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JUN 22 1987

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MEMORANDUM FOR:

Ronald L. Ballard, Chief  
Technical Review Branch  
Division of High-Level Waste Management  
(Return to WM, 623-SS)

THRU:

Philip S. Justus, Section Leader  
Geology-Geophysics Section  
Technical Review Branch  
Division of High-Level Waste Management

FROM:

Harold E. Lefevre, Project Manager  
Geology-Geophysics Section  
Technical Review Branch  
Division of High-Level Waste Management

SUBJECT:

REPORT OF 1987 MEETING OF THE 83RD CORDILLERAN SECTION,  
GEOLOGICAL SOCIETY OF AMERICA, AT HILO, HAWAII

Between May 20-22, 1987, I attended numerous sessions of the 83rd Annual Meeting of the Cordilleran Section of the Geological Society of America (GSA) at the University of Hawaii, Hilo. Although my primary focus was on BWIP-related papers presented at the Fourth Columbia River Basalt Symposium, I did attend selected sessions of the Symposium on Geologic Hazards and an Environmental Geology session dealing with the Nevada (NNWSI) Site.

In addition to the May 20-22, 1987 technical sessions, I was fortunate enough to participate in the May 23-24 GSA-sponsored "Volcanoes of the Island of Hawaii" Field Trip. Although not directly analogous, of course, to the Columbia River Plateau flood basalts, knowledge acquired regarding the nature, diversity and the nonpredicability of hazards associated with volcanic processes is directly applicable to NMSS's evaluation of the BWIP program.

Rather than prepare numerous, separate write-ups on each of the individually-attended sessions, I have elected to consolidate and present my impressions on those geological-geophysical subjects of direct relevance (from my perspective) to the Reference Repository Location at the Hanford Site, Washington. For those who may be interested in specifics beyond those included in this report, I have attached the Technical Sessions Program for reference. Attended sessions are noted by an asterisk. The inquirer may wish to consult the session abstracts which are available in my office. For those sessions I have personally attended, I will attempt to provide additional comments as requested.

BACKGROUND

Many of the approximately fifty Columbia Plateau-related papers were presented by the Department of Energy (DOE) and its contractor, Rockwell Hanford Operations (RHO). Although a number of papers dealt with non BWIP-specific subjects topics such as physical volcanology or with geographic areas either

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at, or beyond, the Columbia Plateau margins or otherwise remote from the Hanford Site, a significant number of papers did address subjects of geotechnical relevance to the high-level waste program. As a result of the BWIP stop-work order, with few exceptions (namely hydrologic and seismic monitoring), no original field work has been conducted in the BWIP site area for the past 1½ years. Although much of the material presented by DOE and its contractors had been submitted to the NRC previously either in the form of reports or meetings or in telephone conversations, considerable additional information, described later in the report, was acquired principally through scheduled sessions and non-scheduled group discussions. Talks given by other than those associated with the BWIP program were extremely useful, especially those whose observations and suggestions differed from those of investigators associated with the BWIP program.

#### OBSERVATIONS

Rate of Deformation - This issue, which bears upon the long-term stability of the RRL, was addressed (or implied) by a number of DOE-associated workers and by Dr. Robert Bentley of Central Washington University (CWU), Ellensburg.

- (1) Steve Reidel of RHO (Abstract No. 136148) - The author is strongly convinced that anticlinal deformation in the Yakima Fold Belt (citing thinning of basaltic units across the folds as his bases) has remained relatively constant, rather than episodic, since pre-Columbia River Basalt (CRB) time through the present. He indicated (in an after-hours session with Robert Bentley of CWU) that this thesis is supported by his colleagues, Terry Tolan and Mike Hagood of Rockwell Hanford Operations (RHO) and by James Anderson of Pomona College. According to S. Reidel, additional support is claimed through seismicity studies conducted by another RHO worker, Alan Rohay (see Abstract No. 136144). Indeed, papers delivered by S. Reidel's colleagues seem to support this conclusion.
- (2) Michael Hagood of RHO (Abstract No. 134656) - Mr. Hagood's work along a portion of the Horse Heaven Hills suggests that the timing and rate of growth of the Horse Heaven Hills is similar to that found in other Yakima folds within the central portion of the Columbia Plateau.

NOTE: Of particular interest to the observer were Mr. Hagood's after-paper discussion period statements that (1) the data does not permit determination of post-Columbia River Basalt deformation and (2) the deformation curve is, for the most part, extrapolated, and is based upon very little hard data.

- (3) Robert Bentley of CWU (Abstract No. 125540) - Dr. Bentley's paper was perhaps the most interesting of those presented as far as relevance to the BWIP program. Highlights of his paper include:

- (a) Frenchman Springs Member (FS) of the Wanapum Basalt suggests 8 or 9 mappable units. (NOTE: The DOE's Final Environmental Assessment of June, 1986, Figure 3-6, lists only 6 flows).
- (b) No thinning of the Frenchman Springs across the anticlinal ridges (including the Umtanum, Saddle Mountains and the Hog Ranch-Naneum Ridge structures). This is based upon isopachs of five FS flows (Ginkgo through Sentinel Gap). Construction of the isopachs in turn is based upon approximately 100 complete measured sections in the study area including about 50 across the Hog Ranch-Naneum Ridge axis.
- (c) No reflection of uplift and deformation of the Yakima structures during FS time.
- (d) Thickness variations are as great in the synclinal areas as near the anticlines.
- (e) Local thinning of the units that occurs near Sentinel Gap and Priest Rapids is probably random and not necessarily related to deformation during FS time.
- (f) Dr. Bentley expressed the opinion that fold deformation occurred much later, based upon field evidence mapped in his study area, than is usually stated by others.

NOTE: Dr. Bentley's thesis (that no thinning is observed across the anticlinal ridges during FS time) is in direct disagreement with that of RHO. This disparity resulted in many spirited Bentley-Reidel discussions both during the formal sessions and in post-session informal groups.

Although a portion of Dr. Bentley's study area is coincident with that of BWIP's (e.g., Umtanum Ridge-Priest Rapids Dam area) most lies in areas not mapped by BWIP. Conversely, much of the BWIP study area has probably not been studied in detail by Dr. Bentley. The strong differences in opinion may have been subdued considerably if the workers had had an opportunity to study the other's field evidence.

- (4) Newell Campbell of Yakima Valley College (Abstract No. 134653) -Dr. Campbell suggests that pre-basalt rocks encountered in the Shell Oil Company wells (Yakima Minerals, Bissa, and Saddle Mountains) can be generally correlated with rocks found along the Columbia River basalt margin and that few pre-basalt faults extend into the Columbia River basalt along the northwestern margin. Campbell suggests that the basalt thins across the Leavenworth-Hog Ranch structure, thus indicating that this feature was active during the Miocene.

NOTE: During the discussion session Dr. Campbell indicated that he was not certain that the granite encountered in the bottom of the Shell Oil Company's Saddle Mountains well was in place, feeling that it may have been a transported boulder.

Faulting - The issue of faulting, especially the amount, timing (including the age of last movement) and location was not addressed to any detail. However, as in the case of the rate of deformation, the issue was debated on several occasions, as described below, by Steve Reidel of RHO and by Bob Bentley of CWU.

- (1) Steve Reidel of RHO (Abstract No. 136148) - Discussion following S. Reidel's talk included the following:
  - (a) Pasco Basin may represent an old graben that subsided during CRB time.
  - (b) Rattlesnake Mountain fault is high-angle reverse.
  - (c) Faults noted in the deep hydrocarbon test wells of Shell are "small" with no major repeats noted. These faults are steep, almost vertical.
- (2) Robert Bentley of CWU (Abstract No. 125540) - Dr. Bentley has mapped extensive thrust faulting of the Frenchman Springs flows in the Yakima River Gorge.

NOTE: In an after-hours informal group discussion, Dr. Bentley cited field evidence suggesting that the Umtanum thrust in the vicinity of the Priest Rapids dam may be of pre-Pomona (Saddle Mountain formation) age. This is based upon a conglomerate overlying the faults which are, in turn, overlain by the Pomona flow (age of 12 million years).

Tectonics - Several papers of considerable interest were delivered as follows:

- (1) Don West of Golder Associates at Redmond, Washington (Abstract No. 135650) - Mr. West had been involved in investigating the Wenas Valley fault (normal fault or gravitational sliding cutting Holocene (?) alluvial fan debris) for the Hanford Reservation's nuclear power plant, the Washington Public Power Supply System, in the early 1980's. This northwest-trending, four-kilometer-long scarp is located in the Wenas Valley on the southwest flank of the Umtanum anticline, some 40 miles northwest of the RRL. Reconnaissance investigations by Golder Associates topographic feature. No trenching, boreholes or other subsurface investigations were conducted to verify the preferred (gravity-induced feature) model.

NOTE: The NRC's Office of Nuclear Reactor Regulation's WPPSS No. 2 Safety Evaluation Report of August, 1982 (see NUREG-0892, Supplement No. 1, page 2-13) agreed with the WPPSS position that "the Wenas Valley features are more likely to have been the result of gravity rather than tectonics . . . ."

Interpretation of the USGS's recently-flown (1987) SLAR imagery, coupled with discussion with workers familiar with the area, such as Dr. Bentley of CWU may provide additional insight into this matter.

REMARKS: The Wenas Valley fault was identified by C. E. Glass in 1977 through remote-sensing techniques (using LANDSAT imagery and aerial photography). Since the Umtanum Ridge anticline extends into the RRL vicinity, I would suggest that the Wenas Valley area (1) be examined upon availability of the recently-flown USGS SLAR data and (2) be discussed with Dr. Robert Bentley of CWU. Perhaps Dr. Bentley has additional information bearing upon Quaternary faulting in the Wenas Valley and elsewhere in the Yakima Fold Belt.

- (2) James Anderson of Pomona College (Abstract No. 136156) - The author presented an interesting paper on the tectonic evolution of the Southwest Columbia Plateau. Anderson suggests that the uplifts in the Yakima Fold Belt were established during the emplacement of the Grande Ronde Basalts as a result of multilayer viscoelastic buckling of the Columbia River basalt above heterogeneous mechanically weaker underlying rocks.

NOTE: This paper supports the DOE-BWIP position of thickening of basalt in lows and thinning at highs during continuing basalt emplacement and continuing deformation. Anderson suggests that his model accommodates 200-kilometer-long structures while those of Bentley (1979), Bruhn (1981) and Laubscher (1981) do not.

- (3) Joseph Caggiano of RHO (Abstract No. 136155) - The author indicates that a plethora of tectonic models have been suggested in attempting to satisfactorily accommodate the petrogenesis of the Columbia River basalt and the penecontemporaneous chronologic and mechanical development of the Yakima folds. Recognizing that there may not be substantial support for any one model, Caggiano suggests assumption of the "worst case" disruptive scenarios associated with a model or models and a conscious determination of the ability of the repository to maintain its integrity under these assumptions.

Precision in the Acquisition of Geosciences Data - Dr. David H. Dahlem of the Department of Energy at BWIP (Abstract No. 136154) stressed, by comparison with commonly-designed structures such as dams and mine construction having design lives of 10 to 50 years, the formidable task of demonstration of the Basalt Waste Isolation Project's capability to isolate potential radionuclide releases over a much longer period - 10,000 years. Dr. Dahlem made his point

through discussion supported by many graphics, focusing on potentially adverse and favorable conditions. In particular, he mentioned the disruptive scenarios associated with hydrologic pathways and with repository intrusion as a result of human activities, especially the exploration/development of natural resources.

NOTE: The paper was well received and, as one might have expected, did prompt several questions from the audience regarding (1) a recent Association of Engineering Geologists (AEG) paper indicating the unsuitability of basalt as a repository medium and (2) questioning the DOE's wisdom of selecting a site with such formidable hydrologic problems. Dr. Dahlem acknowledged these issues and indicated that they are the subject of extensive investigative plans.

#### NEVADA (NNWSI) SITE PAPERS

Two papers relative to NNWSI, one addressing (1) detachment faulting and the other (2) normal faulting, were to have been presented. Since the authors (Sandia National Laboratory's J. Neal and W. J. Carr) were unable to attend the session, only the first paper "Detachment Faulting Beneath Yucca Mountain - Conditions Potentially Adverse to Safe Storage of Nuclear and High-Level Radioactive Waste" was delivered. The author is Edward Eschner, Department of Geoscience, University of Nevada, Las Vegas.

Detachment Faulting - Based upon an independent review of many papers, the author strongly suggests that detachment faulting likely underlies Yucca Mountain. This conclusion is based upon (1) the geometry of the high-angle normal faults in the Yucca Mountain vicinity, (2) the association of precious- and base-metal mineralization in the nearby mining districts with detachment faulting and (3) the probable relationship of the Yucca Mountain detachment to the Sheep Range, Kingston Range and the Bull Frog Hills detachments. Mr. Eschner

indicates that the possibility of detachment faulting underlying the Nevada Test site is not addressed adequately in the DOE's Final Environmental Assessment of May, 1986. Based upon his document review, Mr. Eschner suggests that the presence of detachment faulting beneath Yucca Mountain could represent potentially adverse conditions related to tectonics, rock characteristics, and hydrogeology as identified in 10 CFR 960.

NOTE: H. Lefevre's observations at the session, coupled with discussions with the author, both prior to and subsequent to the presentation are as follows:

- (1) Mr. Eschner had arrived at many conclusions similar to those of the NRC, but did so totally independently, reaching these conclusions prior to release of the NRC's Final Environmental Assessment comments of December, 1986.
- (2) Mr. Eschner indicated, as a preamble to his paper, that the opinions expressed during his talk are his alone and do not necessarily

represent those of either the State of Nevada or those of the University of Nevada.

- (3) In addition to the references mentioned in the abstract, the author cited a number of additional papers, some presented as recently as March 1987, at the Rocky Mountain Section of GSA.
- (4) Mr. Eschner impressed me as a serious, conscientious scientist convinced that the detachment faulting issue at the Nevada site has been largely overlooked in the DOE's Final Environmental Assessment and requires considerable investigation in order to warrant dismissal of the possibility of detachment faulting beneath Yucca Mountain.
- (5) A DOE geologist attended the presentation, questioning Mr. Eschner at length both prior to and during the session.
- (6) Mr. Eschner's paper was well-received at the session with comment made to the effect that he is to be praised for speaking out publicly on such a controversial matter.

SUGGESTIONS: Although Mr. Eschner indicated that he would provide an expanded version of this paper to Harold Lefevre, the NRC's lead Nevada geologist may wish to consider contacting the author directly in order to (1) discuss all the bases for Mr. Eschner's conclusions in detail and (2) request a copy of the expanded abstract.

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Harold E. Lefevre, Project Manager  
Geology-Geophysics Section  
Technical Review Branch  
Division of High-Level Waste Management

Enclosure:  
As stated

OFFICIAL CONCURRENCE AND DISTRIBUTION RECORD

MEMORANDUM FOR: Ronald L. Ballard, Chief  
 Technical Review Branch  
 Division of High-Level Waste Management

FROM: Harold E. Lefevre, Project Manager  
 Geology-Geophysics Section  
 Technical Review Branch  
 Division of High-Level Wasts Management

SUBJECT: REPORT OF 1987 MEETING OF THE 83RD CORDILLERAN SECTION,  
 GEOLOGICAL SOCIETY OF AMERICA, AT HILO, HAWAII

DATE: JUN 22 1987

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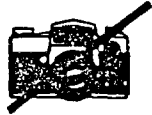
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# TECHNICAL SESSIONS

Annual meeting policy prohibits the use of cameras or sound-recording equipment at technical sessions and poster sessions.



A no-smoking policy has been established by the Program Committee and will be followed in all meeting rooms for technical sessions.

**WEDNESDAY, MAY 20, 1987**

**SYMPOSIUM: THE EFFECTIVE DISCOVERY OF GOLD DEPOSITS, PART I**  
Campus Center 306-307, University of Hawaii, 8:00 A.M.

Marshall A. Koval and Roland H. Ridler, Presiding

- 1 Stanley B. Keith\*: SPACE, TIME, GEOTECTONICS, MAGMATISM, AND METALLOGENY [134611] ..... 8:00 A
- 2 Gordon E. Taylor\*: DIACHRONOUS EVOLUTION OF GREENSTONE BELTS - THE METALLOGENIC IMPLICATIONS [134607] ..... 8:25 A
- 3 Richard I. Grauch\*: GOLD DEPOSITS ASSOCIATED WITH EARLY-MIDDLE PROTEROZOIC UNCONFORMITIES [132755] ..... 8:50 A
- 4 Nancy L. Parduhn\*: EXPLORING FOR SUBSURFACE MINERALIZED BEDROCK USING AN INDIGENOUS SOIL BACTERIUM, BACILLUS CEREBUS [132754] ..... 9:15 A
- COFFEE BREAK ..... 9:40 A
- 5 Randy S. Hall\*: GEOLOGY OF A STRATABOUND IRON FORMATION-HOSTED ARCHEAN GOLD DEPOSIT: THE WEST ANTICLINE ZONE, MUSSELWHITE PROSPECT, OPAPIMISKAN LAKE, ONTARIO, CANADA [132774] ..... 10:00 A
- 6 David R. Melling\*, David E. Watkinson: GEOLOGICAL SETTING AND THE DISTRIBUTION OF GOLD IN THE CAMERON-ROWAN LAKES AREA, NORTHWESTERN ONTARIO, CANADA [132271] ..... 10:25 A
- 7 David E. Watkinson\*, David R. Melling: RELATIONSHIPS OF BASALT ALTERATION, VEINING, AND SHEAR ZONE DEVELOPMENT: CAMERON LAKE GOLD DEPOSIT, NORTHWESTERN ONTARIO, CANADA [132273] ..... 10:50 A

**SYMPOSIUM: THE NATURE AND ORIGIN OF CORDILLERAN MAGMATISM, PART I**  
EKH 122, University of Hawaii, 8:00 A.M.

J. Lawford Anderson and Andrew P. Barth, Presiding

- 1 Holly J. Stein\*, James G. Crock: COLORADO MINERAL BELT LATE CRETACEOUS-TERTIARY MAGMATISM: NEODYMIUM ISOTOPIC AND RARE EARTH ELEMENT DATA [136009] ..... 8:00 A
- 2 M. J. Walavender\*, R. C. Castil, M. Wardlaw, J. M. Calhoun, B. M. Smith: GEOCHEMICAL, GEOCRONOLOGIC, AND ISOTOPIC CONSTRAINTS ON THE ORIGIN AND EVOLUTION OF THE EASTERN ZONE OF THE PENINSULAR RANGES BATHOLITH [124913] ..... 8:20 A
- 3 Gordon B. Hazel\*: TRACE-ELEMENT SYSTEMATICS OF PERALUMINOUS LEUCOCRANITES, BABOQUIVARI MOUNTAINS CHAIN, SOUTH-CENTRAL ARIZONA [134730] ..... 8:40 A
- 4 Andrew P. Barth\*: MESOZOIC MID-CRUSTAL PLUTONISM IN THE SAN GABRIEL MOUNTAINS, SOUTHERN CALIFORNIA [124754] ..... 9:00 A
- 5 J. Lawford Anderson\*, Andrew P. Barth, Edward D. Young: MID-CRUSTAL ROOTS AND TECTONIC DEPRESSION OF METAMORPHIC CORE COMPLEXES [124760] ..... 9:20 A

