said. But later they had been confirmed by studying children. While observation of adults in regressive states had led to deductions about children's unconscious fantasies, it had required the analysis of children to reveal the details of the defence mechanisms which were used to deal with these fantasies at different stages of development.

Dr. E. J. ANTHONY (Institute of Psychiatry, London) then gave a historical account of the development of Piaget's system, and contrasted it with the Freudian system.

### First Social Relationship

Mr. J. A. AMBROSE (Tavistock Clinic, London) then described, from an ethological standpoint, a preliminary study forming part of a wide programme of research on the processes underlying the development of the infant's attachment to its mother—its first permanent social relationship. The study concerned the variations of the smiling response of babies to the stimulus of the sight of a motionless, unsmiling human face. The "smiling time," defined as the number of seconds a baby smiled in a total period of 30 seconds' exposure to the stimulus, was found to diminish rapidly from a maximum, but could be revived by moving, speaking, or smiling at the baby, or by removing the stimulus for a short period. If a constant stimulus was repeated intermittently the smiling response waned. This waning curve differed from infant to infant and was sensitive to a variety of external and internal conditions affecting the baby. However, smiling was only part of a baby's response. It engaged in a good deal of other forms of activity which Mr. Ambrose described and discussed.

Mr. T. MOORE (Institute of Education and Child Health, London) gave an account of a study of the sleeping habits of babies in their first year of life. At three weeks an infant slept for some 14 out of the 24 hours, and only slowly during the course of its first year did its sleeping tend to occur wholly at night. At the end of this year 10% of the babies he studied had never slept regularly through the night for four consecutive weeks, and half of those who had settled relapsed to waking at night later. Among the factors associated with this failure to settle at night were neonatal asphyxia, male sex, feeding difficulties, insufficient nursing, and inconsistent handling at night.

### Separation from Home

Dr. C. M. HEINICKE, Ph.D. (Tavistock Institute, London), described a carefully designed clinical investigation on the effects of temporary separation from the home and a stay in a residential nursery on children, aged 15–30 months. A control group matched in all respects except for the absence from home were similarly studied. This work confirmed the damaging effect of separation from the home.

Dr. T. R. LEE, Ph.D. (St. Andrews University), had obtained assessments of the social and emotional adjustment of 883 infants attending 57 village schools from their teachers. He found greater maladjustment in those who went to schools far from home. Of possible explanations for this (including fatigue), the only one which satisfied the data was a situation where the child felt its mother to be inaccessible.

Mrs. KELLMER PRINGLE, Ph.D. (Birmingham University), reported that children who had been admitted to institutions early in life and had lost contact with their families, when tested at the ages of 8, 11, and 14 for range of vocabulary and intelligence, obtained lower scores than those admitted later and with persisting home contacts.

### Other Medical Contributions

Mr. P. H. GLOW (University College, London) described the effect of a hallucinogen—lysergic acid—on the behaviour of rats. His experiments had shown that its effect was related to its concentration in the brain and was due to its action on the afferent system, not the motor system.

Dr. M. HAMILTON (Leeds University) gave an account of the application of psychometric methods to the assessment of the symptoms of anxiety neurosis. Patients were assessed on 13 variables (symptoms), using a five-point scale, and simultaneous assessment by two psychiatrists showed that the method was more reliable than most psychological tests of personality. The method of factor-analysis had been used to study the relations between the variables, and it was shown that these could be ascribed to two independent factors, one accounting for "psychic" symptoms, and the other for somatic symptoms. German psychiatrists, he pointed out, classified the latter group as a distinct syndrome of "autonomic dysfunction."

Professor H. J. EYSENCK (Institute of Psychiatry, London) gave an account of a recent work in which excitatory drugs such as amphetamine and caffeine and sedatives such as amylobarbitone sodium were used to alter cerebral functioning. Previous work has shown the importance of excitation and inhibition on the personality. This paper was concerned with the effects of these drugs on the development of visual after-images.

No account of this meeting would be complete without some reference to Dr. E. B. STRAUSS'S presidential address on "The Anatomy of Treachery." He gave a literary and sparkling address in which sound judgment of character, wisdom, and clinical acumen were nicely mingled. It made a fitting climax to a stimulating meeting.

