SIMON FRASER UNIVERSITY

S.75-59

As amended and approved by Senate, April 7, 1975.

MEMORANDUM

To: SENATE

From: ACADEMIC PLANNING COMMITTEE

Subject: PROPOSED PH.D. PROGRAM IN KINESIOLOGY

Date: MARCH 20, 1975

MOTION 1: "That Senate approve and recommend approval to the Board, as set forth in S.75-59, the proposed Ph.D. Program in Kinesiology including the regulations for the degree and the proposed new course, KINE. 899 - Ph.D. Dissertation."

MOTION 2: "That Senate direct the attention of the Dean of Graduate Studies to the internal regulations of the Kinesiology Department, which are that no faculty member shall at one time be senior supervisor to more than three students."

MOTION 3: "That Senate recommend to the Board that the Program be introduced commencing on or about September 1975."

CERTIFIED CORRECT AS PASSED BY SENATE AT ITS MEETING OF APR - 7 1975

SECRETARY OF SENATE

SIMON FRASER UNIVERSITY

S.75-59

MEMORANDUM

To SENATE

From B.G. Wilson,
Chairman,
Academic Planning Committee

Subject

Date 20 March,1975

The Academic Planning Committee has reviewed the program for the degree of Doctor of Philosophy in Kinesiology and recommends its acceptance by Senate.

This recommendation follows a review of the documents prepared by the Department of Kinesiology and comments made by the Assessment Committee of the Senate Committee on Graduate Studies, together with external assessments of the program. The Committee also interviewed Dr. Banister and Dr. Calvert from the Department.

Members of the Academic Planning Committee were concerned about the nature of the program as compared with others of this type in Canada, the faculty resources and capital resources necessary to mount the program,and the external assessments. It was pointed out in response that while there were other departments in Canada called Kinesiology or something similar, most of these had been built from existing Physical Education departments and had utilized existing faculty with a few additions in specific areas. The Department at Simon Fraser had been founded with people from different disciplines and no other department in Canada had this interdisciplinary approach. The most similar department was at Waterloo but even there half the staff have Master's degrees in Physical Education. It was felt that more universities would develop Kinesiology departments like Simon Fraser's and that there would be a tremendous demand in the next few years for graduates of Simon Fraser's programs to instruct in such new departments. It was also pointed out that because of the similarity between portions of the Kinesiology program to instruction offered by traditional schools of Physiology, students could find entry into Physiology departments as well. It was pointed out that Kinesiology is an area where there is significant student interest on campus and where the University would be offering a unique program.

In addition to present faculty an appointment of an academic physician has been authorized and consequently the faculty resources within the department seemed clearly adequate for the supervision of a small Ph.D. program. Departmental representatives pointed out that even when a Ph.D. program was implemented it was unlikely that the total number of graduate students would significantly increase, at least until faculty and other resources grew. Concerns regarding inadequate physical space and facilities were as applicable to Master's students as Ph.D. students, and were gradually becoming overcome. The design of new physical

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space for Kinesiology was well advanced, and hopefully would be available in 1976. While the level of external funding support for faculty within the Department was not as high as for other scientifically-based departments within the University, its level was significant and it was felt that the reputation of the Department was well-founded.

As a result of input from external reviewers of the program, the Assessment Committee had recommended that implementation of the program be delayed by two years, but this had not been endorsed by the Graduate Studies Committee. It was pointed out that the negative review of the program had come from an individual who had not viewed the Department personally but based his judgment solely on material mailed to him. On the other hand, external reviewers of the Department who had spent time within the Department and interacted with the faculty and students, had been unanimous in pointing out the need for a Ph.D. program.

After reviewing the appropriateness of the program in a Canadian context, the stature of the faculty who would be involved in the program and the resources of the Department, the Academic Planning Committee voted without dissent to recommend the program to Senate with an implementation date of September 1975.

B.G. Wilson

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SIMON FRASER UNIVERSITY

MEMORANDUM

To Dr. B. Wilson, Chairman
Academic Planning Committee

From Marian McGinn
Assistant Registrar-
Graduate Studies

Subject Proposed Ph.D. Program in Kinesiology

Date December 3, 1974

Attached is a copy of the proposed Ph.D. program in Kinesiology for consideration by your Committee.

The following two motions were approved by the Senate Graduate Studies Committee at their meeting on November 25, 1974:

Motion 1: That the academic merits of the proposed Ph.D. program in Kinesiology be approved and be forwarded to Senate for approval.

17 in favour
2 abstentions

Motion 2: That the proposed Ph.D. program in Kinesiology be implemented in September 1975.

11 in favour
7 against

mm/
encl.

PROGRAM FOR THE DEGREE

OF

DOCTOR OF PHILOSOPHY (PH.D.) IN KINESIOLOGY

JANUARY, 1974

Graduate Program Committee
Department of Kinesiology
Simon Fraser University
Burnaby 2, B.C.

PROGRAM FOR THE DEGREE OF DOCTOR OF PHILOSPHY (PH.D.) IN KINESIOLOGY

This material has been prepared in accordance with the document "The establishment of new graduate programs" approved by Senate, July 10, 1972.

a. *Justification and Rationale for the Ph.D. Program*

In January 1974, the Kinesiology Department has reached a stage of development where we believe a Ph.D. program is desirable, is in demand by potential students and can feasibly be mounted by the faculty. There are 65 undergraduate majors, 25 students enrolled in our M.Sc. (Kinesiology) program, 9 regular faculty and one visiting faculty member. Thus, it is not surprising that several of our graduate students have become involved in programs of study and research which have resulted in work well beyond the level normally required for a master's degree. This is a particularly appropriate time to institute a Ph.D. Program since revised undergraduate and M.Sc. curricula are currently in the final stages of approval. With the new courses proposed for our M.Sc. program, there will be no need to implement any new courses specifically for the Ph.D. Program.

It is envisaged that the Ph.D. program will always be quite small in relation to the M.Sc. program - we project about 2 new students each year with a total of 6 - 8 in residence at any one time. This projection is based on our current faculty strength and not on student demand - our current experience of serious enquiries indicates that we could easily recruit 4 - 5 students per year.

It is appropriate to note that in the "External Review" of the Kinesiology Department conducted in 1973, the reviewers all felt that a modest Ph.D. program was justified and desirable.

As an interdisciplinary department with a multidisciplinary faculty, it is to be expected that the research interests of our students will be at least as wide as those of our faculty. However, it is our intention that although individual topics may be quite different, they will each examine some rather tightly constrained area in considerable depth. Further, although the individual topics may overlap activity in other departments and programs, (e.g. Biology, Biochemistry, Psychology), it is our intention that approved topics will generally relate to human performance or movement in some way.

b. New Positions Needed

No new faculty positions are necessary to implement the proposed Ph.D. program, other than those needed for our existing programs.

c. Summary of Finances

i) Space: The university has committed funds to provide space for the Kinesiology Department in a new building.

ii) Supporting Personnel:

iii) Miscellaneous Running Expenses:

The type of research involved in a Ph.D. dissertation inevitably requires more space, equipment and personnel than M.Sc. research. It seems futile to argue that a Ph.D. program will require more funding than our current M.Sc. program when our existing funding is totally inadequate. Presently, student's M.Sc. research projects must either fit the requirements of some faculty member's research grant or the student must find a faculty member willing to "bootleg" funds from his grant for an unrelated project. The situation severely contrains the student's research topic and the second alternative is clearly illegal if not unethical. However, we estimate that realistically our existing M.Sc. program requires an annual addition of $6,000 for miscellaneous supplies and services and that the proposed Ph.D. program could require a further $4,000, unless it was mounted at the expense of a decrease in our M.Sc. enrollment.

iv) Student Support: It is anticipated that 6 Ph.D. students could be supported by Teaching Assistantships, Research Assistantships and miscellaneous fellowships.

d. Names of Persons Involved in Program

All persons named have an indefinite commitment to the program.

i) Faculty:

Eric W. Banister

B.Sc. (Manchester), M.P.E. (Brit. Col.)
Ph.D. (Illinois), F.A.C.S.M.
Professor
Chairman, Kinesiology

Area of Research:

Physiology of Exercise, Physiological assessment of training in athletes and coronary heart disease patients. Ultrastructural adaptations to exercise. Effects of hypoxia, hyperoxia and hyperbarism on work capacity.

N.M.G. Bhakthan

B.Sc. (Trivandrum), M.Sc., Ph.D. (Baroda)
Associate Professor

Area of Research:

Electromicroscopic and biomechanical investigations on stress induced changes in muscular and nervous tissues. Histophysiology of aging in mammalian tissues. Aspects of lipid metabolism in different environmental conditions.

Thomas W. Calvert

B.Sc. (University College, London)
M.S. (Wayne State), Ph.D. (Carnegie Institute of Technology)
Associate Professor

Area of Research:

Medical systems engineering. Modelling the nervous system.

Allan J. Davison

B.Sc. (Cape Town), M.Sc., Ph.D. (New Jersey)
Associate Professor

Area of Research:

Chemical and energetic studies of the mechanism whereby oxygen is activated in living cells, and the normal and abnormal reactions of free radicals with tissues, cells and subcellular preparations. Lipid peroxidation in aging and disease. Energy metabolism on nutrition.

John Montgomery

B.P.E. (Brit. Col.), M.S. (Oregon), Ph.D. (Oregon)
Assistant Professor

Area of REsearch:

Skill learning and performance. This embodies research into the acquisition of information (sensory and perceptual studies), memory storage and retrieval process, decision making processes and the control of movement.

William D. Ross

B.P.E. (Brit. Col.), M.A., M.S., Ph.D. (Oregon), F.A.C.S.M.
Associate Professor

Area of Research:

Growth and development including anthropometry, somatotype, body composition, skeletal age, work capacity and other assessments of performance in relation to normal growth and training activity.

ii) *Supporting Faculty: who can contribute to the program but should not act as senior supervisors until their research background is strengthened.*

Arthur E. Chapman

Diploma in Physical Education (Loughborough)
M.A. (Ohio State), M. Phil. (London) (Currently completing a Ph.D. dis-
Assistant Professor sertation - University of London)

Area of Research:

Validation and modification of mechanical models of human muscles by means of direct observation in vivo. Investigation of the relation of quantitative electromyography to mecahnical aspects of muscles.

Iris Garland

B.Sc. (Illinois), M.S. (U.C.L.A.)
Assistant Professor

Area of Research:

Choreography, and thesociology of movement.

Margaret Savage

B.A., M.S. (Washington)
Assistant Professor

Area of Research:

Sport Psychology. Investigation of personality traits of athletes; use of psychological techniques in training programs.

Curriculum Vitae are attached as Appendix 1.

iii) Graduate Program Committee:

Banister, E.W.
Bhakthan, N.M.G.
Calvert, T.W.
Davison, A.J.

iv) Other faculty within S.F.U. who can offer support to the program (by serving on supervisory committees, etc.)

Dr. John Walkley, Chemistry Department
(Physico-chemical properties of respiratory gases)

Dr. Peter Oloffs, Biosciences Department
(Drug and pesticide metabolism)

Dr. Chris Davis, Psychology Department
(Motor Learning)

Dr. Theodor Sterling, Computing Science Department
(Computers in rehabilitation)

Dr. Jay Weinkam, Computing Science Department
(Computers in body measurements)

Dr. A.L. Diamond, Psychology Department
(Physiological Psychology)

Dr. P. Belton, Biosciences Department
(Electrophysiology, biological membranes)

Dr. K. Colbow, Physics Department
(Biological Membranes, biophysics)

Dr. I.R. Glen, Biosciences Department
(Genetics and tissue culture)

Dr. G. Bojadziev, Mathematics Department
(Biomathematics)

Dr. C.L. Kemp, Biosciences Department
(Genetics and Cell Biology)

Dr. W.R. Richards, Biosciences Department
(Biochemistry and cytochemistry)

Dr. K.K. Nair, Biosciences Department
(Physiology, cytochemistry and ultrastructure)

v) *Other individuals not at S.F.U. whose professional activities suit them to serve on appropriate supervisory committee, etc.*

Dr. A.C. Pinkerton, Director, G.F. Strong Rehabilitation Institute (Chronic and degenerative disorders)

Dr. George Szaz, Director, Office of Interprofessional Education, U.B.C. (Reproductive Physiology)

Dr. A. Connolly, Physician at the Vancouver Narcotic Foundation (Problems related to drug abuse)

Dr. I. Desai, Department of Food Science, University of British Columbia (Nutritional Aspects)

Dr. G. Drummond, Chairman, Pharmacology Department, U.B.C. (Cell regulation, properties of drugs)

Dr. T. Godwin, Head, Department of Cardiology, Royal Columbian Hospital (Physiological and pathological chemistry)

Mr. J. Foort, Department of Orthopedic Surgery, VGH/UBC (Prosthetics, biomechanics, medical engineering)

Dr. D. Clement, Physician - Richmond (Sports science and sports medicine)

Dr. B. Gilbert, Division of Audiology and Speech Sciences, U.B.C. (Auditory function and damage, preventative aspects)

Dr. C.J.G. McKenzie, Department of Health Care and Epidemiology, U.B.C. (Public health aspects)

Dr. J. Milsum, Imperial Oil Professor of Health Systems, U.B.C. (Health and Physiological Systems)

Dr. K. Ryan, National Research Council (Bioengineering, Electrophysiology)

e. *Fields of Study and Core Areas*

Human Structure and Function in Health and Disease (including biochemical, physiological, anthropometric, ultrastrutural, biomechanical, psychomotor and bioengineering aspects).

In relating these disciplines to human structure and function, the following problems would be emphasized by existing faculty.

i) *Applied Physiology: including man in extreme environments (in the cold, in the desert, at high altitudes, at extreme pressures, etc.) endocrine, nutritional and cardiovascular or respiratory function, growth and development motor function, etc.*

ii) *Mechanisms, prevention, and rehabilitation of debilitating diseases: including neuromuscular disorders, aging, coronary infarction, drug addiction, radiation damage, and oxygen toxicity.*

iii) *Exercise physiology and biochemistry, human performance and energy metabolism, limiting factors in athletic endurance as well as physiological adaptations in motor activity, and in training.*

iv) *Biomedical and human systems engineering - man machine systems, the human motor control system and its function in man-machine information processing and control, prosthetic motor and sensory systems.*

The approach taken in a particular problem will be multidisciplinary, within the range of expertise listed above. To allow maximum inter-disciplinary interaction, the scope of the program is broadly defined, but individual projects will be problem-centered and supervisory committees will be expected to set clearly delineated boundaries.

Areas into which the program might be expanded in the future include: mathematical analysis and representation of human movement, sports science, physical rehabilitation, social and cultural aspects, and sports psychology. It seems improbable to the authors of this document that the areas of dance, recreation, and economic and geographic aspects will warrant development beyond the master levels in the forseeable future, however, events may prove this to have been a short-sighted viewpoint.

f. *Relationship of Individual Faculty to Program*

All of the core areas listed above will reflect the interests and activity of most the faculty in varying degrees. Against each area we list all appropriate faculty in approximate order of decreasing involvement.

i) *Banister, Ross, Bhakthan, Davison, Calvert (Chapman, Savage)*

ii) *Bhakthan, Banister, Ross, Davison, Calvert (Savage, Chapman)*

iii) Davison, Banister, Bhakthan

iv) Calvert, Montgomery, Banister (Chapman, Garland, Savage)

This shows that our faculty with doctoral backgrounds in Biology, Biochemistry, Physiology, Anthropometry, Psychology and Biomedical Engineering can combine to bring different viewpoints to the core problem areas.

g. *Degree Sought and Faculty of Jurisdiction*

The proposed program will lead to the degree of Doctor of Philosophy (Ph.D.) and the Faculty of Interdisciplinary Studies will exercise statuatory power of faculties.

h. *Academic Requirements*

Admission:

Graduates fulfilling the admission requirements referred to in the General Regulations are encouraged to apply.

Degree Requirements:

Candidates will be admitted to the doctoral program to carry out a program of study and research in an area previously defined and determined to be within the capabilities of the department and the student by the departmental graduate program committee. The Ph.D. candidate will be expected to show competence in methodology and in quantitative techniques relevant to his proposed research.

A Ph.D. candidate must also complete a minimum of 24 semester hours of course work beyond the B.Sc. degree. Of these 24 hours, at least 15 are to be in graduate courses of the 800 level and the remaining 9 may be chosen from courses at the graduate or upper division undergraduate level within the Kinesiology Department or any other department at the discretion of the candidates supervisory committee.

At the discretion of his Supervisory Committee, a student may be directed to acquire an adequate knowledge of a language which would be relevant to his studies.

The program of formal course work and research is designed to suit the background and research objectives of each candidate and may differ widely from candidate to candidate.

The candidate will be expected to present at least two seminars on topics selected by the candidate in consultation with his Supervisory Committee.

The seminars will be presented before interested faculty, graduate and undergraduate students, normally in the period between the first and sixth semesters, but before the qualifying examinations. Both the timing and the subject matter of the seminars will be chosen by the student in consultation with his Supervisory Committee.

Qualifying Examinations:

At a time set by the Supervisory Committee, normally at the end of the second year of residence, the candidate will be required to sit written and oral qualifying examinations.

The Qualifying Examination Committee will consist of at least four faculty members from the Department, including the Senior Supervisor (who will be the Committee Chairman), plus one faculty member to be drawn from outside the Department.

i) *Written: In consultation with his supervisory committee, the candidate will select one of the following two options:*

(a) The Qualifying Examination Committee will present to the student a research problem related to the candidate's general research interests. The student will normally be given two weeks to prepare and present a well documented reationale for its solution to the Qualifying Examination Examination Committee and his performance will be judged on the basis of clarity of thought and presentation, appropriate reference to relevant literature, satisfactory collection, analysis and presentation of data and depth of understanding portrayed. Attention will be paid to the appropriateness of the methodology, and the consistency of the conclusions.

A student who fails the field problem may retake it once, after a one semester lapse.

(b) Written Examinations: There will be four examinations:

Part One: One examination paper will be devoted to his field of specialization and will be designed to permit him to explore extensively his chosen area of research.

Part Two: The other three examination papers will be based upon three topics chosen by the candidate in consultation with his Qualifying Examination Committee.

