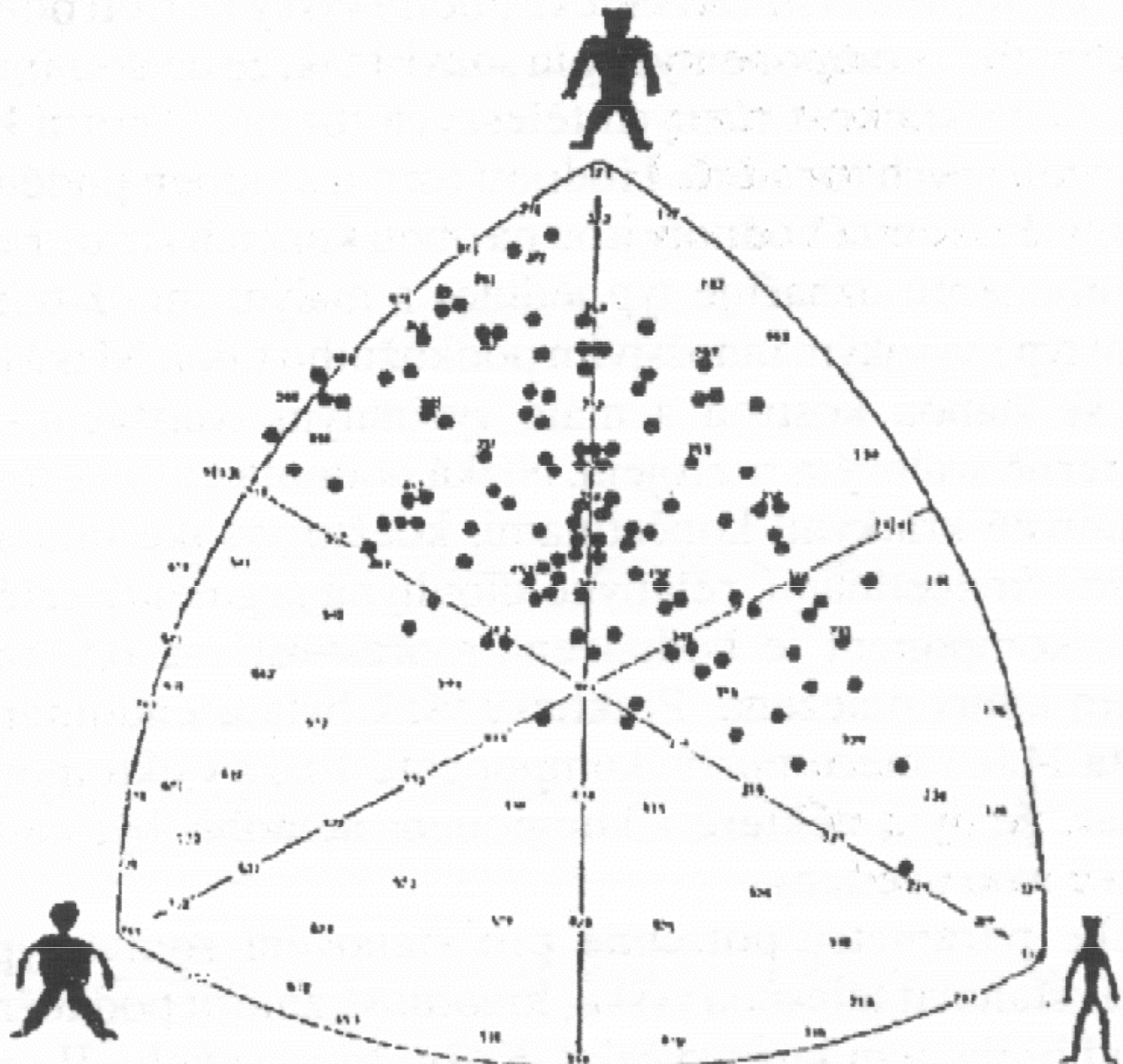


# Somatotyp

Vyjádření morfologické struktury jedince na základě vzájemného poměru tří složek.

# SOMATOTYP

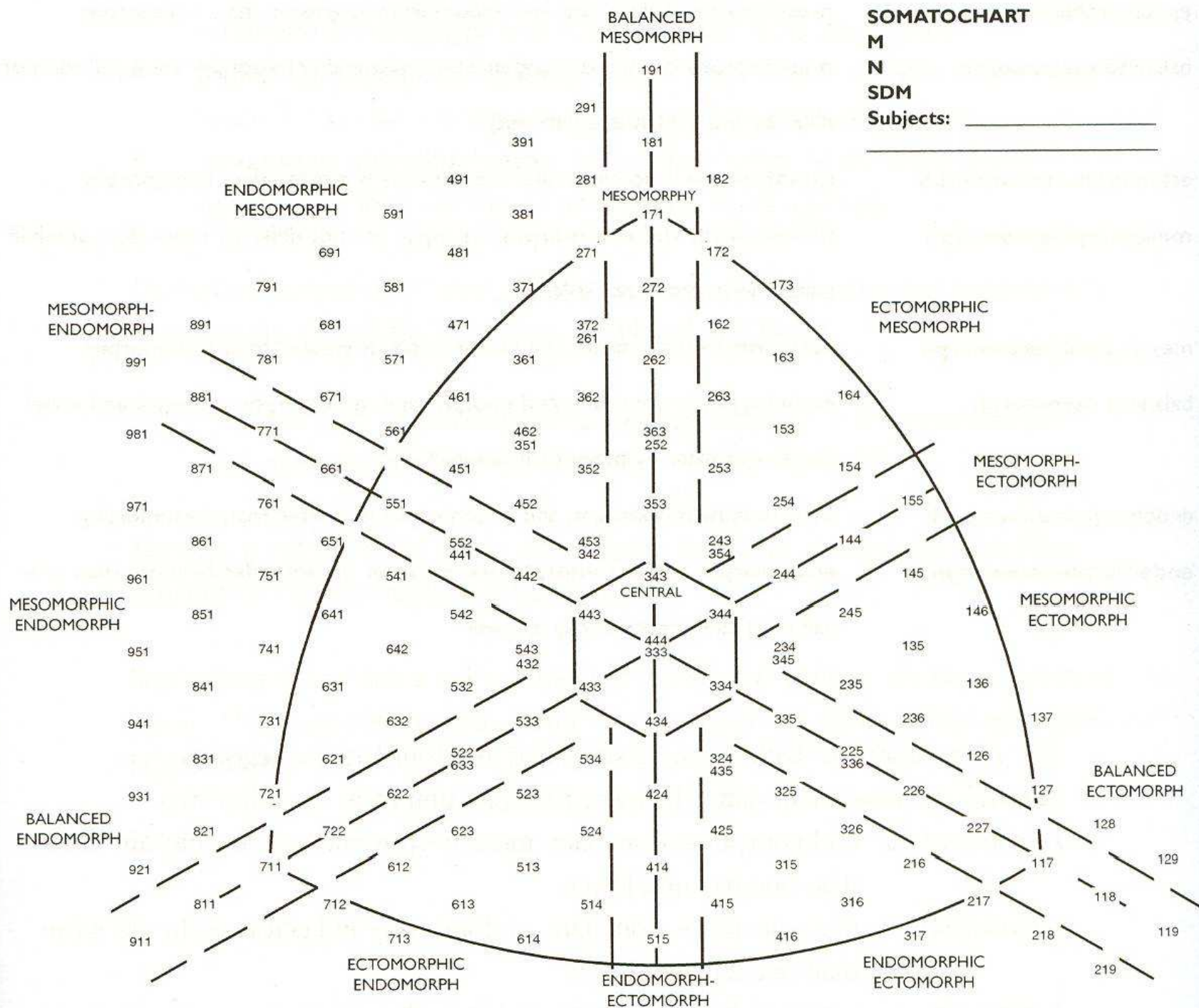
<b>1) Endomorfní komponenta</b>	<b>charakterizuje stupeň tloušťky dle podkožního tuku</b>
<b>2) Mezomorfní komponenta</b>	<b>vyjadřuje stupeň rozvoje svalstva a kostry</b>
<b>3) Ektomorfní komponenta</b>	<b>určuje stupeň štíhlosti, křehkosti a relativní délky končetin</b>



