

# INSTITUTE OF AVIATION MEDICINE

(Flygmedicinska institutionen)

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ANTHROPOMETRY OF FLYING PERSONNEL IN THE ROYAL SWEDISH AIR FORCE

by

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ANTHROPOMETRY OF FLYING PERSONNEL IN THE ROYAL SWEDISH AIR FORCE

(KROPPSMÅTT FÖR FLYGANDE PERSONAL)

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B. Andrae

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*Institute of Aviation Medicine, Malmslätt, Sweden, Report 68:9, 1968*

Translator

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THE NATURE OF THE WORK

To meet the current demand for information and to complete proposals begun in 'TOMT' concerning anthropometry, its equipment and cockpit space.

AUTHORS' SUMMARY

During the year 1967-8 detailed anthropometry was carried out on a total of 240 flying personnel born 1925-7, 1939-40 and 1944. Factors influencing the general growth of the body are discussed and examples given from the study of increase in stature of Swedish conscripts for military service during the last century. The measurements obtained and subsequent analysis have resulted in (i) suggested changes in standard requirements and enrolment regulations for flying personnel and (ii) recommendations concerning future measurements and pattern for experiments.

## Abstract

During the year 1967-68 detailed anthropometry was carried out on a total of 240 flying personnel born 1925-1927, 1939-40, and 1944. Factors influencing the general growth of the body are discussed. The report includes a longitudinal study with repeated measurements of stature and body weight at different ages of the same individual (Fig 9 & 10). The present situation as regards the body measurement of pilots is given in cumulative frequency curves (Fig 20). Stature, sitting height, eye level, and lower leg length of pilots born in 1944 in several cases show a smaller range with high mean values and fewer large values, which could mean that this age group is not yet fully grown. Certain information concerning variations in the normal male population was also obtained. The stature of Swedish conscripts for military service during the last century shows a relatively linear growth with certain slight deviations. Based on the present authorized requirement for stature in the RSAF, on the assumption of continued stature increase in conscripts (1 cm per decade), and on the obtained mean values for pilots born 1925-27, 1939-40, and 1944 (1771, 1791, and 1797 mm respectively), a mean stature of pilots in 1980 is expected to be about 1800 mm. On enrollment of pilots it is evidently of great importance that limits for acceptable body measurements are prescribed and that these are taken into account in designing cockpit, ejection seat, apparel etc. Minimum and maximum body measurements for the year 1980 are suggested (Table 12). The measurements give only a statistical picture of body dimension development. Not until the scope and capacity for function in the cockpits of aircrafts has been analysed for various minimum and maximum sizes of pilots, can calculations be extended and estimates made of the effects of increased body size. Finally, recommendations concerning future measurements and patterns for experiments are given.

