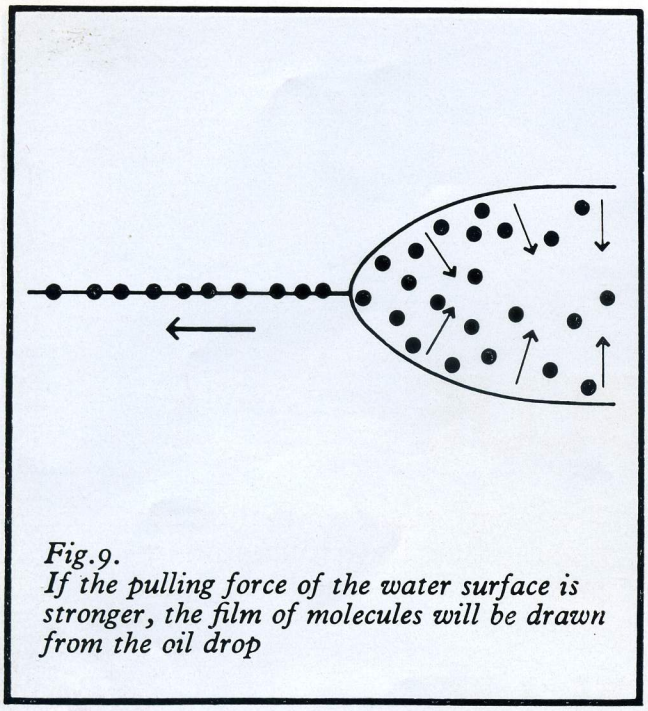

Fig.9.
If the pulling force of the water surface is stronger, the film of molecules will be drawn from the oil drop

desensitised. If the pH falls below 4 the protective films on the plate's surface will begin to dissolve and the plate will only be kept clean by a process of continuous corrosion of the exposed metal surface. This chemical attack can undermine the printing areas, causing the image to sharpen and eventually the plate is likely to go 'blind'. Some of the fountain solution tends to transfer on to the paper being printed so as the pH of the fountain solution becomes lower it will have the same effect as an acid paper, giving an increasing risk of delayed ink drying. If the pH rises above 7 it will be easier for the ink to emulsify in the water to give tinting. The desensitised layers on the plate can also be destroyed in alkaline conditions. On anodised aluminium plates the oxide layer, which helps to keep the non-printing areas water accepting, can be destroyed at a pH above 9. Lithographic plates are prepared to have clearly defined image and non-image areas. Fountain solutions with a pH below 5 and above 7 have a tendency to destroy this definition.

BB One sometimes hears the idea that fountain solutions should be composed of pure water. Is this so, or should the fountain solution be specially formulated? If a special formulation is required, how would one go about preparing such a solution?

Banks Using modern anodised plates, where it is unlikely that the ink will spread, one may be able to use pure water provided the machine is so perfectly adjusted that the plate does not suffer mechanical wear, and also provided that the paper does not contain any chemicals likely to sensitise the plate. These conditions can rarely be guaranteed and, while it is undesirable to use acidic etches in the fountain, the adoption of desensitisers like gum arabic can be regarded as an insurance against unpredictable hazards. Recent work has also shown that the surface tension of the fountain solution should be carefully adjusted. During printing the non-image areas on a litho plate always carry a layer of water. Sometimes an oil film, one molecule thick, spreads from the ink over the water layer. If during a short stoppage the water evaporates from the plate, the oil film comes into contact with it. The oil molecules tend to congregate on the peaks of the plate grain and when printing recommences they will pick up ink and cause scumming. The normal precaution is to gum up the plate at the start of a stoppage. When this is done the oil layer stands on the gum instead of on the plate surface and is removed when the gum is washed off. It is possible to formulate a fount solution and adjust its surface tension so that the spread of oil molecules across the non-image areas is prevented. Pirafount was formulated to take into account these recently discovered ideas.

BB How important is ink formulation in lithography?

Cross-section of plate treated with etch, which is used in the last stages of platemaking