The Distribution of Offset Litho Inks.—Offset litho inks are not only reduced to thinner final films (down to 1 μ) but have to provide for the extra transfer process, plate to blanket. These factors necessitate the greatest possible concentration of coloured pigment with the added proviso that the penultimate ink film must not absorb more than a certain maximum quantity of water. The lithographic process depends ideally upon a perfect interfacial balance between ink and water, but, perfection being impossible, the lesser of two evils is chosen, *i.e.*, rather than risk permanently ruining a plate by wetting it with oil, an ink which is slightly water absorbent is preferred.

The absorption of water augments the disperse phase of the ink, which, for reasons stated above, is already of high concentration, and can easily be increased to the point where distribution becomes sluggish. *This point will depend upon the job being printed*—the amount of work on the plate, its distribution, speed of press, absorbency of paper, amount of driers, etc.—and there is no yardstick to determine the degree of water resistance necessary. The widespread use of fats and waxes in offset inks represents the printer's attempt to adjust the water absorbency to meet each specific case.

THE IMPRESSION: THE FINAL FILM TRANSFER

The final transfer of ink from printing surface to paper in all commercial processes is accomplished by means of pressure, which may vary from about 10 tons to the square inch in the case of copperplate printing to the "kiss" impression of flexographic printing. The final forces on the ink film are therefore heavy pressure against a porous surface followed by a tension sufficient to split the ink film. The applied mechanical forces are only different quantitatively from those operative in a distribution system, and in

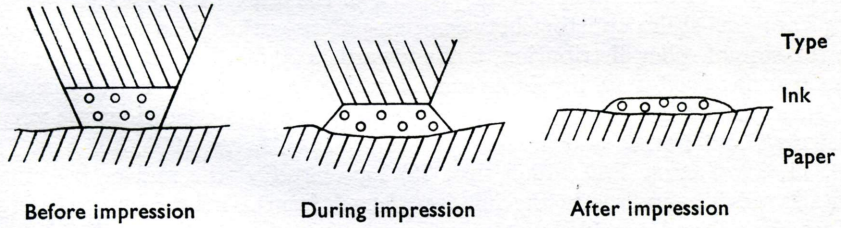

Fig. 8.19—Changes in an ink film during impression (diagrammatic).

printing on non-absorbent surfaces the final film splitting is quantitatively similar except for some lateral flow of ink under pressure between the two impervious surfaces.