Winter 1982 Vol. XVII No. 1

McGill Journal of Education

Tom Greenfield on

Anarchistic Theory

Stanley Frost on

Science in Montreal in the 19th Century

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The *McGill Journal of Education* is published three times a year, in Winter, Spring, and Fall.
Subscription rates, post paid: 1 year — $13.50.
Single copies — $5.00.
Subscriptions, payable to the *McGill Journal of Education*, should be sent to 3700 McTavish Street, Montreal, Quebec, Canada H3A 1Y2. Phone: (514) 392-8843.

The *M.J.E.* is indexed by the *Canadian Education Index* and Educational Resources Information Center (ERIC).
It is listed in Ulrich's *International Periodicals Directory*, abstracted by *Sociology of Education Abstracts* and *Canadian Social Science Abstracts*, and is available on microfilm from University Microfilms, Inc., Ann Arbor, Michigan. Back issues available in microform from Micromedia Ltd., Box 34, Station S, Toronto, Ontario, Canada M5M 4L6. International Standard Serial No. CN ISSN 0024-9033.

McGill University

Résumés

Against Group Mind:
An Anarchistic Theory of Organization — Thomas B. Greenfield

L'enseignement public s'occupe d'une collectivité d'enfants au nom d'une collectivité d'adultes, ce qui se traduit inévitablement, quelles que soient les aspirations professées sur l'individu, par l'entretien et l'alimentation de l'esprit de groupe. (Chaque fois que l'on note la façon de penser d'un individu par exemple). Voilà ce contre quoi s'élève l'auteur de cet article. Il faut convenir, comme le donne à entendre la remarque de la fin, que cet article a été conçu à l'origine comme un plaidoyer unilatéral prononcé face à deux adversaires dans le cadre d'une conférence. Mais Greenfield ne mâche pas ses mots. Dans la mesure où ses arguments sont solides, il semble justifié de commencer une revue sur l'**éducation**, vocable que l'on croit trop souvent s'appliquer presque exclusivement à la scolarisation publique, avec un auteur qui attaque avec virulence l'un des traits saillants de ce système.

On Being of Two Minds:
The Structure of Scientific Evolution — Peter J. Brown

Des progrès étonnants ont été réalisés ces dernières années pour détecter les travaux physiques du cerveau humain, ce qui a inévitablement multiplié nos chances de mieux comprendre le comportement humain et de l'éduquer. Dans cet essai où il dresse en badinant l'analogie entre le comportement des neurones et celui des hommes, Brown tire une ou deux leçons sur la façon dont les gens devraient poursuivre des recherches scientifiques, surtout à une époque où l'utilité d'un paradigme qui jouit des honneurs du temps commence peut-être à tirer à sa fin. Les conclusions que tire Brown sur ce que nous savons de la complémentarité des deux hémisphères du cerveau indiquent le rétablissement d'un certain équilibre en éducation (équilibre chancelant du fait qu'on a trop longtemps insisté sur la logique aux dépens de l'intuition), pourvu que nous nous servions de notre cerveau à bon escient.

Three Dimensions of Education Donald Seckinger

Compte tenu de la structure bilatérale de notre cerveau, on peut facilement admettre que l'enseignement doit se faire de deux façons. Mais pourquoi pas trois? Seckinger préconise la "triade de Broudy" comme fondement de notre profession; il y note des rapports entre la pensée moderne et ancienne et il affirme que ce n'est qu'en maintenant l'équilibre entre les modes d'éducation que l'on peut se tenir à l'abri des nombreuses formes de "réductionnisme" qui prévalent tant aujourd'hui. Ainsi, même une juste combinaison des deux modes cognitifs, le mode didactique et le mode heuristique, ce qui représente l'une des principales préoccupations de ceux qui sont chargés de la réforme des programmes, ne tient pas compte du mode affectif et existentiel de l'enseignement et de l'apprentissage; Seckinger va jusqu'à explorer les erreurs et les remèdes de la tendance actuelle qui consiste à tenir bon quant à cette réforme. Il n'y a pas que notre cerveau qui ait besoin d'être éduqué.

The Natural History Society of Montreal, 1827-1925 Stanley B. Frost

Nous vivons à une époque où les délices de l'enfance n'ont pas grand rapport avec la réalité de la vie et où la notion de "science" revêt des proportions tellement gigantesques que nous sommes très peu nombreux à oser l'aborder. Avant cela, au siècle dernier, comme l'illustre l'anecdote suivante, la science suscitait chez des hommes comme Dawson un enthousiasme de gamin et une curiosité ressemblant à celle d'un chiot se hasardant au-delà des frontières de ce qu'on nomme aujourd'hui avec conviction, disciplines. C'est tout à fait dans cet esprit que Stanley Frost semble s'être hasardé dans l'un des méandres de l'histoire de McGill, avec son récit d'une phase oubliée de la recherche scientifique alors qu'il y avait tant de choses à venir et qu'un enfant était capable d'en saisir tout le sens.

"Stones and Bones and Skeletons" The Origins and Early Development of the Peter Redpath Museum (1882-1912) Susan Sheets-Pyenson

L'idée de musée a certaines connotations d'inertie pour l'homme d'aujourd'hui, connotations qu'elle n'avait pas avant que nous ne devenions un grand village planétaire. Le rédacteur se souvient que dans son enfance, on appelait "zoo-cimetière" le musée de l'université d'Edimbourg, dont il est fait brièvement état dans les pages suivantes. Et pourtant, c'était un vrai plaisir que de s'y rendre par un après-midi pluvieux alors qu'aujourd'hui, on préfère rester collé devant la télévision. Comme le fait remarquer Sheets-Pyenson, l'essor des musées au XIXe siècle est intimement lié au regain d'intérêt et d'enthousiasme des gens de l'époque

pour l'histoire naturelle; on aimait alors collectionner les bibelots du monde entier pour pouvoir les admirer ensemble, ce qui était indispensable à la recherche scientifique. Le fait que ce ne soit plus toujours le cas de nos jours, sans doute à cause des appareils d'enregistrement et de communication extraordinaires que l'on a mis au point, ne signifie pas que les musées n'ont plus le même rôle à jouer qu'autrefois; le musée Redpath est toujours bien vivant comme institution de savoir. Mais comme nous l'apprend ce récit, ces anciennes habitudes d'individualisme ont connu des moments difficiles avec les changements de direction du vent tandis que la science se ramifiait en système.

Physical Education in the Soviet Union — Victor Zilberman

S'il faut vraiment posséder un système pour maintenir les gens en bonne santé, faisons en sorte qu'il fonctionne comme il faut. En Grande-Bretagne, la majorité des écoles encouragent leurs élèves à jouer à des jeux sans que cela soit obligatoire et l'on constate que cette forme d'activité se perpétue chez certains jusqu'à un âge avancé; beaucoup s'arrêtent, mais on ne peut pas dire que ce soit par élitisme. En Amérique du Nord, les possibilités d'exercice physique à l'école deviennent de plus en plus restreintes et spécialisées et il n'y a que les "champions" qui persistent pour s'orienter bien souvent vers une carrière dans le sport de compétition; le regain de popularité d'activités telles que le jogging et le ski de fond qui n'ont rien de compétitif semble être une réaction contre les efforts d'un enseignement institutionnalisé, combiné peut-être à un réel souci de sa forme physique. La description que Zilberman donne du système soviétique qui englobe toute la population nous fait découvrir quelque chose de nouveau: voilà un système qui ne manque pas de nous impressionner. Dans la réalité, le sport d'élite est-il compatible avec la participation de masse? Sans pouvoir répondre à cela, nous ne devons pas oublier qu'en sport, comme en éducation, le fait d'être communiste n'est pas nécessairement synonyme de malfaisance.

Against group rigour

It is February the 2nd, Candlemas, and Groundhog Day. There is sunshine on the snow, and shadows of trees lie across its brilliant contours in simple, clear-cut patterns, but no ground hog is in view. I am distracted as I write, however, by a pair of glossy black squirrels who are celebrating the day as a holiday from hibernation, and are darting and swaying about in the branches after a few wizened crab apples still hanging there. They have already feasted on some crusts they had found buried in the snow under the bird-feeder, from which some chickadee must imperiously have chucked them. Although plump and in excellent shape for further hibernation, the squirrels are foraging as if they knew all about those legendary six weeks of winter yet to come and predicted by the groundhog, wherever he is.

Robert Burns declared to the famous mouse on that far ago hillside, "The present only toucheth thee" (in plain contradiction of the evidence - the wee bit housie built with many a weary nibble that his plough had just shattered). As I contemplate the present and future of this Journal, I find a different message in the behaviour of these wilder but less worried and more natural earth-born companions and fellow mortals. In their instinct for what really matters they are far removed from the robotic processes to which this journal is now subject during publication, and to which so much of our modern approach to education now seems addicted. Like idiots who must be constantly kept from burning the house down, word-processing computers, and thought-processing systems of research and "decision-making", have no warning sense of the dangers that may threaten over the long term.

Our readers will have noticed the changes in the appearance of the Journal in the last issue and may have guessed at their fashionable cause - saving money. Because the Journal's style and policy have not conformed with the more robotic aspects of process deployed by funding agencies, federal or provincial, it has had little luck in its support from either. Both are programmed to ensure the greatest good of the greatest number, in their respective constituencies. It is no paradox in Canada that the Journal's readership falls into neither's "greatest number" category. In each agency the more machine-like aspects of process are supposed to be compensated, however, if not outweighed, by a human factor in the persons of a few selected academic colleagues. But human beings do sometimes aspire to the

superhuman: the judgments of these colleagues are required to be made in a Star Chamber process from which there is effectively no appeal. You are informed after the verdict of some of the evidence of expert witnesses that has been brought to bear; and no matter how biased or indeed false that evidence may have been, there is no way it can then be challenged.

No matter by what rule of thumb the writing appearing in these pages may be judged by those who, provincially or federally, claim foreknowledge of what "education" needs, the one criterion that the Journal tries to apply is that the stuff be interesting. Funding agencies, and word-processing machines, and educational research, seem simply unable to discriminate interestingness. The apparatus chatters remorselessly, paper and words appear endlessly from its depths, and the entire contraption cannot turn itself off until it reaches the end of its program. Bland commonplaces, streams of incoherent babble, and words of great pith and moment emerge indifferently; they are folded, packaged, and dispatched; and in due course they are jettisoned or "consumed". This Journal's publication may have its rough and ready aspects, but we like to think that here and there an active, playful, and predatory reader may scramble for some food for thought with the instinct that tells him or her this is going to be a long winter.

Education is a stodgy word but a fascinating topic; we who are in it professionally find it crops up and is pursued on any and almost every social occasion, through no act of ours. It is interesting, but too many of the publications devoted to it fail to catch any spark. This Journal was conceived and reared in an academic context, but was from the first intended to reach beyond that. As our experience has shown, this is a position not easily understood by many academics, who unsurprisingly expect that from an egg hatched by ducks should emerge a duckling. Their habits of thought, and their computers, have provided them with what they now call parameters for such ducklings (or journals for academics). This Journal has nothing against ducklings, ugly or otherwise, but is not interested in being one.

Accordingly this issue marks the beginning of our turning more firmly towards that larger audience beyond. From now on the purely academic paper, written for fellow academics, is unlikely to appear here. The paraphernalia necessary to academic reports, the tables and the bibliographies, should become less obtrusive. Only if such papers are written so clearly and on such vital aspects of education that they may set alight that spark of interest in a lay readership will we consider them for publication. What the Journal most wants from its colleagues in academic life are readable essays, that deal in intimate understanding with the aspects of their work that touch on the main issues of this huge

field of social and political aspiration called education.

What the Journal most wants from our colleagues in school life are articles that reflect the actual events of that huge field of human interaction. The Journal wants from any one and in any form writing that is knowledgeable, interesting and readable. After all, education is about life, and humour, and hope. The proper place of rigour, that admirable but grim criterion of research, is in service to these ends rather than in domination over them; it is a domination that it enjoys, unfortunately, however, over the terms of acceptability of manuscripts in many otherwise scholarly publications in education. Rigour is a word associated with death; it is what the squirrels were keen to avoid.

J.K.H.

The Journal wishes to acknowledge the generosity of Miss **Gloriana J. Martineau,** MA'47, whose financial support made possible the publication of this issue.

Photographs of the Redpath Museum are by courtesy of the Notman Photographic Archives.

Thomas B. Greenfield

Against group mind

An anarchistic theory of education

Public education deals with a collectivity of children on behalf of a collectivity of adults, and inevitably results, no matter its professed aspirations about the individual, in the care and feeding of group mind. (Wherever grades are given for the way one thinks, it follows.) That is what this article is against. Admittedly, as the note at the end of it suggests, it was originally conceived as a one-sided advocacy matched against two other sides for the sake of an argument at a conference. But Greenfield's tongue is not really in his cheek. Because his points are seriously made, it seems entirely right to start off a journal about education, a word which too often is presumed to refer exclusively to public schooling, with a writer who takes dead aim against that schooling's most salient feature.

An anarchistic theory of organization recognizes the individual as the ultimate building block in social reality. Whatever it is that joins man and mankind exists in people. Whatever allows speech, understanding, sympathy, dominance, submission, rejection, and inflicted trauma, and whatever allows social intercourse, finds expression through the individual. Within the limits set by nature and our ephemeral life, we make the world we live through. We make it out of the self that reflects, chooses, wills, and imposes order on itself and on others.

I offer not a philosophy of anarchism applied to organizations, but a glimpse of the anarchy that inheres in all thought and that tyrannizes (and humanizes) us under the guise of Logic and Social Order (1). In Lewis Carroll's little fable, Achilles gives the Tortoise a lesson in Logic (2). When Achilles says we

must all accept conclusions derived by Logic, the Tortoise answers simply, "But **why** must I?" When Achilles fails by Logic alone to demonstrate the truth of Logic, he then reveals the real and only force of Logic by saying the Tortoise **must** draw the necessary inference, for otherwise Logic will take him by the throat and compel his acceptance. Of course, it is not logic that will so assail us, but rather other people who attack us when we reject the Logic that is in their minds (3).

Organizations hold the power of life and death over us, as for example in the questions of whether the foetus has a right to life and whether Karen Ann Quinlan has a right to die. But these questions and all that lie between them are answered not by abstractions, but by other people. As Sartre said, Hell has no need of brimstone and turning on the spit. Hell is other people. It exists here and now. We ourselves make it. Once made, we call the resulting order organization.

An anarchistic theory of organizations may be summed up in two statements: first, a statement that rejects group mind and rejects an overarching social reality, thought to lie beyond human control and outside the will, intention, and action of the individual (4); second, a statement that acknowledges the tumult and irrationality of thought itself (5). Acting, willing, hoping, passionate, fearful, mortal, fallible individuals and the events that join them are therefore always more complex, interesting, and real than the ideas we use forever vainly to explain them.

As someone infected with anarchistic thought, I should stop at this point and possibly leave also. But as we all know, we must go on -- for politeness' sake if for no other reason. And for the most part, we do go on. What we go on with is life, in all its ambiguity, possibility, promise, apparent victories and defeats, its pleasure and pain.

Let me offer twelve short observations that may illuminate and helpfully elaborate what I have said to this point.

I It is the individual that lives and acts, not the organization. It is therefore the experience of individuals that we must seek to understand. Huxley (1977, pp.11-12) says it clearly.

> We live together..., but always in all circumstances we are by ourselves. The martyrs go hand in hand into the arena; they are crucified alone. Embraced, the lovers desperately try to fuse their insulated ecstasies into a single self-transcendence; in vain... We can pool information about experiences, but never the experiences themselves. From family to nation, every human group is a society of island universes.

The world we know is created by our perception of it. We learn to see and we build what we see. As Kant said, we do not create our world, but we do make it. This observation is true about the world in general, but has its greatest force and importance in the interpretation of social reality. Clearly, there is something "out there" that contains forces man does not control. The individual does not give birth to herself or himself; nor can the individual by will withstand death. But within these limits, the individual has enormous creative scope. As Wittgenstein (1961) makes us see, the ideas in our heads are not so much models of the world as models for the world (6). We believe in the ideas in our heads; we trust our models for the world, so deeply that we make them true. We will them to be true.

3 (It is pure anarchy that accounts for the non-rationality in the numbering of these points. See No. 6 for an "inexorable" logic to explain it.)

We live in separate realities. What is true for one person is not for another. In that sense, we live in different worlds. Each of us, as Huxley says, is an island universe. There is no action - however terrible or appalling it may appear to some of us - that is not sensible and rational to others. Some months ago, I found it virtually impossible to read press stories of how certain prisoners in a rural province of India were routinely blinded by police who thrust acid-tipped needles into their eyes. Prime Minister Indira Gandhi expressed her revulsion for the action and ordered the dismissal of the officers involved. When British reporters reached the town where the horrors were done, they found civil disobedience in the streets in front of the police station. The demonstrators were protesting, however, not against the police, but against Mrs. Gandhi. They wished to see the police reinstated as their only effective protection against outlaws whose crimes they saw as much worse than anything the police did. The practice in rural India is to safeguard personal wealth in gold, and this is often kept in bands tightly fastened to fingers or arms. So to remove their life savings more conveniently, the bandits had simply lopped off the victims' hands or arms. As one citizen said, "We never heard from Mrs. Gandhi when that happened."(7)

4 Individuals act out of will and intention. If we are to understand organizations we must understand what moves people to act and we must suspend, if we can, our own judgment of their action. This task is difficult because our judgment of acts clouds our observation of them. It is difficult also because people usually hide their wilfulness - certainly from others and often from themselves as well. Yet the study of intentionality is the

key to understanding organizations.

