

AN APPARATUS FOR OPTICAL STUDIES
TO VERY HIGH PRESSURES

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Equipment has been developed which permits the observation of the effect of pressure on optical phenomena at least to 200,000 atmospheres pressure. The apparatus is in two stages, one of which is operable to 60,000 atmospheres while the second is used in the higher range. These are described as Cell I and Cell II below.

Both cells use an alkali halide (normally NaCl) as a pressure transmitting "fluid", and NaCl windows. Although sodium chloride has a relatively low shear strength and is effectively a fluid at very high pressure, it is a very viscous fluid. When fused in a long narrow hole by the repeated application of 30,000 - 40,000 atmospheres pressure at both ends, it is not extruded for a very long time even under the action of 60 - 80,000 atmospheres pressure. Using relatively intense light sources many optical and spectroscopic observations can thus be carried out on a sample at high pressure.

Cell I

The outer steel jacket (B) is AISI 6150 steel hardened to 46-48 Rockwell C. The inner cell (A) is made from Solar steel hardened