# Somatotypy dělíme:

1) podle dominance jednotlivých komponent (Štěpnička 1979)

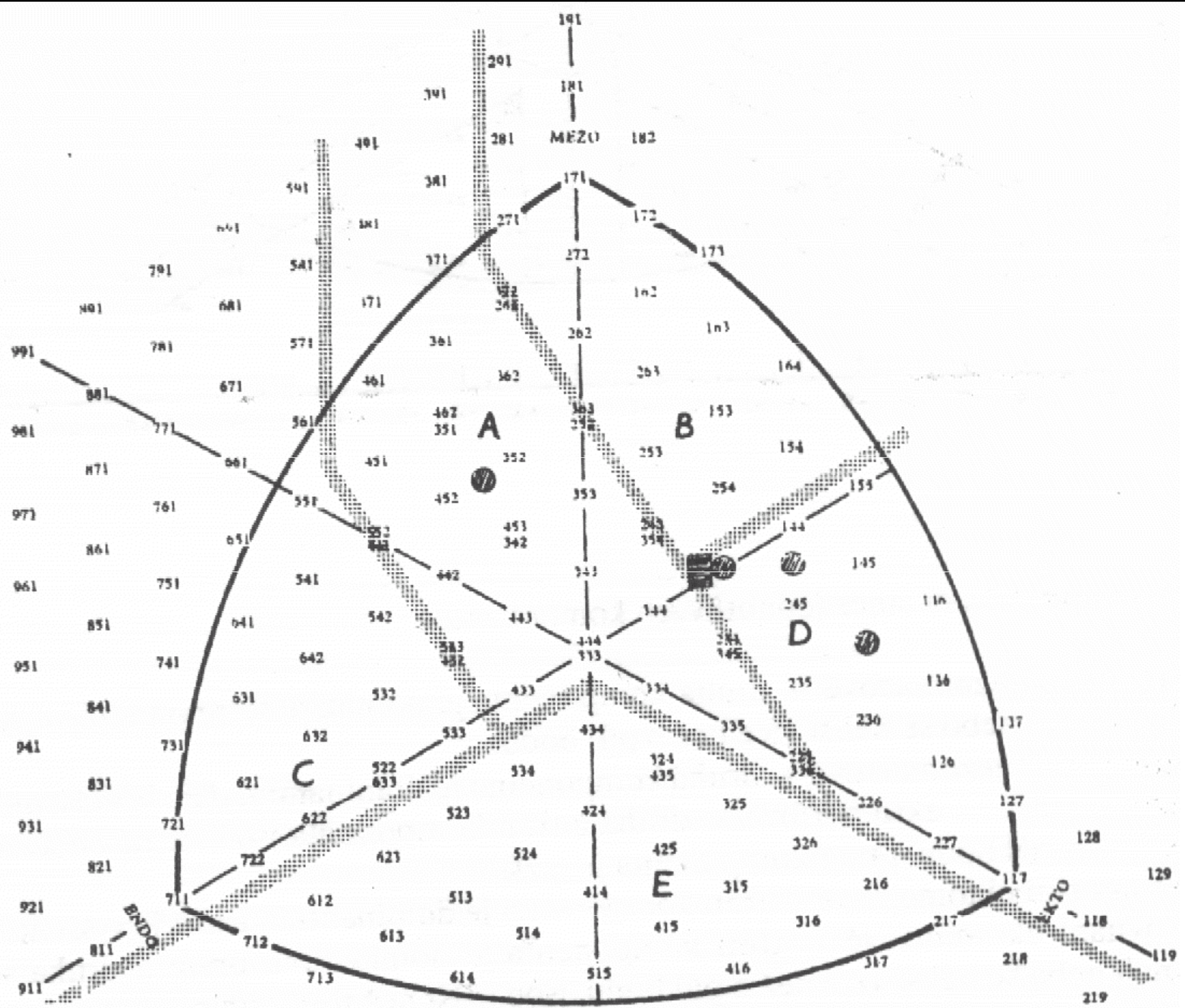
<b>vyrovnání endomorfové (vyrovnání mezomorfové, vyrovnání ektomorfové)</b>	<b>1 komponenta převládá, 2 a 3 vyrovnané</b>
<b>mezomorfní endomorf (ektomorfní endomorf, endomorfní mezomorf, atd.)</b>	<b>1 komponenta převládá, 2 je vyšší než 3</b>
<b>endomorf - mezomorf (endomorf - ektomorf, ektomorf - mezomorf)</b>	<b>1 komponenta pod 3, 2 a 3 vyrovnané</b>
<b>střední somatotypy</b>	<b>všechny komponenty mezi 3, 4</b>

