

ASTRONOMISCHE NACHRICHTEN.

N^o 2602.

A uniform Ephemeris of the Clock Stars.

A noteworthy feature in the progress of our astronomical annuals is the rapid increase that has taken place within a few years in the number of the clock stars. This increase seems to have been brought about chiefly by the influence of the Berlin list of 539 stars, which was published for the use of astronomers who were engaged in observing the zones of the northern heavens. The convenience of this list for the use of observing parties in the field seems to have led to the large increase that we find in the annual publications. For the year 1886 the Nautical Almanac gives the mean positions of 198 stars, the *Connaissance des Temps* of 316, the *Berliner Jahrbuch* of 622 and the *American Ephemeris* of 383 stars.

That this great increase in the number of clock stars has some advantages will not be denied, but on the other hand there seem to be some disadvantages that ought to be considered. In the first place the mean positions of the stars given in the different publications do not agree as well as might be expected when the great number of observations of these stars is taken into account, and the number of years over which the observations are extended. These differences of position are indeed small, and their influence on the observed positions of other stars and planets cannot be great; but we have already examples in astronomy of the extension of such small errors into large catalogues of stars, and of their development into periodic errors.

The constants for the reduction of the clock stars from one epoch to another, and to apparent position, are now so well known, and the adopted values are so nearly the same, that the differences produced by the various reductions are frequently neglected, but even here it seems

to me there is room for improvement. At the present time the values of the constants of reduction are known to a good degree of approximation, and it ought not to be difficult for astronomers to unite on a common system of values of these constants, and also on a uniform notation to be used in reductions. The great advancement in stellar astronomy made by Bessel in his *Tabulae Regiomontanae* seems to have been partly disregarded and lost, and his methods for bringing the labors of many observers into harmony, and of making them all tend towards the advancement of the science have sometimes been overlooked and forgotten.

Again, if a large list of clock stars is at hand, the astronomer is apt to make his work purely differential. In many cases this may be his best course, but such work would be more easily reduced and compared if it could all be referred to a common system of clock stars. The computation of systematic errors would not be avoided, but the work would be made easier and more certain.

In order to obtain an extensive and convenient ephemeris of the clock stars, suitable for general use, it would be better to make such a work a special publication. In this way the adoption of the mean positions of the stars, and the selection of the constants of reduction and the system of notation, could be brought under the direction of one Office. The work should be so elaborate that the apparent position of a star could be interpolated with ease and certainty for any time, but even with such an extension the cost of the publication would not be great. I hope that the *Astronomische Gesellschaft* may be willing to undertake a work of this kind.

A. Hall.

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Quelques remarques sur l'intégration d'une équation différentielle.

Par *T. J. Stieltjes* à Leyde.

1. L'équation différentielle, étudiée par M. H. Bruns dans les N^{os} 2533, 2553 de ce Journal (voyez aussi l'article de M. Callandreau dans le N^o 2547)

$$(1) \quad \frac{d^2x}{dt^2} + n^2x = 2\beta x \cos t$$

$$(1') \quad u(1-u) \frac{d^2x}{du^2} + \frac{1}{2}(1-2u) \frac{dx}{du} + (n^2 + 2\beta - 4\beta u)x = 0$$

a été considérée aussi par M. F. Lindemann dans les »*Mathematische Annalen*, Bd. XXII pag. 117 e. s.». Il m'a paru intéressant de rapprocher ces deux solutions et de déduire les conclusions de M. Bruns de l'analyse de M. Lindemann.

En posant $\cos^2 \frac{1}{2}t = u$, on obtient: