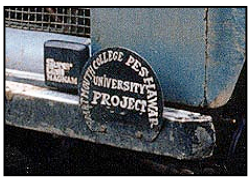
THE DARTMOUTH-PESHAWAR PROJECT



A SOUTH ASIAN COLLABORATION

WHERE DO WE GO FROM HERE?

University Of Delhi | Peshawar University | National Centre of Excellence in Geology | Geological Survey Of Pakistan | Wadia Institute Of Himalayan Geology | Dartmouth College

Collaborators

Prior Support

National Geographic Society | National Science Foundation | British Petroleum | AMOCO Production (Pakistan)

Introduction – The Dartmouth-Peshawar Project

Beginning in 1972, the Department of Earth Sciences initiated what was to become a long-term collaboration with the Department of Geology, University of Peshawar, Pakistan. Professor Gary D. Johnson, who had previously worked in South Asia for several years during the field research phase of his PhD dissertation, initiated this project. At the time, the University of Peshawar was known as an historically important institution of higher learning that serviced mostly students from the Northwest Frontier Province (now known as Khyber Pakhtunkhwa), one of the regions of Pakistan that borders eastern Afghanistan. At the time, the university's faculty members were mostly Pakistani-trained with a few having obtained their graduate degrees from a variety of European or UK universities. Few had studied in the States. Peshawar, also the capital of the province, is located at the east end of the Khyber Pass, the access point for travel to the Afghan capitol of Kabul and various Central Asian points beyond. Always a strategic location, Peshawar also commands an access point to many of the most important regions of the Western Himalaya and Hindu Kush mountains. Our efforts at fostering collaboration with the university, stemmed in large part from the recognition of the historical and geological importance of the area.

Successes

Over the next nearly three decades, four additional Earth Sciences faculty members from Dartmouth, as well as over fifty Dartmouth undergraduate and graduate students had the opportunity to become involved in this multi-disciplinary research collaboration. This expanded work resulted in the development of many new research initiatives under which the Peshawar collaboration would eventually evolve. A summary of the many student research projects developed under the Dartmouth Peshawar Project is appended below at the end of this document.

What we have found interesting and certainly rewarding over the course of these many years, is the degree to which many of our local Pakistani colleagues have been successful in growing their academic and scientific careers during and after their initial involvement with the D-P Project. With collaborative histories dating from the early years of the Project during the 1970s and 1980s, some of these earliest collaborators have now risen to the top of the geological establishment in Pakistan (see following list).

Professor Rashid A. K. Tahirkheli
Professor of Geology, University of Peshawar
Chairman of the Geology Department, University of Peshawar
Fullbright Fellow to Dartmouth College

Director of the (Pakistani) National Centre of Excellence in Geology (at the University of Peshawar)
Vice Chancellor (President) of the University of Peshawar
Vice Chancellor (President) of the Khyber Medical College

Professor Qasim Jan

Associate Professor, University of Peshawar
Professor of Geology, University of Peshawar
Director of the (Pakistani) National Centre of Excellence in Geology (at the University of Peshawar)
Vice Chancellor (President) of the University of Peshawar
Vice Chancellor (President) of the Sarhad University of Science and Information Technology
Distinguished National Professor of the (Pakistan) Higher Education Commission
Vice Chancellor (President) of the Quaid-i-Azam University, Islamabad (current)

Professor M. Javed Khan

Research Scholar, Dartmouth-Peshawar University Project, University of Peshawar
Lecturer, Department of Geology, University of Peshawar
Assistant Professor, Department of Geology, University of Peshawar
Associate Professor, Department of Geology, University of Peshawar
Director, Staff Training Institute, University of Peshawar (concurrently)
Professor, Department of Geology, University of Peshawar
Controller of Examinations, University of Peshawar (concurrently)
Director, Planning and Development, University of Peshawar (concurrently)
Project Director, Institute of Information Technology, University of Peshawar (concurrently)
Scientific Secretary, Pakistan Council for Science & Technology, (Pakistan) Ministry of Science and Technology
Registrar, University of Peshawar (concurrently)
Meritorious Professor, University of Peshawar
Dean, Faculty of Life and Environmental Sciences, University of Peshawar (current)
Vice Chancellor (President) (Acting), University of Peshawar

Dr. Imran Khan

Graduate student exchange (Dartmouth College)
Staff geologist
Senior geologist
Director General, Geological Survey of Pakistan (current)

Additionally, after that early start in the 1970s with Dartmouth, the geological community at the University of Peshawar subsequently developed collaborations with many additional international universities: USC, Columbia, Stanford, Lehigh, Columbia, Cambridge, Oregon State, UC Santa Barbara, Edinburgh, McGill, Imperial, etc. Many of these universities have faculty that participated in the Dartmouth-Peshawar Project early in their careers.

