A Tribute to Henry Heinz Brecher, BPRC

In 1964 I was very fortunate to meet Henry at the Institute of Polar Studies where I had just freshly arrived from New Zealand. I came to IPS to study glaciology under Colin Bull and glacial geology under Richard Goldthwait. Henry already was an Antarctic ‘pro’ and took me under his wing, so to speak. He soon invited me to take a room at the Bexley Mansion that he, Gil Dewart and John Molholm (other Antarctic folks) were renting.

That summer, a number of IPS students (under Colin Bull) trooped up to the Icefield Ranges Research Project at Kluane Lake run by the Arctic Institute of North America. Colin Bull was my advisor for an MS thesis. Henry (doing an MS in geodesy) and I went down by ‘Polaris’ snow machine to the start of crevassing on the North Arm of the Kaskawulsh Glacier where we set up ‘Crevasse Camp’, a place Colin Bull declared to be the ‘depths of squalor’. Henry never complained. I probed the mysteries and mechanics of transverse crevasses and he studied diurnal and weekly ice flow velocity variations. We both used conventional surveying techniques and supported each other in our tasks as much as possible. This included sharing of a Wild T2 and also ensuring each other’s safety in a minefield of crevasses.

Unknown to us, the Polaris snow machine had developed a fatigue crack in the gas tank due to flexing of the frame and tank mounts. One morning we discovered the tank to be dry and smelled fuel in the snow. We had extra cans of fuel, so Henry rigged up an auxiliary ‘gas tank’. It was a large ex-fruit can with a jury-rigged clamp (I think my finger) to hold the fuel line running into the can. I sat on the back seat, facing to the rear, holding the can in one hand with a light ‘trigger’ finger on the gas line and a plastic bag cover, concentrating on avoiding a fuel spill, while Henry gingerly drove the rig up to the Divide Base Camp, where we procured another more reliable machine.

[Before this, Henry did service in the US Air Force before entering Antarctic ‘service’; he was an active private airplane pilot in Columbus (and many years later an aspiring astronaut). This illustrates his proficiency at all levels of physical endeavor taken in his usual competent and unassuming style. His life is one of physical involvement in technical areas].

Even back at IPS, in Columbus, after the 1964 field season, he gladly helped me with reducing my survey data using the Department of Geodetic Sciences data adjustment software (using punched cards!). I was a greenhorn then in computer matters.
My next story takes place in Wright Valley, Antarctica, in the summer of 1965/66 or possibly the next one. I had selected the Meserve Glacier as the site of my PhD thesis work under Colin Bull. Henry was already doing gravity survey work elsewhere with Colin, who, I vaguely recall, told Henry to drop over to the Meserve Glacier afterwards with the g-meter with the object of measuring the depth of ice at various points on the glacier. He not only did this, but while waiting for the flight out from McMurdo to Christchurch he worked out the ice depths and sent the results over to me on the next helicopter flight. It does not get any better than that.

In 1967 he flew one of the helio courier STOL aircraft for the Icefield Ranges Research Project, thus being of direct help to many different research projects that season. In 1974, I coerced him to accompany me as senior surveyor on my topographic survey of Mt Logan before the ice core project was initiated in 1975. I still owe him ‘reparation’ for this work.

Lastly, I remember that we were both involved on a reconnaissance of Mts Bona-Churchill in 1991 after I had earlier suggested to the USGS Denver that here was a likely Alaskan ice core paleo-climate site. I remember that Henry, at my suggestion, put in considerable (and a frustrating) time producing a 1:10,000 scale map of the saddle between Mts Bona and Churchill.

Later, this reconnaissance work must have helped Lon Thompson in planning his ice core drilling operation at the site a decade later.

This, together with other peoples’ similar experience with Henry over four decades definitely calls for a plan of recognition to be established, like a fund in Henry’s name that would help students in field work projects.