5 Facts and values are closely interwoven. Positivistic science insists on splitting them and disregarding the values. It thus ignores the most important part of our lives and falls into the error of thinking that values can be derived from facts. Facts decide nothing. It is we who decide about the facts. Hodgkinson (1978 b, p. 220) sums up the conundrum of facts and values in the following aphorisms:

> The world of fact is given, the world of value made.
> We discover facts and impose values.
> Facts must go undefined.
> Values are special kinds of facts; but never true or false.

6 Modern science and ancient philosophy have taught us to think that a universal logic and rationality governs the world. And we are taught to hope as well that those who master the logic and the rationality may also govern the world. But ideas both ancient and modern give a glimpse of the chaos that inheres in our supposedly universal logic and rationality. Zen (Suzuki, 1955) sets out to "break the mind of logic", and that perhaps is what we must do as well if we are to see past it to other realities. It is a delicious irony that Charles Dodgson could write **Alice in Wonderland** and then turn his hand to a parable that uses Logic to unhorse Logic itself. He shows that at the heart of Logic is something illogical. As Winch (1958, p.57) points out, "inferring a conclusion from a set of premises is to **see** that the conclusion does in fact follow" (Emphasis added) There is therefore also an intentionality in logic, mathematics, and apparently objective science. For Wittgenstein, it is we who are inexorable, not mathematics. And he says, "That is why it is inexorably insisted that we shall all say 'two' after 'one', 'three' after 'two' and so on." For Bertrand Russell, 1 + 1 = 2 was not only a proposition of symbolic logic and mathematics, but also a declaration of intent meaning "Know that" or "Know that I am aware that" 1 + 1 = 2. (8)

7 Individuals are responsible for what they do. Organizations and our habit of thinking in categories ease this sense of responsibility. As Hodgkinson (1978 b, p. 173) points out, the required allegiance to the organization removes notions of right and wrong. The organization is not only reified, but also deified. The individual is thereby no longer author of his act, but agent for a larger reality. Absolutist Christians often speak - usually through clenched teeth - of loving the sinner and hating the sin. This schizophrenia of thought serves both to sanctify the Christians and to justify what they are about to do to the sinner.

8 Hodgkinson (1978 b, p. 208) says, "We are all either administered or administering", while William Blake says, "I must Create a System, or be enslav'd by another Man's." And G.B. Shaw's Don Juan (1946, p. 169) argues that is is better "to be able to choose the line of greatest advantage instead of yielding in the direction of the least resistance... To be in Hell is to drift: to be in Heaven is to steer." This leads us to think that it is better to run organizations than to be run by them. And so we slip into seeing the force of the Machiavellian position: the "reasonableness of evil", the wisdom of "rejecting kindness and love for self-interest; trust for fear." (Segal, 1974, p. 158)

9 The alternative to action, and probable evil, is disengagement. Orwell uses the metaphor of Jonah inside the whale to express the individual's best approach to forces that are totally beyond his control:

> The whale's belly is simply a womb big enough for an adult. There you are, in the dark cushioned space that exactly fits you, with yards of blubber between yourself and reality, able to keep up an attitude of the completest indifference, no matter what happens. A storm that would sink all the battleships in the world would hardly reach you as an echo. (Orwell, 1957, p. 43)

The image here is of security attained by personal detachment from the maelstrom that swirls around the individual. But detachment from events does not mean non-awareness of them. As Orwell says, we should think of the whale as transparent. In this circumstance, Jonah becomes an observer who can see what others locked in the struggle are oblivious to. Because his detachment and security let him see things that remain hidden to others, Jonah as observer bears the obligation to describe what is happening and to make us aware of it. This task also becomes the obligation of the social scientist, who sets out to understand and explain organization.

10 History and law should be our models for studying organizations, for these branches of knowledge know of no completion and recognize the interests of the writer and the advocate as crucial to what is declared to be true and right. So it is that Feyerabend (1975, p. 17), quoting the historian Butterfield, finds that history provides a model for knowledge generally and not least for that knowledge we call scientific:

> History is full of 'accidents and conjunctures and curious juxtapositions of events' and it demonstrates to us the 'complexity of human change and the unpredictable character of the ultimate consequences

of any given act or decision of men.'

In the study of organizations, the analysis of our language and the flat description of what happens appear as our best approaches and methodological tools.

11 Language is power. It literally makes reality appear and disappear. Those who control language control thought - and thereby themselves and others. We build categories to dominate the world and its organizations. The anarchist wants to let the reality of people within the categories shatter them and thereby reduce the control. In the words of Thomas Szasz (1976, pp. 46, 42), "the less a person understands another, the greater is his urge to classify him - in terms of nationality, religion, occupation, or psychiatric status... In short, classifying another person renders intimate acquaintance with him quite unnecessary - and impossible." And he adds, "... the human larynx and tongue are actually used as claws and fangs, and words as venom." Organizations are sets of categories arrayed for the linguistic and other wars that people wage among themselves.

12 As Wittgenstein pointed out, propositions are not merely models **of** the world; they are models **for** the world. They offer ways of understanding the world and also of creating it. We should pay closer attention therefore to the study of reality and social forms through propositions. Here are some propositions from Wittgenstein (1961, p. 15) in which he reverses commonsense understanding and makes the world dependent upon our propositions or models of it:

2.1 We picture facts to ourselves.
2.12 A picture is a model of reality.
2.141 A picture is a fact.
2.1511 That is how a picture is attached to reality; it reaches right out to it.

Propositions are thus pictures of the world. Their truth lies in our understanding them and in their power to make us believe in them and act in accord with them. Here are some propositions from Hodgkinson (1978, pp. 202ff):

1.221 Language is the basic administrative tool.
1.2211 Language cloaks power and has power.
1.36 Policy goes beyond logic.
2.1 Administration secures services **from** men **for** organizations.
2.12 To advise can be to command.
6.1 Administrative power is a function of the will. The contest of wills is the pragmatic test of power.
6.121 There is such a thing as the judicious rage, the

calculated loss of control.

6.132 Beware of friendliness in the realms of power. There is no need to beware of friendship. It does not exist.

An anarchistic conclusion

Anarchy does not fit neatly into a box. Neither does reality. This non-fit says it all. We press a few pieces of multi-faceted reality into our minds and live as though we were omniscient gods. That is why we must needs learn to unloosen our minds and let them run freely. If we are to understand what we ourselves and others see as reality, we should follow R.D. Laing's dictum when he says, "I have made an arrangement with my mind: I let it do anything it wants to." And that is the nub of anarchism in the study of organizations: while we ourselves are bound, we may yet free our minds.

This paper was presented to the American Educational Research Assocation, Annual Meeting, Los Angeles, 16 April 1981, Session 36.07, "Researching Educational Organizations - Three Perspectives: Marxist, Anarchist, Phenomenological."

NOTES

1. Most of what I offer in this vein has been written over the past decade in various articles. Some of these are listed below in the references. I do not claim the ideas advanced in these articles as uniquely mine. I just say the assembly of them is my own and that I have been trying to organize and advance them with enough clarity to force their acceptance in a field that for the most part has managed to conduct inquiry by ignoring them. Perhaps I have only rattled the bones of a skeleton in the intellectual closet, but for doing so I have had sometimes to face the anger and sometimes the indifference of my colleagues who study organization theory in education. I wish I could say with Kant that I more feared being misunderstood than refuted. What I have found instead is that many of my colleagues who study educational organizations are simply embarrassed by my statements and choose therefore to ignore them as they would a social gaffe. This response brings to mind Szasz's proposition (1975, p.145) that bears perhaps on the social organization of knowledge: "A 'paranoid' is a person

who insists you don't like him when in fact you don't, but when the polite thing for him to do would be to keep quiet about it."

2. The significance of Dodgson's deceptively casual victory over Logic is seen in Winch, who "draws the moral" that the "heart of logic" cannot be represented logically.
3. The difference between Logic and logic is that the first is held to be holy, unassailable, and universal. In Szasz's terms (1976, pp. 37-38), Logic is a metaphor used for strategic purposes. The humbler logic is man-made, fallible and open to correction. Kaplan (1964, pp.6-11) argues for qualitatively different logics with "logic-in-use" being a natural logic and "reconstructed logic" an artificial logic. He perhaps best evokes the distinction by quoting John Locke: "God has not been so sparing to men to make them barely two-legged creatures and left it to Aristotle to make them rational."
4. Arrow's General Impossibility Theorem points to the problem of ordering preferences rationally, especially in groups. As expressed by Hodgkinson (1978a, p.272), the Theorem states: "Either we must accept the Fascistic notion of some kind of group mind, or else the group leader must himself impose his own will by force or guile."
5. I acknowledge here Feyerabend's (1975) crusade against method and his outline of an anarchistic theory of knowledge. The idea echoes as well the mysticism in Wittgenstein's (1961) thought.
6. Wittgenstein's ideas are terse but often expressed with beauty and clarity. He is a philosopher whose life and ideas bear examination together. See Malcolm's (1958) **Memoir** and the accompanying poignant biographical sketch by von Wright (the **Sunday Times,** 7 December 1980).
8. For the sources of these ideas and a discussion of them, see Greenfield (1979a, pp.177-8) and Hodgkinson (1978b, p. 83).

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Peter J. Brown

On being of two minds

The structure of scientific evolution

Astonishing strides have been taken in the last few years in detecting the physical workings of the human brain, and these have inevitably affected the prospects of our understanding human behaviour and educating it. In an essay that playfully draws an analogy between the behaviour of neurons and the behaviour of people, Brown draws a moral or two about the manner in which groups of people should pursue science, especially in a period when a time-honoured paradigm may be reaching the end of its usefulness. The implication he draws from what we know of the complementarity of the brain's two halves points towards the restoration of a balance in education - a balance long distorted by a bias towards logic at the expense of intuition - if we are to use our brains efficiently in the way they were designed.

The single most important fact that we have learned about neurons is that they are gregarious. The composite bits of our brain are continuously eager to exchange information, to talk to one another. They are usually constrained by time and space - as are the members of any social unit - to pay the most attention to those nearest and most familiar to them. However, when isolated in a tissue culture, they are quite content to start forming relationships in a group of total strangers with no hesitation and little apparent shyness. They appear to share none of the social awkwardness and introversion of the larger neuronal aggregates (us). For most neurons, communication appears to be

an end in itself.

The preferred form of communication among neurons is the formation of a synapse, defined by Sir John Eccles as "a very intimate contact." It is the structure of the synapse which defines the relationship between the cells involved. Far from being the static entity it was originally imagined to be, this structure is as richly variable and flexible as any spoken conversation. The all-purpose strategy of the neuron appears to be to receive and to transmit data (with suitable editing) under any circumstances. When new input registers, synapses are activated, modified, and, if the news is important enough, grown. The loss of information, either through injury or through lack of input, also triggers off a re-defining of synaptic contacts in an attempt to re-structure existing information. Either way, the impulse to find out what is going on and to pass it along, after modifying the news in an individual manner, is paramount. By my last count, neurobiologists had discovered at least a half dozen different ways in which two cells can vary the process and structure of their synapses. The synapse functions to allow two or more neurons to sum their respective messages: to say **we** instead of **I.** It is this summation which defines modules of neurons, allowing them, in combination, to exert a far-reaching effect both on other modules and on the organism as a whole.

Outside of this matrix of communication it is hard to think about neurons at all. Much like a single note of music or a lone thought, an isolated neuron does not make any sense. Considered apart, a cell which has the sole purpose of making contact with other cells becomes a paradox. Without the symmetry of the larger pattern and the resultant similarities and contrasts, a neuron is just another random event. Only a community of neurons can have any meaning, perform any function. Within this organization a neuron becomes important, and especially so to those others in its immediate group, who have the same common interests. Similarly, these units are defined by their relations to other units, forming a module and so on. What becomes evident is the interdependency, the stake each cell has in maintaining the environment; any discussion of the ecology of neurons inevitably involves consideration of the structure of the brain itself.

Considering the enormous complexity of the brain, it is astounding that more things don't go wrong. Each module contains up to 10,000 neurons in continuous contact with one another. At the next level of magnitude, there are about one million modules in each cerebral hemisphere. The potential for information exchange is of such staggering proportions that verbal descriptions are hopelessly inadequate - an attempt to put a tiny frame around a vastly more complex reality. Even the calculations of our most sophisticated thinking machines, while

just fine for supervising the most advanced of our current technological hardware, cannot begin to provide us with an adequate description of the neuronal matrix. For my money, the closest thing we have come to anything near a full model of the brain is Bach's **St. Matthew Passion.** Perhaps it could serve as a pattern for future models, both in breadth of inspiration and sureness of craftsmanship. As the problem is approached, there is a growing conviction that words alone will not be enough; something more is necessary.

Me and me, in stochastic process

Perhaps we need a new mode of description, or maybe two at once. Neurophysiological evidence suggests that such modes are available. The lateralization studies of the past two decades (particularly with people who had undergone commissurotomy, the severing of the connections of the two hemispheres) have confirmed the clinical evidence of over one hundred years: we are of two minds about everything. A concept of duality in our nature has been present in every major religion and in much of our everyday talk about ourselves. It would appear that every function of our conscious (or dominant, or verbal) hemisphere is paralleled by similar, complementary, but not identical, functions in the other. The part of me called **I**, the part which pays the bills and has always believed it runs the show, now appears to be sharing control with a not so silent partner. One of me is analytical and time-oriented, continuously pre-occupied with breaking things into composite parts and ordering the parts sequentially. The other me has no sense of time (a fact long suspected by colleagues) or formal logic.

Despite this, I/he seems to manage quite nicely performing virtually everything that is of importance to me/us. This self has synthetic and mechanical abilities as well as the types of non-verbal thinking often referred to as imagination or intuition. A slice serve in tennis, the harmonies of the third Brandenburg concerto, and the occasional split-second recognition on meeting a new acquaintance that this person will become a close friend, are all within the domain of this other self. Two distinct modes of thinking appear to operate, each with specific tasks. I don't know how I hit upon this division of labour, but I appear to have thought of everything.

The results of the "split brain" experiments, and the increase of interest in establishing the differences in hemispheric function, have not escaped the notice of the popular press. The results have been rather a lot of pop meta-phychologic theorizing and the acquisition of a whole new set of short-hand personality descriptions for the trendy. Descriptions of modes of thinking are

used as nosology: "It will never work out, she is a right-brained person, while he is totally into his left hemisphere" is used to describe the marital prospects of a baseball player and his wife. While arguably a significant improvement over the jargon of the human potential movement, or the indiscriminate use of psycho-analytic epithets of bygone days, this view overlooks the most important point of all. Though the two modes of thinking are different, and problems can arise if we ignore this difference, they are also complementary. In the undamaged human they are inescapably intertwined. We appear to be wired up on the macroscopic level for the same sorts of intimate, continuous conversation that the neuron has on the microscopic level. The **corpus callosum,** which connects the two hemispheres, carries over two hundred million fibres from one to the other. These connections provide an exact mirror linkage, a one-to-one correspondence between each major cortical area and its twin in the opposite hemisphere.

The single most important finding of the split brain experiments is not that there are two modes of thinking, but that the two work together with considerable elegance. The clear isolation of functions in each hemisphere after surgery does not obscure all that is lost in interrupting the flow of communication. Not only is the integration of the two modes disrupted, but it is also strikingly clear that each hemisphere is much poorer in its own specific tasks when working separately. The diminished potential of the whole is reflected in the impoverishment of each of the two halves. Choice, the use of two parallel modes simultaneously, appears to be the key. Without choice, without the chance of exploring other options, each hemisphere is a parody of its former self. What we are describing is a stochastic process.

Stochastic comes from the Greek **stochazein,** literally, to shoot with a bow at a target. A stochastic process is one which combines two components, one random and the other selective, in order to achieve a specified outcome. The process combines the flexibility of a number of possible alternatives with the precision of applying any which best fit the situation. It is the common factor in all biological systems, or at least those which survive and continue to evolve. Evolution itself is the largest example, with the genetic inheritance continually producing new choices and the current environment selecting what is most useful or adaptive. Each is separate, but neither means anything when considered outside of its relationship with the other.

