Conclusions

Apart from skin tumours cancer at other sites in the head and neck is uncommon and is seldom seen by general practitioners or dentists. It has an excellent prognosis at most sites if diagnosed early and when confined to its tissue of origin. Metastasis tends to be late, regional, and above the clavicles. Careful attention to persistent symptoms and clinical vigilance at routine examinations is essential. If in doubt about any lesion there is no place for a wait-and-see policy. Speculative treatment with antibiotics or other medication can give a false sense of security. If the lesion does not resolve rapidly and completely suspicion must remain high and further investigation be initiated without more delay.

When a diagnosis of cancer is probable the fate of the patient may depend literally on the initial pattern of referral. Fortunately an increasing number of surgeons in the larger centres of population today have special training and interest in this complex field. They exist to provide the best service, and they should be used.

Hospital Topics

Growth of medical laboratory work during 1920-2000

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Summary

The volume of work carried out by pathology departments has grown exponentially since they were first opened, and this is likely to continue to the end of the century. Computer diagnosis may modify the process.

Introduction

The growth of hospital pathology departments since their establishment in the first half of this century has been persistent and is likely to continue to the end of the century. The increase in work undertaken in the Beverley District (fig 1) is probably typical and is described here.

Pathology work has been recorded in different ways in different decades (fig 2), and all are imperfect measures of output, effort, or utility, depending on one's objective. (The DHSS, as I see it, wants man-hours of output—the "load"—to set beside the man-hours it pays for.) Nevertheless, the figures we have are reasonable measures of change in output and, broadly speaking, reflect experience. During the early decades the work of this area was carried out at Hull Royal Infirmary, and for that period I have taken, on the basis of population, one-sixth of the work of Hull Royal Infirmary as being for the Beverley District. Much searching of records disclosed runs of years of fairly reliable and intrinsically comparable figures. Plots of these runs were lined up on a graph. Overlapping records of work—that is, those given in two ways—allowed some checking of these changes. Moreover, we have locally some good memories that span the period.

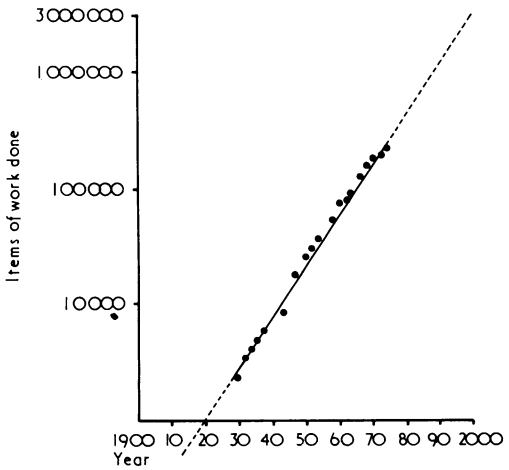

FIG 1—Increase in pathology work in Beverley District, 1920-2000.

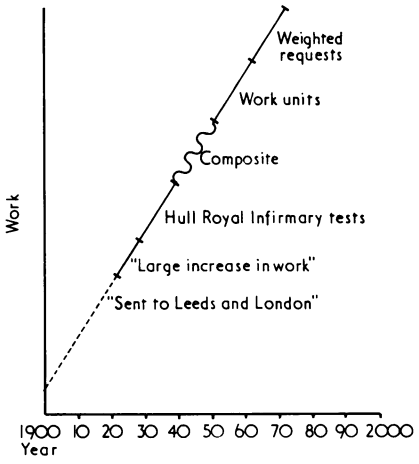

FIG 2—Sources of data.

Past growth

The laboratory at Hull Royal Infirmary was started in 1922 "by a donation from Thomas Bailey," and no longer were "specimens sent to Leeds and London." In 1925 an extension was opened "to deal with the large increase in work." In 1929 the annual report gives the numbers of tests done (along with "the egg appeal has reached £54 000," and "the potato growing

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competition has been started"). Interestingly, when the laboratory at Hull opened the *x*-ray department had been in existence for some 20 years.

Costing was accomplished by essentially armchair calculations. The staff numbers and grades at different points were recalled and they were allotted contemporary pay, this being the largest item. The same was done for equipment. Such approximation may still serve where virtually only large changes matter.

Growth rate varies, of course, between departments (biochemistry high, histopathology low), and some activities lessen (diphtheria swabs) while new ones arise (transfusion). In our case, as specialised laboratories have opened in adjoining areas, so categories of work have been transferred to them—for example, syphilitic serology, cytology, and calcium studies. At the same time we have accepted work from the adjoining areas—for example, renal biopsies, fat biochemistry, and screening for phenylketonuria. The sum effect of these changes, in our case, is to render the curve less steep than if the laboratory had continued to be a self-sufficient island.

Pathology laboratories began to open in non-teaching hospitals in the 1920s, and the need for the rest of the country to be levelled up to the privileged became clear. By the end, in 1950, of the Emergency Medical Service expansion under Professor Panton and the start of the National Health Service the country was, I suppose, essentially levelled up. Yet pathology work continued to grow. The increase has been sustained and exponential, doubling every seven years. Throughout this period one has heard from clinicians "this increase cannot go on," but it has. It became apparent that laboratory staff not only carry out tests requested but also invent new ones. Moreover, the demand they generate by a day spent inventing a new test magnificently exceeds the demand assuaged by a day spent doing an old one.

