

Department of Soil Science Newsletter



Summer 2003
Vol. 9, No. 1

Department of Soil Science
University of Wisconsin-Madison



Birl Lowery

Greetings from a department that is in stages of great flux. We continue to see major changing of the guards: Dr. Jaya Iyer retired in January 2003 after 35 years of service to the Department (see p. 7). Her position has been filled by Dr. Nick Balster who obtained his PhD in forest science from the University of Idaho in 1999. Nick has a 60% teaching/40% research appointment and is very interested in helping us increase our undergraduate enrollment. As some of you know, Dr. Kevin McSweeney moved into 100% administration as Associate Dean and Director of the School of Natural Resources. We are pleased to inform you that the College permitted us to fill his position with Dr. Cindy Stiles. Cindy joined our faculty in August 2002 and got off to a great start by teaching Soil Pedology in her first semester here. Cindy obtained her PhD in geology from the University of Tennessee in 2001. Her appointment is 60% research/40% instruction.



Nicholas J. Balster



Cynthia A. Stiles

Drs. Keith Kelling and Wayne Kussow have announced their plans to retire in January 2004 and September 2004, respectively. A request was submitted to CALS for release of Dr. Kelling's position in February 2003. The position has not been released at this time but we are hopeful, although the state budget problems have caused significant reductions for the University. We were successful in obtaining a University-level cluster hire position to replace Dr. Kussow, but because of the budget situation (UW System is expected to be cut about \$250 million), this position has been put on hold. We will request this position at the College-level this winter, provided there is an opportunity.

While we have had many new additions to our Department, we have seen the loss of two giants in soil science with the passing of Emeritus Professor Francis Hole in January 2002 (Spring 2002, Vol. 8, No. 1) and Emeritus Professor M.L. Jackson on December 21, 2002 (see p. 6, this issue). We have established an M.L. Jackson Memorial Fund at the University of Wisconsin Foundation with the goal of becoming a permanent graduate student fellowship in soil chemistry and mineralogy. Shortly before his death, M.L. and Chrystie donated the copy right to "Soil Chemical Analysis - Advanced Course" to the Department for a commemorative reprinting (see p. 2).

We certainly want to express a very special thank you for the support you continue to provide the Department. In addition to general Department support, alumni and industry support have provided funds for the Wayne R. Kussow Wisconsin Distinguished Graduate Fellowship in Turfgrass and the Leo M. Walsh/Wisconsin Fertilizer and Chemical Association Soil Fertility Wisconsin Distinguished Graduate Fellowship. Doug Soldat, the first student appointed to the Kussow/WTA fellowship, is nearing the end of his MS program, and a second student will be appointed to this fellowship in late fall. The first Leo M. Walsh/WFCA fellowship will be awarded in January 2004.

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Newsmakers!

“Understanding Soil Phosphorus,” written by **Larry Bundy**, and “Crop Responses to Amisorb in the North Central Region,” co-authored by **Keith Kelling**, both received a Certificate of Excellence in the 2002 ASA, A-4 Educational Materials competition.

Larry Bundy has been appointed co-director of the Nutrient Pest Management Program.

Dwight Muller, MS '79, superintendent of the Arlington Agricultural Research Station, received the 2003 CALS Agricultural Research Stations Staff Award.

Phil Helmke was appointed Rothermel-Bascom Professor of Soil Science, 2002-2007.

Keith Kelling was elected Fellow, Soil Science Society of America; recipient (for the second time) of Second Mile Award from the Wisconsin County Agents Association.

Leslie R. Cooperband has been promoted to Associate Professor, July 2003.

King-Jau Samuel Kung received a Vilas Associate award, June 2002 - June 2004.

Joel Pedersen was awarded \$2.4 million grant from the Dept. of Defense-National Prion Research Program to research the environmental impact of chronic wasting disease (*see p. 10*).

William L. Bland has been promoted to Professor, July 2003.

Virtual Museum of Minerals and Molecules <http://www.soils.wisc.edu/virtual_museum/> was a winner of a 2003 Sci/Tech Web Awards. Scientific American selects 50 of the best sites on the web for these awards and had this to say about the museum (virtual curators are **Phil Barak** and Ed Nater (Univ. Minnesota): “You’ll have to download a free plug-in to get the full experience on this site ... but it’s well worth it. With it installed, you can wander the wings of this virtual museum and check out twistable, turnable 3D models of materials both ordinary (carbon) and exotic (valinomycin). In addition to the impressive images, which allow you to highlight specific atoms and compare a structure to its real-world crystallographic data, there’s plenty of old-fashioned information, from how minerals got their names to how likely you are to come across them.”

