ASTRONOMY.

Mr. Stone, F. R. S., the Radcliffe observer, has recently drawn the attention of astronomers to a most interesting system of stars in the Southern Hemisphere, which seems to present a remarkable case of an apparent connection between stars widely distant from one another.

Astronomers are familiar with cases of double stars, which seem connected together in some manner analogous to the Earth and Moon. But these stars are very close to one another, being only separated by a few seconds of arc. In the present case the stars form an isosceles triangle, with sides nearly 20 degrees in length and with a base of over 30 degrees. This system of stars consists of two stars ζ^1 and ζ^2 *Reticuli*, forming the apex of the triangle, and scarcely as bright as the fifth magnitude; ζ *Toucani*, a fourth magnitude star at the southern base angle, and ε. *Eridani*, a star of between the fourth and fifth magnitude, at the northern base angle. All four stars are invisible from England. Besides the apparent motion in Right Ascension and the North Polar Distance, which is possessed by all stars, astronomers have long recognized the fact that many stars possess a real independent motion in space, which though much smaller than their apparent motion, is too large for its existence to remain in doubt. In general this proper motion, as it is called, amounts to only a small fraction of a second of arc per annum; but in some few cases it amounts to considerably over a second of arc, or even to over two or three seconds of arc.

In forming the Great Catalogue of Southern Stars, which has been the main work at the Royal Observatory at the Cape of Good Hope, whilst under his direction, Mr. Stone was led to examine all the cases of supposed great proper motion in the Southern Stars of the British Association Catalogue. In the greater number of cases they were found to arise from defective observations, but in some few cases they were confirmed.

The most noteworthy instances were the group to which Mr. Stone has directed attention. From a careful consideration of each case, Mr. Stone arrived at the following conclusions:

That the four stars of the group under consideration have proper motions much larger than the average proper motions of stars.

That the stars have a common proper motion of more than a second of arc.

That each star of the group is moving away from every other star of the group, by quantities which are small compared with the common proper motion of the group.

That, roughly speaking, the velocities of separation are larger, the greater the present angular separation of the stars.

From these conclusions it seems probable that all these stars are slowly moving away from one common point, so that many years back they were all very much closer to one another, and may have formed part of one common star system.

With the present rate of motion of separation it must have taken these stars over three million years to have moved to their present positions from a point where they would have been close together.

Mr. Stone remarks that it appears to him that such a system of stars like a^1 and a^2 *Centauri*, which consist of two binary stars moving round each other, and with a large common proper motion, having by reason of that large common proper motion been brought sufficiently near to another binary double star to disturb the orbital motion of each, and change the motion of each from closed to open orbits. The whole question opened by Mr. Stone is one of the highest interest, and deserves still further investigation, when the proper time arrives.

THE NEBULA IN THE PLEIADES.

Some twenty years ago, Temple, whilst at Venice, discovered, with a four inch telescope, a fine bright nebula close to the bright star *Merope* in the *Pleiades*. It was elliptical in form, and covered an area of nearly a fifth of a square degree. Temple showed it to Valz and other astronomers, and it was seen by Peters with the eight inch equatorial of the Altona Observatory.

Subsequently it was looked for by other observers, either without success, or else seen as a very faint, indistinct object. Even Temple, though it is true with another instrument and in another locality, describes it as being far less distinct than when first seen. Subsequently, when observing near Florence with larger instruments, Temple saw the nebula as large and as bright as ever. Prof. Schiaperelli of Milan also observed it with the fine refractor at Milan, and describes it as bright and distinct, and completely surrounding the star *Merope* whilst outlaying portions seemed to extend as far as Electra. Schiaperelli remarks, it is singular that so many persons should have examined the Pleiades without paying attention to this great nebula, which, nevertheless, is so evident an object on a clear sky. Maxwell Hall, in Jamaica, also found the nebula very bright with a four inch telescope, and shows it as nearly half a square degree in area. Several astronomers came to the conclusion that the nebula was variable. Others even doubted its real existence, and were inclined to ascribe its supposed observation to the effects of atmospheric action. Of late it has been drawn by several observers, so that its real existence cannot be questioned. During this year it has been looked for by Mr. Common with the great 37-inch reflector at Ealing. The nebula was seen as a distinct object of considerable extent, but beyond it, and right within the *Pleiades*, were discovered two others, both long elliptical nebulas of tolerable well defined form. There seems reason to believe, therefor, that the entire background of the *Pleiades* is nebulous.

Dr. J. Lawrence Smith, of Louisville, Ky., has made a personal investigation of the great meteorite which fell in Emmett County in 1879, having visited the spot for the occasion. An interesting report may be seen in the *American Journal of Science*. The external appearance was that of a mass, rough and knotted like mulberry calculi, with rounded protuberances projecting from the surface. The larger portions were of a gray color, with a green mineral irregularly disseminated through it. The total weight of the portions found amounted to 307 pounds. The stoney part of this meteorite consisted essentially of bronzite and olivine, the three essential constituents being silica, ferrous oxides and magnesia. An analysis showed, that in composition the meteorite contained nothing that was peculiar. Its position, however, among meteorites is unique, on account of the phenomena accompanying its fall, especially the great depth to which it penetrated beneath the surface, and also because of its physical characters and the manner of association of its mineral constituents.