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Peripheral visual acuity part II

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Peripheral visual acuity part II

Abstract

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PERIPHERAL VISUAL ACUITY

PART II

by

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Sidney A. Hays

Dr. Harold M. Haynes

PERIPHERAL VISUAL ACUITY
PART II

PROBLEM

To obtain a clinical set of norms for peripheral visual acuity in the two oblique meridians by compiling results of the measurements taken with three different size acuity targets on one hundred individual eyes selected at random. This data is to be used to supplement the work in the principle meridians done by Lind and Larson.

APPARATUS

Brombach perimeter

Special central fixation target

Three graduated acuity Landolt "C's" on special carriers

Perimeter scaling reduced to 1° gradations

Eye patch

PROCEDURE

Details of procedure and construction of targets are identical to those of the Lind-Larson study unless herein specified.

Of the fifty subjects selected at random, twenty-two were optometry students. Eighteen of the subjects were women. The range of ages for the entire group was ten to forty-two years.

Targets of three acuity levels were used: 20/900, 20/500, and 20/300. The 20/100 target was not used since in the Lind-Larson study it was found that it was frequently too small to allow recognition before touching the fixation target. The Landolt "C's" were so placed that with the perimeter in the

oblique meridians (45° and 135°) the gaps were up, down, right, or left. A scale drawing of one of these acuity blocks with its carrier apparatus and one of those used by Lind and Larson is in the appendix.

The left inferior field was tested first, then right superior, left superior and right inferior fields.

All readings were taken in degrees from the perimeter scale reduced to 1° gradations.

The means and sigmas for each eye and both eyes at each acuity level and in each field are recorded in tables 1, 2, 3, and 4.

RESULTS

Table 1--A table of the means and sigmas for each acuity size for nasal superior field and for right eyes, left eyes and both eyes, all recorded in degrees.

Table 2--Same as table 1, but for temporal inferior field.

Table 3--Same as table 1, but for nasal inferior field.

Table 4--Same as table 1, but for temporal superior field.

Graph 1--Representation of the means on a circular graph of all four fields for all right eyes.

Graph 2--Same as graph 1, but for left eyes.

Graph 3--Same as graph 1, but for both eyes.

Graph 4--A frequency sampling of the smallest acuity size target, inferior nasal fields.

Graph 5--A frequency sampling of the largest acuity size target, inferior nasal fields.

Graph 6--A frequency distribution of the incorrect responses of the individual eyes while obtaining 36 correct responses.

Graph 7--The peripheral visual acuity curve of the nasal superior and temporal inferior fields.

Graph 8--The peripheral visual acuity curve of the nasal inferior and temporal superior fields.

Graph 9--Graph 1 of this study superimposed upon Graph 1 of the Lind-Larson study.

Graph 10--Graph 2 of this study superimposed upon Graph 2 of the Lind-Larson study.

Graph 11--Graph 3 of this study superimposed upon Graph 3 of the Lind-Larson study.

CONCLUSIONS

I. The means in the oblique meridians were consistently smaller than the means in the principle meridians. Some variables which might account for this are:

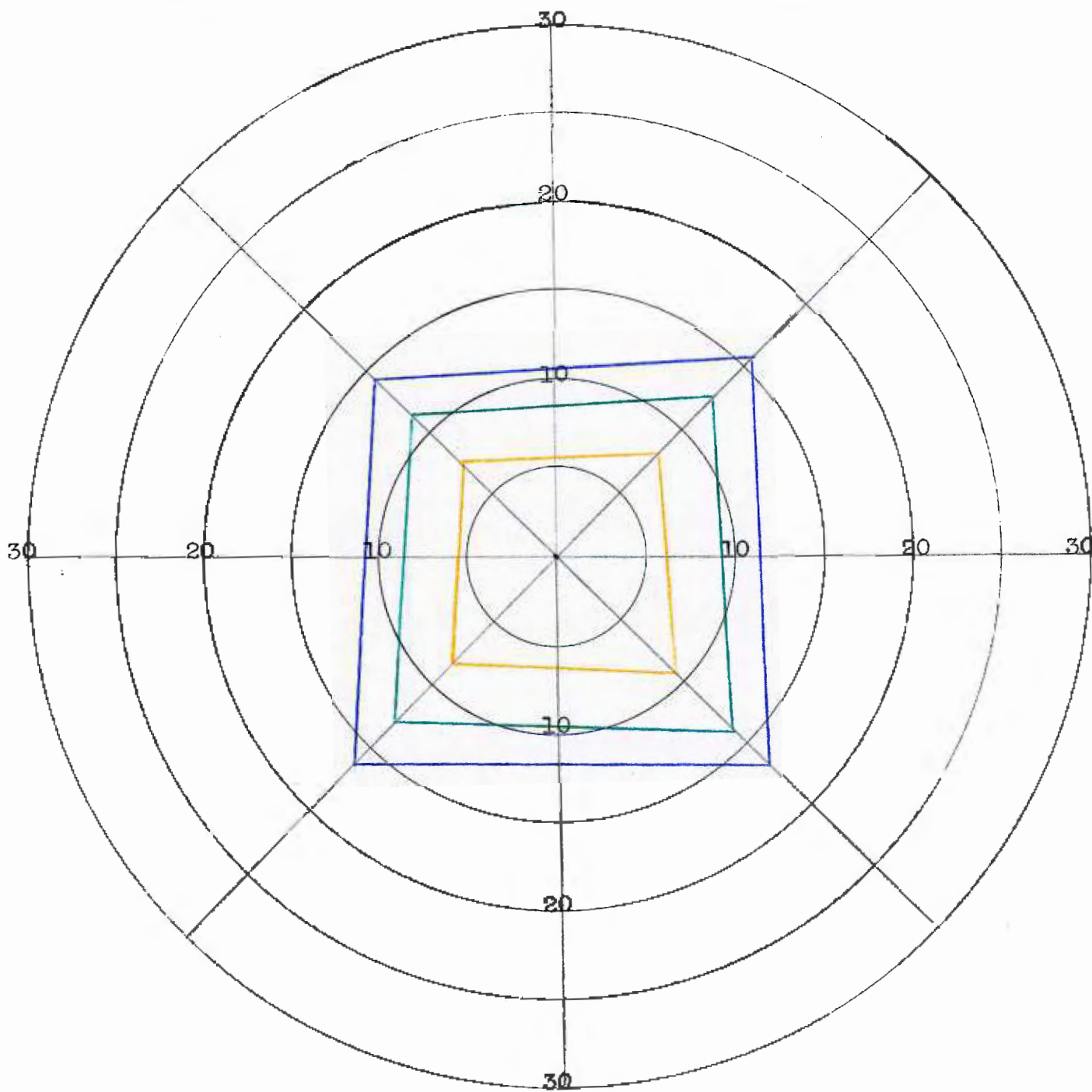
- 1) Two different pairs of examiners.
- 2) The random population for this study contained fewer optometry students and more women.
- 3) The "up, down, right, or left" response was not in the same relationship to the obliquely placed perimeter arc.

