ties in these fitted curves are indicated by error bars, representing estimated standard errors. The large variability from day to day shown in Fig. 1 is believed to be mainly due to a real variability in the drifts rather than to measurement errors. For the IQSY results the standard error of a value on the fitted curve is estimated at ± 3 m/sec near noon, and at ± 8 m/sec near midnight. The uncertainty on the IGY curve is somewhat greater, and both near noon and midnight the standard error is estimated to be about ± 15 m/sec.

It thus appears that *F*-region drift velocities have decreased significantly and substantially from sunspot maximum to sunspot minimum: near noon, from about 75 ± 15 m/sec to about 41 ± 3 m/sec, and near midnight from about 100 ± 15 m/sec to about 55 ± 8 m/sec. The ratio of decrease is about 1.8 in both cases.

If the observed drifts are produced by electrodynamic forces in the manner suggested by Martyn⁴, it is not obvious why such a change in drift velocities should occur. Although conductivities and electric currents vary with the solar cycle, tidal velocities and electric fields, and hence electrodynamic drift velocities, should, at least on a simple model, remain constant. From the present evidence it appears, however, that the *F*-region drift velocity varies almost as much as the daily range of the horizontal component of the Earth's magnetic field, ΔH . At Ibadan this decreased by a factor of about 2.1 between the solar maximum of the IGY and the solar minimum of the IQSY, which may be compared with the ratio of 1.8 for drift velocity. It is interesting also to compare this result with the evidence obtained by Osborne and Skinner⁵ of a correlation between drift velocity and ΔH even on a day-to-day basis.

In the *E*-region we have found no evidence of any solar-cycle variation of drift velocity similar to that found in the *F*-region. Thus the drift velocity in the *E*-region near noon was 42 ± 3 m/sec in October 1964 and 39 ± 5 m/sec in March 1965. The IGY data are less numerous, but from eighteen values obtained between 10 and 14 h in equinox months at sunspot maximum the median value is 45 ± 10 m/sec. The median of seventeen values obtained between 10 and 14 h in winter months is similarly 51 ± 6 m/sec. It thus appears that if there is any change in *E*-region drift velocity with sunspot activity, it is considerably less than occurs in the *F*-region. This would seem to be consistent with the results reported by Rao and Rao³.

It may be remarked in conclusion that the IGY data and the IQSY data were analysed by somewhat different methods. For the former the usual full correlation method was used, but for the more recent data a method originally suggested by Briggs and Spencer⁶ has been used. Fuller details will be given elsewhere and here we shall only say that we have concluded from numerous test comparisons that there is no appreciable systematic difference between the two methods.

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Variation of the Ratio Intensity to Susceptibility in Red Sandstones

As the remanent intensity of magnetization, *I*, of rocks is dependent on the strength of the magnetic field in which it was acquired, an estimate of relative field

strengths can be made by comparing the remanent intensities from different rock units which have supposedly acquired their magnetization in a comparable manner¹. A statistical method that gives an effective mean for each unit would be expected to be capable of revealing broad changes in the strength of the palaeogeomagnetic field. It has been found that the distribution of remanent intensities generally seems to follow the log normal distribution. As the susceptibility, *K*, of red sandstones has been found to be proportional to the amount of iron oxide present² the ratio of intensity to susceptibility is partially compensated for variations in the amount and type of magnetic material present. This ratio should be more dependent on the field strength than would be the intensity alone. The geometric means of this ratio have been calculated for a collection of red sandstones obtained from the United States^{3,4} mainly from flat lying sites. The results from eighty-two sampling sites in thirty formations are summarized in Fig. 1. It can be seen that the *I/K* ratio yields a smoother pattern with age than the *I* plot. It shows a palaeozoic low. The vertical lines give the standard deviation of the geometric site values for the given era.

Fig. 1. Log_{10} plots of *I*, *K* and *I/K* against age of red sandstones

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