

decision to give further narcotics the drugs may well be given too late to have any effect on the mother, although if given slightly earlier, and if delivery does occur within the next one to two hours, the baby may be affected and the start of his respiration impaired. For patients who are progressing rapidly in labour after induction and who can be expected to deliver within two to three hours from the time of induction a totally satisfactory form of analgesia does not appear to be available. The use of a relatively new form of analgesia, transcutaneous nerve stimulation,<sup>8</sup> may be of value in this situation, and we are currently evaluating this method. It is interesting to note that six patients in the two-to-six hour group received no analgesia other than premedication and considered this quite adequate.

I thank sisters L Green and C McColl and staff midwife C Davis

for questioning the patients, and Mr V G Kenyon and Mr M L Cox for permitting patients under their care to be included in the survey.

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## Letter from . . . Chicago

### Jet lag science

GEORGE DUNEA

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At the southern end of the Monterey Peninsula stands Carmel-by-the-Sea, a small picturesque town that slants to a greyish-white beach and a foaming surf. Just north is Pebble Beach, the golfer's paradise, and then the 17-mile drive to Monterey—one of California's most scenic routes. The town is quiet and unspoiled, with low-set wooden houses half-hidden by surrounding shrubbery, with ferns and cypresses lining the streets, and with a sprinkling of eucalyptus. There are no neon lights, no garish signs, but, for the tourists, art galleries and book-stores, elegant shops and fine restaurants, open air cafes, and even espresso bars. The sun shines warmly here, at a time when most of America is frozen and snowbound; and it is in these idyllic surroundings that the western sections of the three societies for biomedical research hold their annual meeting.

There is much to be said for skipping the scientific sessions and walking among the trees or along the beach. But once this temptation is overcome and the decision is made to educate oneself, one may admire slides of polymerising haemoglobin-S molecules, of naughty gonococci that have become resistant to penicillin, of complex diagrams explaining cholesterol transport and intimal damage, and the role of high-density lipoproteins. Hodgkin's disease in 1977 has an excellent prognosis, and the treatment with radiation and chemotherapy is complicated and successful. Potassium-depleted rats increase their water intake before they develop polyuria and impaired urinary concentrating ability. Idiopathic hypercalciuria is a compensatory response to a renal phosphate leak—one expert claims, and another shakes his head in dissent. Hydrallazine and other vasodilators reduce cardiac afterload and may help

some forms of heart failure. Clonidine suppresses catecholamine release and prevents certain types of flushing. Patients taking phenytoin need twice as much prednisone to achieve an equivalent therapeutic effect. Gallium scans are good for studying the response of Paget's disease to calcitonin. Patients with  $\alpha_1$ -antitrypsin deficiency have basal as well as apical lung scan defects and no  $\alpha_1$ -globulin peaks on electrophoresis; not smoking stops the endoproteases from digesting the alveoli; and the trouble lies with the hepatocytes' failure to release the  $\alpha_1$ -antitrypsin granules.

The most exciting presentation, however, was Dr Roger Guillemin's on the peptides of the hypothalamus. Starting with the observation that the human brain had receptors for opiate alkaloids and with the surmise that these receptors might be concerned with the perception of pain, he found it a simple matter to grind up a quarter of a million pig hypothalamuses and neurohypophyses; carry out a series of elaborate separation procedures; determine which fraction was biologically active; and isolate several "endorphin" peptides that have opiate-like activity. These endorphin peptides and the related enkephalins fit together like a jigsaw puzzle into a 90 amino-acid  $\beta$ -lipotropin, a pituitary extract long in search of a function, and are stored in the pars intermedia, also long in search of a function. And then it was shown that various endorphins, when injected into rats, can make them depressed or catatonic, agitated or tranquillised—thus raising the hope that some day we may learn what makes people psychotic, or addicted, or tolerant to various drugs.

### Hypertension

Next, we find ourselves walking through the narrow streets of old San Juan, admiring the magnificent El Convento Hotel or the solid stone El Moro fortress guarding the entrance to the harbour—or we might leave for Puerto Rico's fashionable

Dorado Beach, where this year's Hahneman symposium on hypertension was held. And, although some time was left over for sipping rum drinks and bathing in the ocean, the main thrust was directed at the epidemiology and treatment of high blood pressure. So that there was much talk about diuretics and propranolol and clonidine, and how no one was really sure how they worked, and how diuretics may increase serum lipids and cholesterol, and how the brain has beta-adrenergic receptors, and how rebound hypertension may occur after stopping clonidine abruptly.

Professor Dollery explained that cotton-wool exudates were infarcted nerve fibres and that clinical evaluation of the arterio-venous ratio was unreliable. Dr Tarazi described how the hypertensive heart was less compliant because of collagen and hydroxyproline accumulation; and Dr Hollander emphasised that the occlusive vascular disease of the hypertensive affects primarily the small vessels, and that the hypertensive heart is essentially different from the arteriosclerotic heart. There was much discussion about salt and risk factors and nurse practitioners, the possible importance of the systolic blood pressure, and the relative role of genetic and environmental factors in the cause of hypertension. There was also some doubt about the advisability of treating with drugs millions of borderline hypertensives, a question that may long remain unanswered.

