

bution of the fixed stars according to difference of magnitude, down to the ninth, in about the following proportion .

to $+90^\circ$), whence we should obtain 21,300 for the whole firmament. According to the introduction to Weisse's *Catal. e Zonis Regionontanis, ded.*, p. xxxii., Struve found in the zone extending from -15° to $+15^\circ$ by the calculus of probabilities, 3903 stars from the first to the seventh, and therefore 15,050 for the entire heavens. This number is lower than mine, because Bessel estimated the brighter stars nearly half a magnitude lower than I did. We can here only arrive at a mean result, which would be about 18,000 from the first to the seventh magnitudes inclusive. Sir John Herschel, in the passage of the *Outlines of Astronomy*, p. 521, to which you allude, speaks only of 'the whole number of stars *already registered*, down to the seventh magnitude inclusive, amounting to from 12,000 to 15,000.' As regards the fainter stars, Struve finds within the above-named zone (from -15° to $+15^\circ$), for the faint stars of the eighth magnitude, 10,557; for those of the ninth, 37,739; and, consequently, 40,800 stars of the eighth, and 145,800 of the ninth magnitude for the whole heavens. Hence, according to Struve, we have, from the first to the ninth magnitude inclusive, $15,100 + 40,800 + 145,800 = 201,700$ stars. He obtained these numbers by a careful comparison of those zones or parts of zones which comprise the same regions of the heavens, deducing by the calculus of probabilities the number of stars actually present from the numbers of those common to, or different in, each zone. As the calculation was made from a very large number of stars, it is deserving of great confidence. Bessel has enumerated about 61,000 different stars from the first to the ninth inclusive, in his collective zones between -15° and $+45^\circ$, after deducting such stars as have been repeatedly observed, together with those of the 9·10 magnitude; whence we may conclude, after taking into account such as have probably been overlooked, that this portion of the heavens contains about 101,500 stars of the above-named magnitudes. My zones between $+45^\circ$ and $+80^\circ$ contain about 22,000 stars (*Durchmusterung des nördl. Himmels*, s. xxv.), which would leave about 19,000 after deducting 3000 for those belonging to the 9·10 magnitude. My zones are somewhat richer than Bessel's, and I do not think we can fairly assume a larger number than 2850 for the stars actually existing between their limits ($+45^\circ$ and $+80^\circ$), whence we should obtain 130,000 stars to the ninth magnitude inclusive, between -15° and $+80^\circ$. This space is, however, only 0·62181 of the whole heavens, and we therefore obtain 209,000 stars for the entire number, supposing an equal distribution to obtain throughout the whole firmament; these numbers, again, closely approximate to Struve's estimate, and, indeed, not improbably exceed it to a considerable extent, since Struve reckoned stars of the 9·10 magnitude among those of the ninth. The numbers which, according to my view, may be assumed for the whole firmament, are therefore as follows: first mag., 20; second, 65; third, 190; fourth, 425; fifth, 1100; sixth, 3200; seventh, 13,000; eighth, 40,000; ninth, 142,000; and 200,000 for the entire number of stars from the first to the ninth magnitude inclusive.

If you would contend that Lalande (*Hist. Céleste*, p. iv.) has given the number of stars observed by himself with the naked eye at 6000, I would simply remark that this estimate contains very many that have been repeatedly observed, and that after deducting these, we obtain only about 3800 stars for the portion of the heavens between $-26^\circ 30'$