I 20

February 15, 1922.

Professor E.P. Hubble
Member Committee on the Nebulae,
American Section International Astronomical Union,
Mount Wilson Observatory,
Pasadena, Calif.
Dear Prof. Hubble:

The Executive Secretary of the American Section of the International Astronomical Union wishes a report of our committee by March 1, and I hope you can let me have soon the assistance of your wide experience in the investigation of nebulae. I am jotting down some suggestions, incomplete of course, intended to serve in opening the discussion of the observational problems. Please suggest lines of work you consider important and discuss ways and means of doing the work.

A. General photographic survey for type, brightness, distribution and affiliations of nebulae. It is desirable that the brightness of the spirals be determined relative to certain chosen spirals as standards, in the manner that Curtis has done the planateries, employing uniform exposures and methods. This would contribute toward a photographic catalog and also statistical studies. In this survey moderate instrumental power can do valuable original work. (The ~~photographic determination~~ brightness of the brighter spirals is very much needed in spectral work)

B. Studies on the light quality of the nebulae, employing the methods of spectrum analysis, color filters, color index, interference, effective wave-lengths and polarization: for their chemical and physical constitutions and the nature of their luminosity, emission, absorption, reflection etc. In this efficient work can be done with moderate sized instruments.

C. Exhaustive studies of special subjects and typical objects, for type-forms as basis for theoretical study, for changes in nebulae, for novae etc. This needs high instrumental power and special methods.

D. Observations for accurate position of the nucleus and other details, for proper motion, rotation, internal motions and related studies; employing powerful instruments and specialized methods.

E. Completing in the Southern hemisphere the splendid work of Barnard on the Galactic and extended nebulae of the Northern sky.

F. Spectrographic observations for radial velocity and rotation and internal motion should be continued. This needs the more powerful instruments. The plates are also useful under B above.

G. Photometric studies, employing visual, photographic and perhaps other methods.
H. What visual work can be done on the nebulae? And what can you suggest along the line of the most profitable utilization of the great amount of visual data now available?

In recent times scientific interest in the nebulae and clusters has grown greatly. It is true also that our knowledge of them has substantially increased and at the same time the questions to be answered concerning them have perhaps also increased. But the situation is encouraging, real progress is being made and the future promises still further development. With this present wide interest in the nebulae it appears to be an opportune time for those in touch with nebular observation - in addition to carrying forward their own work - to enlist more workers and to aid them in formulating their observing programs to the end that valuable supplemental data may more rapidly become available.

Reflectors are now becoming fairly numerous, and I believe, some of these could share in the general survey under A, perhaps on a cooperative plan. Much of the work would be sufficiently original to be stimulating in its direct results and by-products. There is, judging from my experience, need of a photographic catalogue of the nebulae; and, could not this survey be carried on with that end in view? With that aim should not a uniform exposure, of say one hour on Seed 30 plates, and uniform dark-room methods be recommended?

The time is becoming short for the committee report to be in and I hope you can let me have an early expression of your views on the lines of nebular work that should be carried on and the means and methods that should be followed.

Very truly yours,

Signed V. M. Slipher

Chairman
Committee on the Nebulae