

CURRICULUM VITAE

Gareth J. Davies
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Education

M.S. (Geology) University of Southern Mississippi, 1987,
B.S. (Geology) Millsaps College, 1984, Cum Laude

Training

Breakthroughs in Karst Geomicrobiology and Redox Geochemistry, 1994
Chemical and Radionuclide data validation, 1992
Practical Tracing of Ground Water, Geological Society of America 1992
Practical Karst Hydrogeology, with Emphasis on Ground-water Monitoring, National Ground Water Association, 1991
Analytical Quality Assurance/Laboratory Contract Program, 1989
40-hour MSHA-approved Miner Health and Safety Training
40-hour, and 8-hour supervisor, OSHA-approved Health and Safety Training for work at Hazardous Waste Sites
Radiation Safety, 1984

PROFESSIONAL REGISTRATIONS / MEMBERSHIPS

Registered Professional Geologist, Tennessee, No. 1298
Geological Society of America
Sigma Xi, The Scientific Research Society

Expertise and Strengths

Recognized expert in geological, hydrogeological and contamination investigations in karst, carbonate and fractured-rocks in a variety of regulatory programs, uranium-series and carbonate geochemistry, isotope hydrology, radionuclides, use of in-situ contaminants as tracers, application of injected tracers to contaminant transport investigations, ground-water investigations at active and abandoned mine sites. Expert witness testimony.

Professional Experience

Geologist, Tennessee Department of Environment and Conservation, DOE Oversight Division (2009 - present)

Groundwater monitoring, with specific reference to analysis of data with respect to isotope geochemistry, uranium-series disequilibrium, carbonate/fractured rock hydrogeology on and in the hinterland of the DOE Oak Ridge Reservation.

President and Principal Scientist, Cambrian Ground Water Co., (1995 - 2009)

Hydrogeological studies in a wide variety of settings, karst and carbonate terranes, fractured-rock settings, glacial sediments, particularly using injected tracers, tritium, uranium-series disequilibrium, isotope hydrology, particularly in relation to impacts to springs and their ground water basins.

Task group member for ASTM sub-committee D18-21.07; developing standards relating to ground-water monitoring.

Independent Hydrogeologist (1993-1998) Independent Hydrogeologist

Specialist in carbonate, fractured-rock investigations, isotope hydrology and ground-water tracing.

Vice-chairman of the task group for ASTM sub-committee D18-21.09; writing standards relating to ground-water monitoring in karst, carbonate and fractured-rock aquifers.

Field geologist/hydrogeologist and quality assurance manager for two firms (Geraghty & Miller Inc., and Advanced Sciences Inc.) involved in project management (hydrogeology, sampling, QA/QC, karst/carbonates, also radionuclide, uranium series isotope contamination (Tennessee and Florida) (CERCLA, RCRA, state programs).

Project Summaries (1988 - Present)

Lead ground-water tracing scientist for the design, execution and interpretation of several ground water tracing tests in the Woodville Karst Plain of northwest Florida yielding data vital to the protection of groundwater and spring water quality (For Florida DEP/FGS).

Expert advisor for US EPA Region 2 in RCRA programs relating to ground-water tracing and carbonate/karst hydrogeology for sites in the Caribbean.

Project Summaries (1988 - Present) - continued

Lead karst/tracing scientist for ground-water investigations in a karst/carbonate terrane at the NASA Marshall Space Flight Center, Huntsville, Alabama, as part of a Remedial Investigation/CERCLA investigation.

Ground-water tracing in the Leadville (Colorado) Mine Drainage Tunnel and California Gulch superfund site and applied geochemistry and isotope hydrology as part of a Remedial Investigation of a CERCLA investigation.

Lead scientist for extensive ground-water tracing, karst/carbonate hydrogeology at US Army facility, overlying the Trinity and Edwards Aquifers, San Antonio, Texas. This was some of the first tracing done in the Edwards Aquifer.

Ground-water investigations in a Paleozoic dolostone for evaluation of a future landfill site for a major chemical company in east Tennessee.

Ground-water investigation for pilot study/evaluation of performance of freeze-barrier technology at a waste disposal unit, U.S. Department of Energy, Oak Ridge Reservation, Oak Ridge, Tennessee.

Ground-water tracing investigation to evaluate the impact of ground water and surface water and inferred property damage in a carbonate terrane in a neighborhood in Oak Ridge, Tennessee.

