

CALIFORNIA INSTITUTE OF TECHNOLOGY
PASADENA

1032

November 8, 1929

Dr. Max Mason
The Rockefeller Foundation
61 Broadway, New York City.

My dear Mason:

We now have another result of similar importance, though even Ross thought it beyond reach. After Adams had tried for years to find an efficient short focus commercial lens for photographing stellar spectra (short focus camera with ^{long} collimator), Anderson and Bowen hit on the idea of trying a greatly enlarged and modified microscope objective, designed for parallel rays. Anderson took it up with Bausch & Lomb's best lens designer, and the result is a remarkable objective of 50 mm aperture and only 32 mm focal length - the first lens of this ratio. It gives excellent definition, showing good absorption lines as well as the emission lines of the comparison spectrum.

Several years ago Pease succeeded in photographing the spectrum of the companion (M32) of the Andromeda Nebula with an exposure of 16 hours or more. The other night Humason, with seeing 0 (the worst we have) tried the new lens on the same object and got an overexposed spectrum in one hour. Another lens recently tried by Humason was considerably better than the one used by Pease, but the new one is twice as fast as the best ever used before, and fully doubles the power of the 100-inch telescope for such work. It therefore renders accessible at once a large number of small and very remote ^{spiral} nebulae hitherto out of reach, and thus permits further tests of the "curvature of space" to be made. You may be interested to know, by-the-way, that Zwicky, one of Millikan's men, has just worked out a new theory which may account for the enormous apparent radial velocities of remote spirals without the assumption of curvature of space. Millikan can tell you about this when you see him. He expects to arrive in New York on November 16 and will attend a committee meeting that morning (I think at Elihu Root's office).

We have been delayed in starting the shop building by the architect's illness, but he has just been here and bids will be taken as soon as the specifications can be revised.

With best regards,

Yours very sincerely,

GEH:G

(Signed) GEORGE E. HALE