Large scale weather situations and influence on bird migration during seasons of the year

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During the last years Denmark, Sweden and Swisserland tried to get informations about relationships between weather parameters and bird migration. They developed special modells with the aim to forecast birdstrike-risk and bird movements over medium and longer periods.

In Germany with its different geomorphological and therefore also climatological conditions it seemed very difficult to make such forecasts based on such models as weather in the various regions - German Bight, Highland,Alpes - is too different.Therefore we used an other way : we found out 11 standardised weather situations and tried to correlate it with bird migrations intensities and frequencies. These weather situations are the following:

Anticyclone Central Europe(AC)	Fig.1
Anticyclone Western Europe(AW)	Fig.2
Anticyclone Southern Europe(AS)	Fig.3
Anticyclone Eastern Europe(AE)	Fig.4
Anticyclone Northern Europe(AN)	Fig.5
Cyclone Western Europe (CW)	Fig.6
Cyclone Southern Europe(CS)	Fig.7
Cyclone Eastern Europe (CE)	Fig.8
Cyclone Northern Europe(CN)	Fig.9
Trough Western Europe(TRW)	Fig.10
Trough Eastern Europe(TRE)	Fig.11

The reason for this subdivision was that in some times or seasons for the northern German district an antycyclone over northern Europe with its various meteorological parameters was important for bird migration whereas in western Germany migration was influenced by a trough and southern Germany was standing under cyclone influence. Therefore the migratory situation in the different regions could not be comparable.

The trial for correlation was done as follows : about 30.000 bird observations(1966-1974) - radar and visual observations - were transfered on videoscan document and stored on a data tape of a computer. Weather reports of selected weather stations

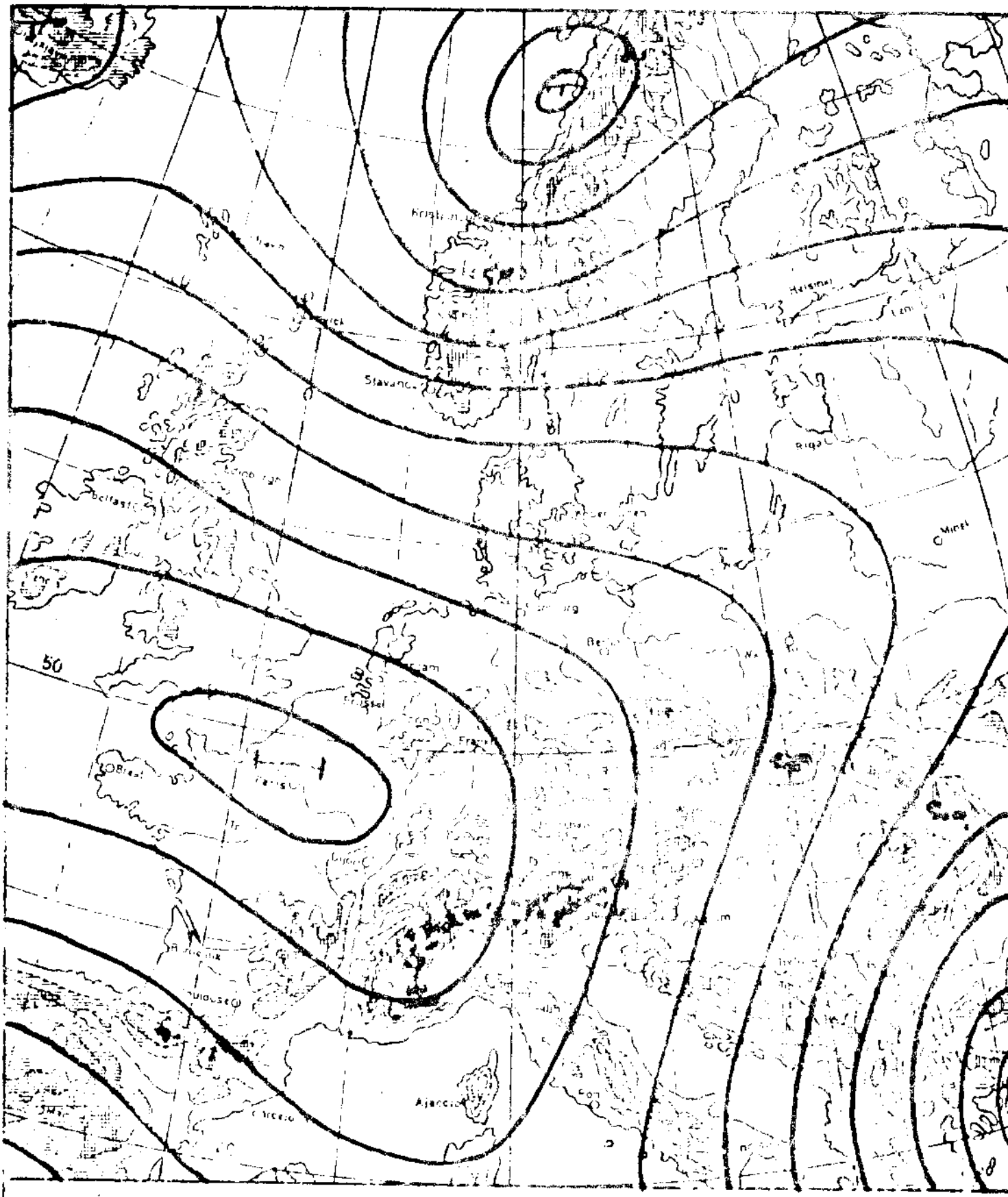
as well as large scale weather situations were added to the data tape. A special program, called "bird oberservation", produced the desired correlation between bird migration and large scale weather situation.