Environmental investigation for development corporation in Perak, Malaysia to assess the ecological impact of land-use management of a tower, and tower karst landscape.

Review of ground-water monitoring systems in volcanic rocks at the municipal landfills for St. Thomas and St. John, U.S. Virgin Islands (U.S. EPA Region II).

Co-authorship of manual for spring-head and well-head protection for karst and carbonate aquifers for U.S. EPA (under subcontract to U.S. EPA Region IV).

Ground-water tracing investigation in a fractured quartz-monzonite at a disused hard-rock mine site in the Collegiate Range, central Colorado.

Ground-water tracing at a former hard-rock mine site in Montana to evaluate potential flow paths from a proposed pair of waste-rock repositories on a glacial till overlying a granite.

Ground-water tracing in sandstones overlying granites in the foothills of the Colorado Rocky Mountains Front Range at an EDB-contaminated municipal wells at Woodland Park, Colorado.

Project Summaries (1988 - Present) - continued

Ground-water tracing investigation in a fractured-rock aquifer and igneous/sulfide ore body at a high-altitude mine site in (Basin - Rimini, Montana).

Ground-water tracing in unconsolidated sediments as an evaluation of barrier technology at former waste disposal units at the Rocky Mountain Arsenal, Denver, Colorado.

Teaching Experience (1984 - Present)

Adjunct Faculty, (Geology) Roane State Community College, Oak Ridge, Harriman, Tennessee (2002 - present)

Physical geology (Lecture and Laboratory) - University of Southern Mississippi, Department of Geology (1984 - 1987)

Field Geology (Lecture and Laboratory) - University of Southern Mississippi, Department of Geology (1986 - 1987)

Field Trips in Southern Appalachians (Assistant-leader) - University of Southern Mississippi, Department of Geology (1986 - 1987)

Laboratory/Student Teacher Coordinator -- University of Southern Mississippi, Department of Geology (1984 - 1987)

Analytical, Computing, Technical Skills

Alpha particle spectrometer

Scanning spectrofluorophotometers

Filter fluorometers, hand-held, lab, insitu (submersible, down hole), multiple concurrent tracers quantitation

Laboratory preparation of waters for tracer analysis, preparation of standards and other control samples

Laboratory separation of uranium and thorium from solids and liquids (preparation for alpha spectrometry)

Falmouth Inc. oceanographic meters (water velocity, electrical conductivity, temperature, hydraulic pressure)

In-situ Level-Logger, Global Water transducers (hydraulic pressure)

ISCO automatic water sampling machines

Microsoft (DOS, Windows), Linux, Unix, Apple (OS7 - 9, OSX), HP programming,

Microsoft Office (Word, Excel, Powerpoint), many other open source applications

GPS, Garmin, Magellan, application to field mapping and presentation

Related Interests

Mountaineering, hiking, caving, meteorology, kayaking and canoeing, astronomy, aviation, telemark skiing, coaching youth (high-school) rugby (USA Rugby Level 2 Certified Coach, Tennessee High School Rugby Certified Coach, USA Rugby/IRB Rugby Referee L3)

Publications

1. Peer-reviewed journal articles

Loper, D.E., Werner, C.L., Chicken, E., Davies, G.J., and Kincaid, T., 2005, Coastal carbonate aquifer sensitivity to sea level change, *EOS*, v. 86, no. 39, p. 353-364.

Worthington, S.R.H., Davies, G. J., and Ford, D. C., 1999, Quantification of matrix, fracture and channel contributions to storage and flow in a Paleozoic Carbonate aquifer. Chapter in: *Approaches to Understanding Groundwater Flow at Contaminant Transport in Carbonate Aquifers*, Balkema, Rotterdam, p. 113-128.

Quinlan, J.F., Davies, G.J., Jones, S.J., and Huntoon, P. W., 1996, The applicability of numerical models to adequately characterize ground-water flow in karstic and other triple- porosity aquifers, *Subsurface Fluid-Flow (Ground-Water) Modeling*, ASTM STP 1288, J. D. Ritchey and J. O. Rumbaugh, eds., American Society for Testing and Materials, 1996, p. 114-133.

Quinlan, J.F., Davies, G.J, and Worthington, S.R.H., 1994, Discussion of: Review of ground water quality monitoring network design, by Loaiciga, H.A., Charbeneau, R.J., Everett, L.G., Fogg, G.E., Hobbs, B.F., and S. Rouhani, *Journal of Hydraulic Engineering*, v. 118, No. 1, 1992, American Society of Civil Engineers, p. 1436-1442.

