

4. *The Photographic Camera*, the Optical Lantern, the Refracting Telescope, the Opera Glass, the Prismatic Binoculars, the Reflecting Telescope.
5. *The Compound Microscope*. Consists of two specially designed converging lens systems, the objective and the eyepiece. Functions: objective produces real enlarged image at distance 16 cm. (optical tube length) from focus; eyepiece produces virtual enlarged image of first image at 25 cm. from its eye end. Resolving power limited by nature of light.
6. *The Ultra Microscope*.

LECTURE L.

Spectroscopy: the analysis of light.

1. Light composite, consisting of different wave lengths. Components separated by refraction.
2. *Spectroscopes*. Consist of (a) a dispersing system (one or more prisms of glass), (b) a focussing system (slit and collimator placed before (a) and a telescope placed after it), (c) a subsidiary scale for making records. Optical diagram of typical system.
3. *Spectrum* of light entering slit consists of row of virtual images of slit, one image corresponding to each constituent. Classes: (a) emission, line, fluted, continuous; (b) absorption. Typical examples.
4. *Solar spectrum*. Fraunhofer lines; situation of principal lines. Reversal experiment.
5. Illustrations and applications.

LECTURE LI.

Polarisation of Light.

1. Vibration form of particles propagating waves.
In plane polarised light all vibrations take place in parallel straight lines which are at right angles to the rays.
Mechanical wave model, waves on strings.
2. *The Nicol prism*: transmits only vibrations parallel to one plane, *i.e.*, polarised light; can be used to test light for polarisation.
3. Other polarisers: natural crystals, reflection, small particles (sky light, the Tyndall experiment).
4. *Rotation of the plane of polarisation*, by quartz, sugar solutions, organic liquids.
Saccharimeter consists essentially of two Nicol prisms (a polariser and an analyser). To measure rotation determine vibration direction of analysed light before and after inserting substance between analyser and polariser; the analyser is rotated through the required angle.