



Quaternary Geologist and Geomorphologist

NEWSLETTER OF THE QUATERNARY GEOLOGY AND GEOMORPHOLOGY DIVISION

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MANAGEMENT BOARD MEETING BOSTON, 25 OCTOBER 1993

The Management Board of the QG&G Division met on Monday, 25 October, 1993, during the Annual Meeting of the Geological Society of America, at Boston. Attending were: V. Baker, P. Calkin, J. Costa, S. Colman, F. Donath, T. Gardner, A. Gillespie, A. Hansel, R. Madole, D. Mickelson, C. Olson, K. Prestegaard, B. Tormey, J. Vitek, S. Wells.

The meeting included the following items:

1. Introductions
2. Approval of minutes of 1992 meeting
3. Secretary's report [D. Harden]:
 - 1993 election results:
Second Vice Chair: William Graf
New Panel Members for 1993-95: Carolyn Olson, James Teller, Waite Osterkamp
 - Winner of 1993 Kirk Bryan Award: William B. Bull for *Geomorphic Responses to Climate Change*: Oxford Univ. Press, 1991.
 - Financial condition (see accounting below)
For 1994 the Division will obtain a list of donors to the Macron and Howard funds so that donors can be thanked. Several retroactive charges were applied to the balance of the Division's Mackin Fund and Howard Fund by GSA Foundation. The Board would like written clarification from the Foundation of these adjustments.
 - Division membership 1993 was 1,294, down from 1,317 in 1992. QG&G remains the third-largest GSA Division
 - The Secretary would like to step down from her position after completion of the current term in Fall 1994
4. Second Vice-Chair's report [S. Colman]
 - Winners of the 1993 Mackin grants are: Joseph Liccardi, Oregon State Univ., and Joseph Mason, Univ. Wisconsin
 - Division awards to graduate students will be made from both the Mackin and Howard funds beginning in 1994. The Board also agreed to change the application letter and form so that applicants are required to notify the Division Secretary if they change the topic of their research after submitting the application.
 - The theme for the 1995 Annual Meeting at New Orleans, "Bridging the Gulf," will be suitable to Division symposia and theme sessions, especially those focused on wetlands and coastal environments.
5. First Vice-Chair's report [P. Calkin]
 - About 10% of abstracts submitted to QG&G for the 1993 meeting were rejected.
 - The Board heard three proposals for symposia at the 1994 Seattle meeting. The Board voted to support a proposed symposium by J. Costa and R. Waitt titled "Hydrology and Active Volcanism". The Board voted to support a symposium proposed by D. Kauffman and P. Lea titled "Beringia" for an at-large symposium. A third proposal submitted by W. Dietrich was also supported for consideration as an at-large symposium.
6. Division Chair's report [S. Wells]
 - The winner of the 1993 Distinguished Career Award is Victor Prest, Geological Survey of Canada.
 - The Board voted to sponsor a proposed short course by P. Bierman and A. Gillespie on "Cosmogenic isotopes and their geomorphic applications" for the Seattle meeting. The Board voted to sponsor this as the first in a series of **G.K. Gilbert Short Courses**. One proposed short course will be chosen as the G.K. Gilbert Short Course for each Annual Meeting.
 - With the Archeological Geology, Engineering Geology, and Hydrology Divisions, QG&G Division is co-sponsoring at this (Boston) meeting a timely special symposium on the Great Floods of 1993, to be held Wednesday evening 27 October.
 - A discussion of the need for a Division long-range planning committee led to a vote to establish such a committee. S. Wells will chair the committee, which will incorporate the goals of the *ad-hoc* committee and build on that committee's activities to date. R. Madole and V. Baker will attend the 1994 INQUA meeting as representatives of the long-range planning committee.
 - S. Wells and P. Calkin participated in the 1993 meeting of the International Association of Geomorphologists at Hamilton, Ontario and are enthusiastic about the Division's membership in the American Geomorphology Coordinating Board.
7. *Ad-Hoc* Committee for Scientific Health of QG&G [V. Baker]
A position statement "The Earth's Surface, Quaternary Sciences, and Global Habitability" is in the works under the direction of an NRC committee for INQUA, chaired by W. Graf. The QG&G Board voted to co-participate in a workshop to be held at UC-Irvine in spring 1994. The Board also voted to authorize expenses for the Chair and Secretary to attend this meeting. The Ad-Hoc Committee is also working on a summary of "Scientific Health" issues, including those raised at the public forum at the San Diego Annual Meeting in 1991, for publication in *GSA Today*.
8. Institute for Environmental Education (IEE)
[F. Donath] Donath discussed interactions between QG&G Division and IEE. IEE continues to encourage abstracts and theme sessions on the "Urban Issues" theme.
9. GSA Council [K. Prestegaard]
Prestegaard discussed activities at GSA Headquarters, including a status report on the search for a new Executive Director.
10. Other Items
 - S. Wells will serve as the Division's member on GSA's Committee for External Funding.
 - J. Costa as GSA Bulletin Editor spoke on the lack of publications of applied research in GSA journals. The Council has voted to sup-

port a new journal to address these needs. The Management Board supports the idea of a GSA-sponsored journal for applied research.

- The Fall newsletter will go to GSA earlier in July so that Division members receive it well before the Annual Meeting.
- R. Madole is working on a revised QG&G Division Manual
- D. Harden will spearhead preparation of an article for *GSA Today* summarizing activities of the QG&G Division

QUATERNARY GEOLOGY & GEOMORPHOLOGY DIVISION

Financial Activity Summary YTD through September 30, 1993

Division Fund Balance 12/31/92	2,197.84	
1993 Division Dues Income	<u>5,092.00</u>	
Total Division Resources		\$7,289.84
Division Expenses:		
Contribution to I.A.G.	334.00	
Newsletters—GSA expense	77.93	
Newsletters—invoice MB 060	<u>1006.74</u>	
Total division expenses		<u>1,418.67</u>
Division Fund Balance 9/30/93		\$5,871.17

The J. Hoover Mackin and the Arthur D. Howard Funds are maintained by GSA Foundation, who supplied figures reported here.

J. HOOVER MACKIN FUND Financial Activity Summary 12/31/92–9/30/93

Fund Balance 12/31/92		\$17,058.45
Income		
Contributions	430.00	
Interest	522.94	
92 Investment gain	(309.43)	
92 investment adjust.	<u>(296.46)</u>	
Total Income		965.91
Expenses		
Awards	1,500.00	
Service charges	18.64	
92 Management Fees	30.04	
92 Investment Revaluation	<u>751.89</u>	
Total Expenses		<u>(2,300.57)</u>
Balance 9/30/93		\$15,723.79

ARTHUR D. HOWARD FUND Financial Activity Summary 12/31/92 - 9/30/93

Fund Balance 12/31/92		\$27,775.65
Income		
Contributions	150.97	
Interest	942.47	
93 Investment gain	555.48	
92 Investment Adj.	<u>(586.81)</u>	
Total Income		<u>1,062.11</u>
Expenses		
Service charges	32.72	
92 Management Fees	<u>59.46</u>	
Total Expenses		<u>(92.18)</u>
Balance 9/30/93		\$28,745.58

EXPLANATORY NOTES: m, Mackin fund; h, Howard fund

- m,h One investment company overstated the gain on investments at year end, and an audit adjustment was made to correct this overstatement
- m,h Additional investment management fees that were not included on the 1992 year-end statement are included on this current statement
- m For several years the auditors held a "reserve for investment revaluation" figure in Foundation funds. At the end of 1992 the auditors decided to eliminate this calculation. Any gains on invested funds are now posted monthly. Elimination of this "reserve" caused a deduction from each individual fund.

HOW TO HAVE INPUT TO THE DIVISION

1. Submit nominations for Division offices and awards.
2. Submit suggestions, gripes, etc., for consideration by the Division Management Board.
3. Submit contributions (long ones on disk, IBM-compat.) to Division Newsletter.

Correspondence to the Division may be sent to Division Secretary:

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San Jose State University
San Jose, CA 95192-0102

Or you may write or call Division Chair:

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Newsletters are mailed in February and August of each year; deadlines for contributions are January 15 and July 15, respectively. Members are encouraged to use their Division newsletter to communicate with other members. Please send contributions (long ones please on IBM-compatible disk in WordPerfect) to the Newsletter Editor:

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NEWS FROM THE CHAIR

Parker Calkin provided the following news items about QG&G Officers, Panel, and committees.

- ✓ **Division officers:** Parker E. Calkin (Chair); Steven M. Colman (First Vice-Chair); William L. Graf (Second Vice-Chair); Deborah R. Harden (Secretary).
- ✓ **Division Panel:** Alan R. Gillespie, Ardith K. Hansel, Thomas V. Lowell, Carolyn G. Olson, James T. Teller, and Waite R. Osterkamp.
- ✓ **The Committee on Long-Range Planning,** a new standing committee to replace the ad-hoc committee of this name, is chaired by Steve Wells (909) 787-4367. Other committee members are Rich Madole and Vic Baker.

