

EDINBURGH MEDICAL COLLEGE AT THE END OF THE EIGHTEENTH CENTURY AND THE TRAINING OF NORTH AMERICAN DOCTORS

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John Stephenson (Figure 1), the co-founder of McGill Medical Faculty, was born with a cleft of soft palate that resulted in a speech impediment and handicap throughout his adolescence, but he insisted on training as a physician in Edinburgh where he graduated in 1820. A later serendipitous encounter with Dr Philibert Roux in Paris resulted in a subsequent repair of the defect.¹ In his time every student at the Edinburgh Medical College was required to produce a thesis in Latin in order to graduate: Stephenson's contained a fascinating account of his medical training at Edinburgh between 1817 and 1820,² intriguing details of the repair of the cleft of soft palate, and also a great tribute to the members of the Medical Faculty.

This thesis remained untouched on the shelves of McGill library for 140 years (Figure 2) until an English translation of it was published in 1963 by the Osler librarian, Dr W.W. Francis.³



FIGURE 1
Photograph of John Stephenson, co-founder of the McGill Medical College in 1829.



FIGURE 2
Stephenson's Graduation Thesis on Velosynthesis which reported the operation on the cleft of his soft palate by Dr. Philibert Roux of Paris, as well as autobiographical details of his childhood and adolescence and the difficulties of communication before the surgical repair in 1819.

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At the end of the eighteenth century no medical schools existed in Canada, and only a few in the United States. The training that individual doctors received before they started to practice varied tremendously. However, some formal evidence of medical training was required before a doctor was permitted by the authorities to practise medicine; a graduating certificate from a medical school was accepted as sufficient evidence.

The Edinburgh Medical School had an excellent reputation during the eighteenth and early nineteenth century. Students were taught current theories as well as the more traditional and accepted concepts of medical practice.⁴ There were 321 medical students admitted from nine seaboard states of North America in 25 years around the end of the eighteenth and the beginning of the nineteenth century⁵ and, during the last quarter of the eighteenth century, an average of 12 American students enrolled every year at Edinburgh. The loyalty of the students from the Southern States to Edinburgh could be explained by their Scottish forebears; the tradition of attending Edinburgh Medical School spanned three generations of some families.⁶

The usual procedure for becoming a doctor at this time was that after completion of high school an apprenticeship with a respectable local medical practitioner was taken up. Subsequently, the student enrolled in a medical college. A medical degree from Edinburgh gave a distinct advantage to young graduates and assured them of a successful career. On return to their own country, Edinburgh graduates were often influential in establishing private instruction for the training of aspiring doctors, utilising methods they had learned.

Canada was not advanced in medical education. Many of the practising doctors were army surgeons who were originally attached to the garrison, and later retired from the army and set up practice either in Montreal or Quebec City. As in the United States, the usual training of doctors in Canada was by apprenticeship to an established doctor, many of whom were graduates of Edinburgh Medical School. Hence, a large number of aspiring doctors who enrolled into Edinburgh. Table 1 lists the names of Canadians who graduated from Edinburgh Medical School during the first quarter of the nineteenth century,⁷ and I was able to trace 14 graduates of Edinburgh University practising in the Quebec area during the period of 1820-30.

It was not surprising, therefore, that after completing his medical course Stephenson hurried home to carry on with the practice of medicine and the training of future Canadian doctors. The Montreal General Hospital was not yet completed, but only three months after the opening of the hospital Stephenson placed an advertisement in the *Montreal Gazette* announcing his lectures in anatomy, physiology and surgery.

Stephenson's *Graduating Thesis*, published in 1820, is a particularly good source of general information regarding the medical curriculum and the daily life of the students,⁸ as was the *Report of the Commission on Educational Reform* appointed by George IV, who surveyed the medical faculties of Scottish universities in 1826.⁹ The report contains the replies from Edinburgh Medical Faculty in 400 pages of text, including a verbatim account of questions and answers from all of Stephenson's teachers. Since they were aware that the results of the inquiry would be printed and presented to Parliament, the responses were carefully considered; yet there was a great frankness and openness in the expression of their opinions regarding such issues as the medical curriculum and how it could be improved, the nature of preparation of the students before admission, and the assessment of the graduating doctors for medical or surgical practice.

