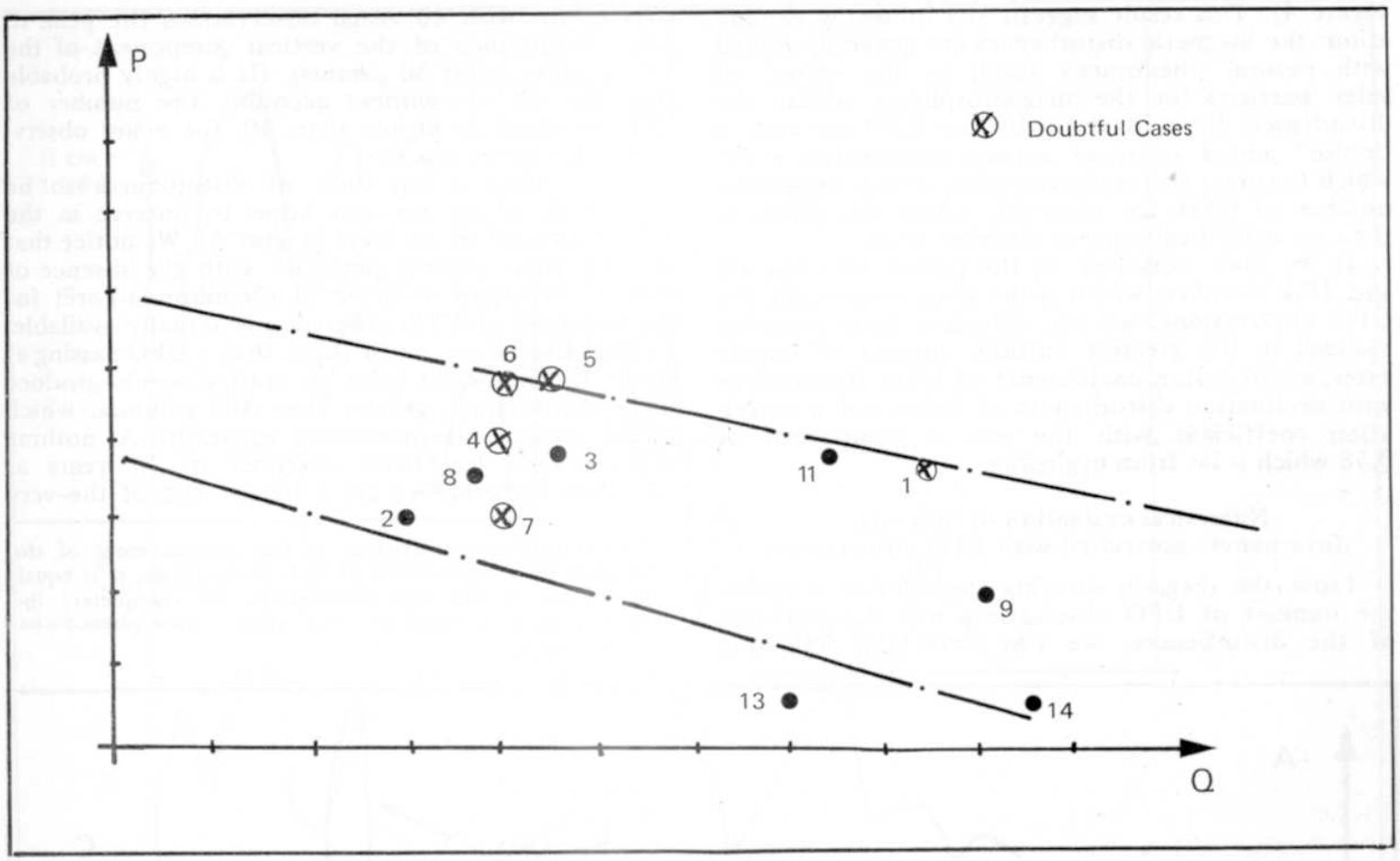

Fig. 2. Key: P axis = Module of total variations in earth's magnetic field during the 3 hours before and after a UFO observation; Q axis = distance in Kms of UFO from Chambon-la-Forêt.

