The Metaphysical Scot:
A Look At The Arts Curriculum In The
Scottish Universities At The Turn Of The
Nineteenth Century

By the early 19th century, the Scots had inherited at least five characteristic traditions from the Enlightenment of the 18th century: first, a balance or compromise between the purely liberal and the purely professional or vocational studies; second, an unique art of instruction; third, a fixed course of instruction for their degree candidates; fourth, an almost universal zeal for intellectual development and, fifth, the student enjoyed a considerable degree of freedom. (1)

The university course of study was an inter-related combination of three definite parts: a language and literature course presented through the classics; a philosophy course, which overshadowed all the other parts of the curriculum; and a mathematics and physics course. But its outstanding feature was that students were introduced to the general principles in each subject before going into details; a feature which led to a great debate during the 19th century as to whether or not this resulted in any kind of effective education or real culture. Those who defended it pointed out that the professors themselves, not just a tutor or an assistant, spent a considerable time not only teaching, but also examining, the class by both oral and written exercises. The method of instruction was the lecture, but this was not a conventional lecture in the modern sense: it took the form of a continuous dialogue between the professor and his large class resembling something like a Socratic dialogue. And, because of the immaturity of his class, (Scottish students usually began university about age 14, but it was not uncommon to have students as young as 10 or 11 years old) the Scottish professor often had to resort to rhetorical display to hold their attention. The result was a lower standard of academic achievement, especially as compared with the standards of classics and mathematics at Oxford and Cambridge, but the Scots argued that this comparison was unfair. Their tradition of learning, they insisted, was metaphysical: the principles of things in general were more important than mere mechanical proficiency. The class was not encouraged to concentrate on the details of the subject, but on the relation of the principles found in each to life in general. The class was the unit of instruction - tutors did not appear until late in the 19th century - however, because the students had a considerable degree of freedom and choice at the university, many of their most important influences came from outside the classroom. Scottish students, left free to associate and to discuss their interests, formed numerous student societies which encouraged a surprising and often brilliant commerce of ideas.
University magazines were being published at Edinburgh and Glasgow by the 1820's.

It has been suggested that this rather unorthodox system, both inside and outside the classroom helped to develop, and to perpetuate, a certain type of mind associated with Scotland which its critics called "the metaphysical Scot". In a pejorative way, they meant that the Scot was forever eager to explain the principles of mathematics he barely knew how to manipulate, and to produce literary and aesthetic criticisms of the classics he could translate only very badly and, often, only with the aid of a crib. In rejoinder, the system's defenders replied that the product of this social influence was not only a sober intellectual, but also a very adaptable Scot: the very Scot who had made so large a mark in Britain and overseas. Well into the 19th century, the Scots held a remarkable belief in the power of a general education through the study of philosophy. Unfortunately, it was precisely during this period that new developments in the physical and natural sciences began to threaten the old philosophical tradition. It became just a question of time before the controversy between liberal and applied studies would have to be resolved: Could a general education founded on philosophy survive, or would specialized training and a study of techniques replace it? In Scotland, the clash between the newer, more specialized studies and the older, humanist studies began early in the 19th century, but the final resolution was postponed until early in the 20th century. This may help to explain why it was that in places like Canada, where the Scottish influence was strong, that the philosophical bias continued until much later than it did in other places, like the United States, where the influence of the German universities in research and specialization was more dominant. (2)

It was generally taken for granted that, as compared with students in England and Germany, the Scots were backward in the classics. On the other hand, the Scots felt that the classical studies in their curriculum had to satisfy the ideal of a general education which, in their view, had to include philosophy and science as well as literature. This close association of classics with philosophy and science had two rather unique effects: it reduced the amount of time Scottish students devoted to the classics, but in so doing, it prevented classics from becoming detached from life in general. This may be regarded, therefore, not only as a rather peculiar tradition, but also a very considerable educational achievement. The Scots held that the English gave the classics undue prominence, that English students had a knowledge of mere words: the ability to make "good longs and shorts." They claimed that by Scottish methods their students became more interested in a knowledge of the content of classical literature. English Classics were too philological, too "Ciceronian", too pedantic; more concerned with verse-making than ideas. (3)