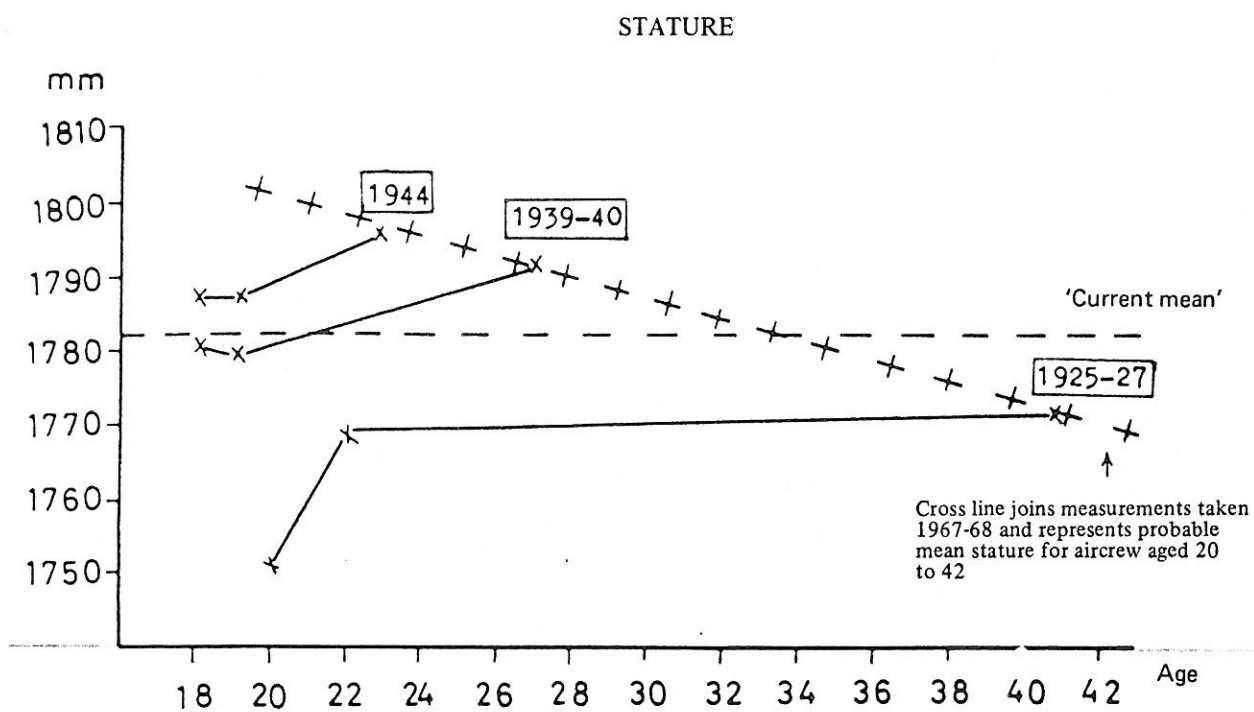


Fig.9

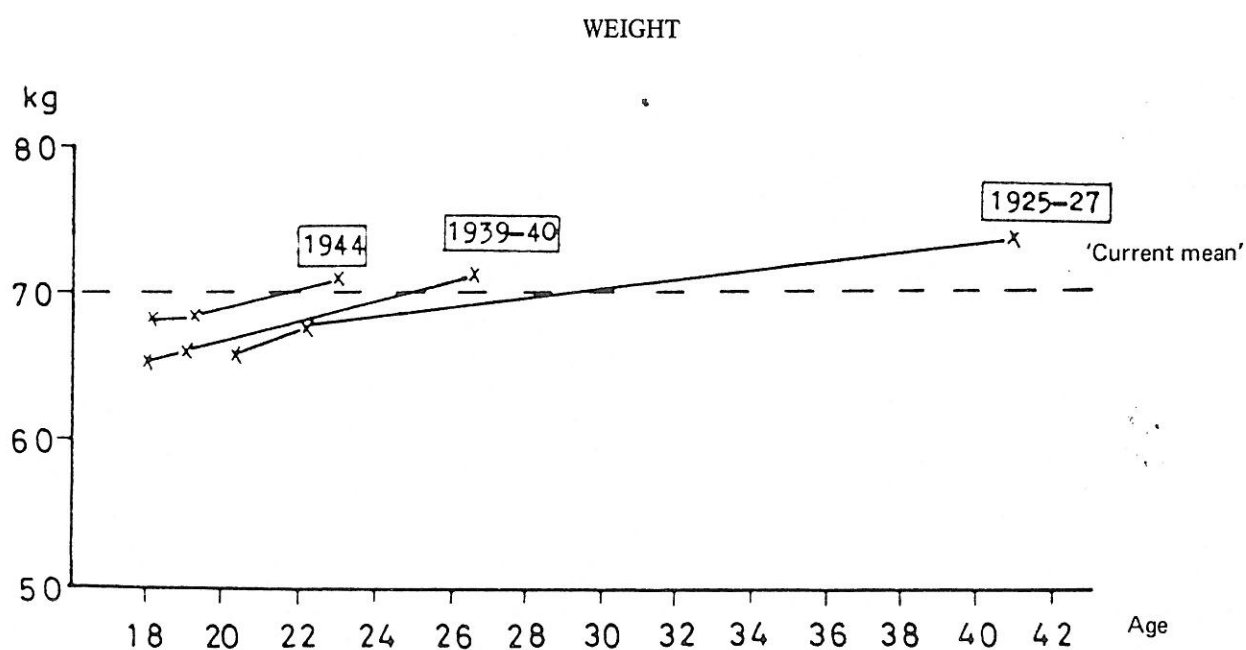


Fig.10

Fig.9&10

# STATURE (1) mm

Occasion for measurement: 1967-68

Age class	1925-27	1939-40	1944
Number	80	80	80
Mean	1771,2	1790,6	1796,6
Standard error	7,16	6,73	4,96
Standard deviation	64,0	60,2	44,4
Range	1642-1943	1618-1927	1695-1923
Coefficient of variation	3,61	3,36	2,47