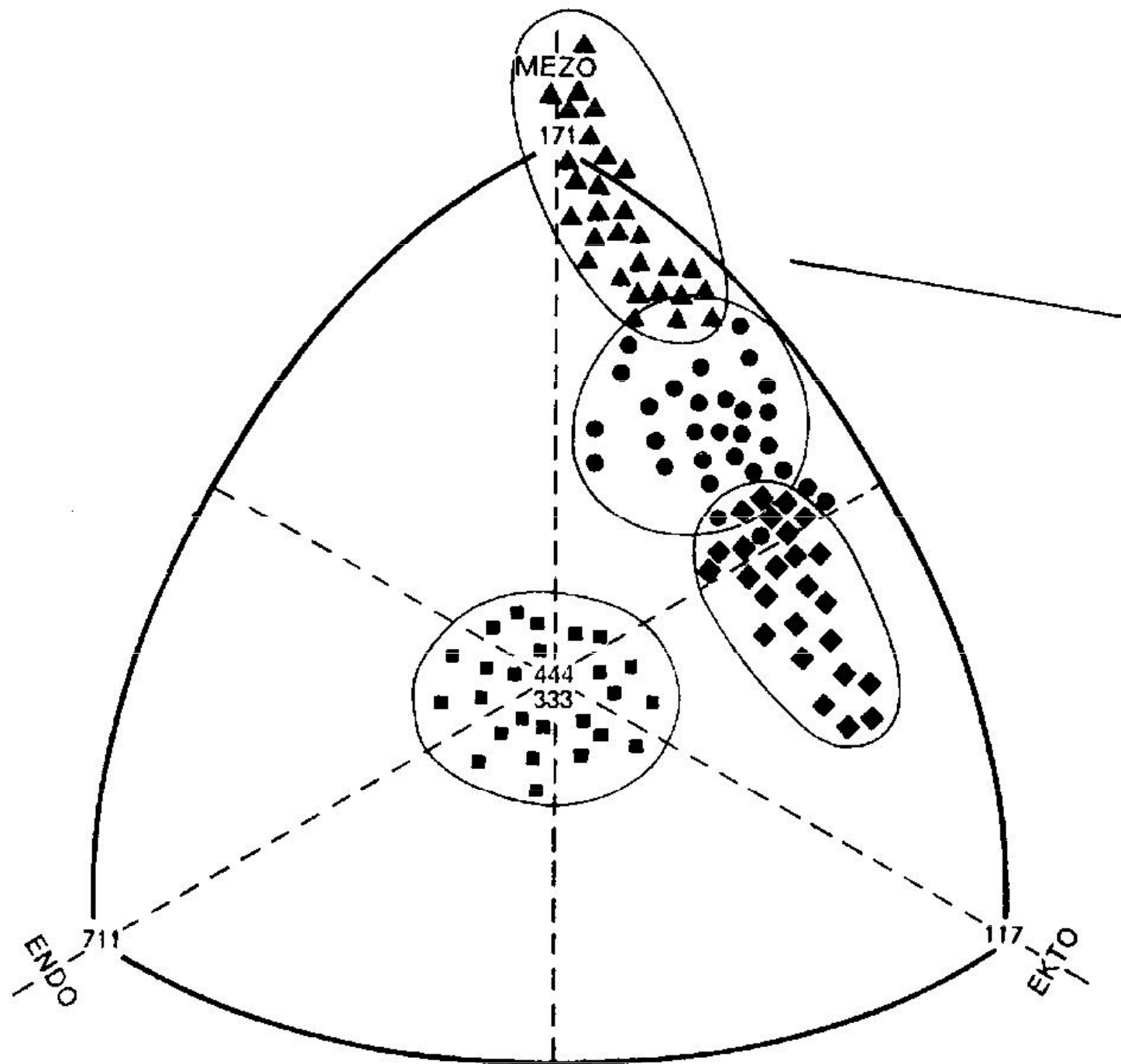


**Figure 10** Somatotype categories labelled according to Carter and Health (1990). Somatoplots falling within the same area are grouped by category.

## 2) podle vztahu k pohybovým schopnostem (Chytráčková 1989):

<b>Kategorie A</b>	<b>nadání pro silové schopnosti</b>
<b>Kategorie B</b>	<b>nejvšestrannější nadání pro sport</b>
<b>Kategorie C</b>	<b>nejhorší předpoklady pro sportovní činnost</b>
<b>Kategorie D</b>	<b>nadání pro vytrvalost a obratnost</b>
<b>Kategorie E</b>	<b>malé nadání z důvodu nízké mezomorfní komponenty</b>