- 6 C. F. Miller\*, M. D. Barton: PERALUMINOUS PLUTONS IN THE INNER CORDILLERA, WESTERN U.S.A.: GENERALIZATIONS, CONSTRAINTS, SPECULATIONS [121067] ..... 9:40 A
- 7 J. L. Wooden\*, J. S. Stacey: LEAD ISOTOPIC CONSTRAINTS ON THE ORIGIN OF CORDILLERAN GRANITIC MAGMATISM IN THE WESTERN U.S. [132357] ..... 10:00 A
- 8 Lydia K. Fox\*: SODIUM METASOMATISM OF JURASSIC PLUTONS, EAST-CENTRAL MOJAVE DESERT, CALIFORNIA [130749] ..... 10:20 A
- 9 M. D. Barton\*: CRETACEOUS MAGMATISM, MINERALIZATION AND METAMORPHISM IN THE EAST-CENTRAL GREAT BASIN [125769] ..... 10:40 A
- 10 James M. Mattinson\*: PETROGENESIS OF SALINIAN CORDILLERAN GRANITES [130796] ..... 11:00 A
- 11 David L. Liggett\*: GEOCHEMISTRY OF A GARNET-BEARING PLUTON IN THE SOUTHWESTERN SIERRA NEVADA [124847] ..... 11:20 A
- 12 Jason B. Saleeby\*: STRUCTURAL RELATIONS IN THE CRETACEOUS SOUTHERN SIERRA NEVADA BATHOLITH AND SOME IMPLICATIONS ON PETROGENETIC PHENOMENA [124839] ..... 11:40 A

**SYMPOSIUM: HAWAIIAN PETROLOGY**  
EKH 124, University of Hawaii, 8:00 A.M.

Michael O. Garcia and David A. Clague, Presiding

- 1 Michael O. Garcia\*: COMPOSITIONAL EVOLUTION OF LOIHI VOLCANO, HAWAII: RESULTS FROM RECENT ALVIN DIVES [134322] ..... 8:00 A
- 2 David A. Clague\*: PETROLOGY OF WEST MOLOKAI VOLCANO [135549] ..... 8:20 A
- 3 Chu-Yung Chen\*, John Sinton, J. S. Shiou: TRACE ELEMENT GEOCHEMISTRY OF LAVAS FROM WEST MAUI VOLCANO [122520] ..... 8:40 A
- 4 Steven Spengler\*, Michael O. Garcia: PETROLOGY AND GEOCHEMISTRY OF THE HAWI FORMATION, KOHALA VOLCANO, HAWAII: IS THERE A GAP IN COMPOSITION AND AGE? [134325] ..... 9:00 A
- 5 David A. Clague\*, G. Brent Dalrymple: AGE AND COMPOSITION OF ALKALIC VOLCANISM ON KAUAI [135548] ..... 9:20 A
- COFFEE BREAK ..... 9:40 A
- 6 Gautam Sen\*: COMPOSITION AND THERMAL EVOLUTION OF PYROXENITE SUITE XENOLITHS FROM THE SALT LAKE GROUP, OAHU, HAWAII [129199] ..... 10:00 A
- 7 Edward W. Wolfe\*, George E. Ulrich, Robert Y. Koyanagi, Arnold T. Okamura: THE POU OO MAGMA RESERVOIR, MIDDLE EAST RIFT ZONE, KILAUEA VOLCANO, HAWAII [133007] ..... 10:20 A
- 8 George P.L. Walker\*: ORIGIN OF STRUCTURES OF BASALTIC LAVAS [134311] ..... 10:40 A
- 9 Scott K. Rowland\*: HISTORIC DISTRIBUTION OF PAHOEHOE AND A'A ON MAUNA LOA [134308] ..... 11:00 A

- 10 R. V. Podor\*, R. B. Moore: PETROLOGY OF GABBROIC INCLUSIONS IN THE 1960 KAPOHO BASALT FLOW, KILAUEA VOLCANO, HAWAII [133006] ..... 11:20 A
- 11 Thomas L. Wright\*, Christina C. Heliker: MAGMA STORAGE AND DIFFERENTIATION IN THE KILAUEA EAST RIFT ZONE PRIOR TO THE PUU OO ERUPTION (JANUARY 1983-PRESENT) [131553] ..... 11:40 A

SYMPOSIUM: EVOLUTION OF THE BROOKS RANGE OROGEN: COLLISIONAL COLLAPSE OF A CONTINENTAL MARGIN? PART I: THE WESTERN BROOKS RANGE.  
Campus Center 301, University of Hawaii, 8:30 A.M.

Wesley K. Wallace and Thomas E. Moore, Presiding

- INTRODUCTION ..... 8:30 A
- 1 J. Thomas Dutro, Jr.\*, Anita G. Harris: SOME STRATIGRAPHIC AND PALEONTOLOGIC CONSTRAINTS ON TECTONIC MODELLING OF THE BROOKS RANGE, ALASKA [133302] ..... 8:40 A
- 2 Inyo Ellersieck\*: A STRUCTURAL MODEL OF THE BROOKS RANGE FROM THE STRATIGRAPHIC VIEWPOINT [132350] ..... 8:55 A
- 3 J. A. Dumoulin\*, Anita G. Harris: CAMBRIAN THROUGH DEVONIAN CARBONATE ROCKS OF THE BAIRD MOUNTAINS, WESTERN BROOKS RANGE, ALASKA [133297] ..... 9:10 A
- 4 Jeanine Schmidt\*: PALEOZOIC EXTENSION OF THE WESTERN BROOKS RANGE (WBR) CONTINENTAL MARGIN - EVIDENCE FROM MINERAL DEPOSITS, IGNEOUS ROCKS AND SEDIMENTARY FACIES [135411] ..... 9:25 A
- 5 I. L. Tailleux\*: WHAT BROOKS RANGE COLLISION, CONTINENTAL MARGIN? [132342] ..... 9:40 A
- COFFEE BREAK ..... 9:55 A
- 6 David J. Harding\*, Karl R. Wirth, John M. Bird: LANDSAT TM STUDIES, BROOKS RANGE, ALASKA [136164] ..... 10:10 A
- 7 R. A. Harris\*: STRUCTURE AND COMPOSITION OF SUB-OPHIOLITE METAMORPHIC ROCKS, WESTERN BROOKS RANGE OPHIOLITE BELT, ALASKA [131547] ..... 10:25 A
- 8 A. B. Till\*, J. M. Schmidt, S. W. Nelson: THRUST-INVOLVEMENT OF PROTEROZOIC AND MESOZOIC METAMORPHIC ROCKS, SOUTHWESTERN BROOKS RANGE, ALASKA [117780] ..... 10:40 A
- 9 Stephen E. Box\*: LATE CRETACEOUS OR YOUNGER SW-DIRECTED EXTENSIONAL FAULTING: COSMOS HILLS, BROOKS RANGE, ALASKA [132362] ..... 10:55 A
- 10 Elizabeth L. Miller\*: DISMEMBERMENT OF THE BROOKS RANGE OROGENIC BELT DURING MIDDLE CRETACEOUS EXTENSION [133601] ..... 11:10 A
- 11 S. M. Karl\*, C. L. Long: EVIDENCE FOR TECTONIC TRUNCATION OF REGIONAL EAST-WEST TRENDING STRUCTURES IN THE CENTRAL BAIRD MOUNTAINS QUADRANGLE, WESTERN BROOKS RANGE, ALASKA [135412] ..... 11:25 A

SYMPOSIUM: GEOLOGICAL HAZARDS  
EKH 127, University of Hawaii, 8:30 A.M.

Robert I. Tilling and Bruce A. Bolt, Presiding

- \* 1 Robert I. Tilling\*, Bruce A. Bolt: GEOLOGICAL HAZARDS AND MONITORING: OVERVIEW AND SYMPOSIUM INTRODUCTION [134426] ..... 8:30 A
- \* 2 George F.L. Walker\*: VOLCANIC HAZARDS: THE CHANGING PERSPECTIVE [134310] ..... 8:50 A
- \* 3 T. L. Wright\*, D. A. Swanson: ERUPTION PREDICTION AND HAZARD EVALUATION AT TWO VOLCANOES [134436] ..... 9:10 A
- \* 4 J. P. Lockwood\*, E. J. Moore, Elmer Robinson: LAVA DIVERSION STRUCTURES TO PROTECT THE MAUNA LOA OBSERVATORY, HAWAII [134429] ..... 9:30 A
- COFFEE BREAK ..... 9:50 A
- \* 5 Carl E. Johnson\*, Robert Y. Koyanagi: EARTHQUAKE HAZARDS OF HAWAII: EVALUATION, MONITORING, AND RISK ASSESSMENT [134431] ..... 10:10 A
- \* 6 Bruce A. Bolt\*: EARTHQUAKE MONITORING: THE ASSESSMENT OF SEISMIC INTENSITY [134430] ..... 10:30 A
- \* 7 Gordon D. Burton\*: TSUNAMIS: OCCURRENCE, MONITORING, AND WARNING SYSTEMS [135034] ..... 10:50 A
- \* 8 James E. Slosson\*: LANDSLIDES AND OTHER GROUND FAILURE HAZARDS: WHERE HAVE WE FAILED? [135555] ..... 11:10 A

PALEONTOLOGICAL SOCIETY SYMPOSIUM: ADAPTATION AND MALADAPTATION IN THE FOSSIL RECORD  
EKH 128, University of Hawaii, 9:00 A.M.

Gregory J. Retallack, Presiding

- 1 Sandra J. Carlson\*: ONTOGENETIC VARIATION IN ARTICULATE BRACHIOPOD HINGE MECHANICS: AN EXAMPLE OF TEREBRATALIA TRANSVERSA [134800] ..... 9:00 A
- 2 Richard E. Thoms\*: ADAPTATIONS OF FLUVIAL BIVALVES - OVER 350 MILLION YEARS OF SURVIVAL IN THE BED LOAD [133675] ..... 9:20 A
- 3 Philip W. Signor\*: ADAPTIVE TRADE-OFFS IN HIGH-SPIRED SNAILS: CONFLICTING GOALS IN A CONSPIRICAL WORLD [125949] ..... 9:40 A
- 4 Richard Coven\*: METABOLIC COST AS A NEGLECTED CONSTRAINT ON ADAPTATION [125018] ... 10:00 A
- 5 Jack D. Farmer\*: A SYSTEMS APPROACH TO FUNCTIONAL ANALYSIS: COLONIAL FEEDING IN LIVING AND FOSSIL BRYOZOA [117647] ..... 10:20 A
- 6 Greg J. Retallack\*: MALADAPTATION OF OLIGOCENE MAMMALIAN FAUNAS OF NORTH AMERICA [117669] ..... 10:40 A

STRUCTURAL GEOLOGY  
EKH 125, University of Hawaii, 8:00 A.M.

Rachel J. Burks and Marie D. Jackson, Presiding

- 1 Jacqueline Windh\*, Roger C. Griffith: IMPLICATIONS OF KINK BANDS AND CRENULATION CLEAVAGE IN ARROYO CALAHUJE, BAJA CALIFORNIA, MEXICO [132443] ..... 8:00 A
- 2 John Fletcher\*, K. E. Karlstrom: FOLD GEOMETRY AND DEFORMATIONAL MICROFABRIC IN THE PIUTE RANGE, SOUTHEASTERN CALIFORNIA [117151] ..... 8:20 A
- 3 George E. Stewart\*, Rachel J. Burks: DEFORMED CROSS-BEDS AS STRAIN MARKERS IN THE STIRLING QUARTZITE, CLARK MOUNTAINS THRUST COMPLEX, SOUTHEASTERN CALIFORNIA [126235] ..... 8:40 A
- 4 Jay L. Jackson\*, Rachel J. Burks: SIGNIFICANCE OF CRENULATION CLEAVAGE IN THE ARICA MOUNTAINS, SOUTHEASTERN CALIFORNIA [133737] ..... 9:00 A
- 5 Rachel J. Burks\*: OCCURRENCE OF MYLONITES WITHIN THE GARLOCK FAULT ZONE, QUAIL MOUNTAINS, SOUTHEASTERN CALIFORNIA [126234] ... 9:20 A
- COFFEE BREAK ..... 9:40 A
- 6 Edward H. Oakes\*: AGE AND RATES OF DISPLACEMENT ALONG THE FURNACE CREEK FAULT ZONE, NORTHERN DEATH VALLEY, CALIFORNIA [133859] ..... 10:00 A
- 7 Richard T. Chen\*: STRAIN ANALYSIS OF MONTEREY FORMATION ROCKS IN THE LOS PRIETOS SYNCLINE, SANTA MARIA BASIN, CALIFORNIA [135250] ..... 10:20 A
- 8 Marie D. Jackson\*, Duane E. Champion: PALEOMAGNETISM OF ROTATED SILLS AT MOUNT HILLERS, HENRY MTS., UTAH: IMPLICATIONS FOR THE EARLY STAGES OF GROWTH OF NEAR SURFACE IGNEOUS DOMES [133626] ..... 10:40 A
- 9 T. T. Fitzgibbon\*, K. A. Howard: TECTONIC SIGNIFICANCE OF MIDDLE PROTEROZOIC DIABASE SHEETS IN SOUTHEASTERN CALIFORNIA AND ARIZONA [134229] ..... 11:00 A
- 10 James L. Talbot\*, Mike P. Coward: ANALYSIS OF STRAIN IN THE BEINN UIDHE/BEN MORE AREA OF THE MOINE THRUST ZONE, ASSYNT, SCOTLAND [117747] ..... 11:20 A
- 11 T. H. Kusky\*, D. G. De Paor: STRAIN ANALYSIS OF ARCHEAN PILLOW LAVAS IN THE SLAVE PROVINCE [119751] ..... 11:40 A

TECTONICS I: WESTERN WASHINGTON  
EKH 126, University of Hawaii, 8:00 A.M.

Robert B. Miller and Jon M. Einarsen, Presiding

- 1 Timothy E. Roberts\*, David C. Engebretson: GEOPHYSICAL INVESTIGATIONS OF THE CRESCENT TERRANE--NORTH AMERICA BOUNDARY, NORTH-EASTERN OLYMPIC PENINSULA, WASHINGTON [125282] ..... 8:00 A
- 2 Jon M. Einarsen\*, D. C. Engebretson: CONSTRAINTS ON THE ORIGIN AND TRAVEL OF THE CRESCENT AND SILETZ TERRANES FROM PLATE KINEMATICS [125283] ..... 8:20 A

3 E. B. Brown*, J. A. Vance: CORRELATION OF PRE-TERTIARY THRUST STRUCTURES BETWEEN THE SAN JUAN ISLANDS AND NORTHWEST CASCADES, WASHINGTON [117744] .....	8:40 A
4 M. P. Gallagher*, E. B. Brown: RECOGNITION OF AN ARC-COMPONENT IN THE SHUKSAN BLUESCHIST TERRANE, NORTHWESTERN WASHINGTON, U.S.A. [129719] .....	9:00 A
5 Bryan Kriens*: CRETACEOUS-TERTIARY TECTONIC EVOLUTION OF THE NORTH CASCADES, WASHINGTON: NEW FINDINGS FROM THE ROSS LAKE FAULT ZONE AND VICINITY [135272] .....	9:20 A
6 Robert B. Miller*, Nicholas W. Walker: STRUCTURE AND AGE OF THE OVAL PEAK BATHOLITH: IMPLICATIONS FOR THE ROSS LAKE FAULT ZONE, WASHINGTON [117301] .....	9:40 A
7 W. Michael Wade*, Frank Raviola, Will Hopkins: EMPLACEMENT OF THE EOCENE COOPER MOUNTAIN BATHOLITH INTO THE ROSS LAKE FAULT ZONE, NE CASCADES, WASHINGTON [125059] .....	10:00 A
8 Christopher G. DiLeonardo*: EVOLUTION OF THE SMITH CANYON FAULT AND GOLD CREEK SHEAR ZONE, NORTHEASTERN CASCADES, WASHINGTON [117298] .....	10:20 A
9 Michael F. McGrade*: YALAKOM-FOGGY DEW FAULT: A 500(+) KM LONG LATE CRETACEOUS-PALEOGENE OBLIQUE-SLIP FAULT IN WASHINGTON AND BRITISH COLUMBIA [134880] .....	10:40 A
10 David R. Bazard*, Russell F. Burmeister: PALEOMAGNETISM OF LATE CRETACEOUS ROCKS IN THE METHOW-PASAYEN BELT, WA. INDICATES REMAGNETIZATION BETWEEN TWO MAJOR DEFORMATIONS [117748] .....	11:00 A
11 V. R. Todd*: JURASSIC AND CRETACEOUS PLUTONISM IN AND NEAR THE METHOW BASIN, NORTH-CENTRAL WASHINGTON: PRELIMINARY K-Ar DATA [134249] .....	11:20 A
12 James E. Evans*: TECTONIC EVOLUTION OF A TERTIARY WRENCH-FAULT BASIN, CRUMSTICK FORMATION, CASCADE RANGE, WASHINGTON [134882] .....	11:40 A

**SYMPOSIUM: THE FOURTH COLUMBIA RIVER BASALT, PART I: PHYSICAL VOLCANOLOGY**  
 UH Theatre, University of Hawaii, 1:00 P.M.