Other Publications

2. Peer-reviewed Conference Proceedings/Abstracts

Davies, G.J., 2011, Carrying on Jim's Lead with a combination of multiple tracing data and modeling, *Geological Society of America Abstracts with Programs*, Vol. 43, No. 5, p. 168.

Kincaid, T. R., Davies, Gareth J., and Dyer, Scott B., 2010, Tracing reversing groundwater flows in the coastal Floridan aquifer, *Geological Society of America Abstracts with Programs*, Vol. 42, No. 5, p. 434.

Publications (continued)

Sebastian, J. E., Davies, G. J., and Worthington, C. E., 2010, Forty-two years of self-regulated operation of a major nuclear facility on a karst/fractured rock, Oak Ridge, Tennessee: What could possibly go wrong? Geological Society of America *Abstracts with Programs*, Vol. 42, No. 5, p. 435.

Davies, G.J., 2008, Mixing of rapid recharge and rapid flowing ground water: Implications to protecting municipal wells in the Woodville Karst Plain, North Florida, Geological Society of America *Abstracts with Programs*, Vol. 40 No. 5.
Kincaid, T. R., Davies, G.J., Meyer, B.A., and Hazlett, T. J., 2007, Karst aquifer response to variations in distribution and magnitude of recharge and implications to land use planning in the Woodville Karst Plain of north Florida, Geological Society of America *Abstracts with Programs*, Vol. 39, No. 6, p. 478.

Kincaid, T.R., Hazlett, T.J., and Davies G.J., 2005, Quantitative groundwater tracing and effective numerical modeling in karst: an example from the Woodville Karst Plain of North Florida, Sinkholes and the Engineering and Environmental Impacts of Karst. Barry F. Beck (Ed.). Reston: Geo Institute of the American Society of Civil Engineers, 2005. 114-121.

Davies, G.J., Kincaid, T.R., Hazlett, T. J., Loper, D., Dehan, R., and Werner, C., 2005, No, it's not beautiful, they never looked like this: finding what ails Florida's springs, Geological Society of America *Abstracts with Programs*, v. 37, no. 7

Jones, S.W., Wheat, J.D., Davies, G.J., Benfield, Robert C., 2004, The dissolution of a conceptual model: The karst hydrogeology of U.S. DOE Oak Ridge Reservation, Geological Society of America *Abstracts with Programs*, v. 36, no. 5

Schindel, G. M., Johnson, S., Alexander, E. C. Jr, Worthington, S.R.H., and Davies, G. J., 2004, Quantitative tracing as a predictive tool to assess the potential impacts of hazardous materials to water supplies and environmental receptors, Geological Society of America *Abstracts with Programs*, v. 36, no. 5

Davies, Gareth J., Gertson, Jord N., Williams, Mark, Lui, Feng Jing, Wireman, Michael, and Stephens, Donald, 2004, Tommyknocker heaven: attempting quantitative hydrogeochemistry in the Leadville Mining District and its hinterland, Geological Society of America *Abstracts with Programs*, v. 36, no. 5

Kincaid, T. R., Davies, Gareth J., Hazlett T. J., Loper, D., Dehan, R., Mckinlay, C., 2004, Groundbreaking characterization of the karstified Floridan Aquifer in the Woodville Karst Plain of North Florida, Geological Society of America *Abstracts with Programs*, v. 36, no. 5

Publications (continued)

Hazlett, T. J., Kincaid, T., Loper, D.E., Davies, G.J., Dehan, R., Mckinlay, C., 2004, Realistic numerical modeling of ground-water flow based on quantitative site characterization in the Woodville Karst Plain of North Florida, Geological Society of America Abstracts with Programs, v. 36, no. 5

Davies, G.J., Hazlett, T. J., Kincaid, T., Loper, D.E., Dehan, R., Mckinlay, C., 2004, Why do quantitative groundwater tracing? Lessons and examples from the Woodville Karst Plain of North Florida, Geological Society of America Abstracts with Programs, v. 36, no. 5

Loper, D.E., Hazlett, T. J., Kincaid, T., Dehan, R., Davies, G.J., 2004, A karst hydrologic observatory in the Woodville Karst Plain of North Florida, Geological Society of America Abstracts with Programs, v. 36, no. 5.