No important variation of the measured magnetic field, at the time of the various UFO observations, can be noticed on the recordings made at Chambon-la-Foret (see Figure 1). One could be led to suppose that the UFO observations were made a long way from the station and that the disturbances were very feeble and lasted an incomparably longer time than the visual evidence. To try to verify this position, I have studied the variations in the strength of the fluctuations recorded, in relation to the distance between the visual observation and Chambon-la-Forêt. There seems to be some connection between the distance and the strength of the variations of the field (the variations decrease in strength when the distance increases) but this phenomenon is not precise enough to have real significance.

First Conclusions

1) No direct correlations between visual UFO observations and recorded fluctuations of the earth's magnetic field has been brought to light.

2) The greatest magnetic disturbances which could be associated with these observations would therefore be less than 30 gammas for a distance of about 40 kilometres and less than a few gammas for about 90 kilometres in a bandwidth of a few hertz.

3) The variations in the magnetic declination which could be associated with UFO observations would be less than 3 arc minutes for distances between 30 and 90 kilometres.

4) Nevertheless, it seems that a qualitative examination of the recordings for the whole year 1954 leads us to think that the periods of maximum disturbance correspond with those of the greatest number of UFO observations. We have afterwards attempted to make a statistical analysis, more accurate than this subjective impression.

Statistical study of correlations between magnetic disturbances and UFO observations

To avoid undertaking an enormous task of searching through archives, we can limit ourselves to a particularly representative period of UFO observations, in this case, the year 1954. The histogram of eye-witness observations of UFOs shows, for France, a marked maximum in 1954. This year alone covers 23% of French observations for the period 1944 — 1971.

The results show a good correlation between the two phenomena for the month of October (see Figure 3). This can be more carefully examined by the analysis of the distribution of witnesses' UFO accounts each day during October.

By comparing the distribution of UFO observations with that of disturbances in the vertical component of the earth's magnetic field or with that of the magnetic declination, a fairly good correlation of reciprocal variations can be noticed during the first half of the month, a period when UFO observations were specially numerous (see

Figure 4). This result suggests the following explanation: the magnetic disturbances are generally linked with natural phenomena (such as the arrival of solar particles in the magnetosphere) whilst the disturbances brought about by the UFO are only a "noise" added to these natural phenomena, noise which becomes preponderant when a very important number of UFOs are observed, which was precisely the case at the beginning of October 1954.

If we limit ourselves to the period between 1st and 18th October, which is the most remarkable for UFO observations, we can calculate from statistics realized in the greatest possible number of sample cases, a correlation coefficient† of UFO observations with declination disturbances of 0,034 and a correlation coefficient with the vertical component of 0,58 which is far from negligible.

Numerical evaluation of magnetic disturbances associated with UFO observations

From the diagram showing the relation between the number of UFO observations and the intensity of the disturbances, we can draw the following conclusion: with 40 visual observations the peak to peak disturbance of the vertical component of the field attains about 30 gammas. (It is highly probable that for 40 eye-witness accounts the number of UFOs involved is higher than 40, for many observations are never reported.)

This allows a top limit of disturbances to be calculated, which we can hope to observe in the neighbourhood of an UFO (Figure 5). We notice that this top limit accords perfectly with the absence of direct correlation observed at Chambon-la-Forêt for the accounts of UFO observations actually available.

This also allows us to think that a UFO passing at about 10 kilometres from the station would produce there disturbances greater than 400 gammas, which would saturate the measuring apparatus. As nothing of this kind has been observed in 20 years at Chambon-la-Forêt, we get a better idea of the very

† The correlation coefficient is the measurement of the possible interdependence of two phenomena; it is equal to ZERO if the two phenomena are completely independent, it is equal to ONE of the two phenomena are identical.

