untrained staff use equipment. Nor do such people do the quality control checks and record data that laboratory workers know to be of such vital importance; nor do they compare their results with the laboratory, which recognises when its equipment is responding less well than it should.

The employment of individuals specifically to carry out work outside normal working hours is not the right approach; such staff should be part of the laboratory as a whole and be conversant with activities during normal working hours. Some form of out-of-normal-hours working with an appropriate payment is highly desirable. Laboratory equipment on wards (or even in specially constructed laboratories) where non-laboratory workers can use equipment has advantages for patient and clinician, but such laboratories should be under the direction of professionally trained laboratory workers whose duty it will be to ensure the quality of such analyses. This means that doctors and nurses must comply with laboratory "discipline". A medical laboratory scientific officer who spattered blood on the ceiling without clearing it up or who ate food in the laboratory would face disciplinary action at the very least. Nor should we forget the medicolegal implications of poor-quality results produced by untrained workers.

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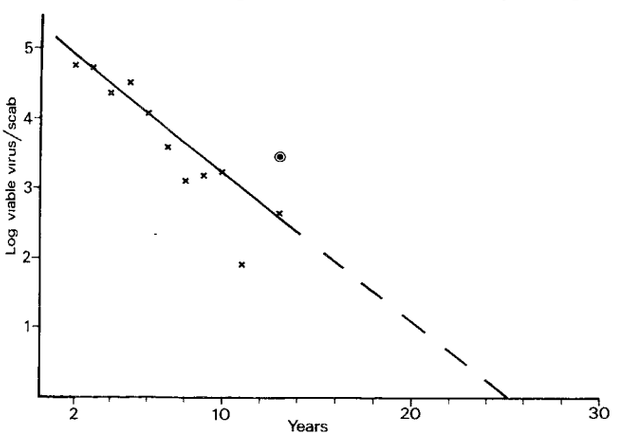
SMALLPOX STILL ENTOMBED?

SIR,—The debate in your correspondence columns (see, for example, Jan 19, p 175) reveals a difference of opinion about the ability of smallpox virus to survive on its victims post mortem, and hence about the risk to archaeologists who might disturb their remains. The issue has become topical in the UK where the Health and Safety Executive temporarily halted archaeological work on the site of Christchurch, Spitalfields, when a corpse with the outward signs of smallpox was uncovered. First reports on studies of samples sent to the Centers for Disease Control, Atlanta, show that smallpox virus has not been grown.

Poxviruses in general are very hardy, especially when kept cool and dry; however, data on the survival of variola virus under natural conditions are scanty. What seems certain is that the virus remains viable for the longest period in the dried scabs from the skin lesions of smallpox, where it is inactivated in a matter of some months at 30°C, at a rate that varies with the humidity.[1,2] Reducing the temperature to 20°C or 25°C prolongs survival to a year or more;[1,3] in the study mentioned by Professor Zuckerman, survival in significant numbers was reported for up to 13 years, after which no more material was available to prolong the experiment.[4] The paper he cites records annual counts of viable variola virus in scabs stored in envelopes at room temperature. These counts can be expressed graphically to indicate the slope of the inactivation curve under the conditions of the experiment (figure). Extrapolation (assuming first-order kinetics) suggests that inactivation might take 25 years under these conditions. Increasing the initial viable count by taking as the "sample" the whole of a corpse rather than a single scab, or by expanding the sample still further to include all the victims of smallpox in a crypt containing many hundreds of bodies buried when the disease was prevalent, would greatly prolong this period. Further significant prolongation, perhaps to over 100 years, follows if the slope of the curve is made more shallow, as would happen in unusually cool, dry conditions, such as may be found in crypts in temperate climates. In these circumstances and in the time-scale suggested by a single series of observations, it would be unwise to assume the inactivation of the last variola virus from among the multiple billions originally present.



◉ Retitration by a slightly different method

Survival of variola virus in smallpox scabs kept in envelopes at room temperature.[4]

With smallpox eradicated and with negligible communal immunity to the disease, Zuckerman's prudent recommendation about vaccination[5] ought to be accepted in the special circumstances where archaeologists disturb possible smallpox victims interred in exceptionally cool, dry conditions. The ultimate example would be burials in permafrost.

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1 MacCallum FO, McDonald JR. Survival of variola virus in raw cotton. *Bull WHO* 1957; **16:** 247–54
2. MacCallum FO, McDonald JR. Effect of temperatures of up to 45°C on survival of variola virus in human material in relation to laboratory diagnosis. *Bull WHO* 1957; **16:** 441–43.
3. Downie AW, Dumbell KR. Survival of variola virus in dried exudate and crusts from smallpox patients. *Lancet* 1947; i: 550–53.
4 Wolff HL, Croon JJAB. Survival of smallpox virus (variola minor) in natural circumstances *Bull WHO* 1968; **38:** 492–93.
5 Zuckerman AJ Palaeontology of smallpox. *Lancet* 1984; ii: 1454.