S. P. Reidel and D. A. Swanson, Presiding	
INTRODUCTION .....	1:00 P
* 1 Randal W. Cross, Kingsley R. Fairchild*: LATERAL CONTINUITY OF INTRAFLOW STRUCTURES OF THE COHASSETT FLOW (GRANDE RONDE BASALT) AT SENTINEL GAP, WASHINGTON [134645] .....	1:10 P
* 2 Harold D. Taylor*, Randal W. Cross, Philip E. Long: GEOSTATISTICAL ESTIMATION OF COHASSETT INTRAFLOW GEOMETRY IN SUPPORT OF NUCLEAR WASTE REPOSITORY DESIGN [136147] .....	1:25 P
* 3 Martin E. Ross*: STRATIGRAPHIC RELATIONSHIPS OF INVASIVE AND SHEET FLOWS OF SADDLE MOUNTAINS BASALTS IN THE TROY BASIN, OREGON [118037] .....	1:40 P
* 4 Gary R. Eyerly*, D. A. Swanson: THE TRANSITION FROM SUBAERIAL TO INVASIVE LAVA FLOWS, GRANDE RONDE BASALT, NORTHWESTERN COLUMBIA PLATEAU [132363] .....	1:55 P
* 5 Ray E. Wells*, Alan R. Niemi: GEOLOGY OF THE COLUMBIA RIVER BASALT GROUP IN THE ASTORIA BASIN, OREGON AND WASHINGTON: EVIDENCE FOR INVASIVE FLOWS [134238] .....	2:10 P
* 6 Virginia J. Pfaff*, Marvin E. Beeson: MIOCENE BASALTS OF COASTAL OREGON AND WASHINGTON: GEOCHEMICAL AND GEOPHYSICAL EVIDENCE FOR COLUMBIA PLATEAU ORIGIN [136146] .....	2:25 P
* 7 Kent McMillan*, Randal W. Cross, Philip E. Long: INTERNAL VESICULAR ZONES OF GRANDE RONDE BASALTS, PASCO BASIN, WASHINGTON [136162] .....	2:40 P
COFFEE BREAK .....	2:55 P
* 8 Philip E. Long*: REVIEW OF EVIDENCE FOR THE QUENCHING ORIGIN OF ENTABLATURES IN COLUMBIA RIVER BASALT FLOWS [136141] .....	3:10 P
* 9 Donald A. Swanson*: REGIONAL VARIATION OF JOINTING STYLE IN GRANDE RONDE BASALT RELATED TO MIOCENE GEOGRAPHY, COLUMBIA PLATEAU [132368] .....	3:25 P

* 10 Marvin E. Beeson*, Terry L. Tolan, Stephen P. Reidel, Karl R. Fecht, James Lee Anderson, Peter R. Hooper: JOINTING IN THE COLUMBIA RIVER BASALT (CRB) FLOWS: ASSOCIATION OF JOINTING STYLES WITH OTHER FACTORS [136158] ...	3:40 P
* 11 James M. DeGraff, Atilla Aydin*, Philip E. Long: FRACTURE GROWTH DIRECTIONS AND INFERRED THERMAL REGIME DURING SOLIDIFICATION OF BASALTIC LAVA FLOWS [128426] .....	3:55 P
* 12 Joyce P. Meints*: ORIENTATION AND SPACING OF COOLING JOINTS IN TWO COLUMBIA RIVER BASALT FLOWS [136151] .....	4:10 P
* 13 Jonathan W. Lindberg*: COOLING JOINT WIDTH AND SECONDARY MINERAL INFILLING CHARACTERISTICS IN FOUR GRANDE RONDE BASALT (GRB) FLOWS AT HANFORD, WASHINGTON [136153] ...	4:25 P
* 14 John W. Evert*: SULFUR IN THE FRENCHMAN SPRINGS MEMBER OF THE WANAPUM BASALT IN WASHINGTON AND OREGON [132362] .....	4:40 P

**SYMPOSIUM: EVOLUTION OF THE BROOKS RANGE OROGEN: COLLISIONAL COLLAPSE OF A CONTINENTAL MARGIN? PART II: THE CENTRAL BROOKS RANGE**  
 Campus Center 301, University of Hawaii, 1:00 P.M.

Wesley K. Wallace and Thomas E. Moore, Presiding	
1 J. W. Handschy*, J. S. Oldow, J. C. Phelps, E. G. Ave Lallemand: STRATIGRAPHY AND FACIES RELATIONSHIPS OF THE ENDICOTT GROUP BETWEEN ATIGUN PASS AND THE EASTERN DOONERAK WINDOW, CENTRAL BROOKS RANGE, ALASKA [126923] .....	1:00 P
2 Arlene V. Anderson*: PROVENANCE AND PETROFACIES OF THE ENDICOTT AND HAMMOND TERRANES, PHILIP SMITH MOUNTAINS AND ARCTIC QUADRANGLES, BROOKS RANGE, ALASKA [117167] ....	1:20 P
3 J. T. Dillon*: ROOT ZONE OF THE ENDICOTT ALLOCOTTON, ALASKA [132741] .....	1:40 P
4 R. J. Alexander*, C. G. Mull: STRUCTURE AND LITHOSTRATIGRAPHY OF THE KIKIKTAT MTN. SYNCLINE, NORTH-CENTRAL BROOKS RANGE, AK [117772] .....	2:00 P
5 R. Keith Crowder*, C. G. Mull: LOWER MISSISSIPPIAN TURBIDITE SEDIMENTATION IN THE CENTRAL BROOKS RANGE, ALASKA: STRATIGRAPHIC LINK BETWEEN THE ENDICOTT AND FICHIK CREEK ALLOCOTTONS [132734] .....	2:20 P
COFFEE BREAK .....	2:40 P
6 K. A. Adams*, R. Keith Crowder, Charles G. Mull: PERMIAN STORM-DOMINATED SEDIMENTATION PATTERNS, NORTH-CENTRAL BROOKS RANGE, ALASKA [117771] .....	3:00 P
7 R. R. Gottschalk*: TECTONICS OF THE SCHIST BELT METAMORPHIC TERRANE NEAR WISEMAN, ALASKA [126919] .....	3:20 P
8 C. H. Seidensticker*, F. E. Julian, J. S. Oldow, E. G. Ave Lallemand: KINEMATIC SIGNIFICANCE OF ANTITHETIC STRUCTURES IN THE CENTRAL BROOKS RANGE, ALASKA [116878] ....	3:40 P
9 J. S. Oldow*, R. R. Gottschalk, E. G. Ave Lallemand: LOW-ANGLE NORMAL FAULTS: SOUTHERN BROOKS RANGE FOLD AND THRUST BELT, NORTHERN ALASKA [126921] .....	4:00 P
10 Donald K. Morris*: PORCUPINE VIRGATION - A KEY TO THE COLLAPSE OF THE BROOKS RANGE OROGEN [136106] .....	4:20 P
11 E. G. Ave Lallemand*, J. S. Oldow: DEVONIAN SOUTH-DIRECTED THRUSTING IN NORTHEASTERN ALASKA AND NORTHWESTERN CANADA [126922] .....	4:40 P

**SYMPOSIUM: THE NATURE AND ORIGIN OF CORDILLERAN MAGMATISM, PART II**  
 EKH 122, University of Hawaii, 1:00 P.M.

J. Lawford Anderson and Andrew P. Barth, Presiding	
1 R. W. Kistler*: LITHOSPHERE TYPES IN THE SIERRA NEVADA [134296] .....	1:00 P
2 Howard W. Day*, J. S. Beard: MESOZOIC PLUTONISM IN THE NORTHERN SIERRA NEVADA, CALIF. [125021] .....	1:20 P
3 J. S. Beard*: MIGHATIZATION AND MELT GENERATION IN MID- TO UPPER-LEVELS OF ARC CRUST, SMARTVILLE COMPLEX, CALIFORNIA [134959] .....	1:40 P

4 Geoff Christie, Judith L. Hannah*: CONTINENTAL ARC VOLCANISM IN THE EASTERN MESOZOIC BELT, NORTHERN SIERRA NEVADA, CALIFORNIA: IMPLICATIONS FOR A REVISION OF JURASSIC PALEOGEOGRAPHY [118331] .....	2:00 P
5 C. G. Barnes*, C. M. Allen: MAGMA MIXING AND ASSIMILATION IN A VERTICALLY IONED PLUTON, KLAATH MTNS., CA [116781] .....	2:20 P
6 Spencer J. Cotkin, L. G. Medaris, Jr.*, R. J. Arculus: PETROGENESIS OF THE RUSSIAN PEAK PLUTON, EASTERN KLAATH MOUNTAINS, CALIFORNIA [134833] .....	2:40 P
7 Robert J. Fleck*: NEODYMIUM, STRONTIUM, AND TRACE ELEMENT EVIDENCE OF LARGE-SCALE CRUSTAL CONTAMINATION OF MAGMAS OF THE IDAHO BATHOLITE [134295] .....	3:00 P
8 Donald W. Hyndman*: SYNPLUTONIC MAFIC DIKES AND MELTING TO FORM GRANITOID MAGMAS: THE IDAHO BATHOLITE [127924] .....	3:20 P
9 G. Lang Farmer*, Fred Barker, George Plafker: A Nd AND Sr ISOTOPIC STUDY OF MESOZOIC AND EARLY TERTIARY GRANITIC ROCKS IN SOUTH- CENTRAL ALASKA [135482] .....	3:40 P
10 F. Barker*, J. G. Arth: COAST BATHOLITE, SOUTHEASTERN ALASKA [129065] .....	4:00 P
Joseph G. Arth*: REGIONAL ISOTOPIC VARIATIONS IN THE CRETACEOUS PLUTONS OF NORTHERN ALASKA [129064] .....	4:20 P
12 David A. Brew*: LATE MESOZOIC AND CENOZOIC MAGMATISM IN THE NORTHERN CORDILLERA: SOUTHEASTERN ALASKA [132374] .....	4:40 P

**SYMPOSIUM: PACIFIC HOTSPOTS: NEW GEOPHYSICAL, GEOLOGICAL,  
AND TECTONIC STUDIES**  
EKH 124, University of Hawaii, 1:00 P.M.

J. N. Kellogg, G.P.L. Walker, and R. C. Bostrum, Presiding

1 Kenneth L. Dugger*: LOCALIZATION OF PACIFIC HOT SPOTS FROM SEASAT: A COMPARISON WITH PREVIOUSLY IDENTIFIED FEATURES [134509] .....	1:00 P
2 Jeffrey T. Freymueller*, James W. Kellogg: MATHEMATICAL MODELING OF SEAMOUNT GRAVITY ANOMALIES [134318] .....	1:20 P
3 R. C. Bostrum*: S. PACIFIC: PLUMES, FS'S AND ABANDONED AXES [134507] .....	1:40 P
4 John A. Tarduno*, Michael McWilliams, William V. Sliter: CRETACEOUS ABSOLUTE MOTION OF PACIFIC OCEANIC RISES [133625] .....	2:00 P
5 Loren W. Kroenke*, Chun Yeung Yan: INDO- AUSTRALIAN PLATE MOTION: THE ORIGIN OF HOT SPOTS [134324] .....	2:20 P
Peter R. Vogt*: VOLCANIC ISLANDS AND SEAMOUNTS IN THE PACIFIC: A NEW EXAMINATION OF CORRELATED EPISODICITY AMONG PACIFIC AND ATLANTIC HOTSPOTS [134332] .....	2:40 P
<b>COFFEE BREAK</b> .....	
7 Barbara E. Keating*: COMPARISONS OF THE MORPHOLOGY OF HOT-SPOT AND RIDGECREST SEAMOUNTS WITHIN THE EEZ OF HAWAII [134326] ...	3:15 P
8 Alexander Malahoff*: TECTONICS AND NEOVOLCANISM, LOIHI SUBMARINE VOLCANO, HAWAII [133920] .....	3:35 P
9 P. Fryer*, E. Matsumoto, F. Duennebier, P. Cooper, J. Kellogg, M. Garcia, K. Kelly, A. Malahoff, K. Mansfield: LOIHI SEAMOUNT: A RECONNAISSANCE SEAMARC II SURVEY [131545] .....	3:55 P
10 James W. Kellogg*, William Chadwick: NEOTECTONIC STUDY OF THE HILINA FAULT SYSTEM, KILAUEA, HAWAII [134319] .....	4:15 P
11 Dennis A. Lindwall*, Thomas M. Brocher: CRUSTAL STRUCTURE UNDER THE HAWAIIAN ISLANDS [134314] .....	4:35 P
12 Christina A. Neal*, Robin T. Holcomb: GEOLOGY OF THE SOUTHWEST RIFT ZONE AND WESTERN FLANK OF KILAUEA VOLCANO, HAWAII [131552] .....	4:55 P

**SYMPOSIUM: THE EFFECTIVE DISCOVERY OF GOLD DEPOSITS,  
PART II**  
Campus Center 306-307, University of Hawaii, 1:30 P.M.

Marshall A. Koval and Roland H. Ridler, Presiding

1 Michael T. Kiser* A REVIEW OF ORE GENESIS THEORIES PROPOSED FOR THE MOTHER LODE GOLD ZONE OF CALIFORNIA, AND DISCUSSION OF EVIDENCE FOR THEIR APPLICATION AT CARSON HILL, CALAVERAS COUNTY, CALIFORNIA [134583] ...	1:30 P
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2 Lance D. Miller*, Earl Redman: THE ALASKA - JUNEAU MINERAL SYSTEM, SOUTHEASTERN ALASKA [124001] .....	1:55 P
3 Irving T. Kiff*, William H. Spence: VOLCANOGENIC EPITHERMAL-EXHALATIVE GOLD DEPOSITS OF THE HAILE-TYPE IN THE CAROLINA SLATE BELT [134596] .....	2:20 P
<b>COFFEE BREAK</b> .....	
4 William H. Spence*, Anthony P. Taylor, Irving T. Kiff: DISCOVERY OF THE RIDGEWAY, SOUTH CAROLINA GOLD DEPOSIT [134621] .....	3:00 P
5 Stanley N. Watowich*: THE MESQUITE GOLD MINE - A NEW DEPOSIT IN SOUTHEASTERN CALIFORNIA [132776] .....	3:25 P
6 Robert G. Garwood*, M. W. Roper: THE GOLDEN SUNLIGHT MINE, MONTANA--ITS HISTORY AND GEOLOGY [132779] .....	3:50 P

**PALEONTOLOGY/MICROPALAEONTOLOGY**  
EKH 128, University of Hawaii, 1:00 P.M.

Claude Spinosa and Calvin E. Stevens, Presiding

1 Seema S. Sonnad*: TRIASSIC AMMONOID SHELL MORPHOLOGY: COMPUTER METHODS FOR ASSESSING CHANGE THROUGH TIME [132267] .....	1:00 P
2 Claude Spinosa*, W. W. Nassichuk, W. S. Snyder, D. L. Schwarz: THE LOWER PERMIAN AMMONOID URALOCERAS IN NORTH AMERICA AND ITS SIGNIFICANCE TO THE WRANGELLIA TERRANE IN SE ALASKA [117116] .....	1:20 P
3 Martin B. Lagoe*, W. Eyles, C. E. Eyles: FORAMINIFERAL BIOFACIES VARIATIONS IN THE GLACIOMARINE YAKATAGA FORMATION, MIDDLETON ISLAND, GULF OF ALASKA: SIGNIFICANCE FOR CLIMATE HISTORY AND GLACIOMARINE FACIES MODELS [123785] .....	1:40 P
4 Norman M. Savage*, George E. Gebrels: EARLY DEVONIAN AND LATE TRIASSIC CONODONTS FROM ANNETTE AND HOTSPUR ISLANDS, SOUTHEASTERN ALASKA [133499] .....	2:00 P
5 William Miller III*: GIANT SPECIES OF BATHYSIPHON (FORAMINIFERIDA: TEXTULARIINA) FROM FRANCISCAN FLYSCH AND ITS IMPLICATIONS [134566] .....	2:20 P
6 Calvin E. Stevens*: AFFINITIES OF PERMIAN FUSULINID FAUNAS IN THE GOLCONDA ALLOCHTHON AND NORTHERN SIERRA NEVADA [133061] .....	2:40 P
<b>COFFEE BREAK</b> .....	
7 Michael Savarese*, Philip W. Signor: NEW OCCURRENCES OF ARCHAEOCYATHANS IN THE UPPER BARKLESS FORMATION OF ESMERALDA COUNTY, NEVADA, AND THEIR PALEOECOLOGICAL SIGNIFICANCE [130669] .....	3:20 P
8 Gerald R. Licari*, Joan P. Licari: LOWER CAMBRIAN VOLBORTEHELLA, SALTERELLA, AND OTHER CONICAL FOSSILS FROM THE NORTHERN SALT SPRING HILLS, SAN BERNARDINO COUNTY, CALIFORNIA [135632] .....	3:40 P
9 Cary T. Madden*: PRIMITIVE PROBOSCIDEAN IN CALIFORNIA BORDERLANDS DURING LATE MIOCENE: FIRST DWARF SPECIES OF GOMPHOTHEIIDAE [131528] .....	4:00 P
10 Nancy Schmidt*: CLOSE ENCOUNTERS: AN EXAMINATION OF GASTROPOD SHELL REPAIR IN THE NORTHERN GULF OF CALIFORNIA [124535] .....	4:20 P

**TECTONICS II: EXTENSION AND DETACHMENT FAULTING**  
EKH 126, University of Hawaii, 1:30 P.M.

Carol Simpson and Allen F. Glazner, Presiding

1 Laura Serpa*: THE SEISMIC EXPRESSION OF EXTENSION IN CONTINENTAL CRUST [134949] .....	1:30 P
2 Allen F. Glazner*, Sydney B. Dent, John M. Bartley: MIOCENE DETACHMENT FAULT IN THE WATERMAN HILLS, CENTRAL MOJAVE DESERT, CALIFORNIA [129097] .....	1:50 P
3 G. E. Hileman*, C. F. Miller, M. A. Knoll: MIDDLE TERTIARY STRUCTURE OF THE OLD WOMAN MOUNTAINS REGION, SOUTHEASTERN CALIFORNIA [121065] .....	2:10 P
4 W. J. Taylor*, J. M. Bartley, D. R. Lux: 39Ar/40Ar AGE CONSTRAINTS ON VOLCANISM AND FAULTING, RAILROAD VALLEY-PIOCHE TRANSECT, NEVADA [103971] .....	2:30 P
<b>COFFEE BREAK</b> .....	
	2:50 P

- 5 G. J. Axen, J. M. Bartley\*, W. J. Taylor:  
TIME-SPACE RELATIONSHIPS OF TERTIARY  
EXTENSION AND MAGMATISM IN THE EASTERN  
GREAT BASIN [103972] ..... 3:10 P
- 6 David S. Diamond\*: DETACHMENT FAULTING AND  
BASIN FORMATION IN THE NORTHERN SILVER PEAK  
RANGE, EMERALDA COUNTY, NEVADA [125756] ..... 3:30 P
- 7 Keith J. Jagiello\*, Edmund Stump: EVOLUTION  
OF THE PHOENIX BASIN, ARIZONA [124264] ..... 3:50 P
- 8 David Lee Smith\*, Elizabeth L. Miller: LATE  
PALEOZOIC(?) EXTENSIONAL TECTONICS IN  
CENTRAL NEVADA [133574] ..... 4:10 P

NEOTECTONICS: RECENT FAULT MOVEMENTS AND SLIP RATES,  
CALIFORNIA AND BAJA CALIFORNIA  
EKH 125, University of Hawaii, 1:30 P.M.