Current conditions

Of course, both political and security issues have loomed large in Pakistan during the past decade or so, with the result that virtually all of the above mentioned universities have curtailed their activities in the country. The Peshawar area in particular, is now amongst the most dangerous areas in the world for travel, and even today appears to be increasingly volatile. With none of our students and only a very few (ill-advised, in my opinion) university-based scientists actively doing research in the area, we have all found it increasingly difficult to maintain an active involvement with our Pakistani research collaborators and their students, as well as with the new, tenure track faculty that have joined the university in recent years. This applies to other Pakistani geological institutions as well. This, of course, has now placed many of our youngest colleagues at Peshawar in the untenable position of going it alone, with diminished opportunities to interact with their educational peers in the UK, Europe or North America.

In view of the long-term, and very successful collaboration that Dartmouth has had with Peshawar, I am beginning to feel that we should try to step forward and provide some sort of educational opportunity for some of the youngest faculty members of the University of Peshawar in this difficult time. Various international educational programs with an interest in providing this type of educational opportunity do exist, but are generic, and not specifically targeting a certain university or discipline. The United States Educational Foundation in Pakistan (USEF/P), a nonprofit, jointly administered foundation established in 1950 by both the governments of the U. S. and Pakistan to "promote the goals of mutual understanding", is actively engaged, and represents a good example of this effort. The USEF/P is responsible for administering the Fulbright Academic Exchange Program in Pakistan (at one time, the largest Fulbright program in the world) as well as other U.S. funded educational grants in Pakistan. USEF/Pakistan also oversees educational advising services, and assists in the promotion of U.S. higher education throughout Pakistan. Professor M. Javed Khan, mentioned above and one of our earliest collaborators, was recently a finalist in the Foundation's search for a new Executive Director.

A proposal

In view of the long-term relationship between Dartmouth and Peshawar, it is my belief that Dartmouth might be in a position to provide short-term opportunities for targeted engagement with certain young Peshawar faculty in this very uncertain time for that university. The university's potential decent into becoming a progressively more insular institution as a result of the on-going geopolitical constraints affecting this part of South Asia is not a good thing. As a result of these observations and concerns, and Dartmouth's collective history of collaboration with Peshawar, my proposal is to seek ways to bring young, tenure-track university faculty to Dartmouth for short-term visitations. The program should include many diverse disciplines as well. I envision that this interaction could be accomplished by bringing certain individuals here for perhaps one academic term, allowing them to interact with our students and faculty, observe our classroom, seminar, field and laboratory methodologies, and participate in any number of research activities currently being undertaken. While not without its financial implications, I feel that Dartmouth may be in a position to host several of these scholars each year.

As I reflect on the generosity of the University of Peshawar over the years, it is important to note that our various projects, students and faculty benefited from free housing in university guest houses, the use of university vehicles to assist in the various field projects, the housing and maintenance of Dartmouth-owned field vehicles, and the provision of university drivers to assist in most of our field efforts when requested. Peshawar students accompanied Dartmouth students during their fieldwork in a collaborative effort in many cases. In general, Peshawar became a second home to many, providing many fond memories of a genuine hospitality.

At this point, travel funds may likely be derived from Pakistani sources. Local housing and per diem allotments may be negotiated both from Pakistani and U. S. sources. I do not see the issue of salaries as being part of the mix, since these individuals would be on salary from Peshawar. At any rate, at this point in the discussion, I do not wish to couple fiscal implications with the general concepts outlined in this proposal. *What I am most interested in is whether or not this something Dartmouth could do?* I'm merely testing the waters. Details could be worked out as needed

This is an unusual experiment. Although I am proposing the creation of an educational opportunity somewhat outside the realm of traditional academic fellowships, I feel that this may be an important additional opportunity for Dartmouth as it continues to foster and grow its international mission and visibility as an innovator in higher education. I look forward to the opportunity to discuss these points.