II. It is felt that the oblique meridians are not satisfactory for clinical testing due to the common difficulty of subjects to give an "up, down, right, or left" response when the perimeter arc is placed in oblique meridians.

MEANS FOR O.D.

Nasal Field

Temporal Field

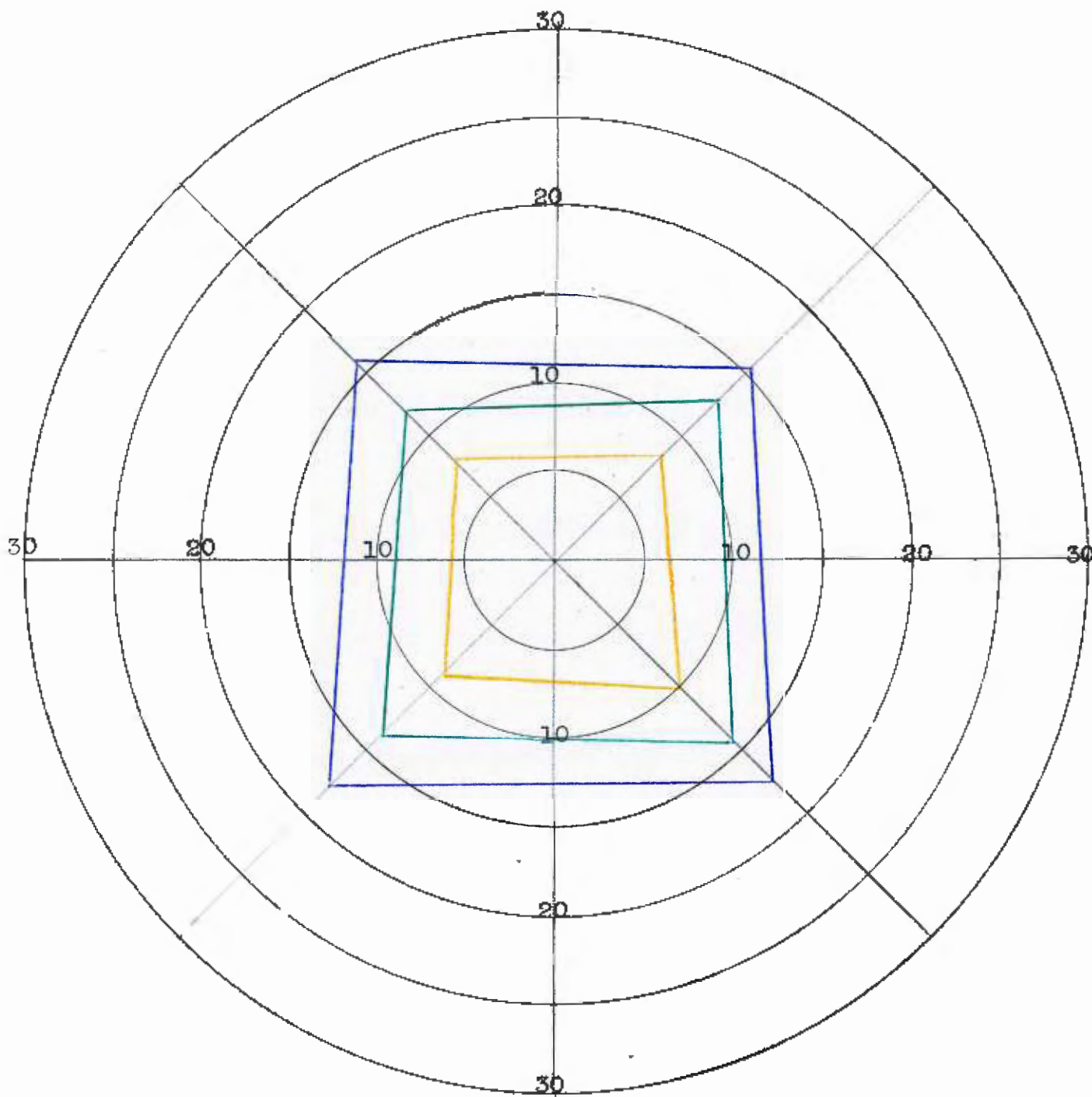


20 / 872 — blue line
20 / 504 — green line
20 / 298 — yellow line

MEANS FOR O.S.