John D. Sims and Glenn R. Roquemore, Presiding

- 1 David L. Schug\*, T. K. Rockwell, M. E. Hatch:  
SLIP RATE ESTIMATES FOR THE WESTERN REACH  
OF THE AGUA BLANCA FAULT, BAJA CALIFORNIA,  
MEXICO [135646] ..... 1:30 P
- 2 P. M. Merifield\*, T. K. Rockwell, C. C. Loughman:  
SLIP RATE ON THE SAN JACINTO FAULT ZONE IN  
THE ANZA SEISMIC GAP, SOUTHERN CALIFORNIA  
[135821] ..... 1:50 P
- 3 Donald L. Wells\*: PERCENT STRAIN AND SLIP  
RATE ESTIMATES FOR A PROPOSED BURIED  
EXTENSION OF THE CLARK FAULT, SOUTHERN SAN  
JACINTO FAULT ZONE, IMPERIAL VALLEY,  
CALIFORNIA [124919] ..... 2:10 P
- 4 Howard R. Shifflett\*: A POSSIBLE ASPERITY  
ALONG THE SAN ANDREAS FAULT, CALIFORNIA  
[136536] ..... 2:30 P
- 5 P. R. Vaughan\*: ALLUVIAL STRATIGRAPHY AND  
NEOTECTONICS ALONG THE ELSINORE FAULT AT  
AGUA TIBIA MOUNTAIN, CALIFORNIA [135333] ..... 2:50 P
- COFFEE BREAK ..... 3:10 P
- 6 Douglas M. Morton\*, Fred K. Miller: K/Ar  
APPARENT AGES OF PLUTONIC ROCKS FROM THE  
NORTHERN PART OF THE PENINSULAR RANGES  
BATHOLITE, SOUTHERN CALIFORNIA [134236] ..... 3:30 P
- 7 John D. Sims\*: LATE HOLOCENE SLIP RATE ALONG  
THE SAN ANDREAS FAULT NEAR CHOLAME,  
CALIFORNIA [135254] ..... 3:50 P
- 8 Katherine K. Harms\*, Jennifer W. Hadden,  
Malcolm M. Clark: USE OF QUANTIFIED SOIL  
DEVELOPMENT TO DETERMINE SLIP RATES ON THE  
PAICINES FAULT, NORTHERN CALIFORNIA  
[132360] ..... 4:10 P
- 9 Glenn R. Roquemore\*, John T. Sellner, Ray Goff:  
TECTONIC IMPLICATIONS FROM SUPERSONIC  
TEST TRACK MISALIGNMENTS, INDIAN WELLS  
VALLEY, CALIFORNIA [132220] ..... 4:30 P

POSTER SESSION I: GENERAL

Lanal of Mookini Library, University of Hawaii,  
1:00 P.M. - 4:30 P.M.

Authors will be present from 2:00 to 4:00

- Bruno Barroux\*, Alexander R. McBirney:  
THOLEIITIC SERIES IN A HOT SPOT INTERACTING  
WITH A SPREADING CENTER: WESTERN SUBPROVINCE,  
GALAPAGOS ARCHIPELAGO [133495] ..... Booth 1
8. Bhattacharji\*: MAGMA RESERVOIR GROWTH,  
CRUSTAL RIFTING AND VOLCANISM OVER A MANTLE  
PLUME [118972] ..... Booth 2
- E. E. Bender\*, C. F. Miller: PETROLOGY OF THE  
FENNER GNEISS, A MAJOR PROTEROZOIC  
METAPLUTONIC UNIT IN THE EASTERN MOJAVE  
DESERT, CALIF. [121066] ..... Booth 3
- Robert E. Crippen\*, John E. Estes, Earl J. Hajic:  
BAND AND RATIO SELECTION TO MAXIMIZE SPECTRAL  
INFORMATION IN COLOR COMPOSITE DISPLAYS  
[130783] ..... Booth 4
- Michael L. Cummings\*, Leonard L. Orzol, Paul M.  
Trone: CHARACTERISTICS OF THE TROY FLOW, GRANDE  
RONDE BASALT IN AREAS OF THICKENED FLOW-TOP  
BRECCIAS, NORTHEASTERN OREGON: EVIDENCE FOR  
MIXING [126152] ..... Booth 5
- Robert B. Forbes\*, Wyatt G. Gilbert, Earl C.  
Redman: THE FOUR WINDS COMPLEX; A NEWLY  
RECOGNIZED PALEOZOIC METAMORPHIC TERRANE IN  
SOUTHEASTERN ALASKA [135946] ..... Booth 6

- Larry D. Friend\*, Mary J. Heassler: GEOLOGY OF  
THE VALJEAN HILLS [133440] ..... Booth 7
- A. S. Jayko\*, B. L. Murchey, B. R. Wardlaw,  
C. B. Stevens: REVISED INTERPRETATION OF THE  
PRE-CENOZOIC GEOLOGY OF THE BUTT LAKE AREA,  
NORTHERN SIERRA NEVADA, CALIFORNIA [134271] ..... Booth 8
- Alan R. Ramelli\*, Craig M. Depolo: LATE  
QUATERNARY TECTONISM OF THE SOUTHERN WHITE  
MOUNTAINS FAULT SYSTEM, EAST-CENTRAL  
CALIFORNIA [135766] ..... Booth 9
- David B. Sams\*, Jason B. Saleeby: METAMORPHISM  
AND DEFORMATION OF THE SOUTHERN SIERRA  
NEVADA, CALIFORNIA [125877] ..... Booth 10
- William R. Short, Jr.\*, Jon C. Cummings:  
GEOLOGY OF THE SANTA TERESA HILLS, SANTA  
CLARA COUNTY, CALIFORNIA [117352] ..... Booth 11
- Daniel C. Schneider\*: STRATIGRAPHY OF  
MESOZOIC VOLCANIC AND SEDIMENTARY ROCKS, INYO  
MOUNTAINS, CALIFORNIA [117555] ..... Booth 12
- Paul M. Trone\*, Michael L. Cummings:  
PARAGENESIS OF SECONDARY PRECIPITATED PHASES  
IN GRANDE RONDE BASALT, NORTHEASTERN OREGON  
[126153] ..... Booth 13

THURSDAY, MAY 21, 1987

SYMPOSIUM: THE EFFECTIVE DISCOVERY OF GOLD DEPOSITS III  
Campus Center 306-307, University of Hawaii, 8:00 A.M.

Marshall A. Koval and Roland H. Ridler, Presiding

- 1 Jacob Margolis\*: GEOLOGY, HYDROTHERMAL  
ALTERATION, AND GENESIS OF EPITHERMAL Au-Ag  
MINERALIZATION, WENATCHEE HEIGHTS,  
WASHINGTON [132261] ..... 8:00 A
- 2 Kurt T. Katsura\*: PARAGENETIC VEIN SEQUENCES  
AND GOLD MINERALIZATION AT THE CHAMPION  
MINE, AN EPITHERMAL VEIN SYSTEM IN THE  
BOHEMIA MINING DISTRICT, OREGON [117672] ..... 8:25 A
- 3 Jim Kaushikaua\*, Donald B. Hoover: USE OF  
GEOPHYSICAL TECHNIQUES FOR GOLD EXPLORATION  
IN THE REPUBLIC OF PALAU [131540] ..... 8:50 A
- 4 Michael J. Ford\*: GOLD AND COPPER  
MINERALIZATION IN THE SACKLY SKARN, CENTRAL  
ALASKA RANGE, ALASKA [123997] ..... 9:15 A
- COFFEE BREAK ..... 9:40 A
- 5 Thomas E. Gray\*: MINERALIZATION AND  
ALTERATION AT A SUBMARINE VOLCANOGENIC  
Sn-Cu-Pb-Au DEPOSIT, JOHNSON RIVER, ALASKA  
[117673] ..... 10:00 A
- 6 Peter B. Larson\*, Hugh P. Taylor, Jr.:  
OXYGEN ISOTOPE VARIATIONS IN TERTIARY  
SOLFATARIC DEPOSITS, SAN JUAN MOUNTAINS,  
COLORADO [135140] ..... 10:25 A
- 7 J. W. Brooks\*, P. B. Larson: OXYGEN AND  
HYDROGEN ISOTOPES AS AN EXPLORATION TOOL IN  
THE EPITHERMAL ENVIRONMENT: EXAMPLE FROM  
THE MAMMOTH REVENUE VEIN, PLATORO CALDERA,  
SAN JUAN MOUNTAINS, COLORADO [135129] ..... 10:50 A

SYMPOSIUM: THE FOURTH COLUMBIA RIVER BASALT,  
PART II: STRATIGRAPHY  
UHH Theatre, University of Hawaii, 8:00 A.M.

R. D. Bentley and P. E. Long, Presiding

- 1 Terry L. Tolan\*, Stephen P. Reidel, Marvin H.  
Beeson, James Lee Anderson, Karl R. Fecht,  
Donald A. Swanson: REVISIONS TO THE AREAL  
EXTENT AND VOLUME OF THE COLUMBIA RIVER  
BASALT GROUP (CRBG) [136140] ..... 8:00 A
- \* 2 Ajoy K. Baksi\*: REEVALUATION OF THE TIMING,  
DURATION AND MAGNETOSTRATIGRAPHY OF THE  
IMNABA, PICTURE GORGE AND GRANDE RONDE  
BASALTS [127423] ..... 8:15 A
- (CANCELLED)
- \* 3 Craig Amerigian\*, John Toth, Stephen Reidel:  
PALEOMAGNETISM OF THE COLUMBIA RIVER BASALT  
GROUP [136139] ..... 8:30 A
- \* 4 S. P. Reidel\*, T. L. Tolan, J. L. Anderson,  
M. H. Beeson, K. R. Fecht: REGIONAL  
STRATIGRAPHY OF THE GRANDE RONDE BASALT  
(GRB) AND ITS TECTONIC AND PETROGENETIC  
IMPLICATIONS [136149] ..... 9:00 A
- \* 5 R. D. Landon, P. E. Long\*: DETAILED  
STRATIGRAPHY OF THE UPPER GRANDE RONDE  
BASALT, COLUMBIA RIVER BASALT GROUP, IN THE  
CENTRAL COLUMBIA PLATEAU [136161] ..... 9:15 A

6 Robert D. Bentley*, John E. Powell: BASALT STRATIGRAPHY OF THE FRENCHMAN SPRINGS MEMBER IN THE TYPE AREA, CENTRAL WASHINGTON [125540] .....	9:30 A
COFFEE BREAK .....	9:45 A
7 Barton S. Martin*: CHEMICAL STRATIGRAPHY OF THE ROZA MEMBER, COLUMBIA RIVER BASALT GROUP [134740] .....	10:00 A
8 Marvin E. Beeson*, Terry L. Tolan: COLUMBIA RIVER BASALT GROUP (CRBG) IN WESTERN OREGON: FACTORS CONTROLLING FLOW EMPLACEMENT [136150] .....	10:15 A
9 Robert D. Bentley*, John E. Powell: EVOLUTION OF THE YAKIMA RIVER CANYON AND TIMING OF DEFORMATION, CENTRAL WASHINGTON [125541] .....	10:30 A
10 K. R. Fecht*, B. N. Ebjornstad, S. P. Reidel, T. L. Tolan, J. L. Anderson, M. E. Beeson, G. A. Smith: RECONSTRUCTION OF NEOGENE DRAINAGE SYSTEMS IN THE AREA COVERED BY COLUMBIA RIVER BASALT GROUP (CRBG) [136136] .....	10:45 A
11 G. A. Smith*, K. R. Fecht, B. N. Ebjornstad: NEOGENE SYNVOLCANIC AND SYNTECTONIC SEDIMENTATION ON AND ADJACENT TO THE COLUMBIA PLATEAU [136152] .....	11:00 A
12 Nevell P. Campbell*: STRUCTURAL AND STRATIGRAPHIC RELATIONSHIPS BETWEEN THE NORTHWESTERN COLUMBIA RIVER BASALT MARGIN AND RECENT SUB-BASALT GAS WELLS [134653] .....	11:15 A
13 David H. Dahlem*, Anthony J. Knepp: GEOSCIENCE APPLICATIONS IN THE BASALT WASTE ISOLATION PROGRAM [136154] .....	11:30 A

**SYMPOSIUM: SEISMOTECTONICS OF THE CENTRAL CALIFORNIA COAST RANGES I: GENERAL SEISMOLOGY AND SEISMIC REFLECTION**  
EKH 124, University of Hawaii, 8:00 A.M.

Ina Alterman, Robert Brown, Lloyd Cluff, Richard McMullen, and Burton Slemmons, Presiding

PURPOSE AND MEETING PROCEDURE: Ina Alterman .....	8:00 A
MAJOR ISSUES: Robert Brown .....	8:05 A
1 D. Burton Slemmons*: CAPABLE FAULTS AND TECTONICALLY ACTIVE FOLDS OF THE CALIFORNIA CENTRAL COAST RANGES [135759] .....	8:20 A
2 Ray Weldon*, Eugene Humphreys: PLATE MODEL CONSTRAINTS ON THE DEFORMATION OF COASTAL SOUTHERN CALIFORNIA NORTH OF THE TRANSVERSE RANGES [124835] .....	8:35 A
3 Thom L. Davis*, Kirk D. McIntosh: A RETRODEFORMABLE STRUCTURAL SOLUTION ACROSS THE SOUTHERN COAST RANGES AND IMPLICATIONS FOR SEISMICALLY ACTIVE STRUCTURES [133249] .....	8:50 A
4 Eutizio Vittori*: STRUCTURAL ANALYSIS OF LATE CENOZOIC DEFORMATION, SOUTHERN COAST RANGES, CENTRAL CALIFORNIA [135758] .....	9:05 A
DISCUSSION .....	9:20 A
COFFEE BREAK .....	9:35 A
5 P. Dehlinger*, E. A. Bolt: TECTONIC PATTERNS AND THEIR VARIATIONS ACROSS A PART OF THE CENTRAL COAST RANGES OF CALIFORNIA [135763] ...	9:50 A
6 W. U. Savage*, M. E. McLaren: RECENT SEISMICITY OF SOUTH-CENTRAL COASTAL CALIFORNIA [133243] .....	10:05 A
7 C. M. Poley*, J. F. Eaton, A. G. Lindh: RECENT SEISMICITY OF THE CENTRAL CALIFORNIA REGION FROM SAN FRANCISCO TO THE TRANSVERSE RANGES [135770] .....	10:20 A
8 William U. Savage*, Donald V. Helberger: SOURCE CHARACTERISTICS AND TECTONIC ASSOCIATION OF THE 1927 LOMPOC, CALIFORNIA, EARTHQUAKE [135343] .....	10:35 A
DISCUSSION .....	10:50 A
9 James K. Crouch*, Steven B. Bachman: THE NATURE OF THE OFFSHORE HOSGRI FAULT ZONE [132988] .....	11:05 A
10 John W. Steritz, Bruce P. Luyendyk*: HOSGRI FAULT ZONE OFFSHORE SANTA MARIA BASIN, CALIFORNIA [130785] .....	11:25 A

**SYMPOSIUM: EVOLUTION OF THE BROOKS RANGE OROGEN: COLLISIONAL COLLAPSE OF A CONTINENTAL MARGIN? PART III: NORTHEASTERN BROOKS RANGE**  
Campus Center 301, University of Hawaii, 9:00 A.M.

Wesley K. Wallace and Thomas E. Moore, Presiding

1 J.T. Dillon, A. A. Bakke*: EVIDENCE FOR DEVONIAN AGE OF THE OKPILAK BATHOLITE, NORTHEASTERN BROOKS RANGE, ALASKA [132753] ....	9:00 A
2 Randall Carlson*, K. F. Watts: SHALLOWING UPWARD CYCLES OF THE WAHOO LIMESTONE, EASTERN SADLEROCBIT MOUNTAINS, ANWR, NE BROOKS RANGE, ALASKA [132745] .....	9:15 A
3 N. H. Harun*, R. K. Crowder: SHALLOW MARINE DEPOSITION OF THE IVISHAK FORMATION (LOWER TRIASSIC), SADLEROCBIT AND SHUBLIK MOUNTAINS, NORTHEASTERN ALASKA [132732] .....	9:30 A
4 Douglas G. Knock*: DEPOSITIONAL SETTING AND PROVENANCE OF UPPER NEOCOMIAN KEMIK SANDSTONE, ARCTIC NATIONAL WILDLIFE REFUGE (ANWR), NORTHEASTERN ALASKA [132729] .....	9:45 A
5 Mark A. Vandergon*, R. Keith Crowder, John Decker: TURBIDITE DEPOSITIONAL ENVIRONMENTS OF THE UPPER CRETACEOUS TO TERTIARY CANNING FORMATION, ARCTIC NATIONAL WILDLIFE REFUGE (ANWR), ALASKA [132733] .....	10:00 A
COFFEE BREAK .....	10:15 A
6 Wesley K. Wallace, Andrew J. Meigs, Jeffrey A. Rogers: RELATIONSHIPS BETWEEN STRATIGRAPHY AND STRUCTURAL EVOLUTION OF THE SADLEROCBIT AND SHUBLIK MOUNTAINS, NORTHEASTERN BROOKS RANGE, ALASKA [132747] .....	10:30 A
7 Jeffrey A. Rogers*, Wesley K. Wallace: LATERAL VARIATION OF RANGE-FRONT STRUCTURES, SHUBLIK MOUNTAINS, NE BROOKS RANGE, ALASKA [132746] .....	10:45 A
8 J. T. Dillon*: LATEST-CRETACEOUS-EARLIEST TERTIARY METAMORPHISM IN THE NORTHEASTERN BROOKS RANGE, ALASKA [134155] .....	11:00 A
9 Catherine L. Banks*, Wesley K. Wallace: THE STRUCTURAL GEOLOGY OF LEFFINGWELL RIDGE: IMPLICATIONS FOR THE DEFORMATIONAL STYLE OF THE NE ARCTIC NATIONAL WILDLIFE REFUGE (ANWR), BROOKS RANGE, ALASKA [132744] .....	11:15 A
10 C. G. Mull*, W. R. Camber: STRUCTURE OF BATHUB RIDGE SYNCLINE, ARCTIC NATIONAL WILDLIFE REFUGE, NORTHEASTERN BROOKS RANGE, ALASKA [117770] .....	11:30 A
11 W. R. Camber*, C. G. Mull: STRATIGRAPHY AND DEPOSITIONAL ENVIRONMENT OF LOWER CRETACEOUS STRATA, WESTERN BATHUB RIDGE, NORTHEASTERN BROOKS RANGE, ALASKA [117769] ....	11:45 A

**IGNEOUS PETROLOGY I: GENERAL**  
EKH 122, University of Hawaii, 8:30 A.M.

J. L. Rubenstone and Michael C. Jackson, Presiding

1 T. L. Pavlis*, M. D. Reason, J. L. Rubenstone: EARLY CRETACEOUS NEAR-TRENCH PLUTONISM IN SOUTHERN ALASKA: PLUTONISM SYNCHRONOUS WITH THRUSTING ALONG THE BORDER RANGES FAULT SYSTEM [134941] .....	8:30 A
2 M. D. Reason*, T. L. Pavlis, J. L. Rubenstone: EARLY CRETACEOUS METAMORPHISM ALONG THE BORDER RANGES FAULT SYSTEM, SOUTHERN ALASKA: PT CONDITIONS DURING NEAR-TRENCH PLUTONISM AND COEVAL THRUSTING [134948] .....	8:50 A
3 J. L. Rubenstone*, J. R. Bowman, T. L. Pavlis, M. Reason, T. C. Onstott: ISOTOPE SYSTEMATICS OF A CRETACEOUS TONALITE-TRONDHJEMITE COMPLEX IN SOUTHERN ALASKA [134366] .....	9:10 A
4 R. F. Gribble*, C. G. Barnes: THE COMPOSITE ASHLAND PLUTON: EVIDENCE FOR MULTIPLE PELVIC MAGMAS IN A TILTED PLUTON, KLAMATH MTS., CA AND OR [116782] .....	9:30 A
5 T. A. Riley*, R. G. Coleman: PETROGENETIC EVOLUTION OF THE ROGUE FORMATION: LATE JURASSIC SUBMARINE VOLCANIC ROCKS OF THE WESTERN JURASSIC BELT, KLAMATH MTS., OREGON [133387] .....	9:50 A
COFFEE BREAK .....	10:10 A