So it is with our two minds. One produces a random selection of patterns while the other fits them to the task at hand. It is the relationship which defines them both. Without it, each is an evolutionary dead-end, a pointless jumble of biologic

syntax. The sharing of new information, otherwise known as learning, requires a process which can both generate new possibilities and apply them in trial and error fashion. If the two function more or less simultaneously, then a new dimension is added in the same way that depth perception is the result of two monocular views of the same scene. The results of intimate communication at the hemispheric level are a deepening of perspective and a widening of the variety of choices in any situation.

Perhaps it is not so surprising that an analogous situation occurs at the next level of organization as well. The benefits of contact with new modes of arranging information are evident when people are working together. At our best we have many of the attributes of a collection of neurons.

The neuronal dialectic, the greater whole

A model of group scientific thinking has been described by Thomas Kuhn in his book **The Structure of Scientific Revolutions.** Kuhn suggests that what is defined as the body of accepted fact by the scientific community working in a particular area constitutes a **paradigm** or model of reality. In effect, the paradigm is a structure of beliefs which organizes the perceptions that will be accepted by the group, and also dictates the course of further investigation. As such it is both a necessary support and, ultimately, an artificial restraint. While the paradigm saves us from having to continually re-invent the wheel, it also, by necessity, discourages other avenues of investigation - alternative ways of looking at problems.

The paradigm functions reasonably well for a period of time, and then things begin to go wrong. Data begin to accumulate that are incompatible with the official version of reality. If the new data cannot be dismissed or refuted then the paradigm (or the consensus of minds which holds it together) begins to disintegrate. The stage is then set for a Copernicus or Einstein to provide his particular contribution which, if picked up by the other members of the network, leads to the formation of a new paradigm. A new and, usually, more useful map of reality is available.

The comparison between what goes on at different levels between neurons, hemispheres, and people is inescapable. The sharing of information generously and incessantly is what we do best. More precisely, that sharing gives us definition and purpose. On a human level, learning and re-making our descriptions of reality are the results of the stochastic process of science. The paradigm and any counter-paradigm currently available are the

two complementary parts of the same process. Neither exists without the other. As we shape our knowledge we simultaneously shape ourselves.

The process never finishes. The final step in any sequence only serves to trigger off the other mode, producing a series of themes and variations which, in turn, are themselves elaborated upon. So it goes. The two modes of thinking intertwine in a contrapuntal fashion. All of which leads me back to the nature of neurons and their addiction for contact with one another.

In a system with these characteristics the need to receive and pass on information is inevitable. Communication is never quite done, as each new message prompts further exploration, ultimately coming back to the starting point not as a complete answer, but as a more satisfying question. Surrounded by this incessant flow, the neuron has no choice except to be insatiably curious. The biologic given is to share information, and to do it with both diversity and specificity as the part of a greater ensemble. The neuronal dialectic leads always to the formation of a greater whole:

> If they be two, they two are so
> As stiffe twin compasses are two;
> Thy soule, the fixt foot, makes no show
> To move, but doth if th' other doe.
>
> Such wilt thou be to me, who must
> Like th' other foot, obliquely runne.
> Thy firmness drawes my circle just,
> And makes me end where I begunne.
>
> **John Donne**

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KIERKEGAARD AND THE COMPUTERS

(The McGill Philosophy Department has done an extensive computer analysis of "aberrant frequency" words in the authorship of Soren Kierkegaard.)

Trapped in the works
amidst coils of wire
and multicoloured tubing,
rubbing shoulders with filaments
lodged between buttons poised
for pressing, a dialogue ensues
concerning fear and trembling.
The concept of dread capitulates
to numerical analysis.

Melancholy has ceased sweeping
the circuits of these machines,
signalling that the author finally
accepts separation from Regine Olson.
(Some key cells have failed to record
a similarity between his sacrifice
of Regine and Abraham's
near-sacrifice of Isaac.)

The Great Little Dane, packed
into a space more miniscule
than his reception by the Church
of Denmark during his lifetime,
now comes alive in his words,
preparing a brisk pamphlet to deny
anything deviant in his writings.

There is some clicking
and a message appears:
"I feel with increasing frequency
It's the computers which are aberrant."

David Lawson

Donald S. Seckinger

Three dimensions of education

Considering that our brains have a two-sidedness to them, it is fairly easy to accept that education should be conducted in two modes. But three? Seckinger advocates the "Broudy triad" as the basis of our practice, finding connections in it between modern and ancient thought, and asserting that only a proper balance between modes in education can protect us from the many forms of reductionism prevalent today. Thus even a just combination of the two cognitive modes, the didactic and the heuristic, which has been the major preoccupation of official curricular reform in our time, ignores to our peril the affective, existential mode of teaching and learning; and he explores both fallacies and remedies in the present tendency to stand pat on that reform. There is more than our brain that needs educating.

The three modes of education known as didactic, heuristic, and philetic, which I applied to the teaching of social foundations in the **McGill Journal of Education** in 1974, have continued to receive investigation by others. In Magsino and Couvert's **The Modes of Teaching** of 1977, Couvert called the three-fold scheme the "Broudy triad", for Broudy himself wrote on the triad in the early to middle 1970's.

Broudy seems to be restating in modern terms a classification of human nature and conduct at least as ancient and universal as that used by Plato and later by Kant. The **didactic** would seem to correspond with Plato's education for philosopher kings, at least in its higher reaches; the **heuristic** would seem appropriate to the education of courageous warriors or political activists; the **philetic** in its higher aspects is not unrelated to the warriors and statesmen, but in its lower or perverted forms it

seems appropriate for the people of animal appetites whom Plato felt required discipline and control.

Writings such as those of Broudy and his allies point up our contemporary need to give full credit to all three modes of human being and knowing. They reflect the concern of many modern philosophers and psychologists that the human being not be reduced to an object of technical manipulation. They confirm the suspicions of educators such as George Kneller that a social science or physical science model for human learning is highly inappropriate, owing to the limitations of science and a vulnerability to descent into scientism. I propose in this paper to pursue a little further the notion of a threefold conception of education, as well as to explore some of the dangers of allowing one or two dimensions to dominate at the expense of the other important facets of a truly human life.

Two cognitive modes

Didactics, the cognitive-intellectual mode of teaching and learning, appeals to our human need to make sense out of our world. It involves the organization of experience into classificatory schemes whereby we may gather, refine, and transmit theoretical knowledge. This is second order knowledge and knowing, abstracted from cultural experience and possessed of explanatory power. It is the sort of knowledge glorified by Plato in his **Republic** and by Hutchins and Adler in the Great Books Program. It is the primary emphasis in traditional philosophies of education and the stock in trade of most formal schooling, and is sometimes reduced to a "Back to Basics" travesty of itself.

There is a cold beauty in the didactic procedures of testing hypotheses, gathering evidence, developing arguments, and reaching conclusions. At its best, as in the dialogues of Socrates and Plato or the dialectics of Hegel, the cognitive intellectual mode of educating generates thoughtful and stimulating debate. Unfortunately, in its debased reductionist form didactics becomes the memorization of given truth for its own sake, divorced from its original contexts of argument and experiment (Seckinger, 1977, pp.322-325).

Heuristics, the cognitive-problem-solving mode of teaching-learning, appeals to the equally valid human need to act on the world. It requires holding knowledge to be tentative and subject to change, in the best argumentative traditions of didactics. Heuristics employs what Dewey called the method of science, but what I would term applied science, as a necessary complement to philosophical and scientific theorizing. It is the primary emphasis of progressive philosophies of education, the

basis for much informal and alternative schooling, bearing the slogan "Learning By Doing in a Social Setting."

As I have pointed out elsewhere (1974, pp.240-241), didactics and heuristics need and complement one another. Human societies require didactics to organize, interpret, classify, and administer academic knowledge, law, custom, and tradition. To avoid stagnation, at least in the Western view, we also need heuristics to test, experiment, explore, and change our ways - assuming as we do the tentative nature of knowledge and the contingent, relative status of values. Didactics provides the basis of judgment, expressed in traditional subject matters, against which we measure progressive innovations in contemporary life. Heuristics involves us in methods of inquiry which may yield unforeseen or undisclosed knowledge.

An emphasis of radical philosophies

Philetics, the affective or existential mode of teaching-learning, appeals to yet a third essential human need. We require not only sense-making and acting-upon, but also a sense of gratification and well-being. Philetics means a love of human knowing and doing, a joy and satisfaction in the use of knowledge and in the exercise of skill that are intrinsic in performance and of a different order from cognitive content. This is the kind of personal knowledge glorified by Rousseau and the Romantic poets and used by Rogers and Neill as the basis of their critique of contemporary education. It is a primary emphasis of radical philosophies of education.

Recognizing strong overtones of affect in both didactic and heuristic dimensions of education, radical and existential critics have asserted the need to focus upon the non-cognitive and the pre-cognitive. While traditional and progressive philosophies seem to take the view that what is good and constructive in the affective domain derives from intelligent and wholesome developments in the two cognitive modes - something like Aristotle's definition of happiness consisting of exercising one's abilities in a life affording them scope - radical philosophies and psychologies find it necessary to take seriously such phenomena as intuition, precognition, and the subconscious.

The battle cry for breaking through the reductionist tendencies of the cognitive modes of explaining the world is sounded by Nietzsche when he says "... a specialist in science gets to resemble nothing but a factory workman who spends his whole life in turning one particular screw or handle on a certain instrument or machine." (1924, p.39) For the radical philosopher the modes of sense-making and acting-upon are simply not

sufficient and do not render justice to the fully-functioning human being.

All three modes or dimensions of education have come to the forefront at one time or another, in cycles of educational theorizing and curriculum development. Around the turn of the present century, educators were highly concerned about the academic standards and accreditation of secondary schools in the midst of a high school population explosion that brought in a great diversity of American youth. In the aftermath of the First World War, the learner's subjective, affective needs became a source of concern in much theorizing and some alternative schooling, while didactics was extended to encompass a rationalized business model for educational administration.

As we moved through the Depression, the Second World War, and the early postwar years, it seemed as if the heuristic, social-problems curriculum, keying into the needs of "All American Youth", would make of our educational system a social-democratic, learning-by-doing model. Yet the 1960's saw a Post-Sputnik, didactic, subject-centered revival, designed by specialists in academic disciplines. To this was added a heuristic, social-problems emphasis transformed in terms of Civil Rights and Multi-Ethnic Studies; to be followed as we turn into the "Me Decade" of the 1970's with so-called New Humanism, focusing on the mode of affect.

Modes in partnership

A number of philosophers of education in recent years have proposed partnerships between the two cognitive modes of teaching-learning, and even working alliances between the cognitive and affective dimensions of education. Hugh C. Black, for example, writing in **Educational Theory** in the mid-1950's, equates the cognitive-intellectual with the social tradition and the cognitive-problem-solving with individual learning-by-doing. He sees them as complementary modes of the educative process.

> The social heritage, the structure of Civilization (the art of living together) constitutes the resources for the development in the individual of a personal structure which enables him to live best and to cultivate life at its higher levels. (1954, p.117)

Put another way, the social heritage takes the form of the essential, time-tested subject matter in the school curriculum, a didactic or cognitive-intellectual conception of social knowledge. The process of individual learning, on the other hand, follows a heuristic bent, rediscovering human social knowledge from a

personal standpoint. The two cognitive modes of teaching-learning are naturally related to one another on the basis of the idea that "social experience is individual experience writ large," with the repeatable lessons of humanity discovered anew in each generation.

A problem with this method of reconciling the two cognitive modes of education is its slight tilt toward tradition or the learning product, but its major difficulty, from the standpoint of existential philosophers, is the assumption that the affective domain will naturally follow in the footsteps of success in the first two dimensions of education. Cognitive educational theorists at least from the time of Aristotle have shared the belief that proper attention to knowing and to doing will yield, as an indirectly sought after good, human happiness. The presence of irrational, intuitive, or subconscious human drives and needs is looked upon as not really central in rationally organized education; sublimation is the prescription within the socially acceptable range of the irrational, special counseling beyond that.

Leroy F. Troutner, writing in the anthology **Existentialism and Phenomenology in Education** in the mid-1970's, proposes a working partnership between the cognitive-problem-solving and the affective-existential modes of teaching-learning. He recognizes that an actual synthesis of these two modes is probably not possible, but that the very different ways these two aspects look at reality may just enable them to complement one another's strengths and weaknesses.

He sees the archetypes of the cognitive-problem-solving and the affective-existential in philosophy as, respectively, Dewey and Heidegger, and he thinks of them as helpful in the total process of education from childhood to adulthood in different ways.

> ...In trying to teach students the significance of the relationship between education and the man-culture relationship, the largely theoretical approach of John Dewey needs to be supplemented by the more personal approach of the existentialists... In order to realize how man is the creature of culture, the student must become aware of the power of culture in his own life and then, after recognizing what culture is, he must be able to distance himself from it in order to criticize it and thereby help create it by changing it. (1974, p.44)

The connection for Troutner between the two dimensions of heuristic and affective is the process of cultural change. Progressivism places the emphasis on the human being, being a creature of culture **first** and **then** becoming able to act upon and

contribute to culture. Existentialism acknowledges the prior claim of culture as the creative context of the human, but goes on to envision the person as a creator of culture once he or she becomes aware of the significance and the possibility of making meaningful personal choices.

Some dangers

This approach to the reconciliation of different modes of teaching-learning has its own problems precisely where the learning-product approach of Black has its greatest strengths. It assumes that the didactic or cognitive-intellectual mode of educating has been totally accounted for within Dewey's cognitive problem-solving emphasis. A serious difficulty involves giving less than deserved recognition to the power and influence of the social heritage; it is complementary to the potential problem in Black's approach, of making the social heritage the primary touchstone for measuring individual achievement.

The arguments for somehow taking into account all three modes of human development are borne out in both of these examples. Black, quite rightly from a rational, cognitive conception of teaching-learning, would utilize the products of the social heritage, reflected in logically organized subject matters, to bring about the proper formation of human character, responsibility, and creativity. Troutner, taking a process approach to education, relates the social problem-solving curriculum and methodology of group process to the eventual recognition on the part of the individual that he or she may make unique contributions of their own. The product philosophy of Black (and of Aristotle, among others) takes into account the proper and reasonable conditions for human happiness, pursued indirectly. The process philosophy of Troutner (and of Dewey and Heidegger, among others) takes into account human history as resource and as partial context.

In other hands, didactics may be reduced to formalism and traditionalism for their own sake, as in the case of a legalistic approach to religion or in the reduction of science to routine technique, as Nietzsche pointed out. Heuristics may be reduced to quantitative expediency, as in the accountability movement, shrinking human learning into behaviorally measurably modules and components. Philetics may be reduced to narcissistic self-absorption. Self-congratulatory "touchy-feelies" deserve our scorn more perhaps even than overt attempts at behavioral conditioning, since often these so-called educative enterprises take advantage of, and manipulate, very real human vulnerabilities.

Given the technical demands of a given educative situation,

it may be necessary temporarily to focus predominantly on one or another of the dimensions. But this temporary focus is a means, not an end in itself. Grammatical rules, for example, are not a discrete entity separable from their context in literature or in everyday conversation. Learning-by-doing in a social setting is not applicable to all subject matters. Philosophy itself as a subject is not reducible exclusively to language analysis, however useful this may be as a means of clarification. So-called humanistic experiences in pseudo-therapy are not fully representative of the heights and depths of human inspiration and human anguish; these experiences trivialize existence.

If the three dimensions of education, whether understood as the Kantian categories of intellect, feeling, and will, or from Broudy's discussion of the didactic, heuristic, and philetic, are taken fully into account, then we will have countered to a considerable extent the many forms of reductionism so prevalent in contemporary society. We will be able to see more clearly the absurdity of trying to encompass the work of educative institutions within mere technologies of behaviour. The teacher may then re-emerge as more than a legalistic rule follower and learning technician. He or she may be allowed, as students should be allowed, to become caring, intelligent, and purposeful human beings.

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Stanley Brice Frost

Science education in the nineteenth century

The Natural History Society of Montreal, 1827-1925

We live in an age when the several delights of childhood appear to have little to do with the business of life, and when the word "science" represents a monument of such awesome scale and scope that far too few dare approach it. But before that monument arose, as the following little history shows, science was pursued in the last century by men like Dawson with an unmistakably boyish enthusiasm, and with a sense of curiosity that might rambled like a puppy across all the boundaries of what we now rather earnestly call disciplines. Stanley Frost seems to have ramble in much the same spirit down a side alley of his History of McGill project, with this account of a forgotten phase in the pursuit of science when so much was yet to come, and, when a child could understand the point of it all.

This society had the distinction of being the oldest scientific organization in Canada, and one of the earliest such societies in North America (1). For the greater part of the nineteenth century it played a major role in the development of science in Montreal; in the later decades the encouragement of what might be called "professional science" passed increasingly to the university and to disciplinary societies and their specialized journals, but the Society maintained into the twentieth century a valuable role in the popularization of science, and in the spread of a general understanding of its aims and its achievements.

Regrettably the Society dissolved in 1925, and there is a

considerable danger, more than half-a-century later, that its history may be forgotten. McGill University's Blacker-Wood Library of Zoology and Ornithology possesses remarkably full records of the Society throughout its history, including minutes, annual reports, Journal publications, catalogues of the library and of the museum, lists of members, and lists of donors with details of their donations (2). Together these documents present a fascinating picture of a near-century of popular science, in the best sense of that term.