If Scottish classics were generally considered to be backward, their teaching of Greek was said to be particularly sad. Even by the 1830's, rudimentary Greek, starting with the alphabet, had to be taught at the university: most schools did not include it in their curriculum. The Arts course at a Scottish University extended over four years. The first, or Bajan, class was taught Greek, Semis were taught classical languages and logic, Tertians studied moral philosophy and Magistrates studied natural philosophy, except at Aberdeen where Logic and Natural Philosophy had been interchanged. (4)
Traditionally, Latin had not been a part of the regular Arts course; the medieval student on entering the university was supposed to have had a sufficient knowledge of Latin to follow the lectures. Latin instruction was not considered to be an integral part of the curriculum in Arts, but by a strange circumstance, by the latter part of the 18th century, even though both the necessity for speaking in Latin and the practice of lecturing in Latin had gradually been discarded, Latin had practically become a compulsory subject for those who intended to take the degree. This paradoxical situation had developed not from the requirements of university studies per se, but from the requirements of the General Assembly of the Presbyterian Church of Scotland, who had some jurisdiction in education. (5)

For many Scottish students, the real objective of their attendance at a Scottish university was the three-year philosophy course. To enter this course students often attempted to avoid the Bajan class; they wanted to enter at once into the Semi class and begin with the philosophies. To obtain the degree, however, and this was usually essential for divinity candidates, attendance in the Greek class was compulsory. Those students who wanted to take the philosophy courses, however, or any of the other attractive new courses, such as geology or natural history, did not have to matriculate or to follow the regular course of study. A student simply paid his class fees to the professor, obtained his class ticket, and learned as much, or as little, as he pleased. Entrance examinations were non-existent, and regular examination papers, as we know them today, were unheard of: only a few students had any desire to finish with a degree. Indeed, the Scottish reform movement of the 19th century was aimed specifically at what the reformers felt was an intolerably slack situation all around. (Many university reformers today would probably describe it as ideal). In Scotland, at the time, it suited both the students and the professors: “Attendance at a university, to a greater or less extent, is considered as a part of the ordinary education of a large portion of the inhabitants of Scotland,” the Rosebery Commission to Visit the Universities and Colleges of Scotland noted in 1831. “It is anxiously desired by many, whose views are not directed either to the future prosecution of literary studies or to any of the learned professions, and by many who are intended for the ordinary occupations of the middle ranks of society. Students of this description constitute no inconsiderable proportion of those who attend the universities. They attend only for the number of years which suit their convenience; they select the classes which are best adapted to their peculiar views, and often begin with those which are the last in any regular Curriculum.” (6)

Although the Rosebery Commission praised the Scottish universities for their democratic entrance policies and their flexibility, it reserved serious criticism for, what was in their opinion, the low state of the classics, especially Greek. (7) This was a serious charge, because, by the 18th century, the period of the Scottish Enlightenment, Scotland's universities were considered to be among the pre-eminent in Europe, and their reputation had been established particularly through their capacity to perpetuate the cultural values of the Renaissance. It was the breadth of their studies, especially, which was the most notable part of their tradition.

In their own peculiar way, however, the Scots had kept alive the spirit of the
Renaissance. They had preserved the humanists' ideal of a love of literature in general, and they preferred their intellectual and philosophical approach to classical scholarship. (8) It may well have been backward as defined by the standards of philology adopted at Oxbridge; but, throughout the early 19th century, these were the standards brought to the Canadian colonies by Scottish masters, such as Thomas McCulloch of the Pictou Academy in Nova Scotia and Daniel Wilkie of the Quebec High School, trained under professors like John Young at Glasgow. Young was a brilliant scholar in the Class of 1769 at Glasgow, who in 1774 was appointed to the Greek Chair. During his forty-six years, he acquired a reputation as one of the most efficient and popular teachers of the classics in Scotland. One of his most famous students, William Hamilton (later Sir William), the Edinburgh philosopher, eulogized him for restoring "the majesty of ancient learning". By the time Hamilton had retired from teaching at Edinburgh, after 1844, the tradition had almost "faded away".

