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Note on the comparison by C. Payne Gaposchkin and S. Gaposchkin of Harvard Magnitudes in Selected Areas with the Cape Zone Catalogue

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The residuals from the two equations given above are not entirely free from systematic effects. If mean values are computed for 5 minutes' intervals in right ascension, we obtain:

$12^h\ 05^m - 09^m$	$-^m\cdot082$	(24)
12 10 — 14	— ·025	(28)
12 15 — 19	+ ·081	(26)
12 20 — 24	— ·040	(22)
12 25 — 29	— ·087	(32)
12 30 — 34	+ ·005	(19)
12 35 — 39	+ ·132	(26)
12 40 — 44	+ ·073	(32)
12 45 — 50	— ·061	(27)

If the residuals are plotted on a map, they show a considerable clustering of sign, but their number is too small to draw any further conclusion.

Addendum: The scale correction for the Yale magnitudes derived above does not agree with the results of a comparison with the photographic magnitudes of the Henry Draper Extension for 1040 stars with α between 5^h and 7^h. The latter are based on magnitudes in Harvard Standard Regions. The differences (Y.—H.D.E.) are essentially constant between the magnitudes 9 and 11, their mean value is —·014. If arranged according to α they show large and rapid systematic variations, which sometimes surpass a third of a magnitude.

Note on the comparison by C. Payne Gaposchkin and S. Gaposchkin of Harvard Magnitudes in Selected Areas with the Cape Zone Catalogue,

by *P. Th. Oosterhoff.*

The results of this comparison have been published in *Harvard Bulletin* No. 901, 25. The authors divided the material in six spectral groups according to the classification by Becker and for each group computed the regression lines, which are given in their Table 1. These regression lines intersect at HSA = $1^m\cdot8$ and Cape = $1^m\cdot8$ approximately, which means that HSA and Cape probably stand for HSA — $9^m\cdot3$ and Cape — $9^m\cdot3$, as is also indicated by the final equation on page 28. The point of intersection of the regression lines then becomes HSA = $11^m\cdot1$ and Cape = $11^m\cdot1$. This value $11^m\cdot1$ should therefore represent the mean magnitude of the stars used in the comparison, which seems quite reasonable.

The relation between the Cape and Harvard magnitudes within each group is then given by the bisector of the regression lines. The equations of Table II however do not represent the bisectors and they should be replaced by the following set:

Group	Relation between Harvard and Cape		Number of stars
Bo - B5	(H−9·3) = 1·006 (C−9·3)	−·027	134
B6 - A5	1·000	+·000	519
A6 - F5	1·018	+·065	294
F6 - G5	1·041	−·076	300
G6 - K5	1·022	−·033	544
K6 - M	1·101	−·191	46

A possible colour equation should make itself felt in the constant term of these equations, but as the latter are also affected by the accidental errors in the scale coefficient, the constant terms should be computed for equations in which the mean magnitude has been taken as zeropoint. Replacing therefore $9^m\cdot3$ in the above equations by $11^m\cdot1$, we find the following constant terms:

Group	^{m}
Bo — B5	— ·016
B6 — A5	·000
A6 — F5	+ ·097
F6 — G5	— ·002
G6 — K5	+ ·007
K6 — M	— ·009

Evidently the conclusion that no appreciable colour equation exists remains intact. The third group is rather discordant, although it contains nearly 300 stars. Its regression lines intersect at magnitude $10^m\cdot6$, whereas the points of intersection for the other groups are confined between $11^m\cdot1$ and $11^m\cdot3$.

If the mean is taken of the corrected equations of Table II, the relation between Harvard and Cape magnitudes is given by the formula:

$$\text{HSA} - \text{Cape} = +\cdot02\ (\text{Cape} - 9\cdot3) - \cdot02.$$

This equation takes therefore the place of that given at the bottom of page 28, in which the minus sign of the scale coefficient is a misprint.

It is not likely that the change in this formula will materially influence the corrections depending on galactic latitude and right ascension, which are given in the Tables IV and V, but the difference in zero-point between HSA and HSR given on page 29 as $-^m\cdot13$ is reduced to $-^m\cdot08$.

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