Kincaid, T.R., Schmidt, W, Cook, S.A., Loper, D., Davies, G.J., Mckinlay, C., 2004, Collaborating for a better tomorrow: Research and community outreach aimed at protecting Wakulla Spring, Geological Society of America Abstracts with Programs, v. 36, no. 5

Davies, G.J., Jones, S.W., and Benfield, R. C., 2003, If I was a spring that's exactly what I'd look like, Geological Society of America Abstracts with Programs, v. 34, no.7

Schindel, G.M., Worthington, S.R.H., Davies, G.J., Alexander, E. C., Jr., Ray, J.A., and Johnson, S., 2003, Quantitative tracers as contaminant surrogates - an important tool for planning and managing source water protection areas, Geological Society of America Abstracts with Programs, v. 34 no.7.

Holmes, M, Davies, G.J., Wireman, M, King, K, Gertson, J. N., and Stefanic, J. M, 2002, What the heck is happening to mine pool water at Leadville? Geological Society of America Abstracts with Programs v. 34, no. 6.

Davies, G.J., Holmes, M, Wireman, M, King, K, Gertson, J. N., and Stefanic, J. M, 2001, Water tracing at scales of hours to decades as an aid to estimating hydraulic characteristics of the Leadville Mine Drainage Tunnel, Geological Society of America Abstracts with Programs, v. 33 no. 6.

Davies, G.J., Wireman, M., and Stover, B.K., 2000, Mary Murphy's chest pains: resorting to geological angioplasty to study specific metals loading at a high-altitude mine site, Geological Society of America Abstracts with Programs, v. 32., No.7.

Wireman M., Davies, G.J., and Stover, B.K., 2000, Characterizing ground-water flow paths in high-altitude fractured rock settings impacted by mining activities, Proceedings, Annual Abandoned Mine Lands Conference, Steamboat Springs, Colorado.

Publications (continued)

Wireman, M., and Davies, G. J., 2000, Characterizing ground-water flow paths in high-altitude fractured rock settings impacted by mining activities, TraM'2000, International Conference on Tracers and Modelling in Hydrogeology, Liège, Belgium, Conference convened by the Laboratory of Engineering, Geology, Hydrogeology and Geophysical Prospecting, University of Liège, International Commission on Tracers, International Commission on Ground water (of the) International Association of Hydrological Sciences (Abstract only, manuscript available from authors).

Davies, G.J., Worthington, S.R.H., 1999, Realistic estimation of permeability-scaling effects in carbonate aquifers, Geological Society Abstracts with Programs, v. 31, no. 7.

Ketelle, R.H., and Davies, G.J., 1999, Hydrogeochemical responses to precipitation of Knox Group springs at Oak Ridge, Tennessee, Geological Society of America Abstracts with Programs, v. 31, no. 7.

Worthington, S.R.H., Ford, D.C., and Davies, G.J., 1999, Techniques for estimating scaling effects associated with channeling in carbonate aquifers, Geological Society of America Abstracts with Programs, v. 31, no. 7.

Davies, G. J., and Jones, S.W., 1999, Using temperature variation at springs to characterize flow in carbonate aquifers, Karst Modelling, Karst Waters Institute Special Publication No. 5 (abstract only)

Worthington, S.R.H., Davies, G. J., and Ford, D. C., 1998, Triple-porosity characteristics of the Central Kentucky carbonate aquifer, Joint Meeting of the Friends of the Karst and the International Geological Correlation Program (Project 379) Karst Processes and the Global Carbon Cycle (abstract only)

Davies, G. J., Worthington, S.R.H., and Jones, S.W., 1997, Ground-water tracing using fluorescent dyes in the carbonate aquifers of Oak Ridge, Tennessee, Geological Society of America, Abstracts with Programs, v. 29, No. 6.

Worthington, S.R.H., Davies, G.J., and Ford D.C., 1997, Combining aquifer testing using wells and spring studies to characterize the carbonate aquifer at Mill Hole, Kentucky, Geological Society of America, Abstracts with Programs, v. 29, No. 6.

Field, M.S., Davies, G.J., and Pinske, P., 1997, Solute transport parameter estimation using a two-region non equilibrium model, Geological Society of America, Abstracts with Programs, v. 29, No. 6.