Temporal Field

Nasal Field

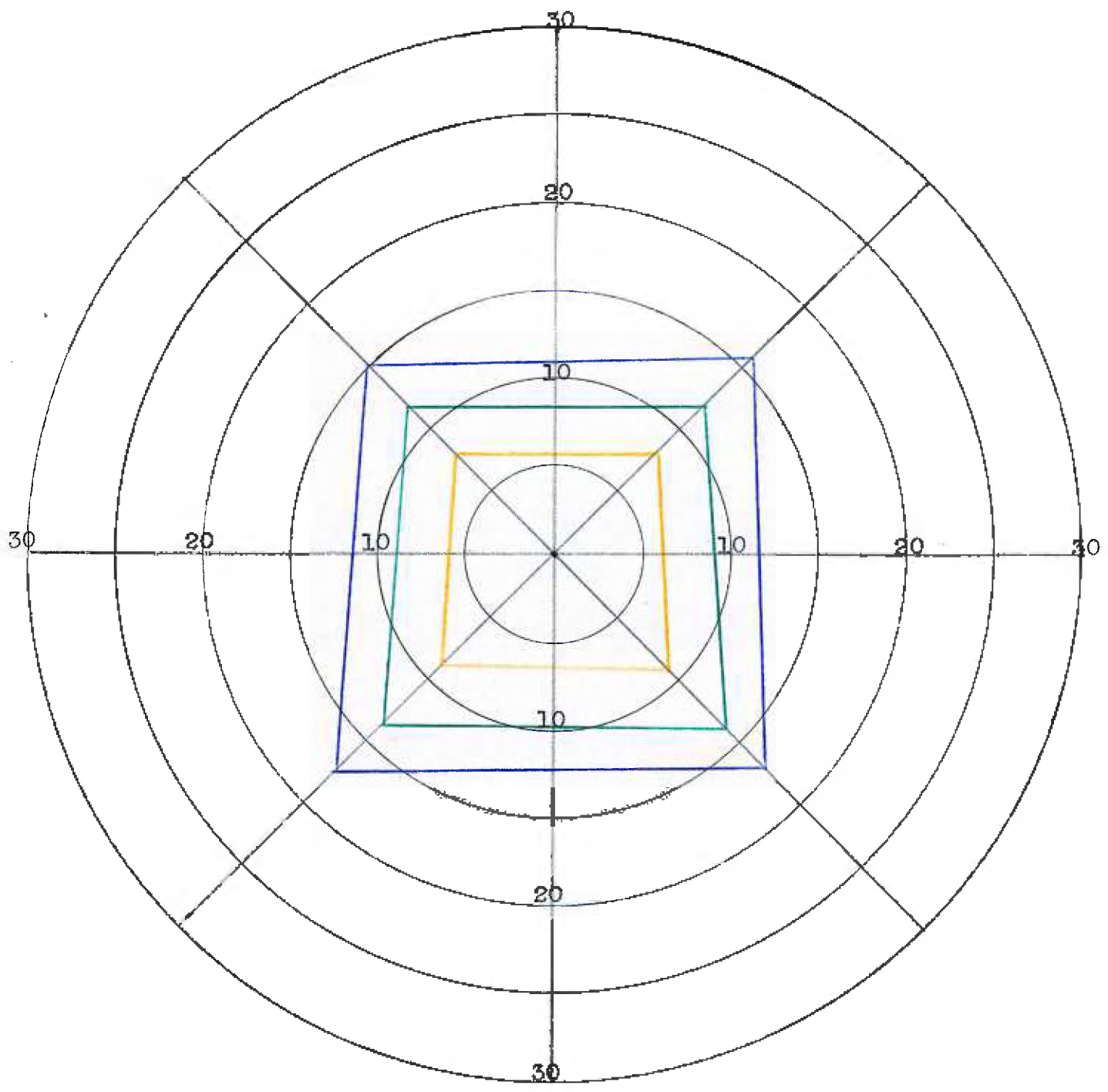


20/872 ———
20/504 ———
20/298 ———

MEANS FOR O.U.