Figure 12 "Occurence of Birds" shows the distribution of bird observations on various large scale weather situations in percent, here f.i. in February 1966 until 1974, a period with the first pre-spring migration. Weather situations with southern or western air currents seemed to be prefered. This figure gives no information about the frequency of the weather situations during this months and therefore the result could be accidentally. So the next figure 13 "Bird migration and large scale weather" regards this frequency for february. The method to get a relative number as relative quantity of birds was the following: frequency of birds during a large scale weather situation in per cent divided by frequency of occuring large scale weather situations in per cent. The result in fig.13 is an other one than in fig.12, for only anticyclone over southern Europe and trough over western Europe favoured spring migration whereas all other situations had no remarkable influence on bird movements. That proofs that especially westerly and southwesterly airflows with mild temperatures favour bird migration during this period.

An other example may show the situation in the month june over 9 years. The figure 14 shows only occurence of birds in per cent; an anticyclone over West- and cyclones over West- and North Europe seem to stimulate bird migration. The figure 15 confirms more or less this result. By the a.m. weather situations with their chardcteristic parameters the so-called inter-migration in early summertime is favoured.
On this way we shall try in future , too, to get a good background for forecasting bird movements in the different parts of our country.

AC

Fig. 1



Wetterlage vom: 4 / 12 Uhr (z) Dienststelle:

AW

Fig. 2

Wetterlage vom [illegible] Uhr (z) Dienststelle [illegible]