At King's College, Aberdeen, there was William Ogilvie who was at least as well known for his philosophical essays as he was for his teaching of Latin. In 1799, when the old system of regenting came to an end at King's, Ogilvie took the Chair of Humanity; however, it was in the field of economic and political theory rather than classics that Ogilvie made his most significant contribution. While he had been teaching philosophy, he had devoted considerable attention to the relationship between society and land, both as a practical agriculturist and as a devotee of Adam Smith's concept of land as the basis of wealth. In either 1781 or 1782 he published, anonymously, the controversial, and now famous, Essay on the Right of Property in Land. (10) It anticipated much of what has since been done in agrarian legislation and in recent theories of land nationalization. And it was just this sort of excursion into far-away fields that is so unique to late-18th century Scottish studies. Small wonder, indeed, that those unfamiliar with this tradition considered the Scot lamentably inept at verse-making in Greek or Latin, and outrageously disputatious. How many young Scots who later emigrated to the colonies in North America, South Africa, Australia and New Zealand must have sat in Ogilvie's compulsory Latin classes? How many of these would have heard the former Regent, now a Latinist, turn to his favourite thesis on the nationalization of land? John Strachan, one of his students, emigrated to Upper Canada in 1799 and was soon involved in the controversy surrounding the Clergy Reserves, the most far-reaching property issue in Canadian history. Unfortunately, the task of exploring the possible influence of Ogilvie's thesis on Strachan's subsequent actions in Upper Canada lie beyond the limits of this paper; nevertheless, the anecdote may help to show that the influence of the Scottish classroom knew few bounds: a professor of classics was often a philosopher in disguise; the Scot was essentially a metaphysician; the difference between the discussions that took place in the Greek and Humanities classes and those in the philosophy classes must often have been indiscernable, for the Scot loves a bonnie fight.

The study of philosophy was the central feature of the Scottish university curriculum. In Northern Europe, the Enlightenment itself was evidence that a transformation of thinking was in progress. Indeed, the general interest uniting the men who brought the Enlightenment to Scotland, the intellectual pioneers: Francis Hutcheson, David Hume, Adam Ferguson, William Robertson, Adam
Smith and John Millar, was "the social behaviour of mankind." The mind of man, Francis Hutcheson, the teacher of them all, argued, "was governed neither by theological determinism nor by its own reasoning faculty but by a common or moral sense that was innate, instinctive and fundamentally virtuous and benevolent...But, in order to know man and the development of his ideas, we must know about society and the different forms of society within which man operates and by which his thinking is determined..." Hutcheson's pupils, from being "moral philosophers, concerned with the problem of virtue, became social historians, concerned with the problem of progress..." (11)

It was the writings of David Hume which were among the first to attract the attention of the English-speaking community to the doctrines of the empiricists, and Hume's scepticism was to stir the members of the Aberdeen Philosophical Society known as the "Wise Club" to intellectual activity. Out of their discussions of Hume came Thomas Reid's *Inquiry into the Human Mind, on the Principles of Common Sense* in 1764. Reid, in trying to provide an answer to Hume, had given a name to the new school of Scottish philosophy: The Philosophy of Common Sense. Largely as result of his essay, he was appointed to the professorship of moral philosophy at Glasgow University, just vacated by Adam Smith. He held it for thirty-two years, until his death, and it was from Glasgow, through his influence on his students, especially Dugald Stewart, and through his *Essays*, which are in the main his lectures prepared for publication, that the philosophy of common-sense was spread throughout Scotland and abroad. Reid's works were addressed to the reading portion of his countrymen: to his old students and to the ministers of the Church of Scotland, who included many of his students. Consequently, they had a great influence upon the body of the Scottish people, "an influence which has made it a factor, so to speak, in the national life." (12)