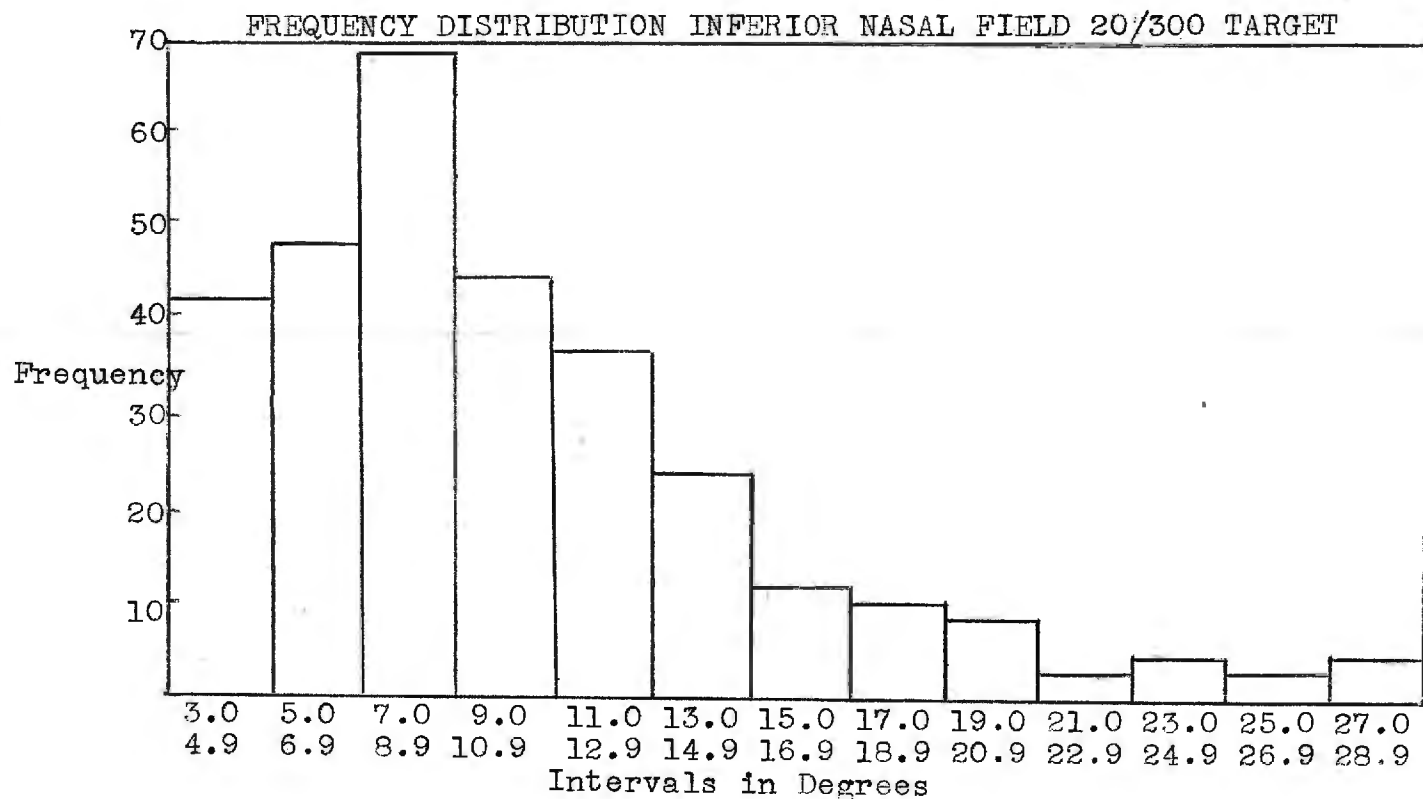
Nasal Field

Temporal Field

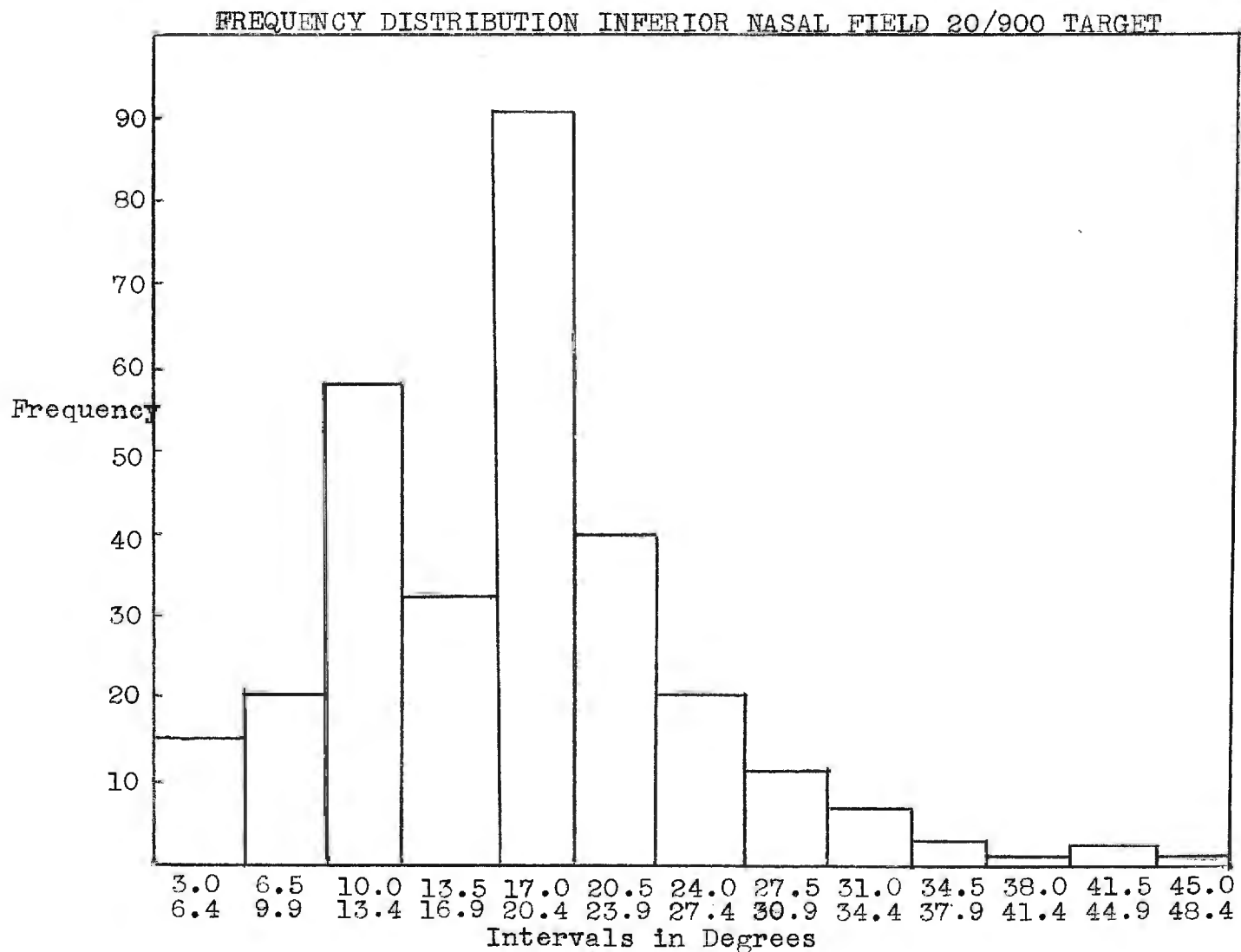


20/872 ———
20/504 ———
20/298 ———

Graph 4

