15

ASH FALL

News Letter of the Volcanology Division
Geological Association of Canada

FIELD TRIP TO WESTERN MEXICO

SPRING 1984(?) or 1985(??)

PLEASE CONTACT JIM NICHOLLS NOW (403-284-7127) IF YOU'RE INTERESTED

WESTERN MEXICO FIELD TRIP - START AND END PUERTO VALLARTA

VISIT THESE VOLCANOES: SAN JUAN, SANGANUEY, NAVAJAS, SANTA MARIA DEL ORO, TEPETILTIC, CEBORUCO, TEQUILA, COLIMA (ACTIVE). SEE CALDERAS, DOMES, ASHFLOWS, FLOWS; SAMPLE COMENDITES; PANTELLERITES, BASANITE, MINETTE, RHYODACITE, ANDESITE, HAWAIITES, MUGEARITES, BENMOREITES. LEADER STEVEN NELSON OF TULANE UNIVERSITY. TIME (SAY SATURDAY, MAY -- TO MONDAY, MAY -- +10) INCLUSIVE.

PLEASE LET J. NICHOLLS KNOW IF YOU'D COME ON TRIP IF IT WERE HELD IN MAY 1984 OR 1985. THE ACTUAL DATES ARE NEGOTIABLE WITHIN MONTH OF MAY. WE WILL SCHEDULE THEM TO MISS THE GAC. COST IS STILL UNCERTAIN; IT WILL INCLUDE HOTEL AND MOTEL RESERVATION FOR 10 DAYS, FOOD FOR SAME, VEHICLE RENTALS, AND AIRFARE TO AND FROM PUERTO VALLARTA. DEPARTURE LOCATION WITHIN CANADA TO BE SETTLED BY NEGOTIATION.

REPORT

HAWAII FIELD TRIP, MAY 13-27, 1983

To see a volcano in eruption is the dream of every volcanologist. Thus on May 13, when the 34 participants on the G.A.C. Volcanology Division field trip left Victoria for Hawaii, there was anticipation that this dream would come true. Kilauea had been erupting intermittently for the past 6 months, and, although then dormant, could resume eruption at any time. Alas, we were to be disappointed. We missed the beginning of the next eruption by several weeks, but the spectacular geology, hot sunny weather, excellent beaches, and other inducements of Hawaii largely compensated for the lack of an eruption. If only the G.A.C.-M.A.C. meeting had been 3 weeks later.

The trip commenced on the island of Hawaii and moved westward thrugh Maui and Oahu to look at progressively older and more dissected volcanoes. For the 6 days on Hawaii we were headquartered at Volcano House on the rim of Kilauea caldera, and had beautiful sunrise and sunset views of the caldera and of Mauna Loa volcano to the north. On Kilauea we were treated to some spectacular basalt geology. We walked over 1919-20 flows of Mauna Iki, 1969-74 flows of Mauna Ulu and other vents, 1982 flows of Kilauea caldera, and ultimately the still hot 1983 flows. If only the Canadian Shield had such outcrop.

We had a close look at flow morphology features on both pahoehoe and aa, tholeiitic basalt flows, vent phenomena, downslope transitions in morphology, and rapid revegetation. By examining older flows we could then compare flow-top features with features seen in cross-section. Of particular interest to many participants were cross-sections of pahoehoe toes. In ensuing discussion the perennial questions were raised. What would these toes and other flow features look like when folded and metamorphosed? How could the subaerial toes be distinguished from subaqueous pillows?

While on Hawaii we also examined numerous features of the immense Mauna Loa volcano and briefly looked at the alkalic flows and pyroclastic deposits of the three older volcanoes - Mauna Kea, Hualalai, and Kohala. Petrologists in the group had an excellent opportunity to collect a varied suite of alkalic lavas and the enclosed ultramafic nodules.