- 6 Robert D. Cole\*, John E. Marzolf: A VOLCANIC CENTER OF PROBABLE MIDDLE JURASSIC AGE IN THE EASTERN MOJAVE DESERT, CALIFORNIA [122798] ..... 10:30 A
- 7 Lois M. Jones\*, David J. Mossman: THE ISOTOPIC COMPOSITION OF STRONTIUM AND THE SOURCE OF THE EARLY JURASSIC NORTH MOUNTAIN BASALTS, NOVA SCOTIA, CANADA [132226] ..... 10:50 A
- 8 Lisanne G. Pearcy\*: CLINOPYROXENE COMPOSITIONS AND PETROGENESIS OF THE MANTLE-CRUST TRANSITION ZONE: CANYON MOUNTAIN COMPLEX, OREGON [133384] ..... 11:10 A
- 9 M. C. Jackson\*, P. Fryer, K. Beal: PETROLOGY OF NORTHERN MARIANA BACK-ARC LAVAS [131543] ... 11:30 A

**TECTONICS III: SIERRA NEVADA AND NEVADA**  
EKH 126, University of Hawaii, 8:30 A.M.

Phillip B. Gans and Warren D. Sharp, Presiding

- 1 Warren D. Sharp\*, Carl W. Leighton: ACCRETION OF THE FOOTHILLS OPHIOLITE, WESTERN SIERRA NEVADA POOTHILLS, CALIFORNIA [134347] ..... 8:30 A
- 2 Yildirim Dilek\*, Peter Thy, Eldridge M. Moores: FRACTURE ZONE BASEMENT OF THE SMARTVILLE COMPLEX, NORTHWESTERN SIERRA NEVADA, CALIFORNIA [125019] ..... 8:50 A
- 3 Bradley R. Hacker\*: THE OREGON CREEK UNIT: A PRE-NEVADAN OCEAN BASIN IN THE YUBA RIVERS AREA, SIERRA NEVADA [133051] ..... 9:10 A
- 4 G. A. Lauban\*, P. L. Ehlis, T. E. Davis: EMPLACEMENT OF THE PERMIAN GOODHUE FORMATION AS A SINGLE ERUPTIVE EVENT, NORTHERN SIERRA NEVADA, CALIFORNIA [135806] ... 9:30 A
- 5 J. S. Oldow, A. W. Gelber\*: THE PINE NUT FAULT ZONE: A MESOZOIC TRANSPRESSIONAL FAULT SYSTEM IN WEST-CENTRAL NEVADA [116879] .. 9:50 A
- COFFEE BREAK ..... 10:10 A
- 6 Thomas E. Dubé\*: SIGNIFICANCE OF UPPER DEVONIAN LAMPROPHYRES IN THE ROBERTS MOUNTAINS ALLOCOTHON, NORTH-CENTRAL NEVADA [134884] ..... 10:30 A
- 7 J. E. Marzolf\*: LOWER MESOZOIC FACIES IN SOUTHERN NEVADA: IMPLICATIONS FOR CENOZOIC EXTENSION [122796] ..... 10:50 A
- 8 Phillip B. Gans\*, Douglas Clark, John E. Repetski: CONODONT GEOTHERMOMETRY OF SUPRACRUSTAL ROCKS IN THE EASTERN GREAT BASIN [133602] ..... 11:10 A
- 9 Jonathan O. Davis\*: THERMOCRONOLOGY OF MIDDLE PLEISTOCENE LAKE SEDIMENTS IN KOBEH VALLEY, NEVADA: IMPLICATIONS FOR NEOTECTONICS AND DRAINAGE HISTORY OF THE CENTRAL GREAT BASIN [129533] ..... 11:30 A

**HYDROGEOLOGY**

EKH 128, University of Hawaii, 9:00 A.M.

Jessica E. Donovan, Presiding

- 1 Michael D. Dettinger\*: INFLUENCE OF TERTIARY-AGE EXTENSIONAL TECTONICS ON PRESENT-DAY REGIONAL GROUND-WATER FLOW AND DISCHARGE IN SOUTHERN NEVADA AND VICINITY [132541] ..... 9:00 A
- 2 David S. Morgan\*: NUMERICAL SIMULATION ANALYSIS OF DATA-POOR GROUND-WATER BASINS: A GUIDE TO EARLY MANAGEMENT AND DATA COLLECTION [125370] ..... 9:20 A
- 3 Alan L. Mayo\*, Anthony Muller: DEEP ORIGIN OF CO<sub>2</sub> GAS, IN A SHALLOW GROUND WATER SYSTEM, FROM THERMAL DECOMPOSITION OF CARBONATE MINERALS BENEATH THE UTE PASS OVERTHRUST FAULT [135488] ..... 9:40 A
- 4 Eric J. McBurnon, Jessica E. Donovan\*: PLEISTOCENE SEA LEVEL CHANGES: IMPLICATIONS FOR GROUND WATER CLEANUP IN THE SAN FRANCISCO BAY AREA [135531] ..... 10:00 A

**SYMPOSIUM: THE EFFECTIVE DISCOVERY OF GOLD DEPOSITS IV**  
Campus Center 306-307, University of Hawaii, 1:00 P.M.

Marshall A. Koval and Roland H. Ridler, Presiding

- 1 D. L. Leach\*, R. J. Goldfarb, A. H. Hofstra: FLUID INCLUSION CHARACTERISTICS OF THE JUNEAU GOLD BELT, SOUTHEASTERN ALASKA [135726] ..... 1:00 P
- 2 William J. Pickthorn\*: STABLE ISOTOPE CHARACTERISTICS OF THE JUNEAU GOLD BELT, ALASKA [132351] ..... 1:25 P
- 3 R. J. Goldfarb\*, D. L. Leach, T. D. Light, C. J. Paterson, L. B. Pickthorn, W. J. Pickthorn: THE JUNEAU GOLD BELT: A MOTHER LODE-TYPE SYSTEM IN SOUTHEASTERN ALASKA [135731] ..... 1:50 P
- 4 J. Danielson\*, M. L. Silberman: GEOLOGIC SETTING OF LODE GOLD DEPOSITS IN THE REDDING 1 X 2 DEGREE QUADRANGLE, KLAMATH MOUNTAINS, CALIFORNIA [134539] ..... 2:15 P
- COFFEE BREAK ..... 2:40 P
- 5 M. L. Silberman\*, J. Danielson, M. S. Erickson, D. J. Grimes: CHARACTERISTICS AND GEOCHEMISTRY OF GOLD-BEARING QUARTZ VEINS IN THE REDDING 1 X 2 DEGREE QUADRANGLE, KLAMATH MOUNTAINS, CA [134538] ..... 3:00 P
- 6 K. F. Bull, T. K. Bundtzen\*: GREISEN AND VEIN Au-W MINERALIZATION OF THE BLACK CREEK STOCK, THE FLAT AREA, WEST-CENTRAL ALASKA [123992] ..... 3:25 P
- 7 David A. King\*: CONTROLS OF Au MINERALIZATION IN THE SOUTHERN PORTION OF THE HODSON MINING DIST., WEST MOTHER LODE GOLD BELT, CA [127922] ..... 3:50 P

**SYMPOSIUM: THE FOURTH COLUMBIA RIVER BASALT, PART III: STRUCTURAL GEOLOGY, TECTONICS, AND MAGMA SOURCE**  
UHE Theatre, University of Hawaii, 1:00 P.M.

J. L. Anderson and R. E. Wells, Presiding

- \* 1 K. A. Bergstrom\*, J. R. Kunk, T. H. Mitchell, A. C. Rohay: DEEP STRUCTURE OF THE PASCO BASIN, SOUTH-CENTRAL WASHINGTON [136145] ..... 1:00 P
- \* 2 Michael C. Hagood\*: STRUCTURE AND DEFORMATION ALONG A PORTION OF THE HORSE HEAVEN HILLS, SOUTH-CENTRAL WASHINGTON [134656] ..... 1:15 P
- \* 3 Alan C. Rohay\*: EARTHQUAKE FOCAL MECHANISMS, RECURRENCE RATES, AND DEFORMATION IN THE COLUMBIA RIVER BASALTS [136144] ..... 1:30 P
- \* 4 P. R. Hooper\*: DEFORMATION IN THE EASTERN PART OF THE COLUMBIA PLATEAU [135136] ..... 1:45 P
- \* 5 S. P. Reidel\*, M. A. Channess, K. E. Fecht, M. C. Haygood, T. L. Tolan: TECTONIC DEVELOPMENT OF THE CENTRAL COLUMBIA PLATEAU [136148] ..... 2:00 P
- \* 6 James Lee Anderson\*, Marvin E. Beeson, Terry L. Tolan: TECTONIC EVOLUTION OF THE SOUTHWEST COLUMBIA PLATEAU [136156] ..... 2:15 P
- \* 7 Ray E. Wells\*, Robert W. Simpson: MORE PALEOMAGNETIC RESULTS FROM THE MIOCENE COLUMBIA RIVER BASALT GROUP, OREGON AND WASHINGTON: STRATIGRAPHIC AND TECTONIC IMPLICATIONS [134252] ..... 2:30 P
- COFFEE BREAK ..... 2:45 P
- \* 8 Joseph A. Caggiano\*: USE OF COLUMBIA PLATEAU TECTONIC MODELS FOR DEVELOPMENT OF DISRUPTIVE SCENARIOS FOR A NUCLEAR WASTE REPOSITORY [136155] ..... 3:00 P
- \* 9 Thomas R. Watters\*: VOLCANIC-PLAINS RIDGES ON THE TERRESTRIAL PLANETS: A COMPARISON OF THE COLUMBIA AND THARSIS PLATEAUS [128242] .... 3:15 P
- \* 10 David E. Elliot\*: JURASSIC THOLEIITES OF ANTARCTICA: TECTONIC SETTING [121436] ..... 3:30 P
- \* 11 P. R. Hooper\*, V. Chamberlain, R. St.J. Lambert: STRONTIUM ISOTOPE AND CHEMICAL CONSTRAINTS ON CRUSTAL CONTAMINATION OF THE COLUMBIA RIVER BASALTS [135138] ..... 3:45 P
- 12 V. E. Chamberlain\*, R. St.J. Lambert, M.J.M. Duke: URANIUM, THORIUM AND LEAD SYSTEMATICS OF THE COLUMBIA RIVER BASALTS AND NEARBY YOUNGER VOLCANICS [134549] ..... 4:00 P
- 13 Richard W. Carlson\*, William K. Hart: ON THE CAUSE OF COLUMBIA RIVER BASALT VOLCANISM [128726] ..... 4:15 P
- 14 W. K. Hart\*, S. A. Mosher, R. W. Carlson: PETROGENESIS OF THE PUEBLO MOUNTAINS BASALTS OF SOUTHEASTERN OREGON [121575] ..... 4:30 P



**SYMPOSIUM: SEISMOTECTONICS OF THE CENTRAL CALIFORNIA COAST RANGE II: SAN SIMEON, PISMO SYNCLINE - SANTA MARIA BASIN**  
EKH 124, University of Hawaii, 1:30 P.M.

Ina Alterman, Robert Brown, Lloyd Cluff, Richard McMullen, and Burton Slemmons, Presiding

- 1 W. U. Savage\*, J. M. Howie, C. R. Willingham: INTEGRATED DEEP CRUSTAL STUDIES ONSHORE/OFFSHORE SOUTH-CENTRAL COASTAL CALIFORNIA [135344] ..... 1:30 P
- 2 David Cummings\*, T. A. Johnson, R. A. Gaal: SHALLOW STRUCTURAL GEOLOGY, OFFSHORE SANTA MARIA RIVER TO POINT ARGUELLO, CENTRAL CALIFORNIA [131525] ..... 1:45 P
- DISCUSSION ..... 2:00 P
- 3 K. L. Hanson, W. R. Lettis\*, E. L. Mezger, G. E. Weber: LATE PLEISTOCENE DEFORMATION ALONG THE SAN SIMEON FAULT ZONE NEAR SAN SIMEON, CALIFORNIA [135722] ..... 2:15 P
- 4 Barbara Metz\*, D. Burton Slemmons: REMOTE SENSING STUDY OF PISMO SYNCLINE AND SANTA MARIA BASIN, CENTRAL COASTAL CALIFORNIA [135753] ..... 2:30 P
- 5 Kathryn M. Killeen\*, D. Burton Slemmons, Kirk E. Swanson: TIMING OF FOLDING AND UPLIFT OF THE PISMO SYNCLINE, SAN LUIS OBISPO COUNTY, CALIFORNIA [135752] ..... 2:45 P
- COFFEE BREAK ..... 3:00 P
- 6 E. L. Mezger, K. L. Hanson, W. T. Hall\*, T. D. Hunt: EVIDENCE FOR QUATERNARY FAULTING IN LOS OSOS VALLEY, SAN LUIS OBISPO COUNTY, CALIFORNIA [135719] ..... 3:15 P
- 7 Steve P. Mitchman\*, D. Burton Slemmons: LATE PLEISTOCENE FLEXURAL-SLIP FAULTING POSSIBLY TRIGGERED BY CRUSTAL UNLOADING, PISMO BEACH, CENTRAL COASTAL CALIFORNIA [132993] ..... 3:30 P
- 8 John M. Coyle, W. Timothy Hall\*, James V. Kengesh, William R. Lettis: QUATERNARY DEFORMATION ALONG THE SOUTHWESTERN MARGIN OF THE SAN LUIS-PISMO SYNFORM, PISMO BEACH, CALIFORNIA [135748] ..... 3:45 P
- 9 K. I. Kelson, W. R. Lettis\*, G. E. Weber, G. L. Kennedy, J. F. Wehmler: AMOUNT AND TIMING OF DEFORMATION ALONG THE WILMAR AVENUE, PISMO, AND SAN MIGUELITO FAULTS, PISMO BEACH, CA [135718] ..... 4:00 P
- DISCUSSION ..... 4:15 P

**TECTONICS IV: ALASKA AND BRITISH COLUMBIA**  
EKH 126, University of Hawaii, 1:00 P.M.

Margaret Rusmore and Sarah Roeske, Presiding

- 1 Sarah M. Roeske\*, Thomas E. Moore, Arthur Grants: CRUSTAL STRUCTURE OF SOUTHERN ALASKA ALONG GEODYNAMICS CONTINENT/OCEAN TRANSECT (A-3) [132348] ..... 1:00 P
- 2 Thomas E. Moore\*, Sarah M. Roeske, Arthur Grants: CRUSTAL STRUCTURE OF CENTRAL ALASKA ALONG GEODYNAMICS CONTINENT/OCEAN TRANSECT (A-3) [132347] ..... 1:20 P
- 3 Arthur Grants\*, T. E. Moore: CRUSTAL STRUCTURE OF NORTHERN ALASKA ALONG GEODYNAMICS CONTINENT/OCEAN TRANSECT (A-3) [132373] ..... 1:40 P
- 4 Bruce C. Panuska\*: IS THERE AN OROCLINE IN SOUTH-CENTRAL ALASKA? [135915] ..... 2:00 P
- 5 Robert S. Coe\*, Gordon A. Thrupp: TECTONIC IMPLICATIONS OF ROTATED PALEOMAGNETIC DECLINATIONS IN WEST-CENTRAL ALASKA [125931] ..... 2:20 P
- 6 A. J. Bol\*, R.S. Coe: TERRANE ACCRETION IN AN ACTIVE OROCLINAL BEND: COMPARISON OF STRUCTURE AND KINEMATICS ALONG THE CONTACT FAULT IN E. AND W. PRINCE WILLIAM SOUND, ALASKA [125067] ..... 2:40 P
- COFFEE BREAK ..... 3:00 P
- 7 Peter J. Baeussler\*, Robert S. Coe: NEW PALEOMAGNETIC RESULTS FROM THE HOUND ISLAND VOLCANICS AND IMPLICATIONS FOR THE ALEXANDER TERRANE [125069] ..... 3:20 P
- 8 George Plafker\*, Warren J. Nokleberg: EMPLACEMENT OF ACCRETIONARY ASSEMBLAGES OF THE CHUGACH TERRANE, ALASKA [132340] ..... 3:40 P

- 9 William C. McClelland\*, George E. Gehrels: ANALYSIS OF A MAJOR SHEAR ZONE IN DUNCAN CANAL, KUPREANOF ISLAND, SOUTHEASTERN ALASKA [117165] ..... 4:00 P
- 10 Harold H. Stowell\*: UPLIFT OF THE COAST PLUTONIC COMPLEX AND DEFORMATION WITHIN THE COAST RANGE MEGALINEAMENT, SE ALASKA [120972] ..... 4:20 P
- 11 C. M. Rubin\*, J. B. Saleeby: THE INNER BOUNDARY ZONE OF THE ALEXANDER TERRANE, SOUTHERN SE ALASKA - A NEWLY DISCOVERED THRUST BELT [124834] ..... 4:40 P
- 12 Margaret Rusmore\*, G. W. Woodsworth, Eric Wilmanns: STRATIGRAPHY AND STRUCTURE OF ROCKS ALONG THE EASTERN MARGIN OF THE COAST PLUTONIC COMPLEX WEST OF CHILKO LAKE, BRITISH COLUMBIA [124788] ..... 5:00 P

**SEDIMENTATION/STRATIGRAPHY I: BEACH AND NEAR SHORE ENVIRONMENTS**  
Campus Center 301, University of Hawaii, 1:30 P.M.

Robert H. Osborne and Jennifer H. De Chant, Presiding

- 1 Gerald G. Kuhn, Robert H. Osborne\*: SEA CLIFF EROSION AND CLIMATIC FLUCTUATIONS IN SAN DIEGO COUNTY, CALIFORNIA: 1946 TO PRESENT [124757] ..... 1:30 P
- 2 K. S. Ahlshvede\*, E. A. Compton, R. H. Osborne: SOURCES AND LITTORAL TRANSPORT OF SAND IN NORTHERN SAN DIEGO AND ORANGE COUNTIES, CALIFORNIA: FOURIER GRAIN-SHAPE ANALYSIS [133732] ..... 1:50 P
- 3 David E. Miller\*: SEDIMENTARY STRUCTURES AND DEPOSITIONAL PROCESSES FROM A WEATHER-DOMINATED COAST IN THE QUATERNARY OF THE HUMBOLDT BASIN, N. CA [134564] ..... 2:10 P
- 4 Susan E. Bream\*: THE DEPOSITIONAL ENVIRONMENT OF THE UPPER OLIGOCENE SOOKE FORMATION, VANCOUVER ISLAND, BRITISH COLUMBIA [125286] ..... 2:30 P
- 5 Louis P. Bull\*, John D. Cooper: PROGRADATIONAL BEACH FACIES OF THE SCHULZ RANCH SANDSTONE (UPPER CRETACEOUS), NORTHERN SANTA ANA MOUNTAINS, SOUTHERN CALIFORNIA [124962] ..... 2:50 P
- COFFEE BREAK ..... 3:10 P
- 6 James H. Meyers\*: CRYPTOCRYSTALLINE Mg-CALCITE CEMENTATION OF BEACHROCK IN THE MARINE VADOSE ZONE, MAUI, HAWAII [131533] ..... 3:30 P
- 7 William R. Morris\*, Cathy J. Busby-Spera: TWO MODELS FOR THE EVOLUTION OF GRAVELLY SEDIMENT GRAVITY FLOWS IN THE LATE CRETACEOUS SAN CARLOS SUBMARINE CANYON, BAJA CALIFORNIA, MEXICO [130776] ..... 3:50 P
- 8 Valentine J. Ausfield\*: LATE EOCENE MULTI-EVENT DEBRIS FLOWS IN THE HOKO RIVER FORMATION, NW OLYMPIC PENINSULA, WASHINGTON [116433] ..... 4:10 P
- 9 Jennifer H. De Chant\*, C. A. Sucek: THE PROVENANCE AND TECTONIC SETTING OF THE LATE EOCENE HOKO RIVER FORMATION, NORTHERN OLYMPIC PENINSULA, WA [125287] ..... 4:30 P

**IGNEOUS PETROLOGY II: MIOCENE VOLCANISM IN THE WESTERN UNITED STATES**  
EKH 122, University of Hawaii, 1:30 P.M.

Peter W. Weigand and David C. Buesch, Presiding

- 1 J. S. Miller\*, R. W. Haslett, M. A. Knoll, C. F. Miller: PETROLOGY AND GEOCHEMISTRY OF TERTIARY VOLCANICS IN THE OLD WOMAN MOUNTAINS REGION, SOUTHEASTERN MOJAVE DESERT, CALIFORNIA [135914] ..... 1:30 P
- 2 David C. Buesch\*: COMPOSITIONAL STRATIFICATION OF THE PEACH SPRINGS TUFF NEAR KINGMAN, ARIZONA [130779] ..... 1:50 P
- 3 Keith D. Putirka\*, Peter W. Weigand: MIOCENE VOLCANIC ROCKS OF THE WESTERN MOJAVE DESERT, CA: EVIDENCE FOR MAGMA MIXING [117556] ..... 2:10 P



MINERALOGY/GEOCHEMISTRY

EKH 125, University of Hawaii, 2:00 P.M.