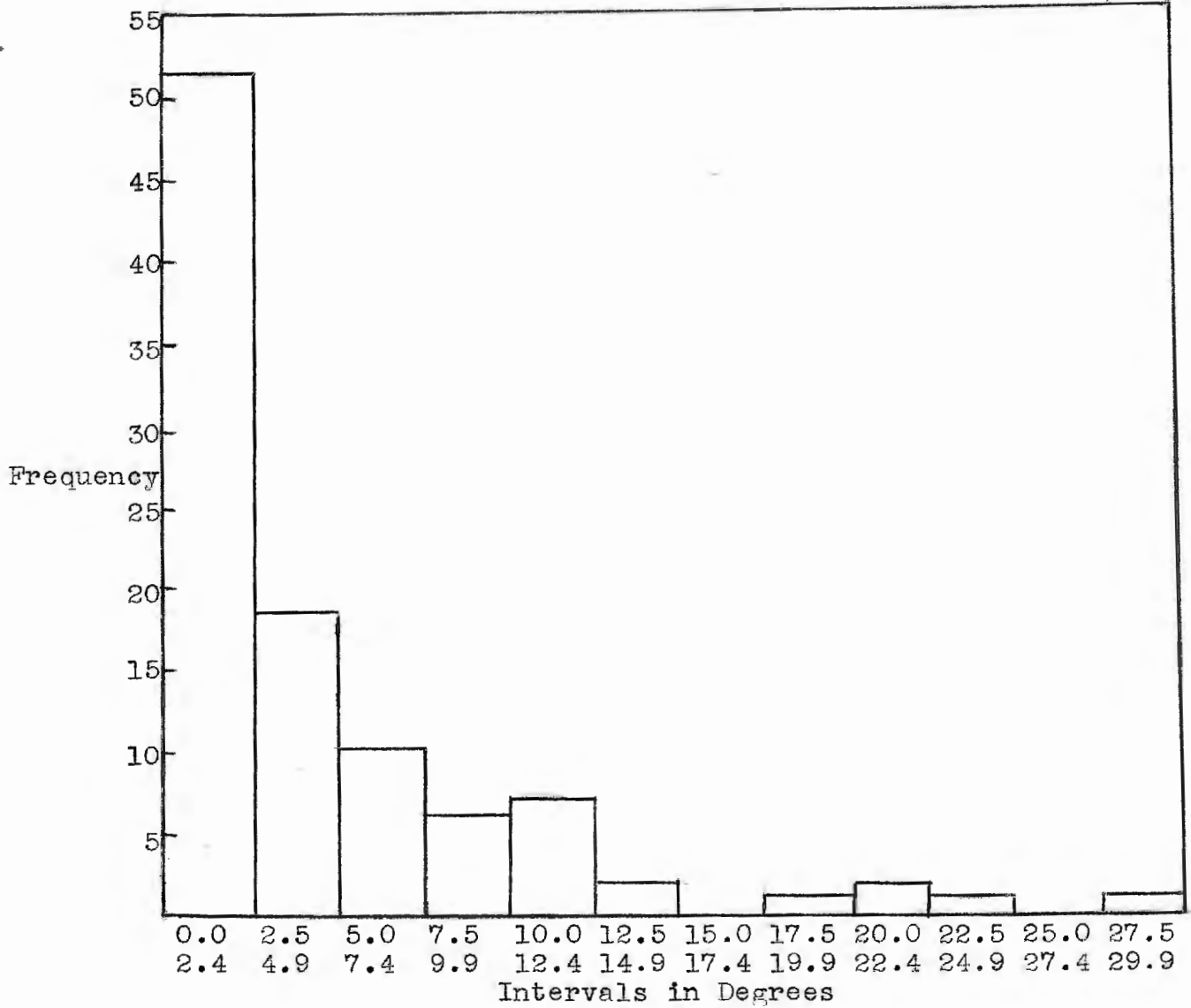


Graph 5



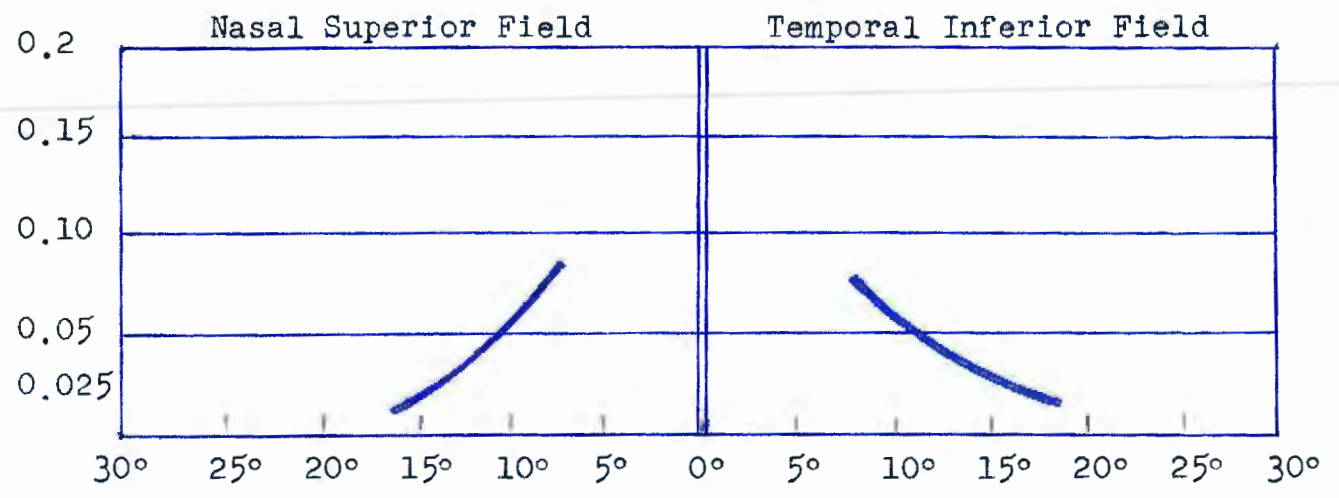
FREQUENCY DISTRIBUTION OF INCORRECT RESPONSES
IN OBTAINING THIRTY ONE CORRECT RESPONSES