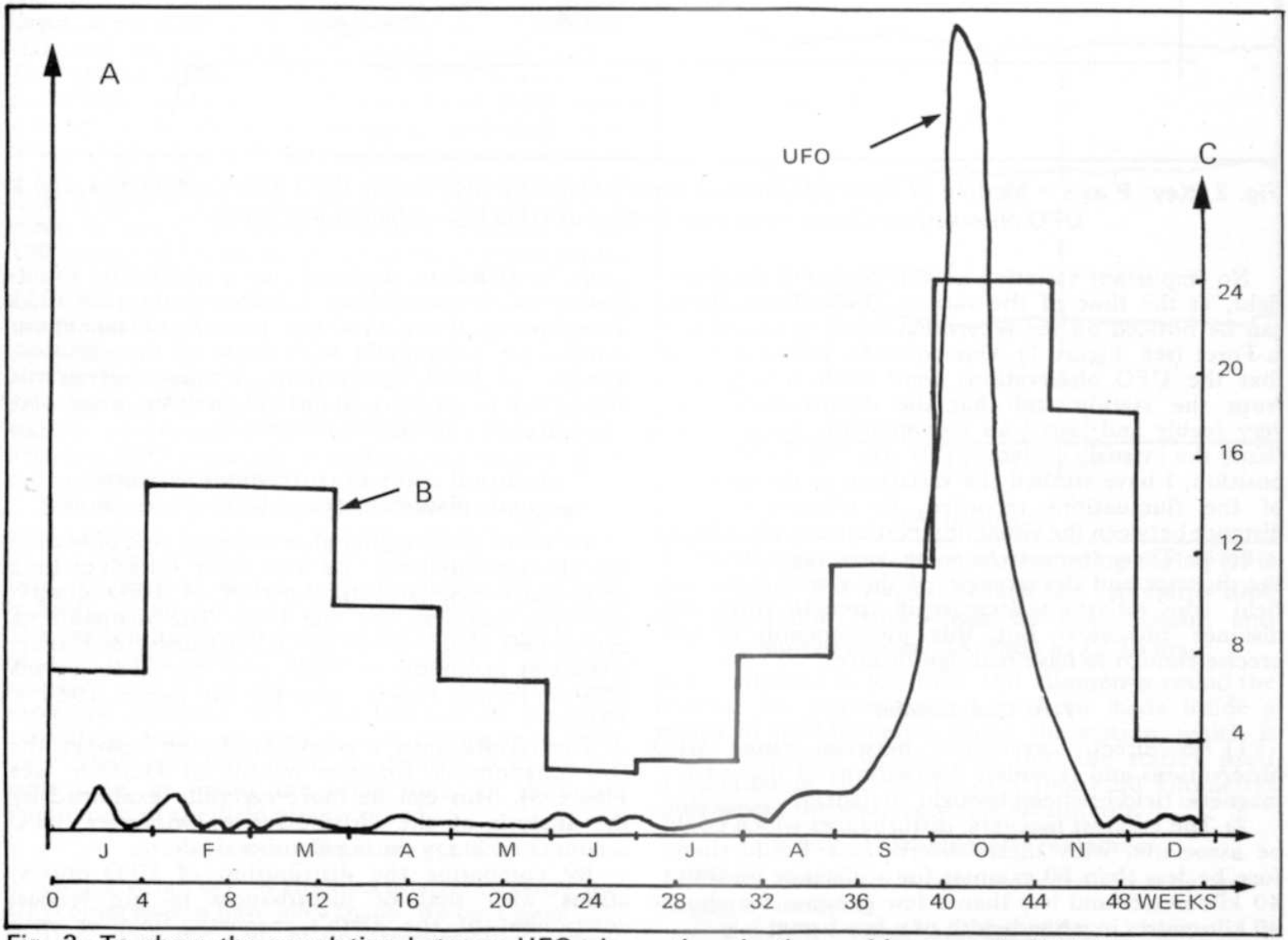

Fig. 3. To show the correlation between UFO observations in the earth's magnetic field during the year 1954 (635 French cases — Saunder's statistics). Key: A axis = Number of observations per week; B = Disturbances of the declination of the earth's magnetic field; C = number of disturbances of the magnetic declination per month