- ✓ **The Committee on Environment** is chaired by John Vitek (405) 774-6358. Other committee members are Marie Morisawa, Duncan Foley, Richard Kesel, and Parker Calkin.
- ✓ **The Ad Hoc Committee on the Scientific Health of Geomorphology and Quaternary Geology** is chaired by Vic Baker (602) 621-6003. Other members are John Costa, Art Bloom, Waite Ostercamp, Milan Pavich, Ken Pierce, Bill Dietrich, and Cathy Whitlock.

1993 QG&G DIVISION AWARDS

The complete citation and acceptances for the **Kirk Bryan Award**, the Society award that is bestowed by the QG&G Division, will be published in the March 1994 *GSA Today*. Only excerpts, edited for economy, are printed here. The **Distinguished Career Award** is solely a QG&G Division Award, its citation is not published elsewhere, and thus is printed in full here.

PRESENTATION OF KIRK BRYAN AWARD TO WILLIAM B. BULL

Excerpts from Citation by
Leslie D. McFadden and Peter W. Birkeland

Owing to development of the "greenhouse-warming" hypothesis, the subject of the impacts of future changes in climate triggered by global industrial and agricultural activities has become popular. How will Earth respond to predicted climatic changes, and how can these predictions be critically evaluated? The subject of the publication *Geomorphic Responses to Climatic Change* by William B. Bull is timely because it develops many hypotheses on responses of landscapes to climate change in diverse environments. Accordingly, the Quaternary Geology Society of America honors this publication with the Kirk Bryan Award for 1993.

One gains insight into Bill Bull's intellectual approach to evaluating climate change and landscapes by inspecting the book's organization. Chapter 1 provides the overall framework to be applied to diverse geographic settings. Fluvial system response to perturbing influences, such as climate change, is interpreted through the recognition that the system response is controlled by several variables. Responses to perturbations and disruption of equilibrium states in the system can be described by process response and relaxation times, complicated by the occurrence of occasional but important system thresholds. A conclusion is that two fundamental fluvial land forms can be recognized: aggradational terraces that reflect climatic response, and strath terraces that form via tectonic controls. The significance of tectonics is important because virtually all landscapes are influenced in some manner.

Illustrating the philosophy of reductionism as used in scientific research, Chapter 2 focuses on the Mojave Desert, an area characterized by landscapes that are geomorphically simple in comparison with other landscapes. Many parts of the Mojave Desert are tectonically inactive. By constraining the complexity of the system, the geomorphic response to climate change can be elucidated. Bull concluded that two strikingly different modes of system operation can be recognized: the arid and semiarid mode. These modes switched repeatedly in the Quaternary, influencing the hillslopes, vegetation, soils, and streams.

Remaining chapters focus on different environmental and tectonic settings. Chapter 3 focuses on studies in the hot, dry desert of the southwest Dead Sea Rift. An additional system variable, lithology, can strongly influence geomorphic processes on different areas subjected to the same climatic changes. Chapter 4 focuses on research conducted in the Transverse Ranges, California, where the new system variable is tectonics. From lessons in the latter areas, influences of tectonics could be identified and separated from those of climate. An outcome was that despite significant uplift during the Quaternary, late Quaternary climatic changes caused a system response that overwhelmed the tectonic influences.

The book represents the results and perceptiveness gained over 15 years of research. Before this, Bill Bull, trained as a hydrologist with the U.S. Geological Survey, began a study of alluvial fans in California. While he gained understanding about alluvial-fan form and processes, this work excited a keen interest in the fundamental question: what are the relative effects of climate and tectonics on the formation of streams and landscapes?

The opportunity to conduct research in the Transverse Ranges arose in part courtesy of the discovery of the acclaimed Palmdale bulge, presumed by many to be an ominous precursor of a great earthquake on the San Andreas fault. Many people live in this part of southern California, so, federal money flowed to geologists to study this phenomenon. A small part of this ultimately supported the geomorphologic studies in the Transverse Ranges. The Palmdale bulge turned out to be an illusion; the impacts of climatic change on these tectonically active mountains was not!

Geomorphic Responses to Climatic Changes reflects Bill Bull's continuing commitment to his scientific discipline. Armed with his field tape recorder, shovel, oyster shuckers, and a computer, he collects vast amounts of data under highly challenging circumstances, from the 115° heat of the deserts to freezing temperatures and harrowing exposures of the New Zealand Southern Alps. He has sustained over the decades research even when funding did not materialize. He simply reached into his pocket and kept going. This demonstrates commitment. We could not end this citation without acknowledging the role his field companion and best friend, his wife Mary, has played during all the global travels and studies. Even as Bill was trying to discern geomorphic responses to climate in New Zealand, Mary studied New Zealand culture and published a book entitled *Judder Bars and Chilly Bins* that explains some of the more curious Kiwi customs for Yankees who might endeavor to visit a country the Bulls have come to admire greatly.

Long ago the senior citationist, as a beginning graduate student, signed up for a seminar on climatic geomorphology. The assigned reading included the earliest versions of the first two chapters of the remarkable publication we honor this evening. As Bill Bull notes in the final chapter, understanding the past impacts of climatic changes on the environment can be used to assess the impacts of future climatic changes on geomorphic hazards such as floods and landslides, or on agricultural productivity, an impact with far-reaching consequences. This as much as any other recent publication in our discipline demonstrates why the voices of field-oriented Quaternary geologists and geomorphologists should be respected as the Global Change Program takes center stage in scientific research of the 21st century.

Excerpts from Acceptance by William B. Bull

Division colleagues and friends: thank you for awarding me the highest honor that a geomorphologist can aspire to. My book is amongst many essays seeking to learn more about how climate and climate change affect landscape evolution. I use this opportunity to chronicle the chaos from which "Geomorphic Responses to Climatic Change" emerged.

In the 1960s Luna Leopold encouraged employees of the Water Resources Division of the U.S. Geological Survey to study geomorphic processes, proposing that we choose "backyard research" projects and that we set career objectives high. Luna had a series of books in mind. The world became my backyard and my goal of writing this book took 15 years to complete!

We live in an age of promotions based on peer-reviewed journal articles, which John Costa this morning called "salami science". A coherent package of research results is thinly sliced and distributed to many journals, with rotating senior authorship. Obtaining research funds requires a track record. Not all books are successful, and the path with least risk would be a torrent of short articles. But I decided to compose gradually a monograph about a challenging global scientific question.

A first outline was about "Tectonic and Climatic Geomorphology of Arid Regions." How naïve to think that both could be discussed ade-

quately in a single book! To understand tectonic geomorphology, one needs to understand climatic controls on landscape evolution. The challenge was to identify different responses of fluvial systems to tectonic and climatic perturbations. Explanations of interactions between geomorphic processes must be elucidated by studies of tectonically active and inactive fluvial systems, in humid and arid regions.

A 15-year odyssey took me from arid Sinai Peninsula to humid New Zealand and to intermediate climatic and tectonic settings. Soils mapping of Quaternary alluvium allowed reflections on genesis of alluvial fans and stream terraces. My work became more interdisciplinary with the recognition of the importance of plants on hills and streams sensitive to climate change, and of the utility and significance of soils. Flights of stable alluvial surfaces give opportunities to hold conditions of topography, vegetation, and parent material constant, allowing assessment of time and of changing climate. Soil chronosequences allowed recognition of synchronous aggradation over large regions. Pulses of deposition induced by global climate change emerged as the main subject of the book.

Stimulating and fruitful discussions with colleagues and students helped the voyage through uncharted waters. It was my good fortune to learn about soils and landscapes with Pete Birkeland, Oliver Chadwick, Les McFadden, Phil Tonkin, and Dan Yaalon. This odyssey was successful, for I achieved professional growth in the process.

It should be clear that I am an optimist, positive about the future of geomorphology. We are no longer on the fringe of earth science. Our strengths lie in a better understanding of the complex processes shaping the landscapes that surround humankind, which have diverse relevance to society's needs. Let's integrate the skills of other scientists with our observational and modeling talents to solve these mysteries. New technologies almost seem to have been developed for geomorphologists. What a great time to be exploring subjects ranging from impacts of global climate change to active tectonics!

Leopold's advice to set one's sights high carries the risk of failure, but it is worth it. Few of us know our limits. We learn by pursuit of carefully chosen goals. The fun of a scientific career is in the unpredictable nature of the pursuit and in the diverse colleagues and friends met along the way.

The Kirk Bryan Award has improved the quality of papers written by Quaternary geologists and geomorphologists. The extraordinary character of the Award has become clearer to me in recent months in the form of sincere congratulations from colleagues. I am deeply touched and appreciative of this privilege. Thank you.



1993 Distinguished Career Award at QG&G Annual Awards Ceremony at Boston, left to right: Denis St.-Onge, Citationist; Victor Prest, Recipient; Parker Calkin, QG&G Division Chair (incoming).