Gary

Gary D. Johnson
Professor of Earth Sciences Emeritus
Department of Earth Sciences
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Dartmouth College
Hanover, NH 03755

DARTMOUTH-PESHAWAR PROJECT

B.A. / B.Sc. Honors theses at Dartmouth:

Barndt, J.K., 1975. Distribution and age of a late Tertiary bentonite from the Siwalik Group, West Pakistan. Unpublished honors thesis, Kresge Library, Dartmouth College. 18 pp. and maps.

Carmony, J.R., 1975. Neogene paleomagnetism of the Rawalpindi and Siwalik Groups, Pakistan. Unpublished honors thesis, Kresge Library, Dartmouth College. 21 pp. and maps.

Ardrey, R.H., 1976. Analysis of a late Miocene paleosol succession from the Potwar Plateau, Pakistan. Unpublished honors thesis, Kresge Library, Dartmouth College. 39 pp. and maps.

Visser, C.F., 1976. Lateral variation in late Pliocene molasse sedimentation within the Jhelum re-entrant, Pakistan. Unpublished honors thesis, Kresge Library, Dartmouth College. 25 pp. and maps.

Rey, P.H., 1978. Implications of paleosol development for the determination of paleo- environment in the Upper Siwaliks, Pakistan. Unpublished honors thesis, Kresge Library, Dartmouth College. 47 pp. and maps.

Zeitler, P.K., 1978. Tectonic control and style of Late Pliocene molasse sedimentation in the vicinity of Jhelum, Pakistan. Unpublished honors thesis, Kresge Library, Dartmouth College. 32 pp. and maps.

Frost, C.D., 1979. Geochronology and depositional environment of a late Pliocene age Siwalik sequence enclosing several volcanic tuff horizons, Pind Savikka Area, Eastern Salt Range, Pakistan. Unpublished honors thesis, Kresge Library, Dartmouth College. 82 pp. and maps.

Moragne, J.H., Jr., 1979. Magnetic polarity stratigraphy and timing of deformation for an Upper Siwalik sedimentary sequence, Soan Syncline, Pakistan. Unpublished honors thesis, Kresge Library, Dartmouth College. 60 pp. and maps.

Feibel, C.S., 1980. Geological mapping of the Himalayan foothills using LANDSAT imagery. Unpublished honors thesis, Kresge Library, Dartmouth College. 15 pp. and maps.

Stix, J., 1980. LANDSAT mapping of the Salt Range, Pakistan. Unpublished honors thesis, Kresge Library, Dartmouth College. 20 pp. and maps.

Small, P., III, 1980. The magnetic polarity stratigraphy of the Buttar Anticline and an estimated age for the Mankiala Bentonite, eastern Potwar Plateau, Pakistan. Unpublished honors thesis, Kresge Library, Dartmouth College. 41 pp.

Bloch, R., 1981. Stratigraphy of and facies variation within subvolcanic lithosomes, Siwalik Group, Campbellpore Basin, Pakistan. Unpublished honors thesis, Kresge Library, Dartmouth College. 74 pp.

Hill, P.S., 1984. Climatic interpretations based on the clay mineralogy of six Siwalik paleosols. Unpublished B.A. thesis, Kresge Library, Dartmouth College. 40pp. (Supervised with R.C. Reynolds)

McCormick, D.S., 1984. The physical and magnetic polarity stratigraphy of the Upper Siwalik Group, Eastern Shinghar Range, Chani Khel, Northwestern Pakistan. Unpublished B.A. thesis, Kresge Library, Dartmouth College. 75pp., tables and maps.

Maria, T., 1984. Zircon morphology and tephrostratigraphic correlation. Unpublished B.A. thesis, Kresge Library, Dartmouth College. 21pp. and tables.

Erickson, E.J., 1988, Cooling History of the Karakoram Himalayas Northern Pakistan. Unpublished B.A. thesis, Kresge Library, Dartmouth College

Hochman, S.D., 1988, Lateral Tracing of a Magnetic Isochron and Interpretation of Stratigraphy in Kamlial - Rainbow Sand Interval, Chinji Formation, Potwar Plateau, Pakistan. Unpublished B.A. thesis, Kresge Library, Dartmouth College

**Poage, M., 1991. Fission-track ages, stratigraphic correlation, and zircon morphology of Pliocene-Pleistocene volcanic ashes, northern Pakistan. Unpublished B.A. thesis, Kresge Library, Dartmouth College. 51 pp. and tables.

