

Les observations au cercle méridien de Tachkent sont terminées. Celles de l'Observatoire d'Odessa seront bientôt achevées. Les observations photographiques sont faites à Poulkovo, Tachkent et Moscou. La qualité des images des nébuleuses dépend des caractéristiques de l'instrument et de la durée de la pose. Pour les nébuleuses choisies la précision est 20% plus faible que pour les étoiles. M. Zverev exprime le vœu que les autres observatoires entreprennent aussi l'observation des mêmes nébuleuses en utilisant les lunettes photographiques dont ils disposent actuellement, soit des lunettes à grand champ, soit des lunettes à grande distance focale. Il estime que si ces observations étaient répétées à 25 ans d'intervalle, elles seraient fécondes en résultats intéressants.

M. Kopff demande la liste de ces 300 nébuleuses. M. Zverev répond que cette liste a été donnée dans les publications de l'Observatoire de Kazan.

Le Prof. G. Armellini pense qu'il est difficile de déterminer avec précision la position des nébuleuses extra-galactiques. M. Mikhailov répond qu'il y a des nébuleuses à noyau dont la position peut être déterminée photographiquement avec précision; il importe donc de choisir les nébuleuses qui conviennent le mieux.

M. Jeffers parle des travaux entrepris au Lick Observatory où l'on fait des poses photographiques de 2 heures sur des plaques qui couvrent  $6 \times 6^\circ$ . Le choix des nébuleuses n'est pas encore fait. La distance focale de l'instrument photographique utilisé est 3.50 m. M. Watts demande si ces projets du Lick Observatory sont semblables à ceux de l'U.R.S.S. M. Mikhailov répond qu'effectivement ces projets sont semblables.

La Commission constate avec satisfaction que ces programmes sont en voie de réalisation aux Etats-Unis d'Amérique et en U.R.S.S.; elle espère que ces travaux conduiront à une liaison entre le système des nébuleuses extra-galactiques et celui des étoiles fondamentales. La Commission considère ce travail comme ayant une grande importance pour l'astronomie de position.

M. Atkinson suggère de déterminer la position des amas globulaires. On choisira dans chaque amas quelques étoiles brillantes qui serviront d'étoiles de repère; elles seront choisies de telle façon que leurs mouvements propres relatifs soient négligeables.

Le Prof. Armellini présente ses observations en ascension droite des grosses planètes. Ces observations ont été effectuées avec la lunette coudée Bamberg (90 mm.-95 cm.). Il estime qu'il est avantageux d'éliminer l'influence de la collimation par le retournement de la lunette à chaque passage. M. Moreau fait remarquer que, dans ce cas, les observations sont différentielles; il estime qu'un cercle méridien de plus grande ouverture est mieux approprié pour l'observation des grosses planètes, particulièrement pour Mars et les planètes inférieures qui exigent une bonne définition de l'image à cause de la phase.

Le Président présente un rapport de l'Observatoire de Tokio (1938-47): Observations méridiennes de la Lune, des grosses et de petites planètes—Catalogue de 3000 étoiles zodiacales—Catalogue de 500 étoiles zénithales—Etude comparative des 2 lunettes de passage Bamberg.

*Report of combined meeting of Commissions 8 (MERIDIAN ASTRONOMY),  
19 (VARIATION OF LATITUDE) and 31 (TIME), August 21. 9.30 a.m.*

PRESIDING: SIR HAROLD SPENCER JONES.

SECRETARY: PAUL SOLLENBERGER.

The President outlined the history of the Ross photographic zenith tube, saying that it was originally designed for measurement of the variation of latitude by Dr Ross, and later adapted to the determination of time by Dr Littel. The success of the instrument and its possible application to various problems in positional astronomy made it of interest to all three commissions attending the combined meeting.

Dr Schilt said that the zenith tube could not determine fundamental positions, but that it could determine fundamental proper motions in declination with a high degree

of accuracy. One instrument can observe only a narrow zone of stars, but several instruments, located at various latitudes, could obtain valuable data. The results obtained could be tied together by means of meridian transit circle observations so as to obtain proper motions for the whole sky. The President noted that the secular motion of the mean pole prevented absolute determinations of proper motion at a single station. Dr Schilt replied that two stations properly located could eliminate the effect of polar motion.

In response to an inquiry as to the accuracy obtainable with the zenith tube, Mr Sollenberger stated that in 25 years the Washington instrument had made possible the derivation of proper motions superior to those obtained with all available transit circle observations.

Dr Atkinson feared that the use of two-element objectives would result in systematic differences in the proper motions determined for stars of different colour. To overcome this he proposed the use of objectives having two elements, each corrected for colour. He noted, however, that no colour difference had been detected in the proper motions derived at Washington. Mr Clemence suggested that by determining the scale value for each colour type of star independently, the difficulty could be eliminated. Mr Sollenberger pointed out that the plates used at Washington were sensitive only at the blue end of the spectrum, thus reducing the effect of such an error. He also stated that the designers of the new zenith tube lens did not consider that the effect would be of importance. Dr Atkinson said the English lens designers had a different opinion. In conclusion he said that he would be satisfied on this matter only if a study of the derived proper motions showed no evidence of colour effect.

Mr Watts said that the transit circle workers used the variation of latitude determined with the zenith tube in the reduction of their work, and that they looked forward with pleasure to the prospect of getting within a relatively few years an accurate system of proper motions. In return for these advantages it would be the duty of the transit circles to observe the stars used by all the zenith tubes, so as to furnish fundamental positions for them.

The President urged that the observing programmes of the zenith tubes be arranged so that stars would be taken near to sunrise and sunset throughout the year. This he considered important for the control of periodic errors in the adopted system of right ascensions. Dr Lambert suggested that refraction differences between evening and morning might cause trouble. The President considered that the declination observations would be mainly affected by diurnal variation in refraction, and it was generally recognized that the constant of aberration, derived from latitude variation observations might be affected by systematic error.

Dr Atkinson discussed the question of suitable distribution of observing stations. For the determination of latitude three or more stations located in the same latitude are desirable. Four stations located ninety degrees apart would be most advantageous, since each one could correct its time observations by utilizing the latitude results at the adjacent stations.

Mr Sollenberger said that the new instrument under construction at the Naval Observatory was originally to be located in Cuba, but that the present plans were to put it in south Florida at a latitude of about  $25^{\circ} 30'$ . He pointed out that there were several advantages, especially from the standpoint of time determination, in locating the instrument in a low latitude. Mr Clemence said that as long as the total number of instruments was small, they should be welcome wherever located. Dr Schilt suggested that a list of present and contemplated stations should be kept available so that some judgement could be exercised in selecting new locations.

Dr Hins pointed out that there were conflicting requirements which affected the location of zenith tubes. Proper motion determinations required instruments in different latitudes, while latitude variation determinations required several instruments in the same latitude. He thought that the two requirements should be considered separately.