50 Years Ago

The First Anthocyanins appearing during the Ripening of Blueberries

We decided to investigate the blueberry, *Vaccinium myrtillus* L. ... It is known that the ripe blueberry contains at least seven anthocyanins ... Collecting the pigment from raw, reddish berries in sufficient amounts for identification was found to be too laborious a task. The pigments separated from raw berries were therefore compared with pigment fractions from ripe blueberries ... The two anthocyanins initially appearing during the maturation process of blueberries are both found to be cyanidin derivatives.

From *Nature* 29 July 1961

100 Years Ago

The Law of Sex Determination and its Practical Application. By Laura A. Calhoun (Mrs. E. E. Calhoun). Pp. 254. (New York: The Eugenics Publishing Co., 1910)

The theory suggested in this book is that "the sex of the embryo in man and the higher animals is determined in the ovary from which the ovum in question is developed." We shall not give away the ingenuous author's practical recipe, but the general theory is that the right ovary is responsible for the males. This will be good news for those who believe that men are always in the right. ... The experiments ... reported in the *Journal of Genetics*, November, 1910, show that "in the rat it is not true that ova determining one sex are produced from one ovary, and those determining the opposite sex from the other, for each rat, with one ovary completely removed, produced young of both sexes." ... It is a well-intentioned book, but it does not contribute much to the difficult problem discussed.

From *Nature* 27 July 1911

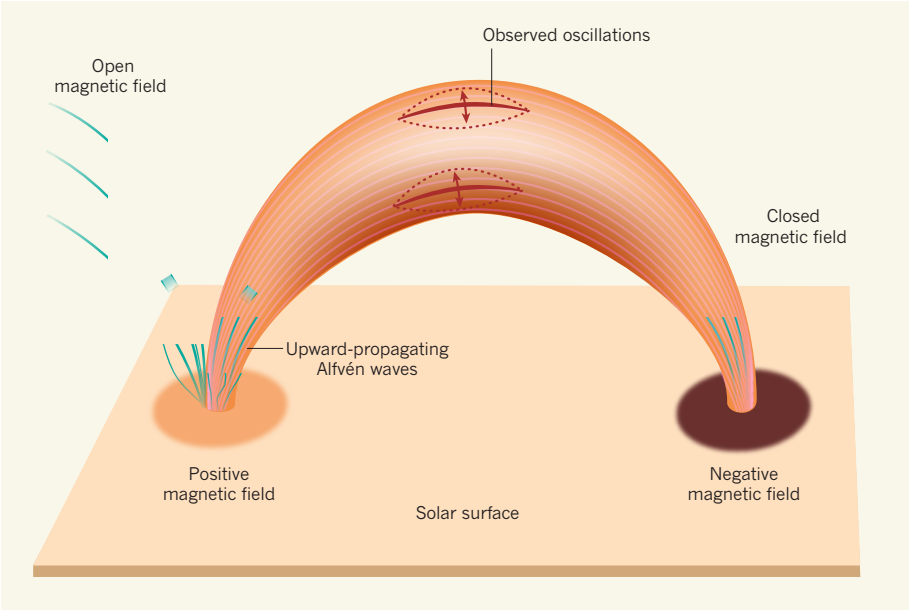

Figure 2 | Alfvén waves in two coronal geometries. The solid lines represent magnetic field lines. On the left, the open magnetic field lines extend into interplanetary space, closing at a large distance from the Sun, and are representative of coronal holes. On the right, the field lines create closed structures in the corona, as occurs in the quiet Sun and active regions, with the lines closing beneath the surface. In both cases, the wavy blue lines represent upward-propagating transverse displacements (Alfvén waves), with the solid blue arrows showing the direction of energy transport. The dashed lines with red arrows represent the oscillatory displacements observed by McIntosh *et al.*[1] in active-region loops, interpreted as Alfvén waves.

the wave power estimated by McIntosh *et al.* is adequate to account for the coronal energy losses. In the observed active region, the measured power is inadequate by some margin. However, superposition of random motions along the line of sight (between the observer/spacecraft and the observed coronal structures) can lead to a large underestimation of the wave power (I. D. M. and D. J. Pascoe, unpublished work), so the authors' results can be considered as minimum values. In addition, higher time resolution may reveal more power at higher frequencies than currently observed.

Where does this leave things? A significant difficulty for coronal-heating mechanisms based on Alfvén waves is the weak damping of the waves, which can be likened to trying to damp the motion of a pendulum in a near-vacuum. Efficient damping is required to convert the kinetic and magnetic energy in the wave into heat. Idealized theories have suggested ways of enhancing the damping through the creation of strong, localized currents[6], but one can see in movies from the SDO and the Japanese Hinode spacecraft that the solar corona is highly dynamic and structured, factors not accounted for in the basic theoretical models. The results of McIntosh *et al.* must lead to a thorough reassessment of the theory of waves in the solar atmosphere, with a focus on the (computational) modelling of complex, dynamic structures.

Finally, the argument about the origin of the corona has been framed for decades as a competition between the dissipation of small-scale currents giving rise to impulsive heating[7,8], direct plasma injection[9] and the dissipation of wave energy, with the first becoming more favoured. The new detection of 'waves galore' by McIntosh *et al.* suggests that this argument needs to be reconsidered as a matter of urgency. We suggest that the dynamic complexity revealed by Hinode and the SDO indicates that both processes are almost certainly at work, and hence a more pragmatic approach is called for to assess the relative contribution of each process in different regions. ■

Peter Cargill *is at the Blackett Laboratory, Imperial College, London SW7 2BZ, UK, and at the School of Mathematics & Statistics, University of St Andrews, Fife KY16 9SS, UK.* **Ineke De Moortel** *is at the School of Mathematics & Statistics, University of St Andrews.*
e-mails: p.cargill@imperial.ac.uk; ineke@mcs.st-and.ac.uk

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