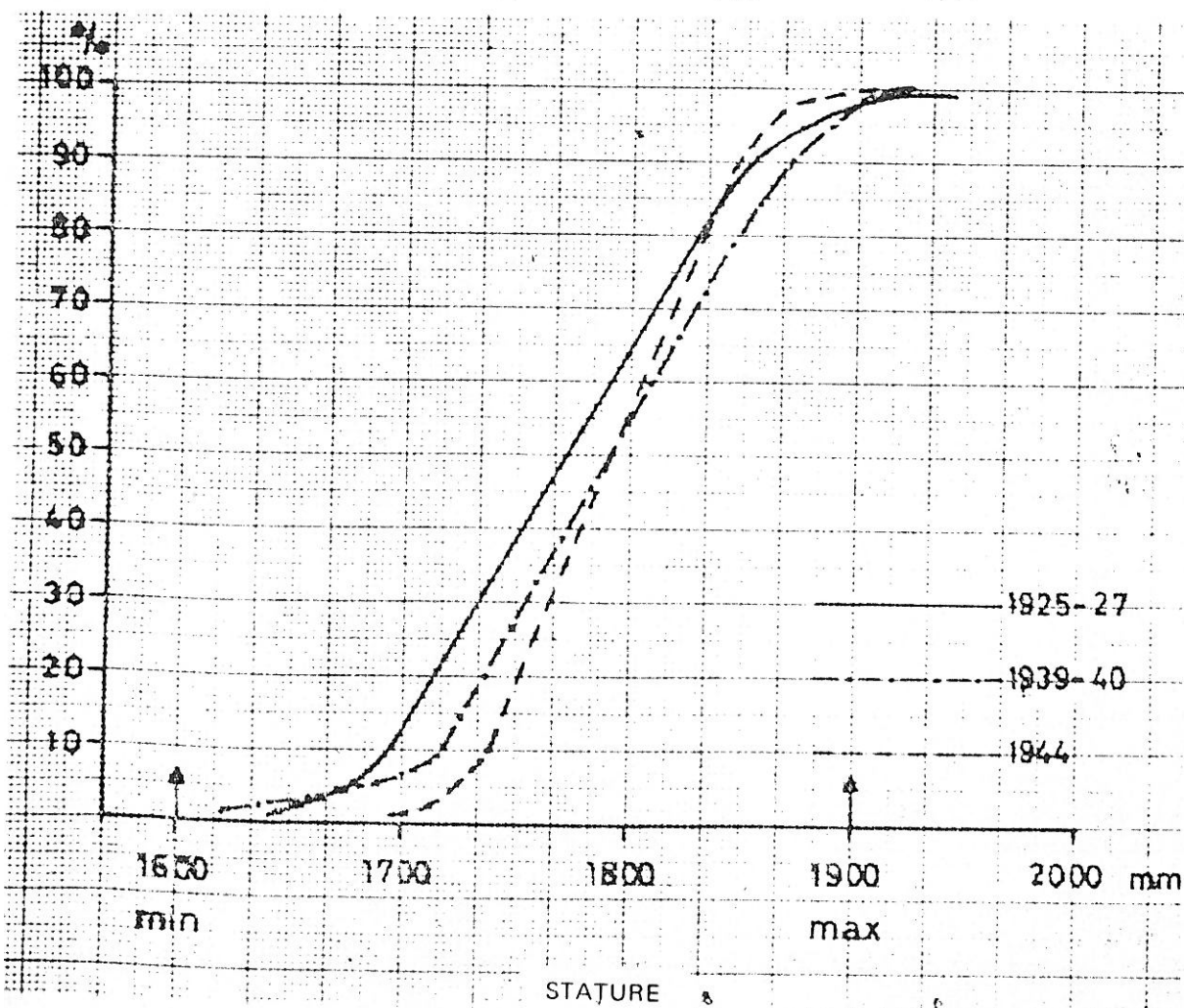


Fig.20

Fig.19&20

Table 12

SUGGESTED MINIMUM, MEAN AND MAXIMUM MEASUREMENTS FOR THE YEAR 1980

Body measurement (mm or kg as appropriate)	Min	Mean	Max
Stature	1660	1800	1960
Weight	56	72	90
Sitting height	890	945	1010
Sitting eye height	775	835	900
Upper arm length	350	380	410
Elbow rest height	200	250	300
Elbow-fingertip length	450	490	530
Leg length	1030	1120	1220
Thigh bone length (Buttock-knee length)	570	615	670
Lower leg length	520	565	610
Chest depth	190	225	265
Abdomen depth	180	220	260
Thigh circumference	480	570	650