Coronal observations certainly support the possibility of X-ray flares. Dolder, Roberts and Billings[3] found that the emission of the coronal yellow line is closely connected with limb flares. The source of the yellow line is Ca XV with an ionization energy of 814 eV. Recent observations of the width of this coronal line due to Doppler broadening correspond to temperatures in excess of 5×10^6 deg. K. Analysis of the spectrum of the X-rays measured by means of rockets on July 20 indicates a 3×10^6 deg. K. source for the shortest wave-lengths.

Further experiments will be carried out during the International Geophysical Year with a ground-based rocket launcher. The 'Dan' system, a combination of 'Deacon' rocket and 'Nike' booster, will be on San Nicolas Island, about fifty miles off the coast of California. Arrangements have been made to launch these rockets without restrictions on firing times. It will be unnecessary to 'waste' rockets on flare-less days, and a dozen or more successful shoots should provide an interesting series of observations on a variety of flares of Class 2 or larger. Of particular interest would be a cosmic ray flare. The presence or absence of a hard X-ray spectrum revealed by rocket measurements at the time of flash could contribute greatly to defining the origin of the cosmic-ray burst.

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Effect of Change in Temperature on the Torsional Energy Losses in some Polyamides

The mechanical energy losses in polyamide fibres have been determined from the damping of low-frequency free torsional vibrations (frequency approximately 0·3 c./sec.) between 20° and 130° C. A graph of energy loss against temperature shows a large absorption peak at 78° C. for undrawn dry 6.6 nylon filament. As the degree of orientation of the 6.6 nylon filament is increased by drawing, the absorption peak shifts to a higher temperature and the energy losses have a higher value. Fig. 1 shows the curves obtained for filaments of different degrees of orientation (draw ratio 1 (undrawn), 2, 3 and 4). The curve of the absorption peak is approximately symmetrical for undrawn 6.6 nylon; it changes in shape when the fibre is drawn. In a recent paper, Thompson and Woods[1] reported similar results for polyethylene terephthalate for different degrees of orientation.

The absorption peak for undrawn 6.6 nylon shifts from 78° C. when the fibre is dry to 40° C. when the fibre is saturated with moisture (11 per cent).

The temperatures of the absorption peaks have been found for the dry polyamides shown in Table 1. Three samples were tested for each polyamide and the total error, including sample variation and test error, did not exceed 3° C.

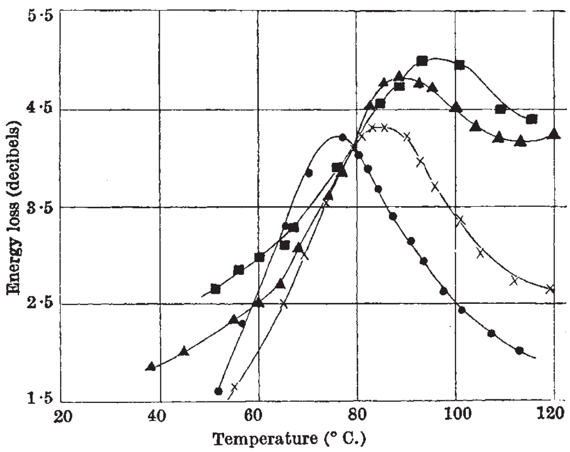

Fig. 1. Energy loss against temperature in nylon 6.6 yarns of different draw ratio: ■ draw ratio 4; ▲ draw ratio 3; × draw ratio 2; ● undrawn

Schmieder and Wolf[2] obtained absorption peaks at the temperatures shown in Table 1 using the method of free torsional vibrations. Table 1 shows that all but one of their peaks occurred at lower temperatures than mine. The discrepancies between the two sets of results may be partly due to moisture effects. Schmieder and Wolf stated that the yarns were made anhydrous before testing, but they do not mention any precautions taken to keep the samples dry during the experiment. My samples were kept dry throughout the temperature-range. Schmieder and Wolf used moulded polymer samples, not fibres, which could also be a reason for the difference in the two sets of results.

Table 1. Value of Temperatures of Absorption Peaks and Melting Points for Different Polyamides

Polyamide	Experimental values for temperature of absorption peak (C.)	Values obtained by Schmieder and Wolf (ref. 2)	
		Temperature of absorption peak (C.)	Temperature of crystalline melting region (C.)
Nylon 6.6	78 ± 1°	65°	250°
Nylon 6.8	75 ± 1°	64°	230°
Nylon 6.10	70 ± 1°	60°	220°
Nylon 6.7	73 ± 1°	58°	220°
Nylon 6	65 ± 1°	40°	210°
Nylon 8	63 ± 1°	49°	195°
Nylon 11	53 ± 1°	56°	190°

My results show that if the polyamides are grouped in order of increasing melting point, the absorption peak temperatures are in the same order. Schmieder and Wolf found that this was true for polyamides which were products of a dicarboxylic acid and hexamethylene diamine (6.6, 6.7, etc.) but not for polyamides derived from aminocarboxylic acids (6, 8 and 11).

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