PRESENTATION OF THE DISTINGUISHED CAREER AWARD TO VICTOR K. PREST

Citation by Denis A. St.-Onge

Shortly after joining the Public Service of Canada in 1958, in the then Department of Mines and Technical Survey, I was contacted by a distinguished gentleman who heard that I would be undertaking geomorphological studies on Ellef Ringness Island the following summer. He pointed out that very little was known of the Quaternary geology of that part of the Arctic. He impressed on me the importance of collecting as much information as possible as this would be important in any future compilation of the Quaternary geology of Canada. This gentlemanly and considerate approach impressed me immensely. This, as I found out in succeeding years, is a fundamental characteristic of Vic Prest. He always has time for young scientists and he always seeks their opinions and considers them carefully. The result is that, as a budding scientist, you are given the distinct impression that your opinion does count. This attitude has had an enormous impact on numerous Quaternary scientists across Canada whose career path was, if not decided, at least strongly influenced by similar conversations with Vic Prest. This is an essential component of Vic's ethos, regardless of your age or seniority, your opinion counts and will be taken in due consideration. The result is that after 40 years with the Geological Survey of Canada, including decades as "retired", Vic has been instrumental in providing opportunities for large numbers of graduate students to carry out field work and write theses both at the Masters and Ph.D. levels.

This evening I will not attempt to itemize in detail the contributions to Quaternary science of Dr. Vic Prest. This would embarrass Vic to no end and, a mere list would not do justice to the person behind the accomplishments. Rather I will attempt to convey to you the breadth of Vic's contribution and the magnitude of his influence on the development of Quaternary geoscience in Canada and in fact in North America. Dr. Prest's seminal contribution to geoscience has to be his syntheses of the history of the Laurentide Ice Sheet on a continental wide scale. In fact, he has become so identified with the Laurentide Ice Sheet, or visa-versa, that the name "Vic Prest Ice Sheet" could be used and everyone would understand. This major accomplishment, in order to be fully appreciated, must be put in an historical context.

Before the war, Vic worked as a field geologist for the Manitoba Mines Branch, the Geological Survey of Canada, the Ontario Department of Mines, and the International Nickel Company of Canada. This provided him with a broad background which would later allow him to integrate data from a variety of sources for the major syntheses that were going to be his lifelong pursuit. During the war he served as an officer in the Royal Canadian Navy and was stationed for awhile in Newfound-



1993 Kirk Bryan Award at QG&G Annual Awards Ceremony at Boston, left to right: Les MacFadden, citationist; William Bull, Recipient; Steve Wells, QG&G Division Chair (outgoing).

land, which was his introduction to Atlantic Canada, a major focus of his later career. After the war he resumed work for the Ontario Department of mines now the Ontario Geological Survey. In 1950 he was recruited by the Geological Survey of Canada and put in charge of the small Pleistocene, engineering and groundwater unit which Vic is largely responsible for nurturing to the current multidisciplinary Terrain Sciences Division by far the largest collection of Quaternary scientists in the country and, as far as I know, on the continent. Vic's role in the development of Quaternary science at the Survey and in the country as a whole was pivotal and is unmatched.

Vic put administrative duties behind him in 1964 to return to full-time research. It was at that time that he turned his attention to compiling the glacial map of Canada which was published in 1968 and to focus the field program of the Survey on filling in the larger holes. This compilation led also to his synthesis of the retreat history of the North American ice sheets, also published in 1969, and to his Quaternary Geology of Canada chapter in the Geology of Canada Volume published in 1970. The tripartite set of publications is historically significant; it capsulizes with typical clarity the state of knowledge of the Quaternary of northern North America at that time. It also clearly defined areas needing further research thus focusing the attention of Quaternary geoscientists both in the Survey and in the university communities. Although now retired, or as Vic prefers, "working without pay", he contributed to three syntheses by GSC staff to mark the occasion of the twelfth INQUA Congress in Ottawa in 1987: a paper with R. J. Fulton on "The Laurentide Ice Sheet and its significance"; another with J-S Vincent on "The early Wisconsin history of the Laurentide Ice Sheet" and finally, one with A. S. Dyke on "The Late Wisconsinian and Holocene history of the Laurentide Ice Sheet", this paper includes two magnificent maps: *The late Wisconsinian and Holocene retreat of the Laurentide Ice Sheet and The Paleogeography of northern North America*. For this work he was awarded the Johnston Medal by the Canadian Quaternary Association and, with A. S. Dyke the Kirk Bryan award by the GSA. These maps showing isochrones on retreat of the last ice sheet, the Late Wisconsinian Glacier complex over North America, and paleogeography of northern North America from 18000-5000 ago years represent premiere interpretations of the dynamics of the Late Wisconsinian-Laurentide Ice Sheet. His more recent work has dealt with continental scale dispersion of distinctive erratics, the now famous OMARS.

Through the numerous letters that supported Vic's nomination for the **Distinguished Career Award** runs a common thread: Vic's major impact on Quaternary geology through his major syntheses of the Laurentide Ice Sheet and his significant role in nurturing young scientists. I would like to quote a few excerpts.

"Throughout his long career he has displayed and stimulated enthusiasm for Quaternary research on the part of numerous students and scientists he had contact with. I can't think of anyone as well acquainted with the big picture of the Quaternary history of Canada, nor as conversant with the local details in most areas."

"...I think his distinguishing contribution has been his ability to assemble data from a wide-range of sources, synthesize them, and make them into pictures of the surface dynamics of the Laurentide Ice Sheet. His 1969 map on the isobases of retreat is a classic and it is easy to get an idea of its significance by examining the glacial and Quaternary literature of the 1970s in which virtually everyone used or referred to his map. —With A. S. Dyke, Prest continued this work and, the maps and discussions by Dyke and Prest, and the use of these maps in the 1989 DNAG k-1 volume, is a solid testimony to the career of this likable geologist, who started out as a bedrock mapper but then saw the light!"

"My interactions with Vic Prest extend back over two decades to early days of my graduate research program. At that time his masterful 100-page synthesis "Quaternary Geology" had just appeared in the book *Geology and Economic Minerals of Canada*. That the task of summarizing the state of the art for Quaternary studies in Canada was Vic's is a measure of his breadth of interest and of his respect amongst the diverse community of Quaternary geologists and geomorphologists. As the preeminent Canadian Quaternarist, Vic might not have been interested in the studies of a young graduate student, but from my earliest days of field work in the Canadian Arctic, Vic was always interested in my field observations,

encouraging in his responses, and helpful in putting my own observations into the context of the broader picture of the Laurentide Ice Sheet that he knew so well. His active interests in all aspects of the Quaternary history of North America is one of the traits that distinguishes Vic Prest from other accomplished scientists of more narrow focus".

"His broad knowledge, and calm critical approach has resulted in the objectivity of his large-scale palaeogeographical constructions. In all these joint ventures Vic Prest has been very inspiring to his co-workers, particularly the young Quaternary geologists at the Geological Survey of Canada. Though formally retired for many years, he is professionally as active as before his retirement and, if he is not at his office at the Geological Survey, he is in the field."

There is no doubt that Dr. V. K. Prest is highly deserving of the Distinguished Career Award by the Quaternary Geology and Geomorphology of the Geological Society of America. As is proper in conveying this award to Dr. Prest the Society is also honouring itself. Although this will embarrass Vic's protestant ethics, I must add that his friends and colleagues recognize him as a giant in the discipline and share in the respect and admiration that he has earned from Quaternary scientists from around the world. Mr. Chairman, it is indeed a pleasure and a very great honor for me to present **Dr. V. K. Prest**, recipient of the Distinguished Career Award for 1993.

Acceptance by Victor K. Prest

In early August I received a page-sized brown envelope from the University of California, Riverside. I opened the letter expecting it would be a request for me to review a manuscript, or an outline of a project, pertaining to some Canadian area. To my great surprise it was from Stephen Wells informing me that I had been nominated for the 1993 Distinguished Career Award of the Quaternary Geology and Geomorphology Division of the GSA. How could an elderly Canadian of my limited and restricted accomplishments be so chosen? And when I read the Citation and Reply for the 1992 award I was left gasping for breath! Who would introduce me? What could I say in reply or defense? I felt very humble indeed though pleased and flattered that my American colleagues had thought of me.

Many in this gathering tonight will have heard or read my rambling comments on the occasion of the 1990 Kirk Bryan Award when Arthur Dyke and I were honoured by this Division at the meeting in Dallas, Texas. I will endeavor to tell you something of my early career without unduly overlapping on that account. Hopefully it will be of some interest to both American and Canadian colleagues.

Let me start by admitting that I never had a paper route! But I did work for a chain-grocery store for a couple of years and handled a lot of brown paper bags. Later as an undergraduate major in both botany and geology I managed to get summer employment with a botany professor at the University of Manitoba. I was his handyman helping with all facets of his experimental work pre-treating cereal grains to speed their growth and improve their yield. This involved laboratory work as well as farm labour, - preparing the experimental plots, caring for them and harvesting. I have painful memories of the latter. The professor did not see too clearly and was a wild-man in the use of binder twine: while bundling the sheaves of grain he commonly completed his knots with my finger or thumb firmly bound. But jobs were hard to come by during the Depression Years! I earned 18 cents an hour, paid car-fare and a zone fare from Winnipeg to the Agricultural College, and of course packed my own lunch. In spite of all that it took a winter session of paleobotany to convince me to concentrate on geological matters. Further courses in Precambrian, Historical, Stratigraphical and Glacial certainly held great promise for an exciting career, and so it proved!

