Letter from . . . Chicago

Meetings in the spring

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Concern about declining numbers of medical students entering careers of medical research dominated the keynote speeches at the annual joint meetings of the three major American societies for clinical research. Warning their members that the future of research was threatened, and that clinical investigators were becoming an endangered species, the three outgoing presidents told the members of their societies that, in a decade when the number of students graduating from medical schools had doubled, the absolute number of doctors listing research as their major occupation had greatly decreased. Several studies have shown a serious decline of interest in research among medical students, with a distinct shift in preference to specialty or general practice—mainly private but also, to a lesser extent, salaried—and few students now seriously consider becoming clinical investigators. Since 1975 the National Institutes of Health have reduced the number of research training grants by almost half, and yet many of these were not being filled because of a shortage of applicants. The speakers also pointed out that as it takes some five to 10 years to train a scientist capable of performing independent research, the full impact of the shortage of adequately trained investigators was yet to be felt.

Disquieted academic world

Economic considerations and the uncertainties of continuing Government support undoubtedly play a major part in determining the student's choice of future career. Several speakers, however, commented on a more pervading reordering of priorities—so that medical students are urged to enter primary care, training in laboratory techniques has been eliminated from curricula, and the requirements for specialty certification militate against time being spent in the laboratory. At the same time, few students ever receive the stimulation or inspiration that would lead them to dedicate themselves to a life of research; and the increasing difficulties in carrying out any kind of experimentation on man may well explain why PhDs are flocking to biomedical research at a time when MDs are shunning it.

Even Senator Edward Kennedy, in his address to the American Society for Clinical Investigation, conceded that these were times of disquiet and uncertainty for the academic community. He said there was a need to bridge the gap between the bench and the bedside, and expressed regret that the feeling of exhilaration of the golden days of the 'fifties and 'sixties had given way to despondency and strained relations between Government and academia. He also thought that society was being cheated by the erosion of the Government's commitment to research, criticised the cuts in the Administration's 1980 budget, and blamed Congress for constantly changing its priorities—funding first one categorical programme and then another, as though it were the Disease-a-Month-Club. Emphasising the need to restore a sense of continuity, the senator drew loud applause when he said that investigators were drowning in paperwork and regulations; and again, when he called for positive programmes designed to encourage young men to develop the new kind of knowledge on which progress in our society depends.

Golden eggs still being laid

Clearly, more needs to be done to help the aging goose that for over three decades has laid so many golden eggs. Yet listening to the many elegant papers presented in the plenary and sectional meetings I could not help feeling that, although the feathers have become somewhat worn, the golden eggs still keep coming—in the form of new treatments and new insights. Some 3000 people attended the meetings in Washington this May, and particularly noteworthy among the 500 papers presented were those dealing with rare diseases whose pathogenesis often illustrates more widely applicable principles. To the 15 diseases that may be helped by marrow transplantation must now be added osteopetrosis (marble-bone or Albers-Schönberg disease), in which an infusion of compatible bone marrow in a suitably immunosuppressed host will restore adequate osteoclastic activity and allow the reconstitution of a normal bone-marrow cavity. Abnormal collagen cross-linking by fibroblasts may be the underlying defect in osteogenesis imperfecta; raised adipose tissue levels of lipoprotein lipase may play a part in causing the pathological obesity of the Prader-Willi syndrome; and a deficiency of protoporphyrogen oxidase may be the cause of porphyria variegata, the disease of kings. Complex changes in globin genes give rise to various forms of thalassaemia; the development of nephritis in mixed cryoglobulinaemias depends on dysfunctional Fc receptors allowing the continued circulation of immune complexes; and a 29-year-old woman with a long history of eczema and skin infections was found to have sluggish polymorphonuclear leucocyte chemotaxis and was cured by reducing the abnormal levels of leucocyte cyclic AMP with therapeutic amounts of lithium carbonate.

New information is also emerging about the common diseases. Some patients with diabetes may have an abnormal type of insulin in which phenylalanine replaces leucine. Several different types of high-density lipoproteins have been isolated, and must be considered separately in evaluating their role in atherosclerosis. Desensitisation to ragweed generates antigen-specific suppressor T-cells; propranolol increases beta-adrenergic surface receptors, and this may account for some of the com-

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plications of abrupt cessation of treatment. The inotropic effect of digitalis, we are told, depends on increasing cellular uptake of sodium and calcium, possibly by means of an exchange carrier mechanism. Scientists have also discovered a new vitamin D precursor—previtamin D—formed from 7:dehydrocholesterol under the influence of sunlight, stored in the skin in an energy-saving measure, and released as necessary according to the ambient temperature. And, as if all these new insights into the pathogenesis of disease were not enough to inspire young people to enter career research, there was Dr Arnold Relman's eulogy and the audience's standing ovation for the recipient of the 1979 George M Kober medal—Dr Franz Ingelfinger, whose career has spanned over half a century of achievement in research, gastroenterology, clinical medicine, and, of course, the highly successful editorship of the *New England Journal of Medicine*.