James A. Woodhead, Presiding

- 1 Kevin G. Knauss\*, Thomas J. Wolery: THE DISSOLUTION KINETICS OF QUARTZ AS A FUNCTION OF pH AND TIME AT 70 DEGREES C [125874] ..... 2:00 P
- 2 William L. Bourcier\*, Kevin G. Knauss: ALUMINUM HYDROLYSIS CONSTANTS TO 250 DEGREES C DETERMINED FROM BOEHMITE SOLUBILITY MEASUREMENTS [125871] ..... 2:20 P
- 3 Lawrence J. Herber\*: CORRELATION OF STRUCTURAL STATES IN COEXISTING FELDSPARS USING THE INDICATORS 2V AND Δ131 [117533] ..... 2:40 P
- 4 Karen J. Wenrich\*, Royt B. Sutphin: UNIQUE MINERALS FROM REDWALL LIMESTONE CAVES, ARIZONA: THEIR ASSOCIATION WITH MINERALIZED BRECCIA PIPES [134544] ..... 3:00 P
- 5 James A. Woodhead\*, George R. Rossman, Andrew P. Thomas: ZIRCON: THE HYDROUS SPECIES IN ZIRCONS OF DIVERSE PARAGENESES AND A BROAD RANGE OF METAMICTIZATION [117634] ..... 3:20 P

POSTER SESSION II: GENERAL

Lanal of Mookini Library, University of Hawaii, 1:00 P.M. - 4:30 P.M.

Authors will be present from 2:00 to 4:00

- K. Kronefeld Beratan\*: TRACE FOSSILS IN MIOCENE LACUSTRINE AND PLUVIAL DEPOSITS, WHIPPLE MOUNTAINS, SOUTHEASTERN CALIFORNIA [124759] .... Booth 1
- Craig M. dePolo\*, John W. Bell, Alan R. Ramelli: GEOMETRY OF STRIKE-SLIP FAULTING RELATED TO THE 1932 CEDAR MOUNTAIN EARTHQUAKE, CENTRAL NEVADA [135778] ..... Booth 2
- Richard W. Galster\*, Lawrence V. Mann: RADAR ANALYSIS OF WESTERN WASHINGTON STRUCTURAL FABRIC [129469] ..... Booth 3
- Terri D. Flake\*: STRUCTURAL ANALYSIS OF THE COLEBROOKE SCHIST, SOUTHWESTERN OREGON [125291] ..... Booth 4
- Daniel J. Ponti\*, Kenneth R. Lajoie, Stephanie K. Appel: AMINOSTRATIGRAPHIC CLASSIFICATION OF THE "TYPE" QUATERNARY MARINE FORMATIONS FROM THE SAN PEDRO-PALOS VERDES AREA, LOS ANGELES BASIN, CALIFORNIA [132359] ..... Booth 5
- Jacques Renault\*: POSSIBLE ORBITAL FORCING OF MIOCENE ALLUVIAL SEDIMENTATION [135401] ..... Booth 6
- P. R. Renne, A. L. Deino, G. R. Scott\*: STRUCTURAL CORRECTION OF PALEOMAGNETIC DATA AND ASSOCIATED ERROR [132562] ..... Booth 7
- Douglas P. Rennie, Stephen R. Durand\*: CLUSTER ANALYSIS AND THE INTERPRETATION OF RELATIVE DATING DATA [135799] ..... Booth 8
- John V. Ross\*, P. D. Lewis, S. L. Garwin: GEOLOGY OF THE QUESNEL LAKE REGION, CENTRAL BRITISH COLUMBIA: GEOMETRY AND IMPLICATIONS [120211] ..... Booth 9
- J. Schweitzer\*, C. Simpson: POLYPHASE DEFORMATION IN LOWER PLATE ROCKS OF SACRAMENTO MTS. DETACHMENT FAULT, SE CALIFORNIA [115716] .. Booth 10
- S. A. Shaver\*: DEVONIAN SHELF CARBONATES AND PERMIAN(?) ARC VOLCANISM RECORDED IN THE NORTHERN SAN ANTONIO MTS., NYE CO., NEVADA [129915] ..... Booth 11
- Donald W. Tarmen\*: ANALYSIS OF CALCITE TWIN LAMELLAE FROM LIMESTONE ALLOCHTHON, SOUTHERN ARIZONA [117536] ..... Booth 12
- Chia-Chen Yeh\*: A DEEP-WATER TRACE FOSSIL ASSEMBLAGE FROM WHEELER GORGE, VENTURA COUNTY, CALIFORNIA [124762] ..... Booth 13

- 4 Peter W. Weigand\*, June M. Thomas: GEOCHEMICAL AND AGE DATA FROM MIOCENE VOLCANIC ROCKS FROM THE SAN EMIGDIO/SAN JUAN BAUTISTA AND HEENACH/PINNACLES AREAS, CALIFORNIA: IMPLICATION FOR EARLY MOVEMENT ON THE SAN ANDREAS FAULT [117554] ..... 2:30 P
- 5 Charles R. Bryan\*: GEOCHEMISTRY OF MID-TERTIARY VOLCANIC ROCKS IN THE EASTERN CHIRICAHUA MOUNTAINS OF SOUTHEASTERN ARIZONA [126434] ..... 2:50 P
- 6 Daniel L. Feuerbach\*, Eugene I. Smith: LATE-MIOCENE FORTIFICATION HILL BASALT, LAKE MEAD AREA, NEVADA AND ARIZONA: SOURCE AREAS AND CONDUIT GEOMETRY [130137] ..... 3:10 P
- COFFEE BREAK ..... 3:30 P
- 7 C. S. Schmidt\*, E. I. Smith: THE McCULLOUGH PASS CALDERA: A MID-MIOCENE CALDERA IN THE CENTRAL McCULLOUGH MOUNTAINS, CLARK COUNTY, NEVADA [130121] ..... 3:50 P
- 8 Terry R. Kaufmann\*, Eugene I. Smith: EVIDENCE FOR MAGMA MIXING IN MID-TERTIARY VOLCANIC ROCKS: LAKE MEAD REGION, SOUTHERN NEVADA [129545] ..... 4:10 P
- 9 Shirley J. Foote\*, John K. Bowman: TERTIARY GEOLOGY OF THE WEST-CENTRAL PORTION OF THE DONNER PASS QUADRANGLE, NORTHERN SIERRA NEVADA, CALIFORNIA [125130] ..... 4:30 P
- 10 A. L. Grunder\*, P. B. Gans, E. R. Schermer: TIME-COMPOSITION TRENDS OF VOLCANIC ROCKS ASSOCIATED WITH MID-TERTIARY EXTENSION IN EAST-CENTRAL NEVADA AND ADJACENT UTAH [126168] ..... 4:50 P
- 11 Allen F. Glazner, W. Ussler III\*: CRUSTAL-DENSITY CONTROL OF MAGMA CONTAMINATION AND ASCENT IN EXTENSIONAL REGIONS [129096] ..... 5:10 P

ENGINEERING/ENVIRONMENTAL GEOLOGY

EKH 128, University of Hawaii, 1:30 P.M.

Ferry L. Ehlig and Monte D. Wilson, Presiding

- 1 James O'Tousa\*: KINEMATICS OF THE FLYING TRIANGLE LANDSLIDE, PALOS VERDES PENINSULA, SOUTHERN CALIFORNIA [125772] ..... 1:30 P
- 2 F. F. Jordan\*, F. L. Ehlig: STABILITY ANALYSIS OF PORTUGUESE BEND LANDSLIDE, PALOS VERDES PENINSULA, SOUTHERN CALIFORNIA [135807] ..... 1:50 P
- 3 Ferry L. Ehlig\*: PHASED STABILIZATION OF THE PORTUGUESE BEND LANDSLIDE, PALOS VERDES PENINSULA, SOUTHERN CALIFORNIA [135808] ..... 2:10 P
- 4 W. A. Charlie\*, D. O. Doehring, D. S. Burnford, M. Hubert: COMPRESSIONAL WAVE-INDUCED LIQUEFACTION OF CARBONATE SAND [126577] ..... 2:30 P
- 5 Michael D. Malone\*: RIDGE-FORMING GROUND DEFORMATIONS NEAR HEALDSBURG, CALIFORNIA [135824] ..... 2:50 P
- 6 Peter A. Almendinger\*: CORRELATION AND PREDICTABILITY OF ALKALI-SILICA REACTIVITY USING SELECTIVE CALIFORNIA LITHOLOGIES: A PETROGRAPHIC AND CHEMICAL ANALYSIS [133232] ... 3:10 P
- COFFEE BREAK ..... 3:30 P
- 7 J. T. Neal\*, W. J. Carr: CHARACTERIZATION OF GEOLOGIC STRUCTURE FOR PLACEMENT OF REPOSITORY SURFACE FACILITIES, YUCCA MOUNTAIN, NV [134562] ..... 3:50 P
- 8 Edward Eschner\*: DETACHMENT FAULTING BENEATH YUCCA MOUNTAIN: CONDITIONS POTENTIALLY ADVERSE TO SAFE STORAGE OF NUCLEAR AND HIGH-LEVEL RADIOACTIVE WASTE [133106] ..... 4:10 P
- 9 Monte D. Wilson\*, Joni J. Hadden: LOGGING ROAD DESIGN AND CONSTRUCTION FOR REDUCED SEDIMENTATION IN MOUNTAIN STREAMS [117117] ..... 4:30 P
- 10 Kathy S. Vanderwal\*: POTENTIAL CUMULATIVE EFFECTS OF SEDIMENT PRODUCED BY HYDROELECTRIC PROJECTS IN THE PACIFIC NORTHWEST [132262] ..... 4:50 P
- 11 S. P. Figuli\*, S. L. English: GEOLOGIC SOFTWARE FOR NUCLEAR WASTE REPOSITORY STUDIES: A QUALITY ASSURANCE PROGRAM [121245] ..... 5:10 P

FRIDAY, MAY 22, 1987

SYMPOSIUM: THE FOURTH COLUMBIA RIVER BASALT, PART IV: PETROGENESIS  
UHH Theatre, University of Hawaii, 8:00 A.M.

- P. R. Hooper and T. L. Wright, Presiding
- 1 A. R. Duncan\*, A. J. Erland, R.S. Smith, J. S. Marsh: CRUSTAL CONTAMINATION IN THE PETROGENESIS OF SOME KAROO BASALTS - IMPLICATIONS FOR OTHER CONTINENTAL FLOOD BASALT PROVINCES [134652] ..... 8:00 A
  - 2 T. M. Fleming\*, D. E. Elliot: JURASSIC THOLEIITES OF ANTARCTICA: GEOCHEMISTRY [121433] ..... 8:20 A
  - 3 Floyd M. Hodges\*, James F. McKimley, Philip. E. Long, Duane G. Norton: MINERAL CHEMISTRY OF COLUMBIA RIVER BASALT FLOWS: PETROGENETIC IMPLICATIONS [136159] ..... 8:40 A
  - 4 G. G. Coles\*, A. D. Brandon, R. StJ. Lambert: TRACE ELEMENT AND ISOTOPIC FEATURES OF LITTLE-KNOWN MIOCENE BASALTS OF CENTRAL AND EASTERN OREGON: PETROGENETIC AND TECTONIC IMPLICATIONS [117671] ..... 9:00 A
  - 5 Michael M. Bailey\*: VARIATION WITHIN THE PICTURE GORGE BASALT (PGB) AND THE POSSIBLE INFLUENCES OF RECHARGE VERSUS ASSIMILATION [135137] ..... 9:20 A
  - COFFEE BREAK ..... 9:40 A
  - 6 R. T. Helz, T. L. Wright\*: A MODEL FOR THE ORIGIN OF THE YAKIMA BASALT SUBGROUP, NW USA [130933] ..... 10:00 A
  - 7 P. R. Hooper\*: COLUMBIA RIVER BASALT GENESIS: NEW GEOCHEMICAL MODELS FOR THE MAIN SERIES [135133] ..... 10:20 A
  - 8 R. StJ. Lambert\*, M.J.M. Duke, V. E. Chamberlain: GEOCHEMISTRY OF INCOMPATIBLE ELEMENTS IN THE COLUMBIA RIVER BASALTS [134550] ..... 10:40 A
  - 9 William H. Taubeneck\*: CRUSTAL CONTAMINATION IN DIKES OF THE COLUMBIA RIVER BASALT GROUP IN THE WALLOWA BATHOLITE, NORTHEAST OREGON [125400] ..... 11:00 A
  - 10 R. StJ. Lambert\*, I. D. Marsh, V. E. Chamberlain: THE UNIVERSAL OCCURRENCE OF INTERSTITIAL GRANITE GLASS IN THE COLUMBIA RIVER BASALTS AND ITS PETROGENETIC IMPLICATIONS [134553] .... 11:20 A

SYMPOSIUM: SEISMOTECTONICS OF THE CENTRAL CALIFORNIA COAST RANGE III: FOLD-FAULT AND SLIP RATES  
EKE 124, University of Hawaii, 8:00 A.M.

- Ina Alterman, Robert Brown, Lloyd Cluff, Richard McMullen, and Burton Slennons, Presiding
- 1 Thom L. Davis\*, Martin B. Lague: THE 1952 ARVIN-TEHACHAPI EARTHQUAKE (M=7.6) AND ITS RELATIONSHIP TO THE WHITE WOLF FAULT AND THE PLEITO THRUST SYSTEM [132995] ..... 8:00 A
  - 2 E. A. Keller\*, R. L. Tepeda, D. B. Seaver, T. E. Rockwell, D. M. Laduzinsky, D. L. Johnson: ACTIVE FOLD-THRUST BELTS & THE W. TRANSVERSE RANGES, CA [130754] ..... 8:15 A
  - 3 N. Timothy Hall\*: LATE QUATERNARY HISTORY OF THE EASTERN PLEITO THRUST FAULT, SAN EMIGDIO MOUNTAINS, CALIFORNIA [135749] ..... 8:30 A
  - 4 David P. Schwartz\*, Ray J. Weldon: SAN ANDREAS SLIP RATES: PRELIMINARY RESULTS FROM THE 96 ST. SITE NEAR LITTLE ROCK, CA [136022] ..... 8:45 A
  - 5 G. E. Weber\*, W. R. Lettis, K. L. Hanson: LATE PLEISTOCENE UPLIFT RATES ALONG THE CENTRAL CALIFORNIA COAST, CAPE SAN MARTIN TO SANTA MARIA VALLEY [135721] ..... 9:00 A
  - 6 C. R. Willingham\*, Douglas H. Hamilton: THE NATURE OF THE HOSGRI FAULT ZONE-PART I: STRUCTURE AND EXTENT [135747] ..... 9:15 A
  - 7 R. G. Beck, C. Richard Willingham, D. H. Hamilton\*: THE NATURE OF THE HOSGRI FAULT - PART II. EFFECT ON STRATIGRAPHY AND TIMING OF TECTONIC EVENTS [135340] ..... 9:30 A

- 8 Douglas H. Hamilton\*: CHARACTERIZATION OF THE SAN GREGORIO-HOSGRI FAULT SYSTEM, COASTAL CENTRAL CALIFORNIA [135335] ..... 9:45 A
- COFFEE BREAK ..... 10:00 A
- 9 Charles W. Branch, N. Timothy Hall\*: EVIDENCE FROM HIGH-RESOLUTION SEISMIC REFLECTION DATA FOR STRIKE-SLIP MOVEMENT ALONG THE HOSGRI FAULT ZONE, OFFSHORE CENTRAL CALIFORNIA [135744] ..... 10:15 A
- 10 Douglas H. Hamilton\*, N. T. Hall: STRUCTURE AND TECTONICS OF THE SAN LUIS-PISMO-SANTA MARIA REGION, COASTAL CENTRAL CALIFORNIA [135751] ..... 10:30 A
- 11 Frank R. Bickner, Patrick R. Vaughan\*: EVIDENCE FOR HOLOCENE ACTIVITY OF THE SAN SIMEON FAULT FROM DEFORMED FLUVIAL TERRACES NEAR SAN SIMEON, COASTAL CENTRAL CALIFORNIA [135737] ..... 10:45 A
- 12 N. Timothy Hall\*, T. Dwight Hunt, Patrick A. Vaughan, Frank R. Bickner, William R. Lettis: TRENCHING AND MAPPING INVESTIGATIONS OF THE LATE QUATERNARY BEHAVIOR OF THE SAN SIMEON FAULT, SAN LUIS OBISPO COUNTY, CALIFORNIA [135742] ..... 11:00 A
- 13 Tom K. Rockwell\*, Frank R. Bickner, Patrick R. Vaughan, Kathryn L. Hanson: APPLICATIONS OF SOIL GEOMORPHOLOGY TO DATING AND CORRELATING COASTAL TERRACE DEPOSITS ACROSS THE SAN SIMEON FAULT ZONE, CENTRAL CALIFORNIA [133248] ..... 11:15 A
- DISCUSSION ..... 11:30 A
- SUMMARY: Lloyd Cluff ..... 11:45 A

SEDIMENTATION/STRATIGRAPHY II: SOUTHWESTERN UNITED STATES AND BAJA CALIFORNIA  
Campus Center 301, University of Hawaii, 8:00 A.M.