As previously recorded I next worked as a field assistant for the Manitoba Mines Branch and then the Geological Survey of Canada. I pursued my geological studies through to the Master of Science degree at the University of Manitoba. My Master's thesis was on what appeared to be a small volcanic centre or plug in the Precambrian rocks near Flin Flon. Thesis work in those "early days" was not as comprehensive as is the case nowadays: there

were no copying machines, much less computers. I recall hiring a young man to type my thesis. No doubt his pay was low!

Having been well-bitten by the geology bug, and in spite of the flies and mosquitoes in the field, I decided to pursue studies towards a Ph.D. Financial considerations were paramount. In 1935 I stayed on in Flin Flon till November 11th to eke out my savings. By that time there was six inches of snow on the ground and the temperature had dropped to 16° below zero. I had earlier corresponded with Dr. Emmons at Minnesota and Dr. Moore at Toronto. As I recall I had better financial prospects at Toronto and could report there in late November. So I chose Toronto. All went well indeed and I served as an assistant in geology at both the University and the Royal Ontario Museum. I received the magnificent sum of \$31.25 a month from each party and that helped keep the wolf-from-the-door for the rest of the winter. I shared an office in the Museum alongside that of Dr. A.P. Coleman and on his demise took over that office—fine start for one interested in glacial matters.

Come spring I was scheduled for summer employment with the Ontario Department of Mines as a senior assistant to Dr. E.S. Moore on his iron formation studies, but that institution was short of leaders and persuaded me to take a party of my own. Though it was rather an embarrassing situation I was swayed by the difference in pay! Thus began several years working for the Ontario Department of Mines while continuing my own work at the University and Museum.

I served as a Lecturer for a couple of years while pursuing my own frustrating studies. I had to abandon work on a metamorphic problem due to a change in the O.D.M. field assignments. Then got involved in a chemical problem concerning the preferential deposition of gold within the Pearl Lake porphyry, near Timmins, Ontario, relative to that in the same vein systems extending into the adjacent volcanic rocks of the Porcupine gold belt. I spent several weeks in mid-winter visiting and collecting samples from several mines in the vicinity of Timmins. The mine geologists were most cooperative though they viewed the project with great skepticism. The University of Toronto geology department provided me with all the platinum ware I needed and I proceeded to establish the K and Na ratios in my samples relative to the gold values, which the mining companies graciously provided. I could do two samples at a time and two batches each week. [As you probably know, aside from the crushing, screening and preparation of "beads" for X-ray analyses, K and Na ratios can be established today in a matter of minutes.] After a few months of painstaking analyses with nothing but negative results and though my supervising professor felt I should go ahead with my summation, I was utterly dismayed. Following some discussion it was decided that I might expand on the general geology of one of my field areas and submit that account on behalf of my doctorate degree. Thus I bailed out and at the end of my fifth year at Toronto was granted my degree in 1941. I must admit that such a thesis cannot compare with the elaborate modern-day theses submitted to geology and geography departments throughout Canada and the States.

As I mentioned in my 1990 rambles in Texas, I accepted work with the International Nickel Company in Copper Cliff, Ontario. The work involved structural problems in and around the Sudbury Basin during the summer of 1941 and early 42, with winter in the Research Laboratory. The latter work involved the mineralogy of ore samples that I collected from the company's operating mines. The Copper Cliff Curling Club was close-by so life was copesetic indeed.

Work with the Nickel company ended when I joined the Canadian Naval Volunteer Reserve. I fancied myself exploring the fiord along the Labrador coast and probably examining their sediments, as microscopic work was mentioned in my Navy interview. Alas, the microscope turned out to be a film view-finder and the work pertained to high-frequency direction-finding as a part of the American and Canadian network of radio stations concerned with the U-boat threat. My main base was at Harbour Grace on the east coast of Newfoundland. alas, no curling club!

The network of stations became obsolete during the latter years of the war but was maintained for concealment and security reasons. None of

my compatriots in Ottawa were the least bit inclined to replace me in spite of my several requests to be drafted elsewhere. Finally, on orders from Ottawa, an officer in St. Johns and I traded places—to give us both a change! There I spent the last six months. When the war ended my planned departure was delayed by the reluctance of a German U-boat commander to proceed to St. Johns. Then it was back to Toronto for my discharge and I resumed work for the Ontario Department of Mines. Again it was mainly Precambrian geology but it also involved some property inspections and one Pleistocene assignment. I also served as acting geophysicist for a couple of years but without any increase in pay, —perhaps an omen of another job change.

As mentioned in my Texas reply in 1990 I accepted a position with the Geological Survey of Canada in mid-summer 1950. I was signed-on as the geologist member of a Canadian group assigned to the Arctic Resupply Mission aboard the ice-breaker U.S.S. Edisto. We boarded the "Edisto" in Boston and sailed from there to Halifax accompanied by the Coast Guard Ice-breaker Eastwind (while a supply ship and a freighter headed directly for Thulé, Greenland). What a change from the congested Halifax of my Naval training in 1942 to the quiet and lovely flowered city of 1950! From Halifax we journeyed via Gulf of St. Lawrence and Labrador Sea to Greenland. There we made short stops at Godthab and Godhaven as well as traveling up Sondre Strom Fiord; and I was privileged to be taken in a jeep up to the war-time U.S. air base on the plateau. Then it was on to Thulé where the supply ships were unloading. Thulé had been abandoned as an airbase at the end of World War II, but changing events in Europe resulted in plans to re-build and expand the base. We were there but a full day when a Lancaster plane, on ice-patrol and a mail-drop mission to Alert on northern Ellesmere, crashed near that signals station. The ice-breakers were ordered to proceed to Alert. Neither ice nor currents cooperated so that ours was a slow and zig-zag course. I was fortunate in getting ashore via a Bell helicopter in a couple of places on Ellesmere, and I at least saw a lot of northwestern Greenland. But before rounding the north end of Ellesmere Island the 'Edisto' rammmed heavy pack-ice and sheared a prop. Thus only the Eastwind could proceed to Alert. While some supplies and gear were being transferred from Edisto to Eastwind, the latter's Sikorsky helicopter went out on ice patrol and on returning caught fire in the air. It was given the OK to land on shipboard where an alert fire-crew remedied the trouble. It was then transferred to the Edisto and following a further check-up was declared air worthy as we slowly wended our way southward. I was able to get ashore in a few more places on Ellesmere and once on Devon Island. But one can do little with but a few hours stay in such rugged terrain.

It was clear sailing westward to the Resolute Base on Cornwallis Island. While we waited there for the 'Eastwind' the Naval Commander-in-charge of the scientific side of the Mission decided to take a plane north to check the ice conditions enroute to Eureka on western Ellesmere. He noted that the channel was plugged at the southeast end of Axel Heiberg. A Polaroid photo indicated it was probably a misplaced ice-island. Later the 'Eastwind' passed it on the Ellesmere side and reached Eureka OK. The mission completed, both ice-breakers made it back to Boston without further troubles. From there it was a flight back to Ottawa for the Canadian group. Thus ended an eventful trip though the geological observations were unavoidably sparse. Needless to say I did not recommend Survey participation on another Resupply Mission!

My return to Ottawa was at a time when the Geological Survey was planning to re-establish a Pleistocene and Groundwater unit. It had earlier supported R.E. Deane from 1945 to 1949 while he was working on his doctorate at Toronto. I will mention his assistants, as many here will know or have heard of them; they were Ted Owen and John Elson in 1946, Carl Halstead in 1947, Keith Pollitt in 1948, and Nelson Gadd, Bruce Craig and Bert Lee in 1949. All of these "young fellers" took up positions with the Survey and some pursued their Ph.D. degrees with financial help of the Survey.

Meanwhile Archie Stalker had been engaged in groundwater investigations in Alberta from 1945 to 1950. He obtained his Ph.D. from McGill University in 1950 and was taken on permanent staff. From 1951 onward he devoted most of his time to the surficial geology of central and southern Alberta. John Elson had similarly pursued groundwater investigations in western Canada from 1947 to 1949. He began mapping the surficial deposits of southern Manitoba in 1950 and began doctoral studies at Yale under Richard Foster Flint. And Eric Henderson following work with Archie Watt, of the Ontario Department of Mines, on Pleistocene and Groundwater studies in the Toronto region in 1946, 1947 and 1949 (and the Saskatchewan Government in 1948) joined the Survey in 1950. He began mapping the surficial deposits in west-central Alberta. Also in 1950 C.P. Gravernor began studies for the Survey in the Lindsay-Peterborough area, Ontario. Both Henderson and Gravernor pursued their Ph.D. degrees at Indiana. John Fyles commenced his Pleistocene studies on Vancouver Island in 1950. His doctoral work was under Dick Goldthwait at Ohio. Bert Lee began work in the St. John River valley New Brunswick in 1950 and undertook doctoral studies at Chicago. Nelson Gadd began Pleistocene investigations in southern Quebec and his doctoral work under George White at Illinois. Owen Hughes participated in groundwater investigations in southern British Columbia, a project supervised by J.E. Armstrong in 1950, and he enrolled for doctoral studies at Kansas.