Lambert, C., 1992. Classification of volcanic terrain types in the Dacht-e-Nawar, Afghanistan, using Landsat MSS data. Unpublished B.A. thesis, Kresge Library, Dartmouth College. 31 pp. and tables.

Burdette, T.E., 1993, Oxygen and hydrogen isotope analysis of hydrothermal fluids and veins in the Pakistan Himalaya. Unpublished B.A. thesis, Kresge Library, Dartmouth College

Eberle, D., 1993, 3C-rich marbles in Neoproterozoic rocks of the Nanga Parbat Haramosh Massif, Pakistan. Unpublished B.A. thesis, Kresge Library, Dartmouth College

Hammer, J.E., 1993, Oxygen isotope analysis of the Fingatori Pluton, Pakistan Himalaya. Unpublished B.A. thesis, Kresge Library, Dartmouth College

Park, B.J., 1994. Paleomagnetic stratigraphy and vertical-axis rotation analysis of the Siwalik sedimentary molasse, southern Surghar Range, Pakistan. Unpublished B.A. thesis, Kresge Library, Dartmouth College. 58 pp., figures and tables.

Leone, D.E., 1996, Major ion chemistry of the Tato drainage in the Himalaya: the effect of rapid uplift on atmospheric carbon dioxide removal by mineral weathering. Unpublished B.A. thesis, Kresge Library, Dartmouth College

McHenry, L., 1998. Identification and correlation of a Pliocene tuff sequence, South Asia. Unpublished B.A. thesis, Kresge Library, Dartmouth College. 64 pp., figures and tables.

Macdonald, A. 2000. Evolution of ratites. Unpublished B.A. thesis, Kresge Library, Dartmouth College. 31pp.

Adams, K., 2004, Neogene ratite phylogeny interpreted from eggshells and its implications for the Eurasian immigration of ratites and associated Miocene-Pliocene megafauna. Unpublished B.A. thesis, Kresge Library, Dartmouth College

Mervine, E.M., 2006, Petrogenesis of alkaline lavas associated with the Deccan Traps. Unpublished B.A. thesis, Kresge Library, Dartmouth College

Awarded Churchill graduate fellowship at Cambridge University
*** Awarded NSF graduate pre-doctoral fellowship*

Recent independent student projects (not leading to a thesis):

Cruz-Urbie, A., 2006, Remote sensing studies in foreland basins settings, Pakistan
Durham, S., 2008, Ratite morphology and possible phylogenetic implications

Masters theses at Dartmouth:

Keller, H.M., 1975. The magnetic polarity stratigraphy of an Upper Siwalik sequence in the Pabbi Hills of Pakistan. Unpublished M.A. thesis, Kresge Library, Dartmouth College. 110 pp. and maps.

Barndt, J.K., 1977. The magnetic polarity stratigraphy of the type locality of the Dhok Pathan faunal stage, Potwar Plateau, Pakistan. Unpublished M.A. thesis, Kresge Library, Dartmouth College. 105 pp. and maps.

Breitzman, L.L., 1979. Fission track ages of intrusives of the Chagai District, Baluchistan, Pakistan. Unpublished M.A. thesis, Kresge Library, Dartmouth College. 69 pp. and maps.

Francica, J.R., Jr., 1980. Geologic mapping of the Ladakh Himalaya by computer processing of LANDSAT data. Unpublished M.A. thesis, Kresge Library, Dartmouth College. 67 pp. and maps.

Zeitler, P.K., 1980, The Tectonic Interpretation of Fission Track Ages from the Himalayan Ranges of Northern Pakistan. Unpublished M.A. thesis, Kresge Library, Dartmouth College

Cronin, V.S., 1982. The physical and magnetic polarity stratigraphy of the Skardu Basin, Baltistan, northern Pakistan. Unpublished M.A. thesis, Kresge Library, Dartmouth College. 226 pp. and maps.