- George C. Dunne and Richard J. Frizzell, Presiding
- 1 G. B. Nieshina\*, C. W. Byers: SEDIMENTARY FABRIC OF MONTEREY FORMATION (MIOCENE) DIATOMITES, CALIFORNIA [134834] ..... 8:00 A
  - 2 Peter Neumann-Mahlkau\*: FAULT RELATED SEDIMENTATION IN THE MECCA HILLS, RIVERSIDE COUNTY, SOUTHERN CALIFORNIA [132788] ..... 8:20 A
  - 3 Richard J. Frizzell\*, Keith E. Pearce, Gerald F. Brem: EARLY MIOCENE SEDIMENTATION, VOLCANISM, AND TECTONISM, NORTHWESTERN BRISTOL MOUNTAINS, CENTRAL MOJAVE DESERT [124971] ..... 8:40 A
  - 4 Juli G. Osborne\*, A. Eugene Fritsche: STRATIGRAPHY AND DEPOSITIONAL ENVIRONMENTS OF THE VAQUEROS FORMATION, CENTRAL AND WESTERN SANTA MONICA MOUNTAINS, CALIFORNIA [124851] ..... 9:00 A
  - 5 Allan J. Scott\*: THE LATE-MIOCENE MUDDY CREEK CONGLOMERATE, LAKE HEAD REGION, SOUTHERN NEVADA: CLAST SOURCE AND TECTONIC SIGNIFICANCE [129546] ..... 9:20-A
  - COFFEE BREAK ..... 9:40 A
  - 6 Douglas P. Smith\*, Cathy J. Busby-Spera: FAULT-CONTROLLED SEDIMENTATION IN A MID-CRETACEOUS FOREARC BASIN: VALLE FORMATION, CEDROS ISLAND, BAJA CALIFORNIA, MEXICO [130781] ..... 10:00 A
  - 7 Jeffrey Geraci, Patrick Fischer, George Dunne\*: INDIAN WELLS CANYON ROOF PENDANT, S.E. SIERRA NEVADA, CALIFORNIA: ANOTHER FRAGMENT OF THE PALEOZOIC CORDILLERAN EUGEOCLINE? [117553] .... 10:20 A
  - 8 Laurence R. Greene\*: A NEW LOOK AT THE DETAILS OF GRAND CYCLE SEDIMENTATION: SMALL-SCALE CYCLICITY NOT LINKED TO GRAND CYCLE DEPOSITION--LOWER CAMBRIAN, E. CALIF. [134803] ..... 10:40 A
  - 9 Jerome A. Carter\*: THE AHARGOSA AULACOGEN: THE INFLUENCE OF PROTEROZOIC TECTONICS ON THE DEPOSITION OF AN ORDOVICIAN SEDIMENT-GRAVITY FLOW, NOPAH RANGE, INYO COUNTY, CALIFORNIA [133105] ..... 11:00 A
  - 10 David Siegel\*: CORRELATION AND AGE OF THE PUTNAM PEAK BASALT, SOLANO COUNTY, CALIFORNIA [117349] ..... 11:20 A

**TECTONICS V: THE CANADIAN CORDILLERA AND NORTHEASTERN WASHINGTON**  
 EKH 126, University of Hawaii, 8:00 A.M.

Vicki L. Hansen and Diane B. Carlson, Presiding

- 1 Paul J. Umhoefer\*: NORTHWARD TRANSLATION OF "BAJA BRITISH COLUMBIA" ALONG A LATE CRETACEOUS TO PALEOCENE TRANSFORM MARGIN AT THE WESTERN EDGE OF NORTH AMERICA [125312] ..... 8:00 A
- 2 Martin G. Miller\*: REPEATED TENSILE FRACTURING AND FAULTING ADJACENT TO THE YALAKOM FAULT, SOUTHERN BRITISH COLUMBIA [132247] ..... 8:20 A
- 3 Lisel D. Currie\*, P. S. Simony: THE GEOLOGY OF THE ALLAN CREEK AREA, SOUTHERN CARIBOO MOUNTAINS, BRITISH COLUMBIA [125631] ..... 8:40 A
- 4 Michael E. McDonough\*: TECTONIC SIGNIFICANCE OF THE HIGH STRAIN ZONE ON THE WEST EDGE OF THE ROCKY MOUNTAINS NEAR VALEMOUNT, BRITISH COLUMBIA [125632] ..... 9:00 A
- 5 Stephen T. Johnston\*, Philippe Erdmer: THE AISHIKI BATHOLITE: AN ALLOCHTHONOUS PLUTONIC SHEET IN SOUTHWEST YUKON [134922] ..... 9:20 A
- 6 V. L. Hansen\*: TECTONIC CORRELATION OF THE YUKON-TANANA (YTT) AND SLIDE MOUNTAIN (SMT) TERRANES [117643] ..... 9:40 A
- 7 M. A. Bloodgood\*, J. V. Ross: STRUCTURAL TRANSITIONS WITHIN THE QUESNEL TERRANE, EUREKA PEAK AREA, CENTRAL BRITISH COLUMBIA, CANADA [120219] ..... 10:00 A
- 8 Steven L. Garvin\*, P. D. Lewis, J. V. Ross: DEFORMATION AND METAMORPHISM IN THE N. SHUSWAP METAMORPHIC COMPLEX, W. CARIBOO MTS., BRITISH COLUMBIA [120213] ..... 10:20 A
- 9 Peter D. Lewis\*, S. L. Garvin, J. V. Ross: POLYPHASE DEFORMATION IN THE WESTERN CARIBOO MOUNTAINS, BRITISH COLUMBIA: STYLE AND TECTONIC IMPLICATIONS [120212] ..... 10:40 A
- 10 Palma J. Moya\*, Diane B. Carlson, W. R. Sackett: TECTONIC IMPLICATIONS OF PALEOGENE IGNEOUS ACTIVITY IN THE NORTHWESTERN UNITED STATES [117268] ..... 11:00 A
- 11 Diane B. Carlson\*, Palma J. Moya: THE COLVILLE BATHOLITE: PALEOGENE PLUTONISM, VOLCANISM, AND EXTENSION IN NORTHEASTERN WASHINGTON [117270] ..... 11:20 A
- 12 Donald O. West\*: THE WENAS VALLEY FAULT: HOLOCENE NORMAL FAULTING OR GRAVITATIONAL SLIDING IN THE YAKIMA FOLD BELT, COLUMBIA PLATEAU? [135650] ..... 11:40 A

**TECTONICS VI: SOUTHERN ARIZONA, CALIFORNIA, AND BAJA CALIFORNIA**  
 EKH 125, University of Hawaii, 8:00 A.M.

S. J. Reynolds and Richard L. Sedlock, Presiding

- 1 Kevin P. Corbett\*, C. A. Nelson: MICA FABRICS, STRAIN ANALYSIS AND DEFORMATIONAL HISTORY OF THE LAST CHANCE THRUST, E. INYO MTS. AND LAST CHANCE RANGE, CA [134779] ..... 8:00 A
  - 2 Christine E. Smith\*, George E. Gehrels: EVIDENCE FOR LATE CRETACEOUS-EARLY TERTIARY THRUST FAULTING, PERALUMINOUS PLUTONISM, AND METAMORPHISM IN THE LITTLE RINCON MOUNTAINS, SOUTHEASTERN ARIZONA [124533] ..... 8:20 A
  - 3 S. J. Reynolds\*, G. S. Lister: KINEMATICS OF MYLONITIC ROCKS IN METAMORPHIC CORE COMPLEXES IN ARIZONA—ORIGIN OF THE MYLONITIC FRONT [126328] ..... 8:40 A
  - 4 Paul R. Renne\*, Brent D. Turrin: TIMING OF DEFORMATION IN THE BENTON RANGE, SOUTHEASTERN CALIFORNIA AND IMPLICATIONS TO NEVADAN OROGENESIS [132560] ..... 9:00 A
  - 5 Leon T. Silver\*: ISOTOPIC EVIDENCE ON ROTATIONS AND DISLOCATIONS IN THE SOUTHERN SIERRA NEVADA AND WESTERN MOJAVE DESERT [126203] ..... 9:20 A
- COFFEE BREAK ..... 9:40 A
- 6 Jeanette Alexander\*, Ray Weldon: COMPARISON OF STRUCTURAL STYLE OF THE LIEBRE MOUNTAIN AND SQUAW PEAK THRUST SYSTEMS, OFFSET ACROSS THE SAN ANDREAS FAULT, SOUTHERN CALIFORNIA [124837] ..... 10:00 A

- 7 R. C. Griffith, C. W. Goetz\*: STRUCTURAL AND GEOCHRONOLOGICAL EVIDENCE FOR MID-CRETACEOUS COMPRESSIONAL TECTONICS ALONG A TERRANE BOUNDARY IN THE PENINSULAR RANGES [124916] ..... 10:20 A
- 8 Richard L. Sedlock\*: UPLIFT OF COHERENT BLUESCHISTS AND HIGH-PRESSURE TECTONIC BLOCKS BY NORMAL FAULTING AND SERPENTINITE DIAPYRISM [133612] ..... 10:40 A
- 9 Suzanne L. Baldwin\*, T. Mark Harrison, Richard L. Sedlock: 40Ar/39Ar GEOCHRONOLOGY OF HIGH-PRESSURE BLOCKS IN MELANGE, CEDROS ISLAND, BAJA CALIFORNIA [133613] ..... 11:00 A
- 10 Richard L. Sedlock\*, David K. LaRue: DETACHMENT FAULTS IN MESOZOIC ROCKS OF WEST-CENTRAL BAJA CALIFORNIA [133609] ..... 11:20 A

**ECONOMIC GEOLOGY**

Campus Center 306-307, University of Hawaii, 8:00 A.M.

John Dilles and Pow-foong Fan, Presiding

- 1 Randolph A. Koski\*, Robert A. Zierenberg, Robin M. Bouse, Wendy A. Bohren, Robert L. Oscarson: THE COMPOSITION OF SULFIDE DEPOSITS FROM THE ESCANABA TROUGH, SOUTHERN GORDA RIDGE: IMPLICATIONS FOR HYDROTHERMAL FLUID COMPOSITION AND DISCHARGE AT A SEDIMENT COVERED RIDGE AXIS [125827] ..... 8:00 A
- 2 Pow-foong Fan\*: ACCRETED TERRANES AND MINERAL RESOURCES OF CHINA [135113] ..... 8:20 A
- 3 Thomas M. Dyehouse\*, Samuel E. Swanson: EVOLUTION OF TIN GRANITES OF THE SEWARD PENINSULA, AK [124000] ..... 8:40 A
- 4 Gary A. Coulter\*, Rainer J. Newberry: A COMPARISON OF CALC-SILICATE ALTERATION AROUND THREE TIN GRANITE COMPLEXES, SEWARD PENINSULA, ALASKA [133420] ..... 9:00 A
- 5 L. Nicholson\*: PORPHYRY COPPER RELATED SKARNS OF THE BIG SPRUCE CREEK AREA, SOUTH-CENTRAL BROOKS RANGE, AK [123999] ..... 9:20 A
- 6 J. Dean Warner\*, Cheryl L. Hardock: RARE EARTH ELEMENT-, NIOBIUM-, THORIUM-, AND URANIUM-BEARING DIKES AT BOKAN MOUNTAIN, SOUTHEAST ALASKA [129407] ..... 9:40 A
- 7 Wim T. van Middelaar\*, Jeffrey D. Keith: ALBITIZATION AND GREISENING: POSSIBLE PATHWAYS OF THE HYDROTHERMAL FLUID IN THE GRANITOID ASSOCIATED WITH SCHEELITE SKARN, TUNGSTEN, NWT, CANADA [115888] ..... 10:00 A
- 8 Janet E. Gabites\*, D. J. Alldrick, C. I. Godwin: LEAD ISOTOPE STUDY OF THE STEWART MINING CAMP, B.C., CANADA [120214] ..... 10:20 A
- 9 John Dilles\*: EVOLUTION OF PORPHYRY COPPER ORE FLUIDS DURING DIFFERENTIATION AND CRYSTALLIZATION OF THE YERINGTON BATHOLITE, WESTERN NEVADA [126169] ..... 10:40 A
- 10 Paul Dean Procter\*, Willis E. Brimhall: SILVER IN THE SPRINGDALE (SILVER REEF) SANDSTONE, JURASSIC MOENAVE FORMATION, UTAH, N. ARIZONA, S. NEVADA [134953] ..... 11:00 A
- 11 John E. Bowman\*: MINERALIZATION OF THE MEADOW LAKE MINING DISTRICT, NORTHERN SIERRA NEVADA, NEVADA COUNTY, CALIFORNIA [125131] ..... 11:20 A
- 12 Robin M. Bouse\*, Joseph L. Wooden, Randolph A. Koski, Leda Beth G. Pickthorn: Pb ISOTOPIC COMPOSITIONS FOR STRATIFORM MANGANESE OXIDE DEPOSITS AND THEIR MIOCENE HOST ROCKS, NEVADA AND ARIZONA [134876] ..... 11:40 A

**METAMORPHIC PETROLOGY**

EKH 122, University of Hawaii, 8:00 A.M.

Thomas D. Hoisch and Bernard W. Evans, Presiding

- 1 David G. Falais\*, Simon M. Peacock: P-T INDICATORS IN METAMORPHIC ROCKS FROM THE SANTA CATALINA METAMORPHIC CORE COMPLEX, SE ARIZONA: CONTACT METAMORPHISM AT SHALLOW CRUSTAL LEVELS [117175] ..... 8:00 A
- 2 Suzanne E. Orrell\*, J. Lawford Anderson: PROTEROZOIC METAMORPHISM IN THE WHIFFLE MOUNTAINS, SOUTHEASTERN CALIFORNIA [117619] ..... 8:20 A

3 Thomas D. Boisch*: CONDITIONS OF LATE CRETACEOUS REGIONAL METAMORPHISM IN THE LITTLE MARIA MOUNTAINS, SOUTHEASTERN CALIFORNIA [133702] .....	8:40 A
4 Stephen M. Wickham*, Hugh P. Taylor, Jr., Arthur W. Snoko: FLUID-ROCK-MELT INTERACTION IN METAMORPHIC CORE COMPLEXES - A STABLE ISOTOPE STUDY OF THE RUBY MOUNTAINS-EAST HUMBOLDT RANGE, NEVADA [126199] .....	9:00 A
5 Aime P. Ruendal*, Jack M. Rice: GARNET ZONING AND P-T PATHS OF METAMORPHISM IN THE HEAD-QUARTERS REGION, NORTHERN IDAHO [125369] .....	9:20 A
6 T. W. Grover*, J. M. Rice, A. Ruendal, J. W. Carey, E. M. Lang: POLYMETAMORPHIC HISTORY OF THE ST. JOE - CLEARWATER REGION OF NORTHERN IDAHO [133498] .....	9:40 A
COFFEE BREAK .....	10:00 A
7 J. E. Sevigny*: GEOCHEMISTRY AND TECTONIC SIGNIFICANCE OF LATE PROTEROZOIC AMPHIBOLITES, SOUTHERN CANADIAN CORDILLERA [129726] .....	10:20 A
8 John W. Goodge*: POLYPHASE METAMORPHISM OF EARLY MESOZOIC OCEANIC ROCKS IN THE CENTRAL KLAMATH MOUNTAINS, CALIFORNIA [133011] .....	10:40 A
9 John Wakabayashi*: AMPHIBOLITE GRADE METAMORPHISM OF FRANCISCAN ROCKS FROM THE SAN FRANCISCO BAY AREA, CALIFORNIA [130660] ...	11:00 A
10 Bernard W. Evans*, Brian E. Patrick, Anthony J. Irving: COMPOSITIONAL CONTROL OF BLUESCHIST/GREENSCHIST AND GENESIS OF SEWARD PENINSULA METABASITES [132246] .....	11:20 A
11 Jerry F. Magloughlin*, Bernard W. Evans: THREE UNUSUAL HIGH PRESSURE ROCKS FROM THE NASON TERRANE, NORTH CASCADES, WASHINGTON [131870] .....	11:40 A

**GEOMORPHOLOGY**

EKH 128, University of Hawaii, 8:30 A.M.

A. E. Fritsche and Neil J. Maloney, Presiding

1 A. Eugene Fritsche, Frank M. Hanna*: LATE PLEISTOCENE LANDSLIDE-DAMMED LAKE IN THE TOPATOPA MOUNTAINS, VENTURA COUNTY, CALIFORNIA [124845] .....	8:30 A
2 Ricardo L. Ispeda*, Edward A. Keller, Thomas K. Rockwell: SOIL CHRONOSEQUENCE AT WHEELER RIDGE, SOUTHERN SAN JOAQUIN VALLEY, CALIFORNIA [130755] .....	8:50 A
John T. Parker*: GEOMORPHOLOGY AND SEDIMENTOLOGY OF A SMALL, DELTAIC MARSH IN BIG LAGOON, NORTHERN CALIFORNIA [134568] .....	9:10 A
4 Neil J. Maloney*, James A. Larwood, Mark M. Zeko: CAPTURE OF MAMMOTH CREEK BY HOT CREEK, LONG VALLEY CALDERA, CALIFORNIA [124963] .....	9:30 A
COFFEE BREAK .....	9:50 A
5 Virginia C. Gulick*, Victor R. Baker: VALLEY EVOLUTION ON THE HAWAIIAN ISLANDS [130712] ....	10:10 A
6 R. Craig Kochel*: VALLEY MORPHOLOGY ON HAWAII AND MARS: ARGUMENTS FOR THEIR ORIGIN BY GROUNDWATER SAPPING PROCESSES [122797] .....	10:30 A
7 T. K. Rockwell, S. Wilson, M. E. Hatch*, G. L. Kennedy, D. E. Muls: AGES AND DEFORMATION OF MARINE TERRACES WITHIN THE AGUA BLANCA FAULT ZONE, NORTHERN BAJA CALIFORNIA, MEXICO [135647] .....	10:50 A
8 Chang Li*: EVOLUTION OF TOPOGRAPHY AND GEOMORPHOLOGY OF PEARL RIVER MOUTH BASIN IN THE PALEOZOIC PERIOD [135112] .....	11:10 A

OPEN FORUM DISCUSSION: FOURTH COLUMBIA RIVER BASALT SYMPOSIUM V--IMPORTANT PROBLEMS, WITH SPECIAL EMPHASIS ON PETROGENESIS

DHH Theater, University of Hawaii, 1:00 P.M.

P. R. Hooper and T. L. Wright, Presiding

SYMPOSIUM: EARTH SCIENCE EDUCATION, SOCIETY, AND TECHNOLOGY  
EKH 122, University of Hawaii, 1:00 P.M.

