The difficulties and limitations of sterility testing, even when properly performed, are not always appreciated. It can be shown by simple statistical methods that when a group of twenty samples is tested there is a 1-in-3 chance of missing a 5% contaminated batch. To be reasonably certain of detecting such a batch (say 95 times out of 100) a sample size of about 80 would be needed. This intensity of sampling would be at best burdensome, and with small batches such as may be made in hospital pharmacies it would be impracticable, for it must be borne in mind that the sample is destroyed in testing. Sterility testing may detect gross failure, but it cannot be relied on to detect lesser degrees of contamination. It may also be useful in checking a sterilizing process against known challenges with contaminated material, particularly when a process is being established. The real controls should be controls of the process, and these should be simple, straightforward, immediate, and visible.

The Medicines Commission is known to be considering, as a matter of urgency, how repetitions of the Devonport disaster can be avoided, and their findings will be awaited with interest. Meanwhile, all producers and users of intravenous fluids will be reviewing their own procedures. They would be well advised to concentrate on ensuring that well-known and well-tried methods are used by staff who really understand what they are doing and why they are doing it. In particular, hospitals should not engage in a frenzy of ad hoc sterility testing by inexperienced staff with inadequate facilities. The most pertinent question is not, Is it sterile? but Who sterilized it and how did he do it? In addition to these basic matters manufacturers should look into the design of containers and giving sets, and hospitals into the way they are used.

It is indeed sad that there was a disaster at Devonport. It is good that it should have been promptly and openly investigated, so that important lessons may be learned and applied.

1 Committee (chairman, C. M. Clothier) appointed to inquire into the circumstances, including the production, which led to the use of contaminated infusion fluids in the Devonport Section of Plymouth General Hospital, Report, Cmdn. 5035. London, H.M.S.O., 1972 (24p net).

Steering Wheel

Promptly christened Cogwheel—after its cover motif—the first report of the Joint Working Party on the Organization of Medical Work in Hospitals1 appeared five years ago. Now Cogwheel mark II is with us.2 The working party was appointed in 1966 jointly by the then Minister of Health, Mr. Kenneth Robinson, and the Joint Consultants Committee, each nominating six members. Sir George Godber, Chief Medical Officer, has held the Chair throughout, and nine of the members have been doctors.

In 1967 the Working Party reported that since 1948 “the hospital medical team” had nearly doubled (from 11,735 in 1949 to 19,541 in 1966) but that there had been no corresponding evolution of an administrative structure among “the clinicians with the ability and authority to deploy medical skills.” Asked to consider what developments in the hospital service are desirable in order to promote im-
proved efficiency in the organization of medical work,” the working party reported that regional policies were not understood and that accurate information from the periphery was lacking at regional hospital board level. Furthermore, the members thought that group and hospital medical advisory committees were not capable of systematically reviewing and statistically analysing the clinical work in all departments. They were also critical of the poor links between home and hospital care locally.

The working party offered a simple, credible, and flexible solution: “Specialties falling into the same broad medical or surgical categories should be grouped to form Divisions. Each division should carry out constant appraisal of the services it provides, deploy clinical resources as effectively as possible and cope with the problems of management that arise in its clinical field. A small medical executive committee composed of representatives from each division should be established.” It was envisaged that nurses, hospital administrators, hospital junior doctors, general practitioners, and medical officers of health should all take part in the Cogwheel organization at divisional or executive committee level.

The Cogwheel report and its twin for Scotland 3 could not be and was not intended to be considered in isolation. The Salmon report (1966) 4, the Seebom report (1968) 5, the Shape of Hospital Management in 1980 (1967) 6, and more recently the Hunter report (1972) on Medical Administrators, 7 and the two volumes on the Hospital Internal Communications Project (1971, 1972) 8 each contained concurrent official or officially approved recommendations for changes in the health and disease services. In addition the Government had reinforced the recommendations of the first report by a pink memorandum (HM(68)67) to the hospital management committees, and the Working Party itself published a detailed study of the work of 85 junior hospital doctors. 10 All these deliberations, nevertheless, took place in the shadow of the impending overhaul of the whole N.H.S.—“the biggest corporation in the country.” The green papers 11 12 kept the shadows shifting but the Consultative Document of May 1971 13 which puts the disease services under area health boards and the health or social services under local authorities is probably definitive, and, in the view of many, cruelly divisive.