It was on the 12th of May 1827, in the manse of the Reverend Henry Esson, Minister of the St. Gabriel Street Presbyterian Church, Montreal, that in the conversation of "a few gentlemen, casually met together," the idea emerged of forming a Montreal Natural History Society (3). They resolved to invite others to meet with them six days later with this purpose in mind, and on 18th May the Society came into being.

The early membership

The founding group contains many names which are familiar to us in other connections. Stephen Sewell, the first President, was the attorney of the Royal Institution for the Advancement of Learning, at this time busy with its suits against the Desrivières family to obtain the legacy of James McGill for the founding of a college. The young physician Andrew Fernando Holmes, one of the two original secretaries of the Society and President for the years 1836-41, was one of the founding fathers of the Montreal General Hospital and its teaching arm, the Montreal Medical Institution. He was probably the animating spirit during the early years of the Society. It was he and the Reverend Henry Esson who were asked to propose a constitution for the new Society; he served for many years as Chairman of the Management Committee and in that capacity he wrote the Annual Reports of the Society from 1828 through the years of his presidency. As a student in Edinburgh he had joined the university's natural history organization, the Wernerian Society, and he had become a keen collector of botanical and geological specimens. His herbarium and his mineral collection, constantly added to over many years, were finally acquired by McGill, and incorporated into the University Museum's holdings. William Caldwell, William Robertson and John Stephenson, Holmes' three colleagues in the Montreal Medical Institution, soon to become the McGill Faculty of Medicine, were also among the founding members of the Society. Caldwell was elected a vice-president and Stephenson a member of the Management Committee. There were at least three other physicians among the twenty-six charter members, so the medical presence was considerable.

There were also three clergymen: both James Somerville and Henry Esson were ministers of the St.Gabriel Street Church, and Alexander Mathieson was a minister of the rival church, St. Andrew's, so all three were Presbyterians. But the Anglican rector of Montreal, John Bethune, joined in the first year, and so did at least one other cleric. The close connection of science and religion at this time was the result of the popularity of "natural theology." According to this view, God had given two "books of revelation": the inspired Bible and the "book of nature." One reinforced, illuminated, and explained the other. Isaac Watts had characteristically written

> Lord, how thy wonders are displayed
> Where'er I turn mine eye,
> If I survey the ground I tread,
> Or gaze upon the sky.

Contemporary sermons supplemented biblical teachings with copious illustrations drawn from "natural history"; the battles of religion and science lay many years into the future, and in the first half of the nineteenth century much amateur science was conducted from the manse and the rectory.

The membership of the one hundred or so persons enrolled on the first register of the Society included in fact a large proportion of the influential anglophone society of Montreal, but it is significant that there were apparently no French-Canadian members and of course no women members. The Roman Catholic Church controlled French-Canadian culture and did not encourage contacts with scientific institutions; women had to wait another forty years before they were welcomed, and then only to associate membership.

The Society's museum

From the beginning the Society had intended to establish a museum, because this would give permanence and continuity. Its avowed intention, as set out in its constitution, was "the investigation of the Natural History of Canada", but enthusiastic donors were soon loading it with specimens and "objects of curiosity" from all over the world. Stephen Sewell the first President donated his very fine botanical collection, and the Montreal Library, founded in 1796, had acquired a number of three-dimensional objects of all kinds, which it was only too happy to donate to the new Society's museum. "The Cabinet", as it was called, was divided into four departments: Zoology, Botany, Mineralogy, and Miscellanies, and each was to have its own catalogue. The 1828 pamphlet containing the Society's by-laws and constitution included for the benefit of the would-be donor

instructions on how to skin quadrupeds and birds, how to stuff and preserve fish, and how to bottle smaller specimens in spirit.

Since captains of sea-going vessels, and furtraders and their agents who voyaged out west, were frequent contributors, not only were the first three departments of the Cabinet soon well-stocked, but the miscellaneous division also grew very rapidly. Early examples of donors are Captain Stoddard of the **S.S. Thomas,** who gave "shells and other objects of interest", and James Keith of the Hudson's Bay Company's station in Labrador, who regularly sent "Indian curiosities, skins of animals, minerals and shells." These latter donations gave the Society clues to cultures and to lands which at that time were remote and largely unexplored, and a committee was set up to report to the Society on "the Indian territories." The Hudson's Bay Company, no doubt by George Simpson's direction, promised to urge its agents to watch for interesting specimens and to send them back to Montreal. The Society was thus in a very favourable situation to be the first depository of Canada's rich variety of flora and fauna and geological specimens.

The botany section began with a selection of European material, gathered by collectors influenced by the well-organized studies of their homelands, but specimens of local flora soon began to come in and quickly came to preponderate. The geological section was much enriched by the donations of one Martyn Raine, M.D., of New York, and these formed in the 1830's the finest and largest part of the Society's collection. The library too, which began only modestly, numbered 352 books in 1832 and was expanding rapidly.

The Discobolus

In that same year, a notable incident occurred. Nathaniel Gould, esquire of London, "made a most valuable and acceptable adition" to the Museum consisting of

> four casts from antique statues, known to connoisseurs as "The Discobolus, the Antinous, a Fawn and a Piping Boy." Unfortunately from want of proper care in the packing and transportation from London, they arrived in such a state of mutilation as to lead to the supposition that they were irrecoverably lost, but the Council has the greatest satisfaction in stating that, owing to the ingenuity and zealous labours of two of the members, the statues have been repaired in a manner far beyond the expectations of those who witnessed them in their dismembered state. The Society cannot but feel grateful to the members who,

> at so much cost of labour and time, have restored these precious objects of art, and have made them ornaments of the collection (4).

These gifts were followed by similar donations from other sources, and no doubt were a major cause of the over-crowding which in 1832 led the Society to move from its first location to more commodious premises. Even here, and at subsequent addresses, many prized objects had to be relegated to the store-rooms, where Samuel Butler found the Discobolus in the early 1870's and was moved to write his sardonic poem "O God. O Montreal."

The Society was, as it recognized in one of its early reports, "being formed in the bosom of an infant state, where consequently almost all are engaged in occupations necessary to existence", and where understandably leisure for the arts and sciences was hard to come by. Greek sculpture was not among the Society's primary interests, but it was making sincere efforts, as the quotation from A.F. Holmes shows, to bring elements of culture into the city's life. In this endeavour, the Society was conscious that it was "working more for posterity than for the present generation."(5) The Society deserved, we may think, Butler's commendation rather than his ridicule; in 1830, its good work was recognized and encouraged by a subvention from the Legislative Assembly in the healthy amount of two hundred pounds.

A considerable variety continued to be shown for many years in the list of donations to the museum. Some were curiosities pure and simple, but others were scientific specimens of considerable merit: "**Geothylypis Philadelphia, Baird,** male (Morning warbler)" donated by W. Hunter, and "**Accipenser carbonaria,** Agassiz (long-nose Sturgeon)" from G. Barnston. But then again these specimens had to compete with "An antique pair of stays, 100 years old", given by Mrs. Hamilton in 1862. As the years passed, however, the nature of the donations became more uniform and in the later years became strictly scientific; in 1880, for example, of some sixty donations or purchases reported all are irreproachably scientific, other than "a Box made out of a plank of the Royal George and a lock of Grace Darling's hair", contributed by Captain Dutton of the **S.S. Sardinian.** For the rest, they range from "a fine **Limulus Polyphemus"** donated by Miss Mathewson to "Green Black Cap Fly Catcher (male, winter plumage) **Muscicapa pusilla",** purchased by the Society.

The Museum of the Society was open at certain times to the public, and as Holmes had foreseen it was from the beginning the Society's greatest asset and its assurance of continuity. A photograph taken probably in the middle 1880's shows a large hall with a high ceiling and an encircling mezzanine. The centre ground floor is occupied by cases displaying geological specimens,

and the wall cases are filled with stuffed birds. On the mezzanine are further cases, above which on the walls are hung Indian spears and other warlike instruments. The Museum must have been for the citizens of Montreal an interesting and instructive place in which to spend an afternoon, as well as one which offered the serious student a great deal of material excellently catalogued and displayed.

Prosperity, decline, and renewal

The most notable achievement of the Society in its early days was its petition presented, with the support of the Quebec Literary and Historical Society, to the newly re-united Province of Canada in 1841. This petition asked that a systematic geological survey of the province might be undertaken; with the government's support the necessary bill was enacted and the Canadian Geological Survey was instituted. This organization remains Canada's oldest scientific organization and one of its most valuable. The Natural History Society incidentally thereby acquired a new and valuable member, for the Director of the Survey, William Logan, made his headquarters in Montreal and became a loyal supporter of its work. In 1869-70 he served as President.

Another, even earlier petition, put forward in 1831, sought funds from the province to establish a series of public lectures on scientific subjects to be given annually "without charge or for some trifling amount." This attempt failed, "largely because of the depressed state of the Provincial finances." But in 1833 the Reverend James Somerville died and left one thousand pounds, the interest from which was to support the kind of lectures the Society had previously advocated. The Annual Somerville Science Lectures thus became a regular feature of Montreal life until the end of the First World War.

By 1852 the Society had been in existence for twenty-five years and for some time the initial enthusiasm had been waning. When Major Lachlan succeeded to the chair in that year, his presidential address took the form of a history of the society and a survey of its prospects. Of the original twenty-six founding members, he observed, only one, Dr. A.F. Holmes, was still active in its affairs. In 1836 the Society had purchased a mansion to give it more much-needed space, but from lack of funds had been obliged up to the present to rent out most of its rooms. In 1841 the government had proposed that when the Bonsecours Market Building was completed, it should house the Mechanics Institute, the Montreal Library, and the Natural History Society united in one Montreal Institute of Literature, Science and the Arts (6). The government proposed to support the new institute with an

annual grant of three hundred pounds; had that imaginative development taken place, the Major said, there would have been no need for the formation of the Institut Canadien; the move "would have gotten rid of those narrow and sectional feelings and prejudices", and the Society would have been a provincial rather than a local one. Presumably he envisaged a bilingual and bicultural society. But the proposal was lost in the aftermath of the parliamentary riots, and the removal of the government from Montreal, and had never been revived.

Major Lachlan urged that the Society must now make a "well-directed, strenuous effort to regain its lost popularity", and suggested that "though the chief object of the Society be the advancement of the study of Natural History, it also embraces, not only Science and Literature, but all useful knowledge." It should therefore broaden the scope of its activities, but members would then have to take a more active part in the life of the Society. One of the points he emphasized was that a society like this one must publish "if it is actually to bear fruit." (7)

Major Lachlan sounds very much like the adherent of a dying cause seeking to whip up a non-existent enthusiasm. Such well-intentioned efforts are seldom successful. But had he known it, the Montreal Natural History Society was on the verge of a remarkable revival and its best days were yet to come. The Royal Institution for the Advancement of Learning had been moved in 1845 from Quebec City to Montreal and its membership reformed by the appointment of just the kind of person who had formerly provided the mainstay of the Society - the professional and merchant leaders of the city. Further, this same group had, in the same year as Lachlan gave his presidential address, been made the Governors of that moribund institution, McGill College. These men were determined to revive its fortunes. The renewal of economic prosperity in Montreal, consequent upon the success of the Reciprocity Treaty with the United States and the coming of the railways, favoured their efforts to the point where in 1855 they were able to appoint a new principal for the College, a man called John William Dawson, from Pictou, Nova Scotia. He at once associated himself with the Natural History Society and proved to be the one who could accomplish all that Major Lachlan had hoped for.

An audacious proposal

Dawson was an extraordinary person, in all kinds of relationships, but as a scientist he is without parallel in Canadian history. When he arrived in Montreal he was already a Fellow of the Geological Society of London, the author of **Acadian Geology** and of a score of scientific articles, and above all, an ardent

naturalist. His enthusiasm was infectious. He was previously friendly with William Logan, the Director of the Geological Survey, and he quickly established close relationships with other members of the Society, such as Dr. Charles Smallwood the meteorologist, who had built his own observatory in St. Martin, and Abraham de Sola, the learned Rabbi of the Spanish and Portuguese Synagogue, and the young Dr. W.H. Hingston, who had recently returned from advanced medical studies in Britain and Europe.

Dawson was elected President of the Society in 1856, a scant year after joining its membership. He probably, however, made his audacious proposal even earlier, soon after he became a member. It was nothing less than that the Society should invite the prestigious American Association for the Advancement of Science to hold its fourteenth annual assembly in Montreal. The Association had never before met outside the United States, and apart from the almost defunct Natural History Society and a barely resuscitated McGill College there was no reason why it should now come north of the border. But Dawson's enthusiasm prevailed, and he, Logan, Smallwood, and four other members journeyed to the 1856 Assembly in Albany to present the invitation. Baltimore put in a competing invitation, and the matter was referred to the Association's standing Committee, which surprisingly decided in Montreal's favour.

The 1857 meeting was a great success. Montreal took its place upon the scientific map of North America, and the cause of science in the city was invigorated (8). Dawson was immediately asked to serve as President of the Society for a second year, 1857-58. He was to serve in that capacity, off and on, for twenty of the next thirty-five years, and in 1890 he was elected Honorary President for life.

The Society's journal

The next step in the rehabilitation of the Society was to fulfil the second element of Major Lachlan's prescription for its well-being - the publication of a journal (9). In its early numbers it was wholly written by Elkanah Billings, described as "Barrister at Law," of Ottawa, Canada West, and later as of Montreal. He served as palaeontologist to the Geological Survey and was an ardent and erudite naturalist. In his hands the journal was a didactic work, giving a survey of such general subjects as geology, or the classification of the animal kingdom, and more detailed accounts of specific subjects such as the natural history of the Canadian moose. Billings' style is well illustrated by the opening remark of his second article: "For the benefit of the juvenile reader, it appears proper in this place to explain, that in

classifying objects of natural history, two names are absolutely necessary for each species." He illustrates this principle with **brown bear, grizzly bear,** and then continues, "The only difference between ordinary and scientific conversation in this respect is, that in the first we use our native language and in the other the dead languages." Accordingly, he does not hesitate to punctuate his articles with very useful etymologies of Latin and Greek terms. But at the end of the twelve months his prolific pen had run dry, and it was announced that Volume II, No. 1, would be published in March 1857 by a committee of the Society.

From this time forward, the articles are contributed by various scientists on subjects of their expertise. T. Sterry Hunt, chemist to the Geological Survey and Associate Professor of Chemistry of McGill College, writes on "Fish Manures", Charles Smallwood on "The Cold Term of January, 1859" (10), Billings himself on "Some new genera and species of Brachiopoda", and Dawson on "The Microscopic Structure of some Canadian Limestones." The didactic note has been dropped, and the communications have become straight scientific reporting. The journal thus served as the premier Canadian scientific journal for many years, and numerous important contributions - for example, those of George Mercer Dawson in his capacity as geologist and botanist to the 1873 North American Boundary Commission - first appeared in its pages.

Popular science

Although the journal became a reputable scientific publication, the parent Society retained its more popular character. This was evidenced by the subjects of the annual Somerville lectures. They appear to have begun in 1840. In 1857 Dr. Hingston lectured on the circulation of the blood and Dawson on "The Physical Geography of the Lower Province." Alexander Johnston, Professor of Mathematics and Natural Philosophy at McGill lectured in 1869 on the history of astronomy, and T.D. King on "The Microscope." The most intriguing titles are those of two lectures given in 1873 by Dr. Philip Carpenter, the protagonist for hygiene in Montreal; they were "The Life of an Oyster from a Man's Standpoint" and "Man's Life in Montreal from an Oyster's Standpoint." They must have been well worth hearing.

Another of the ways in which the Society fulfilled its popular role was to organize an annual **exploring field day.** The first took place in 1867, and each year thereafter it was a happy occasion of mingled instruction and enjoyment. The exercise might take place on Montreal's own mountain, or further afield at some such location as Mount St. Bruno. At the picnic site a brief lecture would be given by a senior member of the Society

on the flora or the geological specimens which might be encountered in that location. At the end of the day there was a prize given to the one who had collected the finest specimen. The specimens had to be entire - that is, root, stem, leaves and flower - unless they were over two feet in height, in which case the root could be omitted; the correct scientific name had to be attached; and the collecting and naming had to be the work of the one person submitting the specimen. In 1890 the prize was won by a young McGill graduate of that year, Miss Maude Abbott (11). In rather the same vein, the Society offered prizes to those submitting the best essays in a yearly contest, but this practice seems to have been conducted only intermittently.

Yet another popular activity of the Society, which began in 1863, was the annual **Conversazione.** Dawson described this as "an occasion on which the members of our association, with all its beasts, birds and creeping things, announce themselves at home, and invite their friends to a scientific and intellectual feast." It was a very distinguished event, often attended by the Governor General; gentlemen had blue tickets and ladies pink ones, and there were separate entrances for them. The evening began at 8 p.m. and "sleighs may be ordered for eleven o'clock." Special displays were mounted, refreshments and music were provided. We can well understand that in Victorian Montreal the Natural History Society's Conversazione had its regular place in the social calendar.