Common-sense, as defined by Reid and the Scottish School, did not mean vulgar opinion; it meant the beliefs common to all men as rational beings. Reid admired the scientific doctrines of Bacon and Newton and, like David Hume, he held that the inductive method could be applied not only to physical science, but to philosophy as well. He also agreed with John Locke that philosophy ought to be based on psychology investigated as an empirical science by inductive methods. In his *Inquiry into the Human Mind*, however, he thoroughly rejected Hume's scepticism and tried to prove that our belief in an external world is immediate, or intuitive. (13) Our perceptions or ideas cannot be merely the result of our sensations of sight and touch, taste and sound, he argued. Sensations are only the occasions, the instances, when we become aware of external reality; they are not, in themselves, the materials out of which reality is constructed. Surely, there must be a real object as well as a real subject perceiving the real object. Both can certainly be checked and verified by the immediate consciousness: the subject through introspection and the object through physical science, if necessary. Our belief in an external world of space is not merely an unverifiable idea, as Hume had suggested. It is an original fact; it is simply common sense: Not only am I here, there is also a whole universe out there, and I can check both immediately. This was the essence of the doctrine of Natural Realism; it was the "common sense" answer to the "ideal system" of the atomists and sceptics.
Reid also propounded his own view of perception: that our senses provide us with immediate sensations plus a common-sense belief in the existence of the objects which caused the sensation. Such a belief was, of course, liable to error, since the function of sensation is only to "suggest" the material objects, but it was this feature of "la philosophie écossaise" which especially appealed to the French of the Romantic generation. It lay precisely in this idea of common-sense as a primitive vision of the whole. Scottish philosophy was vague and imprecise. It assumed what Francis Hutcheson had suggested: that all human beings possessed a common ability, perhaps obscure and often unconscious, to judge on all questions of knowledge. Although the common-sense creed was broad and vague, the doctrine of the orthodox schools was clear and narrow; indeed, its greatest appeal lay in its moderation. It served as a check against the extreme ideologies which often inspired dangerous, simple-minded projects, and it served, too, to temper the zeal of innovation. On the whole, the principle argument of the Scottish common-sense philosophers was delightfully simple and appealing: Humanity is usually right. By looking back over the Scottish university course of study in Arts during the late 18th and 19th centuries, it is now possible to see why the apparent vagueness of its classics, mathematics and sciences correspond so remarkably with the work that went on in the philosophy classes: the general curriculum was the living embodiment of the philosophy of common-sense in practice. (14)

Reid himself had little to say directly about common-sense, but his actual practice, and that of his colleagues at Aberdeen and Glasgow, makes his principles reasonably clear. He was not claiming that verifiable truth can be found through common-sense, but simply that there is such a thing as common-sense knowledge. Partial evidence of this can be seen in the structure of language, which is to a high degree uniform from one natural language to another, and partly by the uniformity of our practical conduct. If philosophers paid more attention to the basic facts and functions of language, he argued, they would avoid the extravagances of scepticism and irrationalism. This is precisely what most Scottish university teachers did. Logic, the first philosophy class, under teachers like his former student and colleague, George Jardine at Glasgow, was primarily a course in the basic structure of language, its psychological foundations, and their metaphysical implications; it was only secondarily a course in Aristotelian syllogisms. Through lectures on the formation and use of language, and its representation through written symbols, his students learned of the constant relation between thought and language. (15)