ACYCLOVIR IN HERPES ZOSTER OTICUS

SIR,—Acyclovir therapy has improved the prognosis in both herpes simplex and herpes zoster[1] infections, especially in herpes encephalitis[2] and in immunocompromised patients.[3] Over the past 18 months we have used it in the treatment of seven patients with herpes zoster oticus (HZO) in a dose of 5 mg/kg three times per day. Within 2–3 days there was a striking improvement in the toxaemia associated with this condition. Of the six patients who had total facial paralysis, four recovered completely, one almost completely (and should recover completely), and one still has no function. This compares favourably with the previous trend of 22% complete recovery, 26% no recovery (average derived from refs 4–6). Two of the three patients with sensorineural hearing loss have regained their hearing and the associated vertigo in these patients resolved rapidly. The patient with residual deafness and total facial paralysis had brain-stem involvement and presumably this is the reason for his residual defect. Our results suggest that acyclovir should be used in all acute cases of HZO.

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1 Peterslund NA, Seyer-Hansen K, Ipsen J, Esmann V, Schonheyder H, Jukl H Acyclovir in herpes zoster. *Lancet* 1981; ii: 827–31
2. Sköldenberg B, Forsgren M, Alestig K, et al. Acyclovir versus vidarabine in herpes simplex encephalitis *Lancet* 1984; ii: 707–11.
3 Balfour HH, Bean B, Laskin OL, et al. Acyclovir halts progression of herpes zoster in immunocompromised patients. *Lancet* 1983; **308:** 1448–55.
4. Devriese PP. Facial paralysis in cephalic herpes zoster. *Ann Otol* 1968; **77:** 1101–19.
5. Taverner D Electrodiagnosis in facial palsy *Arch Otolaryngol* 1965, **81:** 470–77
6 Peitersen E, Andersen P. Spontaneous course of 220 peripheral non-traumatic facial palsies. *Acta Otolaryngol* 1967, **224** (suppl): 296–300.

INOSINE PRANOBEX

SIR,—Dr Mindel's letter (March 16, p 631) contains several incorrect statements. He claims that none of the five clinical trials referred to in a *Lancet* editorial of Jan 26 have been published in full. However, data originally published in abstract form by Galli et al[1] and Lassus et al[2] have since been published in full[3,4] with detailed statistical analyses. In the study by Salo and Lassus[4] in a group of patients with recurrent genital herpes infection, there was a "statistically significant shortening of time to clearing of symptoms and a more rapid improvement in the symptoms of itching, inflammation and swelling in those patients receiving active

therapy". Mindel's comment on Bouffaut and Saurat's study[5] has already been addressed by Dr Saurat (April 13, p 877).

Certainly physicians ought to draw their own conclusions about what treatment will benefit their patients. However, an objective evaluation of two treatments should include a comparison of efficacy and safety. The references cited by Mindel and his own experience[6-8] establish the value of acyclovir, but the data on inosine pranobex reveal similar efficacy. It is difficult to see how one set of data can be interpreted as of distinct benefit while comparable data on another product are deemed "marginal".

The relative safety, mutagenicity, and immunotoxicity need not be reviewed here. However, this must be part of the risk/benefit ratio judgment. The existence of two distinctly different agents (inosine pranobex and acyclovir) now gives physicians the opportunity to choose between two different mechanisms of action (ie, a metabolic inhibitor with antiviral activity versus a stimulator of the body's own natural defences) and two different patterns of safety, while obtaining similar levels of efficacy. Recurrent herpes infections have plagued patients and physicians for years. They are now fortunate to have a choice between two orally active agents.

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1. Galli M, Lazzarin A, Moroni M, Zanussi C. Inosiplex in recurrent herpes simplex infections. *Lancet* 1982; ii: 331–32.
2. Lassus A, Salo OP. Isoprinosine versus placebo in the treatment of recurrent genital herpes *Proc 1st Wld Congr Sex Trans Dis* (Puerto Rico, 1981).
3. Galli M, Lazzarin A, Moroni M, Zanussi C. Treatment of recurrent viral infectious diseases by methisoprinol. In: Immunomodulation: New frontiers and advances. New York: Plenum, 1984. 385–97.
4. Salo O, Lassus A. Treatment of recurrent genital herpes with isoprinosine. *Eur J Sex Trans Dis* 1983, **1:** 101–05.
5. Bouffaut P, Saurat JH. Isoprinosine as a therapeutic agent in recurrent mucocutaneous infections due to herpes virus. *Int J Immunopharmacol* 1980; **2** (no 3): abstr.
6. Mindel A, Adler MW, Sutherland S, Fiddian AP. Intravenous acyclovir treatment for primary genital herpes. *Lancet* 1982; i: 697–700.
7. Mindel A, Adler AW, Sutherland S, Fiddian AP. Intravenous acyclovir in genital herpes. *Am J Med* 1982; **73:** 347–50.
8. Mindel A, Waller ND, Faherty A. Prophylactic oral acyclovir in recurrent genital herpes *Lancet* 1984; ii: 57–59.