Olson, T.M., 1982. Sedimentary tectonics of the Jalipur sequence, northwest Himalaya, Pakistan. Unpublished M.A. thesis, Kresge Library, Dartmouth College. 152 pp. and maps.

Shiekh, K., 1984, Use of Magnetic Reversal Timelines to Reconstruct the Miocene Landscape near Chinji Village, Pakistan. Unpublished M.A. thesis, Kresge Library, Dartmouth College

Johnson, W.P., 1986. The physical and magnetic polarity stratigraphy of the Bungthang sequence, Skardu Basin, northern Pakistan. Unpublished M.S. thesis, Kresge Library, Dartmouth College. 108 pp. and maps.

Cerveny, P.F. III, 1986, Uplift and Erosion of the Himalaya over the past 18 Million Years: Evidence from Fission Track Dating of Detrital Zircons and Heavy Mineral Analysis. Unpublished M.A. thesis, Kresge Library, Dartmouth College

Hanson, C.R., 1987, Bedrock Geology of the Shigar Valley Area, Skardu, Northern Pakistan. Unpublished M.A. thesis, Kresge Library, Dartmouth College

Allen, T., 1990, Part I: Thermal Consequences of Mantled Gneiss Dome Emplacement; Part II: Petrologic Constraints on the Tectonic History of the Northern-Shyok Suture and the Main Karakorum Thrust, Baltistan, Northern Pakistan. Unpublished M.A. thesis, Kresge Library, Dartmouth College

McHenry, L. J., 2000. The geochemistry of Neogene Siwalik tephra units of India and Pakistan: Alteration and possibilities for fingerprinting. Unpublished M.S. thesis, Kresge Library, Dartmouth College. 242pp.

Ph.D. dissertations at Dartmouth:

Summers, D.M., 1977. The petrology of two late Pliocene bentonites and their enclosing rocks, Upper Siwalik Subgroup, Northern Punjab and Southwestern Kashmir, Pakistan. Unpublished Ph.D. dissertation, Kresge Library, Dartmouth College. 237 pp. and maps.

Dykstra, J.D., 1978, A Geologic Study of the Chagi Hills, Baluchistan, Pakistan, Using LANDSAT Digital Data. Unpublished Ph.D. dissertation, Kresge Library, Dartmouth College

Raynolds, R.G.H., 1980. The Plio-Pleistocene structural and stratigraphic evolution of the eastern Potwar Plateau, Pakistan. Unpublished Ph.D. dissertation, Kresge Library, Dartmouth College. 265 pp. and maps.

Burbank, D.W., 1982. The chronologic and stratigraphic evolution of the Kashmir and Peshawar intermontane basins, northwestern Himalaya. Unpublished Ph.D. dissertation, Kresge Library, Dartmouth College. 291pp.

Malinconico, L.L., 1982, Structure of the Himalayan Suture Zone of Pakistan Interpreted from Gravity and Magnetic Data. Unpublished Ph.D. dissertation, Kresge Library, Dartmouth College

Zeitler, P.K., 1983, Uplift and Cooling History of the NW Himalaya, Northern Pakistan -- Evidence from Fission-Track and $^{40}Ar/^{39}Ar$ Cooling Ages. Unpublished Ph.D. dissertation, Kresge Library, Dartmouth College

McRae, L.E., 1989, Chronostratigraphic Variability in Fluvial Sequences as Revealed by Paleomagnetic Isochrons. Unpublished Ph.D. dissertation, Kresge Library, Dartmouth College

Pivnik, D., 1992. Depositional response to encroachment of Himalayan compressional and transpressional deformation on the northern Pakistan foreland. Unpublished Ph.D. dissertation, Kresge Library, Dartmouth College. 252pp.

** Stern, L., 1996. Climate and vegetation change in the Himalayan Foreland from oxygen and carbon isotope ratios of fossils and paleosol clays and calcite. Unpublished Ph.D. dissertation, Kresge Library, Dartmouth College. 170pp.

++ Blisniuk, P. , 1996. The deformational record of the Kalabagh re-entrant and Trans-Indus Ranges, northern Pakistan. Unpublished Ph.D. dissertation, Kresge Library, Dartmouth College. 160pp.

*** Awarded NSF graduate post-doctoral fellowship*

++ Awarded German post-doctoral fellowship

University Of Peshawar