Name	Country of Origin (Span of Life)	Apprenticeship or Army Service	Year Graduated from Edinburgh	Licence Granted	MGH Staff Medical Institution	McGill Medical Faculty	Private Practice in Quebec
Pierre Beaubien	Lower Canada		?	1828			
Charles Blake		Surgeon to Garrison until 1781	?				
Hugh Bone			?				
William Caldwell	Scotland (-1833)	13 Regiment Dragoons	?	?	1821 1823	St Andrew Montreal 1819	1829
Peter Diehl	Lower Canada	With Dr Charles Blake 1800-1807	1809	1809		Partner with Dr Arnoldi 1819	
James Douglas	Scotland (1800-)		1820 Classmate of J. Stephenson	1826		Quebec 1828	
Thomas Fargues			1813	1814			1823-29
Andrew Holmes	Cadiz, Spain (English Parents)	Dr C. Arnoldi 1811-16	1819	1818	1822 1823	Partner with Dr Arnoldi 1820	1829 1842 Prof. 1860 Dean
Jacque Labrie	French, from Lower Canada (-1883)		1808 (First French Canadian)			St Eustache Quebec	
Archibald Rae			?	1823			
Racy			?			Practice with Dr Douglas 1846	
William Robertson	Scotland (1784-)	48th Regiment	1804	1828	1823	Montreal 1815	1829
John Stephenson	Montreal (1797-1842)	Dr W. Robertson (1815-1817)	1820	1821	1820 1823		1829
J.B.C. Tressler			?	1822			

TABLE 1
Edinburgh graduates who practised in lower Canada: 1800-1828.

EDINBURGH MEDICAL COLLEGE: REQUIREMENTS FOR ADMISSION

Following admission to the Edinburgh Medical School, the students followed a prescribed list of courses, including a series of medical lectures by the Medical Faculty professors. The courses were held in different areas within the University or in nearby buildings. The students paid fees directly to the lecturers which varied from £4-6 to £4-9. The Winter Session extended from November to the end of April, and the Summer Session from the beginning of May to the end of July. The students were required to enter their names in the University Register Album on the first day of every month during the teaching session and, before sitting examinations, had to produce a certificate of attendance.

In order to qualify for the degree of medicine, a student was required to spend four years at the University and to produce evidence of participation in both pre-clinical and clinical subjects. The following subjects had to be covered during the four years: anatomy, physiology, botany, chemistry, theory of medicine, materia medica and pharmacy, midwifery, surgery, and a few elective courses.¹⁰ The students were advised to arrange for private courses directly with the professor from whom they obtained the 'ticket'. It was expected that the students would have already studied chemistry and anatomy before signing up for the course in physiology. During the final year, students had to write a dissertation thesis on the subject approved by the Dean, and to present themselves for a series of final examinations, conducted in Latin, covering the whole field of medical sciences. The thesis was usually printed by the University.¹¹

Students quickly discovered that after they had taken several courses, they would also have to obtain a ticket for clinical teaching in the Royal Infirmary (£5-7):⁵ bedside teaching was an integral part of the medical training. The fee covered clinical lectures, attendance at operations and dissections, and other services; the dispensary work was also included in the course. Again, the class fee had to be paid directly to the professors; the Medical College received its revenue from the matriculation and graduation fees.¹²

To this end, Edinburgh Medical College actively encouraged admission of wealthy students from England who could not qualify for Oxford or Cambridge. Charles Darwin's family, for example, had long medical ties with Edinburgh. When his father insisted that Darwin study medicine at Edinburgh Medical College, he was given 'letters of introduction' that would encourage invitations for dinner from members of the faculty. He dined with Thomas Hope, Professor of Chemistry, whom he admired.¹³