The student may select all four topics from within one of the available sub-branches of the discipline (i.e. applied physiology, sports science, rehabilitation, socio-cultural) or may select his topics from within several of the sub-branches. Where applicable, one paper may be written in a field outside Kinesiology.

A student who fails an examination paper may re-sit the paper once, after a one semester lapse.

ii) *Oral: The oral will be held by the Qualifying Examination Committee at the successful conclusion of all written examinations. The student will be examined primarily in the areas of the topics covered by the written examinations, but questions may range over the entire discipline.*

Dissertation: The candidate will prepare a dissertation proposal which will be circulated to faculty and resident graduate students and will present this proposal for discussion at a Departmental colloquium.

The completed dissertation will be judged by the candidate's Examining Committee. If the dissertation defence is failed, the candidate is ineligible for further candidacy in the degree program at this University.

For further information and regulations, refer to General Regulations.

Time Required for Degree:

It is anticipated that the requirements for the degree can normally be completed in 9 semesters.

i. *Proposed New Courses*

No new courses are proposed except:-

Kinesiology 899: Ph.D. Dissertation

Attention is drawn to the new courses recently proposed for the M.Sc. (Kinesiology) program. (Appendix 5)

j. *Laboratory Facilities and Research Equipment*

No new facilities or equipment is necessary to introduce this program. A list of existing equipment is attached as Appendix 2.

k. *Support of Graduate Students*

It is anticipated that there will be no problems in supporting all students with teaching assistantships, research assistantships and miscellaneous graduate fellowships (University, N.R.C., M.R.C., etc.). This is based on our experience with our M.Sc. program (current enrollment - 25).

The department currently appoints about 13 students each semester as teaching assistants and has considerable potential for support of Research Assistants (see History of Research Support - Appendix 3).

l. *Librarian's Report*

See Appendix 4.

m. *Estimated Enrolment*

We anticipate restricting enrollment to an average of 2 students per year with a total of 6 - 8 in residence at one time. This is based on the limits of our faculty and facilities and not on potential students.

n. *Adequacy of Space*

The current space is totally inadequate for a new program but new facilities are being provided by the university. In spite of our sub-standard facilities our undergraduate and M.Sc. programs continue to grow and prosper so this should not limit a modest Ph.D. program.

o. *External Assessors*

Dr. R.J. Shephard, Department of Physiological Hygiene
University of Toronto

Dr. John Holloszy, Department of Medicine
Washington University

Dr. J.H. Milsum, Professor Health Systems
University of British Columbia

p. *Duration of Program*

The program will be of indefinite duration.

q. *Calendar Entry*

See (h) above.

SIMON FRASER UNIVERSITY

CURRICULUM VITAE

NAME: *BANISTER, Eric W.*
surname given names

DATE: *January 28, 1974*

BACKGROUND INFORMATION

1. Department *Kinesiology*

2. Citizenship *Canadian*

3. Contract Status: Tenure: yes [X]; no [ ]

Rank: Instructor [ ]; Assistant Professor [ ]; Associate Professor [ ] Full Professor [X].

4. Date of Birth *18th* *May* *1932*
day month year

5. Educational Background

Degrees	College, University, or Institution	Field of Study	Year
Bachelor	*University of Manchester, England*	*Chemistry*	*1953*
Master			
Doctorate	*University of Illinois*	*Applied Physiology*	*1964*
Other			

6. Academic, Research and Related Professional Experiences (list most recent last)

Position Held	Dates	Department	Institution
Assist. Prof.	*1967-69*	*Kinesiology*	*Simon Fraser University*
Associate Prof.	*1969-72*	*Kinesiology*	*Simon Fraser University*
Chairman	*1969*	*Kinesiology*	*Simon Fraser University*
Professor	*1972*	*Kinesiology*	*Simon Fraser University*

7. Awards, Citations, and Honors:

8. Membership in Learned Societies:

American Association of Sports Medicine
Canadian Association of Sports Science
American Association for the Advancement of Science
Undersea Medical Society
Aerospace Medical Society
Canadian Association of Aerospace Medicine
Canadian Coaches Association

II TEACHING

1. List courses taught by semester over past 3 calendar years. If not teaching indicate professional activity in which engaged, e.g. research semester, sabbatical, leave of absence, etc.

	1971	1972	1973
Spring	*Kines. 100, Bio. 428, Kines. 405*	*Research*	*Kines. 100, (040, 042)*
Summer	*Kines. 040, 042, 100 (lectures)*	*Research*	*Kines. 040*
Fall	*Kines. 100, Bio. 428, Kines. 405 (040, 042)*	*Kines. 100, Bio. 428, Kines. 405, (040, 042)*	*Kines. 040, 405, (428, 100, 043)*

Plus graduate courses - Kines. 806, 807 and 816.

2. Contributions to teaching over last 3 years, e.g. development, redesigning of courses, writing of syllabus, preparation of interdisciplinary course material, etc.

a. *Redesigned Kinesiology 040 - 1973*
b. *Organized Departmental Review - 1973*
c. *Helped redesign and promulgate new organization of curriculum in light of review - 1973-74*
d. *Negotiating Interdisciplinary Professional Qualification with Assoc. of Remedial Gymnast and B.C.I.T. - 1973-74*

3. For last 3 years*, list total number of Masters [9] and Ph.D. [ ] students for whom you were senior supervisor. Please list student and thesis topic, most recent last.

a. *H. King 1970 Mech. & Met. Correlates of Muscular Work*
b. *J.E. Taunton 1971 Cardiovascular Change in Post MI Patients resulting from exercise therapy*
c. *G. Poole 1971 Effect of physical training on oxygen transport system in women*
d. *R. Taylor 1972 Energy cost and efficiency of treadmill walking at different rates.*
e. *K. Licorish 1972 Plasma catecholamines in Post MI Patients after exercise therapy.*

(cont'd)

4. For last 3 years*, list names of supervisory committees of which you were a member, but not senior supervisor.

a. *D. Sanderson Biomechanics 1973-74*
b. *B. Arsenault Biomechanics 1973-74*
c. *Ann Scott Biomechanics 1973-74*

* Please list activity in this category for previous years on separate page

3.

f. W. Woo 1972 Changes in aerobic and anerobic capacity after hypoxic acclimatization

g. N. Cvorkov 1972 Effect of high protein diet on cardiac and skeletal muscle.

h. N. Wilson 1973-4 Cold exposure, exhaustive exercise on serum insulin growth hormone and plasma catecholamines

i. Gordon McKay 1973-4 In progress

III SCHOLARSHIP

1. List Research Grants received during last 3 years*.

Source	Project Title	Amount	
B.C. Heart Foundation	*Exercise Therapy in Rehabilitation from Coronary Heart Disease*	*$15,000*	*1971-72*
N.R.C.	*Oxygen Toxicity Studies*	*$ 5,000*	*1971-72*
B.C. Heart Foundation	*As above*	*$15,000*	*1972-73*
N.R.C.	*As above*	*$ 5,000*	*1972-73*
B.C. Heart	*2,3-DPG X Propanolol*	*$ 9,500*	*1973-74*
N.R.C. (Operating Grant)	*Oxygen Toxicity Studies*	*$ 6,500*	*1973-74*
N.R.C. (Equipment Grant)		*$ 6,429*	*1973-74*

2. Current Interests and Activities.

Research

Adaptation to Exercise and Environmental Stress

Therapeutic Effect of Exercise in Disease States

Physical Working Capacity in Hyperoxia and Conditions of Hyperbarism

Athletic Evaluation

3. External Activities for last 3 years* (invited lectures, papers, refereeing, editorial activities, etc.).

Papers:

Banister, E.W., A.J. Davison, N.M.G. Bhakthan, C. Asmundson (1973) Biochemical Effects of Oxygen at High Pressure in Rats, Canadian J. Physiology and Pharmacology, 51:673-678.

Cvorkov, N., E.W. Banister (1974) Fine Structural Effects of High Protein Diet and Exercise in Rats, Am. J. Physiol. (in Press).

N.M.G. Bhakthan, E.W. Banister, A.J. Davison, C. Asmundson (1974) Finestructural Changes Due to OHP: I Skeletal and Cardiac Muscle In Proc. of 5th Int. Hyperbaric Cong. Eds. W.G. Trapp, E.W. Banister, A. Davison, P. Trapp, Burnaby

4. Publications during last 3 years. Indicate refereed journals.

See attached pages.

Papers (cont'd)

Simon Fraser University (In press).

Abstracts

Calvert, T.W., E.W. Banister (1973) A ~~systems~~ model of the human response to training, IEEE Proceedings, Sept. 20.2.

Banister, E.W., K. Licorish, J.E. Taunton (1973) Serum catecholamine depletion with exercise therapy in post MI patients. Am. College Sports Medicine 5, 70.

Miscellaneous

Banister, E.W., J. Buchanan, A. Chapman (1973) Evaluation and Training of Soccer Players. Int. Symposium Sports Medical Aspects of Soccer (In press).

Banister, 1974 'Ski Training,' Dept. of National Health Publication, Recreation Canada and Ski Alliance Association.

Banister, E.W. and N. Cvorkov, Effect of high-protein diet on rat heart mitochondria after exhaustive exercise. Am. J. Physiol. 226:996(4), 1974.

RECENT PUBLICATIONS:

Banister, E.W. (1973) The evaluation of athletic ability, Int. J. angew fur Arbeits Physiol. (submitted).

Banister, E.W., K. Licorish and J.C. Griffiths (1973) Plasma catecholamine changes in response to rehabilitation exercise therapy in post-myocardial infarction patients, Circulation (submitted).

Banister, E.W., A.J. Davison, N.M.G. Bhakthan and C. Asmundson (1973) Biochemical effects of oxygen at high pressure on rats. Canadian J. of Physiol. and Pharmacology (In press).

Banister, E.W., A.J. Davison, N.M.G. Bhakthan and C. Asmundson (1973) Effects of oxygen at high pressure on cellular ultrastructure and some glycolytic and citrate cycle enzymes. In: 5th Int. Symposium on Underwater Physiology, C.J. Lambertsen, Ed. (In press).

Banister, E.W. and J.C. Griffiths, (1972) Blood levels of adrenergic amines during exercise, J. App. Physiol. 33:674 - 676.

Tomanek, R.J. and E.W. Banister, (1972) Myocardial ultrastructure after acute exercise with special reference to transverse tubules and intercalated discs. Cardiovascular Research 6:671-679.

Banister, E.W. and J.E. Taunton (1971) A rehabilitation program after myocardial infarction, B.C. Med. Assoc. J., 13:1-4.

Banister, E.W., R.J. Tomanek, N. Cvorkov (1971) Ultrastructural modifications in rat heart; Responses to exercise and training, Am. J. Physiol., 220: 1935-1940.

Ross, W.D., R.W. Duncan, E.W. Banister (1971) Cardiovascular training of chronic unemployed middle-aged males. Canadian Welfare. 47:18-21.

Vyas, M.N., E.W. Banister, J.R. Morton, S. Grzybowski, (1971) Response to exercise in patients with chornic airways obstruction II: Effects of breathing 40% oxygen, Am. Rev. Resp. Dis., 103:44-50.

Vyas, M.N., E.W. Banister, S. Grzybowski, J.W. Morton, (1971) Response to exercise in patients with chornic airways obstruction I: Effects of exercise training. Am. Rev. Resp. Dis. 103:37-43.

Banister, E.W., Ch. 25, Energentics of Muscular Contraction in Frontiers of Fitness (1971). International Monograph, R.J. Shephard, Ed., Charles C. Thomas, 1-40.

Taunton, J.E., E.W. Banister, T.R. Patrick, P. Oforsagd, and W.R. Duncan (1970) Physical work capacity in hyperbaric environments and conditions of hyperoxia, J. Appl. Physiol. 28:421-427.

Banister, E.W., J.E. Taunton, T.R. Patrick, P. Oforsagd and W.R. Duncan (1970) Effects of oxygen at high pressure, at rest and during severe exercise. Respiration Physiology, 10:74-84.

Cartmel, J., E.W. Banister (1969) Physical working capacity of blind and deaf children. Canadian Journal of Physiol. and Pharmacol. 47:833-836.

Phillips, G., E.W. Banister, B. Philips (1969) The caloric cost of competitive figure skating. Journal of Sports Medicine and Physical Fitness, 9:89-103.

Duncan, W.R., W.D. Ross, E.W. Banister (1968) Heart rate monitoring as a guide to the intensity of an exercise program. B.C. Med. Assoc. J., 10:20-21.

Banister, E.W. (1968) The potentiating effect of low oxygen tension exposure on acid base balance during exhaustive work in humans. Int. Sym. Exercise Biochemistry, Brussels, Karger.

Banister, E.W., R.C. Jackson, J. Cartmel (1968) The potentiating effect of low oxygen tension exposure during training on subsequent cardiovascular performance. Int. Z. angew Physiol. 26:164-179.

Banister, E.W., S.R. Brown, H.R. Lowen, H.C. Nordan (1967) The Royal Canadian Air Force 5BX Program: A metabolic evaluation. Med. Serv. J. Canada 23:1237-1244.

Banister, E.W. A.D. Purvis (1968) Exercise electrocardiography in the horse. Am. J. Vet. Med., 4:1004-1008.

Banister, E.W., R.C. Jackson (1967) The effect of speed and load changes on oxygen uptake for equivalent power output in bicycle ergometry, Int. Z. angew Physiol. 24:284-290.

Banister, E.W., S.R. Brown, Ch. 10. The Relative Energy Requirements of Physical Activity in Exercise Physiology, H.B. Falls, Ed., New York: Academic Press, 1968, pp 267-322.

IV UNIVERSITY AND COMMUNITY SERVICE (since appointment to Faculty of Simon Fraser University)

1. Department:

Chairman, Kinesiology
Chairman, Dept. Tenure Committee
Member, Dept. Grad. Asmissions Committee
Dept. Space Committee

2. Faculty:

Rep. (Spring, 1974) Faculty Undergraduate Curriculum Committee

3. University:

Member of Senate
Member Senate Nominating Committee
Member Senate Committee on Non-Credit Instruction
Member University Search Committee for President
Member University Appointments Committee
Member Space Committee

4. Community:

Member, Multidisciplinary Advisory Board on Evaluation and Exercise - ongoing
1973-74 - 15 lectures to Lions Clubs, Rotary Clubs, Schools, etc.
Co-Chairman, Provincial Conference on Health & Fitness, December, 1973
Member, Steering Committee, Provincial Conference on Health & Fitness, Dec. 1973.
Annual Lecture to B.C. Heart Foundation, December, 1973.
2 Lectures to Teachers In Service Training Colloquium, Coquitlam School Board, November, December, 1973.
1 Lecture, Vancouver Public Library, November, 1973
2 In Service Teacher Training Practicums on Active Health Program, Coquitlam School District, October, November, 1973
1 Lecture, Capilano College Evening School, October, 1973

1 Lecture to North Shore YMCA during North Shore Health Week, September, 1973
Organizing Committee - 5th Int. Hyperbaric Congress, August, 1973
Editorial Chairman, Proceedings, 5th Int. Hyperbaric Congress, August, 1973
(to be published Feb., 1974) 2 volumes, 1000 pages of scientific articles
1 Lecture - Richmond Hospital Grand Rounds, May, 1973
1 Lecture - Dietician's Assoc., April, 1973
1 Lecture - Peach Arch Hospital Grand Rounds, January, 1973

Continuing Association with Lower Mainland Preventative Medical Centre
Medical Advisory Committee - Remedial Gymnasts Association
Medical Advisory Committee - Canadian Soccer Association
North Shore Committee for Action British Columbia
Member, Greater Van. Reg. Dis. Board Health & Public Protection Committee, 1973

Academic Lectures:

Paper	5th Int. Hyperbaric Congress, Vancouver, August, 1973
Paper	American College of Sports Medicine, Seattle, May, 1973
Paper	Int. Symposium Sports Medical Aspect of Soccer, October, 1973
Paper	Two Day Invited Seminar, Dept. of Kinesiology, Waterloo University, November, 1974.

SIMON FRASER UNIVERSITY

CURRICULUM VITAE

NAME: BHAKTHAN Gouardhan N.M.
surname given names

DATE: December 14, 1973

BACKGROUND INFORMATION

1. Department Kinesiology

2. Citizenship India - Landed Immigrant

3. Contract Status: Tenure: yes [ ]; no [X]

Rank: Instructor [ ]; Assistant Professor [ ];
Associate Professor [X]; Full Professor [ ].

4. Date of Birth 22 April 1935
day month year

5. Educational Background

Degrees	College, University, or Institution	Field of Study	Year
Bachelor	Kerala University, Trivandrum, Kerala, India	Zoology & Chem.	1955
Master	M.S. University of Baroda, Baroda, India	Animal Physiology	1958
Doctorate	" " " " "	Histo-physiology of muscle	1961
Other			

6. Academic, Research and Related Professional Experiences (list most recent last)

Position Held	Dates	Department	Institution
Govt. of India Research Scholar	1959-62	Zoology	M.S. University, Baroda
Senior Lecturer	1962-66	Zoology	M.S. University, Baroda
Fulbright Scholar	1966-68	Biol. Sciences	Northwestern Univ., Illinois
Research Associate	1968-70	Biol. Sciences	S.F.U.
Assist. Prof.	1971-72	Kinesiology	S.F.U.
Assoc. Prof.	1972-		

7. Awards, Citations, and Honors:

Gov't of India Senior Research Scholarship - 1959-62
Fulbright Fellowship 1966-68
Best Athlete of the year, M.S. University 1955-56
Represented the Univ. in Inter Univ. Soccer Tournament
Represented the Univ. in Inter Univ. VolleyBall Tournament

8. Membership in Learned Societies:

Canadian Federation of Biologists
Canadian Cell Biologists
Radiation Research Society (U.S.A.)
Muscle Disease Congress (International)

II TEACHING

1. List courses taught by semester over past 3 calendar years. If not teaching indicate professional activity in which engaged, e.g. research semester, sabbatical, leave of absence, etc.