Mental and moral philosophy, the second philosophy course, was often, depending on the professor, the same principles presented to the students from another point of view. Greek and Latin, taught in the Scottish manner, served to prepare the student for these philosophy classes, for as the Rosebery Commission had noted, they were imprecise: they tended to stress only general concepts and the ability to abstract. By so doing, however, they helped to emphasize the general position of the common-sense philosophers: that a concept is the meaning of the appropriate word or expression, "that to have a concept is to know the meaning of the expression, and that to know the meaning of a word, expression or sentence is to know how they are used." (16)
The teaching of mathematics in Scotland's universities was, like the classics, considered by English standards to be very elementary. On the other hand, it was considered by the Scots to be intellectual. Scottish mathematics, at least at the universities, had their own peculiar distinctiveness: they were taught not so that a student could acquire a mechanical knack, an ability to manipulate symbols efficiently, but as a branch of liberal education. Through a study of the elements which underlay the symbols, such as the theory of arithmetic, a Scottish undergraduate underwent a long and complicated process which provided a precious training in methods of logical reasoning. This philosophical and historical approach was the orthodox Scottish attitude to the teaching of mathematics in the early 19th century: it was treated as a cultural, not a technical, subject. Rather than rushing to get the elements out of the way as soon as possible in order to get on with higher mathematics, the Scots deliberately lingered over the simpler elements. Their opinion was that a student's interest could be maintained by discussing the philosophy and the history of mathematics, and this distinguished Scottish mathematics from that of other nations. (17)

It is Robert Simson, Professor of Mathematics at Glasgow University from 1711 to 1761, the celebrated "restorer of ancient geometry", who is given credit for the linking together of mathematics, philosophy and scholarship in Scotland. It is he who first suggested that a scholarly study of Greek geometry would prove at least as instructive as a mastery of algebra, and in Scotland's universities this became the tradition. Algebra was almost completely neglected in favour of a study of the principles of Euclidean geometry. Through Simson, the humanities became a distinguishing feature of the Scottish tradition in mathematics. This was reinforced by one of his pupils, Colin MacLaurin, a mathematical genius who entered Glasgow University at the age of eleven and mastered the first six books of Euclid in only a few days. He was appointed Professor of Mathematics at Marischal College, Aberdeen, in 1717, at the age of nineteen, and he visited London in the vacations of 1719 and 1721 where he met Sir Isaac Newton and was elected a member of the Royal Society. In 1725 he became Professor of Mathematics at Edinburgh, where he soon established a wide reputation through his great skill in experimental physics, astronomy and practical mechanics, and in Scotland Euclidean geometry was confirmed as the chief means towards a liberal education. By the beginning of the 19th century, this was confirmed and reinforced once again by Professor John Playfair whose Elements of Geometry, first published in Edinburgh in 1795, was derived largely from Robert Simson's work. It became the standard text-book for the first-year mathematics classes, and by 1859 in its eleventh edition, it was still in general use on both sides of the Atlantic. (18)

Unfortunately, the Scots' hellenistic view of mathematics was not enthusiastically shared by the Rosebery Commission, who wrote: "Much of what has been said as to the Elementary Greek class applies to the Elementary Class of Mathematics...we are, therefore, of the opinion that the existing practice in the several universities of devoting the first class of Mathematics to instruction in the primary elements of that science, tends to lessen the general usefulness of that class, and to retard the progress of the great body of the students in Mathematical knowledge." (19)
The Scots reserved their right to disagree. Professor John Leslie was then teaching Natural Philosophy at Edinburgh (he had previously taught mathematics, after John Playfair, for fifteen years). When he was asked by the Commissioners what effect an increase in the amount of mathematics taught would have in the teaching of physics, he told them that at least three-fourths of his science course could be understood with a knowledge of the mere rudiments of algebra, which could be taught in three months. (2) Nevertheless, despite the opinion of John Leslie, there were many critics who thought it ridiculous that Scottish students should spend the whole of their first year doing work which, they thought, might well be done in the schools, or at the university in one term. Moreover, the Scots believed that if geometry were taught in the hellenistic spirit, it connected the other disciplines in the course of study in a way that the more specialized techniques and symbols of algebra could not. Greek geometry, presented in the correct way, kept the spirit of classical conceptualism and abstratalism alive - a spirit so illusive and subtle that a stranger to this peculiar Scottish tradition, however great his abilities in pure mathematics, would not be likely to teach the distinctive “hellenising intellectualism” so distinctive to Scottish mathematics. (21)