Social life in Edinburgh was not too exciting; many students joined medical societies which also provided a social environment for overseas students. The Royal Medical Society was very popular and meetings were held at 7.00 pm on Fridays; the Hall of the Society was in Surgeon's Square. Dissertation on some medical subject was presented by a member, the subject decided at the previous week's meeting, and this was followed by a general discussion.¹⁴ Some students were attracted to debating societies: one, called the Plinian, was founded by Robert Jameson, a Member of the Faculty, and was dominated by radical students who demanded explanations based on physical cause. They in turn, were challenged by the religiously orthodox.¹⁵

EDINBURGH MEDICAL FACULTY

Ordinarily, it would be rather difficult to get to know the views of the medical faculty of 175 years ago. However, these matters can be studied thanks to the decision by King George IV to appoint a Royal Commission to collect information from all the universities of Scotland regarding the views of the faculties on the proposed education reforms planned for the late 1820s.

It has been suggested that an 'enormously powerful professoriate was imbalanced by inadequately prepared students, a dearth of functional textbooks, and by the absence of proper system of examination'.¹⁶ Decline in student enrolment became evident toward the mid-century, but the medical school remained active, attracting students - especially from abroad. The Scottish tradition expected that the University should be a part of the national environment. Edinburgh Town Council participated in making decisions about important faculty appointments.

The proceedings of the Royal Commission, eventually published by His Majesty's Stationery Office, imply that questions were being asked about the state of medical training in Scotland: early signs of a decline in attendance were in evidence due to increased competition from London and Oxford Universities and Queens College, Belfast. George IV appointed the Royal Commission to present the issue to Parliamentary scrutiny, and thus reflect public concern and allow debate of its political implications.

The Commissioners interviewed every member of the faculty, and collected pertinent documentation. It is interesting to reflect upon the technical aspect of the task that the Commissioners faced in order to record, verbatim, hundreds of interviews in all of the Scottish universities. Scores of 'amanuenses' must have been hired and assigned to the various sites and schedules of this project. Volume I for the University of Edinburgh comprises more than 400 pages. It is an invaluable source of expression of the individual views; some offered with great candor.¹⁷

The replies, based on interviews with the professors who made up the faculty of the Medical College, were arranged under the eight principal issues involved (see Table 2) and, to avoid monotonous repetition, only the replies of professors who expressed original views or controversial ones are presented.

TABLE 2
Courses at Edinburgh Medical College

OBLIGATORY:	
Botany:	Professor Daniel Rutheford and Professor Robert Graham (after 1818)
Chemistry:	Professor Charles Hope
Anatomy and Surgery:	Professor Alexander Monro
Practice of Physic:	Professor James Gregory
Materia Medica:	Professor Andrew Duncan I Professor Andrew Duncan II
Institutes of Medicine:	Professor Andrew Duncan I Professor Andrew Duncan II
Clinical Medicine:	Rotated between Medical Professors
OPTIONAL:	
Natural History:	Professor Robert Jameson
Midwifery:	Professor James Hamilton Professor James Hamilton (son)
Clinical Surgery:	Professor James Russell
PRE-MEDICAL SUBJECT:	
Divinity:	Professor W. Ritchie
Mathematics:	W. Wallace
Rhetoric and English Literature:	Andrew Brown

The nature of preparation of students before entering the Medical School

James Gregory, Professor of Practice of Physic, felt that medical students would do well by having taken mathematics, natural philosophy and natural history since these would boost their 'general reasoning' (considered a good preparation for the medical course), but did not consider it essential for them to be able to read the original text of Hippocrates and Galen. He did not feel that the students should be compelled to acquire previous literary education since that might reduce the number of students going into medicine. He felt strongly that all medical graduates from Edinburgh should become competent to practice medicine.¹⁸

James Hamilton, Professor of Midwifery, held strong views and deplored the educational training of the students who were being admitted into the medical course: 'they had no principles or manners of gentlemen and lacked the very basic minimum of liberal education.' He would not allow admission to anyone who did not pass geometry, logic, Latin, Greek and natural history.¹⁹

Definition of the role of the Medical Faculty

Charles Hope, Professor of Chemistry, defined the Medical Faculty as the organisation which delivered clinical lectures on patients of the Royal Infirmary and examined candidates for the degree in medicine. There were seven principal departments in the medical school each headed by the professor who lectured in that subject: (1) anatomy and surgery; (2) chemistry; (3) botany; (4) theory of medicine; (5) practice of medicine; (6) materia medica; and (7) midwifery.²⁰

Who decided the curriculum, appointed professors and examiners, and disciplined them?

