

airways in the adult cannot always be excluded by routine clinical examination or by simple spirometric tests of ventilatory capacity. In bronchitic patients with little disability it might seem unnecessary to embark on the more complex investigations needed to establish the diagnosis. But diseases of the distal airways are usually progressive and can even lead to disruption of the alveoli, especially if there is a well-developed collateral ventilation to the obstructed units of lung tissue.¹ Discovery of the peripheral lesion at an early stage could be helpful in prognosis, in the recognition of certain environmental hazards to the lung, and perhaps in preventing ultimate disability by treatment. Simpler methods are needed for the diagnosis of narrowing of the peripheral airways. Exercise may actually disguise the fault by improving the distribution of ventilation,¹¹ but rapid respirations at rest can bring to light an abnormality of function not evident during quiet breathing.¹⁰ Perhaps a practicable diagnostic test for detecting narrowing of the distal airways will eventually be evolved from measurements made at fast respiratory rates in resting patients.

- ¹ Hogg, J. C., Williams, J., Richardson, J. B., Macklem, P. T., and Thurilbeck, W. M., *New England Journal of Medicine*, 1970, 282, 1283.
- ² Macklin, C. C., *Archives of Pathology*, 1936, 21, 202.
- ³ Weibel, E. R., *Morphometry of the Human Lung*. New York, Academic Press, 1963.
- ⁴ Macklem, P. T., and Mead, J., *Journal of Applied Physiology*, 1967, 22, 395.
- ⁵ Brown, R., Woolcock, A. J., Vincent, N. J., and Macklem, P. T., *Journal of Applied Physiology*, 1969, 27, 328.
- ⁶ Bates, D. V., et al., *Medical Services Journal Canada*, 1966, 22, 5.
- ⁷ Anthonisen, N. R., Bass, H., Oriol, A., Place, R. E. G., and Bates, D. V., *Clinical Science*, 1968, 35, 495.
- ⁸ Gaziano, D., Seaton, A., and Ogilvie, C., *British Medical Journal*, 1970, 2, 330.
- ⁹ Levine, G., Housley, E., MacLeod, P., and Macklem, P. T., *New England Journal of Medicine*, 1970, 282, 1277.
- ¹⁰ Woolcock, A. J., Vincent, N. J., and Macklem, P. T., *Journal of Clinical Investigation*, 1969, 48, 1097.
- ¹¹ Jones, N. L., *Clinical Science*, 1966, 31, 39.

Causalgia

"Causalgia" originally denoted a burning quality in pain.¹ Later it was used to describe a painful syndrome commonly found in wartime traumatic casualties.²⁻⁴ Though the severity of the pain may be variable, its description always includes a burning, scalding, searing, or hot quality. The cause of the distressing symptoms is usually an incomplete lesion of a peripheral nerve in an arm or leg. Causalgia can also follow injury to the plexuses. The pain may be spontaneous but may be aggravated or precipitated by touch or movement. The limb may show typical skin changes with tightness, redness, and sweating. If the pain is severe enough to prevent the full use of the limb trophic changes appear in the skin and nails, and the bones become osteoporotic.

The essential lesion in causalgia is thought to be damage to the sympathetic fibres along the nerve; possibly an abnormal synapse may develop between afferent sympathetic and afferent somatic fibres at the site of injury.⁵⁻⁷ The most effective treatment is sympathectomy or sympathetic block. Preganglionic sympathectomy is the most effective operation for the relief of the pain.²

A less well recognized form of causalgia, not so disabling but with similar pain, may be encountered in peacetime.⁸⁻⁹ Recently F. P. Wirth and R. B. Rutherford⁹ reported 32 such examples of "minor causalgia" taken from the records of the Johns Hopkins Hospital. The main symptom was again burning pain, with increased sensitivity to touch or pressure in some cases. Symptoms affected the leg in 23 and the arm in 9. The cause of the pain was variable; a nearby fracture in

10, surgery in 5, sprains in 4, crush injury in 4, and a miscellaneous variety in the remaining 9. Twenty-seven of the patients were treated by sympathectomy, while in four others sympathetic block was sufficient to give lasting relief. Twenty-four obtained relief from sympathectomy, and in most the improvement was maintained.

The difference between major and minor causalgia may be simply that of degree. Certainly when 310 subjects³ with peripheral nerve injuries were questioned closely 19% had symptoms of major causalgia and 8% had transient symptoms of minor causalgia. In another report of 160 cases¹⁰ minor causalgia occurred in 14%. The disparity between the cause and the severity of the symptoms in minor causalgia raises certain difficulties. The diagnosis may not be obvious at first, and neurological disease may be suspected. Multiple sclerosis, syringomyelia, tabes, post-herpetic neuralgia, or thalamic pain may mimic the same symptoms. The paucity of physical signs may raise the suspicion of psychoneurosis or hysteria, and any question of compensation will only complicate the problem further. However, and perhaps surprisingly, in Wirth and Rutherford's report⁹ all 6 cases of the 32 where compensation was known to have been implicated were relieved by sympathectomy. Where symptoms are suggestive and there is a possible predisposing cause such as an injury then paravertebral sympathetic block is probably the most reliable diagnostic test.

¹Mitchell, S. W., Morehouse, G. R., and Keen, W. W., *Gunshot Wounds and Other Injuries of Nerves*. Philadelphia, Lippincott, 1864.

²Rasmussen, T. B., and Freedman, H., *Journal of Neurosurgery*, 1946, 3, 165.

³Echlin, F., Owens, F. M., jun., and Wells, W. L., *Archives of Neurology and Psychiatry*, 1949, 62, 183.

⁴Porter, E. L., and Taylor, A. N., *Journal of Neurophysiology*, 1945, 8, 289.

⁵Doupe, J., Cullen, C. H., and Chance, G. Q., *Journal of Neurology and Psychiatry*, 1944, 7, 33.

⁶Barnes, R., *Medical Research Council Special Report Series*, 1954, No. 282, p. 156.

⁷White, J. C., and Sweet, W. H., *Pain and the Neurosurgeon*, p. 87. Springfield, Ill., Thomas, 1969.

⁸Homans, J., *New England Journal of Medicine*, 1940, 222, 870.

⁹Wirth, F. P., and Rutherford, R. B., *Archives of Surgery*, 1970, 100, 633.

¹⁰Nathan, P. W., *Brain*, 1947, 70, 145.

Sickness and Job Satisfaction

Sickness benefit may seem barely adequate to the off-sick breadwinner trying to maintain a family. However, the total annual cost of such benefits—now running at around £380 million—when added to estimated gross income lost to the community as a result of the more than 300 million days lost from sickness makes a sum rather larger than the annual cost of the N.H.S.

It is notoriously difficult to make realistic estimates of the cost of a particular social phenomenon, but the Office of Health Economics in its latest pamphlet *Off-Sick*¹ has attempted to do so, while at the same time assembling a useful array of information on sickness absence. The absolute level of sickness absence cannot be accurately estimated, but the official statistics do show trends from which changes in the pattern of sickness absence can be deduced. A particular omission from the figures is the non-recording of periods of three days or less, which nevertheless are common. Sickness absence, particularly short-term spells, is bound to disrupt industry. Recent strikes where a small handful of men have thrown out of work whole industries demonstrate clearly the fine equilibrium of an advanced economy. So it is not surprising that short but frequent spells off by workers or the unexpected sickness of one or two key people can have a serious effect