Scottish stubborness probably played but a small part in their decision to preserve geometry. More likely, they were also hoping to preserve the uniqueness of Scottish natural philosophy, for a great deal of that course was devoted to a metaphysical treatment of topics like light, which needed only a smattering of mathematics. Even as late as the middle of the 19th century, one of the foremost British natural philosophers of the day, Sir David Brewster of St. Andrews, was still principally concerned with light, and he was advocating a reform in the teaching of physics so that a popular and experimental course involving very little mathematics could be taught to most students. Brewster was not a scientist who could easily be ignored: in 1831 he was one of the founders of the prestigious British Association for the Advancement of Science, the same year as his famous publication in Lardner's Cabinet Encyclopaedia of "The Treatise on Optics", which confirmed his reputation in science. He would become Principal of the United College of St. Andrew's University from 1837 to 1859, and of Edinburgh University from 1860 until his death in 1868. Brewster repeated John Leslie's opinion to the Rosebery Commission when asked whether natural philosophy could be studied without a knowledge of mathematics: "It appears to me that a very great degree of information in Natural Philosophy may be obtained, without any knowledge of the higher Mathematics, and with a very slight knowledge of Arithmetic and Elementary Geometry." Indeed, if a choice had to be made between teaching the old metaphysical and the new mathematical physics just making its appearance on the curriculum, Brewster was convinced that "it would be far better that the second course should be omitted entirely, than that 200 pupils should sit and hear lectures which they cannot understand." But acting upon their presumption that some improvement in mathematical knowledge had to be made, the Commissioners then asked Brewster whether or not candidates for the degree should be required to pass a course in advanced mathematics. Brewster's response succinctly summarized the traditional Scottish attitude: The degree itself was of no importance since it did not lead to Church preferment, as it did at Oxford and Cambridge; nor did it lead in Scotland to anything else. It was therefore, not discreditable to the University to give a
degree to those who had only a little mathematics, since "a majority of the Faculty of Arts, in every University in Scotland, have no Mathematical knowledge at all." (22)

The critical point of Brewster's argument was that a knowledge of precise mathematics was not necessary. In his opinion, the recent attempt to improve the quality of mathematics and science in Scotland by compulsion had the opposite result. That until such time as the requirement for a knowledge of precise mathematics had been demonstrated, few students would need to study it in order to improve their understanding of physics. He was not suggesting, however, that mathematics should not be taught at all; he was merely stressing the belief that Scottish physics, at least for the majority of students, did not require a precise mathematical ability. On the other hand, for those students who needed a more precise knowledge of mathematics so that they could study the applications of mathematics to the higher branches of astronomy, optics or dynamics, there should be special lectures called "Mathematics Applied" which could be given during the second hour of the Natural Philosophy course. This was the practice in almost all the foreign universities; however, as Brewster pointed out: "In the foreign universities, Mathematics are taught in a very different manner from what they have been taught here. I do not mean to say in a superior manner, but to a much greater extent." It was precisely this distinction between the way in which mathematics was taught in Scotland and the way it was taught elsewhere that made all the difference. (23)

Essentially, Brewster was defending the Scottish general curriculum, which in Alexander Campbell Fraser's (24) words half-a-century later was "found in the principle that literature, science and philosophy form in combination a discipline that is indispensable for making men all-round intellectually complete." (25) Brewster's argument, coming from one of Britain's most eminent scientists cannot be dismissed as mere Scottish whimsy. Yet, Brewster's defence of the Scottish curriculum begs the questions: Why was a knowledge of higher mathematics not essential to an understanding of Scottish physics? What, exactly, was taught in physics in Scotland that could make a man "all-round intellectually complete"?