CONGENITAL RUBELLA WITH PNEUMONITIS

SIR,—We have seen a case of congenital rubella with pneumonitis, similar to those published by Dr Mahony and colleagues (March 23, p 700).

At 3 months of age this boy presented with severe failure to thrive, recurrent diarrhoea, hepatomegaly, splenomegaly, lymphadenopathy, a chronic facial papular rash, and recurrent otitis media. At 4 months he had severe interstitial pneumonitis which responded well to co-trimoxazole (open lung biopsy did not reveal *Pneumocystis carinii*). His lymphocyte count was 1200/μl (T lymphocytes 9% [normal 50–70], B lymphocytes 79% [normal 5–15]), the serum thymic factor titre was 16 (normal for age 64). Serum immunoglobulin levels were normal. Skin tests with phytohaemagglutinin and tuberculin were negative. The infant had received BCG vaccination at 2 months of age without complication. His haemagglutination inhibition (HAI) titre for rubella was 10, without specific IgM.

At the age of 6 months he had a general maculopapular rash and a severe neurological deterioration; his serum IgG (1630 mg/dl; normal for age 556±111) and IgM (1000 mg/dl; normal for age 70±23) rose sharply, associated with high levels of circulating immune complexes. At the same time, the HAI titre for rubella rose to 80, with specific IgM antibodies. Rubella virus had been isolated at lung biopsy at 4 months of age (2 months before the appearance of specific IgM), and from pharynx and blood at 6 months. He died aged 6½ months from *Klebsiella pneumoniae* septicaemia.

The mother had had a rubella contact at 4 months' gestation. A serologic study a few days after this exposure revealed an HAI titre of 32 (no screening for specific IgM). She was considered as rubella immune.

As stressed by Mahony and colleagues, the fact that a mother is known to have been rubella immune during pregnancy should not exclude the possibility of congenital rubella if the serum has not been tested for IgM. Furthermore, congenital rubella may easily be overlooked if the appearance of specific antibodies in the infant is delayed.

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CARPAL TUNNEL SYNDROME: CLINICAL OR NEUROPHYSIOLOGICAL DIAGNOSIS?

SIR,—Your April 13 editorial on the diagnosis of the carpal tunnel syndrome provides an admirable summary of published work on electrophysiology but contains several clinical inaccuracies.

It is not typical for symptoms to affect the median-innervated fingers, and patients usually state that the paraesthesiae affect the whole hand. You state that the dominant hand is usually affected to the greater extent; however, the non-dominant hand is sometimes affected when the dominant hand is not. Although patients with peripheral neuropathy are more likely to acquire pressure neuropathies (eg, affecting the ulnar or peroneal nerves), the median nerve at the wrist is seldom affected. It is surely incorrect to say that the sensory loss often "splits" the ring finger in carpal tunnel syndrome. With ulnar nerve lesions the sensory loss invariably splits the ring finger, but in the past twenty-five years I have never encountered such splitting in a carpal tunnel syndrome in well over a thousand cases. I think that Tinel's sign is more often positive by tapping the wrist just above the carpal ligament.

Is it always necessary to do nerve conduction studies to assist in the diagnosis of carpal tunnel syndrome, especially in the milder examples, when there may be a long waiting-list for electromyography? It is often simpler to inject the patient locally with hydrocortisone as a diagnostic test, and in some patients—especially those women who have distressing symptoms but no objective neurological signs (though Tinel's sign may be positive)—this may provide relief for a considerable period of time. An operation can always be done if and when the symptoms return, and nerve conduction studies can be used as a preliminary to surgical decompression.

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SIR,—Your editorial on the diagnosis of carpal tunnel syndrome recommends electrophysiological testing on the grounds that it facilitates early diagnosis and operation, and prevents excessive wallerian degeneration. But do we know enough about the natural history of this condition to advise early surgery in all cases? Such a policy presupposes that medical treatments have already been shown to be ineffective and assumes that many cases of clinical carpal tunnel syndrome do not resolve spontaneously.

Ellis and his co-workers[1-3] have undertaken some very small but interesting controlled studies suggesting that pyridoxine in high doses can result in clinical resolution in some cases, although Smith et al[4] in an equally small study could not confirm this finding.

During the past seven years in general practice I have collected 19 cases of carpal tunnel syndrome diagnosed solely on clinical grounds, positive Phalen's and Tinel's sign being present in most cases. The age range was 22–65 years (mean 39). There were 7 men and 12 women, and in 7 cases the symptoms were bilateral. In only 4 cases were there associated systemic diseases (2 with myxoedema and 2 with diabetes). Every patient was treated with 100–200 mg pyridoxine daily for up to three months before any referral was considered. 16 (84%) responded with complete clinical remission. In most instances the response occurred within the first week, sometimes by the second day of treatment. 3 cases relapsed between