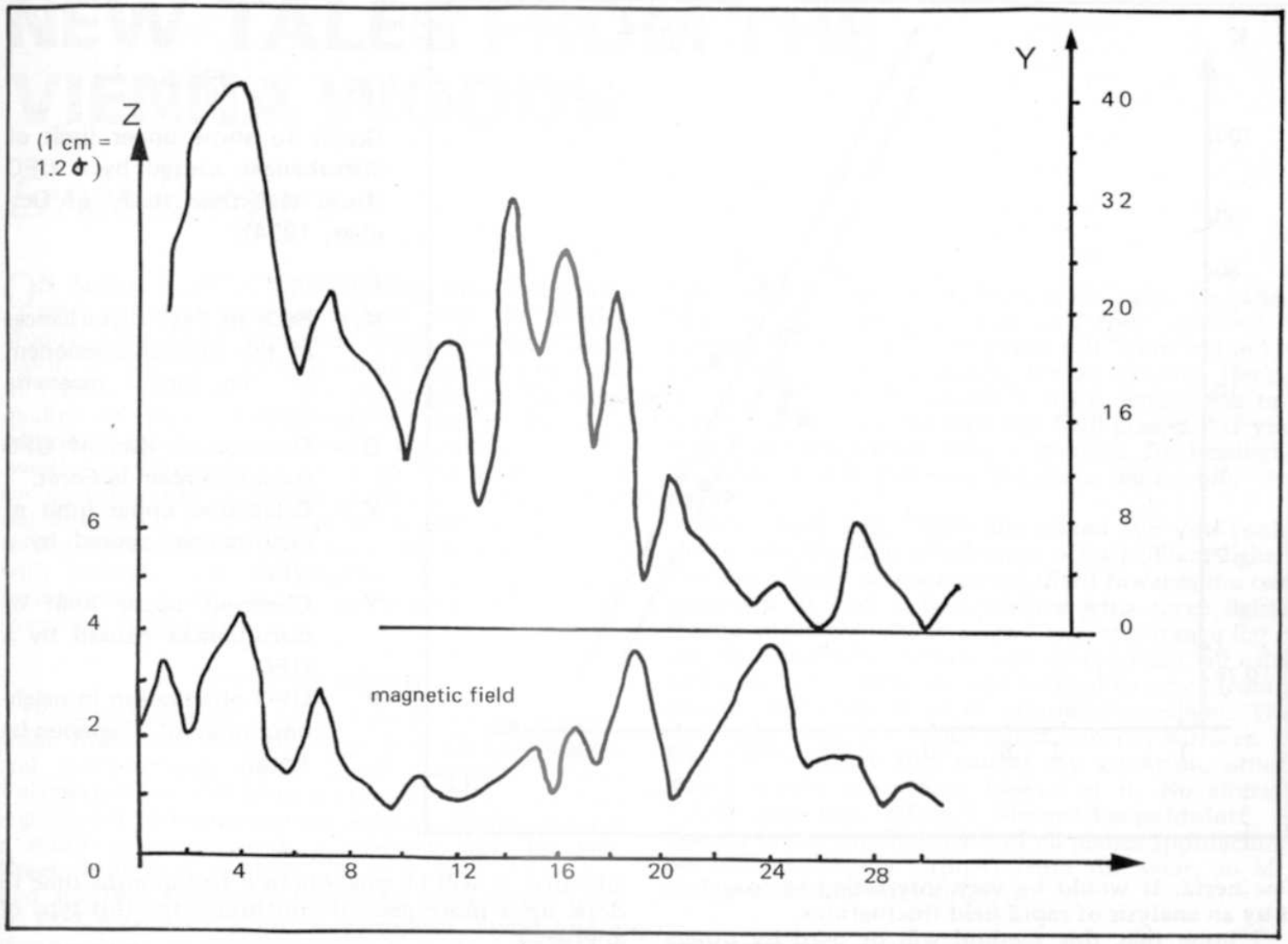

Fig. 4. Graphs to compare distribution of UFO observations with that of disturbances in the vertical component of the earth's magnetic field, Chambon-la-Foret, October, 1954.

Key: Z = Fluctuations in vertical component, peak to peak, in cms (1 cm = 1.2γ)
Y = Number of UFOs per day

feeble probability of observation by a single automatic station.

Conclusions

To sum up, this study allows us to show:

1) A good statistical correlation between disturbances of the earth's field and UFO observations during one month in the remarkable year 1954.
2) A good correlation on a day scale during the remarkable month of October 1954.
3) The confirmation (by results of statistical analysis) of the negative results, case by case, of UFO observations in the neighbourhood of Chambon-la-Forêt geomagnetic station.
4) The very feeble probability of a UFO passing in the field of vision of a single automatic station.
5) The top limit of magnetic disturbances brought about by UFOs, that is a peak to peak value of 10 gammas for the field vertical component when a UFO is observed at 40 km from the measuring station. This leads us to think that the magnetic field produced by the UFO could be 150,000 ampere turns per metre in its immediate neighbourhood.