One thing, certainly, that was not taught was the relationship of science to technology, that is to machines. All the machines that had been invented and developed by the 1830's - the steam engine, the spindle frame and power loom, the locomotive, the cotton gin; and most of the important machines invented later on: the camera, the telegraph, the telephone, the electric light and the aeroplane - came from craftsmen who had only a slight grasp of scientific ideas. (26) There was, almost without a doubt, a wide gulf between science and technology in the early 19th century, but once power machines made their first public appearance, scientists, perhaps to keep alive the interest of their students, or their adult audiences, found it easy to provide simple explanations of the principles which moved them. A slight knowledge of Newton's mechanical universe allowed people, by sight and common-sense, to verify the laws and principles propounded by the physicists for themselves.

Even in the university natural philosophy classes, the phenomena the students usually dealt with were basically the phenomena considered in
Newton. They, too, were mechanical; they could be seen, touched and verified by common-sense. What was taught by the natural philosophers of the early 19th century, men like William Meikleham at Glasgow, John Playfair, Sir John Leslie and James David Forbes at Edinburgh, William Paul at King's College, Aberdeen, and Sir David Brewster at St. Andrews, (27) was not the popular science that was presented in the Mechanic's Institutes, but it was mechanical. The only difference between what was taught to students and to mechanics was the spirit in which it was taught. At the university it was taught to shape and to stretch the students' minds through the contemplation of natural objects; it was presented as a search for order in the physical universe. The students were asked to verify by observation and comparison the metaphysical distinctions they had discussed in mathematics, logic and mental and moral philosophy: that knowledge, itself, is gained only by comparing it with other things in points of likeness and of unlikeness, that information about any given thing's character and detail will grow only gradually; that it is dependent upon the number of appropriate comparisons that can be made concerning it, that precision is never an absolute, that things can be known only vaguely at best. (28) For Brewster and his colleagues, this was the true purpose of science at the Scottish university. It was not intended to teach technical competence, it was not intended to produce professional scientists (at least, not at this level), it was not intended for the few, but for all, students, and it did not, therefore, require precision in mathematical ability to realize any of its metaphysical intentions.

Natural philosophy was taught to provide educated men with a common fund of ideas concerning the physical universe, which, although vague and often in error, nevertheless made science and the results of science a general object of contemplation. All educated men were expected to discuss science; it was common knowledge. There was no division between scientists and humanists: between those who read the Classics and those who did not, between those who talked about science and those who could not. Scientific knowledge, however vague, formed a part of every educated man's culture. What Sir David Brewster and his colleagues feared was that if the teaching of science were made more precise, more specialized and more technical through mathematics, it would drive the majority of undergraduates away from science altogether. How much better it would be to have educated men know a little about science: enough to discuss it, to contemplate its results, to enjoy it, than to create a division between scientists and the community at large. Surely, metaphysical understanding would be better than none at all!

By the end of the 18th century, the most striking thing about Scottish higher education was the combination of the predominant position given to philosophical studies and to the catechetical system of teaching in large classes. The Scots had perfected their catechetical teaching techniques and adapted and extended them to subjects outside the philosophical studies, and by the close of the 18th, and during much of the 19th century, this technique of discussion and lively socratic questioning, reinforced by constant essay writing, leading inductively from the simple to the complex, was clearly "an evolving pedagogical tradition, full of energy and vitality, and not with any dreary, ossified routine". (29)

This was the vigorous technique the Scots brought to Canada. With it they
brought the traditional Scottish belief in the efficacy of a general education based on philosophy, which made Canadian education, until recently, rather unique in North America.

NOTES


3. Davie, *Democratic Intellect*, 204. See also, M.L. Clarke, *Classical Education in Britain, 1500-1900*, Cambridge, 1959, Chaps. XI and XII.