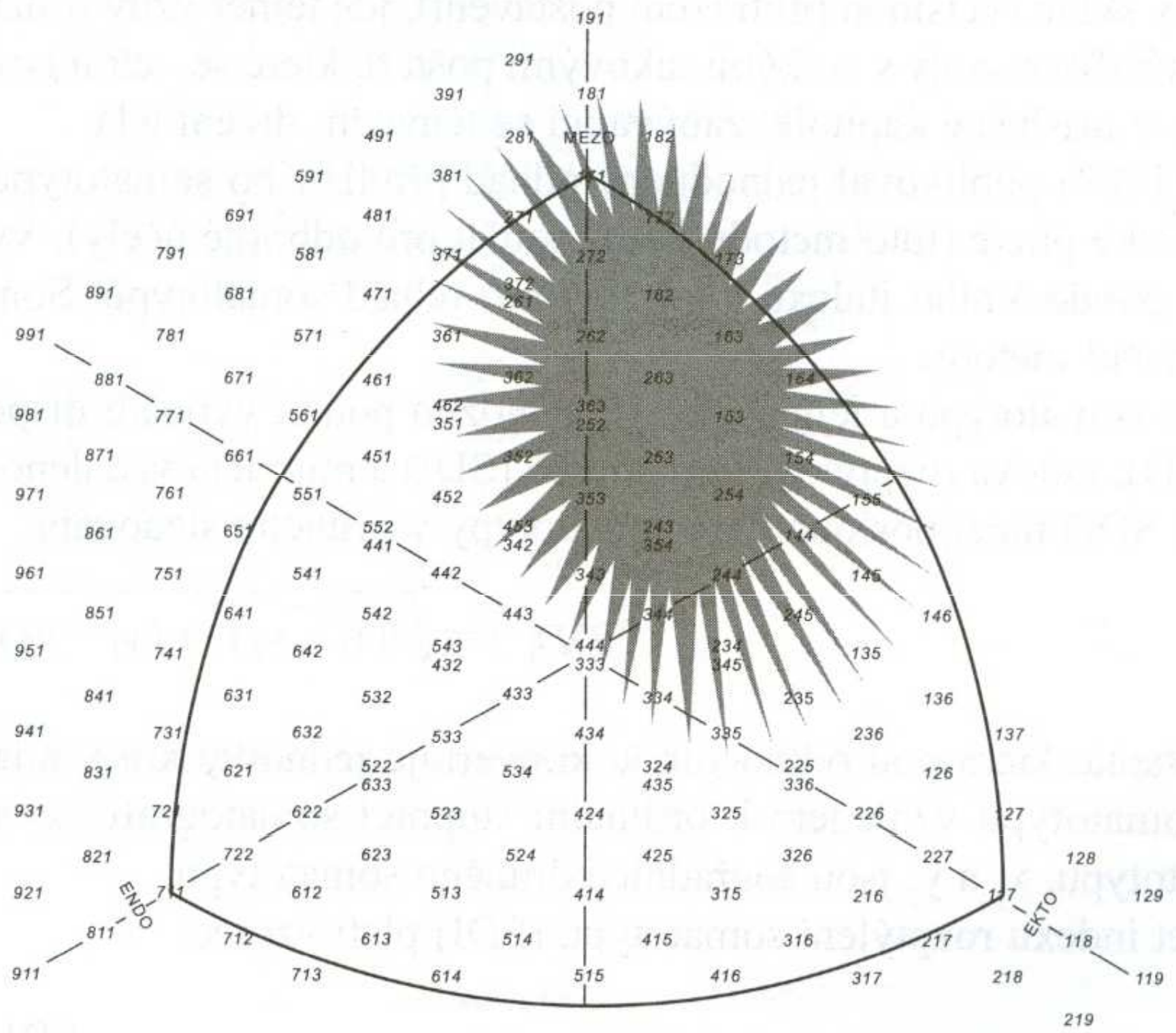
■ průměrná populace

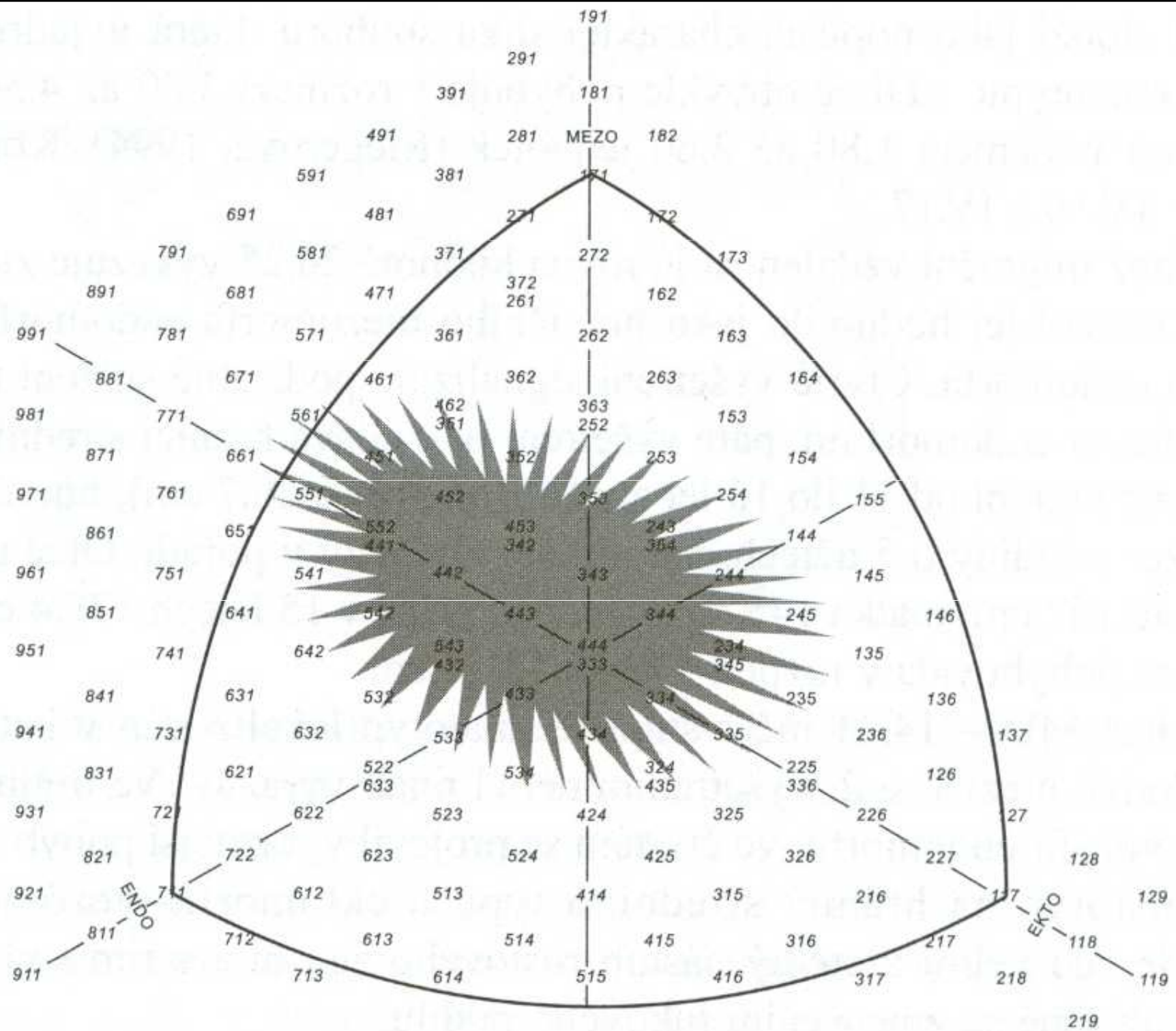
▲ vrcholovi čs.gymnasté

● vrcholovi čs.plavci

◆ vrcholovi čs.hráči košíkové







**Figure 3** Blank anthropometric somatotype rating form.

Name _____		Age _____		Sex M _____ F _____ No _____																					
Occupation _____		Ethnic Group _____		Date _____																					
Project _____		Measured by _____																							
Skinfolds mm		Sum 3 Skinfolds (mm)																							
Triceps =	Upper Limit	10.9	14.9	18.9	22.9	26.9	31.2	35.8	40.7	46.2	52.2	58.7	65.7	73.2	81.2	89.7	98.9	108.9	119.7	131.2	143.7	157.2	171.9	187.9	204.0
Subscapular =	Mid-point	9.0	13.0	17.0	21.0	25.0	29.0	33.5	38.0	43.5	49.0	55.5	62.0	69.5	77.0	85.5	94.0	104.0	114.0	125.5	137.0	150.5	164.0	180.0	196.0
Supraspinale =	Lower Limit	7.0	11.0	15.0	19.0	23.0	27.0	31.3	35.9	40.8	46.3	52.3	58.8	65.8	73.3	81.3	89.8	99.0	109.0	119.8	131.3	143.8	157.3	172.0	188.0
Sum 3 Skinfolds =	$\times \left( \frac{170.18}{h_c} \right) =$	(height corrected skinfolds)																							
Calf =																									
		Endomorphy																							
		1	1½	2	2½	3	3½	4	4½	5	5½	6	6½	7	7½	8	8½	9	9½	10	10½	11	11½	12	
Height (cm) =		139.3	143.5	147.3	151.1	154.9	158.8	162.6	166.4	170.2	174.0	177.8	181.6	185.4	189.2	193.0	196.9	200.3	204.5	208.3	212.1	215.9	219.7	223.5	227.3
Humerus width (cm) =		5.19	5.34	5.49	5.64	5.78	5.93	6.07	6.22	6.37	6.51	6.65	6.80	6.95	7.09	7.24	7.38	7.53	7.67	7.82	7.97	8.11	8.25	8.40	8.55
Femur with (cm) =		7.41	7.62	7.83	8.04	8.24	8.45	8.66	8.87	9.08	9.28	9.49	9.70	9.91	10.12	10.33	10.53	10.74	10.95	11.16	11.36	11.57	11.78	11.99	12.21
Biceps girth (cm) =																									
-- triceps skinfolds (cm) =		23.7	24.4	25.0	25.7	26.3	27.0	27.7	28.3	29.0	29.7	30.3	31.0	31.6	32.2	33.0	33.6	34.3	35.0	35.6	36.3	37.0	37.6	38.3	39.0
Calf girth (cm) =																									
-- calf skinfold (cm) =		27.7	28.5	29.3	30.1	30.8	31.6	32.4	33.2	33.9	34.7	35.5	36.3	37.1	37.8	38.6	39.4	40.2	41.0	41.7	42.5	43.3	44.1	44.9	45.6
		Mesomorphy																							
		½	1	1½	2	2½	3	3½	4	4½	5	5½	6	6½	7	7½	8	8½	9						
Weight (kg) =	Upper Limit	39.65	40.74	41.43	42.13	42.82	43.48	44.18	44.84	45.53	46.23	46.92	47.58	48.25	48.94	49.63	50.33	50.99	51.68						
$Ht / \sqrt[3]{Wt}$ =	Mid-point	and	40.20	41.09	41.79	42.48	43.14	43.84	44.50	45.19	45.89	46.32	47.24	47.94	48.60	49.29	49.99	50.68	51.34						
	Lower Limit	below	39.66	40.75	41.44	42.14	42.83	43.49	44.19	44.85	45.54	46.24	46.93	47.59	48.26	48.95	49.64	50.34	51.00						
		Ectomorphy																							
		½	1	1½	2	2½	3	3½	4	4½	5	5½	6	6½	7	7½	8	8½	9						