# Reports of Societies

## MANCHESTER MEDICAL SOCIETY

"Perinatal Pneumonia" and "Hormones and Adrenalectomy in Metastatic Breast Carcinoma" were discussed recently by the Sections of Pathology and Surgery respectively of the Manchester Medical Society.

### Perinatal Pneumonia

The discussion on perinatal pneumonia was opened by Dr. F. A. LANGLEY, senior lecturer in special pathology. In the years 1950, 1952, and 1954 they had found pneumonia *post mortem* in 10% of stillborn foetuses, in 25% of babies dying on the first day, in 33% of those dying on the second day, and thereafter in diminishing proportion. The stillborn foetuses and infants dying under three days were on average larger than a control group of foetuses and infants dying without evidence of pneumonia, and birth injury and severe dystocia were commoner among them. Particularly striking was the high incidence of pneumonia in infants whose amniotic membranes had been ruptured more than 48 hours, although the duration of labour by itself seemed to play no part. Of stillborn foetuses whose placentas were available for examination, all the ones with pneumonia showed inflammation of the foetal surface of the placenta.

A clinical trial was carried out in 1955 in which women in labour with pyrexia, foetal tachycardia of 160 or more, or offensive liquor were separated into two groups. One group was treated with streptomycin and oxytetracycline, while the other received no antibiotic therapy. Five cases of pneumonia were found *post mortem* in the untreated and none in the treated group. In each case of pneumonia there was evidence that maternal infection had been present for 48 hours or more. And again a close correlation was found between the length of time the membranes had been ruptured and the occurrence of pneumonia.

Dr. R. F. JENNISON, lecturer in clinical pathology, said he had made bacteriological studies during the last two years of 330 lungs from infants dying in the perinatal period. He had isolated bacteria from 128. The commonest organisms were *Bact. coli* (15%), *Strep. faecalis* (9%), and non-haemolytic streptococci (6%). Of the 39 lungs showing pneumonia, 21 had given positive cultures, six of these being of *Bact. coli*.

A comparison of the bacteria isolated from the infants' lungs with those from their mother's vaginas during a controlled trial in 1955 had shown a similar distribution of pathogenic organisms. The number of pathogens increased with the length of time the membranes had been ruptured and also with the duration of maternal pyrexia. All the infants with pneumonia in this series had been born of mothers with a pyrexia of 99.4° F. (37.4° C.) or more for at least 48 hours and whose membranes had been ruptured for 36 hours or more. No cases occurred in mothers without pyrexia or who had been given antibiotics as soon as pyrexia developed. It appeared, therefore, that the majority of cases of perinatal pneumonia were caused by bacteria from the vagina, and were associated with a maternal reaction manifested by pyrexia.

### Bilateral Adrenalectomy and Oophorectomy for Breast Cancer

Mr. A. F. ROBINSON (Burnley General Hospital) opened the discussion on "Hormones and Adrenalectomy in Metastatic Breast Carcinoma." Bilateral adrenalectomy and oophorectomy (or orchidectomy) could help control disseminated breast cancer only if the tumour was hormone-dependent, he said. To eliminate all oestrogenic hormones both adrenals and ovaries had to be removed, unless a hypophysectomy was done instead; a previous *x*-ray sterilization or menopause did not remove the need for oophorectomy. Operation was recommended if the disseminated cancer was active and advancing and simpler treatments had failed. Cases had to be selected with care. Those whom it was thought would not stand operation, those whose arms were grossly swollen, those over about 70, those with much hepatic or mediastinal metastasis, and those with irreversible vital damage, should be excluded. At operation accessory adrenals must be looked for and removed.

After the critical first six hours there was usually little cause for anxiety. In general more cortisone was the remedy for most ills at any stage after operation, and difficulty in cortisone management usually meant failure of response in the cancer. Postural hypotension was an indication for deoxycortone in the follow-up period. Response in the successful cases had been dramatic, bone pain often being relieved by the morning after operation. In 43 cases there had been 5 deaths associated with the operation, and 18 out of the 38 survivors had been greatly helped.

Dr. MARY COLE (Christie Hospital) gave more details of the operative results. Of the 43 patients 19 had been operated upon at least 12 months ago; of these, nine showed a measurable response, seven being still alive, three being well at 18, 17, and 13 months respectively. Including those operated upon six months ago, there were 38 cases; 19 had shown a response and 10 were still in remission after periods between 6 and 18 months.

