carcinoma."[1] Older pathologists may remember a report by Dukes and Masina entitled, "Classification of Epithelial Tumours of the Bladder" in which they not only had a category of transitional cell carcinoma with metaplasia, separate from transitional cell carcinoma and pure squamous cell carcinoma, but they drew attention to its common association with rapidly growing tumours of a relatively high grade of malignancy.[2] Nevertheless, I do think that periodic reiteration is worthwhile, and it has been 40 years.

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Hodgkin's disease presenting with hypercalcaemia

Mayne and Bunch reported a case of Hodgkin's disease presenting with hypercalcaemia.[1] We also report a patient in this relatively rare category of hypercalcaemia in lymphoma.

A 67 year old retired miner presented as an emergency admission with shortness of breath and chest pain radiating to the shoulders. He also complained of backache, difficulty in walking, and weight loss. He had chronic faecal fistulae following diverticulitis and peritonitis five months earlier.

Haemoglobin concentration was 11·2 g/dl and erythrocyte sedimentation rate 102 mm in the first hour. Chest *x*-ray picture and lung scan showed no focal abnormality. Cardiac enzymes, plasma amylase, and electrolytes were all normal. The chest pain, thought to be of musculoskeletal origin, quickly resolved and he was discharged after a few days on codeine phosphate.

Three weeks later he was readmitted with similar symptoms. Examination showed bronchopneumonia and dehydration. The plasma electrolyte concentrations were as follows: sodium 138 mmol/l, potassium 2·3 mmol/l, chloride 92 mmol/l, and bicarbonate 34 mmol/l. Creatinine concentration was 142 μmol/l and urea 13·1 mmol/l. Haemoglobin concentration was now 10·9 g/dl, red blood cell count $4·1 \times 10^{12}$/l, alkaline phosphatase activity 409 IU/l and gamma glutamyl transferase (GGT) 183 IU/l. He was treated with rehydration and calcitonin (320 U/12 hours). Two days later he became very breathless and his general condition continued to deteriorate. The following day he died.

Necropsy showed that he had an enlarged spleen (200 g) and liver (1700 g), both with numerous small deposits of tumour (about 0·5 and 1·0 cm, respectively). Sections of these organs showed nodules of large cell non-Hodgkin's malignant lymphoma. The cause of death was recorded as bronchopneumonia secondary to non-Hodgkin's malignant lyphoma in addition to chronic diverticular disease with fistulae.

Like the case of Mayne and Bunch[1] our patient with Hodgkin's disease presented with hypercalcaemia but without clinically apparent bone disease. Skeletal metastases were not apparent and none was found at necropsy. Raised plasma alkaline phosphatase activity probably reflected hepatic disease rather than bone disease as GGT activity was also increased.

The hypercalcaemia in our patient did not respond quickly to treatment. Little could be done as his general condition rapidly deteriorated in association with the bronchopneumonia and diverticular disease.

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Immunohistochemical identification of bacteria in tissue sections

In their paper on the immunohistological demonstration of *Salmonella virchow* Bignardi and Khong state that they are not aware of any reports describing the identification of bacteria in routinely processed human tissue sections using the immunoperoxidase method.[1] We reported the identification of group B streptococci in necropsy material in *The Journal of Clinical Pathology* using the immunoperoxidase technique with both monoclonal and polyclonal antibodies.[2] The latter was serum used for routine serology in microbiology laboratories. The technique has also been used for the identification of *Leptospira*, *Mycobacterium leprae*,[4] and *Chlamydia trachomatis*.[5]

We have also used rabbit antiserum raised against *Listeria monocytogenes* types 1 and 4 to stain this organism in human formalin fixed tissue. A section of meninges from a woman who died with an *L monocytogenes* type 1 meningitis was stained with immunoperoxidase. The paraffin wax embedded section was stained using the peroxidase-antiperoxidase technique; the serum was diluted 1 in 100 and incubated for 30 minutes. The serum was specific for species but did not distinguish between types.

We are concerned that Bignardi and Khong did not test their serum against other organisms as it is quite possible that the antiserum used would also react with other species of *Salmonella* and maybe other Gram negative organisms such as *Eschericia coli* as well. We feel that it is important to show the specificity of sera used for microbial identification by testing it against other organisms as we have reported.[2] Because of the potential cross reactions between bacteria it is desirable to use monoclonal antibodies when possible.

