
CURRENT SCIENCE—50 YEARS AGO



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A New Theory of Sun-Spots

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SUN-SPOTS, though a very long observed phenomenon, still defy satisfactory explanation. As a result of modern astrophysical research, especially with the spectro-heliograph, the facts known about them are many and any new theory attempting to explain the origin and behaviour of sun-spots has to take note of all these facts.

There was a time, years ago, when the very simple idea that sun-spots arose as a result of a hollow in the sun caused by something of the nature of a volcanic eruption, held the ground; but why these spots never appeared at high latitudes in the sun, and why they are largely confined to the equatorial belt of the sun, could not be given a satisfactory explanation. When you add to it the experimental conclusion of a definitely observed periodicity for this solar activity, this simple explanation becomes almost impossible of accep-

tance. That the dark appearance of these spots is due to the cooler vapours prevailing in this locality and that the cooling is due to the expansion of the hot vapours from the interior that have risen to the surface is quite possible. But then there is the question why if the vapours are right from the interior at a very much higher temperature, they are not actually hotter than the surrounding surface. It may be answered by limiting the origin of sun-spots to within a shallow surface layer of the sun even as terrestrial volcanic phenomenon. Then no very high temperatures different from that of the surface layer are called for. Then the cooling by expansion might become the more predominant factor and the relative darkness of the spots does find an explanation.

The revolutionising discovery of definite rotations round the axis of sun-spots, made with Hale's spectro-heliograph led to the forecast of magnetic fields associated with these spots. This was brilliantly verified by the observation of Zeeman effect in these spots. It was further observed in this study that the spots generally occurred in pairs and that the succeeding spot or spots have, in general, a polarity opposite to that of the leading spot. Thus, any theory put forward now must explain these additional observations as well.

I have been entertaining an idea for the last few years that such polarised phenomenon in the sun can be explained only on the basis of corresponding polarised happenings. An explanation for this peculiar behaviour of sun-spots must be sought in the swarms of planetary or cometary bodies we know to be going round the sun. The assumption is that these fall into the sun giving rise to the spots and that these are bodies having, like planets, a rotation of their own about their axes. Such an assumption seems to explain almost all the observed peculiarities of sun-spots.

ANNOUNCEMENT

WORKSHOP ON HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

The Defence Research and Development Establishment is organising a Workshop on High Performance Liquid Chromatography from 2nd to 4th March, 1984. The Workshop will deal with. 1. Basic Principles, 2. Column Selections and techniques, 3. Instrumentation, and 4. Application. Instruction shall be

supported with programmed self study notes and audio visual aids.

Further details can be had from: The Convener, H.P.L.C. Workshop, Defence Research and Development Establishment, Gwalior 474 002.