At most sites there was some improvement, but bone metastases responded more consistently than others. Many of the patients had had a trial of hormones pre-operatively, and of 18 patients who responded to adrenalectomy nine had previously shown a response to hormones; of 14 who did not respond to adrenalectomy two only had shown a previous response to hormones.

Dr. Cole then compared these results with those from other methods of treatment. *X*-ray castration had resulted in improvement of the metastases in 21.5% of 79 pre-menopausal women, she said. Some 20% of 142 pre-menopausal women receiving testosterone propionate responded, but there was a gradual diminishing response in the older age-groups. Of 258 patients treated with stilboestrol the best response—19.2%—was obtained in those at least 10 years past their menopause, while of the pre-menopausal patients only 5% responded. In spite of the lower remission rate with hormones compared with combined oophorectomy and adrenalectomy, she made a plea for a trial of the appropriate hormone before operation—the final palliative measure—was considered. Some patients, she said, might have a remission with hormones, and subsequently again after adrenalectomy and oophorectomy.

# Correspondence

*Because of heavy pressure on our space, correspondents are asked to keep their letters short.*

### Strontium-90 in Man

SIR,—Strontium-90 is now frequently being discussed all over the world, and your leading article (*Journal*, March 30, p. 752) will no doubt be quoted in lay fora as an expression of the best medical opinion of this country. It is important that some of the weaknesses of this, in most ways excellent, short summary of the situation should be noted.

"The main problem is how to assess the hazard from a given amount of strontium-90 in bone." Most would agree with this quotation.

*Permissible Body Burden for the Occupationally Exposed.*—This has been given by the International Commission on Radiological Protection and the Medical Research Council's Committee on Protection against Ionizing Radiation as 1 $\mu$c of strontium-90 or approximately 1,000 S.U. (strontium units, $\mu\mu$c per gramme of calcium), and was derived as follows. From industrial experience in the luminizing industry it was considered that the minimum toxic body burden of radium—a chemical analogue of calcium and strontium—was 1 $\mu$c. Early results with experimental rodents in Chicago had indicated that the toxic dose of strontium-89 relative to radium was about 10:1. Strontium-90 and its daughter yttrium-90 liberate per disintegration about twice the energy of strontium-89. Therefore the ratio of strontium-90 to radium should be about 5:1 as administered; but radium decays in the body to radon, a gas, much of which escapes in expired air, more in the case of recently deposited radium than from long-standing depots, and more in the case of experimental rodents than man. In terms of body burden of effective radioactive material in human bone it was fair to allow a factor of 2 for this, bringing the ratio strontium-90:radium=10:1. The calculated, minimum toxic permanent body burden for strontium-90 is thus 10 $\mu$c. Allowing a safety factor of 10 a maximum permissible body burden of 1 $\mu$c was derived.

The following uncertainties are relevant. (1) Industrial radium used in the luminizing industry was a mixture containing variable amounts of mesothorium and other radioactive elements, too short-lived for their contribution to the observed toxic manifestations to be assessed at the time when the body burdens of luminizers were estimated. However, a few subjects who had received injections of relatively pure radium for medical (*sic*) reasons have been discovered: in them the minimum toxic body burden appears so far to be about 3 $\mu$c[1] as compared with recent estimates of about half a microcurie of "radium" in ex-luminizers. The minimum toxic body burden of radium cannot therefore be indicated with precision. (2) The ratio of toxic doses of radium and strontium-89 was derived from injected animals. After more chronic administration these radioactive materials may be expected to be more widely distributed in bone. (3) The comparative metabolism of radium and strontium may differ significantly in man from the rodent because of different size and bone structure.

*Permissible Body Burden in General Population.*—In spite of the uncertainties the maximum permissible body burden for strontium-90 remains one of the best authenticated among those derived for occupational purposes. However, because of the uncertainties it is not justifiable to use this figure as a yardstick when one is considering a general population as Libby[2] and Kulp *et al.*[3] have done. Your leading article and the Medical Research Council[4] have given the most cogent reason—the presence in a general population of foetal, neonatal, and adolescent subjects who have greater avidity for and greater sensitivity to radioactive strontium. On the other hand, with the homoeopathic doses they receive daily the young will distribute strontium much more uniformly in bone than will the adult. How much this latter offsets the former is unknown.