The Society's locations

The homes of the Society reflect its history and to a large extent may be said to have determined it. The earliest home was on St. Paul Street in rooms rented from a Mr. Cunningham; they were conveniently located in the centre of Old Montreal. The first move in 1831 was to 20 St. James Street, to share the building occupied by the Montreal Medical Institution, which had lately become the Medical Faculty of McGill. No doubt Dr. A.F. Holmes facilitated these arrangements, and also those with regard to McGill's first degree-granting convocation. It was held in 1833 in the Museum of the Natural History Society. A year or two later, a mansion owned by M. Reguies came up for sale on the same street, and in 1837 the Society decided to purchase it. For a while the new building was shared by the Society and the Montreal Library. When, after the decline of the 1840's, the Society began to revive in 1856, it soon became apparent that yet another dÉmenagement would be required. Dr. Dawson used his good offices with the McGill Board of Governors, and they made available to the Society a piece of land on which a permanent home could be located. With the help of a mortgage from the McGill Governors, a building was erected on the northwest corner

of University and Cathcart Streets, and this was the home of the Society for nearly fifty years.

In 1906 the future of the Society appeared to be sufficiently assured for yet another move to be planned, this time in search of a less commercial, more congenial environment. The University Street building was sold, and two contiguous sites were purchased, one fronting on Drummond and the other on Mountain Street, just below Sherbrooke. Since the houses occupying the land were not suitable for the Society's activities, it was intended to demolish them and erect a new building to house both the Museum and the Library. Until the necessary funds could be raised the museum collections and the library were put in boxes and stored.

This proved to be a fatal mistake. With the Museum no longer functioning the future of the Society became uncertain. One good reason after another delayed the public appeal, until in 1914, just as the Society was beginning to revive and was re-commencing the publication of its **Journal**, the First World War broke out and the favourable moment had passed. By the time the war had ended, the financial indebtedness of the Society had mounted to over sixty-six thousand dollars, nor in the postwar depression was there much hope of an appeal to the public. The most substantial fiscal asset throughout its history had been its immovable property, and as we have seen the land portion had been contributed in 1858 by the McGill Governors. It was therefore appropriate that, in resolving to dissolve itself, the Society should invite McGill to take over both its assets and its liabilities, and to receive its collections. These collections were major accessions which the Redpath Museum, the McCord Museum, and the Redpath Library were very gratified to receive.

Tamen fit surculus arbor

There must have been considerable sadness in the minds of many when the Society finally gathered to approve the motion winding up its affairs. There were some present like Professor Carrie Derick who could remember the Society in its heyday and who were conscious of the major role it had played in the intellectual life of the city. In one sense, it had perhaps fulfilled its purpose, in that it had firmly established the place of science in the esteem of the citizens of Montreal, and indeed, through its journal, of Canada generally. Science had now become more departmentalized, and the learned societies were beginning to provide specialized services for the different disciplines. Yet we have to recognize that the loss of the Montreal Natural History Society's Museum has never been made good. Montreal, indeed the Province of Quebec, still lacks an equivalent to the Royal

Ontario Museum, and the Natural History Society's Museum could have been the foundation stone on which such an institution might have been built.

The Society devised for itself an emblem, a coat of arms as it were. It consisted of a plaque displaying the name of the society and an owl clutching in its beak a twig; the Latin motto was **tamen fit surculus arbor**, the shoot becomes a tree. The shoot planted on 18th May, 1827, did indeed become a great tree; it is fitting that we should remember how it took root, spread its branches and bore much fruit, and how its strength was not lost but gathered up into McGill, where it continues to serve succeeding generations.

This paper was read to the St. James Literary Society, Montreal, in November 1981.

NOTES

1. The Quebec Library and Historical Society was older, but its interests were not exclusively or even mainly scientific, as its name reveals. It did accept occasional natural history lectures.

2. The author acknowledges a particular debt to Eleni Bakopanos, who under his direction researched the Blacker-Wood Natural History Society materials, and to the Librarian Eleanor MacLean for her generous cooperation.

3. **First Annual Report**, 1828.

4. **Fifth Annual Report**, 1831-32.

5. **Annual Report**, 1828.

6. The Mechanics Institute was also founded in the manse of Henry Esson, one year later than the Natural History Society; the Montreal Library dated back to 1796. For the part played in the Bonsecours scheme by the egregious Nicolas Vattemare, see E.C. Moody, **The Fraser-Hickson Library** (London, 1977) pp.15-18.

7. **Annual Report**, 1852.

8. The A.A.A.S. returned for a second visitation in 1882, and the British Association in 1884.

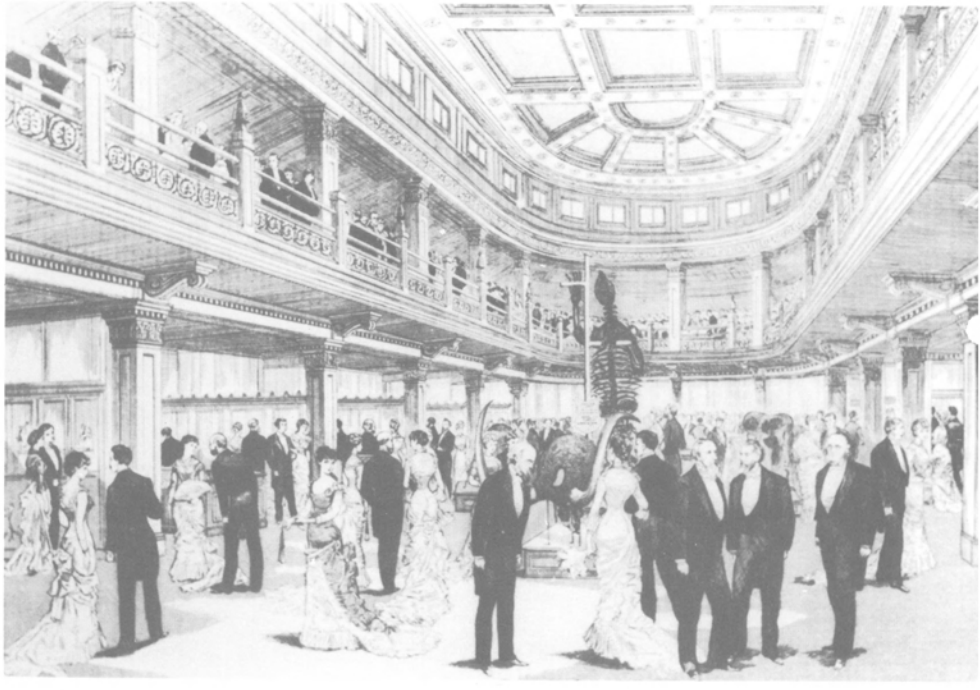
9. **The Canadian Naturalist and Geologist** first appeared in 1856, and volumes 1-8 continued through to 1863. A new series then began, and volumes 1-10 continued through to 1883, having the title after 1869 of **The Canadian Naturalist and Quarterly Journal of Science.** In 1884 the name changed again to **The Canadian Record of Science,** and Volumes I to VIII continued through to 1902. Volume IX numbers 1 through 5 were issued in 1903-04, but then a lack of funds forced a suspension of publication; in April 1914 publication was resumed with number 6, and the journal continued with numbers 7 and 8 through to 1916, when publication finally terminated.

10. He recorded a low of -43.1 F on 11 January 1859 and a level below -20 from 9-13 January, "a record of temperature, I believe, unequalled in Canada, both as to its intensity and duration." Of course, his "Canada" was limited to southern Quebec and eastern Ontario.

11. Maude Abbott, one of the first women to graduate M.D. in Canada, became a cardiologist of international repute. See S.B. Frost, "The Abbotts of McGill", **McGill Journal of Education,** 1978, XIII, No. 3, pp. 253-270.

Exterior of the Peter Redpath Museum.

(Courtesy of the Notman Photographic Archives)



Reception for the American Association for the Advancement of Science in the new Redpath Museum

(from the Canadian Illustrated News, 2 September 1882).

Main Gallery of the Peter Redpath Museum, 1889.

(Courtesy of the Notman Photographic Archives)

Susan Sheets-Pyenson

"Stones and bones and skeletons"

The origins and early development of the Peter Redpath Museum (1882-1912)

The word museum has certain somewhat inert connotations for our contemporaries, one may guess, that it did not have before we all became a global village. The Editor remembers as a child habitually referring to the great university museum in Edinburgh, which is mentioned glancingly in the following pages, as "the Dead Zoo." Yet it was a great pleasure for a family to go there on wet Saturdays, such as now seem to tether families to the television box. As Sheets-Pyenson recounts here, the rise of museums in the 19th century was intimately tied to a phase of enthusiastic growth of interest in natural history, when to collect and house objects of curiosity from all over the world, so that they might be contemplated together, was an activity indispensable to the pursuit of science. That that is no longer so for many aspects of science, given the extraordinary instruments of record and communication now in use, does not mean that museums no longer have the function they were designed for; the Redpath is still alive and well as a teaching institution. But as the following account shows, its early habits of individualism had their anxious moments with the winds of change, as science ramified into systems.

The Peter Redpath Museum of McGill University will celebrate its one-hundredth birthday next August. While such an occasion is in itself cause for reflection on an institution's past,

other reasons make a short history of the museum's early days particularly important now. As the only museum in Montreal devoted to biology, geology, and palaeontology, the Peter Redpath Museum holds a unique position in the city today. No one would have guessed, when McGill's natural history museum flourished alongside those of the Montreal Natural History Society and the Geological Survey of Canada during the nineteenth century, that the junior member of the trio would capture this honour.

A sketch of the early history of the Redpath Museum also holds a moral for institutions struggling to survive economic adversity. It suggests that no matter how ambitious and energetic an institution's creators, their vision cannot be sustained over the years without a firm financial basis. In the case of the Peter Redpath Museum, development depended upon strong personalities rather than sound economics. Once the museum lost its early directors and patrons, collections grew erratically, research declined, and public support waned. All too quickly the Redpath Museum had ceased to be a scientific showcase for McGill, and had become instead a poignant reminder of a glorious past.

The Survey goes to Ottawa

When John William Dawson arrived at McGill as its third Principal in 1855, the university museum consisted of one fossil. Such a deficiency was serious to the palaeontologist Dawson, who had been educated in Edinburgh. There a measure of Professor Robert Jameson's natural history empire had been the collections he amassed over fifty years, which served the university but also had acted as a mecca to any scientifically inclined inhabitant for miles around. Moreover, during the nineteenth century the adequacy of a museum assumed a critical significance within the discipline of natural history. Museums were the institutional expression of that science's domination by collectors, classifiers, and compilers. To Dawson, then, McGill required a respectable natural history museum in order to achieve any standing as a university and as a centre for the advancement of natural science.

By the early 1860's, when the first college buildings were completed, a room was set aside to house a natural history museum. Slowly the collection grew as a result of money acquired through occasional gifts, the fees collected from Dawson's lectures to medical students, and the museum fund established by the banker and brewer William Molson. Important donations of specimens came from other Montreal residents such as Philip P. Carpenter, who gave a shell collection, and Andrew Fernando Holmes, who provided a herbarium. Dawson himself gathered fossils and rocks during his summer holidays. Some of these objects were deposited in the museum, while duplicate

specimens furnished materials for exchange with other institutions (1).

In 1862 Dawson boasted that McGill's museum held 10,000 natural history specimens, arranged to illustrate successive lecture topics in that subject. Besides its function as a teaching aid, the collections might be used by local naturalists to facilitate their research. Yet Dawson was careful to explain that McGill did not intend to amass a "large general collection" to rival those belonging to other institutions based in Montreal: the Geological Survey of Canada and the Natural History Society. In fact, Dawson promised that future additions to McGill's collections would be made in areas not represented in these two museums (2).

Fifteen years brought dramatic change to Dawson's view of the purpose of the natural history museum at McGill and its relationship to others in Canada. Foremost in precipitating this change was the Dominion government's decision to transfer the Geological Survey and its museum to Ottawa, the backward national capital. Dawson's fury over this development fueled opposition that smouldered in Montreal from the first announcement of the plan in 1877 until the actual move during April and May 1881.

First Dawson tried to use influential friends, including Senator Thomas Ryan and Thomas White, M.P., in order to persuade the government to reverse its decision. A Montreal deputation petitioned the Prime Minister and the Governor-General, while the Board of Trade, City Council, and Corn Exchange all remonstrated against "the evil." When the lobbying failed - predictably, to those who saw the increasingly powerful hand of Ontario in the whole affair - Dawson tried to salvage what he could. He proposed that a branch museum of the Survey be maintained in Montreal which might preserve the original exhibits arranged by the first director, William Logan, and the palaeontologist Elkanah Billings. Only the more recent collections made during A.R.C. Selwyn's directorship, as well as all duplicate specimens, should go to Ottawa. Failing this plan, Dawson hoped that the duplicates would be entrusted to McGill. He even argued that the most precious objects should be left in safety in Montreal. Otherwise these materials might be damaged, ruined, or lost during the move or when housed in the old hotel purchased for the Survey in Ottawa (3).

Considerable bad feeling resulted from what was seen in Montreal as the federal government's "want of faith." The promise made by defense minister L-F-R. Masson for the creation of a Montreal geological museum remained unfulfilled, as well as a vaguer pledge to leave duplicate materials behind. Like the government, members of the Survey expressed little enthusiasm

for Dawson's schemes, telling him that he might expect to receive only a small number of specimens at some future date, following the move to Ottawa. Apparently the men lacked the time and money required to inventory and identify their duplicates, causing Dawson to fume that "more than enough are rotting in boxes in the Survey Museum...to remain useless in cellars for years as it has done here."(4)

Preparations for the Peter Redpath Museum

The remarkable indifference that Dawson encountered among some of his former friends and associates, coupled with the actual "act of gross vandalism" removing the Survey museum, seems to have altered his notion of the scope and function of McGill's collections. No longer was he content to build a modest museum, but he aimed to establish "a better collection illustrative of Canadian Geology" than that of the Survey in less than a year. What gave conviction to Dawson's determination was an offer from the Montreal industrialist Peter Redpath to provide McGill with a museum building which would be "the best of its kind in Canada." As it would console him for the loss of the Survey collections, Redpath sought to commemorate Dawson's twenty-five-year tenure as Principal of McGill and, not unintentionally, to dissuade him from accepting a post at Princeton University. The museum that Redpath donated to McGill - costing about $140,000 - initiated a new era in the level of private bequests to the university (5).

As work on the museum's edifice progressed, Dawson laboured zealously to build up the collections. His own cabinet of nearly 10,000 Canadian rocks and fossils (valued at $5,000) formed the nucleus. The heirs of William Logan, as part of a complicated manoeuvre related to the transfer of the Survey, donated $4,000 to form a collection in his memory. With these funds Logan's former assistant, James Richardson, was employed to collect duplicates of Canadian specimens held by the Survey museum exclusively (6).

Another important resource for Dawson's museum-building was his son, who worked for the Geological Survey. In the summer of 1882, George Mercer Dawson toured Europe, sent home timely information about continental museums, and cultivated useful contacts abroad. Particularly impressed by the provincial museums of France, George urged his father to add "a small typical local collection" to the Montreal museum, "with map to accompany it so that anyone could go to the precise spot at which points of importance exist." At Bonn, he visited the geological "merchant" August Krantz, whose immense collection furnished specimens much more cheaply than those from London.

Yet George found that he could procure rocks and minerals in the French countryside for as little as twenty-five centimes apiece (7).

In addition to purchasing materials for the museum, Dawson acquired other natural history objects by exchange with institutions and individuals across Canada, the United States, and Europe. Cordial relations were soon restored with the Geological Survey of Canada. Three months after the move to Ottawa, Dawson received shipments from them; within the next year, the Redpath Museum reciprocated by sending material to Ottawa. Dawson established exchange ententes with keepers at major museums abroad, such as Henry Woodward, head of the British Museum's department of geology. But it was especially to "surveys and private collectors in the United States" that Dawson looked (8).

Earlier Dawson had warned Thomas White that the result of the Dominion government's transfer of the Survey museum was "to annex us practically to the United States." Perhaps Dawson meant that he himself would look south for support. He eagerly swapped fossils with that country's foremost amateurs, including R.D. Lacoe; with state museum directors, like James Hall in New York; and with the most distinguished local societies, such as the Boston Society of Natural History through the efforts of its officers, Alpheus Hyatt and Samuel Scudder. He also arranged exchanges with curators in the largest museums in the land, namely, Richard Rathbun at the National Museum in Washington D.C., and R.P. Whitfield at the American Museum of Natural History in New York City. Assistant Secretary Spencer Baird enticed Dawson to aid the Smithsonian Institution's expedition to Ungava Bay by promising him their first series of duplicates - better than the specimens going to Ottawa - for the Redpath Museum (9).