A5

Fig. 3

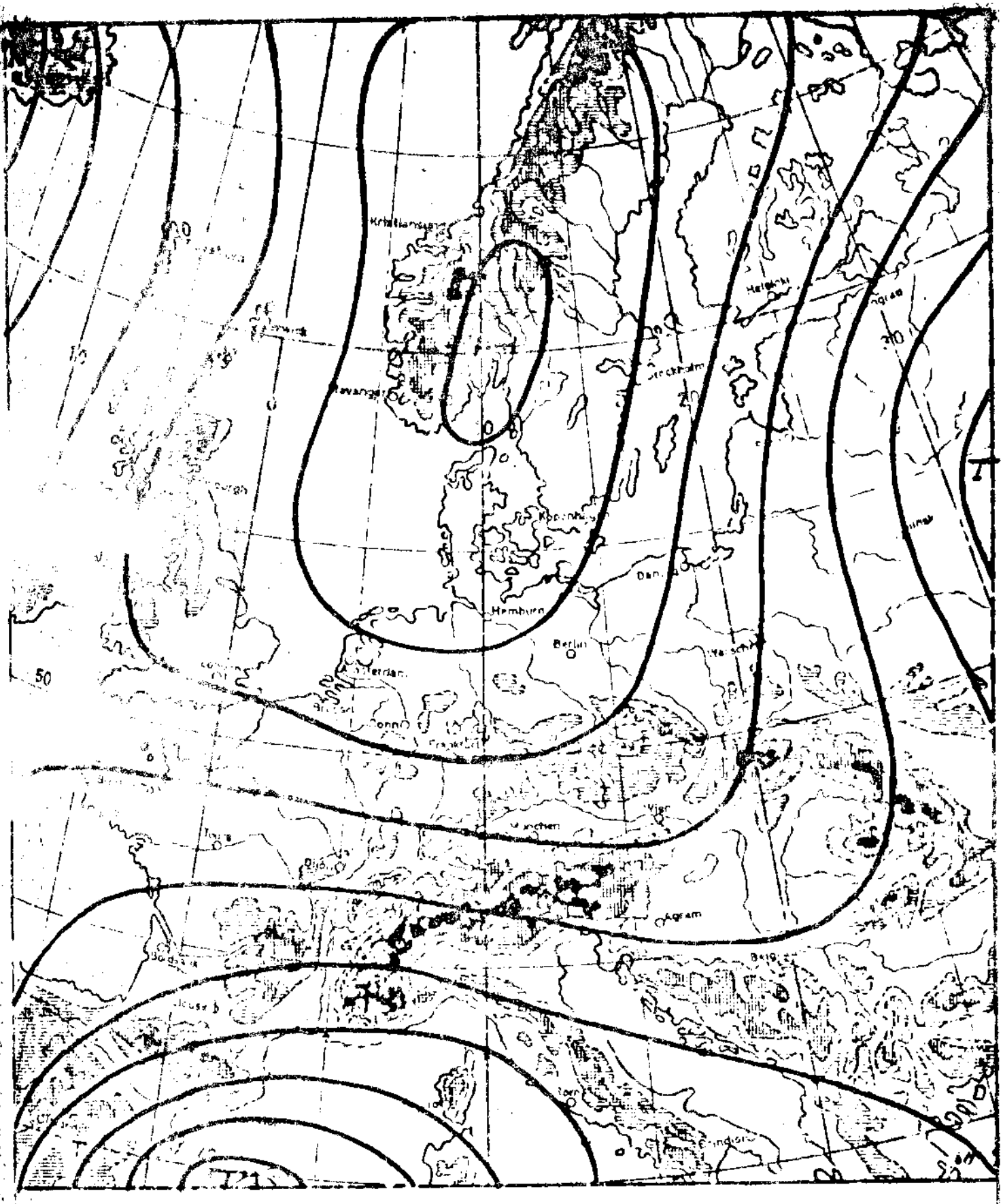
Wetterlage vom: 1-1-L Uhr (z) Dienststelle:

AE

Fig. 4

Maßstab 1:15 000 000

Druck: Meteorologisches Institut ... DMG