Publications (continued)

Wireman, M., Stover, B.K., and Davies, G.J., 1996, OK, Why Not Drill into the Top of the Mountain?: Further Delineation of Metals Loading Pathways to Chalk Creek, Mary Murphy Mine Site, Chaffee County, Colorado, Geological Society of America, Abstracts with Programs, v. 28, no. 7.

Davies, G. J., Jones, S. W., and Huntoon, P.W., 1996, Characterization of ground-water flow in karstic and other triple-porosity aquifers; what numerical models can and can not do, 41st Midwestern Ground-Water Conference, Lexington, Kentucky (abstract), p. 73.

Davies, G.J., and Ewers, R.O., 1996, Rapid-flow and slow-flow carbonate aquifers are virtually never diffuse-flow equivalent porous medium aquifers; the Oak Ridge, Tennessee case, 41st Midwestern Ground-Water Conference, Lexington, Kentucky (abstract), p. 82.

Quinlan, J.F., McCann, M.A., and Davies, G.J., 1995, Standard guide for the design of ground water monitoring systems in karst and fractured-rock aquifers: ASTM standard D 5717-95, International Symposium and Field Seminar on Karst Waters and Environmental Impacts, Antalya, Turkey, (abstract)

Quinlan, J.F., Schindel, G.M., and Davies, G.J., 1995, Principles for delineating boundaries of wellhead and springhead protection areas in carbonate aquifers, Geological Society of America Abstracts with Programs, V. 27, No. 6.

Davies, G.J., Quinlan, J.F., and Ewers, R.O., 1995, Carbonate aquifers: concepts of conduit flow and diffuse flow can neither be used in their classification nor the design of their ground-water monitoring systems. Proceedings, International Association of Geomorphologists, Southeast Asia Conference, 1995, Singapore (abstract).

Davies, G.J., and Quinlan, J.F., 1995, The Oak Ridge carbonates are rapid-flow slow-flow aquifers and not porous-medium equivalent aquifers, Geological Society of America Abstracts with Programs, V. 27, No. 2.

Quinlan, J.F., and Davies, G.J., 1994, Principles of ground-water monitoring in carbonate aquifers; Changing Karst Environments, An International Symposium, University of Huddersfield, and the University of Oxford, England. Cave and Karst Science, Vol. 21, No. 1, p. 19.

Davies, G.J., and Quinlan, J.F., 1994, Estimating rapid and slow recharge using spring chemistry, Eos Transactions, American Geophysical Union, Vol. 75, No. 16, p. 158.

Publications (continued)

Quinlan, J.F., and Davies, G.J., 1993, Ethical aspects of professional conduct with emphasis on ground-water tracing; A guide for consultants, regulators, and students, in Hoose, S. H., (editor) Symposium on Ethical Considerations in the Practice of Environmental Engineering, Geology and Hydrogeology. Association of Engineering Geology. [Sudbury, Mass]. p. 93-06.

Davies, G.J., and Quinlan, J.F., 1993, There is no such thing as a diffuse-flow carbonate aquifer if that aquifer is unconfined and subaerially-exposed, Geological Society of America, Abstracts with Programs, v. 25, no. 7.

Davies, G.J., Rubin, P.A., and Quinlan, J.F., 1993, Indirect observation of the rapid-flow and slow-flow components of recharge to the Knox aquifer, Oak Ridge, Tennessee: Programs with Abstracts, Fourth Annual Walker Branch Watershed Research Symposium, Oak Ridge National Laboratory, Environmental Sciences Division, Oak Ridge, Tennessee.

Rubin, P.A., Zerr, B., Davies, G.J., Lemiszki, P., Neuhoff, P., and Aiken, J., 1993, Preliminary studies in carbonate aquifers of the Oak Ridge Reservation: Programs with Abstracts, Fourth Annual Walker Branch Watershed Research Symposium, Oak Ridge National Laboratory, Environmental Sciences Division, Oak Ridge, Tennessee.

Davies, G.J., Ball, T.K., and Ford, D.C., 1993, A possible minimum oldest age for emergence of deepened vadose cave passages related to the 430-meter and 330-meter erosion surfaces in the Upper Tawe Valley, South Wales: Third International Conference on Geomorphology, McMaster University, Department of Geography, Hamilton, Ontario, Canada, p. 126.

Davies, G.J., 1992, Water-temperature variation at springs in the Knox Group near Oak Ridge, Tennessee, Proceedings, Hydrology, Ecology, Monitoring, and Management of Ground Water in Karst Terranes Conference, (3rd, Nashville, Tenn.) National Ground Water Association, Dublin, Ohio, 1992, p. 197-212.