	1971	1972	1973
Spring	Kines. 336, 806 (part)	Kines. 100 (part) 326, 336, 498, 806 (part)	Kines. 100 (part) Research
Summer	Kines. 100 (part) 336	Kines. 100 (part) 326 (spec. arrangement)	Kines. 100 (part), 496 Research
Fall	Kines. 100 (part), 326, 336, 806 (part)	Kines. 100 (part) 336 498, 806 (part) 811	Kines. 100 (part), 336, 496, 806 (part) 811

2. Contributions to teaching over last 3 years*, e.g. development, redesigning of courses, writing of syllabus, preparation of interdisciplinary course material, etc.

Set up a histology and histochemistry laboratory for Kines. 336 and Bio. 428 (Kines Part)
Reviewed undergraduate and graduate programs and revised the program as member of the committee (curriculum)
Improved laboratory facilities for Kines. 326 (working space, more models and slides)
Introduced electronmicroscope technique for undergrad and graduate research.
As a member of biochemistry committee, collaborated with others to develop a better undergraduate biochemistry syllubus
Acquired an electronmicroscope (used) for the department for teaching and research
Through N.R.C. and University money, obtained spectrophotometer and ultra centrifuge for graduate and faculty research.

3. For last 3 years*, list total number of Masters [3] and Ph.D. [ ] students for whom you were senior supervisor. Please list student and thesis topic, most recent last.

1. Lyle McWilliam, Radiation induced enzyme leakage from heart muscle 1972-
2. John Edyvean, Effects of morphine dependence on the endocrine glands 1972
3. Cheryl Taunton, Effects of high protein diet and exaustive exercise on tendon 1972
4. Shrindu Sandhu, Histo-physiology of aging Jan. 1974

4. For last 3 years*, list names of supervisory committees of which you were a member, but not senior supervisor.

1.	Nelson Thomson,	Ph.D. (Bio. Science)	71-72	S.S. Dr. J.S. Barlow
2.	N. Cvorkov	M.Sc. (Kines.)	71-72	S.S. Dr. E.W. Banister
3.	K. Licorish	M.Sc. (Kines.)	71-72	S.S. Dr. E.W. Banister
4.	T. Legault	M.Sc. (Kines.)	73	S.S. Dr. A. Davison
5.	B. Noble	M.Sc. (Kines.)	73	S.S. Prof. A. Chapman
6.	L. Beebe	M.Sc. (Bio. Science)	73	S.S. Dr. K.K. Nair
7.	V. Douglous	M.Sc. (Bio. Science)	73	S.S. Dr. J.S. Barlow

* Please list activity in this category for previous years on separate page.

III SCHOLARSHIP

1. List Research Grants received during last 3 years*.

Source	Project Title	Amount
N.R.C. 1971-72	Radiation Sensitivity in Animal tissues	$4,500
Presidents Research Grant	Cold acclimatization & cellular changes in rats	$1,200
N.R.C. 1972-73	Radiation & muscle physiology	$5,500
N.R.C. 1973-74	Radiation, enzyme leakage and peroxidation	$12,400
R.O.D.A. (M.R.C.)	Morphine dependence and histophysiology of endocrine glands in rats	$2,000
Presidents Research Grant	Satellite cells in muscle	$1,100

2. Current Interests and Activities.
   1. Electromicroscopic & biochemical changes in focally irradiated cardiac muscle.
   2. Cytochemical & finestructural changes in rat endocrine glands under chronic morphinization
   3. Effects of Vitamin E, Exercise and high protein diets on osteomuscular & musculotendinous regions in rats.
   4. Exploring the possibilities to work on heroin addicts (human) at B.C. Penitentiary.
   5. Cellular changes in rats exposed to oxygen at high pressure (collaborative research with Dr. E. Banister).

3. External Activities for last 3 years* (invited lectures, papers, refereeing, editorial activities, etc.).

   Invited Lectures: U.B.C. Home Economics - Muscle development and growth, 1971.
   U.B.C. Pharmacology - Narcotic analgesic & skeletal muscle morphology, 19
   Columbia University BioSci - Hormones and Reproduction, 1973

   S.F.U. Speakers Forum: Notre Dame School, Vancouver, 1972
   Templeton School, Vancouver, 1972
   Templeton School, Vancouver, 1973

   Papers Presented: Finestructural changes in muscle from rats run to exhaustion.
   Canadian Federation of Biologists, Toronto, 1971.

(cont'd)

4. Publications during last 3 years*. Indicate refereed journals.

   See attached sheet.

* Please list activities in this category for previous years on separate page.

3. (cont'd)

External Activities for last 3 years.

2. Heroin dependance and skeletal muscle finestructure in man. 2nd International Congress in Muscle Diseases, Perth, Australia, 1971.

3. Radiation induced myocardial nerosis, 4th International Congress in Histochemistry Cytochemistry, Kyoto, Japan, 1972

4. Cellular finestructure in rats exposed to oxygen under pressure I Muscle. Hyperbaric Congress, Vancouver, 1973.

4. Publications during last 3 years.

1. Bhakthan, N.M.G., K.K. Nair and J.H. Borden, Fine structure of the degenerating and regenerating flight muscle of Ips confusus. II. Regeneration. Can. J. Zool., 49:85-99, 1971.

2. Bhakthan, N.M.G. and L.I. Gilbert, Effects of epinephrine and lipase on the morphology of the insect fat body. Ann. Ent. Soc. Amer. 64:68-72, 1971.

3. Bhakthan, N.M.G., E.W. Banister and N. Cvorkov, Fine Structural changes in the cardiac and skeletal muscles of rat in exhaustive exercise. Proc. Can. Fed. Biol. Soc., 14:50, 1971.

4. Bhakthan, N.M.G. and L.I. Gilbert, Developmental cytophysiology of the fat body of the American silk moth. J. Zellforsch. 124:433-444, 1972.

5. Bhakthan, N.M.G. and K.K. Nair, Radiation induced fine structural damages in the somatic tissues of housefly. I. Flight muscles. Ann. Ent. Soc. Amer. 65:504-508, 1972.

6. Bhakthan, N.M.G. and K.C. Dharamraj, Radiation idnuced myocardial necrosis in mice; An electron microscopic study. Histochem. Cytochem. 4:571-572, 1972.

7. Bhakthan, N.M.G., Heroin dependence and skeletal muscle fine structure in man. Muscle Diseases: Proc. 2nd Intl. Congr. in Muscle Diseases, Held in Perth, Australia in November, 1971. Eds. B. Kakulas and J.H. Walton. Medica Excerpta Amsterdam, 809-826, 1973.

8. Bhakthan, N.M.G, E.W. Banister, A.J. Davison and C. Asmundson. Effect of oxygen at high pressure on cellular fine structure; I Striated Muscle. Presented 5th International Hyperbaric Congress, 52-64, 1973.

9. Banister, E.W., A.J. Davison, N.M.G. Bhakthan and C. Asmundson. Biochemical effects of oxygen at high pressure in rats. Can. J. Physiol. Pharmacol. 51:673-678, 1973.

10. Banister, E.W., N.M.G. Bhakthan, A.J. Davison, and C. Asmundson. Effects of oxygen at high pressure on metabolic acidosis cellular ultrastructure and some glycolytic and citric acid cycle enzymes. Proc. 5th Int. Congr. Underwater Physiology. Bahamas, August, 1972 (In press).

Previous Publications:

11. Nair, K.K. and N.M.G. Bhakthan, Gamma-radiation induced fine structural damages in the somatic tissues of housefly. Proceedings of the 4th International Congress in Radiation Research, 4:43, 1970.

Bhakthan, N.M.G., J.H. Borden and K.K. Nair, Fine structure of degenerating and regenerating flight muscles of Ips confusus. I. Degeneration J. Cell Sci., 6:807-820, 1970.

13. Bhakthan, N.M.G. and L.I. Gilbert, An autoradiographic and biochemical study of palmitate incorporation in the insect fat body. J. Insect Physiol., 16: 1783-1796.

14. Bhakthan, N.M.G. and L.I. Gilbert, Studies in lipid transport in tobacco moth. Comp. Biochem. Physiol., 33:705-706, 1970.

15. Nair, K.K. and N.M.G. Bhakthan, Ultrastructural damage in the flight muscles of gamma-irradiated housefly, Int. J. Radiat. Biol., 16:396-399, 1969.

16. Bhakthan, N.M.G., K.K. Nair and J.H. Borden, Occurrence of a fat body layer around the testis of Ips confusus. Ann. Ent. Soc. Amer., 62:1495-1496, 1969.

17. Bhakthan, N.M.G. and L.I. Gilbert, Effects of some vertebrate hormones on lipid mobilization in fat body. Gen. Comp. Endocrinol., 11:186-197, 1968.

18. Bhakthan, N.M.G., Certain biochemical properties of the insect muscle lipase. J. Anim. Morphol. Physiol., 11:285-293, 1964.

19. Bhakthan, N.M.G. and J.C. George, A quantitative study of succinic dehydrogenase in the muscles of a few representative types of insects. J. Anim. Morphol. Physiol., 10:156-161, 1963.

20. Bhakthan, N.M.G. and J.C. George, Intracellular distribution of lipase and succinic dehydrogenase in the flight muscle of the beetle, Heliocopris bucephalus. J. Anim. Morphol. Physiol., 10:146-155. 1963.

21. George, J.C. and N.M.G. Bhakthan, The in vitro lipase activity and oxidation of butyrate by the honey bee flight muscle homogenate. J. Insect Physiol., 6:311-315, 1963.

22. Bhakthan, N.M.G., A histochemical study of certain enzymes in the thoracic muscles of the beetle, Heliocopris bucephalus, J. Anim. Morphol. Physiol., 9:142-151, 1962.

23. George, J.C. and N.M.G. Bhakthan, Lipase activity in the slow and fast contracting leg muscles of the cockroach. Nature, 198:4800, 356, 1961.

24. George, J.C. and N.M.G. Bhakthan, Fibre diameter and certain enzyme concentrations in the flight muscles of some moths. J. Anim. Morphol. Physiol., 7:141-149, 1960.

25. George, J.C. and N.M.G. Bhakthan, Lipase activity in the thoracic muscles of the beetle, Heliocopris bucephalus. Naturwissenschaften, 24:602-603, 1960.

26. George, J.C. and N.M.G. Bhakthan, A study on the fibre diameter and certain enzyme concentrations in the flight muscles of some butterflies. J. Exp. Biol., 37:308-315, 1960.

IV UNIVERSITY AND COMMUNITY SERVICE (since appointment to Faculty of Simon Fraser University)

1. Department:

Undergraduate Curriculum Committee	1971 -
Graduate Curriculum Committee	1971 -
Space Committee	1971 -
Promotion and Tenure Committee	1971 -

2. Faculty:

Biochemistry Committee (Science)	1971 -

3. University:

Safety Committee	1972 -
Animal Care Committee	1971 -
University Affairs Committee (Faculty Association)	1973 -
Radiation Safety Committee	1971 -

4. Community:

Guidance and Consultance for elementaly school health program (Vanier School Coquitlam)
Talk to B.C. Penitentiary (New Westminster)
Drug groups
Involved in the preparation of a 30 minute T.V. program (University of the Air, CTV) to be filmed before March, 74.

Invited to present papers in the following International Congresses

Eighth International Congress on electronmicroscopy, Canberra, Australia, Aug., 1974
Sixth International Congress on Radiation Research, Seattle, June, 1974
Fourth International Congress on Muscle Diseases, New Castle-upon-Tyne, U.K., Sept. '74

SIMON FRASER UNIVERSITY

CURRICULUM VITAE

NAME: CALVERT Thomas W.
surname given names

DATE: December 13, 1973

BACKGROUND INFORMATION

1. Department Kinesiology

2. Citizenship U. S.

3. Contract Status: Tenure: yes [ ]; no [X]

Rank: Instructor [ ]; Assistant Professor [ ]; Associate Professor [X]; Full Professor [ ].

4. Date of Birth 12 (day) 4 (month) 1936 (year)

5. Educational Background

Degrees	College, University, or Institution	Field of Study	Year
Bachelor	University College, London, England	Electrical Engineer	1957
Master	Wayne State University, Detroit, Mich.	" "	1964
Doctorate	Carnegie Institute of Technology	" "	1967
Other	Ontario College of Education	H.S. Teaching Cert.	1963

6. Academic, Research and Related Professional Experiences (list most recent last)

Position Held	Dates	Department	Institution
Engineer	1957-60	Engineering	Imperial Chemical Industries Ltd
Engineer	1960-61	Instrumentation	Canadair Ltd.
Lecturer	1961-64	Elect. Technology	West. Ontario Instit. of Tech.
Instructor	1964-65	Elect. Eng.	Wayne State Univ.
Chairman, Biotech. Program	1969-72	Electrical Engineering and	Carnegie - Mellon
Assist. Prof.	1967-70		University
Assoc. Prof.	1970-72	Bioengineering	
Associate Prof.	1972-	Kinesiology	Simon Fraser University

7. Awards, Citations, and Honors:

8. Membership in Learned Societies:

Sigma Xi
Institute of Electrical and Electronics Engineers
American Association for the Advancement of Science
Society of Neuroscience
Canadian Medical and Biological Engineering Society
Canadian Society for the Computational Studies of Intelligence

II TEACHING

1. List courses taught by semester over past 3 calendar years. If not teaching indicate professional activity in which engaged, e.g. research semester, sabbatical, leave of absence, etc.

	1971	1972	1973
Spring			Kines. 326, Kines. 813 Kines. 100 (co-ord)
Summer			Research Kines. 100 (contrib)
Fall		Kines. 040 Kines. 100 (contribution)	CMPT. 290, Kines. 100 (co-o Kines. 496/805

2. Contributions to teaching over last 3 years*, e.g. development, redesigning of courses, writing of syllabus, preparation of interdisciplinary course material, etc.

Developed the following courses:
Kines. 442-3 - Biomedical Systems
CMPT. 290-3 - Intro. to Digital Systems
CMPT. 291-3 - Analogue and Digital Circuits
CMPT. 390-3 - Digital Circuits and Systems
Phys. 333-4 - Intro. to Instrumentation in the Life Sciences

3. For last 3 years*, list total number of Masters [0] and Ph.D. [7] students for whom you were senior supervisor. Please list student and thesis topic, most recent last.

F. Meno, "Neural Systems Modelling Applied to the Cerebellum," 1971.

D.C. Bellavia, "A Prosthetic Reading Aid for the Blind," 1971.

K.K. Kelly, "Feature Enhancement of Vecorcardiograms by Linear Normalization," 1972.

A.C. Sanderson, "Stochastic Models of Information Processing in the Nervous System," 197

K-C. Yang, "Modelling Studies of the Hippocampus," 1972.

R.C. Wang, "Monitoring Respiration with the VCG," 1972.

W.F. Bennett, "Special Arrangement Ph.D. "The Maximum Entropy Approach to Scalp Potentia

4. For last 3 years, list names of supervisory committees of which you were a member, but not senior supervisor.

B. Wilson: M.Sc.(Kines.)
D. Sanderson: M.Sc.(Kines.)
A. Forget: M.Sc.(Kines.)
Z. Wolofsky: M.Sc.(Kines.)

* Please list activity in this category for previous years on separate page.

III SCHOLARSHIP

1. List Research Grants received during last 3 years*.

Source	Project Title	Amount
N.R.C.	Models of Motor Control in Man 72-3	$6,000
	73-4	$5,000
Applied for:		
N.R.C.	Models of Motor Control in Man 74-5	$13,835
M.R.C.	Models for the Prescription of Exercise Therapy in Cardiac Rehab. 74-5	$11,235
D.R.B.	Studies of Nonlinear Data Structures with Interactive Computer Graphics 74-5	$11,080

2. Current Interests and Activities.

1. Systems models of physiological phenomena, particularly the motor control system in man and the human response to exercise.

2. Pattern recognition and artificial intelligence - particularly in the use of interactive computer graphics for feature extraction.

3. External Activities for last 3 years* (invited lectures, papers, refereeing, editorial activities, etc.).

1972 - Associate Editor for Pattern Recognition and Artificial Intelligence, IEEE Computer Transactions (this involves 40 - 50 papers per year)

Invited Papers, Talks, etc.

Calvert, T.W., "Some studies of intrinsic dimensionality with interactive graphics," Proc. 1973 Symposium on Adaptive Processes. pp. 663-667.

Chairman and Organizer, Session on "Modelling and Indentification of Physiological Systems," at IEEE Conference on Decison and Control, New Orleans, Dec., 1972.

4. Publications during last 3 years*. Indicate refereed journals.

See attached

See attached page.

Please list activities in this category for previous years on separate pages.

Curriculum Vitae - Thomas W. Calvert

PUBLICATIONS

Books:

Young, T.Y. and T.W. Calvert, Classification, Estimation and Pattern Recognition, American Elsevier, 1973 (in press).

Journal Articles:

Wang, R.C. and T.W. Calvert, "A model to predict respiration from the vectorcardiogram," Annals of Bioengineering, (in press).

Sanderson, A.C., W.M. Kozak and T.W. Calvert, "Distribution Coding in the Visual Pathway," Biophysical Journal, 13:218-244, March, 1973.

Calvert, T.W. and F. Meno, "Neural Systems Modelling Applied to the Cerebellum," IEEE Trans. on Systems Man and Cybernetics, SMC-2, pp 363-374, July, 1972.

Kelly, K.K., T.W. Calvert, R.L. Longini and J.P. Brown, "Feature Enhancement of Vectorcardiograms by Linear Normalization," IEEE Trans. on Computers, C-20, 1109-1111, Sept. 1971.

Kelly, K.K. and T.W. Calvert, "Comments on 'The Removal of Coherent Noise from Short Digitized Records'," IEEE Trans. on Bio. Med. Eng., BME-17, 357-358, October, 1970.

Calvert, T.W. and K.K. Kelly, "The Removal of Coherent Noise from Short Digitized Records," IEEE Trans. on Biomedical Engineer., BME-17, 78, January, 1970.

Calvert, T.W., "Nonorthogonal Projections for Feature Extraction in Pattern Recognition," IEEE Trans. on Computers, C-19, 447-452, May, 1970.

Calvert, T.W. and T.Y. Young, "Randomly Generated Nonlinear Transformation for Pattern Recognition," in IEEE Trans. on Systems Science and Cybernetics, SSC-5, 266-273, October, 1969.