Gerry Holdsworth
Cobble Hill
British Columbia
Canada
Henry Brecher

Henry Brecher has been an indispensable member of all my NSF-funded projects studying glaciology in Antarctica and Greenland. His expertise in the field ranged from being the most important member contributing to the science goals because of his skills in aerial photogrammetry to conducting day-by-day essential activities making sure we maintained radio contact with our logistical suppliers and keeping the generators for our electrical power running and in repair.

The first project followed the 12 August 1970 volcanic eruption on Deception Island (63.0°S, 60.6°W), north of the Antarctic Peninsula. The First International Deception Island Volcanological Expedition went there in December. It consisted of scientists from Italy, Argentina, Norway, the USSR, the UK, and the USA. The Norwegian (Olav Orheim) and the American (me) were from the Institute of Polar Studies (now the Byrd Polar Research Center) at The Ohio State University. The eruption produced a crater 500 m across that blew off the snout of a glacier in the interior side of the collapsed and flooded caldera named Deception Island. That side of the crater was an ice wall about 100 m high. Upon returning to OSU, I wrote a proposal to NSF to study flow of ice into the crater and calving of ice slabs from the crater wall. It was a two-year study funded for field work in 1972-1973 and 1973-1974. The field party included Henry Brecher and Claire Parkinson. Claire was one of the first American women on an NSF-funded mixed male-female scientific expedition to Antarctica. She now works at NASA.

In 1972-1973 We installed two surface strain networks about 60 degrees apart, both heading down the glacier slope to end at the crater. Stakes were put in holes one meter deep chopped in ice-cemented ash (permafrost) that had been wet and covered the glacier surface at the time of the eruption. There were 63 stakes in our primary network and 38 stakes in our secondary network. We also made a gravity survey over the whole glacier to get some idea of the ice thickness. Jacques Costeau and his research ship, Calypso, visited Deception Island at that time, and Henry was able to use the Calypso helicopter to get aerial photos using a Hasselblad camera he had acquired for our expedition. From those photos, he photographically mapped surface elevations for comparison with elevations on a map made before the volcanic eruption. To study calving of ice slabs into the crater, we dug four tunnels into the ice wall at various heights from the bottom to the top of the ice wall, installed strain networks in the tunnels, and collected samples of ice containing shear bands activated by bending shear produced as the ice wall leaned forward toward the crater. All these measurements were repeated in 1973-1974 if they were still accessible. Ice rushing into the crater during that year had some characteristics of a glacial surge.

Henry presented our results at the Symposium on Andean and Antarctic Volcanology Problems in Santiago, Chile, in September 1974. It was sponsored by the International Association of Volcanology and Chemistry of the Earth’s Interior. Results were published in the Proceedings volume:


The second project was a study of the surface glaciology of Byrd Glacier (80°S, 160°E), which has the largest ice drainage system in Antarctica (about 10 percent of the ice sheet enters a fjord 26 km wide and 100 km long through the Transantarctic Mountains) and is the biggest and fastest ice stream entering Ross Ice Shelf. Our field work was funded by NSF and done in 1978-1979. Other field members were Charles Swithinbank, James Fastook, “Tad” Pfeffer, and Mark Hyland. We established surveying stations along both fjord walls, with the assistance of a U.S. Geological Survey team using Doppler receivers to get absolute coordinates. From those stations, we triangulated to dozens of “targets” placed on the heavily crevassed surface of Byrd Glacier by Navy helicopters. Three kinds of targets were used, two sizes of red “fish floats” used by Maine fishermen to locate their lobster traps, and anchored to bags of rocks lowered onto the ice, and where the helicopters could land, targets consisting of nylon-reinforced plastic sheeting that could be seen in aerial photos. A big nylon “flag” attached to aluminum poles set in holes drilled into the ice located these sites from our surveying camps. From these sites, using aerial photogrammetry, Henry was able to triangulate from these known sites to any crevasse he could recognize in two photo missions flown two months apart using Navy LC-130 aircraft equipped with a camera bay. We also made mass-balance measurements at stakes we put in the ice and we located the junction with Ross Ice Shelf by measuring changing vertical angles around the clock along a line of paired surveying stations, one on the fjord wall and one on the ice.