Others have reported on the growth of laboratory investigation generally in one branch such as biochemistry or over a part of the laboratory history.[1-3] It has been broadly similar to that reported here. Since a world war made the curve no more than hiccup, neither, surely, will a national slump or other outside force. As I see it this relentless invasive growth will be halted either by the emigration of staff to pleasanter pastures or, more sensibly, by the clinician who clearly delineates work that is not needed.

Future growth

Let us, therefore, suppose that the curve of work will continue until 2000. Is the cost sustainable? (fig 3). At the point 2000 the work undertaken will be 12 times the present level. The proportion of the gross national product (GNP) and the man-in-the-street's pay going to it, however, will increase much more slowly. Now the cost of the growth of pathology is, in essence, recouped by a gain from better and quicker diagnosis. This pathology cost is small when compared with the clinical cost and the cost to the community of absence from work or inefficiency at work and the load put on others in the community. Thus higher pathology cost could, I imagine, be readily balanced by a saving to the community and a reduced level of bed occupancy. In this regard, the average length of stay of an inpatient at Hull Royal Infirmary has, during the life of its pathology department, dropped from 21 to 11 days (post hoc ergo propter hoc?). Thus there is no financial veto on the expansion continuing.

The figures say nothing about where the work will be done in 2000. Is it all to be done in Eurolab at Strasbourg, collected by rocket-pack to overflying Section 8 (Britain) swallowplane at 0900, with reports outprinted on ward and health centre case notes at noon, along with updated diagnoprobabilities? Or will much work be done in peripheral, 100-bed community hospitals offering a human pathology presence to the clinician and the patient. In my view the correct solution lies in encouraging evolution in both directions, central specialisation plus certain intelligent field workers.

As an immediate objective it might be wise to plan laboratory (and other) specialisation by area (1×10^6 people) rather than district and at the same time retain a laboratory presence at district and other principal hospitals. There must be face-to-face consultation, if need be by videophone. While big, in pathology, is certainly not beautiful, growth will continue and be the better for being anticipated.

I should also like to see, say, 0·0001% of the GNP spent on finding out if it is all worth it. The way to do this, it seems to me, is by furthering computer diagnosis. The well-informed computer will achieve significant diagnosis with a shorter request list, and so the up curve of work will flatten.[4-7] Computer diagnosis has already been shown to be practicable and advantageous to the patient and to save money. Moreover, the clinician's diagnosis experience gained in computer dialogue is to a useful extent carried on to other situations.

As such streamlined investigation develops it may be wise to allow some redundancy in test and observation. As is the case with genes, where reduplication and redundancy is rife, this will allow plenty of room for random and intuitive new finds and so for knowledge to evolve. This in turn will draw men of imagination to where they are needed to add the diagnosis to the man; the man who, by so many variables, is unique and virtually unprogrammable; to where the mind of man must study man.

I am indebted to chief technicians Mr A Manby and Mr H Warley. I should also like to thank Mr F T de Dombal for advice on computer diagnosis, Dr T W G Kinnear and Dr P E McGill for helpful comment, and Mrs E Gray for her years of record keeping.

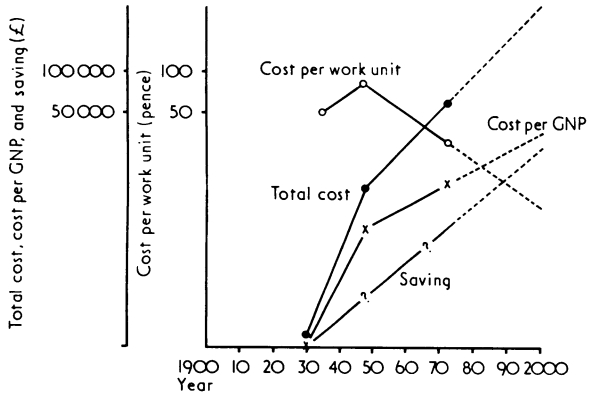

FIG 3—"Total cost" is a guesstimate made at three points at 1973 values. "Cost per GNP" (gross national product) is expressed as a ratio, and the GNP itself is taken (with doubt) as expanding each 10 years from 1·0 to 1·33. "Saving" is a guess of what, in the absence of laboratory investigation, it would cost in loss of productive life and labour and in maintenance of the sick, maimed, and dependent.

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A patient on propranolol 120 mg daily complains of excessive watering of the eyes on any slight stimulus. Does propranolol have any adverse effect on the eyes?

Dryness of the eyes with hyperaemia of the conjunctiva has been described in a patient treated with propranolol,[1] but I have not encountered any case of excessive watering, so that it would be wise to look for some other cause for the symptoms in this case.

1 Cubey, R B, and Taylor, S H, *British Medical Journal*, 1975, **4**, 327.