Regretfully leaving Hawaii we flew to Maui for 2 days of somewhat different geology. On the first morning we were awakened at 4 a.m. for a quick breakfast and a somewhat longer bus ride from sea level to the rim of Haleakala crater (2970 m). Joining the shivering group of tourists we watched the sun rise over the crater. Then, as the rising sun gradually warmed us, we began an 18.5 km hike through the crater to examine Pleistocene and Recent alkalic flows and vents. During the hike we descended 850 m to the crater floor and then ascended 300 m to a lower part of the rim where the bus was waiting.

The final 5 days were spent on Oahu with accommodation at a hotel one block from Waikiki in Honolulu. Here volcanology soon gave way to sedimentology and other distractions with emphasis on the study of beach sands, coral reefs, and the inhabitants of both of these environments. Of particular interest was Hanauma Bay, a breached tuff cone with a spectacular beach and shallow reef.

As we were packing to leave we were informed that our flight to Vancouver was delayed for about 8 hours, giving us an extra night in Honolulu at the expense of C.P. Air. Such delays seem to be a regular part of volcanology field trips.

For most participants the trip was a very educating experience with numerous memories supplemented by voluminous photographs and boxes of samples. The field trip leaders, Mike and Monica Easton, are to be congratulated for their hard work in making the trip a success. At a final group dinner they were presented with a watercolour of a Kilauea eruption.

REPORT

G.A.C. FIELD TRIP TO MOUNT ST. HELENS

"Come in August" they say. "May is the rainy time in the Cascades" and 1983 was no exception. Our pre-G.A.C. meeting field trip saw rain and snow and was restricted from the high roads by the seasonal bad weather. Nevertheless, we explored how volcanic processes have melded with sedimentary processes to produce a variety of volcanic breccia deposits on the flanks of our chosen stratovolcano. Thus, although we continued the Volcanology Division's record of never visting an active volcano, we did see the ongoing sedimentary aftermath of volcanic eruptions. The trip was well attended and nicely organized. The many members of the G.A.C., B.C. Department of Mines, and U.S.G.S. who helped are thanked.

The Mount St. Helens story is well displayed and awesome and yet it is only a small eruption. Determining the origins of various volcanic breccias provides headaches for the would-be paleovolcanologist. We visited various sections and examined a great variety of rock and debris. On Mount St. Helens the clinching argument over genesis of a particular volcanic breccia or breccia-conglomerate was "I saw it happen". Textural or structural features within the mass of large fragments, comminuted rocks and dust are not much help, because physical laws affect all "moving masses similarly". In modern deposits pyroclastic flows (hot ones with gas) are only distinguished from mudflows (cold ones with water) by the presence of abundant charred-tree fragments. Hardly encouraging to someone studying pre-Devonian strata. Worse yet, some tills (ablation tills) look like some of the coarser mudflows. Only an abundance of striated cobbles will tell the difference. And some would say - what about proximal turbidites? From the perspective of a hardrock geologist, the genetic terms used and narrative developed on Mount St. Helens are difficult to apply to ancient rocks. It would seem that in the old rocks we would do best to describe the volcanic breccia deposits we see in a non-committal way, such as mass flow, mudflow, debris flow.

We saw a holocene index rock, asphalt pavement in a stratigraphic section of coarse volcanic breccia and we were further reminded of the immediacy of events by seeing a breached dam which had been built after the volcanic eruption 1980. In the gullies formed after the dam failed we saw a many metre thick coarsening upward section with thin ashfall layers through the section, recording the filling of the lake behind the dam in less than 2 years. Not only can another eruption loose up to a km^3 sludge of snow and many hundred degree hot pieces of pumice and send it down the valleys as happened March 19, 1982 but even ordinary erosion, dictated by the height of the water table and helped by stream banks that are thixotropic, has deepened, then widened the channels that ran before. Silting up rivers cause them to fill their bed and be unstable wandering across the landscape. Seeing pictures of cows caught in the mud and hearing tales of how someone's chest waders had to be abandoned in the mud gain an immediacy when the solid crust that I was walking on gave way and I started to sink rapidly in the grey ooze. For others, the memory of the helicopter flyby of the partially shrouded summit region was the most memorable. We thank the organizers for their work and our memories.