Against this background Sir George Godber’s team have, in their second report, assessed the introduction and working of Cogwheel structures from 1967 to March 1972. Of the 309 large, small, and single specialty, hospital groups in England and Wales 150 had started a Cogwheel structure, though 29 of these had adopted a divisional arrangement without a medical executive committee. Fifteen groups have been studied in depth by sociologists 14 and references to reports from other hospital groups are in Appendix 3.

The second report is pleased with the way Cogwheel has proved applicable to a wide range of circumstances. The first part reviews again why the structure is needed and the indispensable parts of it, emphasizing particularly the part to be played by training-grade staff—which to date has been small, even at divisional level. The retention of a forum in some form for all attending consultants is favoured and 50% of the groups using Cogwheel have done this—with the medical advisory committee being retained in many hospitals. The original proposal that chairmen of the medical executive committee should be appointed was feared by many doctors as a return to the autocratic medical superintendent. So some form of election is usual—the method varies—and is accepted by the working party as reasonable and a tribute to the system’s flexibility. There has been much discussion about financial rewards for chairmen and the problems of their finding time (or giving up sessions) to do a job which if done properly demands much time. The working party comments “If the best way of achieving this is by relinquishing clinical sessions it should be possible to do so” suggesting “suitable safeguards to consultants who have administrative duties temporarily recognized in their contracts.”

The report considers the services which support Cogwheel and rightly regards this aspect to be important, particularly in relation to appreciating and acting on statistical information such as that derived from Hospital Activity Analysis. It also warns against supplying doctors with information unless it is: “(a) acknowledged to be related to the needs; (b) accurate; and (c) presented as simply and clearly as possible.”

The best way of linking the skills and services of the hospital administrators and of the nursing profession at divisional and medical executive committee level has clearly not yet been found. But the members of the working party acknowledge that much depends on the disposition of individuals to overcome apparent obstacles—that is, personalities are at least as important as the system. The working party is understandably disappointed that the representation at Cogwheel committees (divisional or executive) of general practitioners and other doctors working in the community is so limited (to about one third of Cogwheel structures). It may be that habits need to change and that having got their internal structure right the hospital staff can turn their attention more outwards to the community by 1974. If the N.H.S. is to function in an integrated fashion such a re-orientation will be crucial. On their side family doctors must be prepared to play a part in Cogwheel.

In the second part the report looks at some of the difficulties in establishing Cogwheel structures and the benefits derived from them. Only three undergraduate teaching hospitals have not established divisional systems and the Working Party is impressed by the ease with which the special organization problems of teaching hospitals have been overcome. The divisional system has apparently been easy to set up especially in the major specialties. Other specialties have been free to join a division of their choice or set up new division. Some heterogeneous divisions may be found—for example, diagnostic radiology, pathology, medical physics, and pharmacy are strange bedfellows. But this itself illustrates a willingness to include voices other than those of doctors, which the working party applauds. Certainly clinicians seem more prepared to scrutinize their needs for staff and equipment with regard to the needs of others as expressed at divisional and executive committee meetings. Communication is, of course, a thread running through the whole report but emphasis is laid on the establishment of divisional policy for communicating with patients and their relatives, though direct benefits from Cogwheel to the patient cannot otherwise be measured. Nevertheless, the ready availability of more accurate and up-to-date information coupled with the exchanges of opinion which Cogwheel facilitates should permit an improvement in the ordering of priorities in the N.H.S. This will ultimately benefit patients.

This second report confirms, therefore, that the cogs proposed by its predecessor suit the peculiar psychology of N.H.S. consultants and their junior medical, nursing, and administrative colleagues, and can be adapted to widely
differing circumstances. Having designed the machine and watched it in motion for five years the working party now feels that it can be steered effectively into the new relationships which will arise when the N.H.S. is reorganized in 1974. At the same time Sir George Godber and his colleagues wish to withdraw from the scene in favour of a new team. They deserve the thanks of all Health Service staff for their several efforts to find a flexible administrative structure—linking medicine and management—in which the energies and ideas of hospital doctors can be harnessed to make the best use of our limited N.H.S. resources.