Opening day, 1882

Peter Redpath chided Dawson that his insatiable appetite for "stones and bones and skeletons of all kinds" might overwhelm the new building. As the August 1882 opening date approached, preparations reached a feverish pitch. Dawson and his son-in-law Bernard James Harrington, then professor of chemistry and mineralology, sacrificed their summer holidays in order to label and arrange specimens in their cases. To speed the work of assistant curator Thomas Curry, the piano-factory employee Paul Kuetzing was hired to mount and renovate vertebrate animals. Edwin Howell, Henry Ward's partner in the taxidermy firm located in Rochester, New York, travelled to Montreal to set up a copy of the British Museum megatherium and some other large objects.

A number of McGill students and graduates volunteered to help transfer the college collections into the new museum building (10).

Dawson called the sight that greeted the 2000 guests who revelled at the formal reception "the greatest gift ever made by a Canadian to the cause of natural science, and...the noblest building dedicated to that end in the Dominion." The Grecian-style exterior, built of limestone quarried near Montreal, represented conventional architectural practice. (By this time the new natural history museums in London and Paris had turned away from classical traditions, and had incorporated biological symbolism into their Gothic or Romanesque facades.) Nor were the dimensions of the building remarkable by world standards, when the American Museum of Natural History covered thirteen acres. Still, Redpath Museum exhibited pleasing external proportions and a well-designed interior plan, with space adequate to display a series of natural history specimens for teaching purposes (11).

Entering the Peter Redpath Museum, the visitor saw at the back of the ground floor a handsome lecture theatre with seats for 200 students. Rooms closer to the front of the building would soon accommodate a herbarium, reference library, classroom, boardroom, and office. At the right side of the entrance, a staircase fitted out with archaeological objects and large slabs of fossil footprints on the landing led to the main floor or "Great Museum Hall." Ward's imposing cast of the megatherium distinguished this floor, which displayed palaeontological, mineralogical, and geological specimens. Fossils along the centre and at either side were arranged according to their progression in geological time; subordinate to this organization came their botanical or zoological classification. The visitor, then, could view the general order of geological succession or trace any group of animals or plants through several geological formations. The second floor of the museum - the gallery of the great hall - contained zoological material. Invertebrates were stored in table cases, while vertebrates were displayed in upright cases. The basement contained a laboratory where specimens could be prepared and stored (12).

Growth in the early years: 1882-1897

A small but distinguished committee chaired by Dawson managed the affairs of the Peter Redpath Museum. In addition to McGill's natural history professors (only B.J. Harrington at first, but later including botany professor David Penhallow and the zoologist E.W. MacBride), three other members of the corporation sat on the committee. The Board of Governors elected Peter Redpath to the group in January 1882. Given Redpath's

anticipated long absence in England, the committee added J.H.R. Molson to their number. Unlike Redpath, Molson took the responsibility seriously, attending the bimonthly meetings regularly and reporting back to the other members on various matters. For the next five years the composition of the group remained fixed, once Professor John Clark Murray of moral philosophy had replaced the deceased Dean of the Medical Faculty, George W. Campbell, in August. By the late 1880's, however, resignations and deaths had altered the committee, which had begun to meet at quarterly intervals (13).

The Redpath Museum Committee worked with remarkably scanty financial resources. From the university came a small portion of medical students' fees (several hundred dollars per year) in exchange for their use of laboratory facilities in the building. On occasion the Board of Governors advanced funds to allow the museum to balance its accounts, but these amounts had to be repaid (each operation of the university had at this time to be financially self-supporting). Because McGill had agreed to preserve the museum, according to the terms of Peter Redpath's donation, the corporation paid for repairs and improvements. Yet the museum was held responsible for general maintenance. A somewhat arbitrary and bizarre division of responsibility ensued: McGill paid for snow removal from the roof; the museum, from the grounds. The university took charge of painting the roof, while the museum oversaw the varnishing of woodwork around the windows. Revenue also came to the museum from the 25 cent admission charge, levied upon all visitors except university staff, McGill graduates, school teachers, and clergymen. Money accrued, in addition, from interest on the various museum funds and from fees paid by the Ladies' Educational Association (about $100 per year) for lectures delivered in the museum theatre (14).

Perhaps because of their first-hand knowledge of the Museum's dire financial situation - which seldom moved outside the red - members of the museum committee gave generously of their money as well as their time. In addition to Redpath's annual grant of $1,000 for maintenance of the museum building (continued by his widow who increased the sum to $1,500 in 1894), Louisa Molson contributed $2,000 to establish a fund for paying the salary of Thomas Curry, the assistant curator. Louisa's husband J.H.R. Molson donated at least $500 and sometimes as much as $1,000 a year for the purchase of otherwise unobtainable collections.

Molson's generosity enabled Dawson to buy rocks and fossils from naturalists and dealers overseas, including Anton Dohrn at the Zoological Station in Naples, the elderly Edward Charlesworth of London, Charles Moore in Liverpool, and August Krantz at Bonn. By the late 1880's the museum collections were valued at

nearly $60,000 (15). Generally, however, Dawson relied upon donations from friends in Montreal, elsewhere in Canada, and abroad, which were duly acknowledged in the annual reports of the museum and at quarterly intervals in the **Montreal Gazette.** Some of these acquisitions, such as Lieutenant-Colonel Charles Coote Grant's collection of Silurian fossils, provided invaluable additions to the museum's inventory. Yet items like stuffed song sparrows and Baltimore Orioles - accepted in order not to discourage or offend potential patrons - strained the already limited museum resources in providing for their display and preservation.

The salaries and fees of those who cared for these materials and maintained their surroundings accounted for a major source of expenditure. In addition to Curry, who mounted, labelled, arranged, catalogued, and occasionally collected specimens, Edward Ardley became a permanent employee of the museum. As caretaker, he initially earned only $30 a month plus lodging in the museum basement, and with fuel gas, but over the years that he tended the museum, his tasks became increasingly skilled and specialized. The museum committee purchased him a set of carpenter's tools in 1886, to aid his construction of display stands and shelves. Three years later Ardley regularly cleaned and mounted specimens, owing to the increasing size of the collections and Curry's failing health. He also learned to operate a lathe in order to slice sections of rocks and fossils. Upon Curry's death in the spring of 1894, Ardley took charge of the museum specimens and earned the new title of "caretaker and museum assistant" along with a modest pay increase (16). Not until 1906 was he permitted to relinquish the post of janitor and to reside outside the museum building. Five years later he had picked up further skills as a collector of fossils and rocks and as a preparator of ethnological materials.

Other hands were hired on a casual basis to carry out specific assignments. Several McGill graduates arranged, labelled, and catalogued collections of insects and fossils. Henry Ward set up a gorilla skeleton acquired from Liverpool, but generally Jules F.D. Bailly acted as resident taxidermist. To him fell the honour of mounting the skeleton of the bison shot by Molson and Dawson between Calgary and Medicine Hat (17). Another Montrealer, George Roberts, constructed display cases that were required increasingly as the collections grew. When the museum lacked $600 to purchase cases for some of the botanical specimens, Roberts' offer to defer payment was eagerly accepted. Unfortunately for the poor carpenter, a year elapsed before he received even half the amount owed him (18).

By 1897, McGill employed a full complement of professors of natural history who also served as honorary curators in their

specialities. David Penhallow joined Dawson and Harrington in 1883, as professor of botany. (In 1893 Frank Dawson Adams succeeded Dawson as Logan Professor of Geology.) E.W. MacBride became professor of zoology in 1897, replacing W.R. Deeks, who had worked his way through the ranks of preparator, demonstrator, lecturer, and instructor in that field, only to resign because of the demands of his medical practice. Each of these men generously gave his time collecting, preparing, labelling, and arranging specimens (19).

Although the primary function of the Peter Redpath Museum was to serve McGill students and faculty, a variety of educational and professional organizations also enjoyed its facilities. The American and British Associations for the Advancement of Science held geological sessions in the lecture theatre and receptions in the Great Hall during their Montreal meetings in the early 1880's. The Protestant Association of Teachers and the Canadian Society of Civil Engineers also met in the Redpath Museum. There the Ladies' Educational Association heard lectures on botany, zoology, and the "geology of Bible Lands." By the early 1890's, however, the committee decided to cease holding evening entertainments in the museum, given the great risk of fire (20).

By coupling its uses by the university with an average annual attendance of around 2,000 during these years, the Redpath Museum could lay claim to being "the foremost educational institution in Canada." But lack of funds impeded its development as a research institution from the beginning. In 1886 Dawson proposed to publish a series of bulletins or memoirs to illustrate important specimens. After a short trial in the annual report, the scheme lapsed. Two years later, however, **Notes on Specimens** began publication. But again because of financial difficulties, the series suspended publication after only one number had been issued (21).

Consolidation: 1898-1912

The first decade and a half of the Peter Redpath Museum had exhibited gradual but sustained growth in the size of museum collections, staff, and attendance. Certain patterns involving finances and administration, including a division of responsibility towards the building and its various departments, had been established over the years. Although the level of funding was not as great as Dawson desired, the regularity of these arrangements permitted the committee to plan for the future. Beginning in the mid-1890's, however, stability in any realm of museum operations could no longer be assured. As a result of a variety of circumstances, direction became less confident and the museum began to falter even in its educational mission.

The death of its long-time patron J.H.R. Molson in June 1897 cast an inauspicious shadow as the Peter Redpath Museum approached the twentieth century. During the next decade Dawson and the first two senior curators - B.J. Harrington and David Penhallow - would also pass away. In 1908 death claimed the practised hand of the taxidermist Bailly. By 1910 all the original members of the museum committee were deceased (22). Unfortunately for its future development, the Redpath Museum failed to recruit equally enthusiastic supporters to replace those lost through attrition. Although both Sir William Macdonald and Sir Donald Smith (Baron Strathcona) donated specimens and cases - including extensive series such as the Quebec advocate Germain Beaulieu's coleoptera and the Read collection of African curios - their commitment lacked the intense dedication of the museum's early guiding lights.

With the increasing infirmity and eventual passing away of its first patrons and directors, the Peter Redpath Museum languished. The minutes of the museum committee, mirrored in the ever more abbreviated **Annual Reports**, became perfunctory and formal. Trivial matters such as allocations for camphor balls, paper trays, and rubber hose occupied the committee's time. Meetings convened at irregular and infrequent intervals: by 1909, the committee usually met only once a year.

Since the endowments of Molson and his wife had ceased with their deaths, the financial situation of the museum worsened. The committee pleaded with the university to establish regular curatorial positions and a permanent fund for the purchase of specimens. Yet the variety of **ad hoc** arrangements sanctioned by the committee itself to cope with temporary difficulties acted to undercut these requests. The gradual takeover by the former janitor Edward Ardley of Curry's vacant assistant curatorship, for example, enabled the university to avoid making a regular appointment. Instead of assistants hired on a permanent basis, students were used - earning little or no pay - to help arrange the herbarium.

Already the **Report** for 1896 had pointed out that the museum "should not be dependent on donations and private gifts", but "should be recognized as a permanent department of University expenditure." The following year's report claimed that lack of means had brought the work in some museum departments practically to a standstill. Even the services of Bailly could not be fully utilized, "owing to the need of anatomical jars to contain some of the specimens prepared by him." The next annual report noted that only $80 - the interest on the Wiliam Molson fund - was available for the purchase of specimens. In 1899 and 1900, Harrington communicated the museum's desperate financial plight to a meeting of the Corporation and emphasized that there were

no funds whatsoever to increase its collections. At this time museum resources ran behind expenditures by around $400 to $500 per year. Harrington even argued somewhat facetiously that the absence of funds to purchase specimens gave the Peter Redpath Museum "a unique position among the University Museums of the Continent."(23) The university nevertheless paid little attention to these complaints, and continued only to undertake general museum repairs and maintenance as it had originally been obliged to do.

Because accidents of fate or fortune prevailed in the realm of acquisitions, the collections grew erratically during the early twentieth century. Previous years had been characterized by gradual growth through donations, exchange, and purchase. Around 1900 individual gifts declined markedly; only in 1907 did the annual report note that such contributions were once again on the increase. Suddenly in 1910 the museum instituted exchange ententes with institutions in Germany and Japan. The acquisition of several major collections around this same time created acute exhibition and storage problems. The need to accession and display 6,000 specimens in the Ferrier mineral collection led the report of 1906 to raise the issue, first mooted ten years earlier, of separating biological from geological material and keeping the latter only in the museum. Two major ethnological collections acquired a few years later had to await show cases for months, and found exhibition space finally in the corridor (24).

The unpredictability of resources eventually threatened to affect the museum's role as an instrument of instruction as well as its role as a public attraction. As the museum committee pointed out in 1896, "a museum without means of growth soon falls behind the requirements of education." In 1903 the annual attendance began to decline precipitously from its average during the late 1890's of around 2,500, to an all-time low of 1,380 in 1906. A number of measures were instituted to reverse this trend. The committee designated special "visiting days" and instituted "college teas" in order to publicize the museum. The earlier pattern of accommodating student and professional meetings "in the interest of science or art, or questions of leading public importance" was reinstated during the late 1890's at an even more popular level: meetings of the Banjo Club, an amateur dramatic performance, and the public lectures of the Montreal Natural History Society all took place there.

By the early twentieth century the museum had renounced its past view of school classes as a distraction to serious workers and claimed that it had always encouraged "nature study for the young." Annual reports began to list the local schools that sent ever more and larger classes. They also mentioned the names of distinguished scientists from all over the world who either travelled to the museum to study its collections or borrowed

specimens for research and comparison with their own materials. In a final bid to broaden museum support, the committee abolished the admission fee in 1907. The tally of visitors increased dramatically thereafter, with over 3,000 in attendance in 1908. This increase, however, seems to have reflected a different method of tabulation that included students from schools in the total number (25).

The decline of the Peter Redpath Museum during the early twentieth century in large measure reflected the flagging fortunes of the museum movement around the globe. As the natural history sciences - now pursued by specialist geologists, zoologists, and botanists - began to present more promising vistas from the microscopic, rather than the macroscopic, level, museums began to lose their disciplinary centrality. Even Darwinian evolution, which at first had accelerated the zeal to collect by rationalizing taxonomy and giving new scientific significance to varieties, seemed to offer greater inducements to the geneticist in the laboratory than to the ornithologist or mammalogist in the field. Those who remained in the field found that new techniques like photography provided better data about ecology and behaviour than copious museum specimens (26). Developments external to biological discourse, such as the rise of public and private research institutions diverted resources and interest away from museums to other scientific endeavours.

Yet to some extent the waning fortunes of the Redpath Museum in this period resulted from the particular circumstances of its own past. Its development had been wedded to the aspirations of its first director, John William Dawson, and the designs of its early patrons. Once the imprint and especially the resources of these men were lost, the museum lacked sustenance as well as a clear sense of purpose. By neglecting the public until too late, its directors had failed to imbue others with that love for natural history and for the museum which might have led to recruiting them as supporters and eventual patrons.

The writer is grateful to Nisar Ahmed, Denise Alison, and the McGill University Archives, particularly Brian Owens, for their help with various stages of this paper. Her analysis of the scientific correspondence of J.W. Dawson, upon which this study is based in part, has been spported generously by the Social Sciences and Humanities Research Council of Canada. Marianne Ainley, Robert Daley, and Paul Dufour assisted this project.

NOTES

1. William Dawson, **Fifty Years of Work in Canada: Scientific and Educational.** London: Ballantyne, Hanson & Co., 1901, 169-72.
2. "Notice of the Natural History Collections of the McGill University," **Canadian Naturalist and Geologist, 7,** 1862, 221-23.
3. Earl of Dufferin to JWD, 20 June 1877. Acc. 927, no. 47: ref. 9, J.W. Dawson to J.A. MacDonald, December 1879; ref. 5, H. Lyman to JWD, 15 December 1879; ref. 2, JWD to A.R.C. Selwyn, 7 November 1879; ref. 30, Marquis of Lorne to JWD, 19 February 1881; ref. 7, JWD to W.H. Gault, 24 December 1879; ref. 37, JWD to Tilly, 24 December 1879; ref. 19, T.H.S. White to JWD, 18 February 1881. Thomas Ryan to JWD, 2 March 1881.
   All letters cited are held by the McGill Archives, unless otherwise specified. Where no accession number is given, letters belong to the Dawson collection: J.W. Dawson papers.
4. **Daily Witness,** 28 February 1881. Acc. 927, no. 47, ref. 1b, (**Montreal Gazette**?), 28 February 1881; ref. 29, J.F.Whiteaves to JWD, 1 March 1881; ref. 44, Selwyn to JWD, 4 March 1881. For example, Acc. 927, no. 47, ref. 38, JWD to Charles Tupper, 12 February 1881; ref. 20, JWD to T.H.S. White, 17 February 1881.
5. **Witness,** 28 February 1881. Acc. 927, no. 47: ref. 38, JWD to Charles Tupper, 12 February 1881; ref. 1b, "The Geological Survey," (**Gazette**?). Stanley B. Frost, **McGill University for the Advancement of Learning.** Vol. I, 1801-1895. Montreal: McGill-Queen's University Press, 1980, 243. J.W. Dawson, **In Memoriam: Peter Redpath, Governor and Benefactor of McGill University.** Montreal: "Witness" Printing House, 1894, 15. Redpath also provided $10,000 for the purchase of display cases.
6. **Fifty years,** 176.
7. George Mercer Dawson to JWD, 20 and 26 June, 17 and 23 July, 24 September 1882. JWD to James Ferrier, 3 April 1884.
8. Robert Hamilton to JWD, 12 August 1881; A.H. Foord to JWD, 13 November 1882. Acc. 927, no. 47, ref. 38: JWD to C. Tupper, 12 February 1881.
9. Acc. 927, no. 47, ref. 20: JWD to T.H.S. White, 17 February 1881. Spencer Baird to JWD, 10 May, 17 May, 4 June 1883.
10. Peter Redpath to JWD, 17 January 1881. **Report on the Peter Redpath Museum, 2,** January 1883, 1-2. P. Kuetzing to JWD, 12 September 1882.
11. **Fifty Years,** 174. **In Memoriam: Redpath,** 15, 17.
12. **Guide to Visitors to the Peter Redpath Museum of McGill**

University. Montreal: 1885, 2.