Graph 6

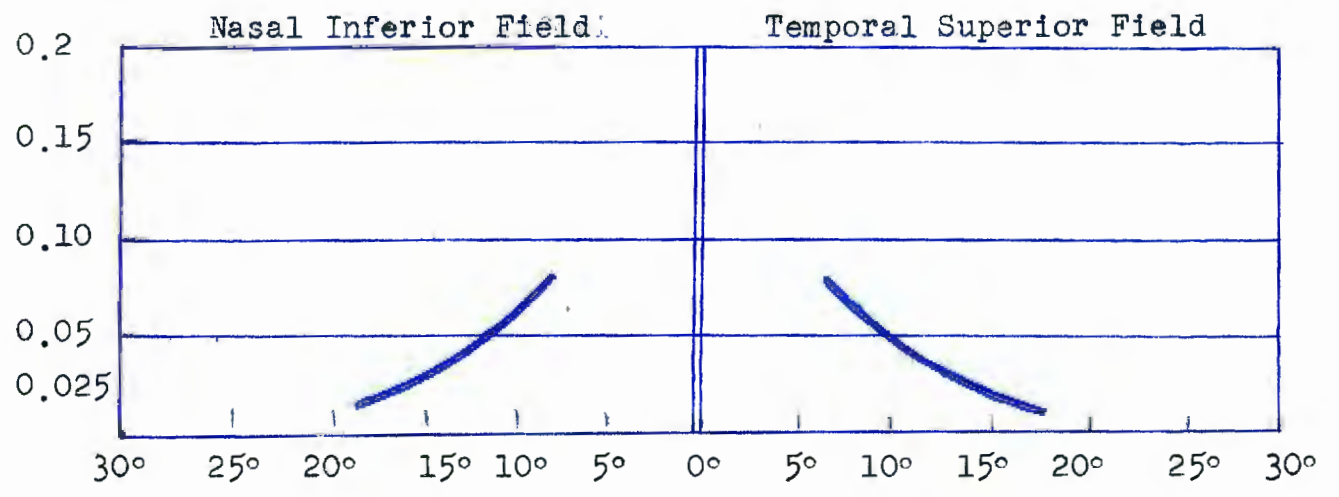


PERIPHERAL ACUITY CURVE

Graph 7



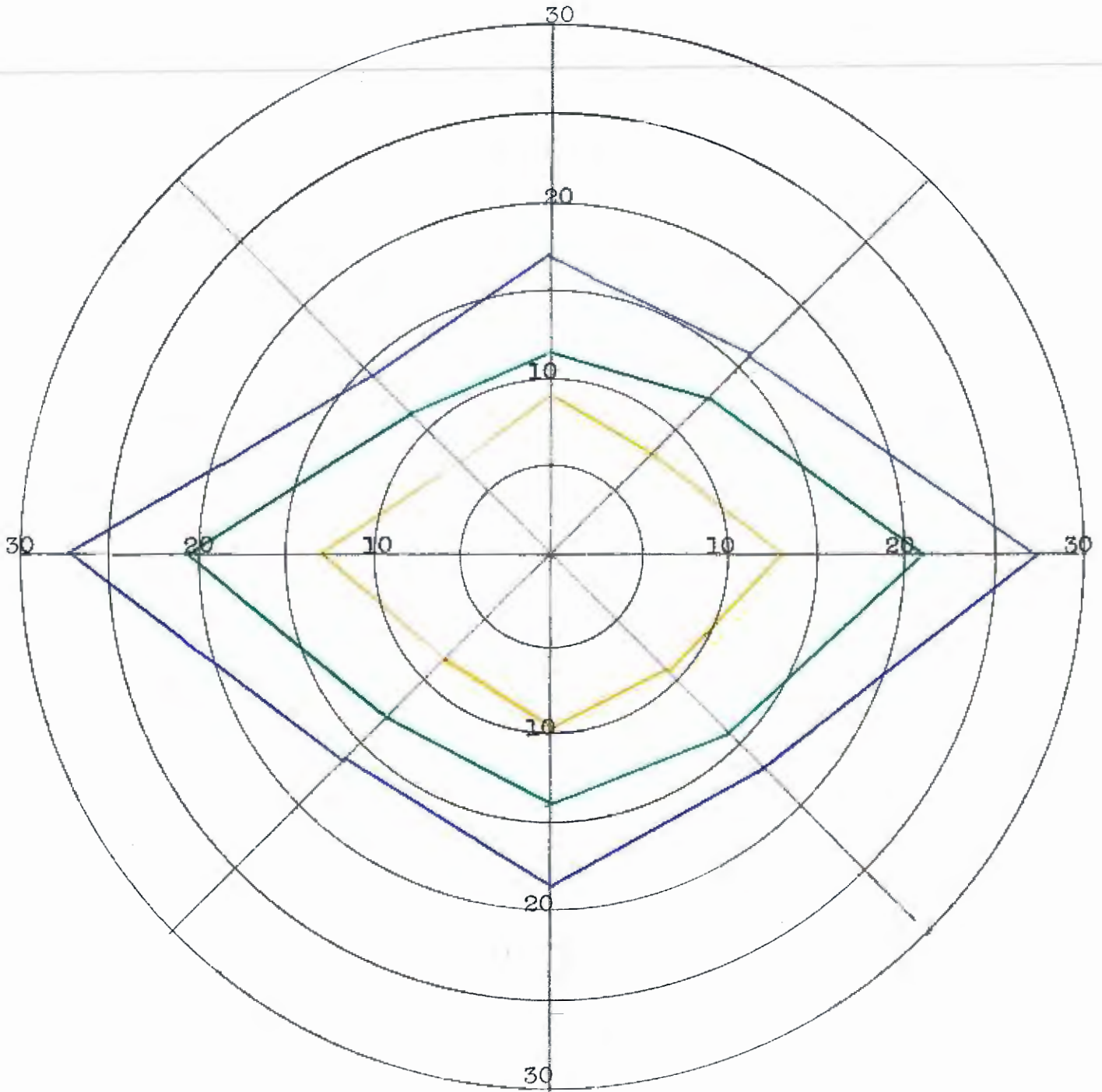
Graph 8



MEANS FOR O.D.