Biceps girth in cm corrected for fat by subtracting triceps skinfold value expressed in cm. Calf girth in cm corrected for fat by subtracting medial calf skinfold value expressed in cm.

Anthropometric Somatotype	ENDOMORPHY	MESOMORPHY	ECTOMORPHY	BY:
Anthropometric plus Photoscopic Somatotype				RATER:

Figure 1 Calculations of the anthropometric somatotype for subject A using the rating form.

Name A. Medhurst Age 20yr 5 mo Sex (M) F No A  
 Occupation Designer Ethnic Group Black Date 1 Jan 1996  
 Project Track sprinter Measured by TSO

Skinfolds mm		Sum 3 Skinfolds (mm)																							
Triceps = <b>6.4</b>	Upper Limit	10.9	14.9	18.9	22.9	26.9	31.2	35.8	40.7	46.2	52.2	58.7	65.7	73.2	81.2	89.7	98.9	108.9	119.7	131.2	143.7	157.2	171.9	187.9	204.0
Subscapular = <b>7.1</b>	Mid-point	9.0	13.0	<b>17.0</b>	21.0	25.0	29.0	33.5	38.0	43.5	49.0	55.5	62.0	69.5	77.0	85.5	94.0	104.0	114.0	125.5	137.0	150.5	164.0	180.0	196.0
Supraspinale = <b>4.6</b>	Lower Limit	7.0	11.0	15.0	19.0	23.0	27.0	31.3	35.9	40.8	46.3	52.3	58.8	65.8	73.3	81.3	89.8	99.0	109.0	119.8	131.3	143.8	157.3	172.0	188.0
Sum 3 Skinfolds = <b>18.1</b>	$\times \left( \frac{170.18}{hc = 178.3} \right) = 11.3$ (height corrected skinfolds)																								
Calf = <b>5.2</b>																									
Endomorphy		1	<b>1½</b>	2	2½	3	3½	4	4½	5	5½	6	6½	7	7½	8	8½	9	9½	10	10½	11	11½	12	
Height (cm) = <b>178.3</b>	139.3   143.5   147.3   151.1   154.9   158.8   162.6   166.4   170.2   174.0   <b>177.8</b>   181.6   185.4   189.2   193.0   196.9   200.3   204.5   208.3   212.1   215.9   219.7   223.5   227.3																								
Humerus width (cm) = <b>7.20</b>	5.19   5.34   5.49   5.64   5.78   5.93   6.07   6.22   6.37   6.51   <b>6.65</b>   6.80   6.95   7.09   <b>7.24</b>   7.38   7.53   7.67   7.82   7.97   8.11   8.25   8.40   8.55																								
Femur with (cm) = <b>9.75</b>	7.41   7.62   7.83   8.04   8.24   8.45   8.66   8.87   9.08   9.28   9.49   <b>9.70</b>   9.91   10.12   10.33   10.53   10.74   10.95   11.16   11.36   11.57   11.78   11.99   12.21																								
Biceps girth (cm) = <b>33.9</b>																									
-- triceps skinfolds (cm) = <b>0.6</b>																									
<b>33.3</b>	23.7   24.4   25.0   25.7   26.3   27.0   27.7   28.3   29.0   29.7   30.3   31.0   31.6   32.2   <b>33.0</b>   33.6   34.3   35.0   35.6   36.3   37.0   37.6   38.3   39.0																								
Calf girth (cm) = <b>37.6</b>																									
-- calf skinfold (cm) = <b>0.5</b>																									
<b>37.1</b>	27.7   28.5   29.3   30.1   30.8   31.6   32.4   33.2   33.9   34.7   35.5   36.3   <b>37.1</b>   37.8   38.6   39.4   40.2   41.0   41.7   42.5   43.3   44.1   44.9   45.6																								
Mesomorphy		½	1	1½	2	2½	3	3½	4	4½	5	<b>5½</b>	6	6½	7	7½	8	8½	9						
Weight (kg) = <b>69.2</b>	Upper Limit	39.65	40.74	41.43	42.13	42.82	<b>43.48</b>	44.18	44.84	45.53	46.23	46.92	47.58	48.25	48.94	49.63	50.33	50.99	51.68						
Ht/ $\sqrt{Wt}$ = <b>43.4</b>	Mid-point	and	40.20	41.09	41.79	42.48	43.14	43.84	44.50	45.19	45.89	46.32	47.24	47.94	48.60	49.29	49.99	50.68	51.34						
	Lower Limit	below	39.66	40.75	41.44	42.14	42.83	43.49	44.19	44.85	45.54	46.24	46.93	47.59	48.26	48.95	49.64	50.34	51.00						
Ectomorphy		½	1	1½	2	2½	<b>3</b>	3½	4	4½	5	5½	6	6½	7	7½	8	8½	9						

ENDOMORPHY                      MESOMORPHY                      ECTOMORPHY

Anthropometric Somatotype

Anthropometric plus  
Photoscopic Somatotype

<b>1½</b>	<b>5½</b>	<b>3</b>	BY: <b>TSO</b>
			RATER:

Biceps girth in cm corrected for fat by subtracting triceps skinfold value expressed in cm.  
Calf girth in cm corrected for fat by subtracting medial calf skinfold value expressed in cm.

Figure 2 Calculations of the anthropometric somatotype for subject B using the rating form.