13. This and subsequent information on the administration, finances, and management of the Peter Redpath Museum comes from its minute books for 1882-1892 and 1892-1917. These are held in the McGill Archives (Acc. 1602, 1b and Acc. 1459, 1).
14. Upon reducing the fee to 10 cents, the Minute Book (1882-1892), however, claimed that it was "not imposed for revenue." (p.128)
15. Minute Book (1882-1892), 44, 48-49, 95.
16. Minute Book (1882-1892), 74, 82, 113. Minute Book (1892-1917), 28-30, 36-37.
17. Minute Book (1882-1892), 30, 115, 51, 66. In 1896, Bailly became a full-time employee of the university. His $1000 annual salary and his services as taxidermist and anatomical preparator were shared equally between the museum and the faculty of medicine. According to the Museum **Report** for 1901-1902, Bailly's job was to adapt the zoological collections to teaching purposes by remounting the specimens.
18. Minute Book (1882-1889), 81, 92, 103-104.
19. **Report of the Peter Redpath Museum for the Year 1897,** 24. Minute Book (1882-1892), 29.
20. Minute Book (1892-1917), 10. Also in the Corporation Minutes, 1889-1894, 392 (McGill Archives).
21. Minute Book (1892-1917), 107. Report of the Peter Redpath Museum for the Year 1886, 82; **...for the Year 1888,** 105; **...for the Year 1890, 127.**
22. T.H. Clark, McGill University Museums: A Report of Progress, 1855-1950, p.2. Typescript enclosed in Acc. 1476, 1, f. 12 (McGill Archives).
23. **Report of the Peter Redpath Museum for the Year 1896,** 21; **...for the year 1897,** 24; **...for the year 1898,** 38. Corporation Minutes, 1894-1901, 398, 451. Minute Book (1892-1917), 82, 84. **Report ...for the Year 1899-1900,** 30.
24. Minute Book (1892-1917), 66. **Report of the Peter Redpath Museum for the Year 1901-1910,** 65; **...for the Year 1910-11,** 65.
25. Minute Book (1892-1917), 66. **Report of the Peter Redpath Museum for the Year 1907-1908,** 67; **...for the Year 1904-1905,** 44 (cf. Minute Book, 1892-1917, 21). The **Report** for 1908-1909 (p. 64) mentions the larger number and size of school classes as a factor in the increase. Earlier these classes were excluded from the annual attendance figures, which were derived from the names in the visitors' register.
26. L.V. Coleman, **The Museum in America** (Washington, D.C., 1929), iii, 225, 226.

View from the back of the main gallery
of the Peter Redpath Museum, circa 1885.

(Courtesy of the Notman Photographic Archives)

Lecture theatre, Peter Redpath Museum.

(Courtesy of the Notman Photographic Archives)

Victor Zilberman

Physical education in the Soviet Union

If there is to be a system for maintaining health in a population, let it be one that works well. In Britain most schools encourage but do not insist on the children playing games to keep them active, and many do go on playing games into middle age; many don't, but it cannot really be elitism that deters them. In North America the options for physical exercise at school quickly become narrower and specialised, and only winners persist with them, often going on into competitive careers in sport; the popularity among adults of such unsystematic and non-competitive activities as jogging and cross-country ski seem to be an index of reaction against the efforts of official education, in alliance perhaps with a quite proper concern for personal grooming. Zilberman's description of the Russian system, that embraces the entire population, carries us into unfamiliar seas; on paper, and in such evidence as international competition presents to us, the system is an impressive affair indeed. In actuality, he seems to ask, are they really finding elite athletics compatible with mass participation? Without having the answer, we must remind ourselves that in sport, as in education, being Communist doesn't have to mean you've got it wrong.

Because of its achievements in international sporting competitions, the U.S.S.R. holds a leading position in the international sports movement. In the socialist countries, especially the U.S.S.R., it is believed that elite athletics and mass participation in sport are compatible and complementary - one needs the other (Botterhill, 1979). Physical education in schools is an important part of the Soviet sports movement inasmuch as it encourages mass participation while facilitating the identification of athletic talent. The Soviet government places much importance on education and sport as two means of

developing loyalty to the State and Party, and of developing such qualities as discipline and collectivism.

To provide some understanding of the physical education program in Soviet schools I will briefly describe a few important dimensions of the Soviet sports movement, its ideological basis, its organization, and the importance of the All-Union Sport Classification and the GTO rating systems.

Making new men

In contrast to the educational systems of some western countries, the Soviet system is very centralized, for the Soviet Union, with its large territory and population, requires such centralization. Many government agencies participate in making the educational system a smooth mechanism, the ministries of education at the republic and national levels cooperating and working together. Decisions affecting the physical education of the general schools are mainly made by the U.S.S.R. Ministry of Education and the U.S.S.R. Committee on Physical Culture and Sport. Instructions are passed on to the ministries of republics, to regional, city, and district educational departments, and ultimately for implementation to school directors and teachers. As Grant (1972) has noted, "By the time it comes to the teacher, the area of personal discretion, though greater than it used to be, is very small...not only basic policy, but the content of the curriculum, schemes of work, textbooks, and the like are prescribed for the teacher in considerable detail."

The Soviet government considers the creation of a "new man", a builder of the Communist society, of great importance; the Soviet school plays an important role in raising the young generation with a Communist mentality. Folsom (1957) writes, "Education is viewed by the Communist Party as an instrument for the formation of a Communist society." This orientation is carried on through the school system in many different ways: through every subject taught, through the Communist youth organizations (the Octobrists, ages 7-9; the Pioneers, ages 10-14; the Komsomol, ages 15-27), and through school celebrations, competitions, and so on. By means of such school activities an attempt is made to produce politically trained, disciplined "builders" of Communism, patriots, and internationalists (**Pravda**, Aug. 22, 1969).

Soviet education begins in kindergarten, where Soviet poetry and songs are learned and political holidays celebrated. Political education in the U.S.S.R. continues through the entire education program - general school, secondary, and higher education, and through every part of life. Outside of school, Communist ideology

is presented through radio, television, books, newspapers, magazines, movies, songs, celebrations, and the arts - opera, ballet, sculpture, paintings.

Teaching and learning in Soviet schools is planned with the intention of inculcating responsibility to the collective. This feature of Soviet education has its origin in the work of Makarenko, who experimented with collectivist methods of raising children during the early 1920's. In his view, the purpose of the collective in the Soviet education system is to develop such qualities as discipline, comradeship, and respect for elders, teachers and the State. Makarenko believed that children are most easily influenced and disciplined through peer pressure. For example, if a student is not spending enough time to do well in his studies, according to Makarenko, improvement is more likely if the collective (his classmates) encourage him to study, offer him help, and try to make him realize that his poor grades are a reflection on the class as a whole. Responsibility for monitoring behaviour is therefore placed on the students, with the teacher's guidance. A friendly, purposeful collective is thought to provide a positive environment where the best qualities of an individual should develop. The collective is a mini-society, a model of adult society; it is an environment where the individual learns and experiences relations between himself and society. Makarenko used sports terminology in describing the functioning of collectives. He pointed out that Communist resoluteness, spirit, and purposefulness cannot be fostered without "exercise" in appropriate behaviour. And the collective, he added, is "the gymnasium for this type of gymnastics." (Krasovitskiy, 1978)

The all-round developed personality

The important goal of creating a new man is being achieved by the Soviet state through different institutions embracing all of the Soviet population at different ages starting from kindergarten - through the school system, the military forces, factories, farms, and so on. The task of raising the young generation as all-round developed individuals, as Soviet educator Korolev (1960) has stated, "is a root problem, the main problem of pedagogical theory and practice." In Lenin's words (Belorussova, 1972), "Our aim is toward education, teaching and the preparation of the all-round developed person who will be able to do everything...this is the direction of Communism and to achieve it will take many years." Krupskaya (Lenin's wife), Gorkiy, Makarenko, Lunacharskiy, and other Soviet educators concerned themselves with this subject. Krupskaya, for instance, suggested that the Soviet schools should prepare all-round developed, spiritually disciplined men; to achieve this, people have to be healthy, brave, and physically prepared, she said. She therefore considered

physical education essential to a complete education. Attaching importance to the fostering of all-round developed personalities has continued down to the present day. In his speech celebrating the 50th anniversary of the Komsomol, Soviet President Leonid Brezhnev remarked "we want to see our youth not only beautiful, but also healthy and physically strong."

Marx and Engels (Folsom, 1957) stressed that "education should be mental, physical (gymnastics and military training), and technical, (acquainting children with the process of production)." Their educational philosophy was based on the writings of Fourier and Owen, regarding the harmonious development of physical and mental aptitudes. Fourier and Owen, according to Korolev (1960), had argued that "man must develop his abilities in every way through varied practical activity, and work must regain the attractiveness it (has) lost as a result of its division." This point was later elaborated by Marx, who according to Korolev "performed a great service in discovering and formulating an objective universal law of social production that demands changes in labour and the rounded development of the individual...the very nature of large-scale industry requires that the incomplete worker, the simple performer of a particular social function, should be replaced by a roundly-developed individual for whom different social functions represent successive means of vital activity." In this process, the division between intellectual and physical work is completely removed.

What precisely is the "rounded development of the individual", as understood by Marxism? Answers vary, but Korolev's explanation touches on the essential points:

> It means moulding a person who will perform both physical and mental work, will produce both material and spiritual values, will be harmoniously developed physically and spiritually, and will be active in public affairs. It means inculcating lofty ethical ideals and aesthetic tastes, and varied material and spiritual needs. It is the training of a person who can orient himself anywhere in the system of production and in its scientific and technical principles, has mastered the basic principles of modern science, and is prepared to change his occupation if the interests of society and his inclinations require it. (p.12)

In other words, the physical, ethical, aesthetic and cognitive aspects of education are supposed to complement each other in achieving a common goal which is expressed in terms of the upbringing of a worthy citizen of a Communist society. For this reason, the program of the Communist Party gives encouragement to all forms of mass sport and physical training (**Soviet Sport,**

Questions and Answers, 1974).

Rating systems

Much of the accomplishment of Soviet physical education and sport should be attributed to the rating systems of the All-Union Sport Classification ("Edinaiya Vsesoyuznaiya Sportivnaiya Clasifikatsiya") and GTO ("Gotov k trudu i oborone", or Ready for Labour and Defence) which facilitate mastery in sport and mass participation in all areas of the sport movement. The All-Union Sport Classification is a system of norms and requirements according to which athletes are awarded ranks, titles, and categories in different sports. It covers 56 sports and is updated every four years after the Olympic Games. The 1977-80 Classification includes (1) Juniors (Third, Second and First levels) and (2) Seniors (Third, Second, First, Candidate for Master of Sport, Master of Sport of the U.S.S.R. International Class, Grand Master in Chess and Checkers, and Merited Master of Sport).

The GTO system's purposes are to encourage sport in the everyday life of the Soviet people, to enhance military preparedness, to teach civic defence, and to improve personal hygiene. GTO programs span the ages of 10 to 60 and are organized into 5 stages. First, Brave and Adroit (for boys and girls 10 to 13 years old); Second, Rising Generation (for boys and girls 14 to 15 years old); Third, Strong and Courageous (for boys and girls 16 to 18 years old); Fourth, Physical Perfection (men 19 to 39, divided into two groups: 19 to 28 and 29 to 39; women 19 to 34, divided into two groups: 19 to 28 and 29 to 34); and Fifth, Vigour and Health (men 40 to 60, divided into two groups: 40 to 49 and 50 to 60; women, divided into two groups: 35 to 44 and 45 to 55).

The goals of the GTO and the All-Union Sport Classification systems are similar in that they encourage people to participate in the sports movement, but they are different in other respects. The GTO was greated to increase mass involvement in sports, and to provide the requirements for physical education in the general school as well as the physical exercise programs for the military and for collectives in rural and urban areas. The main goal of the All-Union Sport Classification system, on the other hand, is to raise the proficiency of Soviet athletes essentially to the level of winning major Soviet and international sport competitions.

The goal of fitness programs in Canada and other western countries like Sweden is getting fit, reducing weight, and so on, and their achievements in fitness are not tested in competition. In Russia, fitness has a different meaning. The GTO rating system can be considered a fitness program that helps people

improve their physical abilities and their health; this is the way Soviet physical educators present it. The GTO test consists of two parts, the requirements of each of which must be satisfied in order to obtain the GTO badge for a particular age group. The first, which is the most difficult and most important, involves a point system test in various sports, which is carried out in the context of competition. An individual is tested in running, long or high jumping, swimming, grenade throwing, or shot put throwing and so on. The second part is academic, and participants are examined on personal hygiene, civil defence, and the organization of the Soviet physical education system. Depending on the points accumulated in the academic and practical tests, badges are then awarded.

Physical education in the curriculum

The Ministry of Education, the Committee of Physical Culture and Sport, the Central Committee of the Komsomol, and the Ministry of Health participate in planning and organizing physical education programs for students in general schools. Such programs seek to improve the health of the students by developing motor skills which would be useful in their daily lives, to encourage fitness and participation in sport, to raise the level of sports achievement, to instill moral and aesthetic values consistent with Communist ideology, and to prepare students over 10 years of age to pass the GTO tests (Kukushkin, 1975).

From grade 1 onward, students are divided into three groups for physical education according to their health and physical abilities:

(1) The basic group - all healthy students who exhibit normal or above normal motor development;
(2) The preparatory group - pupils who are in poor physical condition, overweight, or physically underdeveloped; and
(3) The special group - students with physical or mental disabilities.

In this paper, the author's concern is with those physical education programs which are oriented to the needs of children without physical deficiencies or disabilities.

Physical education is provided in various ways by the schools: regular classes which are included in the general education curriculum; recreational activities held during school hours; after-school recreational activities conducted within the school's general educational program; and athletic competitions and special events supervised by the school, in which participation is voluntary.

Physical education lessons are based on the requirements of the curriculum of Physical Culture for each school grade. The curriculum includes compulsory and, in later grades, elective physical education subjects to be used, depending on the qualifications of the teachers, the school's geographical location, the availability of suitable facilities and equipment, and so on. No elective subjects are offered in grades 1 to 4, whereas in the higher grades electives comprise about 10% of physical education classes (Schneidman, 1978).

Table 1. Percentages of total time devoted to physical education activities in the General Schools.

Age	Gymnastics %	Games %	Sports %	Hiking %	Total %
8 - 9	40	50	5	5	100
10 - 11	40	40	10	10	100
12 - 13	30	35	20	15	100
14 - 15	30	25	25	20	100
16 - 17	20	25	35	20	100

(Kukushkin, 1975, p.193)

Table 1 shows the percentage of time devoted by schools to various activities according to the age of the students. Here **Gymnastics** means general exercises used in many sports, for warm-up, for example. **Games** include basketball, volleyball, and soccer. **Sports** denotes such activities as track and field, gymnastics, skiing, and swimming.

In allocating time for different activities within the curriculum, physiological and psychological differences among children of different ages are taken into consideration. For example, the table shows that during physical education classes for children between 8-9 years of age (grades 2-3) half of the instructional time is spent on games. This is because children of that age have difficulties concentrating on physical activities requiring sustained performance, and therefore the learning of motor skills is often undertaken in the context of games. Games (50%) and gymnastics (40%) take up the majority of teaching time at this age, but decrease in importance as the children get older. In the final grades of school the teacher can concentrate more on the teaching of various sports. Nevertheless, games remain an important part of the physical education program, as can be seen by the fact that even at the 16-17 age level (grade 8) games are

still scheduled for 25% of the physical education curriculum in the general schools.