Nasal Field

Temporal Field

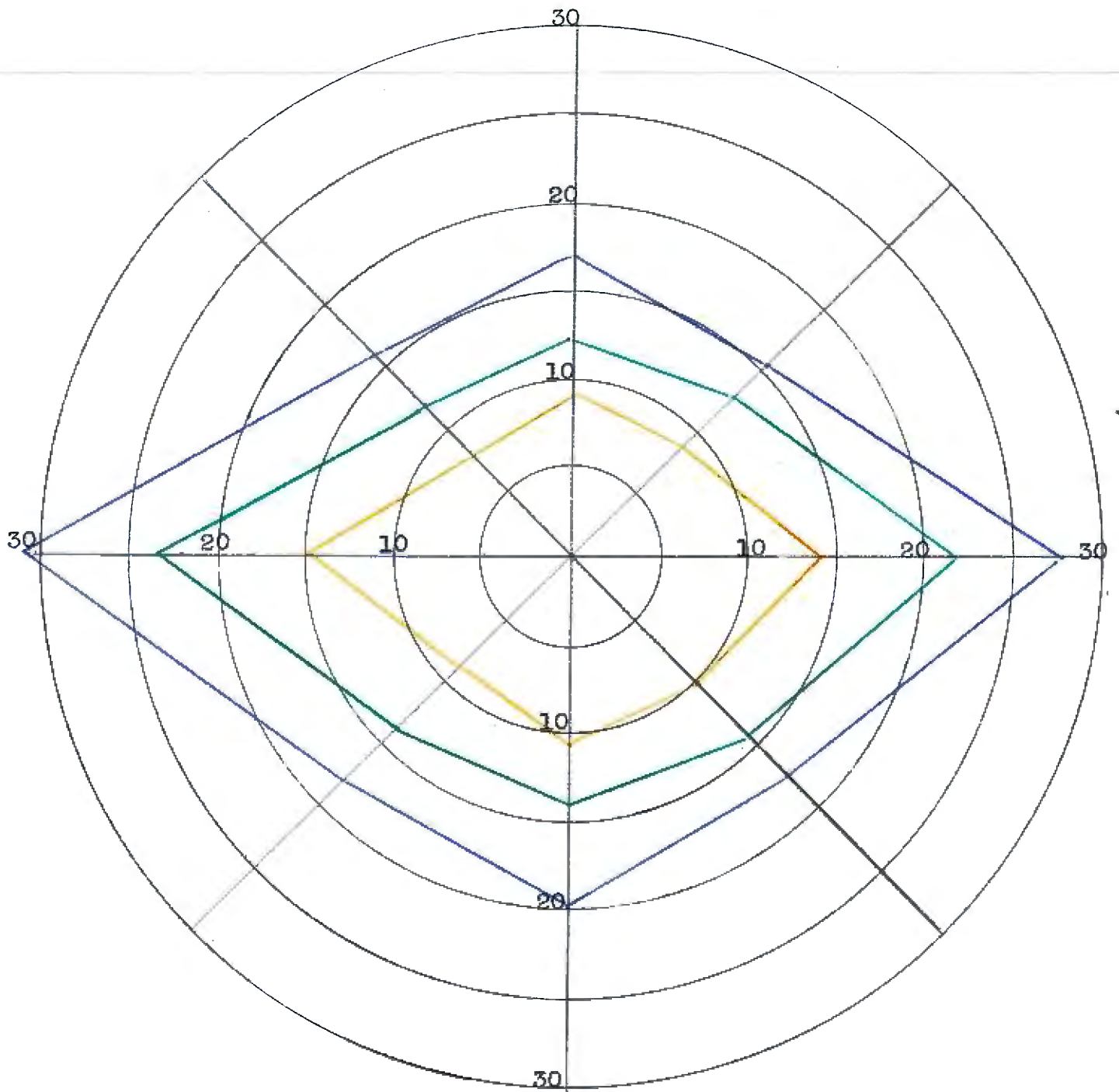


20/872 ———
20/504 ———
20/298 ———

MEANS FOR O.S.