Wetterlage vom: HN Uhr (z) Dienststelle:

AN

Fig. 5

CW

Fig. 6

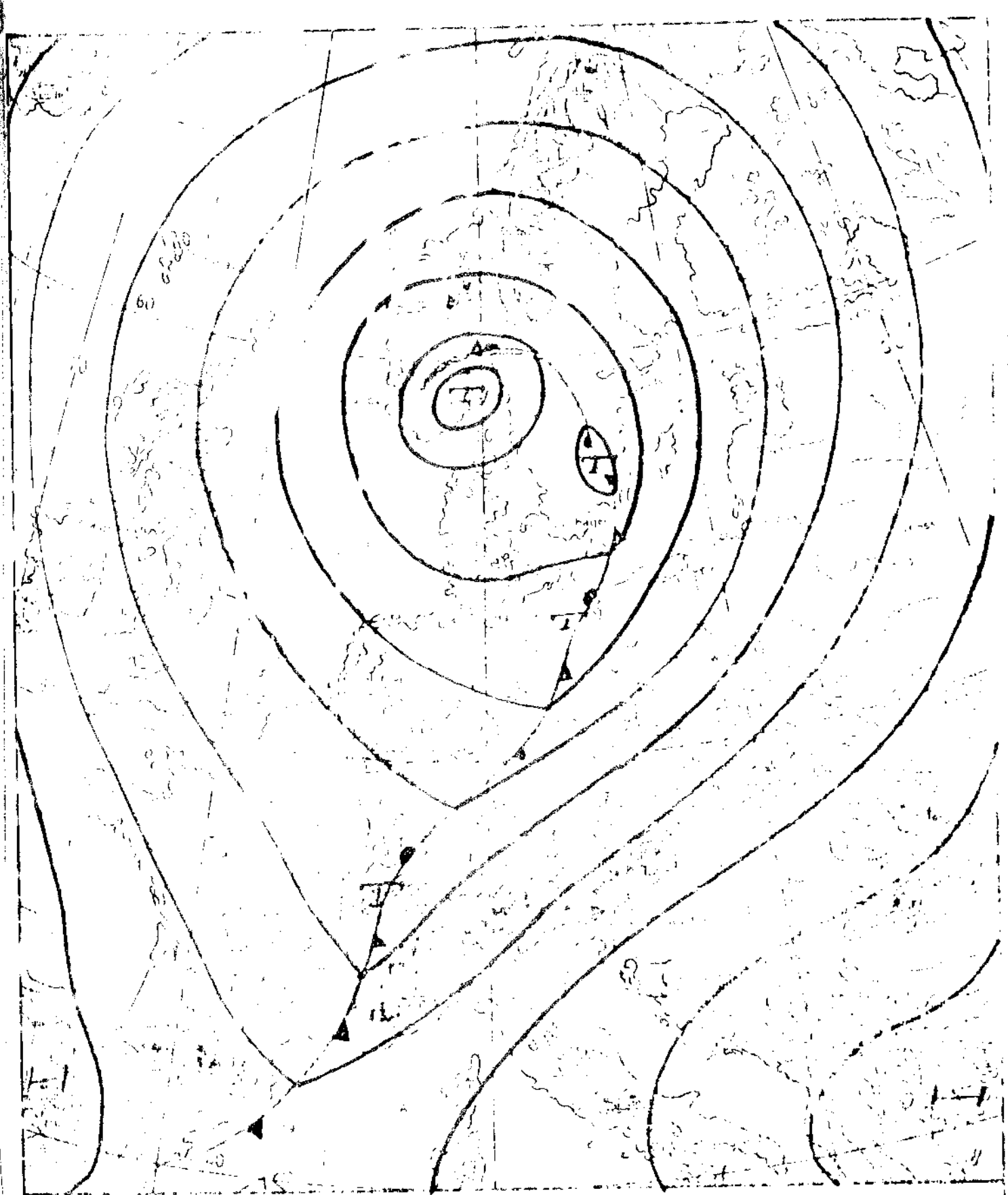
Wetterlage vom 7 5 ... Dienststelle:

CS

Fig. 7

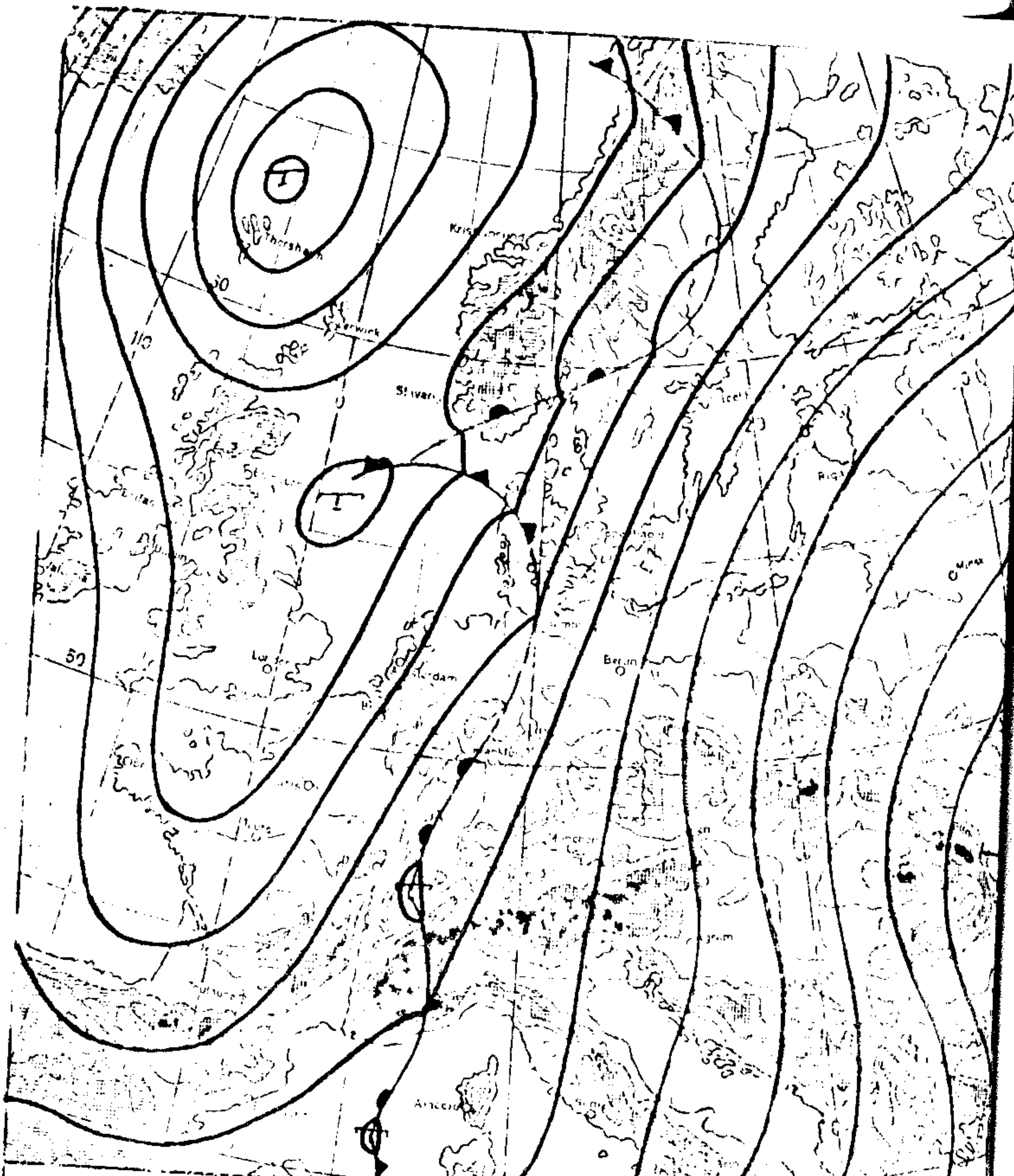
CE

Fig. 8



GN

Fig. 9



Wetterlage vom: Tr W

Uhr (Z) Dienststelle:

