Long-acting Contraceptives

It appears from lay press reports[1] that scientists working for the Population Council at the Rockefeller Institute in New York have prepared subcutaneous steroid implants which have a contraceptive action lasting for many years. There is no evidence that the new departure is due to any startling innovation in the pharmacology of the synthetic progestational compounds. It seems to be largely a hopeful prediction based on a possible marriage of two ideas which have been current for some years; firstly, that small continuous doses of progestins can promote infertility without interfering with the menstrual cycle, and, secondly, that by an ingenious use of plastics the parenteral absorption of some compounds can be greatly prolonged.

The new feature of this use of steroidal contraceptives is the claim that the menstrual cycle is not suppressed. Present-day oral contraceptives cause what is in effect a form of medical castration, and many of the untoward effects from their use are due to the inability of the synthetic hormones completely to mimic the metabolic effects of the natural substances. The nortestosterone derivatives which are found in nine out of every ten oral contraceptives on the British market almost certainly act by suppressing gonadotrophin secretion, either by preventing the production of releasing factors by the hypothalamus, or by inhibiting the release of pituitary gonadotrophin. Direct action on the ovary[2] has now been amply disproved, though much of the contraceptive effect of these compounds may derive from their secondary effects on tubal motility, on the state of the endometrium, and on the composition of cervical secretion.

The great success of oral contraceptives is due in large measure to their effectiveness, which in turn is due to their multiple sites of action. For the Western woman at least this has been the consideration which has made her often tolerate a degree of discomfort which would not be acceptable in any other drug. Effectiveness is likely to be the prime criterion applied to the new technique. The usual progestins act mainly by inhibition of ovulation,[3] probably largely through their oestrogenic component,[4] although suppression of ovulation is not a prerequisite for their antifertility action.[5] The new approach is likely to involve the use of progestins which do not give rise to oestrogenic metabolites such as the 17-hydroxyprogesterone derivatives. G. Pincus[6] is known to be working on norandrostane derivatives which prevent implantation if administered to animals after mating, but these again are highly oestrogenic in action and very likely to upset the normal menstrual rhythm.

If the new contraceptive lives up to the promise of the press release its role is likely to be concerned with the prevention of implantation. It is difficult to see how alterations of tubal motility can be consistently effective in this respect, and a change in the receptivity of the endometrium to the fertilized ovum is the most likely mechanism. When it is considered that the ovum can implant and grow in all manner of recherché places such as the surface of the kidney, it seems surprising that its normal habitat, the endometrium, could be made consistently to refuse it lodgement. There is some evidence, however, that the endometrium, of all tissues, is best able to resist the intrusion of a fertilized ovum at the wrong moment. It may be that the endocrine process which at specific times suspends this immunity to invasion is an integrated series of events capable of being harmlessly and temporarily interrupted by mild progestational stimulation in the proliferative phase of the cycle.

[1] *The Observer*, 27 November 1966.
[2] Loraine, J., Bell, E., Harkness, R., Mears, E., and Jackson, M., *Lancet*, 1963, **2**, 902.
[3] Junkmann, K., *Mitt. dtsch. pharm. Ges.*, 1964, **34**, 33.
[4] Yen, S., *Fertil. and Steril.*, 1965, **16**, 97.
[5] Holmes, R., and Mandl, H., *J. Endocr.*, 1962, **24**, 497.
[6] Pincus, G., Banik, U., and Jacques, J., *Steroids*, 1964, **4**, 657.

Mycoplasma Infections

Though reports have appeared on the epidemiology of *Mycoplasma pneumoniae* infections in both military and civilian populations[1,2] relatively little information has been published on the pattern of transmission of this respiratory pathogen. A recent report from Seattle[3] on the spread of *M. pneumoniae* within family groups goes some way toward filling this gap in our knowledge. It stems from a study of the incidence of pneumonia due to *M. pneumoniae* among members of a large Group Health Co-operative.[4]

In 36 out of 114 families which were followed up, the "index" patient was infected with *M. pneumoniae*. Transmission to other members occurred in 23 families. It is of interest that there were more young children in these families than in the 13 where there was no spread of infection. Moreover, the incidence of secondary infection in the 23 families suggested that children under 15 are particularly susceptible, for 64% of the children became infected, compared with 17% of the adults. While the infection rate was highest in children under 15, the highest incidence of asymptomatic and mild infections was also found in this age group. The greater frequency of the asymptomatic carrier state among children points to their potential role in transmitting the disease, and the child of school age may be an important factor in introducing it into a family group.