Name B. Roberts Age 21.5 Sex M **F** No B  
 Occupation Student Ethnic Group White Date 25 Dec 1995  
 Project FS Measured by KIN

Skinfolds mm		Sum 3 Skinfolds (mm)																							
Triceps = <b>15.0</b>	Upper Limit	10.9	14.9	18.9	22.9	26.9	31.2	35.8	40.7	46.2	52.2	58.7	65.7	73.2	81.2	89.7	98.9	108.9	119.7	131.2	143.7	157.2	171.9	187.9	204.0
Subscapular = <b>8.8</b>	Mid-point	9.0	13.0	17.0	21.0	25.0	<b>29.0</b>	33.5	38.0	43.5	49.0	55.5	62.0	69.5	77.0	85.5	94.0	104.0	114.0	125.5	137.0	150.5	164.0	180.0	196.0
Supraspinale = <b>6.0</b>	Lower Limit	7.0	11.0	15.0	19.0	23.0	27.0	31.3	35.9	40.8	46.3	52.3	58.8	65.8	73.3	81.3	89.8	99.0	109.0	119.8	131.3	143.8	157.3	172.0	188.0
Sum 3 Skinfolds = <b>29.8</b>	$\times \left( \frac{170.18}{170.7} \right) = \mathbf{29.7}$ (height corrected skinfolds)																								
Calf = <b>12.4</b>																									

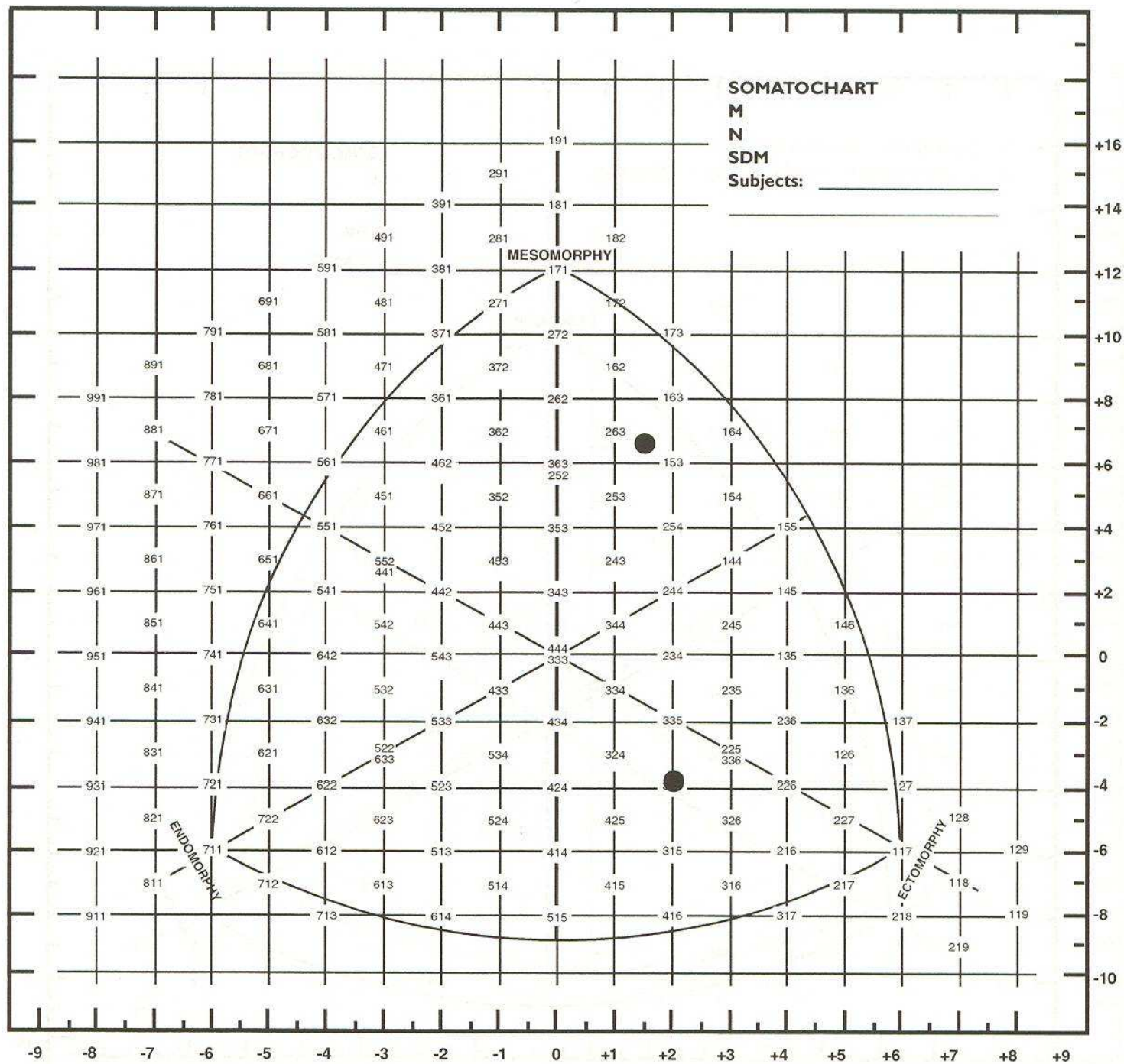
	Endomorphy	1	1½	2	2½	<b>3</b>	3½	4	4½	5	5½	6	6½	7	7½	8	8½	9	9½	10	10½	11	11½	12	
Height (cm) = <b>170.7</b>		139.3	143.5	147.3	151.1	154.9	158.8	162.6	166.4	<b>170.2</b>	174.0	177.8	181.6	185.4	189.2	193.0	196.9	200.3	204.5	208.3	212.1	215.9	219.7	223.5	227.3
Humerus width (cm) = <b>6.10</b>		5.19	5.34	5.49	5.64	5.78	5.93	<b>6.07</b>	6.22	6.37	6.51	6.65	6.80	6.95	7.09	7.24	7.38	7.53	7.67	7.82	7.97	8.11	8.25	8.40	8.55
Femur with (cm) = <b>8.65</b>		7.41	7.62	7.83	8.04	8.24	8.45	<b>8.66</b>	8.87	9.08	9.28	9.49	9.70	9.91	10.12	10.33	10.53	10.74	10.95	11.16	11.36	11.57	11.78	11.99	12.21
Biceps girth (cm) = <b>24.9</b>																									
-- triceps skinfolds (cm) = <b>1.5</b>																									
Calf girth (cm) = <b>23.4</b>		<b>23.7</b>	24.4	25.0	25.7	26.3	27.0	27.7	28.3	29.0	29.7	30.3	31.0	31.6	32.2	33.0	33.6	34.3	35.0	35.6	36.3	37.0	37.6	38.3	39.0
-- calf skinfold (cm) = <b>1.2</b>																									
<b>31.9</b>		27.7	28.5	29.3	30.1	30.8	<b>31.6</b>	32.4	33.2	33.9	34.7	35.5	36.3	37.1	37.8	38.6	39.4	40.2	41.0	41.7	42.5	43.3	44.1	44.9	45.6

	Mesomorphy	½	1	1½	<b>2</b>	2½	3	3½	4	4½	5	5½	6	6½	7	7½	8	8½	9
Weight (kg) = <b>52.6</b>	Upper Limit	39.65	40.74	41.43	42.13	42.82	43.48	44.18	44.84	45.53	46.23	46.92	47.58	48.25	48.94	49.63	50.33	50.99	51.68
Ht/√Wt = <b>45.56</b>	Mid-point	and	40.20	41.09	41.79	42.48	43.14	43.84	44.50	45.19	45.89	46.32	47.24	47.94	48.60	49.29	49.99	50.68	51.34
	Lower Limit	below	39.66	40.75	41.44	42.14	42.83	43.49	44.19	44.85	<b>45.54</b>	46.24	46.93	47.59	48.26	48.95	49.64	50.34	51.00
	Ectomorphy	½	1	1½	2	2½	3	3½	4	4½	<b>5</b>	5½	6	6½	7	7½	8	8½	9

ENDOMORPHY                      MESOMORPHY                      ECTOMORPHY

Anthropometric Somatotype	<b>3</b>	<b>2</b>	<b>5</b>	BY: <b>KIN</b>
Anthropometric plus Photoscopic Somatotype				RATER:

Biceps girth in cm corrected for fat by subtracting triceps skinfold value expressed in cm.  
 Calf girth in cm corrected for fat by subtracting medial calf skinfold value expressed in cm.



