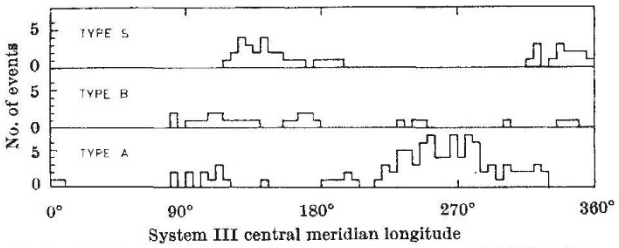

Fig. 2. The number of events of the three spectral types plotted against System III central meridian longitude.

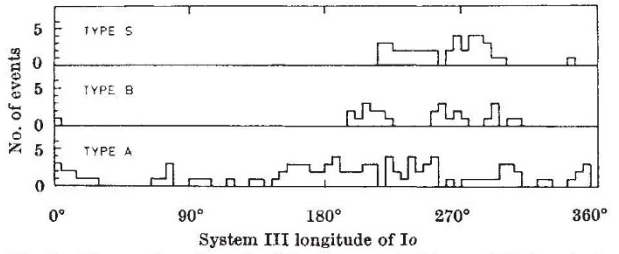

Fig. 3. The number of events of the three spectral types plotted against Io's longitude on System III.

a classification of the bursts could be made on the basis of their duration only, as has been the trend in the current literature. Also records obtained at relatively widely spaced fixed frequencies may not give a true picture of the radiation unless the spacing between the adjacent recording channels is of the order of 50 kc/s. It is therefore suggested that the classification of radio bursts from Jupiter should be based on the characteristics of their high resolution dynamic spectra.

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Fireballs associated with the Barwell Meteorite

SINCE we reported[1] the fireballs associated with the meteorite fall at Barwell, Leicestershire, on December 24, 1965, further information has accumulated which permits a slight extension of the conclusions reached there. Our original report explained that the observations indicated the existence of two fireballs (possibly resulting from a fragmentation in the upper atmosphere) which passed over the South Midlands in a north-north-east direction on roughly parallel tracks. The more westerly of the two fireballs (which we denoted by track A) fragmented again over the Gloucestershire–Warwickshire border.

The additional data now available imply the existence of a further fireball with a track approximately parallel to the other two, but some 30 km to the west of track A, thus passing slightly to the west of Bristol. Some of the eighteen observations which have been considered in deriving this track are rather fragmentary, but, on the whole, the descriptions agree reasonably well. They suggest that the fireball was bluish-green in colour, perhaps with a short, yellowish tail.

It is significant that no sound effects seem to have accompanied its passage. This suggests that only a small fragment was involved, which probably burnt up completely in the atmosphere. Some observers also noted that the fireball shed sparks along its track, which implies that it disintegrated further during its flight. It is worth noting that the fireballs described in our previous paper were also said to shed sparks by some witnesses. This suggests that they, too, were subject to minor fragmentation. It is possible that some of the anomalous sightings which were reported may have been the tracks of these smaller fragments.

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Potassium–Argon Ages of Slates from the Southern Caledonides of the British Isles

THE Caledonian orogenic event in Britain is divisible into a number of episodes of deformation and recrystallization[1]. In the low grade Caledonian metamorphic belt (here referred to as the "Southern Caledonides") which lies to the south of the Scottish Highlands and includes its continuation south-west into Ireland, there is a considerable amount of structural and stratigraphic evidence for the episodic nature of the Caledonian orogeny[2–5]. Potassium–argon ages have been obtained from several members of the magmatic sequence in North Wales[6,7], but recent investigations in S.W. England[8] and in the Scottish Dalradians[9] have demonstrated the advantages of using whole-rock samples of low grade metamorphic rocks to date episodes of deformation and recrystallization in orogenic belts. This latter approach has now been extended to the Southern Caledonides and the results of a preliminary investigation involving twenty-eight samples are reported here. The analytical data are presented in Table 1 and the geographical distribution of ages is shown in Fig. 1. Details of analytical techniques and precise sample localities are given elsewhere[10].

The average age of twenty-six samples is 411×10^6 yr, but the numerical spread of the ages (470×10^6 to $360 + 10^6$ yr) is much greater than that expected through analytical uncertainties alone ($\pm 10 \times 10^6$ yr), so that the observed spread of ages is regarded as having geological rather than analytical significance. Variations in the measured ages caused by mineralogical factors are minimal as all the whole-rock samples are from low grade metamorphic slates with monotonously similar mineralogy. The measured ages are thus divided into four groups (see Table 1) on the basis of their numerical distribution. An error (2σ) is assigned to the average of each of three groups based on the observed spread of ages within the group.

The youngest ages were obtained from six slates from North Wales, Isle of Man, and Co. Mayo (Nos. 83, 85, 86, 89, 104, 105). These rocks yielded potassium–argon ages in the range 360×10^6 to 387×10^6 yr. Biotite from the Dhoon granite on the Isle of Man gave an age of 370×10^6 yr. Similar ages (365×10^6, 360×10^6 yr) have been reported from granites at Galway and Weardale[12], although older ages ranging up to 405×10^6 yr for granites in the Southern Uplands[13], Lake District[14–16], and at Leinster[13] indicate prolonged intrusive (and/or metasomatic) activity in the Southern Caledonides. More recent age work on the Galway[17] and Weardale[18] granites suggests that these, too, may have been emplaced before 360×10^6 to 375×10^6 yr ago. Structural relationships on the Isle of Man[19] show that the Dhoon granite post-dates the first (F_1) movement phase and was intruded at the beginning of the succeeding (F_2) phase. Thus the 370×10^6 yr age on