Possible Format of Meeting on Mafic Dyke Swarms

(The Volcanology Division formally supports this meeting and has so communicated to the GAC Executive.)

Day 1

Composition, trend and age of mafic dyke swarms: a global "State of the Art" summary.

Reports by invited experts for all continents, if possible. Each speaker will be requested to display maps which will be available for inspection and discussion throughout the meeting.

A typical program might be:

Early morning	The Gondwana Continents
Late morning	North America and Greenland
Afternoon	Europe, Asia and Fennoscandia
Evening	Evidence and nature of present-day dyke injection from Iceland, Hawaii and other volcanic areas

Subsequent days might be devoted to more detailed aspects of dykes subdivided according to particular disciplines, while evenings could be reserved for broader issues. For example:

Day 2

Morning	Petrology and geochemistry
Afternoon	Geomagnetism and geochronology
Evening	Comparison of dyke swarms with sheeted dyke complexes; relationship of swarms to rifts and "hot spots"

Day 3

Morning	Structural and fabric studies; magma flow direction determinations
Afternoon	Models of dyke emplacement; relation of present-day continental stress patterns to plate tectonic movements
Evening	Discussions: What advances have been made during the meeting; strategy for future dyke studies, plans for future meetings, etc.

Final product of meeting: A volume of all papers presented.

I am interested in attending an international symposium on global dyke swarms .....

I would be interested in giving a paper on .....

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I would like to see the following subject(s) discussed .....

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Other suggestions .....

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Please return to: Dr. H.C. Halls,
J. Tuzo Wilson Research Laboratories,
Erindale Campus of the University of Toronto,
Mississauga, Ontario.
Canada L5L 1C6

MINUTES OF GENERAL MEETING

29 people and proxies

1) Minutes read, approved, moved by W. Padgham, seconded by Monica Easton - PASSED
2) Treasurer's report approved, moved by Mikkel Schau, seconded by L. Ayres - PASSED
3) Michael Easton nominated as Central Councillor - ELECTED
4) Field trip reports on Mount St. Helens, Hawaii and Trans-Mexico (see this Ashfall).
5) Report on short course at London (Growth of Volcanic Edifices) Michael Easton.
6) Session on dykes and field trip in London is on. Contact Baragar or Schau.
7) Report on Guidebooks involved discussions about one for Hawaii, more to come, potential and official GAC sponsorship. No decision (Church to investigate further).
8) Student prize - best publication based on a thesis - Executive is authorized to proceed with prize giving (moved by Coleman, seconded by Gélinas) - PASSED
9) The Henry Hall Dyke Symposium see item enclosed in Ashfall. Volcanology Division has communicated its support to GAC executive and asked it support it as well (moved by W.R.A. Baragar, seconded by N.B. Church) - PASSED
10) Potential short course in Fredericton (tabled).

Treasurer's Report

Carryover May 15,1982 = $767.32

Income:

Membership	470.00
Interest	106.15

Expenses:

2 Newsletters	379.26

Carryover April 28, 1983 = $964.21

Geological Association of Canada short Course Notes, Volume 2 has been reprinted. This 365 page volume entitled: PYROCLASTIC VOLCANISM AND DEPOSITS OF CENOZOIC INTERMEDIATE TO FELSIC VOLCANIC ISLANDS WITH IMPLICATIONS FOR PRECAMBRIAN GREENSTONE-BELT VOLCANOES includes the following papers:

The volume can be obtained from:

The Geological Association of Canada,
Business and Economic Services Limited,
111 Peter Street, Suite 509,
Toronto, Ontario.
Canada M5V 2H1

The cost of the volume is $20.00 plus $2.50 handling and postage.

DETACH AND SEND TO:

J. Nicholls,
Department of Geology and Geophysics,
University of Calgary,
Calgary, Alberta.

PLEASE PHONE JIM WITH THIS INFORMATION AS WELL.

I AM INTERESTED IN GOING ON WESTERN MEXICO FIELD TRIP:

IN MAY 1984

IN MAY, 1985

EITHER DATE

I WOULD LIKE TO LEAVE FROM: