

## SHORTER CONTRIBUTIONS

## A NOTE ON THE QUASI-BIENNIAL OSCILLATION AT DARWIN

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## ABSTRACT

Monthly mean values and twelve-month running means of the E-W component of wind above Darwin from July 1958 to April 1968 inclusive are presented for two levels, namely, 70,000 ft and 90,000 ft. It is shown that the quasi-biennial oscillation is still present, in spite of irregular behaviour following the westerly maximum in 1963.

There are to be found in the voluminous literature dealing with the "26-month cycle" suggestions that the cycle has disappeared (Veryard and Ebdon, 1961), or at least has become greatly diminished in amplitude after 1963 (Berson, 1966). This view has, in general, been based on wind records ending in 1965. Observations of the E-W components of the winds at Australian stations during the years since 1965 show that the oscillation is still present, at least in the portion of the atmosphere represented by these stations.

In Fig. 1 data for 70,000 ft above Darwin are presented. The solid curve shows monthly means of the zonal wind component. Twelve-month running means of these values are represented by the dashed curve. The data for 90,000 ft are shown in the same manner in Fig. 2. At 70,000 ft observations are available from July 1958, but the record at 90,000 ft does not begin until June 1959. At both heights the record is continued up to and including April 1968.

The 90,000 ft curves show that the oscillation has not disappeared but that its "period" has lengthened since 1963. The westerly peak in the monthly mean curve which followed the 1963 peak, occurred not in 1965 as expected, but in 1966. An estimate of the lengthening can be best made from the running mean curve, which does not contain the small but significant annual cycle. The time between successive maxima (most westerly) in the dashed curve was approximately 29 months in 1961-63 but was closer to 34 months in 1964-66.

At 70,000 ft there is a distinct annual cycle present and the quasi-biennial oscillation is not as marked as it is at higher levels. However, it is possible to detect it by visual inspection of the monthly mean curve as well as from the running means, and also to observe that a lengthening of the "period" occurred during 1961-64, i. e. before the lengthening at 90,000 ft. After 1964 the oscillation at 70,000 ft appears to have returned to a period of approximately twenty-six months.

The addition of observations made during 1966 to April 1968 produces no evidence of the disappearance of the oscillation, but does emphasize its irregular character. It is clear that representation by a simple wave with constant phase and amplitude is not adequate, and that theoretical models of the phenomenon must include some kind of modulating mechanism.