TRW

Fig. 10

Maßstab 1:15 000 000

Druck: Militärgeographie

TRE

Fig. 11

Fig. 12

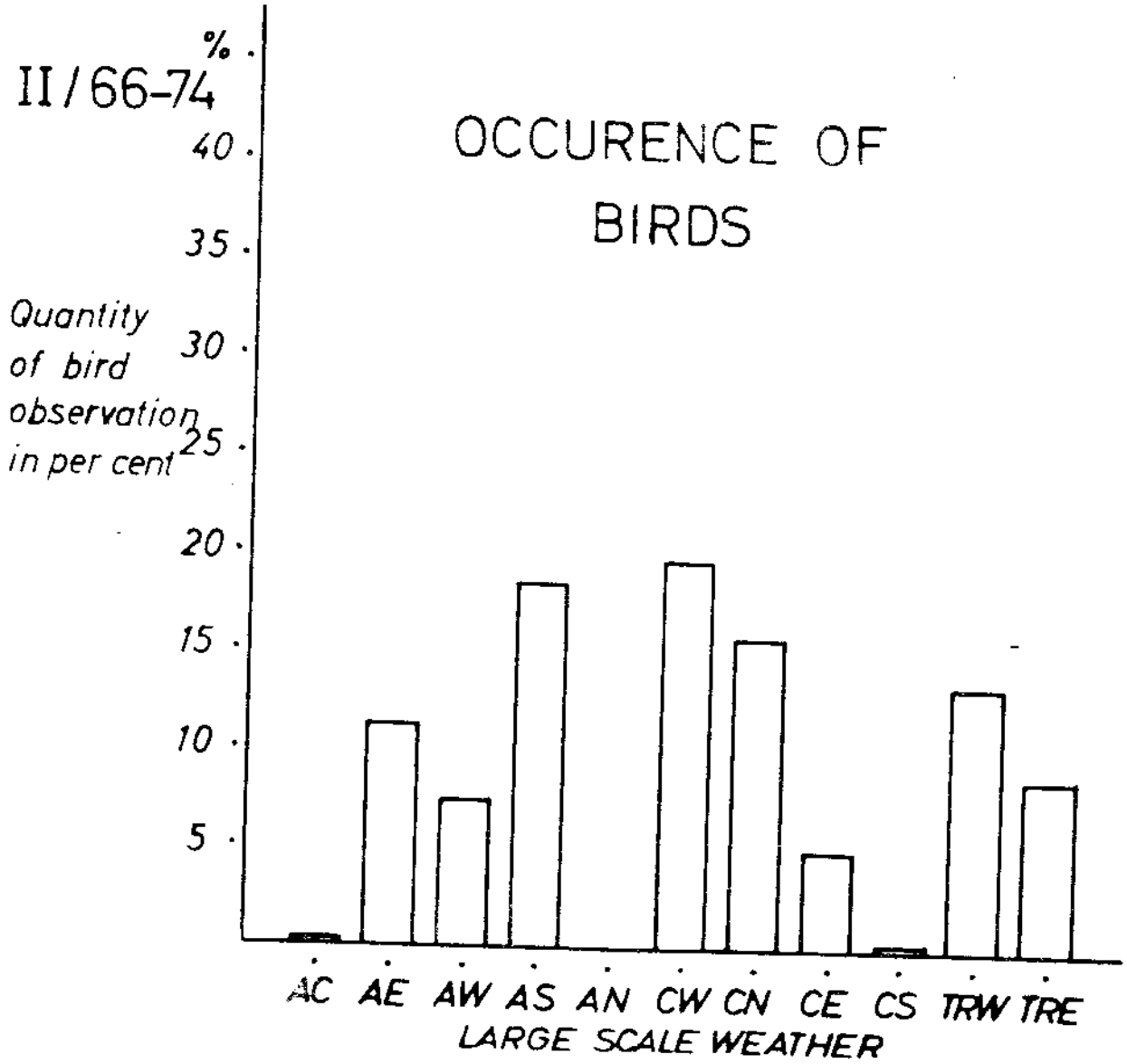

II / 66-74
%
40
35
30
25
20
15
10
5
OCCURENCE OF
BIRDS
Quantity
of bird
observation
in per cent
AC AE AW AS AN CW CN CE CS TRW TRE
LARGE SCALE WEATHER

Fig. 13

II / 66-74.