**Figure 5** Somatochart with superimposed X, Y coordinate grid for plotting somatotypes. Somatotypes 12-52-3 (above) and 3-2-5 (below) are plotted.

- |   |                          |    |                          |
|---|--------------------------|----|--------------------------|
| 1 | Basketball (3.7-4.0-2.9) | 6  | Squash (3.4-4.0-2.8)     |
| 2 | Hockey (3.7-4.5-2.2)     | 7  | Volleyball (3.0-3.5-3.5) |
| 3 | Netball (3.0-3.8-3.3)    | 8  | Badminton (4.1-4.4-2.5)  |
| 4 | Soccer (4.2-4.6-2.2)     | 9  | Lacrosse (4.1-4.5-2.4)   |
| 5 | Softball (3.8-4.3-2.7)   | 10 | Cricket (4.9-4.4-2.0)    |

- |                                |    |                                  |
|--------------------------------|----|----------------------------------|
| Australian Rules (2.1-5.7-2.5) | 6  | Powerlifting (2.7-7.9-0.6)       |
| Basketball (2.1-4.5-3.5)       | 7  | Heavyweight rowing (2.0-5.2-3.0) |
| Gymnastics (1.9-6.1-2.5)       | 8  | Rugby Union (2.7-6.0-2.0)        |
| Hockey (2.4-5.4-2.6)           | 9  | Distance running (1.8-4.4-3.7)   |
| Hurdles (1.8-4.1-3.9)          | 10 | Squash (2.5-5.2-2.8)             |

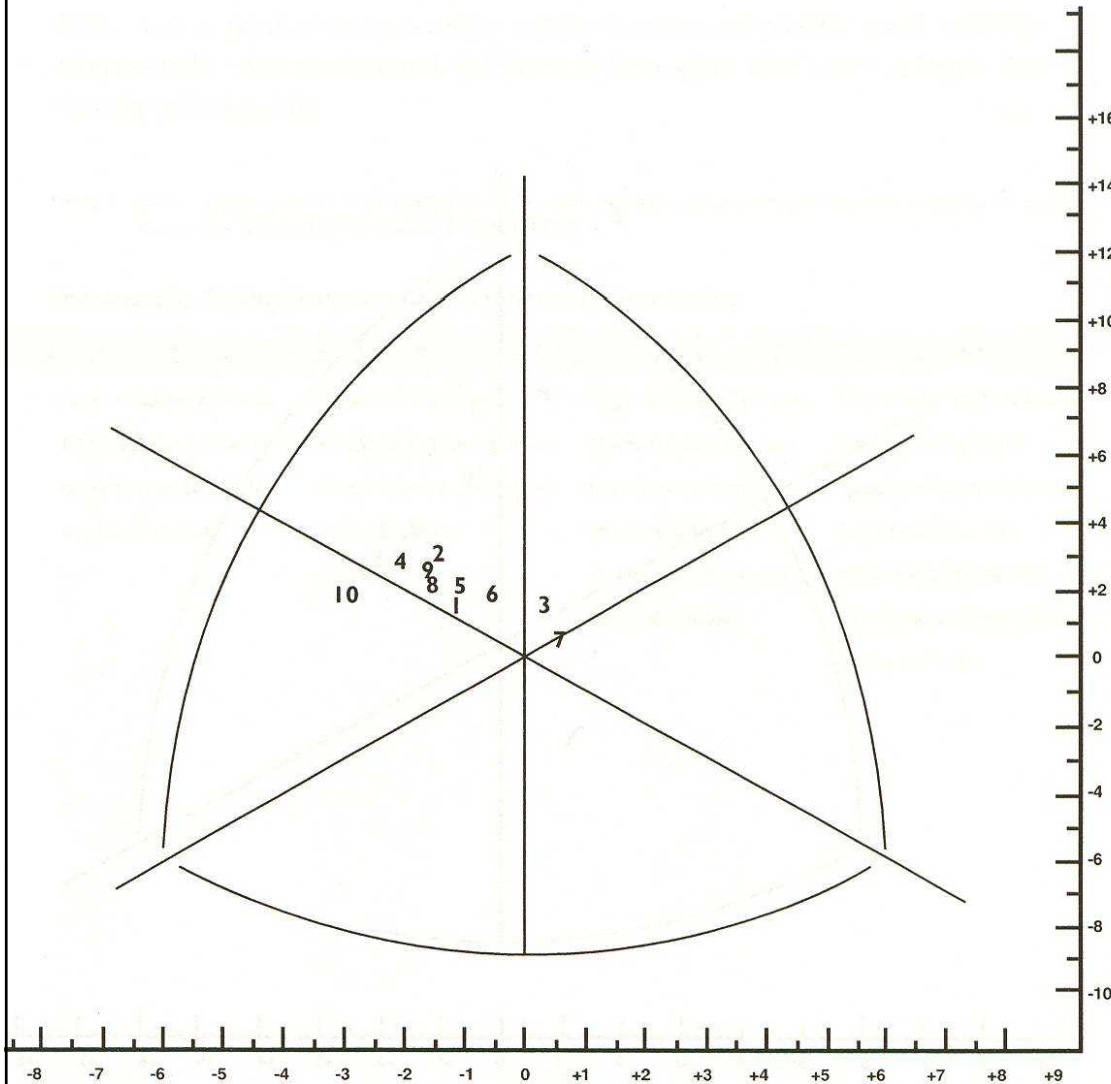


Figure 7 Somatochart showing the somatoplots for Australian female athletes. The mean values are shown after each sport. (Data from Withers, et al., 1987).