Evaluation studies

Turning now to the scientific endeavours of those who prefer large cohorts to small animals, we find that those who have examined the many contradictory studies on anticoagulants for coronary heart disease have concluded that the benefits, if any, are probably restricted to the patients with severe infarction. More important is the speed of resuscitation before admission to hospital, and most of the survivors in a large study of cardiac arrests were those who had received cardiopulmonary resuscitation from bystanders. The paramedics, though useful, cannot make up for the early minutes of ischaemia, though capable of arriving at the scene in an average time of 4-5 minutes. Another study showed that paramedics often wrongly identified and treated cardiac arrhythmias—and this raised questions from the audience as to whether most doctors other than cardiologists would have done any better. Be that as it may, we also learn that moving the low-risk myocardial infarct patients out of intensive-care units within 24 hours increases risks only minimally, but saves a lot of money; as does not ordering throat swabs in patients with sore throats unless they have had tonsillar exudates or fever above 101°F.

Other studies showed that there was nothing to be gained at present from screening asymptomatic subjects for gall stones; and, still on the subject of cost containment, that reducing patient hospital stay by even one day saved much more money than drastic reductions in the number of drugs prescribed or investigations ordered. Providing a group of interns at a university hospital with a daily computerised print-out of cumulative charges incurred by their patients reduced costs by 28%, compared with the control group who received no computer sheets—and therefore also less attention.

For many patients, however, the results of our fashionable education programmes are at times perplexing. In a study designed to evaluate the effect of providing a consumer's guide to self-care in order to reduce the number of marginally indicated visits to a prepaid medical health plan, the results were most impressive in the subgroup of patients who had received the guide but had not read it. In other studies, it was found that patient-education programmes increased knowledge but not necessarily adherence to treatment, and, in the case of hypertension, produced adverse effects such as increased absenteeism from work. The value and cost-effectiveness of the massive effort currently being expended on providing compulsory continuing medical education to doctors have also been questioned periodically.

Speaking at another meeting in Washington, Dr Theodore Cooper, former director of the US Public Health Service, pointed out that 23 states had already enacted legislation requiring mandatory continuing education with credits for relicensing, presumably in response to the public's insistence on better medical care. In 1978, the total cost for these programmes was estimated at $3·6 billion (direct costs plus lost working hours). Yet the frenzy may be expected to increase, and lead to a more extensive bureaucracy and increasingly expensive methods of documenting participation. The medical profession, however, would be well advised to develop programmes of proved efficacy, concluded Dr Cooper. The alternative could be increased direct government implication, with formal periodic re-examinations for recertification, perhaps even partial relicensing of physicians so specialised that they can function only in a limited area—such as, for instance, ophthalmology—and with further implications concerning the setting of fees, malpractice premiums, or the overall arrangements in a future national health insurance system.

Away from science

But Washington in early May has more to offer than science and epidemiology, for the sun shines softly, and the azaleas are in full bloom, covering the city in pink, purple, and white colours. On such beautiful days the visitor may lose himself among the trees and bushes along the Rocky Creek, watch the pandas frolic at the zoo, or walk to the White House and past the George Washington monument along Constitution or Pennsylvania Avenue.

Almost opposite the Capitol he might pause, and visit the new super-modern East Building of the National Art Gallery, with its steel and glass, and with Henry Moore's massive *Knife Edge Mirror Two Piece* under the huge H-shaped entrance. Bright and imaginative, with elegant stairways and balconies, with centrally placed Indian laurel trees, the main hall is dominated by Alexander Calder's overhanging mobile of black, red, and blue triangles swaying gently, almost imperceptibly, like the leaves of a huge tree. For the next few hours the visitor may admire Joan Miro's *Woman*, of dyed woven New Zealand wool; Noguchi's roughly hewn Japanese basalt *Great Rock of Inner Seeking*; Aristidide Maillol's *Venus*; the paintings of Picasso; the collages of Matisse; and Giacometti's bronze walking men, standing women, and human forests. There are 60 lovely small paintings by French impressionists; three rooms full of Modigliani's works; and an exhibit on the life of Berenson—the great diagnostician of Italian paintings—who ruled on their authenticity by paying infinite attention to the detailed structure of the hands, ears, or mouth, comparing them with what he had seen in other paintings, and showing how in paintings, as in diagnostic medicine, it is but a blurred line that divides science from art.

Does the additive compound monosodium glutamate, which enhances the taste of foods, inhibit sleep if given to patients in hospital in evening meals?

Attempts have been made to use glutamate in the treatment of various mental disorders on the assumption that it has central effects.[1] It is doubtful, however, whether ingested glutamate reaches the brain in appreciable quantities. But if there is a sufficiently high concentration of glutamate in the plasma then its transfer across the blood-brain-barrier may occur by simple diffusion. Symptoms such as headaches, a burning sensation at the back of the neck, and chest pain have been commonly experienced after eating Chinese foods (Chinese restaurant syndrome). A Chinese meal may contain up to 10 or 12 g of MSG, and subsequent research pointed to MSG as the culprit in this syndrome.

Several studies have investigated the effect of various doses of MSG and "drowsiness" and "sleepiness" were reported among the many symptoms experienced by the volunteers.[2] It is unlikely that hospital meals have as high a concentration of MSG as Chinese food and so detrimental effects are unlikely to be experienced by the vast majority of patients. The few people, however, who are particularly susceptible to MSG may suffer discomfort after a meal flavoured with this food additive, and I would predict that if a person suffers from headache, chest pain, or any of the other unpleasant side effects reported, then sleep would be disturbed.

[1] Himwich, H E, *et al*, *Journal of Nervous Mental Diseases*, 1955, **121**, 40.
[2] Reif-Lehrer, L, *Federation Proceedings*, 1976, **35**, 2205.