BIRD MIGRATION AND LARGE SCALE WEATHER

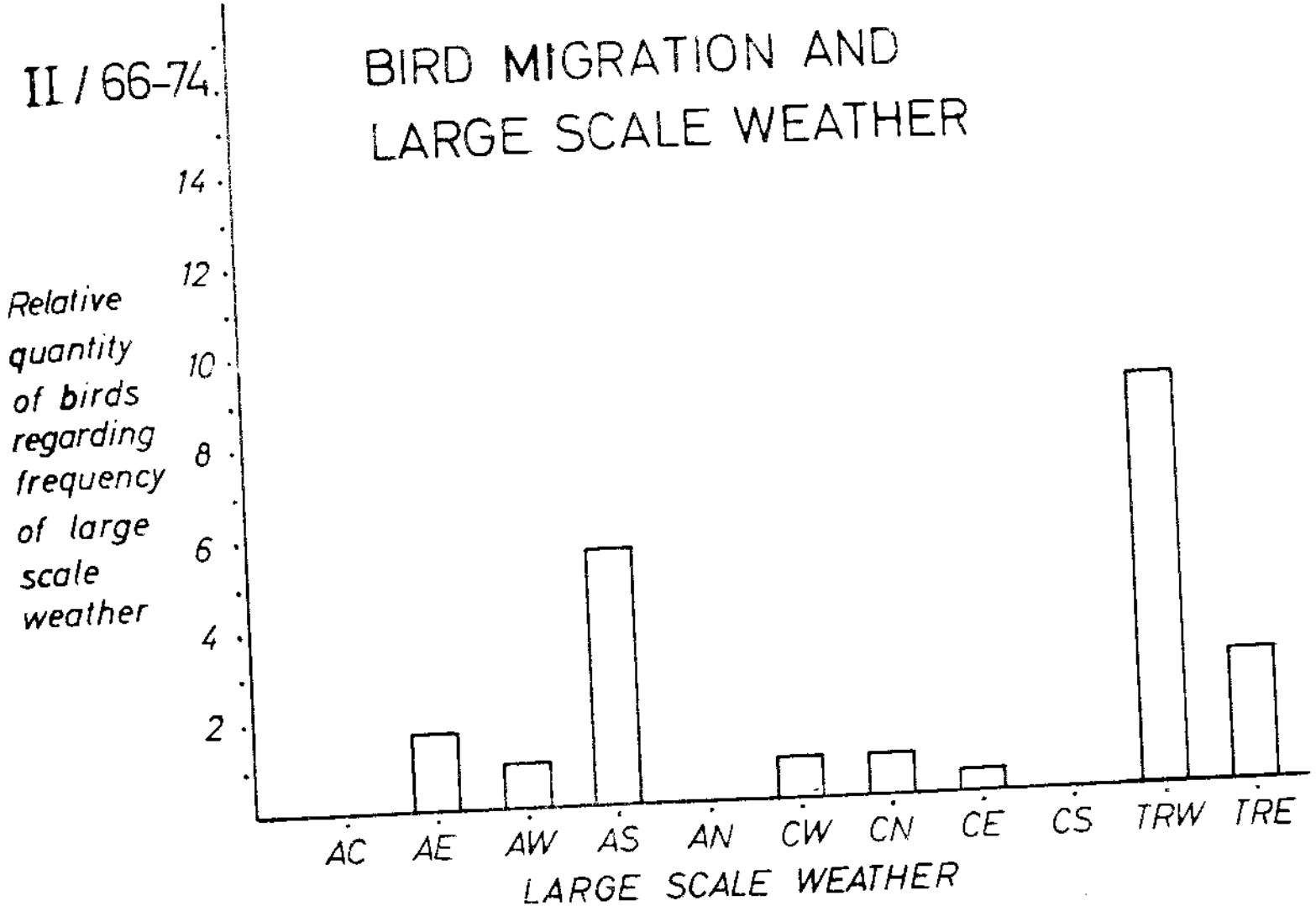
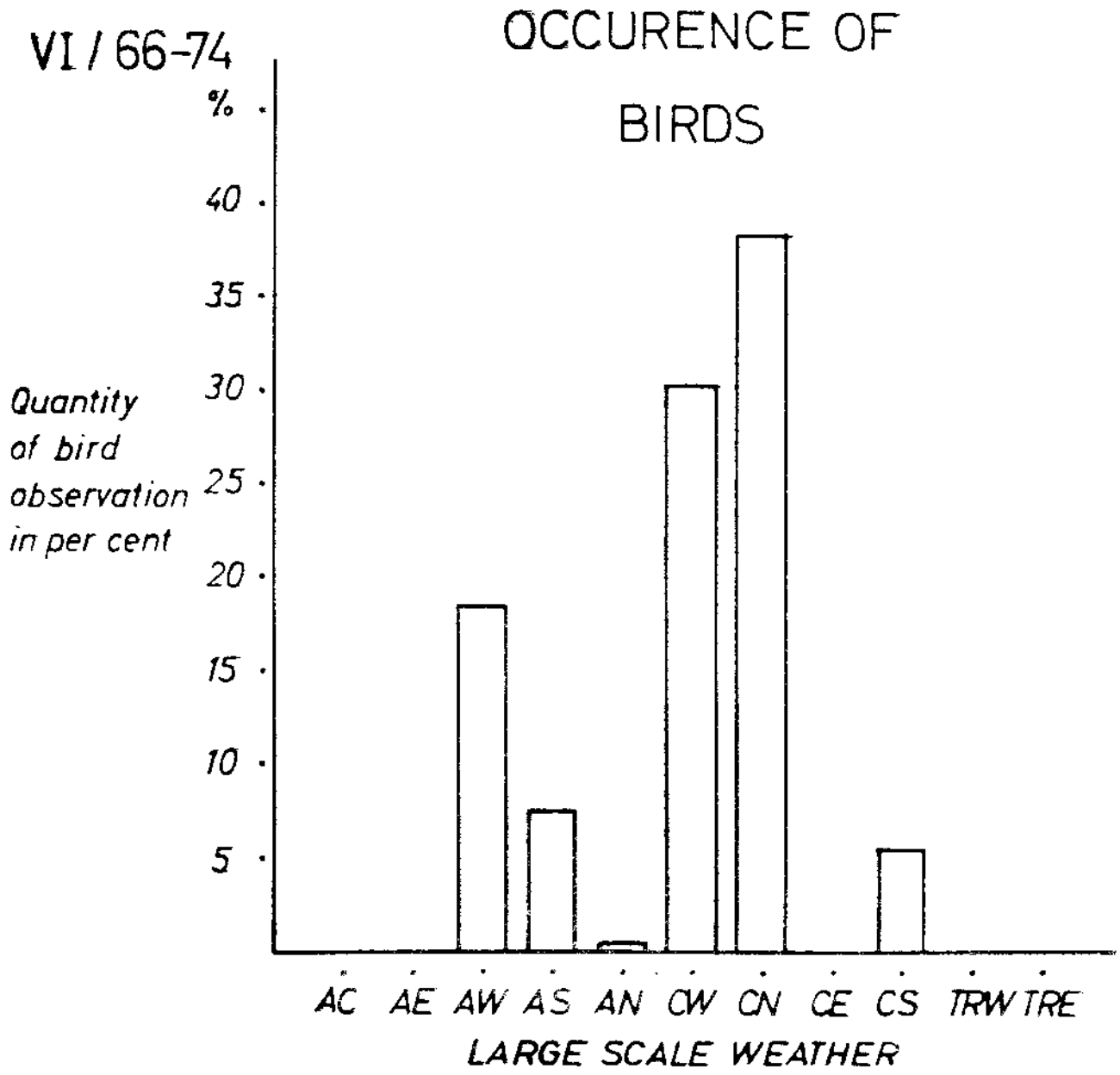