Transmission outside the family seemed to be less frequent. *M. pneumoniae* was found in only one contact—the playmate of a child from a family with the disease. Throat swabs from 23 contacts of other patients were negative, as were 8 from the office colleagues of a positive case and 26 from the classmates of a child with persistent positive throat cultures of *M. pneumoniae*.

The prerequisites for the spread of *M. pneumoniae* thus seem to be prolonged, close contact and the presence of susceptible individuals. The greater susceptibility of children than adults suggests that immunity may develop. Investigations into *M. pneumoniae* vaccines[5-7] indicate that the level of growth-inhibiting antibody is a useful index of protection, but this method of assessment has not yet been used in epidemiological surveys.

In the Seattle survey the average incubation period was estimated to be 23 days. Intervals of about three weeks were

[1] Chanock, R. M., *New Engl. J. Med.*, 1965, **273**, 1199, 1257.
[2] Forsyth, B. R., and Chanock, R. M., *Ann. Rev. Med.*, 1966, **17**, 371.
[3] Foy, H. M., Grayston, J. T., Kenny, G. E., Alexander, E. R., and McMahan, R., *J. Amer. med. Ass.*, 1966, **197**, 859.
[4] Alexander, E. R., Foy, H. M., Kenny, G. E., Kronmal, R. A., McMahan, R., Clarke, E. R., MacColl, W. A., and Grayston, J. T., *New Engl. J. Med.*, 1966, **275**, 131.
[5] Jensen, K. E., Senterfit, L. B., Chanock, R. M., Smith, C. B., and Purcell, R. H., *J. Amer. med. Ass.*, 1965, **194**, 248.
[6] Metzgar, D. P., *et al.*, *Amer. Rev. resp. Dis.*, 1966, **94**, 1.
[7] *Brit. med. J.*, 1965, **2**, 1499.
[8] Foy, H. M., Kenny, G. E., and Koler, J., *Lancet*, 1966, **2**, 550.
[9] Jordan, W. S., *Amer. J. Hyg.*, 1949, **50**, 315.
[10] Rifkind, D., Chanock, R., Kravetz, H., Johnson, K., and Knight, V., *Amer. Rev. resp. Dis.*, 1962, **85**, 479.

also found in another family outbreak with secondary and tertiary cases (including one with Stevens-Johnson syndrome).[8] This interval is longer than that estimated by W. S. Jordan[9] for atypical pneumonia or observed in experimental infections with *M. pneumoniae*.[10] However, Jordan's report was made before specific diagnostic tests for the detection of *M. pneumoniae* were available, and infections due to other respiratory pathogens may have complicated the results. In experimental infections the relatively large doses of *M. pneumoniae* administered probably resulted in a shorter incubation period than that following natural infection. A relatively long incubation period is consistent with the slow spread previously noted for *M. pneumoniae* infection.[1]

Patients excreted *M. pneumoniae* over long periods. Nearly half of them yielded positive throat swabs after two months, and the organism was still present in five patients 12–13 weeks after onset of the disease. Treatment with tetracyclines did not necessarily eliminate the organism from the throat, nor did it reduce the incidence of prolonged cough. It is not known whether the organism is transmissible during these prolonged periods of excretion or persistent cough or only during the early stages of infection.

Clinically the disease ranged from pneumonia or pneumonitis to an asymptomatic infection. Most cases were mild and diagnosed as non-specific respiratory illness. But some evidence of infection in the lower respiratory tract was noted in 71% of the infected contacts. Ear infection occurred in 23% of 87 patients with respiratory illness.

The reports from Seattle[3 4 8] are a valuable contribution to the epidemiology of *M. pneumoniae* infection in a civilian population. Similar studies are needed elsewhere to determine whether the spread of *M. pneumoniae* follows the same pattern. Decisions on the potential value of *M. pneumoniae* vaccines in civilian populations will rest on such information.