Robert Graham, Professor of Medicine and Botany, considered that the University Senate should decide curricular matters and prescribe punishment to delinquent students; he felt that professional degrees should be tested by the specific faculty.

However, Professor Hope was of the opinion that the Medical Faculty should appoint the examiners, conceive and initiate degrees, and initiate changes to the curriculum.²¹

Professor Monro, who had been teaching anatomy and surgery for 20 years, felt that some form of retirement pension should be provided for the 'old professors'. 'My yearly salary is £50, same as my grandfather's a hundred years ago', he would say, 'Some professors have no salary.' The principal earnings came from the fees that the professors collected from the students for their private courses; the main reason why professors continued to give their courses 'into their dotage'.²²

Should surgical training be separated from teaching of anatomy?

Professor Hope suggested that the curriculum could benefit by the addition of clinical surgical lectures, and he believed it to be desirable for the Professor of Surgery to have his own beds in the Royal Infirmary.

Professor Monro (*secundus*) had definite views on surgery:

Surgery as taught by me consists of two branches, the Medical and the Manual parts of Surgery. The Manual part of Surgery is considered as the least important, and I shall read a extract of a lecture given lately by Mr. Lawrence on that very point, to show that the Medical part of Surgery is by far the more important. Mr. Lawrence stated that it is the boast of modern Surgery to have greatly diminished the number, and an improved knowledge of the nature and treatment of diseases will probably effect a still farther reduction (of operations?). Many Surgeons, in considerable practice, operate but seldom and would require a large city

or district to furnish operations enough for the whole employment of one Surgeon. It is stated, in the history of the Academy of Surgery at Paris, 'the study of Chirurgical diseases, which may and ought to be cured without having recourse to operations, should at all times be considered as the principal subject of Surgeon's attention.'²³

Surgeon-anatomists taught in private schools but had little stake in clinical surgery; not being qualified by the College of Surgeons, they probably lacked credibility.

The University Professor of Clinical Surgery had no title or privileges in the Royal Infirmary. In fact, the hospital insisted that clinical lectures should be given by their own attending surgeons. Consequently, unless special provisions were made, clinical professors could not give these courses at the hospital. James Russell, Professor of Clinical Surgery, had been appointed in 1803 and became an attending surgeon at the Royal Infirmary with the title of 'Clinical Lecturer in the Infirmary' given by the managers of the Infirmary, and was thus able to lecture freely.²⁴

The need for greater exposure of medical students to surgery was expressed by many faculty members. Professor Graham (botany) felt that three full professors should be appointed in surgery: Professor of Surgery, Professor of Military Surgery, and Professor of Clinical Surgery. For anyone who was thinking of the future practice of surgery, this suggestion made good sense.²⁵

The role of private lectures in supplementing university courses

Professor James Duncan, the son of the senior Professor Duncan, regarded clinical lectures as the most important method of medical teaching; he felt that too few were required by the Statutes of the University. Duncan, being the youngest faculty member, had cause to be especially conscious of the tradition and hierarchy that existed at the Medical College. The Senior Professors had the first choice; none wanted to lecture early in the morning; 10.00 am, 11.00 am and 1.00 pm were usually reserved for the senior professors. The roster was as follows:

8.00 am	Materia Medica, Professor Duncan, Jr
10.00 am	Chemistry, Professor Hope
11.00 am	Institutes of Medicine, Professor Duncan, Sr
12.00 pm	Hospital rounds at the Royal Infirmary
1.00 pm	Anatomy and/or Surgery, Professor Monro
4.00 pm	Lecture by Professor of Medicine ²⁶

Most of the professors, however, stated that the private courses were an important part of the medical curriculum.