Fig. 14


VI / 66-74
OCCURENCE OF
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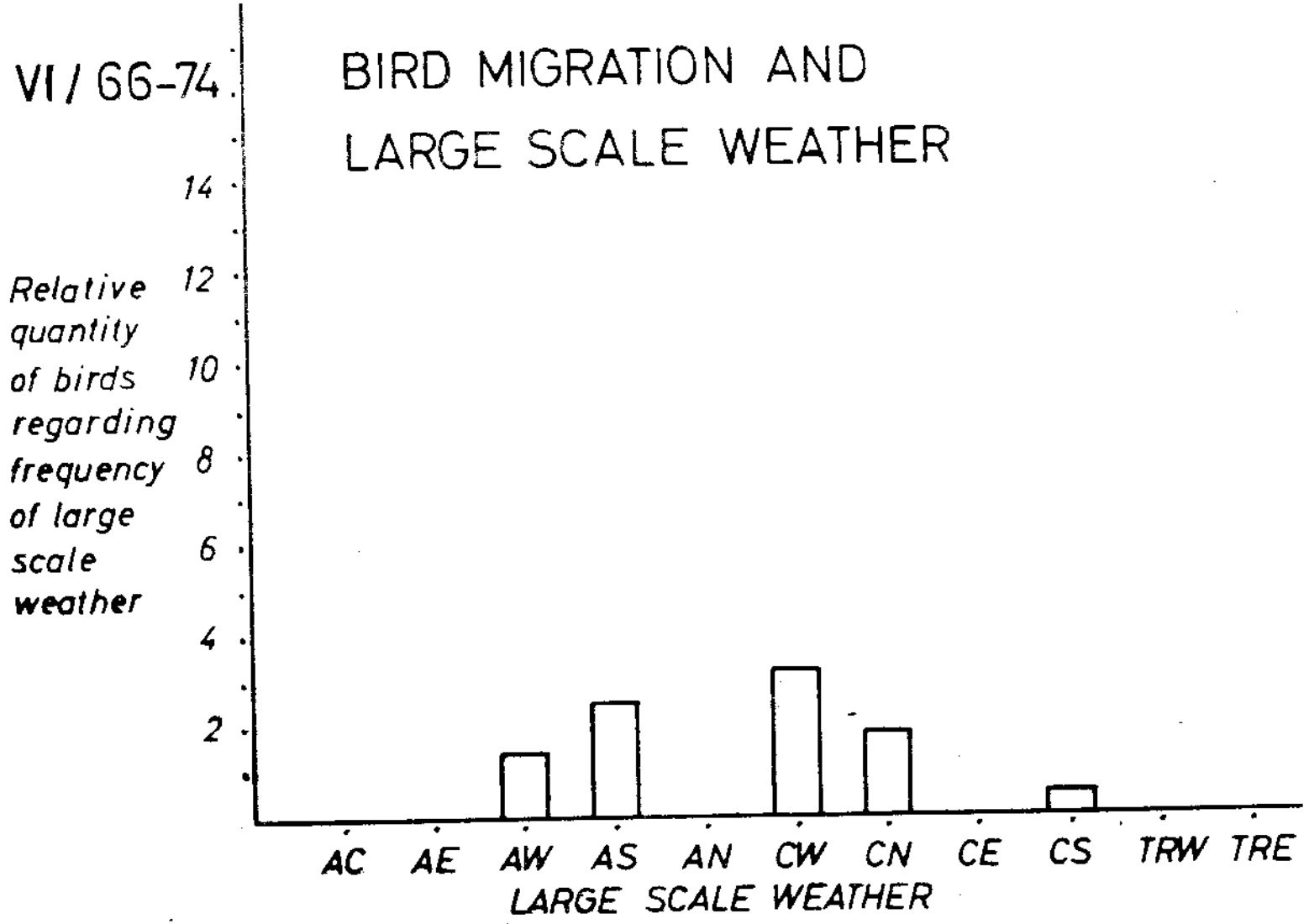
in per cent
AC AE AW AS AN CW CN CE CS TRW TRE
LARGE SCALE WEATHER

Fig. 15

VI / 66-74

BIRD MIGRATION AND LARGE SCALE WEATHER



Discussion on WP 17

Larsson: Have you carried out forecasts based on the material now presented?

Hild: Yes, we do so and sometimes also tendency analysis in order to supplement the forecasts.

Larsson: How great is the efficiency?

Hild: 60-80 %. I can also mention that we issue special forecasts for the crane migration with a validity of 48 hours.

Pierre: Is it possible to study birds migration with the aid of satellite pictures?

Hild: The scale of the satellite photos is of such an order that studies of the migration will probably be difficult.

Larsson: I think such studies will be possible.