Letter from . . . Ontario

Research at long odds

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British Medical Journal, 1978, **1**, 1405-1406

Few would deny that success in scientific research has an element of luck. It is the unexpected observation that often refutes the hypothesis and provokes fresh ideas. Research in Ontario has become more dependent on luck in the past year or so than anyone could have predicted. We are living in the era of "lotteries." It started with the Olympic lottery introduced by the Federal Government to meet the underestimated costs of the 1976 Olympic Games. The provincial governments, not to be outdone by the opportunity to raise large sums of money from the gullible, and possibly jealous of the Federal Government's success, have devised their own lotteries. One such is Wintario. The financial success of this and similar ventures was predictable. What was to be done with this new-found wealth? Possibly influenced by a staunch Presbyterian background, it was decided that the revenue should not be used to reduce the burden of the ever-increasing provincial debt. At first, requests were solicited for support of a wide variety of community projects, on the condition that these were matched by local contributions in cash or kind. But such has been the success of Wintario that new uses had to be found for the accumulated revenue which, if not embarrassing, appeared to disturb the conscience of our politicians. What better use for this new-found wealth than to support medical research; what indeed! Yet this laudable motive was not without its complications. The word "lottery," which had been rarely used in discussions of faculty or departmental affairs except by the discontented at the outcome of meetings on promotion and tenure, now figured prominently on agendas and in minutes. Files were retrieved, requests for equipment previously doomed by financial stringency updated, dormant committees reconvened, and quiescent rivalries reinvigorated. The unfairly despised mandarins of government who had been the implementors of fiscal constraint were now perceived as potential benefactors.

In due course it was announced that each of the health science centres (medical schools) in Ontario would receive between \$169 000 and \$282 000 for replacing or upgrading equipment plus \$100 000 for support of research projects. In addition the University of Ottawa received a capital grant of \$3 500 000 for clinical research space. The four principal voluntary agencies supporting research in Ontario into cancer, cardiovascular diseases, drug and alcohol addiction, and mental health were given respectively \$2 000 000, \$500 000, \$300 000, and \$500 000 in support of research. Not surprisingly, strings were attached and the guidelines were apt to be confusing and not always consistent. The voluntary agencies had to use the funds within two years for defined projects, with the implication

that some tangible, and if possible major, achievement would be accomplished with the funds provided. Money derived from odds of many thousands to one against was to be used to support an endeavour in which the odds, although not as great, were all too apparent to the potential recipients of a designated "lottery" grant. Which of the successful grant recipients was to receive this additional accolade? A new dimension was added to the deliberations of grant review committees. In addition to scientific merit, feasibility, and priority they were now to try to gauge success and public appeal. They needed to adopt the ways of a professional tipster with an eye to form as assessed by the "track record" (publications), the reputation of the "trainer," how many "horses" (grants) have been saddled, and previous "winnings" (other grants received). They had to select winners. Money derived from the losers at long odds had now to be used for the support of "odds on" favourites in the field of research. The wheel of fortune had turned a complete circle.

A little bit of luck

The element of chance extends beyond the conduct of research and the selection of grants. The distribution of lottery funds had overnight changed the fortunes of the voluntary agencies. For one such agency the lottery funds increased the reserves fourfold, for another by about 10%. The fortunes of provincial and Federal-supported agencies also had an element of unpredictability. The success of voluntary fund raising, the allocation of such funds to provincial and national branches of organisations, the political decisions that govern the level of support from the Federal Government to the Medical Research Council of Canada and through provincial granting agencies made the decision about which agency to submit a grant a matter of prime importance. Having decided to enter the field with one's favourite grant, what was competition going to be like, and how large the purse? Some might even assert that they had inadvertently entered a "claiming" race, in which although they did not win, some of their ideas had inexplicably borne fruit in the research laboratory of one of the grant reviewers. Although there are many merits in having several agencies supporting research, their relative financial fortunes are apt to fluctuate as greatly as blue chips, Government bonds, commodities, and futures. Potential grant applicants seeking support for their cherished project view the alternatives with as much apprehension as the cautious investor of hard-won personal savings.

