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POLARISATION

Electromagnetic waves in general and light in particular consist of two "vectors", electric and magnetic, oscillating in mutually perpendicular directions which are themselves perpendicular to the direction of propagation of the wavetrain. (fig.1.)

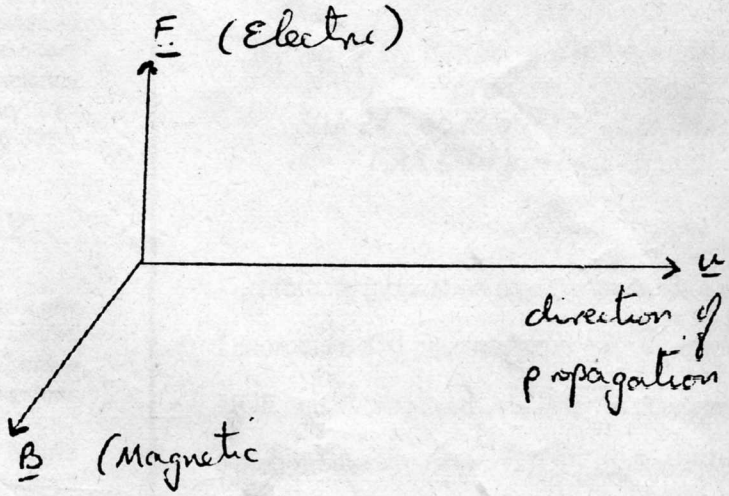

Fig.1.

In an ideal monochromatic wave, the wavetrain is infinitely long and the planes of oscillation of the electric and magnetic vectors are time independent. However, light waves in general consist of a superimposition of several wavetrains each of whose electric and magnetic vectors oscillate in a different plane. The structure of the resultant wave can be determined by a process of combination of the characteristics of each of the component waves; in particular its plane of oscillation can be determined by vector additions of the planes of its component parts. This particular property of light is known as polarisation and by definition, and general concensus, the plane of oscillation of the electric vector is known as the plane of polarisation.

In any complex wave, made from a superimposition of simpler waves, four types of polarisation are found: linear, circular, elliptical and unpolarised.

Consider two waves whose planes of polarisation are mutually perpendicular with electric vectors E_1 and E_2. The resultant electric vector, E_R, of the wave will be the vector sum of the vectors of the individual waves (fib.2.)