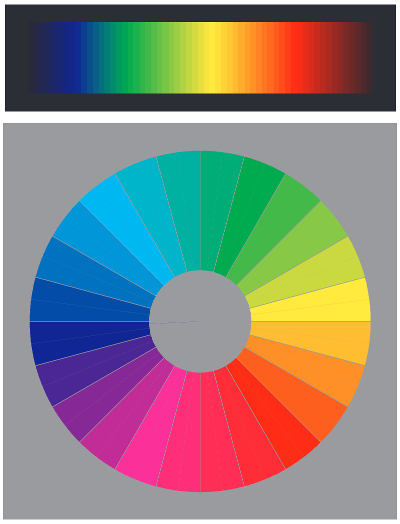

Plate 1 The spectrum and the colour circle. The spectrum is an open, linear segment. Notice how the colours merge into black at each side. The spectrum is not complete as the purples are missing. The colour circle is complete by construction. It is a closed, continuous (thus periodic) arrangement. All hues are as colourful and bright as the printing permits. The relation between spectrum and colour circle is a major topic of this chapter. (See Fig. 1.1.)

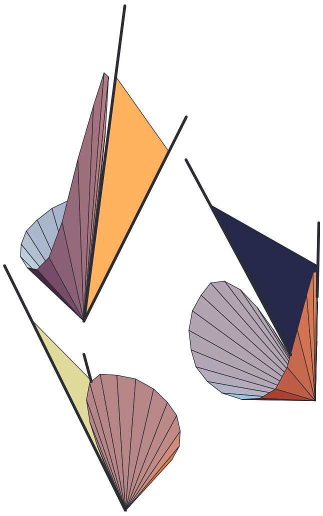

Plate 2 Some views of the spectral cone in the CIE basis. Notice the plane of purples. (See Fig. 1.3.)

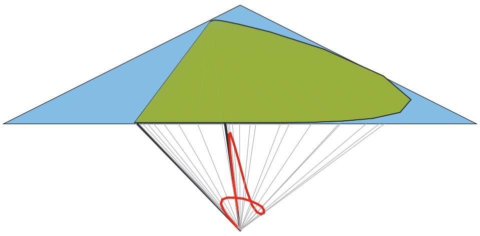

Plate 3 The chromaticity diagram. The cone of colours is projected from the origin on the 'chromaticity plane', **c**. This figure illustrates the CIE basis and choice of chromaticity plane. The red curve is the locus of the monochromatic beams of unit radiant power; it generates the spectral cone. (See Fig. 1.4.)

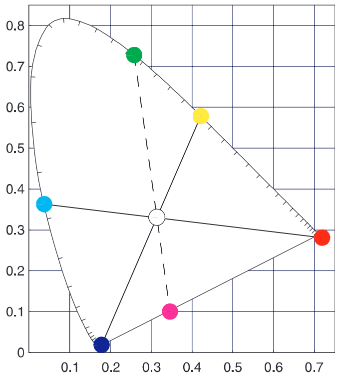

Plate 4 The CIE chromaticity diagram with several remarkable objects: the purple line with the spectral limit points, the warm–cold division on the spectral locus. The achromatic point defines the complementarities of the spectral limits and the plane that divides all chromaticities into warm and cold. All these objects depend for their existence on the introduction of an achromatic beam. (See Fig. 1.13.)

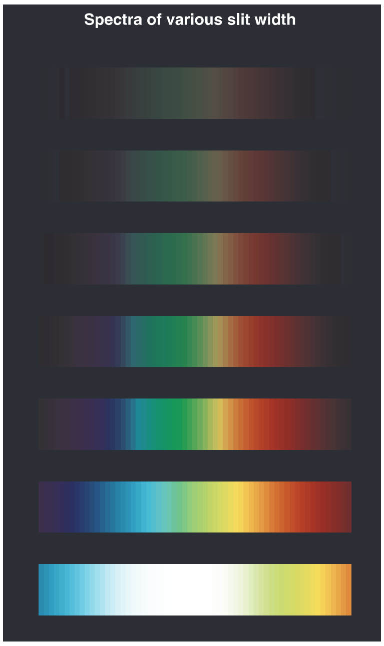

Plate 5 The Newtonian spectrum at various slitwidths. (See Fig. 1.14.)

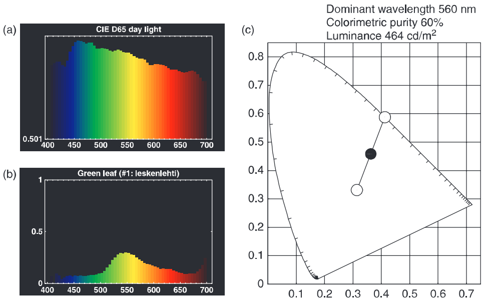

Plate 6 Example of 'Helmholtz coordinates'. The remitted spectrum of a green leaf illuminated with average daylight in the CIE chromaticity diagram. We can obtain the colour as a mixture of the achromatic beam with a monochromatic beam (indicated). The proportions are easily obtained from the chromaticity diagram. (See Fig. 1.15.)