Ice velocities and elevations measured at the fish floats were incidental to the photogrammetric measurements made by Henry at moving crevasses. He obtained coordinates of 1467 terrain points from 6738 image points on 322 photographs. From these he obtained 601 common moving points, 472 of which were on the main trunk of Byrd Glacier, on photos taken 56 days apart. He entered all these data on punch-cards. At the end of his work he sent me a photo of him standing next to a stack of boxed cards that was nearly as tall as Henry. Henry got three publications from his work:


The third project arose from my participation in the East Greenland Glacier Project headed by Commander Ronald Kollmeyer of the U.S. Coast Guard in 1971, 1976, and 1978. He became interested in which glaciers produced the most and biggest icebergs. The USCG operated the International Ice Patrol that was established after an iceberg sank the Titanic in 1912. Kollmeyer established that Jakobshavn Isbrae (69.2°N, 50.0°W) was the likely candidate, being the fastest-known ice stream on Earth at that time (8 km/a). After an
expedition to Jakobshavn Isbrae in 1978, when I had moved to the University of Maine, I wrote a proposal to NSF to do a photogrammetric study of Jakobshavn Isbrae similar to the one we had done on Byrd Glacier. It was funded and we did the work during the summers of 1985 and 1986. Aerial photos were flown by Lear jets equipped with a camera bay. We mapped 10,000 square kilometers of ice, 100 km by 100 km, that converged on Jakobshavn Isfjord as Jakobshavn Isbrae. All of our artificial targets were for photogrammetric mapping: nylon-reinforced plastic sheets 4 m on a side with a Doppler receiver at its center, and longer “pointer” sheets to assist in locating the target sheets in aerial photographs. Flights were two weeks apart each summer, giving us ice elevations and velocities during each summer and for the year between the summers. We used two kinds of artificial targets, fixed white targets on bedrock and moving black targets on the ice. These known positions were then used in a program of photogrammetric triangulation to obtain the positions of crevasses identified in all photo missions.

The four combinations of acceptable common points for the two summers and the “year” 1985-1986 were 338, 395, 333, and 408. Ice elevations were contoured at 20-m intervals and ice velocities were contoured at intervals of 50 m/a over the whole area. Henry got two publications from this work.


Henry's publications demonstrate that all three of these projects would be greatly impoverished without his contributions. I believe Henry is responsible for the success of all three projects. That means Henry Brecher gets the credit for the success of all three of my glaciological projects funded by NSF, and for the major part of my glaciological career.

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13 August 2010
Unlike others who have submitted testimonials for Henry Brecher as a result of collaboration in field research or related activities, my association with Henry on a professional basis was related to my position as Assistant (then Associate) Director of the Institute of Polar Studies (IPS), during the period 1967 – 1974.

I met Henry when I arrived at Byrd Station in November or December of 1960 when I was a member of a geology field team that was waiting for transportation to the Jones Mountains in Marie Byrd Land. Henry had completed his winter-over assignment as aurora observer in 1960, a position he had heard about from a notice seeking engineers (actually physicists and electronics engineers next, but they settled for a mechanical engineer [Henry]—and one other one—when they apparently couldn’t find any of the former two categories; in other words, almost any warm body, or at least one with some technical training) to work in Antarctica. Like many others, including myself, it was the beginning of a career for Henry in polar sciences, and being associated with IPS was the perfect place to do it.

I barely got to know Henry at that time, but met him again when I was hired by Colin Bull, IPS Director, as Assistant Director, arriving in Columbus in July 1967. Colin had arranged lodging for me in an apartment shared by Henry and Scott Kane until I found a permanent place to live. It worked out well for all concerned, and I slowly learned my job through a short overlapping of time with my predecessor, Dr. Arthur Mirsky, which was followed by essentially administration of day-to-day activities at IPS, among other varied tasks. It was an excellent learning period for me as I interacted with many OSU faculty and graduate students and absorbed many aspects of the polar studies they were involved in. As Yogi Berra once said, “You can observe a lot just by watching!”