One of the difficulties of the university courses was that the classes were very large. The clinics in medicine formed the basis of medical teaching, and Edinburgh became famous for 'bedside teaching'. It was, however, impossible for 180 students to get close enough to the patient. Robert Graham, Professor of Medicine and Botany, suggested that the classes of clinical medicine were made smaller and for the courses to be run yearly instead of in alternate years.²⁷

Some of the students felt that the provision of clinical tutors on the wards of the Royal Infirmary, where the patients were assigned to medical students, would help a great deal. The students were responsible for presentation if their assigned patient was chosen for daily rounds.

What language should be used for teaching, examination or writing of thesis? Latin vs English
 Professor Hope felt that the graduating thesis should be written in Latin but that it was acceptable for the thesis to recommend a doctrine which was opposed by the Faculty; the purpose of the examination was to test information and not to inculcate dogmas.²⁸

Professor Russell was less traditional than some of the other professors and commented that, if permission was given to write the graduation thesis in English, there might be more honest effort by the students. He observed that there were some very talented people with medical degrees who helped the medical students to prepare a thesis or 'grind' for final examination. These individuals were called 'Grinders' and charged high fees.

One of the difficulties in preparing for the examinations was that the students had to take them partly in Latin and partly in English. The best Latin scholars frequently had the greatest difficulty in taking their exams: they knew when they were wrong and tried to correct themselves in mid-stream. The mediocre Latin students were not deterred by such knowledge; they put a Latin termination to the English words and 'dash through thick and thin'.²⁹

Professor Duncan (Senior), who taught a course in pathological physiology as well as therapeutics, insisted that it be taught in Latin. In fact, he apparently said, 'No man should be a doctor of medicine who is not able to answer questions in Latin'. His cynical opinion about English being used more for examinations, was that Edinburgh 'will start conferring degrees upon ignorant empyrics'. He approved of the re-institution of printing of the graduation thesis.³⁰

Should there be a written or oral examination?

Professor Hamilton objected to oral examinations, preferring written ones which he would say 'sifts a man most completely'. The oral examination in Latin and English caused some confusion, he believed; he felt that it was sometimes difficult to fathom the extent of the candidate's knowledge.³¹

Professor Hamilton favoured the kind of written examinations that were conducted by the Cambridge Medical Trials and submitted a sample for the Commission:

First day examination: 1st. What Arteries are given off by the Aorta in its passage through the Abdomen? 2nd. Describe the structure of the Kidney? 3rd. Describe the Ligament and Petition Canal? 4th. What is the nature of the Bile? 5th. What is the composition of Biliary Calculi? 6th. Describe the descent of Testes in the Foetus? 7th. From whence does the Gustatory Nerve take its origin?

Second day: 1st. What are the general symptoms that indicate the presence of Fever? 2nd. Describe the principal symptoms of Hydrocephalus and what is its predisposing and exciting cause, and what is the proper mode of treatment in this disease? 3rd. In what class does Bateman place Psoriasis? 4th. What is the proper treatment in _____ Morbus? 5th. What is the nature of Fusible Calculus? 6th. What symptoms are produced taking Hydrargyr, Oxymurins as a Poison, and what tests show its existence? 7th. How is Hydrargyrum Precipitatum Album produced, by the directions of the London Pharmacopoea?³²

Selection of required courses and optional courses in the Medical College

Professor Hamilton expressed enthusiastic approval for attendance at the classes of Military and Clinical Surgery, 'It ought to be required in the curriculum', he said; 'if I were teaching a son of mine to Physic, I should teach him Surgery before Physic.' He stressed that the Edinburgh MD degree was primarily for medical training. They

gave no diploma in surgery, anyone who wished to practice surgery required more training to qualify himself for the Fellowship in the Royal College of Surgeons. He also felt that medical jurisprudence should be part of the curriculum. He quoted some instance in which his own specialty was often involved:

We can show the marks by which the violation of chastity, abortion, child-murder and a number of other cases may be distinguished.... In questions before the court of law, respecting the age after conception at which the infant is thrown off: that can only be explained by a teacher of Midwifery who has embryos from the moment they are visible, up to the period when they are capable of living independent of the parent.³³

Professor Graham stated that there were five optional courses in the current curriculum that were available to the medical students: clinical surgery, practical anatomy, military surgery, midwifery and jurisprudence. Medical students were required to take two of these five courses.