Early in 1950 the Survey had recognized its fledgling surficial and groundwater unit under the title "Groundwater, Glacial and Engineering Division". It was one of seven informal divisions of the Survey. Ted Owen was in-charge of the Groundwater and Engineering unit but there was no senior glacial geologist and no nominal division chief, due to Roy Deane's departure in late 1949 to teach at Indiana. Thus I fell heir to the job! What a break—with that fine group of young enthusiastic geologists already on staff! But within a year there was a major Survey reorganization into only six divisions and our group became part of (get this) a Post-Precambrian Division. Assuredly our Quaternary unit qualified under that title! Thus we became a section and I remained as the nominal head.

Nominal was the word! In 1951 the Chief Geologist directed me to undertake a combined Pleistocene and Engineering study of Montreal Island, and this work continued through 1952. On returning to Ottawa this fall the Division Chief requested ? me to proceed to New Brunswick to relieve Bert Lee on his dam-site investigations, in order that Bert might immediately return to his doctoral work at Chicago: how could I refuse! But there was a bonus, in that I was able to participate with the New Brunswick Power Authority and the American Corps of Engineers on an examination of all the potential dam-sites in New Brunswick and in Maine.

Political pressure from the Province of Prince Edward Island resulted in the Chief Geologist assigning me to commence a study of both the bedrock and the surficial deposits of that island in 1953. After a couple of years there, my supervisory duties took me elsewhere, even though the detailed surficial mapping was far from complete. My friend Dick Godthwait recommended George Crowl from Ohio Wesleyan to replace me in 1955. Being unable to increase the pay-scale, commensurate with his experience, George would not return in 1956. I was then able to hire Larry Frankel, a new Ph.D. from Nebraska. In the following couple of years both these fine men, salaries having been adjusted, carried on with the island studies and completed preliminary papers and one bulletin.

Before rounding off my remarks, regarding my G.S.C. affiliation, I must mention some other long-time colleagues I have had the pleasure to work with. My botanical background came to the fore in 1951 when Jaan Terasmae applied for work with the Survey. He had been a student of that great Swedish palynologist Gunnar Erdtman, and we would certainly need such services. Jaan was hired forthwith and received an excellent geological background working with John Fyles, Nelson Gadd, and Bert Lee in successive years. Jaan left us in 1968 to head-up the newly created Geology Department at Brock University. His stellar

assistant Bob Mott took-over as our palynologist until his retirement in 1993.

Other long-time associates, that some of you will know, are Wes Blake of Arctic fame, and my right-arm Doug Grant our Atlantic Provinces specialist. Doug Grant and Vern Rampton were my close associates in the compilation of the 1968 Glacial Map of Canada. And Bill Shilts has been a source of inspiration in regard to the inter-relation of Laurentide and Appalachian ice. Colleagues of more recent years are too numerous to mention but I have indeed been blest my association with a fine group of fellow workers from 1950 to the present. Also I must mention two Canadian professors who have been an inspiration to me—Alexis Dreimanis and Paul Karrow. Their many publications and friendship have been highly prized. And I must express my appreciation for the kindness and consideration of Jean-Serge Vincent and Denis St-Onge in my retirement years.

But my career would have been stilted indeed were it not for my association with innumerable American colleagues through the "Friends of the Pleistocene" field trips. It was at the "Friends" meeting in Toronto in 1948 that I first met Dick Flint and Dick Goldthwait. I was greatly impressed by their considered opinions and friendly discussions. Others, that I would meet again over the years included John Lucke, Phil Shafer, Paul MacClintock, Don Chapman and Lou Peltier. Also, Canadians on the 1948 trip were Tuzo Wilson, Colin Stern and John Elson. Years later, Eastern Friends trips in Québec were led by Bert Lee and Nelson Gadd.

In the late fifties I was graciously invited to attend lengthy regional field trips in the mid-west organized by that master of planning and teaching, the late Richard Goldthwait. In later years I had the pleasure of showing Dick the geological highlights of his father's field area in the St. Lawrence River valley. We were considering publication of his father's report for the Survey: it had been put aside during the Great Depression when only certain economic reports saw the light-of-day. Alas the surficial geology was on obsolete base-maps that would have required too much cartographic work to ready them for publication. Many years later significant parts of the J.W. Goldthwait work were included as a part of Nelson Gadd's Memoir on the Central St. Lawrence Lowland.

Perhaps many here this evening were unaware that Dr. J.W. Goldthwait had worked for the Geological Survey of Canada in this part of Quebec and Ontario, as well as in Nova Scotia. Also many may be unaware of our Survey's participation in Dr. Warren Upham's great monograph on glacial Lake Agassiz. And I believe that our Survey gave some financial assistance to Harlen Bretz when he extended his Pleistocene studies in Alberta. so you will see that my hiring of George Crowl and Larry Frankel was not without precedent, but just another case of "Hands-Across-the Border". And my reference here to Dr. Upham reminds me of his record of several far-traveled glacial boulders in North Dakota and Minnesota, that are without doubt "Omars" from the Omaroluk Formation from southeastern Hudson Bay.

On several Midwest Friends trips I benefited from conversations with many American colleagues. Those still active include Alan Schneider, Bill Wayne, Herb Wright, Sheldon Johnson, Charles Matsch, Bill Farland, Steve Porter, Bob Stuckenrath, and Jane Forsythe to name but a few. And I must refer to some Eastern Friends such as Charlie Denny, Ernie Muller, Joe Hartshorn, Hal Borns and Art Bloom. And just one other notable that I have long respected, since his early days in Ottawa, and that is John Andrews now at Boulder, Colorado. My career has indeed been enriched by association with all the above-mentioned 'Friends'; and to those still active, I shall look forward to more 'friendly' meetings and field trips.

Perhaps some will wonder what became of our Engineering and Groundwater group. My attempts to activate our engineering unit fell on deaf-ears. But later on our Director, the late Dr. Jim Harrison went to-bat on behalf of our groundwater needs. He made such a good presentation to Treasury Board that we were granted twenty-five new positions. Of course we could not handle such an increase so we settled for five new positions with others to follow in subsequent years. I succeeded in hiring

give good men with rather diverse backgrounds. Everything looked rosy indeed but the following spring a hiring freeze was adopted throughout the government.

Over a number of years one of our groundwater workers was accepted to participate on a U.S.G.S. short course; these proved to be great training experiences. All was well until a managerial decision was made to amalgamate our unit with the Inland Waters Branch of our Department. Some six months later a major governmental reorganization resulted in that Branch being embodied in a new Department of Environment. Thus groundwater studies were divorced from the Geological Survey of Canada. A sad day for sure!

The Distinguished Career Plaque presented to me this evening is received with great humility. I believe it illustrates the respect we all have for colleagues on both sides of our International Boundary. And I must add my heart-felt thanks to present-day colleagues in Ottawa for the beautiful polished "Omar", and to the Geology and Geomorphology Division for its attached Career Award plate and bronze GSA crest—it is truly a lovely gift.

Thank you all for your indulgence this evening and for the 1993 Career Award of this Quaternary Geology and Geomorphology Division.

NOMINATIONS FOR 1994 DISTINGUISHED CAREER AWARD

The Distinguished Career Award was established in 1985 to recognize Quaternary geologists and geomorphologists who have demonstrated excellence in their contributions to science. The recipient need not be a member of the Geological Society of America or the QG&G Division. Nominations will be accepted at any time during the year, but the deadline is April 15, 1994. Nominations should be sent to the Division Secretary, Deborah Harden, and require: (1) a supporting letter of nomination documenting the contributions of the nominee, (2) three letters or signatures of additional members supporting the nomination, (3) a résumé of the candidate (such as a photocopy from *American Men and Women of Science*), along with a bibliography of the nominee's most significant papers. The Division Chair will appoint a committee to oversee the collection and completion of award nominations. The names of unsuccessful candidates proposed for the award will remain open without renomination for the following three years. Further consideration after this period will require renomination.

NOMINATIONS FOR 1995 KIRK BRYAN AWARD

The Kirk Bryan Award needs more nominations. Some papers most worthy of consideration, no member has taken the initiative to nominate. If there is a report in Quaternary geology that a member finds particularly innovative, please take time to write a nomination. The Kirk Bryan Award is given for a paper or book published within the last five years. The work may be single or multi-authored. Nominations are made by writing a letter that identifies the work and provides a statement about its significance. Please send nominations to Division Chair (Parker Calkin) or to Division Secretary (Deborah Hardin). The nomination deadline for the 1995 award is 1 December 1994.

JONATHAN O. DAVIS SCHOLARSHIP Quaternary Sciences Center Desert Research Institute

The Jonathan O. Davis Scholarship is given annually to support the field research of a graduate student working on the Quaternary geology of the Great Basin or surrounding areas. The grant is about \$750. Administered by the Quaternary Sciences Center of the Desert Research Institute, Reno, the scholarship is open to graduate students enrolled in a M.S. or Ph.D. program at any U.S. university. The research must have a substantial geologic component or demonstrate a strong reliance on geologic techniques.

To help the endowment grow, please send contributions to: Executive Director, Quaternary Sciences Center, Desert Research Institute, P.O.

Box 60220, Reno, NV 89506. Checks should be made out to the Board of Regents-DRI. Please indicate on the check or in a note that the donation is for Jonathan Davis Scholarship Fund.