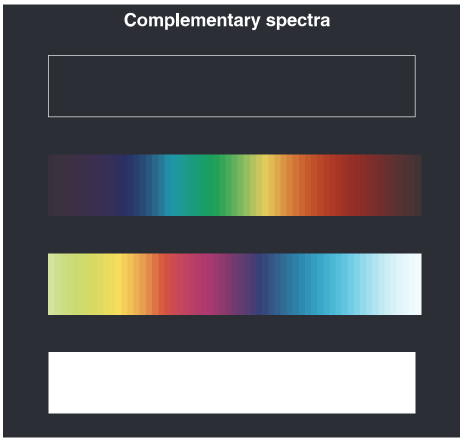

Plate 7 Newton's spectrum and the inverted spectrum at some reasonable slitwidth. Subtractive combination yields black (top), additive combination white (or rather achromatic, bottom). (See Fig. 1.16.)

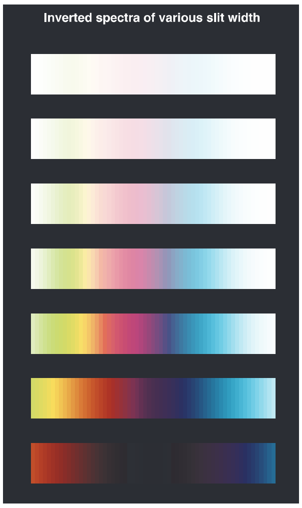

Plate 8 The inverted spectrum at various slit widths. (See Fig. 1.17.)

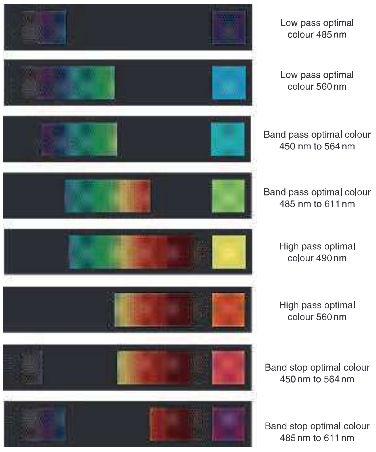

Plate 9 Some representative full colours: spectra (left) and chips (squares on the far right). (See Fig. 1.19.)

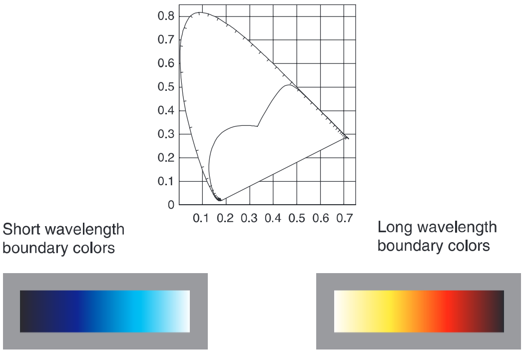

Plate 10 The boundary colours in the CIE chromaticity diagram and impressions of sequence of hues of the short wavelength and long wavelength boundary colours. (See Fig. 1.20.)

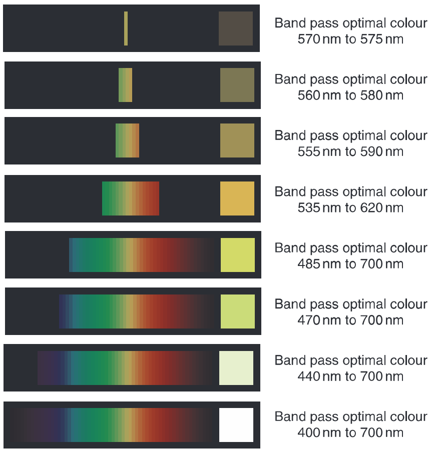

Plate 11 Spectra and samples (chips) of a ‘yellow’ paint. The difference is the width of the spectrum remitted by the paints (they are all optimal colours). When this range is very narrow, the paint appears dark brown. When it is very large (the whole visual region), the paint looks white. The ‘best yellow paint’ remits all wavelengths above 490 nm. Notice that this paint is a long wavelength boundary colour.
(See Fig. 1.22.)

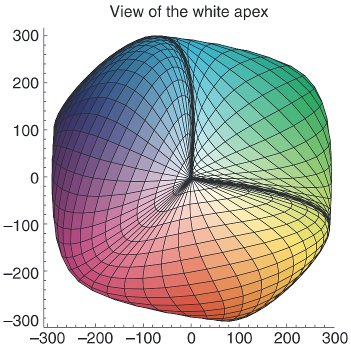

Plate 12 The colour solid in the canonical (SVD) basis. Here is a view of the white pole. (See Fig. 1.24.)