Were they training too many doctors in Scotland?

Professor Russell had remarked that there were too many doctors in practice in Scotland at that time. They had to do general practice and were unable to earn a sufficient amount. It was for that reason that many young doctors enlisted into the army, where they were well looked after and had a chance to travel to different parts of the world.³⁴

One advantage of being in the army was that the doctors could retire, while they were still fairly young, on £100 per year. They were free to start a practice wherever they wished and could supplement their incomes. (Table 1.)

THE COMMISSION'S SURVEY

The high reputation held by the Edinburgh Medical Faculty was reinforced by the Commission's report. The candid expression of opinion by the members of the faculty suggests that they were not too concerned about university tenure. Their views and conclusions expressed 170 years ago, before the establishment of a scientific basis of disease, have a remarkably contemporary ring. Their objective was apparently the improvement of the medical curriculum and of the teaching atmosphere at the Medical School. In the final analysis, it was the substance of the instruction and the enthusiasm of the teachers that helped to secure the competence of the graduating doctors to whom they awarded the MD degrees.

There was clearly great diversity in the level of preparation among the students admitted to study medicine at Edinburgh. Students who had not previously studied mathematics or natural science required some help when they took a course in chemistry while in medical school. There was no indication that the members of the Medical Faculty received any pedagogical training. The ability to teach was assumed when the professor was appointed for his subject.

The medical curriculum was fairly stable: introduction of new courses was done on the recommendation of the Medical Faculty but only with approval of the University Senate. The medical theories of disease had recently stopped following the Tenets of Boerhaave of Leiden. There was no special attempt to teach medical students cognitive skills or how to define problems. They were expected to commit the subject to memory and to restate it at the time of examination.

The 1820s were a period in the evolution of medical knowledge which one would call 'in transition'. The faculty's attitude to surgery, which suggested that in the future

most of the surgical conditions would be treated by drugs, has a very contemporary ring. Jenner had already established empirically the efficacy of vaccination and John Hunter was carrying out interesting experiments. But they were still a generation before Pasteur's breakthrough which demonstrated the bacterial cause of infective diseases, and liberated medical thought, basing it on scientific experiments.³⁵

John Stephenson, following graduation in 1820, returned to Montreal and started a school for training doctors, which eventually became the McGill Medical College (Figure 3).

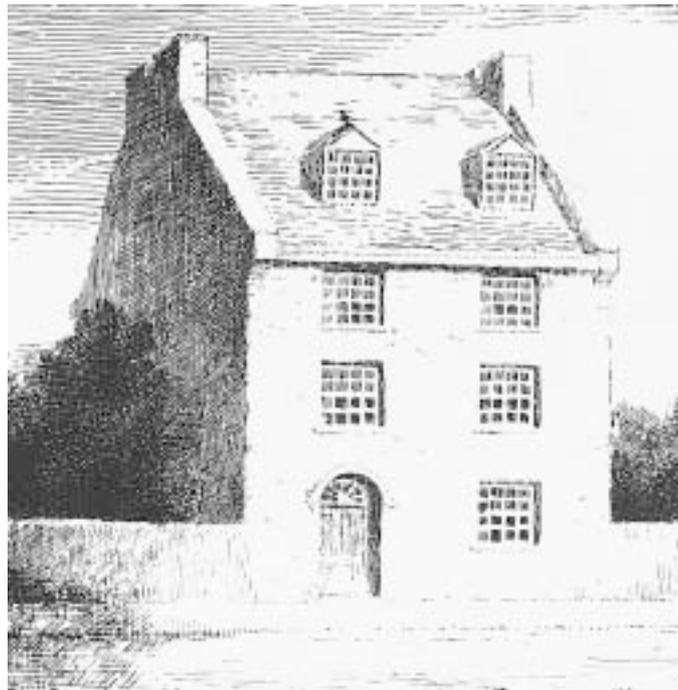


FIGURE 3
Montreal Medical Institution, 20 St James Street, Montreal (Canada, 1824).