Bugliarello, G., T. W. Calvert, T. G Fox, T. K. Hung, M. H. Weissman, "A Study o Health Care in Western Pennsylvania," Proceedings, IEEE, 57, 1853-1869, Nov. 196

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Curriculum Vitae - Thomas W. Calvert

PUBLICATIONS

Books:

Young, T.Y. and T.W. Calvert, Classification, Estimation and Pattern Recognition, American Elsevier, 1973 (in press).

Journal Articles:

Wang, R.C. and T.W. Calvert, "A model to predict respiration from the vectorcardiogram," Annals of Bioengineering, (in press).

Sanderson, A.C., W.M. Kozak and T.W. Calvert, "Distribution Coding in the Visual Pathway," Biophysical Journal, 13:218-244, March, 1973.

Calvert, T.W. and F. Meno, "Neural Systems Modelling Applied to the Cerebellum," IEEE Trans. on Systems Man and Cybernetics, SMC-2, pp 363-374, July, 1972.

Kelly, K.K., T.W. Calvert, R.L. Longini and J.P. Brown, "Feature Enhancement of Vectorcardiograms by Linear Normalization," IEEE Trans. on Computers, C-20, 1109-1111, Sept. 1971.

Kelly, K.K. and T.W. Calvert, "Comments on 'The Removal of Coherent Noise from Short Digitized Records'," IEEE Trans. on Bio. Med. Eng., BME-17, 357-358, October, 1970.

Calvert, T.W. and K.K. Kelly, "The Removal of Coherent Noise from Short Digitized Records," IEEE Trans. on Biomedical Engineer., BME-17, 78, January, 1970.

Calvert, T.W., "Nonorthogonal Projections for Feature Extraction in Pattern Recognition," IEEE Trans. on Computers, C-19, 447-452, May, 1970.

Calvert, T.W. and T.Y. Young, "Randomly Generated Nonlinear Transformation for Pattern Recognition," in IEEE Trans. on Systems Science and Cybernetics, SSC-5, 266-273, October, 1969.

(cont'd . . .)

3.(cont'd)

Wang, R.C. and T.W. Calvert, "A Model to Predict Respiration from VCG Measurement," Proc. IEEE Conf. on Decion and Control, Vol. 72-CHO-705-4 SCS, December, 1972.

Conference Papers (Reviewed):

Calvert, T.W. and E.W. Banister, "A systems model of the human response to training," Proc. 26th Conf. on Engineering in Medicine and Biology, 1973.

Calvert, T.W. and E.W. Banister, "The application of systems theory to the prediction of athletic performance," Proc. Amer. College Sports Medicine Annual Meeting, 1973.

Calvert, T.W. and K-C Yang, "Theoretical and computer simulation studies of rhythmic activity in the hippocampus," Proc. Neuroscience Society Annual Meeting, 1973.

Sanderson, A.C., T.W. Calvert and K.C. Yang, "Interference Phenomena in the Hippocampal Cortex," Proc. 1972 International Congress on Cybernetics and Systems, Gordon and Breach, 1973 (in press).

Sanderson, A.C. and T.W. Calvert, "Distribution Coding in Neural Networks," Proc. 1972 International Conf. on Cybernetics and Society, (IEEE), Vol. 72-CHO-647-8, pp 72-77, October, 1972.

Sanderson, A.C., W.M. Kozak and T.W. Calvert, "Spike Interval Distribution Coding in the Mammalian Visual Pathway," Proc. 2nd Ann. Meeting, Society for Neuroscience, p 258, October, 1972.

Sanderson, A.C. and T.W. Calvert, "The Determination of Blood Velocity from the Decay Time of a Membrane Pressure Transducer," Proc. 24th ACEMB, Las Vegas, Nov. 1971.

Yang, K.C. and T.W. Calvert, "A Modelling Study of Intrinsic Rhythmicity in the Hippocampus," Proc. 24th ACEMB, Las Vegas, November, 1971.

Calvert, T.W., F. Meno and K.C. Yang, "Spatial Information Processing in the Brain," Proc. 1971 Systems Man and Cybernetics Group Annual Symposium, Los Angeles, Calif., October, 1971.

Calvert, T.W. and F. Meno, "Models of Infomration Processing in the Cerebellum," Proc. of IEEE Science and Cybernetics Conference, Pittsburgh, Pa., November, 1970.

Calvert, T.W. and J.W. Hart, "Separating Heart and Breathing Impedance Signals," Proc. of 23rd ACEMB, p 333, Washington, D.C., November, 1970.

Calvert, T.W. and F. Meno, "The Implications of a Cerebellar Model for the Mammalian Response to Movement," Proceedings of Biodynamic Models Symposium, (Dayton, Ohio, October, 1970), pp 541-552. Report #AMRL-TR-71-29.

Calvert, T.W. and K.K. Kelly, "The Removal of 60 Hz Noise from Short Digitized Records," Proceedings of the Annual Conference on Engineering in Medicine and Biology, Houston, Texas, 10, November, 1968.

Calvert, T.W., "Projections of Multidimensional Data for Use in Man-Computer Graphics, AFIPS Conference Proceedings - 1968 FJCC, 33, 227-231, 1968.

(cont'd . . .)

Curriculum Vitae - Thomas W. Calvert

Conference Papers (cont'd)

Calvert, T.W., J.P. Brown, D.B. Francis and R.L. Longini, "Representation of Physiological Measurements to Facilitate Diagnosis," Proceedings of the Annual Conference on Engineering in Medicine and Biology, Boston, Mass., 9, November, 1967.

Calvert, T.W., "Randomly Generated Non-Linear Transformations for Pattern Recognition," Ph.D. Thesis, Carnegie Institute of Technology, Pittsburgh, Pa., 1967.

Calvert, T.W. and T.Y. Young, "Heuristically Determined Nonlinear Transformations for Pattern Recognition," Proceedings, First Annual Princeton Conference on Information Sciences and Systems, Princeton Univ., N.J. 1, 264, 1967.

Sanderson, A.C. and T.W. Calvert, "Discrimination of neural coding parameters in the auditory system," in Proceedings of 1973 Systems, Man and Cybernetics Conference, Boston, November, 1973.

Calvert, T.W. and K-C. Yang, "Theoretical and computer simulation studies of rhythmic activity in the hippocampus," Proceedings of 1973 Neurosciences Conference, San Diego, November, 1973.

IV UNIVERSITY AND COMMUNITY SERVICE (since appointment to Faculty of Simon Fraser University)

1. Department:

1.	Editor, Kinesiology Newsletter	1972 -
2.	Chairman, Graduate Program Committee	1973 -
3.	Departmental Tenure Committee	1972, 1973

2. Faculty:

1.	Search Committee, Dean of Interdisciplinary Studies,	1973

3. University:

1.	Senate Committee on Graduate Studies	1973 -
2.	Biophysics Committee	1973
3.	N.R.C. Scholarship Committee	1973 -

4. Community:

GVRD.	Health and Public Protection Policy Committee	1973

SIMON FRASER UNIVERSITY

CURRICULUM VITAE

NAME: CHAPMAN Arthur E.
surname given names

DATE: December 13, 1973

I BACKGROUND INFORMATION

1. Department Kinesiology

2. Citizenship British

3. Contract Status: Tenure: yes [ ]; no [x]

Rank: Instructor [x]; Assistant Professor [ ];
Associate Professor [ ]; Full Professor [ ].

4. Date of Birth 25 Sept. 1941
day month year

5. Educational Background

Degrees	College, University, or Institution	Field of Study	Year
Bachelor	Loughborough (England) D.L.C.	Physical Ed.	1963
Master	Ohio State (U.S.A.) M.A.	Physical Ed.	1966
Doctorate			
Other	London (M.Phil)	Biomechanics	1968

6. Academic, Research and Related Professional Experiences (list most recent last)

Position Held	Dates	Department	Institution
High School Teacher	1963-65	Physical Education	Islington Green School London, England
Grad. Teach. Ast.	1965-66	Physical Education	Ohio State University.
Research Assist.	1966-68	Anatomy (Biomech. Unit)	Royal Free Hospital, School of Med., Univ. of London, England
Lecturer	1968-70	Physical Education	Loughborough College
Assistant Professor	1970-	Kinesiology	Simon Fraser University

7. Awards, Citations, and Honors:

8. Membership in Learned Societies:

Physical Education Assoc. of Great Britain and N. Ireland
British Association of Sports Medicine
International Society of Electromyographic Kinesiology
International Society of Biomechanics

I TEACHING

1. List courses taught by semester over past 3 calendar years. If not teaching indicate professional activity in which engaged, e.g. research semester, sabbatical, leave of absence, etc.

	1971	1972	1973
Spring	Kines. 100	Research	Research plus Kines. 496, 813, Bio. 428
Summer	Research	Kines. 401, 100 (team teach) 803	Kines. 043, 420 100 (team teach)
Fall	Kines. 043, 100, 401, 496, 801, 806	Kines. 401, 043, 806, 813	Kines. 401, 043, 806, 100

2. Contributions to teaching over last 3 years*, e.g. development, redesigning of courses, writing of syllabus, preparation of interdisciplinary course material, etc.

Kines. 401 has been completely redesigned as apparatus has been both purchased and built.

Kines. 420 has been introduced as "Mechanical Properties of Tissues" and is awaiting notification as Kines. 402.

Kines. 803, taught in 1972-2, was concerned with the topic "Electromyography". It is intended that this be repeated at regular intervals on a shared basis with Dr. T. Calvert.

A number of special topics Biomechanics (Kines. 813) have been covered, each with a different emphasis.

3. For last 3 years*, list total number of Masters [ ] and Ph.D. [ ] students for whom you were senior supervisor. Please list student and thesis topic, most recent last.

A. Scott: The effects of visual and auditory feedback on the ability to control a spastic muscle.

B. Arsenault: The EMG as a measure of the effectiveness of the technique of P.N.E. in physical therapy.

D. Sanderson: The effect of change in length on the force:velocity curve of human muscle in vivo.

4. For last 3 years*, list names of supervisory committees of which you were a member, but not senior supervisor.

R. Taylor, M.Sc.
C. Taunton, M.Sc.

* Please list activity in this category for previous years on separate page.

III SCHOLARSHIP

1. List Research Grants received during last 3 years*.

Source	Project Title	Amount
N.R.C.	The effect of training and disuse on the mechanical characteristics of rat muscle and tendon	$5,000
President Research		$1,020
Presidents Research		$ 480

2. Current Interests and Activities.

Validation and modification of mechanical models of human muscle by means of direct observation in vivo. Investigation of the relation of quantitative electromyography to mechanical aspects of muscles.

Changes in the mechanical properties of muscles and tendons during exercise and atrophy in rats.

The EMG as a measure of the effectiveness of the technique of proprioceptive neuromuscular facilitation in physical therapy.

Synthesis and quantification of E.M.G. waveforms.

3. External Activities for last 3 years* (invited lectures, papers, refereeing, editorial activities, etc.).

Consultant in Biomechanics, Lower Mainland Preventative Medical Centre, Vancouver, B.C.

Coquitlam Schools Experimental Course In Kinesiology (Health Science), 1970-73.

Paper presented to surgeons, Inst. Orthopaedics, Stanmore, England, March, 1972, on the development and use of models in biological systems.

4. Publications during last 3 years*. Indicate refereed journals.

See attached sheet.

* Please list activities in this category for previous years on separate page

4. Publications for last 3 years.

Chapman, A.E. (In Press) The relation between length and the force-velocity curve of a single equivalent linear muscle at the hand during flexion of the elbow. 1973 Fourth Int. Seminar Biomech., Penn State University.

Troup, J.D.G. and Chapman, A.E. (1972). Changes in the electromyogram during fatiguing activity in the muscles of the spine and hips: the analysis of postural stress. Electromyography, 12, 347-365.

Troup, J.D.G. and Chapman, A.E. (1972). Analysis of the waveform of the electromyograph using the analyser described by Fitch (1967). Electromyography, 12, 325-346.

Chapman, A.E. (1972). Some observations on the mechanics of skiing. Appendix F in "Kinanthropometry and young skiers," presented by McKim, D. at National Meeting of Canadian Ski Assoc., Edmonton, July.

Previous Publications:

Chapman, A.E. (1970). Measurement of Muscular Strength, British J. Sports Med. 5, 44-49.

Chapman, A.E. and Troup, J.D.G. (1970). Prolonged activity of lumbar erectores spinae. An electromyographic and dynamometric study of the effect of training. Ann. Phys. Med., 10, 262-269.

Chapman, A.E. and Troup, J.D.G. (1969). The effect of increased maximal strength on the integrated electrical activity of lumbar erectores spinae. Electromyography, 9, 263-280.

UNIVERSITY AND COMMUNITY SERVICE (since appointment to Faculty of Simon Fraser University)

1. Department:

Undergraduate Advisor

Undergraduate Curriculum Committee

Space Committee

Past Library Representative

2. Faculty:

3. University:

Interdisciplinary Faculty representative on Science Undergraduate Curriculum Committee

4. Community:

Consultant in Biomechanics, Lower Mainland Preventative Centre, Vancouver, B.C.

Coquitlam Schools Experimental Course in Kinesiology (Health Science), 1970-73.

Lecture to Templeton Sec. School on mechanical appreciation of athletics.

Consultant on mechanics of skating with Miss K. Magnussen and coach before World Championships.

SIMON FRASER UNIVERSITY

CURRICULUM VITAE

NAME: *DAVISON* (surname) *Allan J.* (given names)

DATE: _____

I BACKGROUND INFORMATION

1. Department *Kinesiology*

2. Citizenship *South African*

3. Contract Status: Tenure: yes [x]; no []

   Rank: Instructor []; Assistant Professor []; Associate Professor [x]; Full Professor [].

4. Date of Birth *8th* (day) *July* (month) *1936* (year)

5. Educational Background

Degrees	College, University, or Institution	Field of Study	Year
Bachelor	*University of Cape Town, South Africa*	*Chemistry*	*1957*
Master	*Rutgers University, New Jersey*	*Physiology and Biochemistry*	*1962*
Doctorate	*Rutgers University, New Jersey*	*Biochemistry*	*1964*
Other	*Bioenergetics Lab., University of Oregon Medical School*	*Post-Doctoral Fellow*	*1970*

6. Academic, Research and Related Professional Experiences (list most recent last)

Position Held	Dates	Department	Institution
Jr. Lecturer	*1958-60*	*Physio. Chemistry*	*Univ. of Cape Town Medical Sch*
Res. Fellow	*1960-64*	*Biochemistry*	*Rutgers, New Jersey*
Res. Assoc.	*1969-70*	*Biochemistry*	*Univ. of Oregon Med. School*
Sen. Lecturer	*1964-71*	*Physio. Chemistry*	*Univ. of Cape Town Medical Sch*
Sup. MRC Group	*1965-71*	*Oxygen Metabolism*	*So. African MRC*
Assoc. Prof. Biochemist	*1971-*	*Kinesiology*	*Simon Fraser University*

7. Awards, Citations, and Honors:

8. Membership in Learned Societies:

Sigma Xi
Biochemical Society (London)
American Society of Biological Chemists,
Canadian Biochemical Society
Society for Neuroscience (B.C. Chapter)
New York Academy of Sciences
Royal Society of South Africa
International Neurosciences Society

II TEACHING

1. List courses taught by semester over past 3 calendar years. If not teaching indicate professional activity in which engaged, e.g. research semester, sabbatical, leave of absence, etc.

	1971	1972	1973
Spring			*Kin. 330, 815, 803, 806(co-or Bio. 428(contr.) K. 100 (cont*
Summer			*Research Semester K. 100 (contri)*
Fall			*Research Semester, K. 100 (contri), K. 806 (contri)*

2. Contributions to teaching over last 3 years*, e.g. development, redesigning of courses, writing of syllabus, preparation of interdisciplinary course material, etc.

Supervised development of proposed Ph.D. program in Kinesiology.

Proposed revision of graduate course offerings in the M.Sc.(Kines) program.

Developed "Human Energy Metabolism" course in Biochemistry Program

Developed proposed Nutrition course in the Kinesiology Program.

3. For last 3 years*, list total number of Masters [3] and Ph.D. [ ] students for whom you were senior supervisor. Please list student and thesis topic, most recent last.

Barry Wilson. Effects of pro-oxidants and anti-oxidants on electrophysiological properties of nerves

Anne Popma. Role of vitamins in promoting or retarding the perioxidation of lipids in membranes.

N.A. Legault. Effects of neurotransmitters and related substances on axoplasmic flow mechanisms in nerve.

4. For last 3 years*, list names of supervisory committees of which you were a member, but not senior supervisor.

J. Edyvean
N. Wilson
D. Sanderson
L. MacWilliam
J. Taunton
R. Smith
R. Taylor
A. Scott

* Please list activity in this category for previous years on separate page.

CURRICULUM VITAE

III SCHOLARSHIP

1. List Research Grants received during last 3 years*.

Source	Project Title	Amount	
Canadian Medical Research Council	*Cellular Mechanisms of Oxygen Toxicity*	*$28,000* *$13,400*	*1971-73* *1973-74*
President's Fund	*Free radical damage to muscle and nerve*	*$ 720*	*1972-73*
Canadian Medical Research Council	*Cellular Mechanisms of Oxygen Toxicity*	*$ 8,800*	*1974-75*

2. Current Interests and Activities.

Cellular mechanisms of oxygen toxicity

Mechanisms of radiation damage, and some novel radioprotective agents

Free radical mechanisms in brain damage due to inborn metabolic disorders

Structural energetic relationships of mammalian cytochromes

Research on energy metabolism and toxicity of oxygen, nutrition and aging

3. External Activities- *Past year only* (invited lectures, papers, refereeing, editorial activities, etc.).

Editor, papers submitted to 5th International Hyperbaric Congress and of 2 volumes of the published proceedings of the Conference.

Member of Education Sub-committee of American Chemical Society Handbook revision

4. Publications during last 3 years*. Indicate refereed journals.

See attached list.

Please list activities in this category for previous years on separate pag

3.

