26. COMMISSION DES ÉTOILES DOUBLES

PRÉSIDENT: M. E. HERTZSPRUNG, *Director of the Observatory, Leiden, Netherlands.*

MEMBRES: MM. Aitken, Baize, B. H. Dawson, Finsen, Giacobini, Kuiper, Luyten, Maggini, Olivier, Przybyllok, Rabe, Rossiter, Russell, van Biesbroeck, van den Bos, Voûte, Zagar.

The discovery of southern double stars carried out at Bloemfontein by Dr R. A. Rossiter and his collaborators with the 27-inch Lamont refractor has recently been brought to a close. The total number of new pairs found in this way and published now amounts to 5252. It is a great satisfaction to know that Dr Rossiter has been enabled to complete his work by micrometrical measures of these objects. Only in this way can full value be given to our knowledge of these new pairs.

Less important, but still of some interest from a statistical point of view, are the numerous wider pairs found and measured on Carte du Ciel plates mainly by Barton and announced in several papers. The total number of such measures published during the last three years is 1622.

It would perhaps be worth while to compare the new close pairs, which will not be recognized as such on the photographic plate, with the lists of stars of large proper motion. In this way we may be able to pick out a number of double stars, which are likely to show rapid orbital motion and therefore deserve immediate attention.

Other objects that deserve examination for duplicity are variable stars, because the presence of a nearby companion may disturb the form of the light-curve. Such examination should preferably be made when the variable is near minimum.

Since the retirement of Dr R. G. Aitken as an observer the insufficiency of visual measures of difficult pairs in the northern hemisphere has been seriously felt. It is one of the greatest wishes of double star astronomers that he will find a successor.

During the last three years the following numbers of visual observations of double stars have been published:

Measures with the micrometer:

van den Bos	5670	Johannesburg	7364
Baize	4062	Paris	4142
Aitken	3197	Lick	3239
Simonow	2845	Babelsberg	2848
van Biesbroeck	2452	Yerkes	2470
Finsen	1825	Johannesburg	—
Phillips	801	Headley	801
Furner	723	Greenwich	1410
Milburn	638	Wolsingham	638
Duruy	519	Nancy	519
Renz	512	Pulkovo	1122
All others	2930	All others	1621
Total	26174	Total	26174

Measures with the interferometer:

R. H. Wilson, Jr.	129	(Flower)
Danjon	109	(Strasbourg)
van den Bos	94	(Johannesburg)
Finsen	42	(Johannesburg)
Total	374	

About 2000 visual observations are reported by Dr B. H. Dawson, La Plata, but as the publication is not yet to hand this contribution will be retained for inclusion in the next list.

The comparison image micrometer, as proposed and tested by Hargreaves and developed at Greenwich, deserves further attention. In the hands of a skilled observer it seems possible to obtain good results by this method even in the case of inferior seeing. This point is of special importance, as the yield of an instrument may thus be increased.

The method of photographic measures of double stars does not receive the attention it deserves. Certainly this method, like any other, has its limits of profitable application, and the question seems to be justified whether too much time has not been devoted to investigations near this limit instead of confining the photography of double stars to the wider pairs, where the full advantage of this kind of observation can be obtained. One good exposure with a telescope, the focal length of which is not less than, say, 10 m., gives about the same accuracy as an ordinary visual measure with the micrometer. But while the mean of repeated visual measures by the same observer during the same epoch is not materially improved by more than, say, three nights of observation because of systematic errors, such errors are much smaller photographically. Consequently it is possible, provided the necessary precautions are taken, to reach a higher accuracy photographically when many exposures are made on the same plate. Owing to this fact the mean error of the resulting position varies considerably from case to case. It is therefore essential to take the individual mean errors of photographic positions into account. It is a mistake to treat the mean position derived from twenty or more photographic exposures, made with a large instrument, as equivalent to one visual measure.

Photography of double stars with refractors of proper size has so far been executed mainly in Potsdam, Johannesburg and Lembang, Java. However, during recent years not much has been done anywhere in this promising field of work. It is therefore a great satisfaction to know that double star photography has recently been taken up in a systematic way by Dr H. M. Jeffers at Mount Hamilton with the powerful 36-inch refractor of the Lick Observatory.

The first important application of photographic measures of double stars to the determination of orbital elements was made some years ago by Dr W. H. van den Bos in the case of ξ Ursae majoris. Recently Dr K. Aa. Strand has successfully done the same for six classical pairs, the most interesting result of which investigation perhaps is that no trace of a third body was found in the case of 70 Ophiuchi. The usefulness of photographic measures has thus been definitely proved.

That observations of this kind will help to find the first trace of orbital motion in wider pairs at an early date is also worth mentioning.

A list of new orbits and other references are given in the council notes of the Monthly Notices. The following announcement by Dr van den Bos may be repeated here:

"The card catalogue of double stars north of $-30°$ is in the hands of Dr R. G. Aitken, whose present address is 1109 Spruce Street, Berkeley, California. The card catalogue of double stars south of $-19°$ is kept at the Union Observatory, Johannesburg, South Africa. Information on discoveries, measures, orbits, etc. can be obtained, for these two regions of the sky, from the appropriate central office. On the other hand, it will be appreciated by these two offices if reprints of papers dealing with double stars, especially those published in the less accessible periodicals, are sent to them by the authors."

E. HERTZSPRUNG
President of the Commission