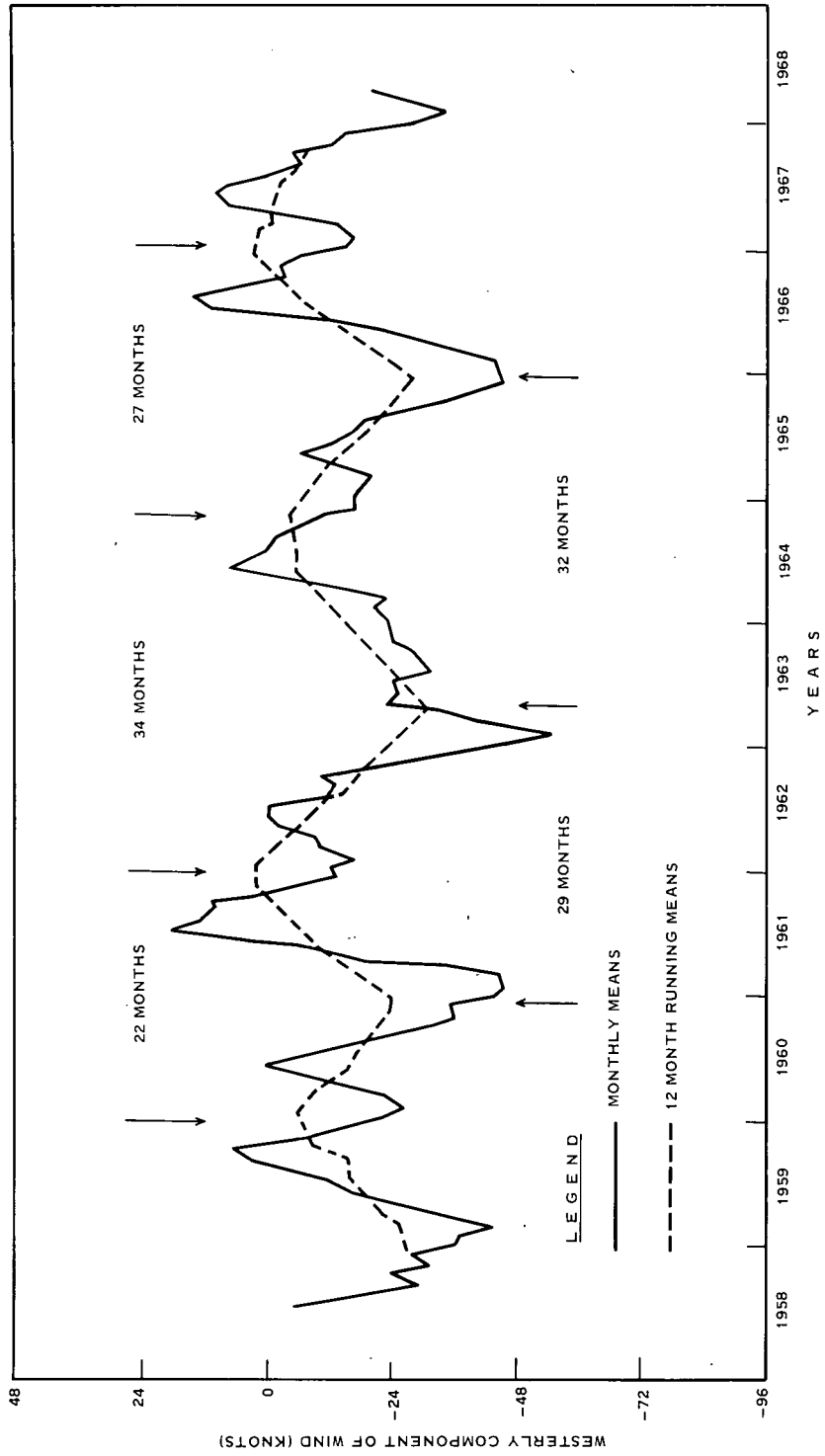


Fig. 1 Zonal component of wind at Darwin at 70,000 feet.

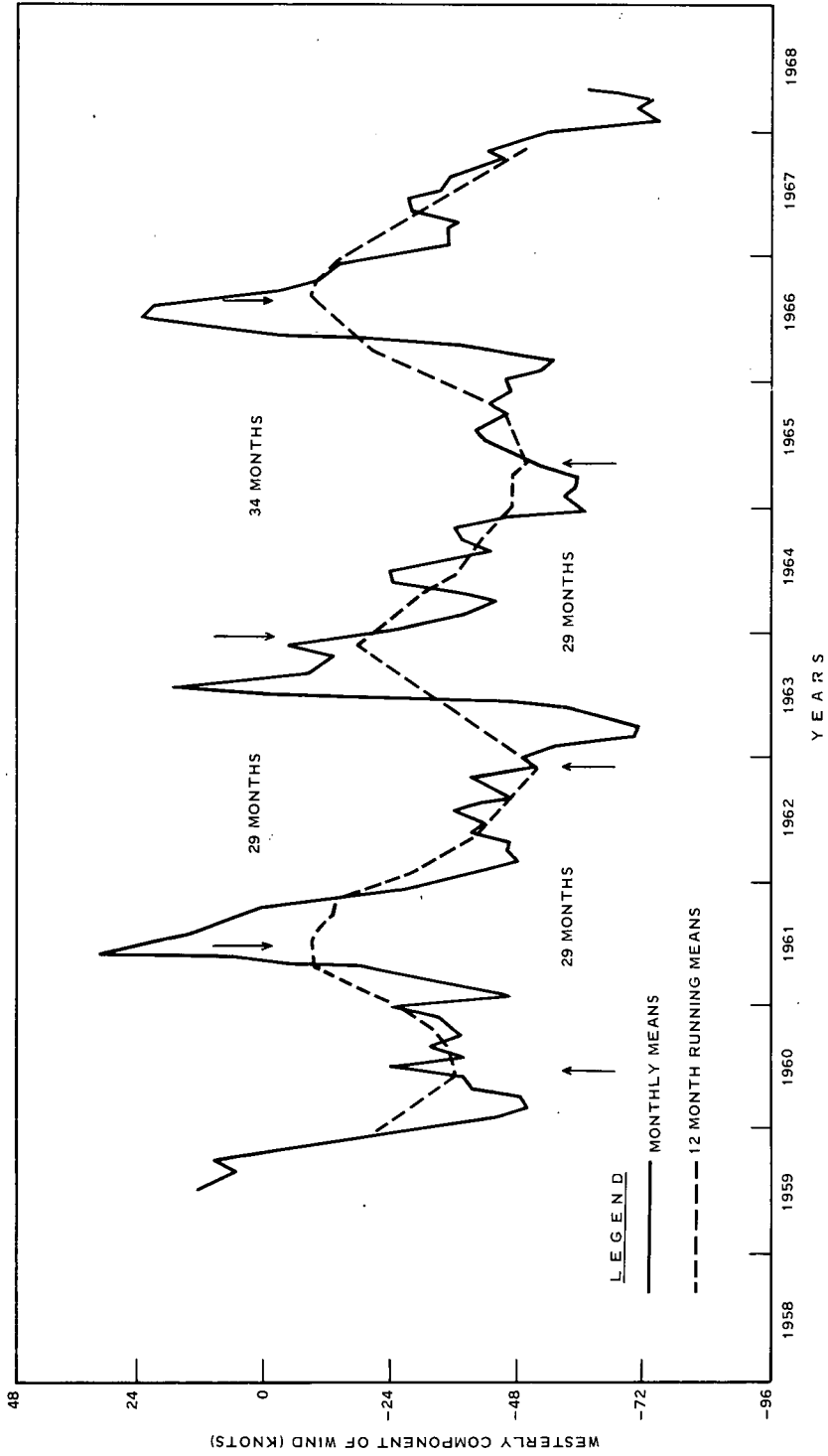


Fig. 2 Zonal component of wind at Darwin at 90,000 feet.

## REFERENCES

- Berson, F.A. 1966 Polar Lobe of the quasi-biennial stratospheric wind oscillation. *Nature*, 210, 1243-1244.
- Veryard, R.G. and Ebdon, R.A. 1961 Fluctuations in tropical stratospheric winds. *The Meteorological Magazine*, May 1961, 90, 125-143.