

a left-handed specimen) if either the analyzer or the polarizer be rotated. A slice of quartz about 4.3 millims. thick produces a single band. One of 8.6 millims. produces two bands at once in the visible spectrum, the number of bands being proportional to the thickness of the crystal.

Now suppose a mechanical contrivance by which both the analyzer and the spectrum can be rotated at the same velocity. A direct vision prism attached to the front of the Nicol prism realizes the optical portion of this combination. There will be seen on rotation a circular spectrum, having either red or violet at the centre and either violet or red at its outer circumference. Now since the dark band spoken of is displaced by a quantity proportional to the amount of rotation, interference will take place in this circular spectrum along points which form geometrically a spiral of Archimedes. The persistence of impressions on the retina will enable this dark spiral to be seen in its entirety, provided the rotation be sufficiently rapid. If a thicker piece of quartz be used, giving two, three or four dark bands, the rotation-spectrum will present a most beautiful appearance, being crossed by a two-branched, or three-branched, or four-branched spiral, the separate lines of which proceed from the centre to the circumference. The sense of these dark spirals will change with the sense of the impressed rotation. The effects, says *Nature*, are very striking.

Apparatus for Raising Water by Compressed Air.—Fr. Honigsmann connects a series of casks, at various heights, so that the water is forced from cask 1 into cask 2. The expanding air drives the water from cask 2 into the higher cask 3, from cask 3 into cask 4, and so on until the elastic force of the air is entirely exhausted.—*Dingler's Journal*. C.

Flow of Compressed Air in Tubes.—M. E. Stockalper, the chief engineer at Goeschenen, has published the result of experiments made in the tunnel of St. Gothard upon the flow of compressed air in long metallic pipes, for the transmission of motive force. The special and very favorable conditions for performing the experiments, upon a scale which had been previously impossible, entitle his work to great consideration. His pipes were 5122 metres (3.17 miles) long and two decimetres (7.874 inches) diameter, and his results differ a little from those of previous observers.—*L'Echo Industr.* C.