

June 30

? WHY THE WEATHER ?

Dr. Charles F. Brooks,  
Secretary, American Meteorological Society  
discusses:

THE RAINBOW

Everyone knows the beautiful rainbow which appears to us on a cloud of rain-drops opposite the sun. Usually it marks the rear of a shower and a return to fair skies. It consists of seven concentric arcs which present successively the colors of the solar spectrum. Sometimes there is but a single bow, but usually there are two. The smaller is known as the primary bow, the larger, which is fainter, the secondary. On very rare occasions a third may be seen, not opposite the sun, but between it and the observer.

The colors of the primary and secondary bows appear in reverse order. In the primary, the outer or highest band is red, the interior band violet or blue. In the secondary bow, the interior band is red, the outer band violet. Rainbows vary very much in appearance. Sometimes their bands are broader than at others. On occasion all seven bands may be counted, though more often not.

Rather narrow bands of color, essentially red, or red and green, often appear, parallel to both the primary and secondary bows, never between them, but along the inner side of the primary and the outer side of the secondary. They are known as supernumerary bows. These also vary greatly in purity and color, the number visible and the width, not only between individual bows, but also between the several sections of the same bow.

The colors are due to the unequal refraction of the components of sunlight, while the appearance of these colors in bows concentric to a point opposite the sun is because of one or more reflections of the light from the inner surface of the transparent drops. The overlapping of reflections gives rise to the supernumerary bows, in which the distribution of color provides an index to the sizes of the rain-drops involved.

-----  
All rights reserved by Science Service

Science Service,  
1115 Conn. Ave., Washington, D.C.