14 In Low Grade Published for the Nufield Provincial Hospitals Trust by the Oxford University Press. 1971.

Burning Feet

The complaint of burning pain in the feet is not uncommon. It may be the presenting symptom or main feature of such diverse conditions as acute polymyelitis, diabetes, subacute combined degeneration of the cord, and ergotism. Usually there is accompanying paraesthesia, and the symptoms may affect the hands as well as the feet.

A much less common cause of burning paraesthesia affecting the feet is "tarsal tunnel syndrome." This is comparable to the carpal tunnel syndrome, with a compressive lesion of a peripheral nerve by a flexor retinaculum. Pain on standing or walking, with paraesthesia, raises the possibility of a neurological lesion. The absence of any motor weakness, with normal reflexes, and normal peripheral pulses, leaves the diagnosis in little doubt.

A recent case report1 describes a 34-year-old welder who developed intense burning paraesthesiae in the feet, extending to the knees, after working for three months during which he squatted twelve hours a day in a stricken oil tanker. The only abnormal physical sign was hyperaesthesia of the soles of the feet. The blood sugar and cerebrospinal fluid were normal. But an electromyogram showed slowing of conduction in the medial popliteal and posterior tibial nerves at the level of the medial malleolus, being 22 metres per second below and 39 metres per second above.

Blocking of the posterior tibial nerve with local anaesthetic abolished the pain in the foot. At operation it was noted that the posterior tibial, medial, and lateral plantar nerves appeared thickened, gelatinous, and flattened by the flexor retinaculum and a well-developed septum originating from its under surface. The flexor retinaculum was excised, with complete and immediate relief of the burning symptoms. A postoperative electromyogram confirmed the recovery in conduction velocity. It is likely that anoxic damage to the nerves resulted from the squatting posture being maintained for several hours with consequent stretching of the posterior tibial nerve over the medial malleolus, and from pressure being exerted by the flexor retinaculum.

The condition is thus akin to the carpal tunnel syndrome, in which compression by the flexor retinaculum at the wrist, with anoxic damage to the median nerve, leads to severe paraesthesiae, typically occurring at night. In a patient who presented with a carpal tunnel syndrome, and who subsequently died of a cerebral tumour, P. K. Thomas and P. M. Fullerton2 reported a reduction in diameter of nerve fibres at the site of the lesion and below it. In an experimental study in a guinea-pig3 chronic compression of the median nerve at the level of the wrist was noted to lead to a reduction in the number of myelinated fibres present in the midforearm if the lesion was severe enough to produce complete degeneration at the wrist. When the lesion was less severe and produced mainly segmental demyelination, transverse sections at the higher level did not show any significant change in the total number of myelinated fibres in the proportion of large-diameter fibres. The loss of large-diameter fibres may explain the burning paraesthesiae in both carpal and tarsal syndromes. Mild examples of the latter may go undetected unless sought.


Acid and the Larynx

The factors most often incriminated in the aetiology of chronic laryngitis are excessive smoking, misuse of the voice, and very occasionally a septic postnasal discharge. In most cases of chronic laryngitis the changes are confined mainly to the glottic level, though in some instances of misuse of the voice there is considerable hypertrophy of the false cords. Injection of the subepithelial vessels and hyperaemia of the vocal cords are the earliest signs of inflammation. They lead on to oedema and eventual hypertrophy of the epithelium, chiefly on the vocal cords, but also on the vocal processes of the arytenoids and the interarytenoid area.

Ulceration of the medial aspect of the vocal processes of the arytenoids is a variant of chronic laryngitis and results from the violent impact of one arytenoid against the other, usually after a bout of prolonged shouting. If the voice is not rested the ulcers may not heal, in which case they become overshadowed by the appearance of granulomata arising from their bases. Rather like this is a condition referred to in the older textbooks of laryngology as pachydermia laryngis. This is characterized by the presence of more or less symmetrical thickenings at the posterior ends of the vocal cords and especially the vocal processes of the arytenoids, together with corrugation of the interarytenoid epithelium. It has always been considered an uncommon condition, being especially rare in women, and the cause of it was thought to be overuse of the voice, though this was by no means always the case.

Recently J. E. Delahunty1 has suggested that pachydermia