The recognition that chance, or luck, may play an important part in the funding, conduct, and presentation of research presents exciting possibilities. A modest increase in the money that is needed to accompany abstract submissions and even, I am told, manuscripts to be considered for publication by certain prestigious scientific journals, a policy that could be readily introduced by granting agencies, would provide a mechanism to give due recognition to the element of chance and to reward the lucky. What more pleasant compensation for the blow to one's pride, when learning that one's original ideas and observations

had failed to stir the imagination of one's peers, to be told that despite ill-considered rejection one's submission had won the prize draw. At least some among the many who attend the crowded plenary sessions in anticipation of learning of the latest breakthrough in science will have their disappointment lessened on learning that their abstract, although rejected, was nevertheless the winner of the lottery prize.

Faced with the uncertainties in the support and conduct of research, the scientific community needs advice. The titles of the eagerly awaited paperbacks readily come to mind: "The Art of Funding for Scientific Research," "How I Made a Million in Research Grants"; for the less successful, "How to Continue Research on \$5 per Day"; for those getting on in years, "Research After Sixty"; and for the curious, "Everything You Have Always Wanted to Know About Research but Were Afraid to Ask."

If the picture described is somewhat confusing, at least we are fortunate that the level of support for research has not lagged too far behind the cost of living. The allocation of lottery funds to the health science centres in Ontario has been of great benefit as it has permitted new research space to be developed and major items of equipment to be acquired or renewed. Nevertheless, I hope that the uncertainties and vagaries in the support of research will also be recognised. Perhaps there needs to be more formal recognition that, in research, as in many human endeavours, the element of luck cannot be ignored. Although I am sure that the decision to allocate lottery funds to support health research was not guided by this principle, it is, nevertheless, very welcome, and recognises the many benefits to society arising from the conduct of health-related research. Although the prizes may not be as great, success in research can be just as pleasurable, and ultimately of potentially greater benefit.

Today's Treatment

Diseases of the respiratory system

Conclusions and problems

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British Medical Journal, 1978, **1**, 1406-1407

The most important chest diseases and methods used in their treatment have been outlined in these articles. What can we conclude from them, and what are the outstanding problems? Our knowledge of the anatomy and physiology of the lungs has advanced tremendously in the past 20 or 30 years. It has been particularly gratifying to see how the knowledge gained from the study of pulmonary physiology has been applied to the study of disease processes. Many of the tests originally described by physiologists have now been applied to the assessment of pulmonary disability in patients. Nevertheless, it is perhaps still important to point out that many of the so-called pulmonary function tests currently in use are relatively crude and are likely to detect only widespread and fairly gross abnormalities throughout the lung. There have been recent advances using radioisotopes to study regional pulmonary lung physiology, both as regards blood and air flows, and I hope that more will be done along these lines. We still badly need also a simple and reliable method of detecting early small airways obstruction. Several methods have been suggested but many of them have difficulties.

Use of drugs

ASTHMA

To turn to some of the specific conditions. The armament of drugs that we now have to treat asthma is impressive, and some

evidence suggests that doctors of all sorts are using these in a better manner. Nevertheless, sudden deaths from asthma still occur; what is more, they occur not only at home but in hospital. A further understanding of asthma and, more important still, education of the patients and the doctors looking after them are still important.

There have been changes in our concepts of asthma in recent years. The previous classification into "intrinsic" and "extrinsic" is now considered to be not so absolute as had been thought. Also, the importance of particular types of asthmatic, such as the "brittle" asthmatic or the "morning dipper," has been realised. The development of some of the drugs to treat asthma has not only been worth while in its own right, but has led to further important study of asthma and understanding of its basic mechanisms. Perhaps more than anything else the introduction of cromoglycate has done a tremendous amount to stimulate interest in, and understanding of, the mechanisms that produce asthma. Not only the very young and definitely allergic asthmatics respond to cromoglycate, but some of the older patients with intrinsic asthma may also do so. This is only one of the many facts that have tended to blur the previously clearly defined margin between these two types of asthma.

Other possible drugs for treating asthma have been introduced recently, including ipratropium. We have yet to see a useful prostaglandin of the "E" series, possibly because those already tried have proved irritant to the upper airways. Recurrence of interest in oral xanthine compounds in treating asthma is also occurring. However good the drugs are, the management of asthma must very much depend on the total care of the patient, which will rest in the hands of the doctor, his medical team, the patient, and the patient's family. Some form of early warning system is still necessary to alert the team that the patient is deteriorating, and home monitoring of pulmonary function by using instruments, such as the peak flow gauge or

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