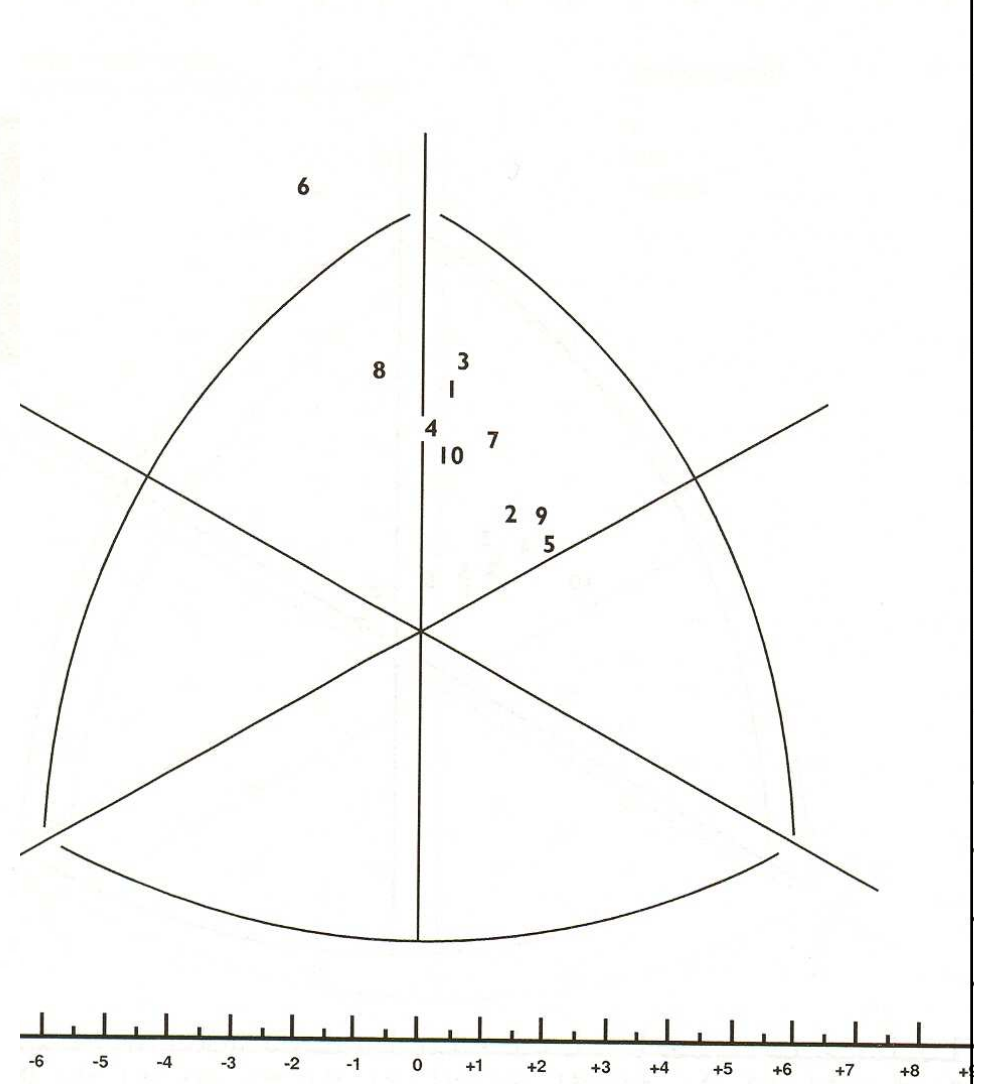


Figure 8 Somatochart showing the somatoplots for Australian male athletes. The mean values are shown after each sport. (Data mainly from Withers, et al., 1986).

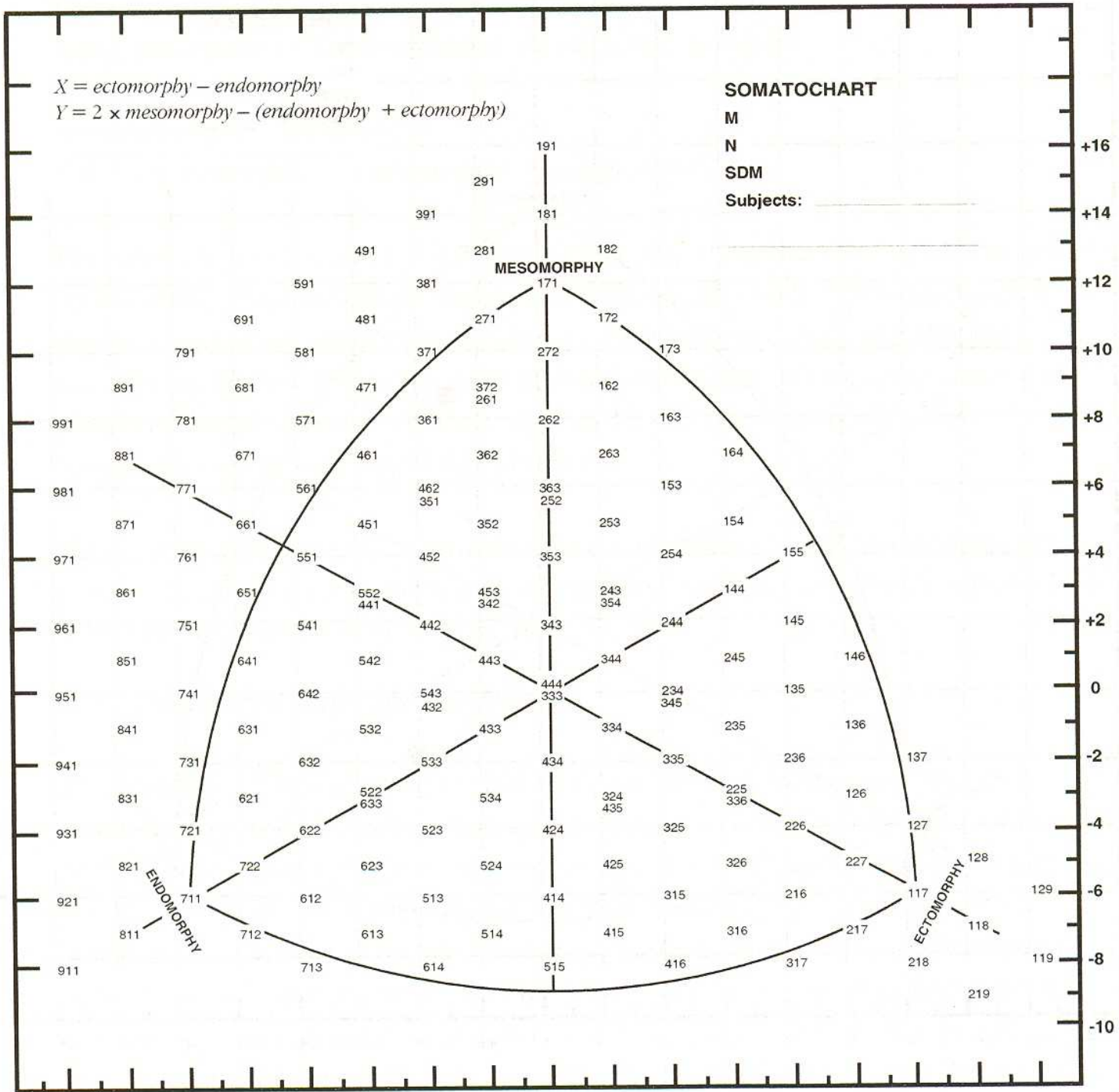


Figure 6 Blank somatochart