Table 1. CORRELATION COEFFICIENT OF BURST INDEX AND BURST INCIDENCE WITH OTHER INDICES OF SOLAR ACTIVITY

Other indices of solar activity	Period studied	Criterion chosen	Correlation coefficient for Burst index	Burst incidence
Sunspot number (R_z)	Mar. 1961 to Dec. 1967	Monthly mean	0·4975	0·8155
Ca plage ($A \times I$)	Mar. 1961 to Dec. 1967	Monthly mean	0·5376	0·7656
Flare index (I_{fl})	Mar. 1961 to Dec. 1967	Monthly mean	0·6704	0·6822
Flare index (I_f)	Mar. 1961 to Dec. 1961	Ten day mean	0·8946	0·7275

correlation coefficient is higher for the burst index than that for the burst incidence, although it is admitted that this has been evaluated with data collected during 10 months. Table 1 also shows that I_b has maximum correlation with I_f among all other indices of solar activity while the correlation with other indices is more or less uniform in the case of B_i. It thus seems that the quantity, burst incidence, is rather an index of the active centres on the solar surface while the burst index itself is a measure of the activities occurring therein.

Obviously, for daily activities on the Sun the index would be more accurate if it were calculated from 24 h observation data. But this requires the same frequency to be observed from, at least, two or three stations well separated from each other with identical equipments. When averaged over a month, however, the values can definitely be used as a measure of solar activity over a wide field of studies.

In conclusion, it can be said that the definition of the index, objective as it is, enables it to be determined throughout the entire band of the radio frequency spectrum and its evaluation at a number of other frequencies at centimetre, decimetre and metre wavelengths seems to be worthwhile. It is quite logical to examine how the index values at these frequencies, representing different regions of the solar atmosphere, compare with each other as also with other solar and geophysical indices. Such studies are in progress and will be reported later.

I thank Mrs G. A. Harvey for reading the manuscript critically.

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Received July 2, 1968.

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Decrease in the Intensity of Hydrogen Lines in the Solar Chromosphere

ROUSE[1,2] has recently tried to explain the decreasing intensities of the high Balmer and Paschen lines in the solar atmosphere with his theory for the hydrogen atom which includes a complete screened Coulomb potential. Rouse's theory takes into account the fact that the volume occupied by a hydrogen atom (and thus the maximum possible value of the principal quantum number n) is limited by the presence of nearby atoms. He has cited observations of the highest lines visible in the photosphere and chromosphere and statements by Ivanov-Kholodnyi and Nikol'skii[3] that "in prominence and chromospheric spectra, it has been found that near the series limit the lines do not merge because of their broadening and convergence, but instead they disappear because of a rapid fall in intensity" and "the problem of the drop in line intensity toward the series limit has not been solved so far". The parts of the quoted statements relating to the chromosphere are ultimately based on the 1952 eclipse data of Athay *et al.*[4]. Although the theory of Rouse concerning the limiting value of n is certainly expected to apply to the chromosphere, my purpose here is to question whether present chromospheric observations confirm the theoretical limit on n and whether the variation of the high chromospheric hydrogen lines is anomalous.

Rouse's computed maximum level n^*, where $n^{*2} = 0{\cdot}59 r_0/a_0$, $4\pi r_0^3/3 = N_i^{-1}$, and N_i is the number density of atoms and ions, is 31 for a density which he has assigned to a height of about 600 km in the chromosphere. Two recent models[5,6] with considerably different temperatures but with approximately the same hydrogen density give a value for the density which is an order of magnitude smaller than Rouse's value at 600 km. The new values are $N_i \approx N_H \approx 4 \times 10^{13}$ cm^{-3} and $n^* \approx 45$.

The highest reported lines in the chromosphere are from levels $n = 37$ in the Balmer series[4,7] and $n = 40$ in the Paschen series[7]. Blends in the Balmer series and water vapour absorption in the Paschen series combined with the normal expected decrease of intensity with quantum number make identification and intensity measurements of lines higher than $n = 31$ very difficult. There have thus been no photometric observations of lines higher than $n = 31$, with the exception of Paschen-32 at the 1962 eclipse[5,8], and it is impossible unambiguously to identify lines higher than Balmer-31 and Paschen-32 on the 1962 spectrograms. Because the theory of Rouse yields values of n^* which are somewhat larger than the highest series members observed (although the difference is not great if Mitchell's Paschen observation[7] is valid), the observations cannot be described as confirming Rouse's theory even though they do not contradict it.

The sensitivity of instruments used for eclipse observing has been such that one would expect lines with $n > 31$ to be difficult or impossible to detect simply because of their weakness based on an extrapolation of the observations for $n < 30$. For $n < 30$ the decrease with n of the inferred emission coefficients in the chromosphere agrees well with the normal expected variation for isolated hydrogen atoms[5]. It is possible that there are deviations greater than the observational errors, but if they are real they are in the opposite direction from those expected from a density effect. The deviations are such that the higher lines (with larger n) are fainter at greater heights relative to the lower lines; self-absorption in the Balmer lines in the low chromosphere seems to explain the deviations. The variation of the observed chromospheric hydrogen lines originating from high energy levels is not therefore anomalous, in contrast to the statement by Ivanov-Kholodnyi and Nikol'skii.

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Received July 12, 1968.

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Drifting and Rifting: A Comment on the Tertiary Rotation of Africa

GIRDLER has presented palaeomagnetic evidence for a clockwise rotation of Africa in the Tertiary[1]. Such a rotation may have occurred, but it cannot be deduced from the results he used. He gives nine sets of palaeomagnetic results from the Tertiary of Africa and shows that eight of them exhibit clockwise rotations of between 0° and 16°. The conclusion that Africa itself has suffered