Quinlan, J.F., Davies, G.J., and Worthington, S.R.H., 1992, Rationale for the design of ground water monitoring systems in limestone and dolomite terranes: cost-effective as designed is not cost-effective as built if the system design and sampling frequency inadequately consider site hydrogeology, Proceedings, Waste Testing and Quality Assurance Symposium (8th Washington, D.C., July, 1992) U.S. Environmental Protection Agency, Washington, D.C., p. 552-570.

Davies, G.J., Quinlan, J.F., and Worthington, S.R.H., 1992, Carbonate aquifers: distinctions between conduit flow or diffuse flow should be abandoned in their classification and in the design of monitoring systems, Geological Society of America, Abstracts with Programs, v. 24, no. 7.

Publications (continued)

Worthington, S. R. H., Davies, G. J., and Quinlan, J. F., "Geochemistry of Springs in Temperate Carbonate Aquifers: Recharge Type Explains Most of the Variation," Proceedings, Colloque d'Hydrologie en Pays Calcaire et en Milieu Fissuré (5th Neuchâtel, Switzerland), Annales Scientifiques de l'Université de Besançon, Geologie—Mémoires Hors Série, No. 11, 1992, p. 341–347.

Davies, G. J. and Spreizer, G. M., 1991, Interpretation of water-temperature variation as an aid to ground-water monitoring in karst terranes, Geological Society of America Abstracts with Programs, v. 23, no. 5.

Davies, G. J., 1990, Uranium series dates of Tennessee speleothems: paleoclimatic and paleohydrological implications, Proceedings, Tennessee Water Resources Symposium, Nashville, Tennessee, p. 186-189.

Davies, G. J., and Russell, G. S., 1989, Speleothem ages from two caves in the Cumberland Plateau document growth in marine isotopic stages 1, 3, 4, and 5, Geological Society of America Abstracts with Programs, v. 21, no. 6.

Davies, G. J., and Russell, G. S., 1986, Control and timing of speleogenesis in Cedar Ridge Crystal Cave, Marion County, Tennessee, Geological Society of America Abstracts with Programs, v. 18, no. 3.

Davies, G. J., and Russell, G. S., 1986, Uranium-series dates of Tennessee speleothems and their relationships to Late Quaternary climatic changes, Geological Society of America Abstracts with Programs, V. 18, No. 6.

Other Publications (some not peer reviewed)

Ball, K. T., Davies, G.J., and Ford, D.C., 1996, How Old is Ogof Ffynnon Ddu? South Wales Caving Club 50th Anniversary Publication, p 73 - 81.

Gillieson, D., Holland, E., Davies, G., 1995, Karst Geomorphology and Hydrology of Gunung Tempurung, Perak, Malaysia, Helictite v. 33, no. 2, p. 35-42

Rintoul, C. H., Davies, G. J., Froelicher, F., and Dennis, J. G., 1987, USM field camp guidebook and introduction to the geology of the Balmberg Area, Jura Mountains, Switzerland, Second Edition. Southern Geological Society, Publication No. 5. 62 p.

Rintoul, C. H., Davies, G. J., and Froelicher, F., 1986, University of Southern Mississippi field camp guidebook and introduction to the geology of the Balmberg Area, Jura Mountains, Switzerland, Southern Geological Society, Publication No. 4. 57 p.

Davies, G. J., 1986, Carbonate microfacies and speleo-genesis, South Wales Caving Club Newsletter, No. 101, p. 12-16:.

Davies, G. J., 1986, X-ray analysis of the Dan-yr-ogof galena, South Wales Caving Club Newsletter, No. 101, p. 30-33.

Other Related Research (partially funded)

Study of the hydrology and chemistry of ground-water and surface water in the Dan-yr-ogof catchment area, South Wales, United Kingdom. (Under the supervision of Dr. L. G. Bray, Acton High School, London). The project involved ground-water tracing and geochemistry of ground and surface waters in the catchment area. (published in the Transactions of the British Cave Research Association, (1973 - 1977)

Uranium-series dating of speleothems, paleo-climate analysis and applied geomorphology, South Wales, United Kingdom. (Partially funded by Dr. T. K. Ball (NERC, UK) and Dr. Derek C. Ford (McMaster University, Hamilton, Ontario, Canada).