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Drs Bignardi and Khong comment:

Drs Feldman and Salisbury criticised us for not testing our anti-Salmonella O6·7 serum against other organisms, but what we used belongs to a panel of sera (Central Public Health Laboratory, Colindale) which is widely and successfully used in this country for the identification of *Salmonella* serotypes. Using a slide agglutination technique intra- and interspecific cross reactions can certainly occur, though they are not likely to persist if a tube technique with multiple dilutions down to the expected titre is attempted. While some cross reactions are well known, such as that between group B salmonellae and *Yersinia pseudotuberculosis* serogroup II and that between group D salmonellae and *Yersinia pseudotuberculosis* serogroup IV, other possible cross reactions have attracted less attention. All practising microbiologists recognise these problems so that the identification of *Salmonella* isolates is never based on seroagglutination alone but on a combination of seroagglutination and biochemical testing.

We would agree that some monoclonal antibodies might produce better immunohistochemical staining, but we do not think that this would eliminate the problem of cross reactivity which may be due to close affinity or identify among antigens carried by strains belonging to different and even completely unrelated bacterial species. Feldman and others tested their monoclonal antibody against a few other strains.[1] We think that this might give a sense of false security and that it would be much better to identify clearly what is one's target. In the case we described, *Salmonella virchow* was isolated from necropsy specimens and identified according to conventional microbiological criteria. The purpose of the immunoperoxidase staining was not to identify an unknown pathogen but to assess which organs had been involved.

We are sorry to have overlooked the work of Feldman and others,[1] but their use of a commercially available polyclonal antiserum is not apparent from the title of their article. The quotation of the other three reports[2-4] is inappropriate as these authors seem to have used only purposely produced antisera. Feldman and Salisbury seem to have missed our point. The production of antisera is beyond the scope of the average diagnostic laboratory, but we showed that an easily available polyclonal serum can be used to identify the site of infection when routinely processed tissue is available and the infectious agent has been identified by conventional methods.

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Value of throat swabs in meningococcal meningitis

We were interested to read the article by Cartwright and Jones on the investigation of meningococcal disease, in particular their discussion of the value of throat swabs as an aid to diagnosis.[1]

Patients with meningococcal meningitis have often (quite correctly) received antibiotics before being admitted to hospital. In anticipation of negative cerebrospinal, blood (and throat) cultures from the patient, an "epidemiological" approach using throat swabs from contacts has sometimes been used to attempt to identify the infecting strain.

Cartwright and Jones point out that as many as 25% of young adults are likely to carry meningococci in the throat, suggesting a very poor predictive value of an isolate from a contact. We have confirmed this by looking back at our cases of confirmed meningococcal meningitis over the past three years in which contacts also had throat swabs taken (table).

Of the five cases of confirmed meningococcal meningitis in which contacts also carried a meningococcus in the throat, the organisms were indistinguishable in both index case and contact on only one occasion (case 3). Furthermore, in this instance another close contact was carrying a completely different meningococcus.

This pronounced lack of correlation between organisms causing meningococcal disease and those carried by close contacts suggests that the practice of taking throat swabs from contacts as an aid to diagnosis is of no value.

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Reference

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Table *Comparison of isolates of meningococci from cases and contacts*

Case no	*Isolate from patient*	*Isolate from contact*
1	Group C NT	a) Group B NT b) Group B15 P1 16 c) Group NG
2	Group C 2a P1 15	a) Group B NT
3	Group B4 P1 16	a) Group B4 P1 16 b) Group NG NT P1 15
4	Group B NT	a) Group B4 P1 15
5	Group B P1 16	a) Group NG 4 P1 15 b) Group B 2b

Book reviews

Perfecting the World. The Life and Times of Dr Thomas Hodgkin 1798–1866. Amalie M Kass, Edward H Kass. (Pp 642; £24·50.). Harcourt Brace Jovanovich Ltd. 1988. ISBN 0 15 171700 1.

Thomas Hodgkin had powers of penetrating observation which put him ahead of most of his generation yet history has failed to acknowledge this. When the Governors of Guy's Hospital, led by their Treasurer, rejectd Hodgkin's promising canditature they initated his belittlement by history as well. Now we have the benefit of the authors' knowledge of medicine, history, and importantly, of Quaker conviction to present a new biography of Thomas Hodgkin, a man hitherto little known other than by the diseases called after him. Hodgkin was an observer of clinical and pathological medicine second to none and his students knew this, as did his distinguished colleages Addison and Bright.