

reconfirms the well-substantiated discovery that “the more credits people have, the more they seek new credits”; second, the study shows that large proportions of those interested in personal development, hobbies and recreation, home and family, and other educational purposes having very little to do with formal steps, levels, grades, etc., would still have some kind of official recognition for their learning effort”.

Also, Waniewicz asked all learners (excluding full-time students) and would-be-learners which method of learning they most preferred for the subjects of interest to themselves. The data shows that the force of traditional methods is overwhelming; and this basic pattern remains unchanged if the two main categories are sub-divided into age groups and genders. From the point of view of degree-credit work, the odds are ten to one in favour of regular classes compared to teaching at a distance.

These findings — and there are many more in the rich Waniewicz mine — invite those involved in any aspect of educational policy to reflect on two major questions, and many more besides. First, should we feel guilty about the half of Ontario’s population which has had enough of education? Even framing the question in this way provides a partial answer because we had been led to believe that the main barrier to adult participation in higher education was the lack of opportunity caused by the invisible walls round the campus. So we had been told by the COPSE report in Ontario, *The Learning Society*, and by innumerable reports and exhortations emanating from UNESCO and OECD. These latter authorities have now acknowledged the paradox that advocates of adult education must concentrate on institutions of higher education in Europe while in North America it is at the population as a whole that they must take aim. Could it be that the wall around the Ontario campus is invisible because it does not exist? The second, and related, major question is what can be done to aid and encourage those who are interested in higher education? Those who do participate appear to be conservative in their beliefs about methods of learning. Where does one start if neither the teachers nor the learners are enthusiastic about departures from established pathways?

Waniewicz’s study provides a planning base which was entirely lacking in the formulation of policy for continuing higher education, a lack which put policy in this area at the mercy of rhetoric. We should be grateful for the careful and imaginative work he has done. We should also ask ourselves why such important work should have been left undone until someone relatively new to Ontario and in an agency peripheral to the system of higher education came along to do it? Another round of inquiry in this vein will be needed before the end of this decade and, collectively, we must not default.

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E. Gordon Young, *The Development of Biochemistry in Canada*, Toronto, University of Toronto Press, 1976. 130 pp.

The Science of Biochemistry has had an exciting quarter century just passed. During this time it progressed from hesitant probings into the nature and properties of the materials of which living things are composed to the present confidence that the workings of “life”

are essentially explained as “chance and necessity” playing on the chemistry of protein molecules and nucleic acids. This has been an international, primarily occidental, enterprise and the Canadian share has been modest indeed — but not negligible.

The burgeoning since 1950 was based, of course, on labors during the previous century becoming more defined as time went on. Though biochemistry was hardly recognized in Canada in the time of Hoppe-Seyler, Miescher and Thudichum, there were Canadian biochemical contemporaries of F.G. Hopkins and the Buchner brothers around the turn of the century and biochemists became generally though thinly spread across the country in the 1920's.

The late Professor Gordon Young's career started in 1921 when he became the first biochemist at Western. He was active during the next fifty years during which time, as he says, he knew personally most of the more prominent Canadian biochemists. This background and period fitted him to his attempt “to trace the development (of biochemistry in Canada) from the beginning to the present”. We are fortunate that he gathered his notes together and prepared the manuscript for this slim volume before his death last year. It is not much more than a footnote to the history of biochemistry but to those of us in Canada and in Canadian universities and biological research institutes, there is much of interest in these brief biographies of our predecessors or older contemporaries.

Dr. Young finds the beginnings at McGill about 1883 organized by R.F. Ruttan stimulated by Dr. Wm. Osler a long time before the latter's knighthood. But the first overt manifestation was the appointment of Archibald Byron Macallum as Professor of Biochemistry in a separate Department of Biochemistry at Toronto in 1908. “After considerable opposition” is the tantalizing phase — not opposition to Macallum surely, he had been Professor of Physiology there and had obtained international recognition and election to the Royal Society in 1906. So it must have been to “Biochemistry” and the fragmentation of “Physiology”. But we get no details of that opposition.

In fact many gossip (but interesting) matters are passed over. There are no hints of arguments around the discovery of insulin. When the Head of Biochemistry at Alberta “resigns” with fair publicity for a biochemist, all that Dr. Young has to tell us is the existence of “a difference of opinion with the administration” and “complaints — of the inappropriate nature of some of the lectures in biochemistry”.

On the whole the book is a compendium of brief biographies — from mention in a sentence to several paragraphs for a few. Where they were born, where educated, their appointments, a few words about their biochemical interests and then on to the next. These are organized into chapters headed Universities, Agricultural colleges, Industry, Government, etc. So the important part of the Index is the list of names to which one can quickly turn (as did the reviewer) to see if one gets in.

It is a pretty general experience, when one reads in the newspaper about an event of which one has personal knowledge, to note that it's approximately right, but — but —. And so it is here. This reviewer's research career is not outlined with much accuracy. In fact the project described, he only watched from the side lines while pursuing other interests. And similarly with events within his own institution. One would have to know that the late J.A.F. Stevenson intervened as Dean of Graduate Studies between Dr. Roger Rossiter and Dr. H.B. Stewart since on this detail, the book could easily lead one astray.

Still most of us wouldn't do without our newspaper, and if we remember not to believe it all, there's a lot of information that is probably mostly correct and some interesting. So it is with Gordon's book – I perused it with pleasure and was reminded of names out of that remote past some thirty or so years ago when a protein might have a cyclol structure and the only nucleic acids were thymus and yeast.

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Gordon N. Patterson, *Pathway to Excellence (UTIAS – the first twenty-five years)*, Institute for Aerospace Studies, University of Toronto, 1977. 288 pp.

As this account of the establishment of the University of Toronto Institute for Aerospace Studies has shown, the unwavering hope that directed early steps, the intuition to choose a right objective, the growing faith that opened the door to significant decisions and the attainment of the understanding required to complete the mission led to the establishment of an acknowledged center of excellence on a firm foundation. (p. 192) This first sentence of the final chapter might appear to be a little arrogant, because the unwavering hope, the intuition, the faith and the understanding referred to are all attributes of one man – the author. But having read the book and talked to some of Dr. Patterson's colleagues I believe the statement to be true – so it is not arrogant, just accurate.

In spite of the subtitle, it is a mistake to approach this book primarily as a history of the Institute. It is both more and less than this; more because it is an autobiography and to some degree a history of the development of aeronautics and aerospace in Canada, and less because its broader scope means that details on the Institute are curtailed. For example, although the author attempts to give credit to the other members of the Institute for their contributions, he does not in general focus on these. He says (p. 2) "It may be difficult to discern at times whether this is the UTIAS story or my autobiography", and he focusses on his own involvements with the Institute, with the University, and with outside agencies. His goal was to establish a broad base for the Institute "It was significant that the Institute did not experience complete administrative and technical well-being until it had established its role at the local, national and international levels." (p. 96).

Throughout the book there is a mystical undertone, perhaps exemplified by the opening lines (p. 1) "The human mind that has never recognized the existence of an infinite source of good outside itself will not profit from reading this book, since this is the story of how the author's conscious association with that source produced an internationally recognized center for teaching and research in aerospace engineering and science". The chapter titles (Casting Bread, Faith is the Substance, Every Good Gift) reinforce this theme, as do many other comments "It is necessary for one to take all appropriate human footsteps needed to accomplish a right purpose." (p. 39)

Dr. Patterson has made a significant contribution to the literature of higher education in Canada through his carefully documented description of the formation and development of the Institute and other related activities. He has kept copies of all correspondence