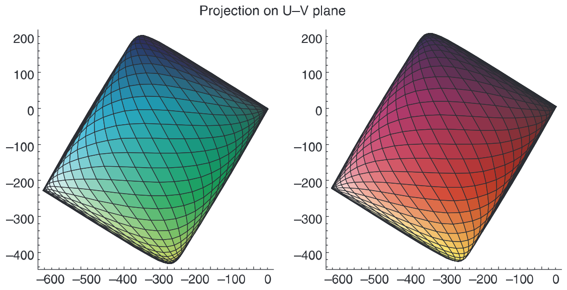

Plate 13 The colour solid in the canonical (SVD) basis. Here is a view in the direction of the third dimension. (See Fig. 1.25.)

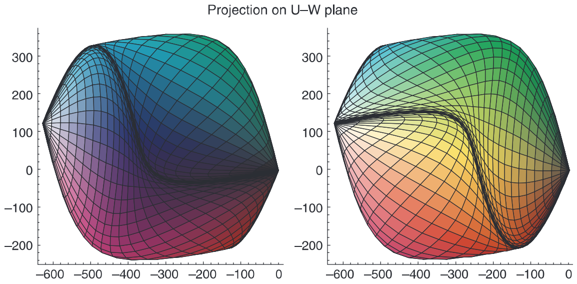

Plate 14 The colour solid in the canonical (SVD) basis. Here is a view in the direction of the second dimension. (See Fig. 1.26.)

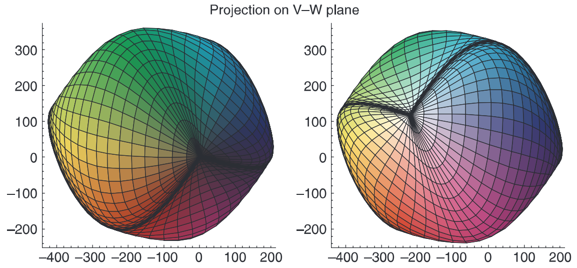

Plate 15 The colour solid in the canonical (SVD) basis. Here is a view in the direction of the first dimension. (See Fig. 1.27.)

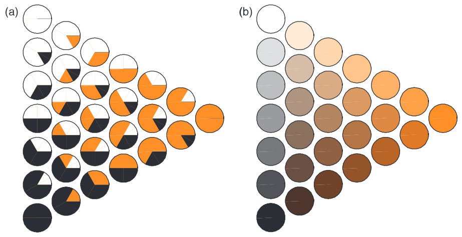

Plate 16 (a) Principle of an Ostwald page. The page consists of partitive ternary mixtures of white, black and an optimal colour. (b) The same Ostwald page as in (a), but with the white, black and colour sectors mixed (one may think of a set of Maxwell tops being spun). (See Fig. 1.28.)

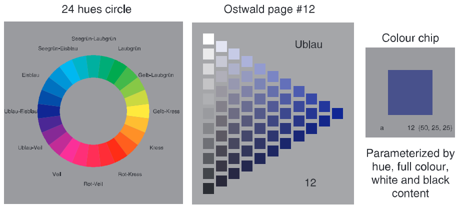

Plate 17 The basic structure of the Ostwald atlas: colour circle (mensurated set of *Vollfarben*), single page, single chip. (See Fig. 1.29.)

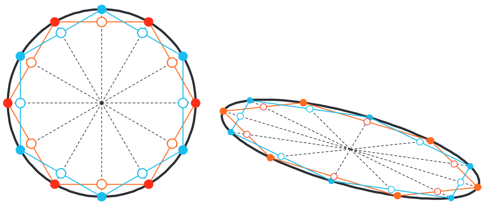

Plate 18 Ostwald's principle of internal symmetry in action. Here we have mensurated a circle and deformed it into an ellipse. The ellipse is automatically mensurated because Ostwald's principle is affinely invariant. (See Fig. 1.30.)

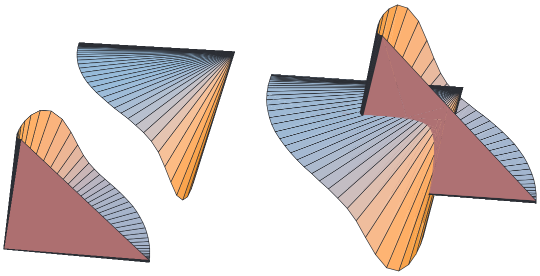

Plate 19 How the spectral cone and its complementary image (inverted spectral cone at the white point) define a double conical volume in C. (See Fig. 1.31.)