(b) Invited Lectures

Jan. 73	W. Vancouver Kiwanis Club: Food pharmacology
Feb. 73	CKVN radio program contribution on Nutrition and weight control
Apr. 73	Chemistry Seminar S.F.U.: Aromatic hydroxylations
Mar. 73	Topics in Chemistry Class, S.F.U. Collagen chemistry and aging
Aug. 73	Chairman interdisciplinary session of the Pacific Slope Biochemistry Conference
Sep. 73	Burnaby Rotary Club, Drugs and poisons in food
Nov. 73	Coquitlam TOPS Club: Appetite regulatory mechanisms
Nov. 73	Physics Seminar Class, S.F.U., Free radical damaage to membranes

PUBLICATIONS - in books and refereed journals (last 5 years):

1. Kaminsky, L.S., and A.J. Davison, Thermodynamics of the opening of the heme crevice of cytochrome c. Biochemistry 12:12 (1973).

2. Banister, E.W., A.A. Davison, N.M.G. Bhakthan and C. Asmundson, Biochemical effects of oxygen at high pressure in rats. Canad. J. Physio. Pharm. (in the press) (1973).

3. Davison, A.J., and L.S. Kaminsky, Involvement of oxygen in radiation damage. Chapter in book, 5th Intl Hyperbaric Congress. (in the press) (1973).

4. Davison, J.J., J. Taunton, and E. Banister, Rate limiting processes in energy metabolism. Chapter in book, Canadian Association of Sports Sciences. (in the press) (1973).

5. Davison, A.J. Rapid calculation of first order rate constants. J. Chem. Ed. 50, 472 (1973)

6. Kaminsky, L.S., P. Burger, D. Helfet, and A.J. Davison, Carbon Monoxide as a probe for conformational changes of ferrocytochrome c. Biochemistry, 11:3702 (1972).

7. Kaminsky, L.S., M.J. Byrne, A.J. Davison, Iron ligands in different forms of cytochrome c: The 620 nm band as a probe. Archiv. Biochem. Bioph. 150:355 (1972).

8. Davison, A.J., Coupled conformational and electrostatic effects in the contraction of muscle: an electrokinetic hypothesis. Physiol. Chem. and Phys. 4:197 (1972).

9. Banister, E.W., A.J. Davison, N.M.G. Bhakthan and C. Asmundson. Effects of oxygen at high pressure on cellular ultrastructure and some glycolytic and citrate cycle enzymes. 5th International Symposium on Underwater Physiology (Freeport, 1972) p. 78 (in the press).

10. Kaminsky, L.S. and A.J. Davison. The autoxidation of cytochrome c: Alcohols as possible models of the hydrophobic mitochondrial environment. So. Afr. Med. J. 45, 144-147 (1971).

11. Davison, A.J. and L.S. Kaminsky. Thermodynamic aspects of cytochrome c function. So. Afr. Med. J., 45 144-147 (1971).

12. Davison, A., R. Hamilton, L. Kaminsky. A thermodynamic comparison of various modes of oxidation of ferrocytochrome c. FEBS Letters, 19:19 (1971).

Publications (cont'd)

13. Davison, J.A. and L.G. Hulett. Consecutive oxidation and reduction of ferrocytochrome c in the presence of hydrogen peroxide and a copper histidine complex. Biochim. et Biophys. Acta. 226:313 (1971).

14. Kaminsky, L., R. Wright and A. Davison. Effects of alcohols on the rate of autoxidation of ferrocytochrome c. Biochemistry, 10:458 (1971).

15. Davison, A. and W.W. Wainio. Implications of the kinetic behavious of a soluble cytochrome oxidase preparation. In: Protein Metabolism and Biological Function, p. 220, Rutgers University Press, (New Jersey, 1970).

16. Kaminsky, L. and A.J. Davison. Effects of organic solvents on cytochrome c. FEBS Letters, 3:338 (1969).

17. Davison, A.J. Catalysis of the oxidation of ferrocytochrome c bu a copper histidine complex. J. Biol. Chem. 243:6064 (1968).

18. Davison, A. and R. Hamilton. Copper promoted oxidation of cytochrome c. Archives Biochem. Biophys. 126:228 (1968).

19. Davison, A. and W.W. Wainio. Oxygenated cytochrome oxidase. J. Biol. Chem. 243:5923 (1968).

PRESENTATIONS WITH PUBLISHED ABSTRACTS: (past 5 years)

1. Davison, A.J. and L.S. Kaminsky. Involvement of oxygen in radiation damage. Proc. 5th International Hyperbaric Congress. (1973) (in the press).

2. Davison, A.J., Does the destruction of catalase by ascorbate involve oxygen radicals? Proc. 9th Intl. Congress of Biochemistry (in the press) (1973).

3. Davison, A.J. and S.F. Khoo, Haemolysis and methaemoglobin formation induced by phenolic and enediol pro-oxidants. Proc. Canad. Fed. Biol. Soc. (in the press) (1973).

4. Davison, A.J., T. Calvert, J. Taunton and E. Banister. Rate limiting processes in energy metabolism. Abstracts of Canad. Assoc. Sports Sci., p. 15, (1972).

5. Reid, K.G., and A.J. Davison. The presence and absence of general acid catalysis in the destruction of cytochromes by hydrogen peroxide. Proc. 1972 Pacific Slope Biochem. Conf. p. 51.

6. Davison, A.J., K.G. Reid and L.S. Kaminsky. Identification of superoxide ions in the action of cellular metabolites causing anomalous reductions of cytochrome c. Proc. 1972 Pacific Slope Biochem. Conf. p. 50.

Presentations (cont'd)

7. Kaminsky, L.S., A.J. Davison. Autoxidation of cytochrome c., - non-aqueous solvents as possible models of the mitochondrial environment. Proc. 3rd International Conference on Prophyrias and Haem. Metabolism (1971).

8. Davison, A.J., L.S. Kaminsky. Thermodynamic aspects of cytochrome c function. Proc. 3rd Internat. Conference on Porphyrias and Haem. Metabolism (1971).

9. Davison, A.J., Activation energies for various modes of oxidation of ferrocytochrome c. Fed. Proc. 29:870 (1970).

10. Davison, A.J. Physiological function and thermodynamic properties of cytochromes. Proc. CSIR Cross Disciplinary Symposium in the basic Medical Sciences. Johannesburg, July (1969).

11. Davison, A.J. Numerical determination of initial enzyme velocities. Proc. 7th Congress Biochemistry, 34:1051 (1967).

Addition to Publications:

Davison, A.J. Protective effects of oxygen against free radical damage to enzymes, Pacific Slope Biochem. Conf. (1973).

Books

Proc. 5th International Hyperbaric Conference (1973). In the press, 2 vols. (eds.) W.G. Trapp, E.W. Banister, A.J. Davison, P. Trapp.

Handbook for teaching assistants - Education subcommittee of the American Chemical Society (1973)

IV UNIVERSITY AND COMMUNITY SERVICE (since appointment to Faculty of Simon Fraser University)

1. Department:

Tenure and promotion committee
Space committee
Library representative
Graduate program committee
Curriculum committee (inactive)

2. Faculty:

Biochemistry committee

3. University:

University ethics committee
University scholarships committee

4. Community:

Burnaby SPEC (Member executive committee)
Burnaby Environmental Committee (joint president)

SIMON FRASER UNIVERSITY

CURRICULUM VITAE

NAME: *GARLAND* (surname) *Iris* (given names)

BACKGROUND INFORMATION

DATE: *January 8, 1974*

1. Department *Kinesiology*

2. Citizenship _____

3. Contract Status: Tenure: yes [X]; no []

   Rank: Instructor []; Assistant Professor [X]; Associate Professor []; Full Professor [].

4. Date of Birth _____ (day month year)

5. Educational Background

Degrees	College, University, or Institution	Field of Study	Year
Bachelor	*University of Illinois*		*1957*
Master	*University of California at Los Angeles*		*1960*
Doctorate			
Other			

6. Academic, Research and Related Professional Experiences (list most recent last)

Position Held	Dates	Department	Institution
Teaching Assist.	*1959-60*		*U.C.L.A.*
Instructor	*1960-61*		*University of North Dakota*
Instructor	*1961-65*		*University of Washington*
Instructor	*1965-66*	*Kinesiology*	*Simon Fraser University*
Assist. Prof.	*1966-*	*Kinesiology*	*Simon Fraser University*

7. Awards, Citations, and Honors:

8. Membership in Learned Societies:

Dance Canada
Canadian Association of Health, Physical Education & Recreation
American Association of Health, Physical Education & Recreation
American Dance Guild
American Dance Therapy Association
Committee for Research in Dance

II TEACHING

1. List courses taught by semester over past 3 calendar years. If not teaching indicate professional activity in which engaged, e.g. research semester, sabbatical, leave of absence, etc.

	1971	1972	1973
Spring		*Kines. 044, 320*	*Kines. 044, 344 Inter/Adv. Dance Workshops*
Summer			*Research, Assisted with Comm. Studies 300*
Fall		*Kines. 044, 320*	*Kines. 044, 320, Inter/Adv. Dance Workshops*

2. Contributions to teaching over last 3 years*, e.g. development, redesigning of courses, writing of syllabus, preparation of interdisciplinary course material, etc.

Redesigned Kinesiology 320
Initiated and proposed Kinesiology 344

Prepared a proposed Dance Major, which has been submitted to the Administration.

3. For last 3 years*, list total number of Masters [ ] and Ph.D. [ ] students for whom you were senior supervisor. Please list student and thesis topic, most recent last.

4. For last 3 years*, list names of supervisory committees of which you were a member, but not senior supervisor.

Zella Wolofsky, M.Sc. Kinesiology.

* Please list activity in this category for previous years on separate page.

III SCHOLARSHIP

1. List Research Grants received during last 3 years*.

Source	Project Title	Amount
Canada Council Arts Award, 1972		

2. Current Interests and Activities.

Choreography and the sociology of movement.

3. External Activities for last 3 years* (invited lectures, papers, refereeing, editorial activities, etc.).

"Dance As A Theatre Experience" paper presented to The Canadian Association of Health, Physical Education and Recreation. Waterloo, Ontario, 1971.

"Drop-In Show" C.B.C. National Television. (Choreography and improvisation and short talk on dance in the University 1973.

Moderator for Dance Sessions of Arts Access Conference sponsored by B.C. Government in October, 1973.

4. Publications during last 3 years*. Indicate refereed journals.

PRODUCTIONS: (in lieu of "Publications")

February, 1970 — *Northwest Dance Symposium. Eugene, Oregon. Celebration - original choreography.*

January, 1971 — *S.F.U. Dance Workshop Concert*

Action Piece - original choreography
Weltenshaaung - original choreography
Haiku - original choreography

* Please list activities in this category for previous years on separate page.

3. External Activities (previous years)

"Future of Dance in B.C." panel participant for the Vancouver Ballet Society at the Vancouver Art Gallery. 1969

"Reverie" a piece of original choreography performed at the Vancouver Art Gallery for the Vancouver Ballet Society Showcase. 1969

Lecture-Demonstration at Capilano College. 1969.

Lecture-Demonstration at Handsworth Secondary School. 1969.

4. Productions (last 3 years)

May, 1972 — Outdoor May Dance Performance. Original choreography - transportation centre, steps and fountain.

March, 1973 — S.F.U. Dance Ensemble Concert

Dance Suite - original choreography
Games for 8 - original choreography
Ancient Voices of the Children - original choreography
Collage - conceived by Iris Garland and choreographed by dancers
No Exit - revivals
Revelations - revivals

May, 1973 — Choreography for Purcell's opera "Dido and Aeneas" performed at Simon Fraser University

PRODUCTIONS (Previous years)

March, 1967 — S.F.U. Dance Workshop Concert
No Exit - original choreography
Danzon - original choreography

November, 1967 — The Dance of Death (Mixed Theatre)
Seven Deadly Sins - Original choreography

March, 1968 — S.F.U. Dance Workshop Concert
The Legend of El Dorado - original choreography
Visions Fugitives - original choreography
Songs of the Youths - original choreography

March, 1969 — S.F.U. Dance Workshop Concert
Revelations - original choreography
Reverie - original choreography
Triptych - original choreography
Switched-on Bach - original choreography

May, 1969 — "Mediums"
Choreographed by Karen Rimmer, Edith Fernstein and Directed by Iris Garland.

4. *Productions (Previous years) cont'd)*

July, 1969 *S.F.U. Dance Worhsop Concert*
Mass for the Present Time - original Choreography.

Choreographed, taught, and directed the Simon Fraser University Dance Workshops in the above public performances.

1. *President's Research Grant - 1967*

Canada Council Arts Award - 1968

IV UNIVERSITY AND COMMUNITY SERVICE (since appointment to Faculty of Simon Fraser University)

1. Department:

Departmental Tenure Committee
Chairman: Brochure Committee
Chairman: Semester Course Guide
Policy Committee of C.C. & A. 1968-69
Arts Centre: Organization of visiting dance artists

2. Faculty:

Dean's Search Committee

3. University:

University Tenure Committee
Senate Library Committee
Senate General Education Committee

4. Community:

Dance Chairman of B.C. for the Canadian Association of Health, Physical Education, and Recreation, 1968 - 1969.

Chairman Northwest Dance Symposium at S.F.U. 1966

Coordination of First Western Canadian Dance Symposium at S.F.U., 1972

Board of Directors - Dance Canada, 1973-74

Member Burnaby Mtn. Dance Company.

SIMON FRASER UNIVERSITY

CURRICULUM VITAE

NAME: *MONTGOMERY* (surname) *John M.* (given names)

DATE: *January 16, 1974*

BACKGROUND INFORMATION

1. Department *KINESIOLOGY*

2. Citizenship *Canadian*

3. Contract Status: Tenure: yes [ ]; no [x]

   Rank: Instructor [ ]; Assistant Professor [x]; Associate Professor [ ]; Full Professor [ ].

4. Date of Birth *11* (day) *Sept.* (month) *1936* (year)

5. Educational Background

Degrees	College, University, or Institution	Field of Study	Year
Bachelor	*University of British Columbia*	*Phys. Education*	*1961*
Master	*University of Oregon*	*" "*	*1970*
Doctorate	*University of Oregon*	*" "*	*1973*
Other			

6. Academic, Research and Related Professional Experiences (list most recent last)

Position Held	Dates	Department	Institution
Inst./Asst. Prof.	*1970-*	*Kinesiology*	*Simon Fraser University*
Res. Asst.	*1968-70*	*Physical Education*	*University of Oregon*

7. Awards, Citations, and Honors:

8. Membership In Learned Societies:

II TEACHING

1. List courses taught by semester over past 3 calendar years. If not teaching indicate professional activity in which engaged, e.g. research semester, sabbatical, leave of absence, etc.

	1971	1972	1973
Spring	K. 420, K. 100	K. 420, K. 100, K. 807	K. 420, K. 100, K. 807
Summer	(between appointments)	K. 420, K. 100	K. 366, K. 100
Fall	Research	Research	Research

2. Contributions to teaching over last 3 years, e.g. text-book, redesigning of courses, writing of syllabus, preparation of interdisciplinary course material, etc.

development in whole of Kines. 366 and 466

in part Kines. 100

3. For last 3 years, list total number of Masters [illegible] and Ph.D. [illegible] students for whom you were senior supervisor. Please list student and [illegible] most recent last.

[illegible] Kolotkin - Computer Animation Techniques

[illegible] Nugent - Learning in Hemiplegics

4. For last 3 years, list names of supervisory committees of which you were member, but not senior supervisor.

1. Taylor
2. Scott
3. Rosenwald
4. Wilson

5. Please list activity in this category for previous years on separate sheet.

III SCHOLARSHIP

1. List Research Grants received during last 3 years*.

Source	Project Title	Amount
Canada Council	*Computer Assisted Movement Analysis*	*$18,075*
Canada Council	*Computer Assested Movement Analysis*	*$ 1,465*
N.R.C.	*Short-Term Motor Memory*	*$ 700*

2. Current Interests and Activities.

1. *Getting 3 computers interfaced to each other so we can proceed with the Canada Council grant.*
2. *Teaching a new course, K. 466, another for the first time - 043 and doing part of three other courses*
3. *Univergraduate advising.*

External Activities for last 3 years* (invited lectures, papers, refereeing, editorial activities, etc.).

Paper III Canadian Symposium on Sport Psychology, 1971.

Publications during last 3 years*. Indicate refereed journals.

Arsenault, B. and Montgomery, J.M., Rehabilitation of the Lower-Limb Amputee, Jour. of the Canadian Physiotherapy Assn. 25:77-81, 1973.

Please list activities in this category for previous years on separate pa

IV UNIVERSITY AND COMMUNITY SERVICE (since appointment to Faculty of Simon Fraser University)

1. Department:

Curriculum Committee
Undergraduate Advising

2. Faculty:

Faculty Curriculum Committee *1970-1973*

3. University:

4. Community:

SIMON FRASER UNIVERSITY

CURRICULUM VITAE

NAME: ROSS William D.
surname given names

DATE: January 29, 1974

BACKGROUND INFORMATION

1. Department Kinesiology

2. Citizenship Canadian

3. Contract Status: Tenure: yes [X]; no []

Rank: Instructor []; Assistant Professor []; Associate Professor [X]; Full Professor [].

4. Date of Birth ____ ____ 1928
day month year

5. Educational Background

Degrees	College, University, or Institution	Field of Study	Year
Bachelor	University of British Columbia	Phys. Ed., History	1951
Master	University of Oregon	Phys. Ed. with	1955
Doctorate	University of Oregon	emphasis in Kin-	1961
Other	University of Oregon - M.A.	anthropometry)	1960

6. Academic, Research and Related Professional Experiences (list most recent last)

Position Held	Dates	Department	Institution
Field Representative	1959-61	Sask. De	Sask. Dept. Education
Acting Dean	1961-63		Calif. Maritime Academy
Assist. Professor	1963-67		Calif. State University
Associate Prof.	1967-	Kinesiology	
Research Fellow	1968-69	Inst. Child Health	University of London, Post. Grad Medical School.
Visiting Professor	Sept.-Dec.1972		Vrije Universiteit Brussel, Belgium

7. Awards, Citations and Honors:
Certificate of Honor, Ministry of Public Education, Peru, 1962
Who's Who in American Education
Phi Epsilon Kappa
Teaching Certificate (Saskatchewan)
Diploma of Honor, Ministry of Public Education, Peru, 1964

8. Membership in Learned Societies:

Canadian Association for Health, Physical Education and Recreation
American Association for Health, Physical Education and Recreation, Fellow
American Association for Sports Medicine, FACSM
Canadian Association of Sports Sciences
National Research Committee, CAHPER, 1967-1971.