As time passed, I noticed that Henry was the ideal person to have at IPS, inasmuch as he was skilled in many things, and fieldwork was his forte, as others have described in their testimonials on his behalf. In addition to those researchers, he was recruited because of his experience while at IPS (now Byrd Polar Research Center) by many others, both OSU faculty and also graduate students. His proficiency at photogrammetry was unmatched by anyone else on IPS projects, and he thus fit into projects that included his presence in the field to record data required for production of maps and other products related to the objectives of the research. Some of these have already been mentioned in the research objectives for Byrd Glacier and Jakobshavn Isbrae, as outlined by Terry Hughes. Henry
improved his background and experience in photogrammetry by attending a course at the ITC, a specialized school in The Netherlands, in 1968 when it was located in Delft, and spending another year at the same institution as a research worker in 1975 when it had been moved to Enschede. I visited him in 1975 for a few days on return from a meeting in Copenhagen, and he showed me the facilities where he was studying, and also many parts of Holland I had never seen previously.

In the absence of others who are no longer available to enumerate project summaries and Henry’s role in them, a short list of individuals would be impractical for me because I might recall only those within my 7-year tenure at IPS. His role included fieldwork with a number of OSU faculty and graduate students in various parts of the world, including (mainly after I left in 1974) the numerous ice-coring projects conducted by Lonnie Thompson, which took him to Andean ice caps, Mt. Kilimanjaro, and China. His energy and stamina were well suited for that type of field exercise, perhaps stemming from his athletic abilities, which I recall to some extent in the many games of handball we played while I was at OSU....I think his wins over mine dominated the final tally.

His skill with producing maps by photogrammetric techniques resulted in a map of Seymour Island, Antarctic Peninsula area, the location of major fossil discoveries by Bill Zinsmeister and geologic work by David Elliot. I used that map myself on several visits to Seymour as I sampled fossil tree remains.

Much of Henry’s work in a variety of projects resulted in numerous publications that reflect the type of work he was involved in. Terry Hughes lists some of these articles in the testimonial, and others can be found in several refereed journals. His record with IPS and BPRC deserves a lasting honor with the University, which is why I endorse the HENRY BRECHER DEVELOPMENT FUND.

John Spletstoesser
Waconia, Minnesota
20 August 2010
Tribute to Henry Brecher, by Colin Bull

I regard the idea of commemorating Henry Brecher's name in a tribute as being little short of inspired. Today I happened across a photo of Henry, Fritz Loewe, and myself standing outside our tent on a lump of moraine at the end of the Sukkertoppen Ice Cap - July 1962 - and that just about marks the time, 48 years ago, when Henry, in a very quiet and unassuming way, started doing things for members of the Institute of Polar Studies and other bodies that at a minimum have made their lives easier and, at a maximum have saved their lives. And he's told no-one of these efforts, because he's too blasted modest.

In Greenland in 1962 we'd just about completed one traverse of the ice cap, and were walking to the side of the glacier, when we encountered a deep and rushing surface melt-water river. Fritz spotted a snow bridge and made a move to walk across. From 50 yards up-glacier I could see that the bridge was too fragile but Fritz couldn't hear my warning shouts, started across, and was dumped into the rushing water as the bridge collapsed. Obviously Fritz could find no purchase on the polished sides - and would have been carried to his death in the moulin 100 yards downstream if Henry had not straddled the stream and, quick as a flash, pulled off his belt and held it for Fritz to grab as he was whisked by. Even so it took all of our efforts to drag him out. Good, 1 life saved!

We walked with a very chilled Fritz to the tent, where we failed to light the primus because the vent was blocked. Henry on this occasion sacrificed the second hand of his watch to clear the vent. Perhaps not quite as valuable a contribution as the other, but absolutely typical of the man!

I don't have time to recount the multitude of other events and contributions that I know Henry has made in the last 48 years, much less those that I don't know about. I can't think of any person more deserving of recognition in this way - and to that I'd just like to add my own very personal thanks for everything that he has done to make my own journey so much easier and more pleasant.

Yours sincerely,

Colin Bull