We can thus draw two important conclusions:
— the method used here looks as if it might be very useful for an objective approach to the study of the phenomena. The analysis would have to be considerably enlarged, using a greater number of observation reports, associated with several geomagnetic recording stations, in order to obtain better quality results.
— the detection of UFOs by magnetic disturbances seems possible, but only if several automatic well-equipped stations are available, which would increase the probability of seeing a UFO pass in the immediate neighbourhood of one of them. At least ten stations would be necessary.

It should also be remembered that this study had to be limited to disturbances in a bandwidth of a

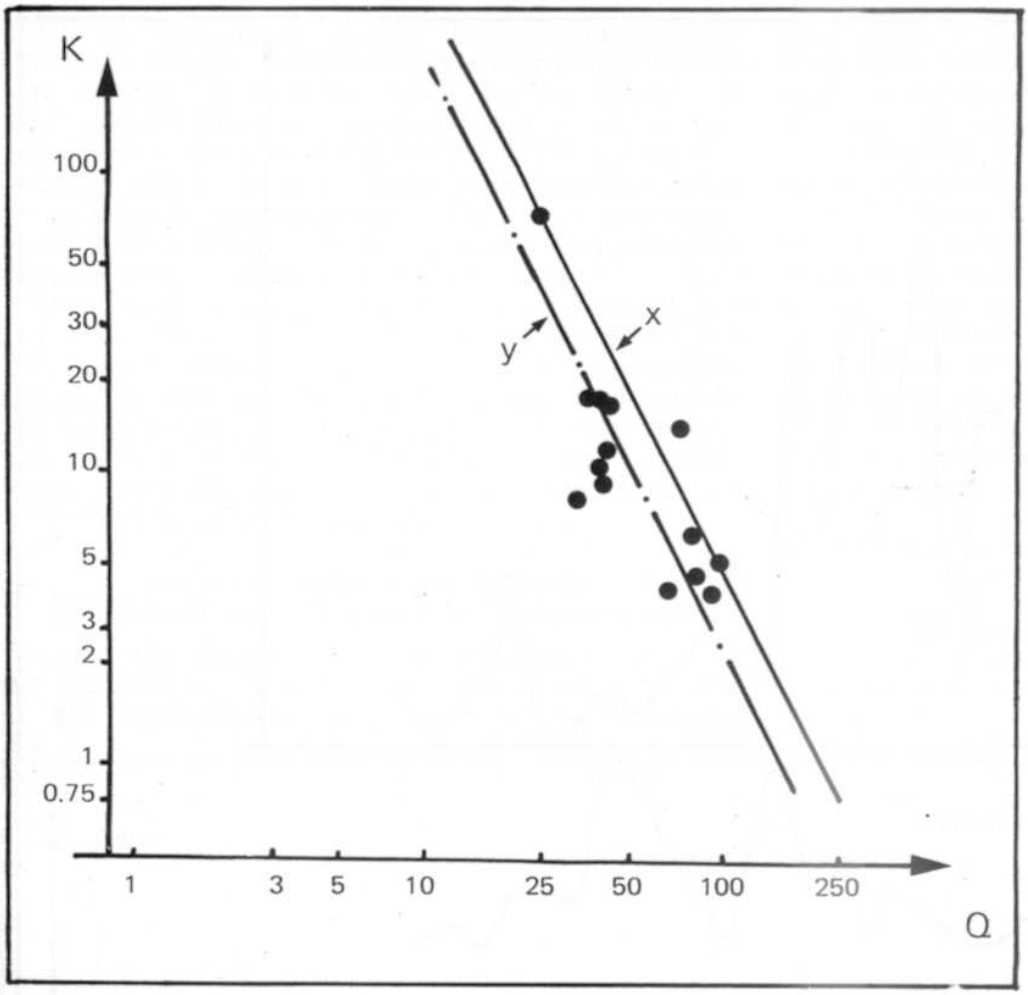

Fig. 5

Graph to show upper limit of disturbances caused by a UFO (from statistical study of October, 1954).

Key:

K = Peak to Peak disturbances of the vertical component of the earth's magnetic field.

Q = Distance in Km. of UFO from Chambon-la-Forêt.

X = Calculated upper limit of disturbances caused by a UFO.

Y = Observed upper limit of disturbances caused by a UFO.

• UFO observation in neighbourhood of Chambon-la-Forêt.

few hertz. It would be very interesting to complete it by an analysis of rapid field fluctuations.

I hope that this method will be used by others and that it will be possible in a few months time to draw up a more general conclusion for this type of approach.

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