### Artificial organs

At Chicago's O'Hare Airport, Air Canada is classified as a domestic airline, but bilingualism starts at the gate, with bilingual signs and sounds and people. In Montreal the issue is "francification," and the future looks uncertain; but for the visitor the city presents a blend of old and new, of French and English, with modern high-rise blocks unfortunately destroying much of the local colour, with statues of Robert Burns and Queen Victoria, a French quarter and a Hotel de Ville, and public conveniences called *vespasiennes*. The tour of the city takes you inside gorgeous old French churches, past the port of Montreal, the exposition, and the Olympic stadium. In the side streets one spies old houses with straight or strangely curved outside staircases leading directly into the second or even third floor. There are the crowded graveyards of Mount Royal, the lavish stone mansions of Westmount, the towers of the University of Montreal, and the young students sitting around the quadrangle at McGill, no doubt talking about the meaning of life, their future plans, their hateful professors, and love.

It is hard to realise that the American Society for Artificial Organs is already 23 years old. During this time we have witnessed not only the growth of an entirely new subculture of dialysis nurses, technicians, social workers, scientists, salesmen, and politicians, but also the birth of prototypes that some day will replace most parts of man with the possible exception of the soul and super-ego. There are artificial bowels and pancreases and livers, hearts and eyes and ears, prosthetic ureters and plastic bladders, and a "new device for the treatment of certain cases of male infertility." Artificial arms can lift, grip, rotate, and move with the freedom of a natural arm. Membrane artificial lungs optimise not only O<sub>2</sub> delivery but also CO<sub>2</sub> removal. Antibodies fixed on to adsorbents may extracorporeally remove immune complexes. There is the possibility of oxygenating the myocardium in a retrograde fashion via the coronary sinus, and of supporting the failing heart with a transapical bypass. To the implantable pacemaker must now be added pumps that infuse insulin and electromagnetic sound sources that replace the larynx. Cells are grown on polymer matrices, enzymes can be put inside red cells, and a calf has lived 160 days with a mechanical heart in its chest and is shown exercising on a treadmill. Fortunately the snails Bourguignon remain unartificial, nor has Cabernet Sauvignon as yet issued from a massive proportioning delivery system.

### A changing world

And now the jet takes us to Connecticut Avenue in Washington, to the research meetings which for almost a century graced the boardwalk in Atlantic City. Feelings of nostalgia for the old tradition were countered with exhortations about the need to adapt to a changing world, lessen the isolation among subspecialties, provide more reassuring prospects for young people entering research, and educate the public to understand that while they should invest in science they cannot purchase results. Dr Petersdorf described how the malaise in academia continues to increase, and how deans and chiefs of medicine are generally phagocytosed within three to four years by paperwork, committees, overwhelming technology, fiscal difficulties, and recruiting efforts. Temporary remedies, presented in a series of slides, included being out of town, lecturing around the world on potassium depletion, non-invasive inspections conducted around a sunny swimming pool, moonlighting in crafts such as carpentry, and, if all else fails, the occasional obscene gesture directed at exasperating associates.

An afternoon of presentations at the National Institutes of Health Clinical Centre included an excellent demonstration of the diagnostic use of radionucleotide imaging of the heart during exercise. There were discussions about insulin receptors in obesity and adult-onset diabetes mellitus, about enzyme replacement in the lipidoses, and more about the structure of endorphins. And there was Dr Gajdusek's presentation of the unconventional slow viruses that cause kuru, scrapie, Jacob-Creutzfeldt disease, and possibly some familial forms of Alzheimer disease. These small viruses, with incubation periods of many years, are non-antigenic and resistant to all known forms of sterilisation. Transmitted by neurosurgical probes, corneal transplantation, and eating various organs of infected people or animals, they have caused the death of at least one neurosurgeon and possibly of other doctors, and present a formidable challenge to medical science.

The formal programme this year included an increased number of plenary sessions, reflecting the desire to break down barriers among subspecialty groups. There was much discussion about receptors, gene transcription, prohormones, lipid metabolism, and disorders of the complement system. Mixed cryoglobulinaemia is often associated with hepatitis B virus; sarcoidosis with circulating immune complexes; cancer with ectopic peptides; and hyperthyroidism with an increase in beta-adrenergic receptors. Nicotinic acid reverses cholera-induced intestinal hypersecretion; familial hypocholesterolaemia is a disease that increases life expectancy by five to seven years; oestrogens do not cause endometrial cancer but may help diagnosis by causing postmenopausal bleeding; and the low molecular weight peptide eosinophilopoietin regulates eosinophil production in mice. There was a dramatic film showing neutrophils chasing a trichomonad around the screen, surrounding it and tearing it apart, and even phagocytosing its flagellae. Finally, there was again the paper on idiopathic hypercalciuria, which, in a new variant of the Ulysses syndrome, brings us back to where we started.

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ONE HUNDRED YEARS AGO A little girl, with a large granulating surface of about seven inches square, the result of a burn, recently came under my care. I procured cicatrization (and without any contraction) of the greater part of this surface by means of the insertion of more than three hundred skin-grafts. But, then, my supply of skin, not unnaturally, came to an end. I had resort in my difficulty to a young pig, and a few days ago I inserted upwards of twenty grafts of his skin, and with very good results. I can now see my way, I hope, to a successful termination of the case, provided I am not interfered with by the Society for the Utter, Total, and Immediate Suppression of Vivisection. I am not forgetful of the sorrows of the pig; but he suffers in very good company, most of his fellow-victims being sisters of mercy. (*British Medical Journal*, 1877.)