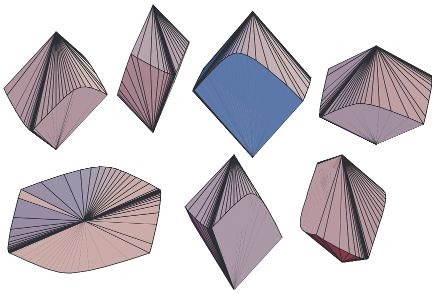

Plate 20 Various views of the intersection of the spectral cone at the black point and the inverted spectral cone at the white point. The sharp edge (equator) is the locus of characteristic colours. Notice that the overall shape is strongly determined by the (flat) purple sector and its inverted copy. (See Fig. 1.32.)

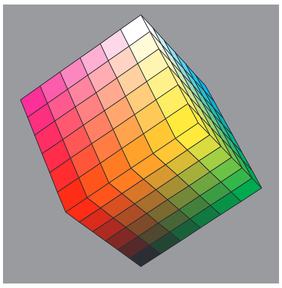

Plate 21 A generic view of the RGB-cube. (See Fig. 1.35.)

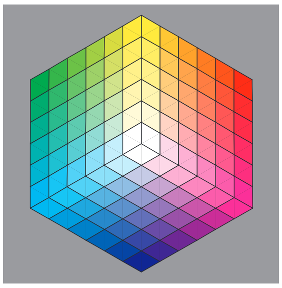

Plate 22 A view at the white pole of the RGB-cube. (See Fig. 1.36.)

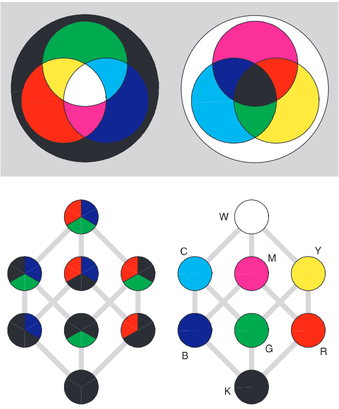

Plate 23 Tricolour spot diagrams for subtractive (top left) and additive (top right) colour mixture. At the bottom, the Hasse diagram of spectral dominance, on the left with the RGB contributions explicitly drawn, at the right with the hues indicated. (See Fig. 1.37.)

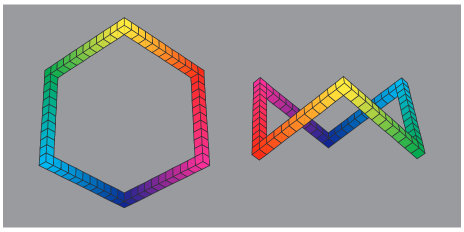

Plate 24 Two views of the locus of full colours on the RGB-cube. (See Fig. 1.38.)

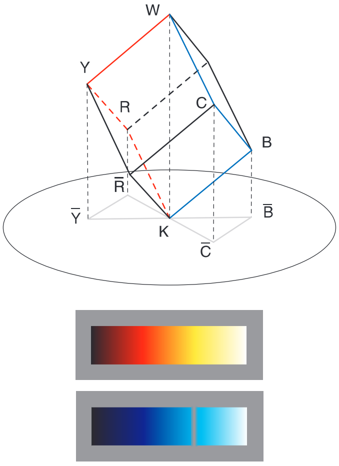

Plate 25 The loci of boundary colours on the RGB-cube with sequences of boundary colour hues. (See Fig. 1.39.)

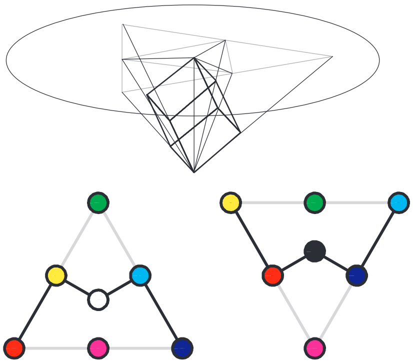

Plate 26 The RGB chromaticity diagram. The boundary colour loci are plotted in the RGB colour triangle and in the complementary (inverted) triangle. (See Fig. 1.40.)

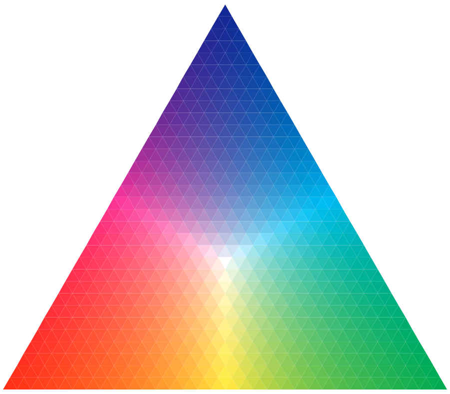

Plate 27 The RGB colour triangle. At each chromaticity we have plotted the brightest RGB colour. (See Fig. 1.41.)