Bernard Pipkin, Andrew J. Verdon, and Donald L. Lamar, Presiding

INTRODUCTION .....	1:00 P
1 D. L. Lamar*: LABORATORY EXERCISES FOR IMPROVED EFFICIENCY IN TEACHING INTRODUCTORY FIELD GEOLOGY [135820] .....	1:05 P
2 James E. Slosson*: SHOULD ACADEMIA AID IN SOLVING THE PROBLEMS RELATED TO GEOLOGIC HAZARDS? [133928] .....	1:25 P
3 Thomas E. Pyle*, Ellen S. Kappel, Phillip D. Rabinowitz, A. W. Meyer, Roger N. Anderson: THE OCEAN DRILLING PROGRAM IN 1987 [133926] ...	1:45 P
4 David A. Clague*, Hawaii GLORIA Staff: NEW INFORMATION ON THE CONSTRUCTION AND SUBSIDENCE HISTORY OF HAWAII FROM LONG-RANGE SIDE-SCAN SONAR IMAGERY [133923] .....	2:05 P
5 Alexander Malahoff*: THE INNER SPACE OF HAWAII--OUTREACH PROJECTS BY THE UNIVERSITY TO SCHOOLS IN THE STATE [134331] .....	2:25 P
COFFEE BREAK .....	2:45 P
6 James V. Taranik*: AEROSPACE REMOTE SENSING IN THE EARTH SCIENCES [133921] .....	3:00 P
7 Mary E. Westerback*, Madeleine J. Long: SHATTERING MINDSETS, EARTH SCIENCE FOR ELEMENTARY SCHOOL TEACHERS [135795] .....	3:20 P
8 Kurt L. Othberg*, Lawrence F. Baum: FIELD RESEARCH TEAMS AND METHODS OF INQUIRY FOR EARTH SCIENCE TEACHERS: A SUMMER WORKSHOP [124339] .....	3:40 P
9 G. M. Petrie*, M. G. Foley, F. A. Eddy: COMPUTERS, A TOOL FOR GEOLOGISTS BUT A PROBLEM FOR GEOLOGY DEPARTMENTS [117689] .....	4:00 P

SYMPOSIUM: CRUSTAL SEISMIC PROFILING IN THE SOUTHWESTERN UNITED STATES: SOME RESULTS OF CALCRUST INVESTIGATIONS  
Campus Center 306-307, University of Hawaii, 1:00 P.M.

David A. Okaya, Presiding

1 T. L. Henyey*, G. A. Davis, J. C. Crowell, T. V. McEvelly, L. T. Silver: THE CRUSTAL STRUCTURE OF THE SOUTHWESTERN UNITED STATES - A REVIEW OF CALCRUST INVESTIGATIONS [132590] ..	1:00 P
2 Emery D. Goodman*, Peter E. Malin: TECTONIC/STRUCTURAL FEATURES AT THE GEOLOGIC HUB OF CALIFORNIA: BASEMENT TO BASIN TRANSITION--TEHACHAPI MOUNTAINS TO SOUTHERN SAN JOAQUIN VALLEY [130786] .....	1:20 P
3 E. L. Amos*, P. E. Malin: CRUSTAL STRUCTURE OF THE TEHACHAPI MOUNTAINS FROM SEISMIC REFRACTION DATA [132596] .....	1:40 P
4 Martin E. Sponberg*, Thomas L. Henyey: CRUSTAL REFLECTION PROFILING IN THE WESTERN MOJAVE DESERT, CALIFORNIA [132592] .....	2:00 P
5 J. Morton*, T. Henyey, P. Leary, R. Clayton, J. Louie, L. Silver, T. McEvelly, D. Okaya: PRELIMINARY RESULTS FROM THE CALCRUST APPLE VALLEY SEISMIC SURVEY [132591] .....	2:20 P
COFFEE BREAK .....	2:40 P
6 T. L. Henyey, P. C. Leary*, D. A. Okaya: 2-D CDP SURVEY AT CAJON PASS DEEP WELL DRILL SITE [132595] .....	3:00 P
7 L. K. Severson*, T. V. McEvelly: ANALYSIS OF SEISMIC REFLECTION DATA FROM THE IMPERIAL VALLEY, CALIFORNIA [132589] .....	3:20 P
8 Rebecca S. Morris*: TERTIARY BASIN FORMATION ABOVE MIDDLE-CRUSTAL SHEAR ZONES IN SOUTHERN CHOCOLATE MOUNTAINS, SE CALIFORNIA [130784] .....	3:40 P
9 Ernst R. Flueh*, David A. Okaya: GEOMETRY AND NATURE OF REFLECTIONS BENEATH THE MYLONITIC FRONT IN THE WHIPPLE MOUNTAINS, SE CALIFORNIA [132593] .....	4:00 P
10 Geoffrey S. Galvan*: GEOMETRIC DESCRIPTION AND INTERPRETATION OF SEISMIC PROFILES IN WEST-CENTRAL ARIZONA [130778] .....	4:20 P
11 E. G. Frost*, D. A. Okaya: UPPER-CRUSTAL, PASSIVE DEFORMATION ABOVE MOBILE MIDDLE AND LOWER CRUST WITHIN CRUSTAL-SCALE SHEAR ZONES [134337] .....	4:40 P

POSTER SYMPOSIUM: EVOLUTION OF THE BROOKS RANGE OROGEN:  
COLLISIONAL COLLAPSE OF A CONTINENTAL MARGIN? PART IV  
Lanai of Hookini Library, University of Hawaii,  
1:00 P.M. - 4:30 P.M.

Wesley K. Wallace and Thomas E. Moore

- Karl R. Wirth\*, David J. Harding, John M. Bird:  
BASALT GEOCHEMISTRY, BROOKS RANGE, ALASKA  
[115253] ..... Booth 1
- Thomas E. Moore\*: GEOCHEMICAL AND TECTONIC  
AFFINITY OF BASALTS-FROM THE COPTER PEAK AND  
IPNAVIK RIVER ALLOCHTHON, BROOKS RANGE,  
ALASKA [132354] ..... Booth 2
- John W. Cady\*: AEROMAGNETIC MAP OF ALASKA, LAT.  
65 DEGREES-68 DEGREES N., LONG. 141  
DEGREES-162 DEGREES W. [135928] ..... Booth 3
- J. G. Clough\*, R. R. Reifensstuhl, T. E. Smith,  
G. E. Pessel, K. F. Watts, T. J. Ryherd, A. A.  
Bakke: PRECAMBRIAN CARBONATE PLATFORM  
SEDIMENTATION OF THE KATAKTURUK DOLOMITE  
(PROTEROZOIC), SADLEROCHIT AND SHUBLIK  
MOUNTAINS, NORTHEASTERN BROOKS RANGE, ALASKA  
[134153] ..... Booth 4
- Teresa A. Imm\*, Keith F. Watts: CHANGES IN  
STRUCTURAL STYLES DUE TO DEPOSITIONAL  
PINCH-OUT OF THE MISSISSIPPIAN KAYAK SHALE  
BETWEEN THE SADLEROCHIT AND SHUBLIK  
MOUNTAINS, NORTHEAST BROOKS RANGE, ALASKA  
[132735] ..... Booth 5
- Mark S. Robinson\*, John Decker, J. C. Clough,  
G. E. Pessel, T. E. Smith, Rocky Reifensstuhl,  
John Dillon, Arne Bakke: DETAILED BEDROCK  
GEOLOGIC MAPPING OF THE SADLEROCHIT AND PART  
OF THE SHUBLIK MOUNTAINS, ARCTIC NATIONAL  
WILDLIFE REFUGE, NORTHEASTERN BROOKS RANGE,  
ALASKA [132752] ..... Booth 6
- Andrew J. Meigs\*, Wesley K. Wallace: STRUCTURAL  
GEOMETRY AND SEQUENCE IN THE NORTHEASTERN  
SADLEROCHIT MOUNTAINS, NE BROOKS RANGE,  
ALASKA [132740] ..... Booth 7

TECTONICS VII: THE KLAMATH MOUNTAINS AND  
FRANCISCAN COMPLEX  
EKH 126, University of Hawaii, 1:00 P.M.

Mary M. Donato and M. Allan Kays, Presiding

- 1 M. Meghan Miller\*: STRATIGRAPHIC RECORD OF  
AN ISLAND ARC, EASTERN KLAMATH MOUNTAINS,  
NORTHERN CALIFORNIA [124842] ..... 1:00 P
- 2 Scott W. Petersen\*: THE BILLY'S PEAK MAPIC  
DIKE COMPLEX IN THE TRINITY SHEET, KLAMATH  
MOUNTAINS, CALIFORNIA [116778] ..... 1:20 P
- 3 Spencer J. Cotkin\*, Richard L. Armstrong:  
Rb/Sr AGE, GEOCHEMISTRY, AND TECTONIC  
SIGNIFICANCE OF BLUESCHIST FROM THE SCHIST  
OF SROOKUM GULCH, EASTERN KLAMATH  
MOUNTAINS, CALIFORNIA: INTRODUCING THE  
CALLAHAN EVENT [134850] ..... 1:40 P
- 4 M. Allan Kays\*: METAMORPHISM OF TRPZ OCEANIC  
ROCKS, BLUE MOUNTAINS AND KLAMATH  
MOUNTAINS, OREGON AND CALIFORNIA [133493] ..... 2:00 P
- 5 Mary M. Donato\*: THE MAY CREEK SCHIST,  
SOUTHWESTERN OREGON: REMNANT OF AN  
INCIPIENT BACK ARC BASIN? [132364] ..... 2:20 P
- 6 Erick A. Bestland\*, David L.S. Blackwell,  
M. Allan Kays: STRATIGRAPHY OF AN AMPHIBOLITE  
FACIES THRUST-SLICE IN THE MARBLE MOUNTAINS  
TERRANE, KLAMATH MOUNTAINS, CALIFORNIA  
[117670] ..... 2:40 P
- COFFEE BREAK ..... 3:00 P
- 7 Mark Cloos\*, Trevor Dumitru: BLUESCHIST  
TERRANES IN THE FRANCISCAN COMPLEX OF  
CALIFORNIA: THEIR FUTURE CHARACTER AND  
IMPLICATIONS FOR PAST PLATE INTERACTIONS  
[123832] ..... 3:20 P
- 8 Krueger, S. W.\*, D. L. Jones, M. C. Blake, Jr.:  
THE COAST RANGE THRUST IN NORTHERN CALIFORNIA  
IS A LOW-ANGLE NORMAL FAULT [134230] ..... 3:40 P
- 9 K. E. Swanson\*, D. C. Noble, E. E. McKee,  
Thierry Sempere, Claude Martinez, M. Cirbian:  
MAJOR REVISIONS IN THE AGE OF ROCK UNITS  
AND TECTONIC EVENTS IN THE NORTHERN ALTIPLANO  
BASIN OF BOLIVIA [133237] ..... 4:00 P

- 10 Steve D. Hurst\*, Eldridge M. Moores: STRUCTURE  
OF THE SOLEA GRABEN, CYPRUS, FROM GRAVITY AND  
PALEOMAGNETIC INVESTIGATIONS [130653] ..... 4:20 P
- 11 E. M. Moores, R. J. Varga\*, Kenneth L. Verosub:  
STRUCTURE AND PALEOMAGNETISM, WESTERN  
TROODOS SHEETED COMPLEX, CYPRUS [135400] ..... 4:40 P

VOLCANOLOGY AND XENOLITHS  
EKH 123, University of Hawaii, 1:00 P.M.

J. E. Nielson and Brent D. Turrin, Presiding

- 1 F. J. Spera\*, S. Clark, B. Cousens, J. Crisp:  
EVOLUTION OF THE MIOCENE TEJEDA MAGMATIC  
SYSTEM, GRAN CANARIA, CANARY ISLANDS  
[130748] ..... 1:00 P
- 2 Gene A. Suenicht\*: INTERPRETATION OF DEEP  
DRILLING DATA FROM THE WESTERN HOAT OF LONG  
VALLEY CALDERA, CALIFORNIA [133793] ..... 1:20 P
- 3 Cathy J. Busby-Spera\*: STRUCTURE AND  
ORGANIZATION OF DEEP MARINE BASALTS  
EMPLACED ON A VOLCANICLASTIC APRON IN A  
JURASSIC BACK-ARC BASIN, CEDROS ISLAND,  
BAJA CALIFORNIA (MEXICO) [130751] ..... 1:40 P
- 4 Brent D. Turrin\*, Paul R. Renne: MULTIPLE  
BASALTIC ERUPTION CYCLES FROM SINGLE VENTS,  
CIMA VOLCANIC FIELD, CALIFORNIA; EVIDENCE  
FOR POLYGENETIC BASALTIC VOLCANISM [132344] ... 2:00 P
- 5 William T. Hughes\*, Allen F. Glasner:  
GEOCHEMICAL EVOLUTION OF BASALTS FROM ANBOY  
AND PISCAG LAVA FIELDS, MOJAVE DESERT,  
CALIFORNIA [135407] ..... 2:20 P
- 6 Gerald W. Harris\*, Samuel E. Swanson,  
Christopher J. Eys: COMPARATIVE PETROLOGY  
AND PETROGRAPHY OF THE 1976 AND 1986 EJECTA  
OF AUGUSTINE VOLCANO, ALASKA [123996] ..... 2:40 P
- COFFEE BREAK ..... 3:00 P
- 7 M. D. Knight\*, M. C. Jackson, G.P.L. Walker:  
VOLCANIC EVOLUTION OF THE KOKO RIFT,  
SOUTHEASTERN OAHU, HAWAII [131544] ..... 3:20 P
- 8 F. F. Sipiara\*, A. Reay, E. E. Hebeda: K/Ar  
AGE DETERMINATIONS ON KAERSUTITE AND  
BIOTITE XENOCRYSTS FROM THE KAKANUI MINERAL  
BRECCIA, NEW ZEALAND [133790] ..... 3:40 P
- 9 J. E. Nielson\*, J. R. Budahn, E. G. Wilshire:  
FRACTIONATION OF REE IN A COMPOSITE  
XENOLITE, DISE HILL, CALIFORNIA [134277] ..... 4:00 P
- 10 Howard G. Wilshire\*, Stephen H. Kirby:  
BRITTLE FRACTURING AND RELATED PHENOMENA IN  
THE LOWER LITHOSPHERE [134273] ..... 4:20 P
- 11 John-Mark G. Stauda\*, Calvia F. Miller:  
LOWER CRUSTAL XENOLITHS FROM A TERTIARY  
COMPOSITE DIKE, PIUTE MOUNTAINS, S.E.  
CALIFORNIA [126019] ..... 4:40 P

SEDIMENTATION/STRATIGRAPHY III: WASHINGTON, CANADA,  
ALASKA, AND HAWAII  
Campus Center 301, University of Hawaii, 1:30 P.M.

Christopher A. Suczek and Wilbert R. Danner, Presiding

- 1 Scott W. Bogue\*: MAGNETOSTRATIGRAPHY OF  
KAUAI, HAWAII [117633] ..... 1:30 P
- 2 Michael R. Fontana\*, J. E. Beget: MULTIPLE  
HOLOCENE TEPHRA LAYERS IN SOUTHCENTRAL  
ALASKA [126052] ..... 1:50 P
- 3 Keith A. Brunstad\*: A STUDY OF DIATOMITE OF  
THE YAKIMA BASALT FORMATION, SOUTHCENTRAL  
WASHINGTON [116364] ..... 2:10 P
- 4 Patrick M. Goldstrand\*: DEPOSITIONAL  
ENVIRONMENTS OF THE COON HOLLOW FORMATION,  
WALLOWA TERRANE, N.E. OREGON AND W. IDAHO  
[117745] ..... 2:30 P
- 5 Christopher A. Suczek\*: ACCRETED TERRANES  
AND SANDSTONE COMPOSITIONS [125288] ..... 2:50 P
- 6 Wilbert R. Danner\*: RELATIONSHIP OF THE  
CACHE CREEK GROUP OF BRITISH COLUMBIA TO  
THE CACHE CREEK GROUP OF THE SAN JUAN  
ISLANDS, WASHINGTON [120220] ..... 3:10 P
- 7 Andrew J. Arthur\*: STRATIGRAPHY AND  
CORRELATIONS OF A MESOZOIC SECTION WEST OF  
HARRISON LAKE, SOUTHWEST BRITISH COLUMBIA  
[120217] ..... 3:30 P

GLACIAL GEOLOGY  
EKH 128, University of Hawaii, 2:00 P.M.

Don J. Easterbrook and Patrick K. Spencer, Presiding

POSTER SESSION III: GENERAL  
Lanai of Mookini Library, University of Hawaii,  
1:00 P.M. - 4:30 P.M.

Authors will be present from 2:00 to 4:00

- 1 Cynthia A. McCarten\*: LATE PLEISTOCENE  
DEGLACIATION FEATURES AT PARTRIDGE POINT,  
WHIDBEY ISLAND, WASHINGTON [125289] ..... 2:00 P
- 2 Don J. Easterbrook\*: PLEISTOCENE CHRONOLOGY  
OF NORTHWESTERN WASHINGTON [125284] ..... 2:20 P
- 3 Eric V. McDonald, Alan J. Busacca\*, Kevin  
Welstead: EVIDENCE FOR PRE-LATE-WISCONSIN  
CATAclysmic FLOODS ON THE COLUMBIA PLATEAU  
INTERFERED FROM THE LOESS RECORD [117403] .... 2:40 P
- 4 Patrick K. Spencer\*: A SMALL-MAMMAL FAUNA  
FROM PLEISTOCENE MISSOULA FLOOD DEPOSITS  
NEAR TOUCHET, SOUTHEASTERN WASHINGTON  
[117686] ..... 3:00 P
- 5 Darrell S. Kaufman\*: MORPHOMETRIC ANALYSIS  
OF MORAINES AND ITS APPLICATION TO THE  
GLACIAL SEQUENCE OF THE RIGLUAIK MOUNTAINS,  
ALASKA [134883] ..... 3:20 P
- 6 Mark W. deWit\*: AN INVESTIGATION OF  
HORNBLENDE WEATHERING AS A RELATIVE AGE  
INDICATOR OF GLACIAL TILLS, EASTERN SIERRA  
NEVADA, CALIFORNIA [117299] ..... 3:40 P
- 7 Douglas P. Rennie\*: GLACIAL DEPOSITS IN THE  
PINE FOREST RANGE, NORTHWESTERN NEVADA  
[135797] ..... 4:00 P

- Olufemi O. Babalola\*: ELLESMERIAN TECTONIC  
EVOLUTION OF ALASKAN NORTH SLOPE FROM SEISMIC  
STRUCTURAL AND STRATIGRAPHIC INTERPRETATION  
OF THE NATIONAL PETROLEUM RESERVE, ALASKA  
[129988] ..... Booth 1
- John E. Bowen\*: THE USE OF COMPUTER CONTROLLED  
VIDEODISCS AS A VISUAL AID IN TEACHING  
ELEMENTARY GEOLOGY [131522] ..... Booth 2
- Steven W. Nelson\*, Randolph A. Koski: THE MIDAS  
MINE - A STRATIFORM Fe-Cu-Zn-Pb SULFIDE  
DEPOSIT IN LATE CRETACEOUS TURBIDITE NEAR  
VALDEZ, ALASKA [117782] ..... Booth 3
- David A. Steffy\*, Warren L. Horowitz: SANAK  
ISLAND TRANSVERSE HIGH OF THE SHUMAGIN  
CONTINENTAL MARGIN, ALASKA [133341] ..... Booth 4