On the use of solarisation for the elimination of magnitude equation,

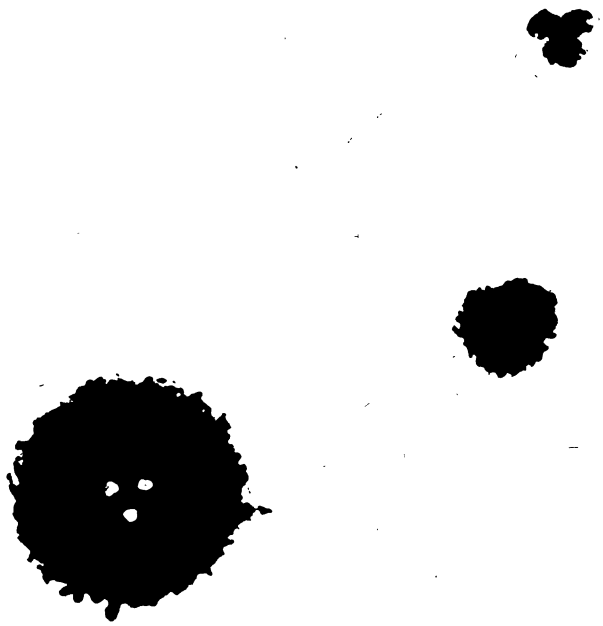
by *Ejnar Hertzsprung.*

The desire to use the nuclei of spiral nebulae as zeropoints for the photographic determination of „absolute" proper motions gives new interest to the problem of eliminating the effect of the large differences in brightness between faint extragalactic objects and bright stars. The median visual magnitude of the 925 stars contained in the third Fundamentalkatalog is $4^m{\cdot}20$ with a mean deviation (in the sense of the mean error) of $\pm\ 1^m{\cdot}15$. In order to connect these stars with faint nebulae it is therefore required to make practically harmless a difference of about 10^m.

Most of the methods aiming at this and proposed so far have the disadvantage that the plate is burdened with extra images of some kind as e.g. by the use of diffraction images of the brighter stars.

In the course of the photographic determination of relative proper motions of stars in the Pleiades it has been noted that on some plates the brightest stars show sharp white spots in their centre, evidently caused by solarisation. In the accompanying figure a case of this kind is represented. If such images of solarisation are shown at all the difference in magnitude between the faintest stars, of which the ordinary black images and the bright stars, of which the central white images are well measurable, is about 10^m. The fact that these sharp white central images do not always show, even when the plates have been taken under similar conditions, raises the question as to which extent the difference of 10^m just mentioned can be altered by the brand of plate and kind of development used.

Also among double stars (e.g. Sirius and Aldebaran) there are cases, where the method proposed here may prove successful.



Images of Alcyone together with Gaultier 133 and 132, enlarged 28 times from a Vatican carte du ciel plate carrying three separate exposures.

It is possible that the effective wavelength of the solarisation images deviates from that of the faint black images thus causing differential refraction. This point has still to be investigated before the method proposed here can be adopted without reservation.

A faint star in the Pleiades possibly sharing the proper motion of the Hyades,

by *Ejnar Hertzsprung.*

Among the stars, of which relative proper motions have been measured on pairs of plates of the Pleiades taken at different observatories, there is one of the photographic magnitude 15·6 in the position $3^h43^m\ 44^s{\cdot}9$, $+\ 24^\circ\ 0'\ 47''$ (1900), the yearly proper motion of which relative to the group of the Pleiades has in the mean from five pairs of plates been found to be $+\ ''/y{\cdot}127$ in $\alpha \cos\delta$ and $+\ ''/y{\cdot}000$ in δ. The mean error of each of these two values is estimated to be $\pm\ ''/y{\cdot}004$.

Adopting for the Pleiades a proper motion of $+\ ''/y{\cdot}022$ in $\alpha \cos\delta$ and $-\ ''/y{\cdot}045$ in δ the p.m. of the faint star considered is $''/y{\cdot}149$ in $\alpha \cos\delta$ and $-\ ''/y{\cdot}045$ in δ or $''/y{\cdot}156$ in the direction $106^\circ{\cdot}8$. Assuming the point of convergence of the Hyades to be at $\alpha = 93^\circ{\cdot}2$, $\delta = +\ 6^\circ{\cdot}9$ (1900) the computed direction of the p.m. for the place of the star in question is $109^\circ{\cdot}4$. The difference O—C is equal to $-\ 2^\circ{\cdot}6$ or expressed in arc $''/y{\cdot}156 \cdot \sin 4^\circ{\cdot}3 = ''/y{\cdot}007$ with an estimated mean error of $\pm\ ''/y{\cdot}004$.