Stephenson considered the Edinburgh Medical School as 'the most famous seat of learning in Europe - from which I have learned so much.'^{36,37} This was his testimony to the fact that some faculty members succeeded in getting the students involved in the challenge and the excitement of learning. Apparently, the professors were able to convince the students of the merit of their instruction and imbue them with a desire to return to their native lands and carry on the 'Edinburgh tradition in bedside teaching'.

REFERENCES

- ¹ Roux PJ. Mémoire sur la staphyloraphie, ou il suture a voile du palais. *Arch Sci Med* 1825; 7:516-38.
- ² Whiteford WM. Reminiscences of Dr. John Stephenson, one of the founders of McGill Medical Faculty. *Can Med Surg J* 1883; 728-31.
- ³ Stephenson J. Translation of *Velosynthesis* from Latin by W.W. Francis, repair of cleft palate by Philibert Roux in 1819. *J Hist Med Allied Sci* 1963; 18:209.
- ⁴ Stephenson J. Graduation thesis: repair of cleft palate by Philibert Roux in 1819, comments by Dr Martin Entin. *Plast Reconstr Surg* 1971; 47:277-83.
- ⁵ Bramwell B. The Edinburgh Medical School and its professors in my student days (1865-1869). *Edinb Med J* 1923; 95.
- ⁶ Rendall J. The influence of Edinburgh Medical School in America in the 18th century. *Edinb Med J* April 1923; 95-124.
- ⁷ Abbott ME. History of medicine in the province of Quebec. McGill University, Montreal, Canada, 1931; 60.
- ⁸ Stephenson J. *De Velosynthesis*; a graduation thesis in Latin submitted to the University of Edinburgh Medical College, 1 August, 1820. Montreal: Arch Osler Library.
- ⁹ Evidence, oral and documentary, Commission appointed by His Majesty George IV, July 23 1826 for visiting Universities of Scotland. Printed for HMSO by W Clowes and Sons, Stanford Street, London, 1837, Volume I, University of Edinburgh.
- ¹⁰ Op. cit. 9, p.258.
- ¹¹ Op. cit. 8, (title page).
- ¹² Medical College Prospectus, 1816-1819. Courtesy of Mrs J Currie, Assistant Librarian, Edinburgh University Library, Special Collection.
- ¹³ De Beer G. Charles Darwin. London, Edinburgh: Thomas Nelson & Sons 1963, 25-9.
- ¹⁴ Op. cit. 4.
- ¹⁵ Grube EW. Darwin on man, London: Whidhouse, 1974; 76,80.
- ¹⁶ Sheets-Pyenson S. Horse race: John Williams Dawson, Charles Lyell and the competition over the Edinburgh Natural History Chair in 1854-1855, *Ann Sci* 1992; 49:461-77.
- ¹⁷ Op. cit. 9.
- ¹⁸ Ibid. p.255.
- ¹⁹ Ibid. p.307.
- ²⁰ Ibid. p.258.
- ²¹ Ibid. p.257.
- ²² Ibid. p.299.
- ²³ Ibid. p.275
- ²⁴ Ibid. p.285
- ²⁵ Ibid. p.334
- ²⁶ Ibid. p.223
- ²⁷ Ibid. p.262
- ²⁸ Ibid. p.282
- ²⁹ Ibid. p.296
- ³⁰ Ibid. p.219
- ³¹ Ibid. p.309
- ³² Ibid. p.306 (a word in question no.4 of the Second Day Examination is indecipherable)
- ³³ Ibid. p.308
- ³⁴ Ibid. p.287
- ³⁵ Pasteur L, Joubert JF, Chamberlain CH. La theorie de germe et ses applications à la medicine et à la chirurgie. Paris: Masson, 1878; 24.
- ³⁶ Entin MA. John Stephenson's secret. Fontanus, 1995; VIII:137-45.
- ³⁷ Entin, MA. John Stephenson, Founder of McGill Medical College - the first cleft palate patient of Dr Philibert Roux. *Can J Plast Surg* 1994; 2:185-9.