Psychiatric Rehabilitation

Whilst traditional forms of occupational therapy have played a part in psychiatric rehabilitation for many years, it is only recently that interest has been aroused in methods of applying industrial therapy in hospital. Such work often includes minor manipulative procedures, and, being mainly by subcontract to outside firms, is comparable to normal factory activity. Manufacture of ball-point pens, toys, cardboard boxes, and cement blocks is some of the work being done. In 1958 half the mental hospitals used this type of therapy,[1] and today it would be difficult to find a hospital without some form of it. Visitors to the B.M.A.'s Annual Clinical Meeting at Worcester this year saw an interesting demonstration of arrangements in the Birmingham Region.[2]

The need for occupation was recognized by Pinel and Tuke in the late eighteenth century, when the liberalization of mental treatment began. The "continuous process of translating the disabled by full medical care to being producers and earners," as envisaged by Beveridge, represented modern thinking but failed to emphasize the special problems of social resettlement of the mentally ill. The habit-training programmes for deteriorated schizophrenics confined to institutions played their part, and the process continued with work training. Therapeutic communities, by deliberate simulation of natural conditions, permitted social reintegration of patients within the hospital environment, and the concept of community care now embodied in the Mental Health Act (1959) provided the framework for social and personal reinstatement. A comprehensively organized mental health service for the local community as in Nottingham,[3] and the principles underlying organized family psychiatry in Norwich,[4] have wide prophylactic implications.

The importance of industrial therapy in psychiatric hospitals is undoubted but difficult to estimate precisely. Yardsticks are elusive. J. K. Wing and colleagues[5] mention that repeated practice alters the results, and that by the crude measure of workshop output the performance of severely ill chronic schizophrenics varied with changes in supervision. They also pointed out the artificiality of distinguishing between long- and short-stay patients. But they showed that 21 out of 45 moderately disabled schizophrenics were working satisfactorily a year after discharge from an industrial rehabilitation unit. Acceptance of psychiatric patients at Ministry of Labour industrial rehabilitation units is customary now, and figures for rehabilitation suggest results comparable with those of other disabled groups.[6] Selection of patients is clearly an important factor, and it has been suggested also that too high a proportion of psychiatric patients in these units defeats the object of them.

Important advances in the provision of sheltered employment for the mentally ill have been made in recent years. From 1961 St. Wulstan's Hospital, Malvern, previously a sanatorium, has been used for rehabilitation of long-stay patients drawn from the twelve psychiatric hospitals in the Birmingham region. A therapeutic community is provided in combination with financial arrangements which include incentives and deterrents as well as deductions at source from patients' wages for sickness benefit and for a resettlement grant on discharge.[7] Industrial therapy organizations operating as commercial concerns have also been set up. Bristol led the field from 1959, and the management of its organization includes representatives from industry, civic authorities, the Church, and trade unions. This scheme has been approved by the Ministry of Labour.[8] The enterprise at Bristol has been followed by other industrial therapy organizations in Surrey, Middlesex, Cheshire, and Northern Ireland. In 1963 Birmingham formed an industrial therapy association, began its activities with a car-washing unit (as at Bristol), and has now opened a factory, now also recognized by the Ministry of Labour. The early approval of the workshop at Bristol has now been extended by the Ministry to a sheltered placements scheme for selected patients in industry. Bristol has also recently opened a petrol-filling station manned by psychiatric patients. At Cheadle Royal Hospital an industrial therapy unit now approved by the Ministry has been set up with the assistance of grants from the Nuffield

[1] Charlton, E. P. H., in *Proceedings of a Conference on the Place of Work in the Treatment of Mental Disorder*, p. 29, 1959. National Association for Mental Health, London.
[2] *Brit. med. J.*, 1966, **1**, 1100.
[3] Macmillan, D., *Lancet*, 1958, **2**, 201.
[4] Howells, J. G., *Family Psychiatry*, 1963. Edinburgh and London.
[5] Wing, J. K., Bennett, D. H., and Denham, J., *The Industrial Rehabilitation of Long-stay Schizophrenic Patients*. Medical Research Council Memorandum No. 42, 1964. H.M.S.O., London.
[6] Jones, M., *Lancet*, 1956, **2**, 985.
[7] Morgan, R., Cushing, D., and Manton, N. S., *Brit. J. Psychiat.*, 1965, **111**, 955
[8] Annual Reports, 1961–5, Industrial Therapy Organization (Bristol) Ltd. Bristol.
[9] *Brit. med. J.*, 1966, **1**, 1532.
[10] Ibid., 1966, **2**, 655.
[11] Barton, R., *Institutional Neurosis*, 2nd ed., 1966. Bristol.