II TEACHING

1. List courses taught by semester over past 3 calendar years. If not teaching indicate professional activity in which engaged, e.g. research semester, sabbatical, leave of absence, etc.

	1971	1972	1973
Spring	Kin. 043, 303, 100 (team)	Kin. 043, 303, 807(team) 100 (team)	Kin. 043, 100 (team) 805, 806 (team)
Summer	Kin. 043, 807, 100 (team)	Research Semester	Kin. 042, 303, 100 (team)
Fall	Research Semester	Kin. 303, 805 100 (team)	Research Semester (European Lecture Ser

2. Contributions to teaching over last 3 years*, e.g. development, redesigning of courses, writing of syllabus, preparation of interdisciplinary course material, etc.

Movie Production:
Fitness at Forty: 16mm, sound colour, 16 minute, 1971 release
Run Young: 16mm, sound colour, 6 minute, 1971 release

Inventions:
Light intensity human body volumeter
Anthropometric equipment: Calipers, Branches, Auxillary devices
Parallax correcting stadiometer

3. For last 3 years*, list total number of Masters [ ] and Ph.D. [ ] students for whom you were senior supervisor. Please list student and thesis topic, most recent last.

Nil: produced five publications with four student co-authors - see Page 3.4.

4. For last 3 years*, list names of supervisory committees of which you were a member, but not senior supervisor.

Gordon Stewart

Please list activity in this category for previous years on separate page.

III SCHOLARSHIP

1. List Research Grants received during last 3 years*.

Source	Project Title	Amount
President's Research Grant	Water Displacement Body Volumeter	$480.00 - 1972
President's Research Grant	Phantom Stratagem for Porportional Growth Assessment	$583.50 - 1973

2. Current Interests and Activities.

Proportional growth assessment and application of phantom stratagem in 1968 Olympic, Saskatchewan, Belgium, Hungarian and Czeck data

Formulae and tactics in somatotype analyses

Maximal oxygen uptake and dimensional relationships in children studied longitudinally (Saskatchewan Growth Study)

Theory of error in kinanthropometry

Computer search programs and the delineation of research in kinanthropometry.

3. External Activities for last 3 years* (invited lectures, papers, refereeing, editorial activities, etc.).

See attached.

4. Publications during last 3 years*. Indicate refereed journals.

See attached.

* Please list activities in this category for previous years on separate page

3. External Activities

Presentations:

1. Physical Education Meaning and Purpose. Surrey Physical Education Specialists Assn., Harrison Hot Springs, February 19, 1971.

2. Acute Flexibility Changes Accompanying Exercise of Middle-Aged Males, AAHPER. Detroit, April 6, 1971.

3. Physique and Performance in Young Skiers, ACSM/CASS, Toronto, May 10, 1971.

4. Research Prospectus in Skiing, D. McKim: Canadian Ski Association, Edmonton, July 21, 1972.

5. Kinanthropometry and Young Skiers, Canadian Association of Sports Sciences. Vancouver, November 1, 1972.

6. Comparability of novice skeletal age assessments, Canadian Child Growth and Development Symposium, Saskatoon, November 18, 1972.

7. Canadian Conference on Child in Sport and Physical Activity, Kingston, Ontario. Research consultant in Growth and Development, May 13-18, 1973.

8. Exercise Management over 40, Canadian Academy of Sports Medicine. Annual General Meeting, Vancouver, June 19, 1973

9. Working papers, Koerner Foundation Study Group in Kinanthropometry, U.B.C., August 17-19, 1973

10. Kinanthropometry and Biomechanics. M. Hebbelinck. Introductory Paper. IV Annual International Symposium on Biomechancis. Pennsylvania State University, August 30, 1973.

11. A Stratagem for Proportional Growth Assessment. Vth International Symposium on Paediatric Work Physiology, de Haan, Belgium, October 14-18, 1973.

12. Phantom Stratagem for Proportionality Assessment. Team visitation seminar. Institute for Leibesubungen, Technische, Hoch-Schule, Darmstadt, West Germany, October 27-29, 1973.

13. Progress and Tradition. Guest Lecture, H.I.L.O. Vrije Universiteit Brussel, Belgium, October 31, 1973.

14. Interdisciplinary Seminar, U.B.C., "Proportionality Assessment," School of Home Economics, March 21, 1973.

15. Pediatric course, U.B.C. Medical School, "Kinanthropometry in Growth Assessment," March 2, 1973.

16. H.E. 351 Human Growth, U.B.C., "Size and Shape Phenomena in Growth," october 2, 1973.

Presentations (cont'd)

17. Y.M.C.A. "Exercise Management in Perspective," September 7, 1973.

18. Montecido 2400, "Exercise Management as a Life Style," September 14, 1973

19. Templeton High School, "Exercise Management for Adults," March 15, 1973.

4. Recent Publications

Ross, W.D. and Wilson, N.C. A Stratagem for porportional growth assessment. Vth International Symposium of pediatric work physiology. ACTA Paediatrica, Belgica (in Press 1974).

Ross, W.C., Hebbelinck, M., Wislon, B.D. Somatotyping in Sport and the Performing Arts. Medicina della Sport, (In press, 1974).

Ross, W.D., Canadian Standard School Certification in Sport and Physical Activity. In: Proceedings of National Conference and Workshop, Kingston, Medi-Edit (In Press, 1974).

Hebbelinck, M. and Ross, W.D. Kinanthropometry and Biomechanics in: Proceedings of IV International Symposium in Biomechancis. Pennsylvania State University S. Karger, Bosel, (In press, 1974).

Hebbelinck, M. and Ross, W.D. Kinesiology and Kinanthropometry: An Emerging Science and Subdiscipline. Testschriff zur 100-Jahr-Feier des Institutes fui Keibeserziechung der Universitat Graz (In communication; by invitation, 1973).

Ross, W.D., McKim, D. and Wilson, B.D. Kinanthropometry and Young Skiers. Canadian Association for Sport Sciences Proceedings, Vancouver. Charles C. Thomas. Springfield, Illinois. (In press, 1973).

Ross, W.D. and Wilson, B.D. A somatotype dispersal index. Research Quarterly, 44, 372, 1973.

Ross, W.D., and Woo, W.K. Comparability of novice skeletal age assessments. Proceedings of Second Annual Canadian Symposium of Child Growth and Development, Saskatchewan. Med-Edit (In press, 1974).

Broms, J., Hebbelinck, M. and Ross, W.D. Somatotype and Maturity in Twelve Year Old Boys. In: Pediatrics Work Physiology Proceedings. 4th International Symposium. Bar-or (Ed.). Wingate Institue, Israel, 85-91 (1973).

Borms, J., Hebbelinck, M. and Ross, W.D. Somatotype and Skeletal Maturity in 12 years old boys. Israel Journal of Medical Sciences. (Abstract) 9, 512 (1973).

Hebbelinck, M., Duquet, W. and Ross, W.D. A Practical Outline for the Heath-Carter Somatotype method applied to children. In: Pediatrics Work Physiology Proceedings. 4th International Symposium. BAr-Or (Ed.). Wingate Institute, Israel, 71-84 (1973).

Hebbelinck, M. Duequet, W. and Ross, W.D. Practical Outline for Heath-Carter Somatotyping Method Applied to Children. Israel Journal of Medical Sciences. (Abstract). 9, 511 (1973).

Publications (cont'd)

Ross, W.D. Chapter 18. Physical Fitness. Life and Health (CRM Books: Del Mar, California) 350-366 (1972).

Hebbelinck, M. and Ross, W.D. Body type and performance. In: Fitness, Health and Work Capacity. Larson, L.A., (Ed) New York, Macmillan and Company, 82-93 (1973).

Ross, W.D., Hebbelinck, M., Van Gheluwe, B. and Memmens, M.L. Kinanthropometrie et L'appreciation de l'error de mesure. Kinanthropologie. 4:23-24 (1972)

Ross, W.D. and Day, J.A.P. Physique and performance in young skiers. J. Sports Med. and Physical Fitness, 12:30-37, (1972).

Ross, W.D., Duncan, R.W., Banister, E.W. Cardiovascular traning of chronic unemployed middle-aged males. Canadian Welfare. 47:18-21 (1971).

Ross, W.D. and Day, J.A.P. Physical education: a teaching art. ATA Magazine. 51: 11-13, (1971).

Plus 68 other citations 1953 - 1970.

IV UNIVERSITY AND COMMUNITY SERVICE (since appointment to Faculty of Simon Fraser University)

1. Department:

Prepared first equipment budget for Kinesiology
Wrote course outlines for approval - Kines. 242, Kines 243, later renumbered Kines. 042, Kines. 043; Kines. 100; Kines. 303
Graduate Studies Chairman, 1969-71 at the time of the approval of M.Sc. degree program
Devleoped mobile laboratory for Kinanthropometry
Developed computer search programs in Kinanthropometry in collaboration with M. Deutsch

2. Faculty:

Participated in recruitment of students (Okanagan, Spring, 1972) - discussed attractiveness of interdisciplinary program

Ran for promotions and tenure committee - tied in election but declined since one other Kinesiology Faculty member was already selected.

3. University:

University Committee to Investigate Function of Joint Faculty

Interdisciplinary Studies Committee 1968-71.

Selection Committees for P.S.A., Mathematics faculty

Conducted M.W.F. Faculty Fitness classes for University Community, 1967 to 1972 - 5 years.

4. Community:

Speakers Bureau and own auspices (about 6 per year)
South Surrey Study Group and environmental protection since 1971.
Development of products for sheltered workshop for mentally retarded - e.g. Ross stadiometer, 1972
Sponsored introduction of Camp Fire Girls into Canada and, on own premises, sponsored the first Canadian Camp Fire Girls Day Camp Program, Summer, 1973.
Consultant for sports groups, e.g. design of strength training program for White Rock Figure Skating Club, 1973
Initiation of "Canadian Standard School" Concept in role as national consultant in area of growth and development at Kingston Conference in the Child in Sport and Physical Activity.

SIMON FRASER UNIVERSITY

CURRICULUM VITAE

NAME: SAVAGE Margaret
surname given names

DATE: January 8, 1974

I BACKGROUND INFORMATION

1. Department Kinesiology

2. Citizenship Canadian

3. Contract Status: Tenure: yes [ ]; no [x]

Rank: Instructor [ ]; Assistant Professor [x];
Associate Professor [ ]; Full Professor [ ].

4. Date of Birth _____
day month year

5. Educational Background

Degrees	College, University, or Institution	Field of Study	Year
Bachelor	University of Washington	B.Sc.	1964
Master	University of Washington	M.Sc.	1965
Doctorate			
Other			

6. Academic, Research and Related Professional Experiences (list most recent last)

Position Held	Dates	Department	Institution
Assist. Prof.	1969 -	Kinesiology	Simon Fraser University
Instructor	1965 - 69	Kinesiology	Simon Fraser University
Research Assist.	1964 - 65	Physical Education	Univ. of Washington
Teacher (tenured)	1958 - 62	High School	Calgary School Board

7. Awards, Citations, and Honors:

8. Membership in Learned Societies:

American College Sports Medicine
Canadian Association of Sports Sciences
North American Society for the Psychology of Sport and Physical Activity.

II TEACHING

1. List courses taught by semester over past 3 calendar years. If not teaching indicate professional activity in which engaged, e.g. research semester, sabbatical, leave of absence, etc.

	1971	1972	1973
Spring	Kines. 042, 040, 807, 100	Kines. 042, 040, 807, 100	Kines. 042, 100, 040 803, 807
Summer	Research Semester	Research Semester	Research Semester
Fall	Kines. 040, 042, 100	Kines. 042, 100	Kines. 042, 100, 806

2. Contributions to teaching over last 3 years*, e.g. development, redesigning of courses, writing of syllabus, preparation of interdisciplinary course material, etc.

a) Redisigning Kinesiology 042

b) Kinesiology syllabus

3. For last 3 years*, list total number of Masters [ ] and Ph.D. [ ] students for whom you were senior supervisor. Please list student and thesis topic, most recent last.

Stewart, Gordon - title to be selected this semester.

Caldwell, Dennis - The Psychological Profile of Individual and Team Sport Athletes

4. For last 3 years*, list names of supervisory committees of which you were a member, but not senior supervisor.

Greg Thomas - U.B.C.

André Forget

* Please list activity in this category for previous years on separate page.

III SCHOLARSHIP

1. List Research Grants received during last 3 years*.

Source	Project Title	Amount

2. Current Interests and Activities.

a) Sports Psychology

b) physiological changes associated with athletic training

3. External Activities for last 3 years* (invited lectures, papers, refereeing, editorial activities, etc.).

Invited participant Kinanthropometry Study Group - Koerner Foundation Project, August, 1973

Paper - Sports Psychology - Templeton High School, 1973

Paper - Fitness - Port Moody Secondary School, 1973

Paper - Fitness - Rotary Club, November, 1972

Paper - Sport Psychology - St. Andrew's Wesley Church, November, 1972.

4. Publications during last 3 years*. Indicate refereed journals.

Savage, Margaret, "Canada's Master Plan" Aquatic World, Vol. 2, No. 1, January, 1974, pp 19-20.

* Please list activities in this category for previous years on separate page.

3. Paper - Fitness, West Vancouver Kiwanis Club - 1971

Paper - Sport Psychology - Templeton High School - 1971.

Paper - Weight Control and the Swimmer, 1972.

Clinic - Psychology and Physiological Basis of Swimming - Prince George, 1972

Clinic Psychology and Physiological Basis of Swimming - Dawson Creek, 1972.

Clinic - Psychology and Physiological Basis of Swimming - Nelson, B.C., 1971

Clinic - Psychology and Physiological Basis of Swimming - Kitimat, B.C., 1971.

Third International Swimming Workshop, Simon Fraser University

Consultant - Dolphin and Port Alberni Swim Clubs on Weight Control and Percent Body Fat, Spring, 1973

Consultant - North Vancouver Swim Club on Weight Control and Percent Body Fat, Fall, 1973.

IV UNIVERSITY AND COMMUNITY SERVICE (since appointment to Faculty of Simon Fraser University)

1. Department:

Space Committee
Policy Committee Proficiency Program - P.D.S.
Program Advisor - Proficiency Program
Sponsor Steindairs - Women's Athletic Honorary
Coordinator Intramurals
Coordinator Clubs
Coordinator - Womens Athletics
Coordinator - General Education Program

2. Faculty:

Member, Education Department ad hoc Committee on Graduate Studies

3. University:

University Health Advisory Committee
University Committee for Continuing Education
University Open House Committee
University Athletic Committee

4. Community:

Liason Officer for B.C. - Canada Summer Games
Ethic Committee - Northwest College Women's Sports Association
Secretary-Treasurer - B.C. Swimming Coaches Assoc.
Chairman, Masters Swimming for B.C.
Secretary-Treasuere - Canadian Swimming Coaches Association.
Chairman, Masters Swimming for Canada
Co-Chairman for 1st and 2nd International Swimming Workshop
Program Advisory Committee - Western Society of Physical Education for College Women
Registration Committee - Western Society of Physical Education for College Women
Chairman - Canadian Women's Basketball Championships
Host - First Canadian Women's Basketball Training Camp.

APPENDIX 3

HISTORY OF RESEARCH SUPPORT

To date, the department has been reasonably successful in attracting research funds adequate for most of its immediate purposes. Totals over the past five years illustrate this.

1967/68	$ 6,584	1968/69	$35,753	1969/70	$36,679
1970/71	$66,168	1971/72	$59,413	1972/73	$54,965
1973/74	$76,305				

Considering that two members of faculty have barely completed the embryonic phase of their research careers, the present situation is encouraging and promises well for the future. In spite of current strictures of most research budgets, many of the areas of interest within the department involve problems which have been selected for immediate and future expansion by government and private research agencies.

These areas include:-

Occupational and environmental health, drug and narcotic action and addiction, radiation damage and radioprotective agents (military and cancer therapy applications), rehabilitation and preventative medicine, aspects of inherited mental and physical disorders of children, and scientific aspects of coaching.

Research Grants for fiscal year 1973-74

M.R.C. Grants

A.J. DAVISON: "Involvement of Oxygen Free Radicals in Disease Processes," $13,400.

N.R.C. Grants

E.W. BANISTER: "Biochemical and Fine Structural Correlates of Oxygen at High Pressure (OHP) and Oxygen Toxicity in the Rat," $6,500 (operating), $6,429 (equipment).

N.M.G. BHAKTHAN: "Radiation Induced Lipid Peroxidation and Enzyme Leakage in Mammalian Tissues," $6,500 (operating), $5,900 (equipment).

History of Research Support (cont'd)

N.R.C. Grants (cont'd)

T.W. CALVERT: "Models of Motor Control in Man," $5,000

A.E. CHAPMAN: "The Effects ofDisuse and Exercise Upon the Mechanical Parameters of Rat Muscle and its Associated Tendon," $5,000.

Canada Council Grant:

J.M. MONTGOMERY: "Computer Assisted Movement Analysis," $18,075.

B.C. Heart Foundation Grant:

E.W. BANISTER: "Training Effects on Total, Bound and Unbound RBC 2,3-DPG in Normal Healthy Adults: Synergistic Effects of Propronolol," $9,500.

January, 1974

LABORATORY EQUIPMENT AND CAPABILITIES

IN KINESIOLOGY

(NOTE: Some items are used by more than one laboratory and are listed more than once.)

ANATOMY AND HISTOLOGY LABORATORY

Equipment:

Electron microscope
Wax dispenser and vacuum for histological preparations
Cryostat
Microtome for paraffin sections
Microscopes (9 students' microscopes and one phase contrast)
High temp and low temp ovens
Refrigerated centrifuge
Flash evaporator
Balances
Gel electrophoresis unit
Thin layer chromatography unit
Ultramicrotomes and Diamond knives for plastic sections
pH meter
Lab cleared for using radioisotopes
Beckman DBGT spectrophotometer with ASR33 Teletype output
Ultracentrifuge, Beckman model L

Techniques:

A range of anatomical histological, histochemical and cytological techniques are available including electron microscopy, autoradiography, light microscopy, cell fractionation, and selected enzyme assays.

ANTHROPOMETRIC LABORATORY

This laboratory features precision instruments for physical measurement including full range of Harpenden and Siber-Hegner anthropometric equipment, somatotype unit, X-ray, densitometric apparatus, and pulmonary function, test equipment.

