2.10. REPORT FROM THE BIRD/RADAR/WEATHER GROUP

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The Scientific Affairs Division of NATO has now approved a grant of $40,000 to be delegated among the seven countries, Belgium, Denmark, France, Germany, Holland,Norway and the United Kingdom, for work under the captionally-noted agreed-upon program. Additional related work may be undertaken by a co-operating country but must not interfere with the agreed-upon program. Other countries may participate now if they wish but will not receive NATO support. Requests for support from additional NATO countries can be considered in future. The grant presently available applies for one year, but if sufficient progress is made a futher grant may be requested for a second year.

The attached outlines offers a proposal for easy and quick handling of data on bird movement related to weather data for the same periods. Bird migration data should be acquired by radar photography on a 24 hour-a-day basis. Each country receiving NATO funds should gather radar data on bird movement. Using the technique outlined, it should plot the relationship between bird movement and weather during the migration season. Data should be plotted once at least for each diurnal and nocturnal period to give about 30 to 60 observations per map for study (2 weeks or 1 month per map). By examining the data collected during migration it will be possible to determine quickly if the same type of relationship applies in Europe that has been found to apply in North America. If it does, one year's past data will provide a good basis for forecasting in a subsequent year.

To ensure uniformity of work, the programs in the seven countries should emphasize the gathering of data on the kinds of birds most likely to be a problem in the European environment. These include cranes, waterfowl, gulls, shorebirds and small birds which move in large groups. The importance of the different groups will vary from country to country but each country should attempt to collect data which will be helpful in its own program and also in the programs of neighbouring countries. Weather data should be uniformally available from meteorological sources in the countries and the same type of basic weather map ought to be used for recording the data at all points. It is suggested that a simple map will be the best. As was discussed at the meeting in The Hague, April 14, 1970, analysis of the data can be done either by computer or by incpection. In all cases, data should be collected in such a way that they can be used to prepare diagrams for analysis

by inspection, and also so that the data can be punched on data cards, for processing by computer.

The pertinent data which should be collected in all cases, will include:

1. the intensity of bird migration on a 0 to 8 point scale or some other scale mutually agreed upon.

2. the direction of bird movement.

3. the sector of the radar scope on which the movement takes place.

4. if possible the relative speed of movement of the birds compared to the windspeed.

5. altitude:

   (a) from height-finding or glide-path radar where available.

   (b) a rough indication of height can sometimes be secured from the distance at which birds show up on the P.P.I. display if the angle of inclination of the base of the beam is known.

   (c) light aircraft flights at known heights by day (or night with landing lights) can give visual information on altitudes of some bird migration.

The weather data should include:

1. wind speed and direction at surface and at pre-determined altitudes.

2. cloud cover.

3. precipitation.

4. temperature at surface and pre-determined altitudes.

The basic analysis must be kept as simple as possible. The first attempt should, therefore, be a search for correlations between intensity of bird movements and relationship of the observation station to the synoptic weather pattern (as shown in the diagrams attached to the proposed program). The procedure outlined is simplified as far as practical, in order to minimize the work involved in achieving a useful result. Much more complex computer analyses have been proposed and carried out by a number of agencies. In some cases those work equally well but with a much greater expenditure of manpower and funds. It is desirable to have a system that can function without computer assistance. For that reason an attempt should be made to

assess the forecast possibilities by using an inspection system and charts similar to those attached.

The differentiation between different sizes of radar echoes and different kinds of birds movements which provide those echoes will be facilitated by analyses of motion-picture film rather than of still photographs. Every effort should be made, therefore, to arrange for the taking of movies of suitable radar displays on a continuous basis during the periods when bird migration is a hazard to aircraft.