nebula and notice the 5th star in the trapezium : : Rigel's Companion I saw ⊙ not easy amid the glare of the star. The Moon is a glorious object. I see twice as much detail as well by old 3½.

By the way I saw Gale's Comet the other night through my glasses X4. It resembled a hazy star. I have not been able to see it in the Eq. as it was not mounted. I think my telescope is a good one. ϵ, $\epsilon_{,,}$ Lyræ are very easy and I hope to catch the debilissimæ. Polaris is wide and very easy.

Instructions in Elementary Astronomy.

Members will recollect that an attempt was made during the last session to organise a system of instruction in the Elements of Astronomy by communication through the post. The Council have honoured me by appointing me Director of Classes this session, and I propose to issue a first series of notes at once, which will be drawn up in such a way as to be a guide to beginners in mastering some of the first principles of the science and to enable them to find their way about among the stars. I propose to conduct the work by means of letters which will each contain the explanation of some selected principle of the science followed by a few simple examples which will enable members to put the theory into practice; the course will not require the use of any instruments. It will be entirely elementary and within the reach of every member. I should be glad if those who desire to receive the instructions and to join the course will write to me without delay.

H. G. TOMKINS.

Extracts from Publications.

Mr. A. H. Plund has published in a recent number of the Physical Review (May 1912) an account of his work on selenium photometry which well repays study and is of considerable interest. The results obtained are summarised as follows :—

1. It has been established that the selenium cell, when used as a photometer, will yield accurate results if the following conditions are fulfilled :

(*a*) Monochromatic light must be used.

(*b*) An accurate sensibility curve must have been established * * *

(*c*) Exposures to light must be made automatically and must be of short duration.

2. Talbot's law has been found to hold (within the limits of accuracy of measurement) throughout the visible spectrum. The range of frequencies covered was from 10 to 60 interruptions per second.

3. For moderate intensities of illumination and for a range of intensities 1 : 18, the relation between the incident energy (E) and the galvanometer deflection (P) has been found to be represented by the expression.

$$D = K.E^{B}.$$

As a consequence of determining the various values assumed by B, it is found that from $\lambda 450—650\mu\mu$ the deflections are proportional, approximately, to the square root of the energy, while from $\lambda 700\text{-}830\mu\mu$ the deflections are directly proportional to the energy. An attempt is made to account for the behaviour of "hard" and "soft" cells.

4. As a consequence of the variations of B with λ it is shown that the form of the sensibility curve varies with the absolute intensity of illumination. It is furthermore shown that, under very faint illumination, the selenium cell is most sensitive toward yellowish-green light, while, under intense illumination, the cell is by far the most sensitive toward red light. An explanation of the cause of disagreement between various investigators in their determination of the position of maximum sensibility is attempted.

5. The conditions are defined under which the selenium cell may safely be used to measure the intensity of white light.

The interest in Mr. Pfund's observations lies in the discovery that the behaviour of the selenium is somewhat analogous to that of the human eye, recalling the well-known Purkinje effect. It appears that the selenium cell may be used with considerable advantage to measure the variation in intensity of the light from a source of fairly constant character, *e.g.*, that of daylight during an eclipse of the Sun.

The following regarding the astronomical and cosmological investigations of Emanuel Swedenborg is taken from a publication issued under the auspices of the Royal Society of Sciences, Upsala. "Before a life-work, such as that of Emanuel Swedenborg, one cannot but be filled with admiration. Perhaps not so much on account of the many sidedness of it; for that was not so very unusual at the time in which Swedenborg lived—in the 18th century; but because his researches were at the same time so *comprehensive* and *penetrating*, because he made such great and important conquests within the most different departments of knowledge; indeed,

in many places discovered by his sharpsighted genius the *lines of development* along which science was to proceed for the gaining of its end. * * * * * * * * * * * * * * * *

He also published during these years an ingenious method of determining the longitude by means of the Moon, a problem upon which the learned had been engaged for several years. (1718) * * * * * * *

Swedenborg also worked out during this period * * * * * the gigantic work "Opera philosophica et mineralia" (published in Dresden and Leipzig, 1734, in three large folio volumes). The last work contains among other things Swedenborg's Cosmology, and it is here that he developes his famous *nebular theory*, which so closely reminds one of the theory worked out in later years by Kant and Laplace, that one strongly suspects that Swedenborg's utterances, in one way or another, lie at the bottom of it. Concerning this work much has been written during recent years, and therefore it may be sufficient here only to refer to the statements made in regard to it by Professor S. Airhenius in his introduction to the above-mentioned edition of Swedenborg's writings, Vol. II., where he says: "If we briefly summarise the ideas, which were first given expression to by Swedenborg, and afterwards, although usually in a much modified form,—consciously or unconsciously—taken up by other authors on cosmology, we find them to be the following:

The planets of our solar system originate from the solar matter—taken up by Buffon, Kant, Laplace and others.

The Earth—and the other planets—have gradually removed themselves from the Sun and received a gradually lengthened time of revolution—a view again expressed by G. H. Darwin.

The Earth's time of rotation, that is to say, the day's length has gradually increased—a view again expressed by G. H. Darwin.

The Suns are arranged around the Milky way—taken up by Wright, Kant and Lambert.

There are still greater systems in which the Milky ways are arranged—taken up by Lambert."