Temporal Field

Nasal Field

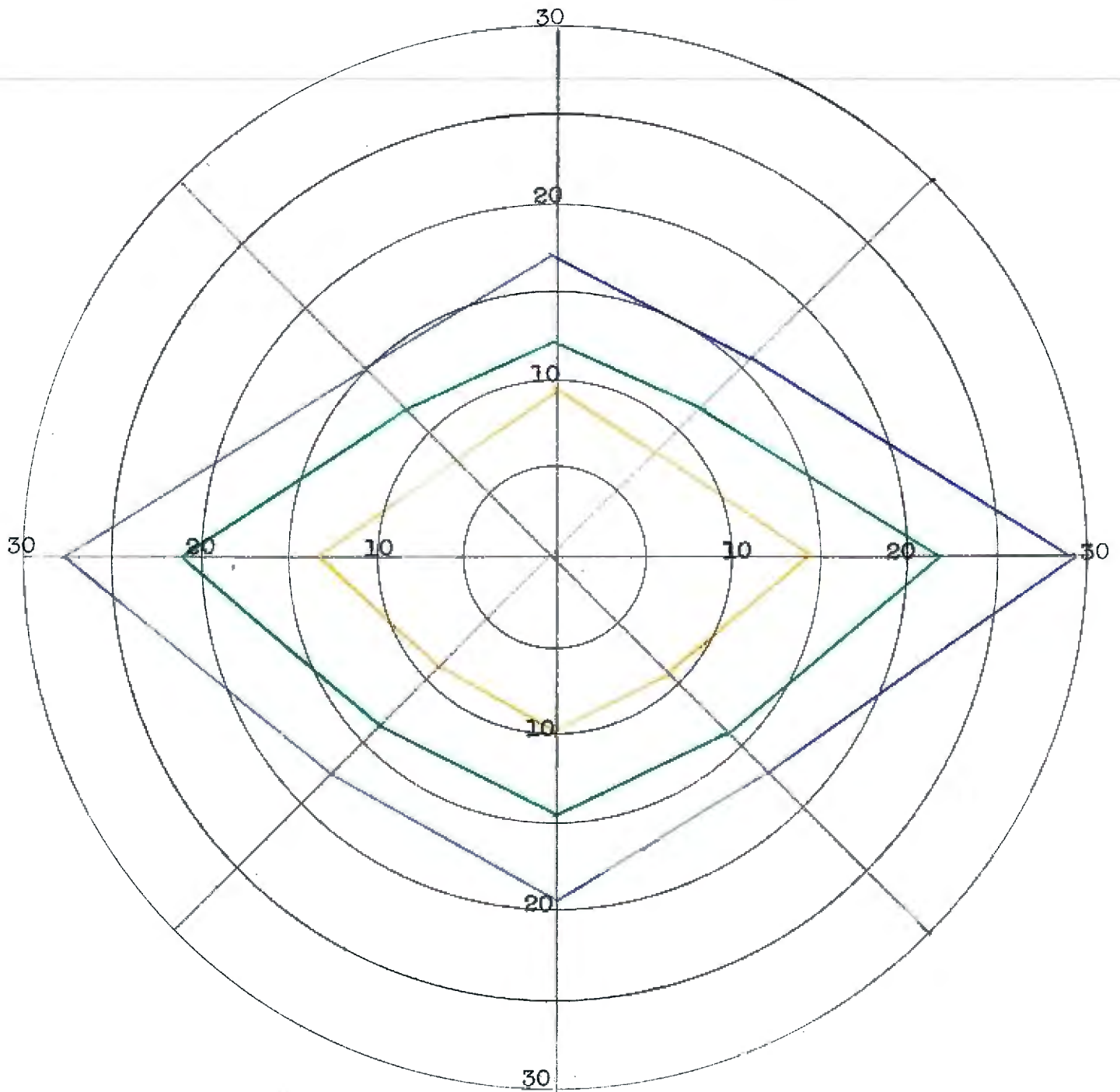


20/872 ———
20/504 ———
20/298 ———

MEANS FOR O.U.

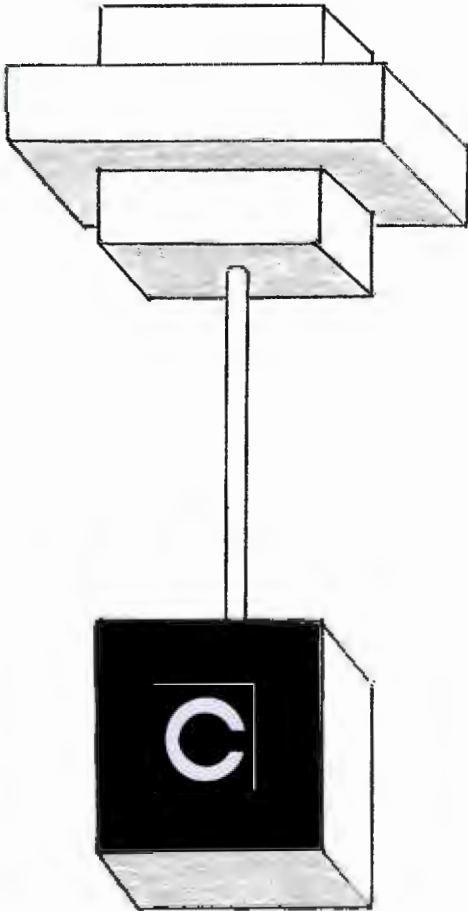
Nasal Field

Temporal Field

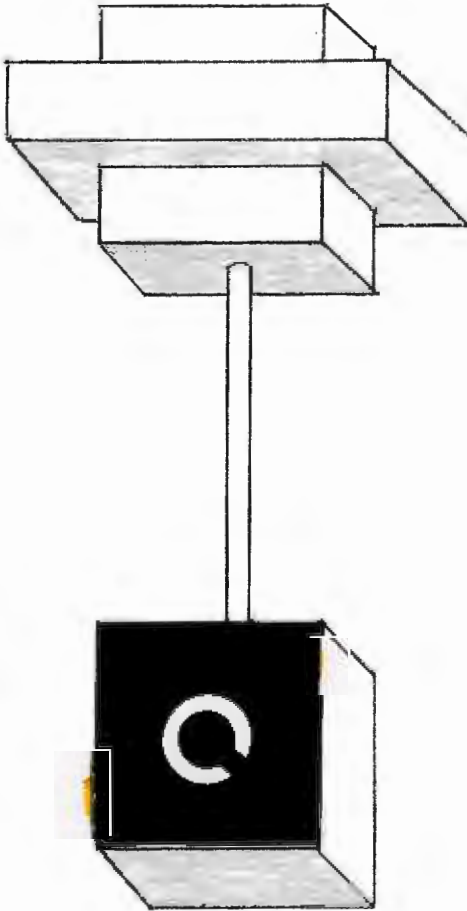


20/872 — blue line
20/504 — green line
20/298 — yellow line

SCALE DRAWING OF TARGET CARRIERS



Used in Part I
by Lind & Larson



Used in Part II
by Hamman & Hays