Considering that children spend up to 10 years in general schools, it is understandable that their exposure to physical education is felt to affect their future involvement in sport. Physical education classes are compulsory from grades 1 through 10, with two 45 minute periods of instruction per week under the supervision of a teacher. Following language and mathematics, physical education requires the next highest number of hours in the curriculum over the 10 year period, an indication of its importance.

Many schools begin their day with eight to twelve gymnastic exercises for about 10 minutes. These are usually conducted in the school yard, auditorium, or school corridors, depending on weather conditions. Such exercises are also urged during breaks between other activities, to help reduce fatigue and to refresh the students by giving them a change in routine. Recess is usually spent playing games or in activities using various sports equipment set up in the school yard. Students participate voluntarily in these activities. The games and exercises are of a simple nature, like soccer or basketball, and the students are well acquainted with them.

Competition

The syllabus and class guides prescribed for physical education programs include suggestions for teachers. Teachers are advised to pay close attention to the body construction of the children. They are shown how to prevent injuries and given necessary first aid information. Beginning with grade 4 physical education classes, children are prepared for the GTO and participate in trial competitions. This is not the sole purpose of physical education classes, but preparation for GTO makes up a large portion of the physical education program, and teachers are expected to prepare a certain percentage of students to become GTO badge holders.

Athletic competitions constitute an important part of the physical education program and are used to improve the health and fitness of the students and, significantly, to develop such qualities as comradeship, collectivism, and team, class, and school spirit. Competitions are organized on various levels: students are divided into four age groups (11-12; 13-14;15-16; and 17-18) for inter-school competitions. Usually, students compete in up to fourteen sports: basketball, volleyball, water polo, cycling, gymnastics, track and field, swimming, diving, table tennis, lawn tennis, soccer, shooting, canoeing, and chess (Howell and Van

Vliet, 1965). The sports and events vary for each age group; research institutes of physical culture establish the guidelines. For example, the 13-14 age group run the 400 meters, but are not allowed to compete in the 800 meter race (Howell and Van Vliet, 1965). To participate, students must have the permission of a physician; the competition site and sports equipment are inspected to prevent any harm or injury to the children. The results in competitions are often of a high standard, especially at the national level. Talented athletes are "discovered" at these competitions.

The highest level of competition for the general school students, however, is found at the U.S.S.R. School Games, which the press refers to as a "holiday of children's sport and a festival of friendship." U.S.S.R. School Games finals are preceded by city, district, regional and republic tournaments, in which millions of school children compete (Shtukalo, 1976). During these competitions many boys and girls receive GTO badges and qualify for sports ratings. The best stadia, gymnasia, and swimming pools are put at their disposal. The 1964 Olympic high jump champion Valeriy Brumel and Vladimir Iashenko the world record holder in the high jump were discovered at school competitions, along with many other top Soviet athletes. These competitions help develop team spirit and friendship in the children, and can also be a means of judging the work of the physical education teachers.

Special schools for sports

Students who have exhibited a desire and talent for a sport may attend special sports institutions. There are boarding sport schools where children continue their general education and perfect their mastery of a particular sport under the guidance of well-qualified coaches. To be accepted at such a boarding school a young athlete must achieve at least 1st Junior ranking in his chosen sport according to the criteria employed in the All-Union Sport Classification system. Applicants are rigorously screened for admission. Room and board in these schools, as well as coaching fees and travel expenses to competitions, are paid by the State. Students in these schools study and practice their sport 6 days per week.

Other institutions for students who wish to be involved in high level sport are the children's sport schools. These schools are attended either in the afternoon or evenings. The local boards of education and sport societies usually operate such schools free of charge. The children are coached by professionally qualified instructors. In 1974 there were more than 4,600 children's sport schools in the U.S.S.R., with over 1.6 million children aged 9 to 14 years attending (**Soviet Sport, Questions and**

Answers, 1974). The programs in the boarding and the children's sport schools are designed to perfect mastery in the various sports.

Conclusions

The ideological purpose of physical activity, according to Marx, Engels, and Lenin, was to develop the new socialist man. Those views on physical culture were adopted by the leading Soviet educators, Krupskaya and Makarenko among others. Mass participation in the sports movement was emphasized, and international athletic competitions were avoided in the early years of the Soviet State. However, a major change in the Soviet sports movement occurred after the 1952 Olympic Games in Helsinki, when the U.S. and U.S.S.R. competed for medals and team standings. While the Soviet Union could not then favourably compete with western countries (especially the U.S.A.) in agriculture, industry, science, or standard of living, it saw a chance for domination in sports and an opportunity to use success in international sports competitions as a means of showing the advantages of a socialist regime. Over the years the Soviet government became more involved in international sporting competitions. An increasing proportion of the sports budget, consequently, was spent on the development of international athletic excellence.

The highly-developed Russian sports system is the major reason for the Soviet's success in international athletics. This system embraces the whole of the Soviet population, beginning with schools at all levels - the army, factories, and clubs, which all utilize the All-Union Sport Classification and GTO systems. All these components of the sport movement stimulate both involvement in sport and a high level of achievement.

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VOLUME XVI

Author

Reviews

The Japanese 'miracle':

Two views

Nobuo K. Shimahara.
ADAPTATION AND EDUCATION IN JAPAN.
New York, N.Y.: Praeger Publishers, 1979.
$19.95.

William K. Cummings.
EDUCATION AND EQUALITY IN JAPAN.
Princeton, N.J.: Princeton University Press, 1980.
305 pp., $9.75 paper, $20.00 cloth.

In the West, there has been widespread faith in the relationship between education and national development. Educated manpower serves industrial development with necessary skills and ingenuity (even though educators often grow restive over "vocationalism"). Surpluses in a secondary, or industrial, phase in turn **can** serve to enrich educational resources (but paradoxically there is some disillusion with education in all advanced societies). "This beautiful romance between education and development" has, however, thrived only in conditions unique to the now advanced societies (Kong, 1979, p.7).

Nonetheless, the model has had a persistent life. The Korean Comparative Education Society, for example, sponsored a pre-Congress conference, just prior to the Fourth World Congress of Comparative Education Societies, in Seoul, July 3-5, 1980. The Korean theme was "Education for Developing Nations."(Korean CES, 1981). It was significant, of course, that the World Congress was then convened in Saitama, Japan, July 7-10, 1980 (WCCES, 1980).

Japan has received considerable attention for the qualities of its modern educational system. The first member of the Confucian family of nations to confront the West on its own terms, the island-nation has also been the first in East Asia to

experience the promises and perils of modernization (**kindaika,** in Japanese). Again, however, the preconditions for development were unique. The British sociologist Dore concluded that on the eve of modernization, the level of literacy among all classes was higher in Japan than in the countries of Europe at the time (1965, p.294). Passin pointed out that high percentages of the Samurai class (100% for men, 50% for women) attended formal schooling; commoner attendance (male, 40%) was also surprisingly high. Contemporary views have singled out Japan as in the class of developed nations, perhaps "the only non-Western specimen in her class."(1965, pp.x-xi)

Japan's modern educational system and its relationship to advanced industrial status have begun to attract attention abroad. Japanese agencies seized the occasion of the World Congress to respond to the demand for data (Gaimusho, 1972; Mombusho, 1979). The Japanese hosts, staff of the National Institute for Educational Research, provided the delegates with an up-to-date outline of the educational system (Kokuritsu Koyiku Kenhyusho, 1978). Since the tumultuous 1960's, education as a national policy issue has ranked with other problems embedded in the advanced industrial society. Scholars who are not specialists on education have noted patterns of Japanese policymaking with case studies drawn from the national debate on higher education (Pempel, 1978).

These two studies, which should be of interest to educators and social scientists alike, have attempted to assay the role of education in the advanced industrial society of Japan. Both rest on solid foundations grounded in contemporary analyses of education (both Western and Japanese sources), including the literature on enculturation and education. Both build up a superstructure from primary materials collected during intensive field observation (Nagoya, 1976-77 and Kyoto, 1975-76, respectively). It is doubtful that anyone will soon so thoroughly mine such rich veins of data. What is of greatest interest is the fact that, partly because of variant assumptions and slightly different focus on what are essentially the same data, the authors arrive at quite different conclusions.

The author of the later study (Cummings, 1980) points out that "conventional literature" emphasizes the role of Japanese schools in teaching "values and orientations" that facilitate adjustment to the demands of the adult society. (Although Cummings does not cite the Shimahara study, it may be assumed that he would recognize its central "adaptation" thesis.) In this sense, the schools would be conservative, conserving "traditional" Japanese values.

Cummings argues, however, that schools also teach youth

lessons that conflict with adult ("traditional") behaviour: the egalitarian orientation toward work, the individuated disposition, and the orientation that is critical of authority (pp.261-2). Presumably these are "modern" values. And in this sense the schools apply a transformationist - as contrasted with the conventional meritocratic - approach. "Postwar Japan," the author maintains, "constitutes an example of a society that has been transformed by education."(p.5)

An advantage (which turns out to be also a disadvantage) of the approach lies in its lovingly intensive description of training at the primary school level. There is probably no better summary of factors in Japan's miraculous accomplishments: **concern** (on the part of wider-ranging interests, from the "Establishment" promotion of education for further development, over to the Japan Teachers Union, Nikkyoso, and its emphasis on "humanistic, self-actualizing goals"); emphasis on **"whole-person"** education, including moral development; **equality** in public education and its relatively low cost; a **demanding** curriculum; the **equitable** nature of teaching; and teacher **security.** "Progressive" forces in Japan, which include the teachers union, have urged that the proper role of education is to develop "whole people" **(zenjin kyoiku)** and not merely to create workers useful to the economy **(hito tsukuri)** (p.60).

The most fascinating section is the description day-to-day, almost hour-to-hour, of the primary school regime. The opening day ceremony, the process for establishing order in the classroom, the subtle introduction (both by the "Establishment" and by the "progressive" teachers) of moral education, the demanding curriculum, the nature of textbooks, conventional and unconventional modes of instruction - all of these are covered with uncommon insight (Chapter 5). The specialist in learning psychology will be intrigued by the author's application of the theory of "mastery learning" (Bloom, 1976) to Japanese practices. The data on cognitive equality is equally fascinating (Chapter 6 and appendix).

Somewhat less space is devoted to the middle school, as marking a transition - the learning process is more difficult and more explicitly cognitive - and to the public high school, where evaluation is tied more explicitly to achievement (pp.132-145). Moreover, at this level two tracks - one academic, leading to university education; one vocational, often leading to higher education but to earlier employment - make their appearance. Now the great socializing influence is the college entrance examination system.

Indeed, this study contains a whole chapter on examination competition (Chapter 8). There is also a selection on the

preparatory schools **(yobiko),** the exam-oriented private academies, and the extra-study schools **(juku),** in short, on the "juku boom." The author points out that there are sectors relatively insulated against examination pressure, for example, second class private universities, the vocational higher school, and technical institutes. Surely, however, it is apparent that both by inclusion and by exclusion the exam system sets the tone.

In any case, the author's argument is that the schools, in conjunction with other socialization agents, are creating a "new youth."(p.235) And it is here that the analysis is weakest. On occasion he dallies with wishful thinking, emphasizing the desires of the teachers union: "...it is possible that some of the egalitarian lessons today's young people have learned will remain with them as they move through their careers."(p.191) Elsewhere doubt is expressed: "...one cannot say whether the availability of realistic information subsequently neutralizes the primary schools's levelling effect or not." (p.193) Finally, in one place the author flatly admits: "The students' expectations are, of course, unrealistic."(p.191)

In at least one area, the author simply misread the data or, to put it more kindly, unfortunately did not have access to later data. In a subtle yet unmistakable kind of ethnocentrism, he goes on a pilgrimage looking for the grail of individualism. "The group is viewed as a collection of individuals, each of whom is seeking self-fulfillment. A group is appreciated so long as it is responsible to individual needs."(p.197)

Later evidence from the Japanese national character surveys (1978), not then available to the author, demonstrates the danger of prediction. "A continuing value consensus," as Ezra Vogel of Harvard University puts it, points to persistent attachment to the group. Cummings' statement must therefore be inverted: the individual in Japan seeks self-fulfillment in the group; individual needs are still satisfied within groups. The immediately postwar, nominal respect for individual freedom (found in 40-50 percent of replies from younger respondents) reached a peak of 60 percent in 1973, and then plummeted to 45 percent over the next five years, according to the sixth survey (1978). What **does** remain is an egalitarian spirit favouring social mobility (merit and achievement as measures of status).

One must add that the author is probably correct in stating that the "Establishment" (called the "corporate class") is doomed and that its "meritocratic ideology" is dated. But then so is the "progressive camp", especially the teachers union, which often (as pointed out) misuses the schoolroom for a personal soapbox to parrot obsolete dogma about inevitable class "struggle." Finally, it is doubtful that even in the ideologically tense 1950's and

1960's, Japanese society presented a simple "confrontation", namely "a clean split in the Japanese polity between the progressive forces for democracy and equality and the conservative forces of reaction." (p.149) Certainly by the 1970's, even the **kakushin** (reform) coalitions transcended traditional class and party lines. And by the 1980's, when Japan had clearly entered the postindustrial era, the postures and slogans of conservatives and progressives alike appeared to be obsolete. The admixture of white-, grey-, and blue-collar classes defied generalization. It is at least doubtful that the author's culturally-derived, "individualistic" values can be the universal answer to the dilemmas generated in very complex, advanced industrial democracies.

The other study (Shimahara, 1979) is equally well-grounded in materials and intensive field work. With a quite different emphasis (on higher levels of education where the college entrance examinations reign supreme) and different assumptions (about the persistence of group orientation), this author understandably arrives at different conclusions.

Shimahara's study clearly illuminates the key propositions: not only can the traditional and the modern coexist, but also the former can play a central role in the transition into modernity. In observing Japanese education, therefore, one should not await the elimination of what some Japanese call "feudal residues" or "traditional" norms. The system is already unmistakably "modern." The author writes:

> The development of Japanese group orientation is a cultural consequence of social strategies adopted to cope with social and natural conditions of the environment. Once it was developed as a prominent mode of responding to environmental pressures, it constituted a vital basis of the Japanese pattern of adaptation. Today it continues to be a dominant mode of orientation guiding Japanese behavior and attitudes. (p.165)

Shimahara thoroughly documents the fact that the college entrance examination is a kind of **rite de passage** through which a youth (most often a male) proves that he has the ability and stamina to become a **sarai man** ("salary man"). The exam is used, as Cummings also pointed out, as the major instrument in the recruitment of the elite. It plays, however, an even wider role which has not been so clearly recognized. The impact of the entrance tests is felt on **all** Japanese trained in schools **all** geared to exams. The system not only identifies early on (by inclusion) future white-collar leadership for the organization sector. It also sorts out (by exclusion) the unskilled help, the blue-collar workers,

and the foremen for the secondary (industrial) sector and, less efficiently, the lab technicians, accountants, key-punch operators, information retrievers, and the grey-collar workers for the tertiary (service) sector.

Back on the elite level, a kind of "degreeocracy" (as the author calls it) produces numerous drifting, displaced students called **ronin** (named after masterless samurai). They now constitute some 40 percent of all college applicants. Among those who are accepted, trained, and graduated even from the prestige universities, there is a new downward mobility into the grey-collar service sector (p.8).

One must agree with the doubts expressed either explicitly or implicitly by both Cummings and Shimahara concerning one current sociological theory. It goes to the effect that egalitarian sentiment is not unique to Japanese youth, but rather is shared by young people in all postindustrial societies (a proposition that is probably true); and that this sentiment is a product of common structural changes in such societies - the shift to a technetronic economy, occupational upgrading, maturation of a baby-boom "youth generation", and mass affluence (p.262). There is here a kind of technological determinism, which makes norms, values, and ideology derivative. Both Cummings and Shimahara would agree, on the other hand, that it is schooling that is central to the process of political socialization.

In summary, Cummings believes that educational systems in all advanced societies do have something in common: they teach values that are inconsistent with the demands of the adult world (Cummings, p.263). Shimahara believes with equal firmness that in Japan prolonged socialization and schooling - and especially the entrance examination system - contribute to the development of cognitive orientations functional to the perpetuation of the adult political and economic systems (Shimahara, p.5).

Although the issue was not directly within the scope of either study, it may well be that these two excellent monographs document a cultural lag. **Neither** the "traditional", meritocratic training favoured by the "Establishment", **nor** the "progressive", transformational schooling favoured by the teachers union, is fully prepared for Japan's plunge into a brand new epoch, the postindustrial era.

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Le *M.J.E.* est indexé par le Canadian Education Index et par le Centre d'information sur les ressources pédagogiques (CIRP). Il figure dans l'International Periodicals Directory d'Ulrich, il est résumé dans Sociology of Education Abstracts et dans Canadian Social Science Abstracts et il existe en microfilms chez University Microfilms, Inc., à Ann Arbor dans le Michigan. Les anciens numéros sont disponibles sous microforme auprès de Micromedia Ltd., Boîte 34, Succursale 5, Toronto (Ontario) Canada M5M 4L6. Numéro de série international: CN ISSN 0024-9033.

Winter 1982 Vol. XVII No. 1

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