Mobile laboratory for field studies

A fully equipped mobile laboratory is available for field studies either in remote areas for where convenient laboratory facilities are not available.

BIOENERGETICS LABORATORY

Equipment:

pH meters, balances
3 spectrophotometers (double beam with automatic sample changer)
3 strip chart recorders
Fluorometer Turner
1 Refrigerated high-capacity high-speed centrifuge
1 Polarographic oxygen electrode (Clark type)
Analog electronic modules including 2 dual operational amplifier multi-purpose instruments
Digital electronic apparatus including 2 analog to digital converters digital counter/clock with logic outputs to paper tape punch
Ultrasonic oscillator, Virtis, TenBroeck, and teflon plunger type tissue homogenizers
Stereotaxic apparatus with micromanipulaters
Function generator - .00002 Hz to 100 kHz
Teletype ASR 38 computer terminal with APL characeter set, and capability for encoding experimental data on punched paper tape for later computer analysis

Techniques:

Various enzyme preparations and assays are routine proceedures in the laboratory which provides facilities for the study of rates and mechanisms of energy producing systems in cells, and the production rate of active forms of oxygen involved in cellular oxidations. Some haematological procedures are available. Preparation of erythrocyte ghosts, estimation of axoplasmic flow rates, preparation of microtubular protein from nervous tissue, studies of hyperbaric and other controlled environments, isotopic tracer studies are at present in progress.

BIOCHEMICAL METHODS LABORATORY

Equipment:

Coulter counter for automated haematological procedures
Astrup blood gas analyser

Techniques:

Include micro-methods for determination of serum enzymes and inorganic elements in 40-50 µl samples of blood. Determination of blood acid-base chemistry by the Astrup method and the determination of some circulating hormones includes serum catecholamines and 17-hydroxy ketosteroids by spectrofluorimetric methods. Haemotological methods using the Coulter Counter are available.. Diphosphoglycerate assays and haemoglobin oxygen affinity studies are in progress.

BIOMECHANICS AND ELECTROPHYSIOLOGY LABORATORY

Equipment:

8 channel oscilloscope module
E.M.G. amplifiers
E.M.G. integrators
8 channel FM/Analog tape recorder (Precision Instrument)
4 channel F.M. tape recorder (Hewlett-Packard)
Strain-gauge dynamometer
Accelerometers
Angular displacement transducer
Apparatus for examining force-velocity relationships in human muscle contraction
Apparatus for examining force-velocity relationships in isolated muscle preparations
Force platform with piezo-electric transducers and charge amplifiers for three axes.

Techniques:

The above equipment provides facilities for relating electrical activity, displacement, and force generated in contracting muscles in vivo, as well as the necessary interfaces for on-line computer analysis of the resultant data.

COMPUTATION

Terminals on-line to SFU's IBM 370:

Tektronix 4013 graphics terminal with APL and ASCII character sets.
Teletype ASR 38 with APL character-set and paper tape reader/punch

Local computers for on-line usage:

DEC PDP 8e computer with 12K memory
Teletype ASR 33
2 DEC magnetic tape transports
DEC high-speed multichannel analog to digital converter
Digital to analog converter with X-Y plotter output
DEC PDP 11 computer with GT40 CRT display and comprehensive graphics capability
Analog tape recorders (multichannel)

Capabilities:

Facilities exist for statistical computations and on- and off-line monitoring of human, biochemical and physiological experiments. Time-dependent processes can be monitored and the data stored using punched paper-tape or magnetic tape for later computation or the calculation can be performed on-line. A compendium of statistical packages relevant to Kinesiology is available in APL to allow computation of most common statistics. Regression analysis, multi-variable curve fitting and graph-

plotting programs are available and operational.

Physiological systems simulation can be carried out using a specially written ANALOG-APL package which is effectively an analog computer. In addition large FORTRAN models are available for simulation of the Respiratory, Cardio-vascular and Thermal Control Systems in man.

EXERCISE BIOLOGY LABORATORY

Contains adequate equipment for the physiological study of exercising human subjects, including: bicycle ergometers, variable incline/ multispeed treadmills, respirometers, telemetry and gas analysis equipment. Continuous measurement of respiratory gas exchange and indwelling catheters allow direct monitoring of physiological events without interupting the activity.

Physical Environment Unit:

This facility where ranges of temperatures, humidity and prevailing atmospheric gas composition and concentration may be manipulated. Basic medical and physiological instruments facilitate the study of the effect of variations in the physical environment on physical working capacity.

Hyperbaric Chamber:

Use of this facility is through co-operation with the Faculty of Medicine, Department of Surgery, University of British Columbia.

Small Animal Surgery Unit:

Includes apparatus for animal surgery, animal room, rat hyperbaric chamber, and treadmills.

HUMAN SKILLS LABORATORY

Equipment:

DEC PDP11 computer with GT40 Graphic Display
Hunter Klockounters
Hunter Decode Interval Timers
Lafayette Standard Timer
Computer Interfaced timing equipment
Noise and Light activated switching systems
Stoelting Pen Recorder - 3 channels
6 channel event recorder
4 channel Hewlett-Packard Instrumentation Tape Recorder
Hewlett-Packard 2 channel storage oscilloscope
Digital/Analog converter
DEC K & M series logic modules and computer interface equipment for computer control of experiments

White Noise generator
Sony Tape Recorder

Capability:

Equipment - can handle experimentation in memory and decision making at present. Electronic tracking equipment allows investigation into motor control and the programming of responses.

An Evaluation Of Library Resources To Support The Currently Proposed Ph.D. Program in Kinesiology

By

Maurice Deutsch

Science Librarian

August, 1972

Library Resources for the Proposed Ph.D. Program

Purpose

This report surveys the library resources to support the currently proposed Ph.D. program in kinesiology. The index and abstract, journal and annual, and book collections were examined. Journal and annual holdings of selected subjects were analyzed and the rate of growth was determined during the two year period from August 1970 to August 1972. The book collections were examined with regard to rate of growth during the 20 month period from August 1970 to April 1972 and growth in specific subjects during the past year as a percentage of books available in Books in Print (1971).

The Nature of the Collection

Kinesiology is a highly interdisciplinary area of learning and makes use of and contributes to knowledge in the biomedical and physical sciences as well as the social sciences. The study of Kinesiology at Simon Fraser University is the study of human movement and this embraces such diverse subjects as anatomy, physiology, bioenergetics, mechanics, biochemistry, movement behavior and motor learning, sports psychology, perception, physical anthropology and anthropometry, microscopy, growth and development, physical medicine and rehabilitation, sports medicine, recreation, health and physical education, man-machine interaction, human factors engineering, biology of work and working environments, dancing and cultural expression of movement, biomedical engineering.

Thus the notion of a discrete book collection and a discrete journal collection, each of which is located in one or two specific areas of the library, must be supplanted by the idea of relevant collections scattered throughout the library's entire book and journal collections.

Growth of the Collections

The kinesiology program at Simon Fraser University represents a new and unique program offered by only a few other U.S. and Canadian institutions. This uniqueness has resulted in the growth and development of a 'working journal and book collection' along empirical lines as opposed to the more conventional method of developing collections by means of standardized bibliographies and book lists. The kinesiology faculty and library staff have worked together to build a book and journal collection to support the program. The kinesiology faculty has been active and enthusiastic in recommending journal and book acquisitions, and the library's energetic purchasing practice has been responsible for the rapid growth in the number of journals and books. (See Table 1). Added intimacy with the research interests of the faculty, as well as with the kinesiology program itself, has been gained through the preparation by library staff of interest profiles, for the National Science Library's CAN/SDI computerized current awareness program.

During the past twelve month period, the library's holdings were checked against large reference files of Dr. A. Davison and

Dr. W. Ross (See Table II). The library possesses over 80% of the volumes on the former and almost 50% of the volumes on the latter reference file.

Monitoring reguests for interlibrary loans assists the library staff in determining journals and books which both faculty and graduate students find useful and which can be ordered as permanent additions to the collection.

Books were also selected from the Subject Guide to Books in Print (1971); more than 90 subjects were compared with the library's holdings. Of the 685 volume sample, 454 volumes, more than 65%, were held by the library. (See Table III). The 'New Books and Serial Publications Received' section of the semimonthly issues of Biological Abstracts and the monthly listing, British Book News, are scanned regularly.

During the past two years, the library has acquired more than 225 journals and annuals in various fields related to kinesiology making a grand total of about 750 serial items relevant to kinesiology. Selection of journals and annuals was originally made from Ulrich's International Periodical Directory and from recommendations by kinesiology faculty members. The 'New Books and Serial Publications Received' section of Biological Abstracts is also scanned regularly for serials.

Future Growth

A growth of about 10% is anticipated for the book collection over the next 12 months. This amounts to the purhcase of about 311 volumes at an estimated unit cost of $15.00 per volume for a

total dollar expenditure of $4665.00. These volumes which are charged directly to the kinesiology account represent the following subjects: human anatomy, 5% of physiology, public medicine, pathology, internal medicine, surgery, pediatrics, therapeutics, pharmacology, physical medicine, physical therapy and ergonomics. (See Table IV).

The rapid rate of growth of both journal and book collections and a continuing active acquisitions program will ensure that the collections are up-to-date as well as adequate in breadth and depth. This, together with rapid interlibrary loans service between Simon Fraser University and the University of British Columbia, provides access to book and periodical collections which are sufficient to support faculty research as well as the currently proposed Ph.D. program.

Table I. Library of Congress Classification of Subjects Related to Kinesiology with Estimates of the Numbers of Pertinent Volumes and Growth Rates for Selected Subjects.

LC Number	Subject	Subset(s) of Interest	Number of Volumes	Percent Growth*
BF	Psychology	Physiological + experimental psychology including movement behavior, motor learning, sensation + perception.	500	12%
GN	Anthropology	Physical + cultural anthropology, ethology, anthropometry, ethnography.	2050	21%
GV	Recreation	Physical training, sports, games, amusements, dancing.	2500	26%
QA	Mathematics	Analytic mechanics, kinematics, dynamics.	140	30%
QC	Physics	Experimental mechanics	150	**
QH	Natural History	Microscopy, general biology, biochemistry, evolution, genetics, biophysics, cell biology.	2400	23%
QL	Zoology	Anatomy (comparative), embryology + developmental biology.	325	15%
QM	Human Anatomy	Gross anatomy, histology, + human embryology.	375	19%
QP	Physiology	Including physiological chemistry + experimental pharmacology.	2800	24%
RA	Public Medicine	Personal hygiene, exercise, breathing, outdoor life, nutrition.	100	**
RB	Pathology	General, experimental + clinical pathology.	250	81%
RC	Internal Medicine	Diseases of the nervous, cardiovascular, respiratory, endocrine + musculoskeletal systems; submarine, aviation, + sports medicine.	250	28%

LC Number	Subject	Subset(s) of Interest	Number of Volumes	Percent Growth*
RD	Surgery	General surgery, athletic injuries, diseases of the locomotor system, orthopedic surgery	125	22%
RJ	Pediatrics	Physiology of children + adolescents including growth + development.	75	32%
RM	Therapeutics, Pharmacology, Physical Medicine + Physical Therapy		325	54%
TA	General Engineering	Ergonomics, biology of work, human performance, man-machine interaction, biotechnology.	50	**

* The percent growth is for the 20 month period from August 1970 to April 1972.

Various subsets of the book collection increased in size from 12% to 81%.

** Data was not available for calculating percent growth.

Table II. Comparison of Library's Book Holdings with Reference Files of A. Davison and W. Ross.

Reference File	Total Number of Volumes	Number of Volumes Held by Library	Percent of Volumes Held by Library
A. Davison	716	582	81%
W. Ross	207	102	49%

(More than 90% of the titles of these files not held by the Library were already out of print).

Table III. Book Selection from the Subject Guide to Books in Print (1971)

Section I. The following is a list of subject headings from which books were selected

Acceleration (Physiology
Action in art
Adolescence
Adolescent Boys
Adolescent Girls
Adulthood
Altitude, Influence of
Animal Locomotion
Animal Mechanics
Athletes
Athletics
Biological Control Systems
Biological Physics
Bionics (Cybernetics)
Biotelemetry
Blood-Circulation
Blood-Circulation, Disorders of
Blood-Coagulation
Blood-Corpuscles and Platelets
Blood Flow
Blood Pressure
Blood Vessels
Blood Volume
Bloodletting
Body, Human
Body Composition
Body Temperature
Cardiography
Cardiology
Cardiovascular Research
Cardiovascular System
Child Development
Children - Growth
Children - Nutrition
Corpulence
Developmental Biology
Developmental Genetics
Electromyography
Exercise
Fatigue
Food
Food - History
Food Additives
Food Contamination
Food Supply
Genetic Psychology
Growth
Heterosis
Human Engineering
Human Figure in Art
Human Mechanics
Industrial Sociology
Isometric Exercise
Life Support Systems (Space Environment)
Man - Attitude + Movement
Man - Influence of Climate
Man - Influence of Environment
Motion Perception (Vision)
Motivation
Motor Ability
Motor Ability - Testing
Movement, Psychology of
Muscle (histol + physiol propert)
Musculoskeletal System
Nutrition
Performance
Physical Education + Training
Physical Education + Training - Research
Physical Fitness
Physical Fitness - Testing
Physiological Chemistry
Physiology, Comparative
Physiology, Experimental
Physiology, Pathological
Posture
Regeneration (Biology)
Sex
Sex (Biology)
Sports
Sports - Accidents + Injuries
Sports - Philosophy
Sports - Psychological Aspects
Sports in Art
Sports Medicine
Stress
Swimming + Diving
Walking
Work - Psychological Aspects
Work Measurement
Yoga, Hatha
Vital Statistics
Vitamins

Section II. Number of Volumes Selected and Purchased

Number of Volumes Selected	Number of Volumes Held By Library	Percent of Volumes Held By Library	Number of Volumes Ordered
685	454	66%	231

This survey was performed during the months of April and May during which time the orders were submitted to the acquisitions department of the library.

Table IV. Estimate of the Annual Growth of the Kinesiology Book Collection During the Next Twelve Month Period.

Estimated Total Number of Book Volumes Relevant To Kinesiology			15000 V.	
Social Sciences Subsets (BF, GN, GV) 1% of Anticipated 10% Increase charged to Kinesiology Account				72 V.
Sciences Subsets 10% Anticipated Increase Charged to Kinesiology Account:			7800 V.	
	QM 375			
	RA 100			
	RB 250			
	RC 250	1550 V.		155 V.
	RD 125			
	RJ 75			
	RM 325			
	TA 50			
3% of anticipated 10% Increased Charged to Kinesiology Account: QP				84 V.
Total Number of Books Purchased on the Kinesiology Account				311 V.
Anticipated Cost at $15 per volume			$4665.00	

The remaining volumes are purchased on the following accounts: mathematics, physics, biology, anthropology, sociology.

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2075 WESBROOK PLACE
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V6T 1W5

HEALTH SCIENCES CENTRE
Division of Health Systems
Instructional Resources Center Bldg.
Telephone (604) 228-5776

July 9th, 1974

Professor K.E. Rieckhoff,
Associate Dean of Graduate Studies,
Simon Fraser University,
Burnaby 2, B.C.

Dear Professor Rieckhoff,

I am happy to enclose my external review of Simon Fraser's proposed Ph.D. program in Kinesiology as requested.

Yours sincerely,

J.H. Milsum,
Professor, and Director
Division of Health Systems

JHM/SAM

External Review of Proposed Ph.D. Program
in
Kinesiology
at Simon Fraser University

1. Is quality of program at high level? I am satisfied that the proposed program can exercise the students (and the staff!) to a completely acceptable level in comparison with other leading institutions. Of course we must note here that the program in Kinesiology has no easy equivalents with which to compare it, but the general calibre can still be estimated with some confidence.

In section (h) of the proposal, which specifies the requirements for the "academic requirements", there certainly are plenty of hurdles installed to disqualify all but the satisfactory candidates, provided that they are policed rigorously. Indeed, I note with some awe the successive requirements for; 2 seminars, field problem plus 4 written examinations in the Qualifying Examination (with a maximum of one paper rewrite; but how long an examination in each?), oral examination (but length of time not indicated), dissertation proposal colloqium, and finally the dissertation examination. However, I take it that these are essentially SFU's basic Ph.D. requirements.

2. Academic Expertise. The six departmental staff members who provide the core for direction of the Ph.D. students should be fully capable of performing this task satisfactorily. The Department has now had enough experience with its M.Sc. graduate program and with the various research laboratory areas, that it should have no intellectual or conceptual difficulties in undertaking this new responsibility. The staff have been able to demonstrate their research effectiveness by generally increasing their research grants each year, with it now averaging nearly $13,000 (1973-74) for each of the six members receiving grants. (There were three others not then in receipt of grants). At a cumulative level of 6-8 Ph.D. students when the program matures, I agree with the proposal's statement that this should be a viable program (large enough to rate, but small enough to be handled - a "modest" program). Further to my Departmental Review report I note that the department still has no full-time physician-researcher on staff. I believe that such a person would be an important resource for the Ph.D. program. However, I understand from Dr. Banister that the position is now established and has been advertised.

3. The Rationale and ....

(a) ... General Academic Concerns. I do not really understand this question, unless it refers to its appropriateness within the SFU context. Certainly, I consider it unfortunate that SFU has no stronger commitment to the Health Sciences since these could provide important support. However, the Kinesiology program has evidently proven itself to be a healthy newcomer to the SFU family, and in this context the Ph.D. program should be able to prosper, and in turn help strengthen the Department. Further, a strong Department of Kinesiology should, I feel, be an asset to SFU.

(b) ... The Present and Future Need. I believe that the Department's overall objectives are important to our society. As such a Ph.D. program is necessary to help train the needed new teachers and researchers. I believe the very availability of such graduates will in turn help catalyse the need for them, and thus, also, that there is indeed a strong future need. I am less certain about the immediate need.