GLADYS W. COLE MEMORIAL RESEARCH AWARD

The Gladys W. Cole Memorial Research Award is for investigations of the geomorphology of semiarid and arid terrains in the United States and Mexico. It will be given each year to a GSA Member or Fellow between 30 and 65 years old who has published one or more significant papers in geomorphology but is for support of new work. The award amount in 1993 was \$7,000.

Application forms for the Gladys W. Cole Award may be obtained from the Research Grants Administrator, GSA, PO Box 9140, Boulder, CO 80301; tel (303) 447-2020. Applications must be postmarked by 15 February each year for award that is made in April.

1994 GSA ANNUAL MEETING, SEATTLE Symposium and field trips in Quaternary Geology

QG&G Division is sponsoring a Symposium, and jointly with GSA's Institute for Environmental Education (IEE) is co-sponsoring a Theme Session, at the 1994 Annual Meeting of the Geological Society of America at Seattle. The Division half-day symposium, co-chaired by J.E. Costa and R.B. Waitt, is "**Hydrology and active volcanism—at the leading edge**". The Theme Session, organized by Duncan Foley, is "**Urban, suburban, and rural environmental geology—at the leading edge**".

Several field trips may be of interest to QG&G Division:

- ✿ Geomorphology and stratigraphy of scores of colossal last-glacial Missoula floods in Washington's channeled scabland and Columbia Valley, and Columbia River Gorge. 10/18-23, \$450: Richard Waitt & Jim O'Connor (206) 696-7558.
- ✿ Earth, water, trees, and fish: Geomorphology and land-use problems in the forested mountains of the Pacific Northwest. 10/21-23, \$260: Matthew Brunengo (206) 902-1433.
- ✿ Mount Rainier, a Decade Volcano. 10/22-23, \$180: Patrick Pringle, et al. (206) 902-1433.
- ✿ Holocene tectonics in western Washington. 10/22-23, \$140: Robert Bucknam & Brian Atwater (303) 273-8566.
- ✿ The 1980 (mostly) and earlier explosive eruptions of Mount St. Helens volcano, 10/27-30, \$300: Richard Waitt & Tom Pierson (206) 696-7558.
- ✿ Geohydrologic setting of the Hanford Site, south-central Washington. 10/28-29, \$160: Steve Reidel, et al. (509) 376-9932.
- ✿ Pleistocene geology of the Puget Lowland. 10/28-30, \$260: Don Easterbrook, Derek Booth, & David Dethier (206) 650-3583.
- ✿ Character of landslides in western Washington and Oregon. 10/28-30, \$260: Tom Kuper et al. (503) 228-7718.

The first annual G.K. Gilbert Short Course sponsored by QG&G Division is "**Geomorphic applications of in-situ-produced cosmogenic isotopes**", taught by Paul R. Bierman (U. Vermont) and Alan R. Gillespie (U. Washington).

1994 GSA SECTION MEETINGS

- South-Central Section: Little Rock, Arkansas. 21–22 March.
- Cordilleran Section: San Bernardino, California. 21–23 March
- Northeastern Section: Binghamton, New York. 28–30 March.
- Southeastern Section: Blacksburg, Virginia. 7–8 April.

- North-Central Section: Kalamazoo, Michigan. 28–29 April.
- Rocky Mountain Section: Durango, Colorado. 4–6 May.

FRIENDS OF THE PLEISTOCENE 1994 FIELD TRIPS

South-Central Cell: 25-27 March 1994

Tom Gustavson and Steve Hall will lead the 1994 south-central FOTP to parts of the Rio Grande valley from El Paso south to Sierra Blanca, Texas, including the Hueco Bolson and Red Light Draw area. We will see some aspects of late Tertiary and Quaternary semiarid to arid depositional systems, paleosols, faulting, and geomorphology, as well as archeological resources of the region. For further information please contact Tom Gustavson, Bureau of Economic Geology, University of Texas, Austin, Texas 78713. Tel (512) 471-1534; Fax (512) 471-0140.

Pacific Northwest Cell: 13-15 May 1994

Jim O'Connor and Richard Waitt will lead an inaugural Pacific Northwest Cell FOTP trip 13-15 May 1994 on the colossal late Wisconsin floods from glacial Lake Missoula that repeatedly swept many hundreds of feet deep through the Columbia Gorge, Wash-Oreg and backflooded up the lower Yakima and Walla Walla valleys of southern Washington. The focus will be on new evidence discerning the number of the largest floods in Columbia Gorge; evidence for scores of floods of somewhat smaller (yet nonetheless enormous) discharge across the region will be presented and argued. Please contact: Jim O'Connor, U.S. Geological Survey, 5400 MacArthur Blvd., Vancouver, WA 98661. Tel (206) 696-7618; Fax (206) 696-7866. E-mail joconnor@pwavan.wr.usgs.gov.

Midwest Cell: 13-15 May 1994

Tom Lowell (University of Cincinnati) will lead the 41st annual Midwest FOTP trip in southwestern Ohio and adjacent Indiana on 13-15 May. The meeting theme is "Sedimentation of a 'typical' glacial cycle". For more information and/or registration materials, contact Tom Lowell, Department of Geology, University of Cincinnati, Cincinnati, OH 45226, Tel (513) 556-41650, E-mail Lowelltv@ucbeh.san.uc.edu. Or Scott Brockman, Division of Geological Survey, Ohio Department of Natural Resources, Columbus, OH 43224. Tel (614) 265-6604.

Northeast Cell: 20-22 May 1994

Diane Braun will lead the Northeast FOTP on a trip to examine late-Wisconsin through pre-Illinoian-G(?) age glacial and periglacial deposits at the glacial limit in northeastern Pennsylvania. Featured will be large exposures of multiple till and colluvium units in Anthracite strip mines. These abandoned mines are being reclaimed and this may be the last chance to observe these exposures. For further information please contact Diane Braun, Geography and Earth Science Department, Bloomsburg University, Bloomsburg, PA 17815. Tel (717) 389-4139.

Rocky Mountain Cell: mid-August 1994

Oliver Chadwick and Robert Hall will lead the 1994 Rocky Mountain FOTP trip to Wind River Basin, Wyoming. Correlations will be presented between extensive river terraces along Wind River and the glacial deposits at Bull Lake, Dinwoody Lakes, and Whiskey Basin. A revised glacial chronology has been developed from a combination of ¹⁴C dating of pedogenic carbonates, cosmogenic isotope dating, and tephrochronology. Please contact Oliver Chadwick, JPL, 183-501, 4800 Oak Grove Dr., Pasadena, CA, 91109. Tel (818) 354-6229; Fax (818) 354-7476.

Pacific Cell: 30 September to 2 October 1994

Rob West (U. Cal. Santa Barbara) and Amalie Orme (Cal. State Northridge) will lead the 1994 Pacific Cell FOTP to Death Valley and Owens Valley, California. Topics include pluvial lake shorelines, and sequences of fans, pediments, etc., from which an interplay of climate and tectonics can be seen on landscape development. For further information please

contact Rob West, Dept. of Geology, Univ. of California, Santa Barbara, CA 93106. Tel (805) 893-3471; Fax (805) 893-8686. E-mail west@magic.geol.ucsb.edu

Southeast Cell: 18-20 November 1994

The 1994 Southeastern FOTP trip will be led by Kelvin Ramsey on Quaternary geology of Delaware. For more information please contact Kelvin W. Ramsey, Delaware Geological Survey, University of Delaware, Delaware Geological Survey Bldg., Newark, DE 19716. To add, update, or delete your name on the SEFOP mailing list please contact J. Steven Kite, Dept. of Geology and Geography, West Virginia University, Morgantown, WV 26506-6300, Tel (304) 293-5603, Fax (304) 293-6522, e-mail KITE@WVUGEO.WVNET.EDU!

GEOLOGICAL ASSOCIATION OF CANADA ANNUAL MEETING Waterloo, Ontario 16-18 May 1994

The 1994 Annual Meeting of the Geological Association of Canada will be held at University of Waterloo, Waterloo, Ontario 16 to 18 May 1994. Of interest to QG&G members:

Field trips:

- Quaternary geology of Waterloo area; I. McKenzie
- Engineering geology of Niagara Falls; B. Semec, N. Yassir
- Environmental geology: National Water Research Institute; J. Coakley, R. Thomas
- Quaternary geology and hydrogeology of the Oak Ridge moraine area; D. Sharpe, P. Barrett, L. Dyke, K. Howard, G. Hunter, R. Gerber, J. Patersen, S. Pullen

Symposium:

- Geology of Canadian urban centres; P. Karrow, O. White

Special Sessions:

- Techniques for reconstructing Quaternary paleoclimates; T. Edwards, A. Morgan
- The Burning Tree mastodon site; B. Lepper, D. Fisher, A. Morgan
- The onshore-offshore geology of the Great Lakes basins; P. Barnett, M. Lewis
- The geology, hydrogeology, and geophysics of the Waterloo Region; J. Greenhouse

For further information please contact: Dr. Paul F. Karrow, Faculty of Science, Department of Earth Sciences, Waterloo, Ontario, CANADA N2L 3G1. Tel (519) 885-1211; FAX (519) 746-7484.

