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Drs Rigaud and Bogomoletz comment:

We thank Dr Harach for his comments on our recent paper. Firstly, we would like to emphasise that the aim of our study was to draw attention to pitfalls in mucin histochemistry when applied to thyroid tumours, in terms of methodology and interpretation. We only raised the possibility that "positive" staining, obtained with conventional histochemical methods for mucins, may be due to naturally occurring carbohydrates (from thyroglobulin or colloid). We did not refute the alternative that genuine mucin production could also take place in some thyroid neoplasms, through dual differentiation for instance. Obviously, solid cell nests derived from the ultimobranchial body could account for still another mechanism of true mucin secretion in thyroid tissue, as suggested by Dr Harach in his letter.

Secondly, we never claimed in our conclusions, as implied by Dr Harach, that positive staining of either genuine acidic mucins or thyroglobulin/colloid carbohydrates (containing sialic acid and sulphate radicals) is the rule in all thyroid tumours.

In our opinion, utmost caution is necessary in the interpretation of all primary thyroid neoplasms showing apparent "mucin secretion".

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Use of microcomputers to facilitate costing in pathology laboratories

I congratulate Stilwell and Woodford on their recent article on microcomputer software.¹ A most erudite and exhaustive procedure was described, providing a cornucopia of data which, while definitive in scope, was limited in its practical application. Its very comprehensiveness would necessitate considerable effort to start and even more to maintain.

Estimates of staff time particularly points II and III, "... how long and how much of his or her time spent on general duties," and "... how much of his or her time spent on supervisory work on ... tests, or at specified work stations," are not only inherently difficult to measure, but more importantly, vary each day according to demands and according to each individual's ability.

While I applaud the concept, some considerable simplification would be needed for actual use. I would respectfully suggest that the authors consider alternatives—for example, the CATER(chemical administrative time equipment reporting) system described by Stenton *et al.*²

To illustrate the difference between academia and the real world, I would direct your attention to the authors' statement on page 823, "Experience of the Canadian workload system is that 35 units per hour is a reasonable expectation." My experience in a routine hospital laboratory is, I am sure, not unique; recent information shows: microbiology = 84 units activity per paid hour; haematology = 64 units activity per paid hour; biochemistry = 50 units activity per paid hour; histopathology = 57 units activity per paid hour. My understanding of the Canadian workload system is that 44 minutes/paid hour should be taken as a target of 100% efficiency.³

Given a staffing of 35 units per hour I am sure that such a costing exercise would "seem" practical if somewhat expensive.

The unconstrained pursuit of accuracy is never cost effective and one doubts the need for the decimal place in realistic management.

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Mr Stilwell and Dr Woodford comment:

We agree with Mr Brownhill that staff time for each laboratory test is difficult to measure

and that it varies from day to day and week to week. Precisely this point was made in introducing our concept of broadly estimating the proportion—not the absolute measure—of time, on average, which each staff member devotes (a) to work which does not produce test results and (b) to each kind of workstation over a lengthy period—for example, a year. It was never the intention to divide up the staff member's time exactly during a particular study period, which would inevitably be unrepresentative.

Several experienced laboratory directors, which we do not pretend to be, have convinced us that this proportional estimation is not difficult to make and is in fact the only way to compensate, in costing, for the fact that staff members do move from test to test and that staff of different grades and salaries perform some of the same tests.

Once the proportions of staff time (and associated actual staff cost) have been assigned to the different workstations—that is, groups of tests—the costs can be very easily redistributed over individual tests at those workstations in ratios based on some independent estimate of the average time required for each, such as Canadian workload units.

We find the CATER system more of a complication than a simplification. Firstly, its inventors incorporate into the CATER unit, which seems to be meant primarily as a manpower factor, four other elements of cost (chemicals, administration, equipment, reporting). Secondly, they assign a seemingly arbitrary number of CATER units to each type of test and then calculate the unit's cost value by dividing the total number of units into the total staff costs, irrespective of whether all the staff is engaged in test production. Our faith in the system is not enhanced by some curious discrepancies in the paper cited¹: the computer printout in table 1 shows the CATER unit for full blood count to be 150, but table 2 shows it to be 3. What seem to be faulty principles, are, of course, more important than simple errors.

Mr Brownhill's reference to the Canadian workload unit manual should, I think, read page 20, not 2, and his reading there has led him astray. The productivity of 44 units per paid hour calculated there refers to a hypothetical "sample laboratory", as is made clear on the previous page: "Suppose that a sample laboratory produced 498,000 laboratory units of work. . .". The Canadian workload unit manuals are careful not to prescribe an ideal productivity level, or even recommend working to a median productivity level. Our statement that 35 units per paid hour was a "reasonable" expectation was based in part on the results of DHSS studies of the Can-