4. Advice regarding Proceeding with Program. I have answered this question in part in number 3.

In my philosophy a Ph.D. program in an established department represents only a minor extension in principle to the work already being done at the undergraduate and Master's levels, and in the teaching, research and service areas. On the other hand it is really a prerequisite in the long run to encourage the staff to remain at the peak of their intellectual striving. I say this because there is less challenge in staying-up with the endeavours of Master's students than with those of Doctoral candidates. Indeed, as many of us know to our wry enjoyment and occasional discomfort, our Doctoral students often march well ahead of us in their own particular areas, and open up new areas of research which we can exploit after their departure.

In another regard I believe that SFU has made an important forward step in establishing a Faculty of Interdisciplinary Studies, with Kinesiology as an important one of its Departments. It seems to me that universities face the risk of becoming not only viewed as increasingly irrelevant by society, but even being so, unless there is at least one major group within the University which continually exploits the need for interdisciplinary work, by breaking down rather than reinforcing traditional Departmental barriers.

For these broad philosophical reasons, as well as because of my detailed approving comments given in paragraphs 1 - 3 above, I believe that it is in SFU's best interests to approve this proposal. At another university my judgement would be affected by the possibly different local circumstances, but in general I would expect to approve also.

5. Summary. In summary, I feel that the Department of Kinesiology is maturing in an excellent way, and should be encouraged to undertake this further responsible program. The intellectual effort which will be involved should also help it sharpen its focus regarding its objectives and areas of work. The proposed program is within its capabilities for educating good graduates and these latter are needed for important work in our increasingly leisure and recreation-oriented society.

July, 1974
JHM/SAM

University of Toronto
SCHOOL OF HYGIENE
TORONTO, ONTARIO
M5S 1A1

DEPARTMENT OF
ENVIRONMENTAL HEALTH

June 21, 1974

Dr. K. E. Rieckhoff,
Assoc. Dean of Graduate Studies,
Simon Fraser University,
BURNABY 2, B.C.

Dear Dr. Rieckhoff:

Thank you for your letter of June 7th and the enclosed materials regarding the proposed Ph.D. programme of the Department of Kinesiology at Simon Fraser University. My comments are shown on the attached sheets.

Yours sincerely,

Roy Shephard

Roy J. Shephard, M.D.,Ph.D.,
Professor of Applied Physiology

RJS/jk

Proposed Ph.D. Programme in Kinesiology

The first impression gained from a reading of this proposal is a quite favourable - the material is well-documented, and the research productivity of the individual staff-members as judged from publication lists seems above average. However, more questions arise on detailed examination of the proposal. The problems can best be illustrated by reference to (i) your specific queries, and (ii) individual items of the proposal.

(i) Specific queries. 1. Likely quality of Ph.Ds. Several objective measures can be applied here. One is the peer-rating of current staff. This I would class as good but not outstanding. Banister and Ross are the two more long-standing members of the department, and both have been reasonably active in presenting contributions at scientific meetings. Their contributions - usually in applied physiology and somatotyping respectively - have been quite well received if not a cause for great excitement. Both are members of the Canadian Association of Sports Sciences but in the 7 year history of the Association neither has been elected to its board of directors, or indeed to membership of any of its permanent committees.

The quality of existing M.Sc. students has in one or two instances been remarkably good. One (Taunton) made an outstanding presentation, qualifying for the junior investigator's award of the Canadian Association of Sports Sciences in Montreal last October. However, it is hard to imagine that 25 good quality M.Sc. projects are being supported on a research budget of $50-75,000 per year.

The standard proposed for the Ph.D. dissertation is not too clear. Is this specified in University regulations? In my judgement, a thesis should incorporate significant research findings meriting publication in a scholarly (refereed) journal, and should be more than the "survey" type of work that so many current applied physiology research contracts require.

2. Available expertise. The title of the department and the areas of proposed study are somewhat divergent. Kinesiology, as commonly understood, refers to the study of muscle movements by the traditional methods of anatomy, cinematography, and electromyography. The proposal seems essentially a request for Ph.D. work in applied physiology, spiced with some exercise biochemistry, electron microscopy, and ergonomics. Five of the staff merit the opportunity to supervise graduate students, and together they cover a fair range of disciplinary interests - Banister in applied physiology, Ross in somatotyping, Bhakthan in electron microscopy, Calvert in ergonomics, and Davison in biochemistry. Montgomery seems a weak candidate even for supervision of Masters students, at least on the strength of present publications (I have not had the opportunity of meeting him or judging his performance at a scientific meeting). However, the other five have a fair level of competence in their respective areas. One obvious weakness of the proposed programme is the lack of support from a traditional medical department, covering such basic disciplines as anatomy and physiology, and available to provide students with both advice and supplementary courses as needed. I am familiar with only one of the

resource people listed (Dr. D. Clement) - although a very pleasant and personable family physician, he is not in my judgement a Ph.D. teacher.

3. Rationale for the programme. Several reasons for introducing a Ph.D. programme are suggested by the applicants: (a) administrative convenience (based on a recent revision of M.Sc. offerings - hardly a strong argument), (b) student demand - I suspect this is overstated - drawing upon the M.Sc. output of many universities (S.F.U. included) I do not see 4 or 5 who merit a Ph.D. course per year ("easily recruiting" is another matter), and (c) government interest in supporting this type of research (a pragmatic argument, but not to be dismissed lightly in a time of financial stringency).

I would have preferred to see a strong case developed for a programme in one particular area - possibly traditional kinesiology, or exercise histochemistry, both of which are poorly represented in Canada. There is a danger that in offering a wide-range of rather ad-hoc topics none will be realized at an adequate academic level.

The demand for graduates from the proposed programme is debatable. Existing programmes in applied and exercise physiology are offered at the Ph.D. level in Toronto (School of Hygiene) and in Edmonton (Faculty of Physical and Health Education). A recent review by the Ontario Council of Presidents has authorized other related Ph.D. programmes, including Exercise Physiology at the University of Western Ontario. The Université de Montréal is also building up a strong faculty in exercise and applied physiology, and I suspect a Ph.D. programme is pending. Academic vacancies are unlikely to absorb even the potential output of existing and approved programmes. It is possible the practical, ad-hoc nature of the Simon Fraser proposal may make their Ph.D. graduates attractive to industry, although to date, Canadian employers have not had a strong record of seeking students with doctoral degrees. In sum, I think almost every Canadian university cherishes hopes of developing a Ph.D. programme in the exercise physiology area, usually within its Department of Physical Education. This is plainly unrealistic in terms of student demands, employment prospects, and adequate supervision of students. At the present time, we are near to saturation, and although an extra two or three Ph.Ds. per year might not be disastrous, they would be placed more readily if a distinct emphasis could be provided for S.F.U. graduates

(ii) Individual items. 1. Student numbers. I cannot believe students are much better graduate material in B.C. than in Ontario. In this Province, I have argued strongly that only about 25 of 80 students in a physical education type programme really merit University training at the undergraduate level. One would thus question the judgement of allowing 25 of 65 students to proceed to graduate study - in Toronto, we would consider that only 2 or 3 merit such consideration. I have had no opportunity to see the M.Sc. programme in operation, but with 25 students and a limited research budget it sounds like a course-work oriented degree rather than a true introduction to a research career, and I would suspect the mean standard of emerging graduates is not too high.

I am surprised that no course work is proposed for the Ph.D. programme. This is certainly a break with Canadian tradition. I am a

little uncertain of the equivalence of semester hours, but by way of comparison a University of Toronto student from a four year honour B.P.H.E. programme would take one make up year (5 full courses) followed by a minimum of one year to complete an M.Sc. The Ph.D. would require further coursework - a major topic (usually 4 courses) and two minor subjects(usually 2 courses for each minor). We would insist for both the M.Sc. and the Ph.D. that the research was completed (rather than promising completion in a specified period such as three years). All of these differences pose questions as to the equivalence of the proposed S.F.U. programme with courses available in Toronto and elsewhere.

2. Faculty needs. I agree that the suggested topic areas each have some coverage, but I would be happier to see concentration on one topic, with an effort to recruit at least one new faculty member in this area with a reputation for excellence rather than a good average standing among his colleagues.

3. Academic requirements. The type of academic background meriting (a) direct admission to the programme and (b) admission with up-grading needs clearer specification. Will entrants come from a 4 year honours B.P.H.E., 3 year B.P.H.E., U.K. Phys. Ed. diploma? Will a one year or a 2 year M.Sc. be required?

4. Dissertation. Any worthwhile Ph.D. thesis should (1) be evaluated by external examiners and (2) constitute material for publication in a scholarly journal. The proposal for a purely departmental evaluation seems unsatisfactory.

5. Equipment. The list of equipment is quite impressive, and should provide adequate opportunity for work at the Ph.D. level.

6. Support. The financial needs of a Ph.D. graduate student seem underestimated. An ideal basis is a team of technician + Ph.D. student + supplies, = $15,000-$18,000 per student. Research in applied physiology can be quite costly. At present the department has only the equivalent of 5 or 6 projects of this calibre, distributed between 25 M.Sc. students.

7. Librarian's report. The librarian's report is confident, although I would have preferred to see a list of journals available to students, with details of the years covered. In view of the youth of S.F.U., I would suspect that many key journals have a rather limited time span.

Summary. In summary, the proposal gives a clear and essentially fair picture of what is requested. My main doubts in recommending initiation of such a programme at this time would lie in its similarity to existing programmes, uncertainties regarding the demand for students with doctorates in such an area, and the diverse heterogeneity of the topics to be covered. With regard to specific inception at Simon Fraser University, it could be argued that the programme follows too closely on authorization of an M.Sc. degree. Although equipment seems plentiful, research support is hardly adequate for 25 M.Sc. and 6-8 Ph.D. students, and I gather there are also at present limitations of space. For these reasons my recommendation would be that the department should be encouraged to resubmit its appli-

cation in perhaps two years time, with the emphasis concentrated on one major area of interest - perhaps traditional kinesiology, perhaps exercise histochemistry. The lapse of two years would allow a clarification of the pattern of research support along with prospects for the provision of additional physical facilities. It could also provide opportunity for recruitment of an outstanding research worker capable of directing research investigations in the selected area.

Roy Shephard

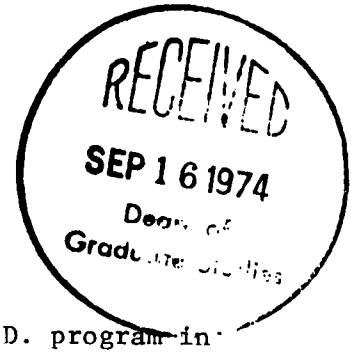
June 21, 1974

Roy J. Shephard

University of Waterloo

Waterloo, Ontario, Canada
N2L 3G1
Faculty of Human Kinetics and Leisure Studies
Office of the Dean

September 12, 1974



Dr. K. E. Rieckhoff,
Associate Dean of
Graduate Studies,
Simon Fraser University,
Burnaby 2, B.C.

Dear Dr. Rieckhoff:

There follows some observations concerning the proposed Ph.D. program in Kinesiology. I will respond to each of the questions raised in your June 4th letter, and add some further comments.

1. With regard to whether the program will produce quality Ph.D.'s comparable to other institutions, my answer is a qualified yes.

   Since this is a pioneer effort in many respects, there are few bases for comparison and thus it is much more difficult to predict success. Moreover, the field of kinesiology unfortunately, is in somewhat of a chicken-egg situation. While there is a need for upgrading the qualifications of persons studying the several aspects of human performance, before this can be accomplished there needs to be programs established to meet this objective. Such a dilemma notwithstanding, if monitored carefully, good results can be had. If I understand the Simon Fraser proposal correctly, I believe that if some attention is paid to what appears to be certain weaknesses or omissions, a Ph.D. program in kinesiology, albeit modest in the beginning, should be implemented.

   As there are few other institutions, if any, that have programs identical to that proposed, it is difficult to make any direct comparison. However, I have recently been a part of a two-year exercise in the Province of Ontario designed to assess the graduate prospects at eleven institutions for the next ten years in the fields of physical education, kinesiology and related fields. As it turns out, plans of our own Department of Kinesiology would be closest in approximating those of Simon Fraser. However, a distinction worth noting is in the manner in which the fields of specialization are defined. For us, these are: physiology of exercise, psycho-motor behaviour, biomechanics, and the social science of sport. We believe that to approach the frontier of discovery at the doctoral level, students' programs must be more focused than currently required at

both the undergraduate and master's level for kinesiology. While I can see from the proposal that this may be possible at Simon Fraser, and recognizing the Waterloo approach to be one of several alternatives, there is some ambiguity in the way the program is characterized and presented. For example, on page seven, although there are four problem areas listed they seem to overlap considerably, and, as indicated in the first sentence, are comprised of either the healthful state or the diseased state. This puts problem area one and three in the same logical group whereas problem area two might be combined easily with problem area number four. In a word, I find the entire section (e) somewhat vague. Much of this perhaps is simply a product of the difficulty of trying to rationalize interdisciplinary studies. While serious health or social problems can be approached from the perspective of several disciplines simultaneously, fundamental contributions to knowledge are more frequently made within the conceptual framework of a single discipline. The thrust of the Simon Fraser plan is not clearly stated. In any case, I am sure that such issues have come up in the discussion of other programs in the Faculty of Interdisciplinary Studies.

2. Regarding academic expertise, I believe that the success of graduate programs depend largely upon the qualifications and commitments of the faculty. In my opinion, only four of the faculty members listed would meet minimum qualifications for directing Ph.D. students. Each of these have experience and an established record of research which reflects consistent funding and a substantial publication record. Again, if I may refer to our Ontario exercise, we agreed to meet a criterion of three to four producing scholars in a particular subfield (i.e., physiology, motor behaviour, biomechanics, or sociology of sport) prior to offering doctoral work in that subfield. Again, I am referring to subfields narrower in scope than the broad "human structure in function and disease". Consequently, I would disagree with the statement under (b) on page two that no new faculty positions are necessary. While the four stronger members of the Department could no doubt mount the program, presumably they would have continued responsibilities to both the undergraduate and master's programs and therefore it may be unrealistic to expect the same people to carry the additional load unless some cutback is contemplated in other areas. However, good people are hard to find in this field and consequently on balance if some way was found to relieve these people of some of the other responsibilities, the proposal would gain in creditability and should go forward.

Nevertheless, I strongly urge serious consideration be given to appointing one or two additional senior people. For example, the area in psychomotor behaviour, I am not convinced that adequate strength is presently available. (However, you should be aware that the group collected in the Department of Kinesiology at Simon Fraser represents by far one of the strongest in North America in this or related fields.)

....3

One might argue that generous support will be provided by faculty members in other departments. While I subscribe to genuine co-operation of this kind, it has been my experience that this only works if people have a stipulated commitment in time, if not salary, to programs in other departments. Otherwise, they necessarily must owe their allegiance to their home department in the interest of their own career development and can only be considered as marginal resources. While a number of doctoral programs related to kinesiology are available in various universities of North America, it is my contention that the comparison should not be made with most, particularly those in physical education, where standards have been traditionally low, but rather with substantial departments in the scientific disciplines.

3. With regard to the rationale as given on page one of the proposal, it is less a conceptual, and more a statistical one. Nevertheless, I can subscribe to most of the points being made. I like the unique inter-disciplinary approach. Surely, our universities must experiment with new ways of organizing and creating knowledge, while at the same time training people to view phenomena from different and more contemporary perspectives. As a relatively new university, therefore, it is not surprising to find such a program being proposed by Simon Fraser.

   As for the need for graduates, this is always difficult to forecast, particularly in a field where we have no previous experience. At this university, where we are strongly committed to pursuing a similar course, our recent experience with both undergraduate and master's graduates has shown that they are finding positions in not only traditional academic departments, but also in fields ranging from biomedical engineering (e.g., the design of prosthetic devices), to the research agencies of the federal government, including the Defence and Civil Institute of Environmental Medicine. Thus we are optomistic that there will be important positions open to a modest number of graduates over the next ten years expected from programs of this kind. Moreover, there is a substantial move in this country to bolster the disciplinary orientation to the many programs in physical education. Clearly, graduates from such programs as proposed at Simon Fraser would be given high priority in any new appointments in view of their decidedly better background than that of those previously appointed.

4. Assuming the qualifications stated elsewhere in this letter are clarified or rectified, I would advise Simon Fraser to implement a program along the lines proposed, largely for reasons revolving around the need for new approaches to the serious study of human movement and performance. However, I believe there is a limit to the number of insititutions taking this approach - probably no more than four or five in Canada for the next ten to fifteen years.

....4

The major conditional factor, of course, would be whether there is an adequate university commitment. I have already suggested additional faculty might be necessary. Moreover, I am somewhat disturbed by the statement on page two concerning supporting personnel and "miscellaneous running expenses". The impression is given that the present program is inadequately funded. If true, I cannot believe that a mere $10,000 would handle both the needs of the present and the implementation of a Ph.D. program. For example, in the research areas proposed, considerable technical assistance is essential. I did not note any reference to this and consequently I suggest some attention be given this matter. Although there would appear to be adequate laboratories and equipment available for research, without technicians, technologists, laboratory demonstrators, etc., the department may find itself mounting a second class program in comparison to those in the departments of the biological sciences. Again, it may be merely an omission from the proposal.

Some additional comments are as follows:

With regard to the proposal, it suggests that the program would be tightly constrained and in considerable depth. I believe this is long overdue for work in this field, but I still find the fields of study and problem areas to be still rather broad. For example, it is not clear to what extent "breadth" would be required of all students, as opposed to so-called "depth".

Regarding space, presumably a new building would accommodate the program adequately. In addition, the supporting documentation suggests that a number of laboratory facilities are already available and well equipped.

As already indicated, I am somewhat concerned about the financial commitment to the Department. However, in the area of student support, in view of the funding records of members of the faculty, I suspect that there would be adequate finances for the small number of students proposed for the program.

Concerning the academic requirements for the degree, I am generally in favour of the flexibility offered the student. The success of such flexibility is, of course, dependent upon a well qualified and experienced research committee demanding high standards.

While somewhat rambling, and perhaps incomplete, I hope the above is of some value to you. In summary, based upon the materials supplied, I would be in favour of the proposed Ph.D. program, provided: that the University can give adequate financial backing; that one or two more faculty members be appointed, one of whom a senior person; and that an effort be made to express more clearly the conceptual rationale.

If I can be of any further assistance, please feel free to call upon me.

Sincerely,

Gerald S. Kenyon

GSK:gm

Gerald S. Kenyon
Professor and Dean