AMQUA BIENNIAL MEETING Minneapolis, University of Minnesota 19-22 June

The AMQUA 13th Biennial Meeting will be held at University of Minnesota, Minneapolis 19-22 June. The theme is: *Data and Models in Quaternary Research*. A first circular was mailed in early January 1994. The invited-speaker program is coherent and exciting. Individual input from established professionals and students is encouraged for the poster sessions, for which there will be abundant time for viewing and discussions. For further information please contact: Linda C.K. Shane, Geology and Geophysics, Limnology Research Center, 310 Pillsbury Drive S.E., Minneapolis, MN 55455. Tel: (612) 626-7889; Fax: (612) 625-3819; E-mail: shane@staff.tc.umn.edu.

TERMINATION OF THE PLEISTOCENE SubProject: Fluctuations of Local Glaciers Aberdeen, Scotland. Late May 1994

As a contribution to the Final Report of IGCP-253, this group will produce a synthesis of data on fluctuation of local glaciers. A 1-2-day discussion meeting at Aberdeen will be followed by a 4-day excursion across the Highlands of Isle of Skye. For further information please con-

tact: Chalmers Clapperton, Department of Geography, University of Aberdeen, Aberdeen AB9 2UF, Scotland, UK. Tel: 02240 27-23-28; Fax: 02240 48 70 48.

BINGHAMTON GEOMORPHOLOGY SYMPOSIUM

The 25th Annual Binghamton Geomorphology Symposium will be held SUNY at Binghamton, New York on 24-25 September 1994. The topic is *GEOMORPHOLOGY AND NATURAL HAZARDS*. Abstracts due 1 April 1994; posters still accepted. For further information please contact: Dr. Marie M. Morisawa, Department of Geology and Environmental Studies, State University of New York, Binghamton, NY 13902-6000. Tel (607) 777-2837; Fax (607) 777-2288; E-mail: marieem@bingvmb.cc.binghamton.edu.

QUATERNARY SCIENCE REVIEWS

David Q. Bowen, Editor-in-Chief
William R. Farrand, Regional Editor (North America)

** Special Subscription Rate **

Members of the Quaternary Geology and Geomorphology Division of the Geological Society of America qualify for the special group rate of \$76/year (six issues). The regular rate is \$599/year. The offer is for personal subscriptions only. Subscription orders with payment (and/or Free Sample Copy) can be sent directly to: Agnes Impellittere, Pergamon Press Inc, 395 Saw Mill River Road, Elmsford, NY 10523. Please identify yourself as a QG&G Division member of GSA.

GEOARCHAEOLOGY: AN INTERNATIONAL JOURNAL

Paul Goldberg and Ofer Bar-Yosef
Editors-in-Chief

** Special Subscription Rate **

Members of the Quaternary Geology & Geomorphology (QG&G) Division and the Archaeological Geology (AG) Division of the Geological Society of America qualify for the group rate of \$75/year. The rate for Division members outside North America is \$105. The offer is for personal subscriptions only. Subscription orders with payment can be sent directly to: Subscription Department, John Wiley & Sons, Inc, P.O. Box 7247-8491, Philadelphia, PA 19170-8491. U.S. members should include appropriate state sales tax and Canadian members should add 7% GST, which Wiley is obliged to collect. Please identify yourself as member of QG&G or AG Division member of GSA.

RESEARCH GRANTS FOR ISOTOPIC ANALYSES

Geochron Laboratories, a division of Krueger Enterprises, Inc., annually awards a series of research grants to graduate students requiring interesting or new applications of isotopic analyses. The awards consist of analytical services to be performed free of charge to the winner in each category. For the past several years awards have been offered in K-Ar dating, C-14 dating, and stable isotope ratio analyses (SIRA), SIRA in dietary studies, and SIRA of fluid inclusions in minerals. The awards are offered by Geochron Labs to encourage the application of isotopic analytical techniques to solve original and significant problems. The deadline for applications is May 1, 1994. Early application is suggested to assist with prompt evaluation and notification of winners. For Research Award Program Guidelines and official rules, call 617-876-3691, fax 617-661-0148 or write 711 Concord Ave, Cambridge, MA 02138.

NAGT-QG&GD SEMINAR EXPEDITION TO ICELAND

The 1994 NAGT Field Seminar Expedition this summer will be coordinated by Dr. Brian Tormey, Associate Prof. of Environmental Sciences at Pennsylvania State University. Field leaders, Ernest Muller, Professor Emeritus of Geosciences at Syracuse University, and Barry Voight, Professor of Geosciences at Penn State, will be assisted by volcanologist Kerby Young (Penn State). With Iceland leader leadership, the trip is an opportunity to visit a showcase of earth-shaping forces such as: volcanic eruptions; rifting of Mid-Atlantic Ridge; and glacial, periglacial, and coastal processes. The cooperation of Iceland Tourist Bureau will assure good food and accommodations. Travel will be by bus and 4WD mountain trail bus.

Dates: 13-28 August 1994
Land cost: \$2500-2600 USD
Airline fares: \$790. approx

For further information please contact: Brian Tormey: Phone & Fax: (814)238-3842. E-mail bbt1@psuvm.psu.edu

IN MEMORIAM

William S. Benninghoff	1/93
Newton E. Chute	5/29/87
Stafford C. Happ	1992
James S. Street	10/16/93

BIographies OF THE CANDIDATES

QUATERNARY GEOLOGY AND GEOMORPHOLOGY DIVISION

ANDERSON, ROBERT S., GEOMORPHOLOGY, QUATERNARY GEOLOGY

Education: Williams College, B.S. 1974; Stanford, M.S. 1977; Univ. Washington, Ph.D. 1986. Prof. Exp.: Res. Assoc. Caltech 1986-88 (Physics); Asst.-ASSOC. PROF. EARTH SCIENCES Univ. California Santa Cruz 1988-present. Honors and Awards: Presidential Young Investigator Award 1991-96. Mem: Geol. Soc. Am., AGU, AMQUA, Int. Glaciological Soc., History of Earth Sciences Society. Res.: Process geomorphology and pattern formation in geomorphic systems, eolian sediment transport and bedforms, neotectonics in coastal and arid regions, landscape evolution modeling, field instrumentation, cosmogenic radionuclide constraints on surface ages and erosion rates. Mailing address: Earth Sciences, UCSC, Santa Cruz, CA 95064

BLUM, Michael D., GEOMORPHOLOGY, SEDIMENTOLOGY, QUAT. GEOLOGY. Educ: Univ. of Texas at Austin, B.A. 1983, M.A. 1987, Ph.D. 1991. Prof. Exp: ASSIST. PROF., DEPT. OF GEOLOGY, SOUTHERN ILLINOIS UNIVERSITY, 1991-present, and Adj. Assist. Prof., Center for Archaeological Investigations, Southern Illinois University. Member: GSA, SEPM, IAS, AMQUA, AAG, Sigma Xi. Research: fluvial, coastal, and eolian geomorphology and sedimentology, sedimentologic response to climate change and glacio-eustasy, sequence stratigraphy, geoarchaeology. Mailing Address: Department of Geology, Southern Illinois University at Carbondale, Carbondale, IL. 62901.

COWAN, Ellen A., GEOMORPHOLOGY, SEDIMENTOLOGY. Educ: Albion College, BA, 1979; Northern Illinois Univ, MS, 1982; Northern Illinois Univ, PhD, 1988. Prof Exp: Asst-Asso Prof Appalachian State Univ, 1988-. Mem: Geol Soc Am, AGU, AMQUA, SEPM, NAGT, Sigma Xi. Res: Sedimentology and history of glacial marine deposits in Alaska, event sedimentation, geomorphology and geoarcheology in the S. Appalachians. Mailing address: Department of Geology, Appalachian State University, Boone, NC 28608.

HALL, Stephen A., QUATERNARY GEOLOGY, PALYNOLOGY, PALEOECOLOGY. Educ: Univ. Oklahoma, BS, 1967 (geology); Univ. Iowa, MS, 1971 (geology); Univ. Michigan, PhD, 1975 (geology); Prof. Exp.: Assist.-Assoc. Prof., North Texas State Univ., 77-85; ASSOC. PROF., UNIV. TEXAS AT AUSTIN, 85-present; Concurrent Pos.: Adjunct Assoc. Prof. Anthro., Texas A&M Univ., 92-93; Res. Scientist, Inst. Geophysics, UT-Austin, 93-present; Honors: NSF Traineeship, Univ. Mich., 73-74; Chairman, Gordon Res. Conf. Aerobiology, 87; Mem: GSA, AAAS, Amer. Assoc. Strat. Palynol. (Director-at-Large, 88-89), Internatl. Assoc. Aerobiol. (Secretary-General, 82-86, Vice President, 86-90), FOP (south-central cell, co-leader, 87, 89, 94), Soc. Amer. Archaeol., AMQUA, Sigma Xi, NM Geol. Soc., TX Acad. Sci., Plains Anthro. Soc.; Res.: alluvial stratigraphy, pollen analysis, paleoecology, geomorphic and paleoclimatic relations, surficial geology, mollusks, geoarcheology, Southern Plains, Southwest, Middle East. Mailing Address: Dept. of Geography, Univ. Texas at Austin, Austin, TX 78712-1098.