4. A Royal Commission, under the chairmanship of the fourth Earl of Rosebery, was appointed in 1826 to inquire into, what was considered by many in Britain, the sad state of Scotland's universities. The commissioners sat for four years and presented their *General Report of the Commissioners to Visit the Universities and Colleges of Scotland* in 1831. Hereafter, it will be referred to as the Rosebery Report. Four volumes of Evidence were later published in 1837, one for each university. (King's and Marischal Colleges were combined in volume IV, Aberdeen). Archibald John Primrose, fourth Earl of Rosebery (1783-1868), the chairman of the Universities Commission, was a Scottish peer, but his background was entirely English. He was a scholar of Pembroke College, Cambridge (M.A. 1804), and had little sympathy for the ideology of the Scottish universities. Politically, he was a liberal. In 1832, he supported the Reform Bill. He was created a baron on January 17, 1828, after his appointment to the Universities Commission. *D.N.B.*, SVI, 379-380. Rosebery Report (1831), pp. 221-222.


9. John Young (1750-1820) was Professor of Greek at Glasgow University from 1774 to 1820. *D.N.B.*, XXI, pp. 1295-1296; Clarke, *Classical Education in Britain*, p. 144. Thomas McCulloch (1777-1843) founded the Pictou Academy in 1816, and in 1838 became the first principal of Dalhousie University. David Wilkie (1771-1851) conducted a famous grammar school in Quebec City from 1803, which became in 1843 the High School of Quebec. *D.C.B.*, p. 798. Sir William Hamilton (1788-1856) was Professor of Logic and Metaphysics at Edinburgh University from 1836 to 1856 although he stopped teaching in 1844. *D.N.B.*, VIII, pp. 1111-1116. For his eulogy of John Young, see David Murray, *Memories of the Old College of Glasgow*, Glasgow, 1927, 205 ff.


pp. 1639-1640. See also Gladys Bryson, *Man and Society, The Scottish Enquiry of the 18th Century*, Prineton, 1945. Francis Hutcheson (1694-1746), often called the father of the Scottish Enlightenment, was Professor of Moral Philosophy at Glasgow University from 1729 to 1746. D.N.B., X, pp. 333-334. David Hume (1711-1776) never held a Chair, but his writings initiated the modern era of philosophical studies. D.N.B., X, pp. 215-226. Adam Ferguson (1723-1816) was Professor of Moral Philosophy at Edinburgh University from 1767 to 1785. D.N.B., VI, pp. 1200-1204. William Robertson (1721-1793), the father of modern history, was Principal of Edinburgh University from 1762 to 1793. D.N.B., XVI, pp. 1311-1316. Adam Smith (1723-1790), the father of modern economics, was Professor of Moral Philosophy at Glasgow University from 1752 to 1764. D.N.B., XVIII, pp. 411-420. John Millar (1735-1801), the father of modern Sociology, was Professor of Civil Law at Glasgow University from 1761 to 1801. D.N.B., XIII, pp. 403-404.


13. The Scottish School of Common-Sense is often called the School of Intuition.


15. George Jardine, *Outlines of Philosophical Education, Illustrated by the method of teaching the logic class in the University of Glasgow, 1825* (second edition). Jardine (1742-1827) was Professor of Logic at Glasgow University from 1877 to 1827, and is usually credited with establishing the techniques of teaching in Scottish classrooms. D.N.B., X, p. 687.


21. Ibid, pp. 127-128. See also Gordon Leff, *Paris and Oxford Universities in the*
23. Ibid., pp. 560-561.
24. Alexander Campbell Fraser (1819-1914) was Professor of Logic and Metaphysics at Edinburgh University from 1856 to 1891. D.N.B., 1912-1921, pp. 195-192.
25. Quoted in Davie, Democratic Intellect, p. 91.
27. William Meikleham (1771-1846) was Professor of Natural Philosophy at Glasgow University from 1803 to 1846; James David Forbes (1809-1868) at Edinburgh University from 1833 to 1860, D.N.B., VII, pp. 398-400; and William Paul (d.1834) at King's College, Aberdeen, from 1811 to 1834. For Sir John Leslie's testimony to the Rosebery Commission, see Evidence, Edinburgh, 1837, I, p. 115; for William Meikleham's, see Glasgow, 1837, II, p. 115; for William Paul's, see Aberdeen, 1837, IV, p. 35.