invaders easily revealed, but the density of the infection and their exact positioning within the SC can also be studied. When the SSB is stained with periodic acid Schiff reagent, an excellent view may be obtained of ringworm fungi, pityriasis versicolor, candida species and the erythrasma micro-organisms (Figs. 3, and 4). The taking of the SSB and its subsequent staining is somewhat easier to perform and the micro-organisms are easier to see than routine skin scraping and potassium hydroxide 'clearing'. It is my preferred diagnostic technique for suspected ringworm. If for some reason a higher magnification is needed with a more detailed view of the relationship between the micro-organism and the SC then scanning electron microscopy (SEM) can be employed. The SSB on the microscope slide is broken so that a small section bearing the actual sample can be stuck to an SEM stub before it is 'coated' with gold and then viewed in the SEM.

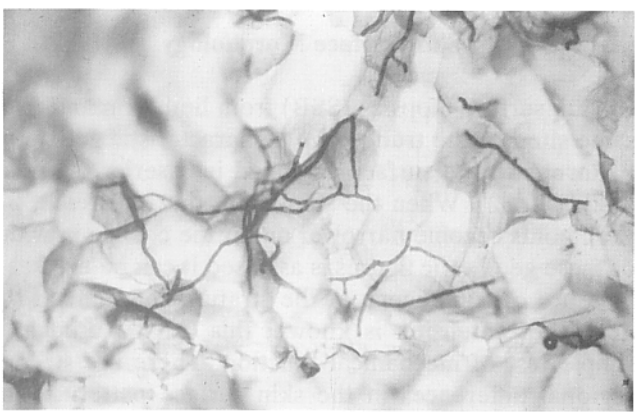

Fig. 3 Photomicrograph of skin surface biopsy stained by periodic acid Schiff reagent showing mycelium from ringworm (×50).

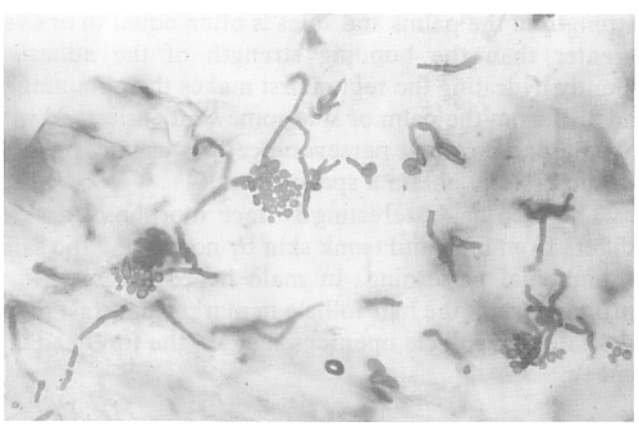

Fig. 4 Photomicrograph of skin surface biopsy stained with periodic acid Schiff reagent to show pseudo mycelium and clusters of spores from lesion of pityriasis versicolor (×50).

Histochemistry

The SSB technique can be adapted to a variety of histochemical applications.[5] Amongst the simplest of these is visualisation of melanin particles with silver stain. This is of major use clinically when there is some doubt as to the nature of a patch of brown/black pigmentation. Silver staining will show abundant black melanin particles while staining with potassium ferricyanide (Prussian blue reaction) will show bluish clumps with blood pigments.

Sebum can be demonstrated using lipid stains and it is possible to produce a rough estimate of the rate of sebum secretion using this technique. At the start of the investigation the forehead is washed and wiped clean with a lipid solvent–alcohol swabs are suitable for the purpose. Then an SSB is taken from one side of the forehead and 30 minutes later another is taken from an adjoining site. At one and two hours other SSBs are taken from other sites across the forehead. All the SSBs are then stained together for the same length of time with a lipid stain such as Sudan red. The density of the lipid staining material and its diameter is an indication of the amount of sebum secreted during the interval between wiping the forehead clean and taking the SSB.

Sweat can also be detected by treating the SSB with one of the reagents that reveals its presence. The SSB specimen is taken at a defined time after cleaning and drying the site and then stained with starch-iodine, orthophthalaldehyde or another of the sweat revealing substances. This can be useful to check for the adequacy of therapeutic manoeuvres to stop excess sweating.

Staining the SSBs with haematoxylin and eosin shows up nuclei in parakeratotic SC. This can have diagnostic importance in distinguishing psoriasis from chronic eczema—the latter not having polymorphs within the SC. It can also be useful in confirming a diagnosis of solar keratosis as the presence of abnormal nuclei is characteristic of dysplasia.

A variety of enzyme histochemical tests have been used on SSBs, most of these having a research application. For example, it has been possible to study the metabolism of various dermatophyte fungi present in SSB samples using enzyme histochemical reactions such as lactic dehydrogenase. This is not quite such an esoteric exercise as it may sound as the mode of action of antifungal agents can be checked in this way.

Studies of Percorneal Penetration

The rate of movement of topically applied drugs into the skin can be measured using the SSB technique.[6–8] It is convenient to use a radiolabelled drug so that