KITE, J. STEVEN, QUATERNARY GEOLOGY, GEOMORPHOLOGY. Education: James Madison Univ., B.S., 1976, Univ. of Maine, Orono, M.S. 1979; Univ. of Wisconsin, Madison, Ph.D., 1983; Professional Experience: Instr., James Madison Univ., 1978-80, Asst.-ASSOC. PROF., WEST VIRGINIA UNIV., 1983-date; Memberships: GSA, AAG, AMQUA, WV Arch. Soc., Southeastern FOP (executive officer); Research: Late Cenozoic history of the Appalachian Mountains, paleohydrology of the Ohio River basin, sedimentology & geomorphology of debris flows & related events; Mailing Address: Dept. of Geology & Geography, West Virginia Univ., Morgantown, WV 26506-6300

MACHETTE, MICHAEL N., QUATERNARY GEOLOGY, PALEOSEISMOLOGY, ARID SOILS.

Education: San Jose State Univ., B.S., 1972 (Geology); University of Colorado—Boulder, M.S., 1975 (Quaternary Geology). Professional Experience: Geologist, U.S. Geological Survey, 1972-1985; Senior Research Geologist 1986. U.S. Geological Survey. Honors and Awards: USGS Superior Service Award (1988); G.K. Gilbert Fellowship, 1990-91. Memberships: GSA (Fellow, 1983), AGU, Colorado Scientific Society (President, 1993), AMQUA, IGCP 206, ILP Project II-2 (Co-chair, World Map of Major Active Faults). Research: Quaternary stratigraphy, surficial geology, genesis and morphology of arid-land soils, mapping of Cenozoic deposits (Western U.S.), tectonic geomorphology, neotectonics, paleoseismology (Western U.S., Australia, China, Baikal rift). Mailing address: U.S. Geological Survey, MS 966, Box 25046, Denver, CO 80225; E-mail: machette@gidvxa.cr.usgs.gov

PRESTEGAARD, KAREN L., b. Readstown, WI, 11-3-54; m. 86; c. 1. GEOLOGY, HYDROLOGY, GEOMORPHOLOGY. EDUC.: Univ. Wisconsin, Madison, B.A. (honors), 75; Univ. California, Berkeley, M.S., 79, Ph.D., 82. PROF. EXP.: Explor. geol., Cities Service Minerals, 75-76; hydrologist, California Coastal Comm., 79; asst. prof., Franklin and Marshall Coll., 81-86; asst. prof. Univ. Illinois, Chicago, 86-90; ASSOC. PROF., DEPT. GEOLOGY, UNIV. MARYLAND, 91--. OTHER POSITIONS AND SERVICE: Adv. Comm. Earth Sciences, 84-88, liaison, Adv. Comm. Atmos. Sci., panels for various programs, Natl. Sci. Found.; chair, Erosion and Sedimentation Comm., Hydrology Sect., Am. Geophys. Union, 84-88. MEM.: Am. Geophys. Union (secy., Hydrology Sect.); Geol. Soc. Amer.; Intl. Assoc. Hydrological Sciences; Assoc. Groundwater Sci. and Engrs. (NWWA). RES.: Hydraulics and sediment transport studies in rivers and beaches, runoff processes and associated erosion processes in watersheds; surface-groundwater interactions; wetland hydrology. PREVIOUS GSA SERVICE: Quaternary Geol. and Geomorphology Div. Panel on Kirk Bryan Award, 88-90; GSA Councilor, 92-94; Comm. on Continuing Education, 94-97, chair, 94; Program Comm., 92-95; Executive Director Search Comm., 93-94.

VITEK, JOHN D., GEOMORPHOLOGY. Educ: Wis. State Univ. Stevens Point B.S., 64; Univ. Iowa M.A., 70; Univ. Iowa Ph.D., 73. Prof. Exp.: Cartographer, No. Illinois Univ. 65-67; part-time Instructor, Geography, Univ. Iowa 67-70; Ass't. Prof. Geography, SUNY-Buffalo 71-74; Ass't Prof. Physical Geography, Univ. Michigan-Flint 74-78; Visiting Prof. Geology, Univ. Michigan-Ann Arbor, Summer 1977; Ass't Prof. Geography, Oklahoma State Univ. 78-80; Assoc. Prof. 80-84; Ass't Dean, Graduate College, Ok. State Univ., 1982-1988; Assoc. Dean Graduate College, Ok. State Univ., 1988-1992; Program Coordinator, Environmental Sciences, Ok. State Univ., 82-92; Prof. Geography, Oklahoma State Univ. 84-86; PROFESSOR GEOLOGY, OKLAHOMA STATE UNIVERSITY, 1987- & AESP (Aerospace Education Services Program)/NASA -50%, 1992-. Mem: Geol. Soc. Am. (fel), AAAS, AGU, AMQUA, Sigma Xi, Phi Kappa Phi; Res: periglacial geomorphology, including rock glaciers and active and relict stone polygons; history of geomorphology (twentieth century); remote sensing education grades 8-12. Mailing Address: School of Geology, Oklahoma State Univ., Stillwater, OK 74078-0451.

WHITTEGAR, G. Richard, QUATERNARY GEOLOGY, HYDROGEOLOGY

Education: Univ. of North Carolina, BS 1974 (Geology), Univ. Wisconsin-Madison, MS 1976 (Geology), Ph.D. 1979 (Geology and Geography, jointly). Prof. Exper.: Asst. Professor, Dept. Geological Sciences, Old Dominion University 1979-1985. ASSOCIATE PROFESSOR, DEPARTMENT OF GEOLOGICAL SCIENCES, OLD DOMINION UNIVERSITY 1986-present. Member: Geol Soc Amer, AMQUA, AGU, AAG, Sigma Xi, SEFOP, Phi Beta Kappa, Phi Kappa Phi, Va Assoc Prof Soil Scientists, Va Acad Sci. Research: Soil-landscape relationships; Alluvial fans and periglacial deposits and landforms of the central Appalachians; Relict Tertiary landscapes of the Piedmont; Hydrogeology of non-tidal wetlands; Coastal geomorphology and Quaternary stratigraphy. Mailing address: Dept of Geological Sciences, Old Dominion University, Norfolk, VA 23529

COLMAN, STEVEN M., b New Kensington, PA, April 1, 49; m 72; c 2. QUATERNARY GEOLOGY, GEOPHYSICS, PALEOCLIMATOLOGY. Educ: Notre Dame Univ, BS, 71; Penn State Univ, MS, 74; Univ. Colorado, PhD, 1977. Prof Exp: RESEARCH GEOLOGIST, US Geol Surv, Menlo Park, CA, 72-74; USGS, Denver, CO, 75-83; USGS, Woods Hole, MA, 83-. Mem: Geol Soc Am (fel), Am Quat Assn (Counc), Am Geophys Union. Hon & Awards: NDEA Fellowship, 71-73; Geol Soc Am QG&G Panel, 85-86; Geol Soc Am, Kirk Bryan Award, 84. Res: Lacustrine and estuarine history and paleoenvironments, sea level and coastal geologic evolution, Quaternary dating methods, soils and weathering processes, glacial chronology. Mailing Add: U.S. Geological Survey, Woods Hole, MA 02543.

GRAF, WILLIAM L., b. Zanesville, OH, Feb 7; FLUVIAL GEOMORPHOLOGY, QUATERNARY PALEOHYDROLOGY. Educ: Univ of Wisc-Madison, BA, 69; Univ of Wisc.-Madison, MS, 71; Univ of Wisc-Madison, PhD, 74. Prof Exp: US Air Force Intelligence Officer, 71-74; Assist and Assoc Prof, Univ of Iowa, 74-78; Assoc Prof and PROF ARIZ STATE UNIV, 78--. Concurrent Pos: GSA, Quat Geol and Geom Div Panel, 87-88, Div Nominat Com, 89, Div Cent Vol. Com. 84, Ed of Div DNAG Vol on geom, 85-87, Div Cole Award Panel, 91; NSF, Geogr and Reg Sci Rev Panel, 86-88; NRC, Water Sci and Tech Bd, 92-, Glen Can Env Studies Com, 86-; AAG, Nom Com, 89; Awards Com, 92, Geom. Spec Gp Chair, 81; Amer Soc Civil Eng, Task Com on Streams and Sed, 82-83. Mem: Geol Soc Amer (Fel); Assoc Amer Geogr; Brit Geom Res. Gp. Hon and Awards: Fellowship, US Dept of Interior, 70; GK Gilbert Award for Geom Res, AAG, 84; Cole Mem Award for Arid Reg Geom Res, GSA, 84; Ariz State Univ Distinguished Res Professorship, 87; Honors Award, AAG, 90; Distinguished Visit Professorship, Univ Col London, 92. Res: river channel change, fluv erosion and sed, dynamics of heavy metals and radionuclides in rivers, Quat hydrol changes, geom interactions with riparian environments. Mailing Add: Dept of Geogr, Ariz State Univ, Tempe, AZ 85287-0104.