CORRESPONDENCE

Chronochemistry, rubber, and formalin

Histopathologists, with their obsessional penchant for prolonged storage of fixed or stained tissues and associated mountants, should take more interest in slow chemical reactions (*chronochemistry*; a possible neologism for which we offer no apology).

A recent foray to rescue 4000 specimens of breast tissue, stored in 10% aqueous formaldehyde for the past 20 years in a notoriously cool mortuary, showed many examples of a dramatic internal candlewax-like ooze of the rubber rings of storage jars (figure). Despite extensive domestic experience from similar commendable patience in storing bottles and demijohns of jellies and home-made wines, also sealed by rubber sealers, this is a new phenomenon to us.

Rubber is an organic polymer of isoprene and its homologues. Formaldehyde is a polymerising agent for proteins. How has this accidental collision of agents led to the dribble which we illustrate? A chemical explanation is needed to prevent future loss of the aesthetic appeal or the forensic value of tissue stored over a long period. Are proper chronochemists out there ready with advice and explanation?

The rubber ring on the neck of an opalescent plastic specimen storage jar containing formalin has oozed downwards after seven years of storage, thus simulating molten candlewax.

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Declining necropsy rate

We read with interest the recent paper by Benbow on medical students' views on necropsies.¹ In common with many other hospitals around the world^{2,3} our own district

Replies of consultant and junior clinical staff to necropsy questionnaire

	Consultant (%)	Junior staff (%)
Are you worried by the declining hospital necropsy rate?		
Yes	79	33
No	16	52
Don't know	5	15
For patients dying in hospital, necropsy is desirable in:		
All cases	19	7
Most cases	51	29
A few cases	30	64
No cases	0	0

general hospital has suffered a steady decline in the hospital necropsy rate from over 50% in 1960 to 10% in 1990 (excluding coroners' necropsies). In an attempt to find out why, we sent a questionnaire to 120 clinical colleagues.

Replies were received from 37 consultants and 43 junior clinical staff. It is interesting to compare the responses of consultants and junior staff. When asked if the falling necropsy rate worried them, 79% of consultants, but only 37% of junior clinical staff, stated that they were concerned by it (table). Furthermore, most consultants (51%) felt that for patients dying in hospital a necropsy was desirable in most cases, while most junior staff (64%) considered necropsy desirable in only a few cases.

When asked about reasons for the declining necropsy rate, decreased emphasis on necropsy in medical education was considered important by the highest percentage of all respondents (64%). Predictably, despite continuing evidence to the contrary,^{4,5} advances in antemortem diagnostic techniques which offset the need for necropsy, were considered important by 54% of all respondents. Failure of junior doctors to ask for a relative's consent and an increased reluctance on the part of relatives to give consent were considered important by 53% and 52%, respectively. Failure of pathologists to communicate their findings, and increased aesthetic, or emotional objections of clinicians to necropsy, were considered important by only 18% and 16% of respondents, respectively.

The somewhat negative attitude to the necropsy expressed by junior clinical staff in our survey, and the acknowledgement that medical education is lacking in this area are important, as it is frequently the most junior of doctors who are called on to ask a relative's consent for necropsy.

We agree with the conclusions of Benbow that more care, effort, and sensitivity must be shown in the training of future doctors, with regard to the necropsy.¹ Only then, perhaps, may the current unacceptable decline in the hospital necropsy rate be halted.

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- 1 Benbow EW. Medical students' views on necropsies. *J Clin Pathol* 1990;43:969-76.
- 2 Cameron HM. Future of the hospital autopsy. *Br J Hosp Med* 1988;40:335.
- 3 Frederici HHR. Reflections on the postmortem audit. *JAMA* 1988;260:3461-5.
- 4 Goldman L, Sayson R, Robbins S, Conn LH, Bettmann M, Weisberg M. The value of the autopsy in three medical eras. *N Engl J Med* 1983;308:1000-5.
- 5 Stevanovic G, Tucakovic G, Dotlic R, Kanjuh V. Correlation of clinical diagnoses with autopsy findings. *Hum Pathol* 1986;17:1225-30.

Dr Benbow comments:

I'd like to thank Dr Giles and his colleagues for their interest in my paper, and to congratulate them on their own contribution to the debate. They are certainly right when they conclude that changes are necessary in the way future doctors are introduced to necropsy, though I remain unsure exactly what those changes should be. My own studies, so far, have done more to define the problem than to provide any solutions.¹⁻³ I remain puzzled that, although most of our students feel that they have been well taught in the necropsy room,¹ many remain reluctant to attend again, even to follow up their own patients.^{1,2} I suspect that progress will be difficult until medical students get more help with understanding and coming to terms with the emotional issues surrounding death and dying.³

I was particularly interested that 54% of respondents in Giles's study felt that current diagnostic techniques have reduced the need for necropsy. Some of my own results show that 75% of second year medical students, and 81% of third year students, disagreed with the contention that modern investigative techniques have superseded necropsy.⁴ A total of 72% agreed that necropsy can assess the accuracy of new radiological techniques (with 25% offering no opinion), and 89% agreed that necropsy can assess the efficacy of antemortem treatment. Clearly, seduction by technology occurs at some stage after the third year of the medical course.

The finding of Dr Giles and his colleagues that consultants are more concerned than juniors about the dropping necropsy rate is an important one. It echoes views expressed by senior academic pathologists in the USA, who feel that one of the most important causes of the decline of the necropsy is a failure to educate medical students and junior clinicians about its value.⁵ It follows that there is a cohort of recently (and not so recently) qualified doctors who have little experience of the necropsy, and who may therefore know little of its benefits. As members of this cohort become the leaders of their profession over the next decade or two, their lack of interest in the necropsy may prove even more detrimental than it does now.

Not only do we need to educate undergraduates, but we need to re-educate post-graduates. We should lose no opportunity to emphasise discrepancies between clinical and necropsy diagnoses in clinical meetings, clinicopathological conferences, and casual discussions: there is plenty of published ammunition to bolster personal anecdote.⁶ Our comments, of course, should be carefully tempered with an understanding of "necessary fallibility".⁷

- 1 Benbow EW. Autopsy demonstrations to medical students: audit by questionnaire. *J Pathol* 1990;162:177-9.