M.L. Jackson’s book, “*Soil Chemical Analysis - Advanced Course*,” is in the process of being reproduced for publication. Dr. Jackson donated the copy right to his book shortly before his death. **Phil Barak** is responsible for initiating the project and keeping it on course and **Ann Curtis**, Dept. of Soil Science office staff, is painstakingly re-entering the text into a word processing program. Our goal is to have copies of the book available for sale in time for the Symposium “On the Shoulders of M.L. Jackson” at the SSSA meetings, Nov. 2-6, Denver, CO.■

Life in The Knapp House

Mauricio Avila, MS '99, and current PhD student, was appointed a Marie Christine Kohler Fellow, 2001-present, by the Knapp Memorial Graduate Center Committee. The Knapp House is a unique community of scholars founded on the principles of scholarship, leadership, and the breadth of ideas. The UW purchased the former Governor’s Mansion in 1951 with funds from Knapp Memorial Graduate Program. Since 1954, the Kohler Foundation has generously assured continuation of the program by funding twelve fellowships.

Fellows are selected on the basis of a letter of recommendation from the student’s advisor, a statement of nomination/support from their department chair, a 350 word public dissertation summary, and an interview with a Graduate School/Knapp House committee. Each fellowship provides free housing and offers an exceptional opportunity for graduate students from diverse disciplines to live together at the Knapp House, sharing research, culture, and interests. Fellows are entitled to reside at the Knapp House for up to 3 years during the final stages of their graduate work. For those pursuing a doctoral degree, the final stage is the dissertation writing phase after preliminary exams.

Third year MFA, Law, Medicine, and Veterinary Medicine students are eligible for one-year residence at the House. Attending and organizing seminars, and monthly house meetings are formal requirements of the fellowship. The decisions made at the house meetings have sovereign authority in the house. The Fellowship hosts monthly seminars, a formal setting for the exchange of ideas. For these seminars, fellows recruit speakers and invite guests from across campus and the community at large.■

Department of Soil Science Newsletter

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Symposia recognizes alumni career contributions

American Society of Agronomy and Soil Science Society of America recognize career contributions of two Guelph and Wisconsin graduates. At their 2002 annual convention in Indianapolis, IN, the ASA and the SSSA sponsored two complementary symposia recognizing the scientific career contributions of Professor **George Thurtell, PhD '65**, of the University of Guelph, and Dr. **Clarke Topp, PhD '64**, of Agriculture and Agri-Food Canada, Ottawa. George and Clarke followed parallel educational paths through Guelph (then affiliated with the University of Toronto) and the University of Wisconsin soil physics group. Together, they have made their contributions in both the above- and below-ground environmental zones. George has improved both instrumentation and analysis for the flux of gaseous components and energy

between the soil and the atmosphere. Clarke has pioneered an improvement to the measurement of soil water content using radio frequency methods in soil, now referred to as TDR. The symposia, Physical Measurements in the Soil-Plant-Atmosphere System: Advances in Measurement at and Above Ground Surface (George) and Advances in Measurements at and Below Ground Surface (Clarke) include a total of 46 papers, many of which are contributed by a wide variety of prominent international scientists. Both George and Clarke pay tribute for this recognition to their early education and the strength of the general science option at Guelph in the '50s and '60s and the excellent way in which that background integrated into the soil physics program at Wisconsin. They were anxious to point out how many soil physicist and agricultural meteorologist careers trace back to that basic science option at Guelph, more than ten, five of whom went to the Univ. of Wisconsin. ■

Heart and "Soil"

Intrigued by Mary Rasmussen's musing about couples (in addition to her and Karl Jennrich) who met through the Department (see Alumni Updates, p. 5), we came up with this quick list of folks who found their "soil"-mate here! If you are aware of others, whether they met while in the Department or after, please let us know.

Meghan (Dawson) Curless, BS'00, MS '03 and Joe Curless, PhD'XX (Agronomy)

Josh Palmer, BS'01 and Anna Schofield Palmer, BS'01

Jane Weber, BS'82 and Tom Erickson, BS'80

Kevin Fermanich, MS'88, PhD'95 and Jill (Jefferson) Fermanich, BS'84, MS'89

Dan Jaynes, MS'78 and Margaret Cemashko-Jaynes, BS'78



Ever-Energetic Emeriti

Last issue we provided updates on Emmett Schulte, M. L. Jackson, Art Peterson, and Gordon Chesters. Here's the latest on **Marv Beatty, Gerhard Lee, and John Murdock.**

Gerhard (Mildred) B. Lee

After retiring in 1988 I spent some time working on my farm and doing some consulting on land-related problems. My health was poor for several years, and in 1993 I finally had 4 bypasses and 2 carotid artery surgeries. Once I recovered, I returned to working on my farm which had been practically farmed to death. Steep slopes had been used for tillable crops and erosion was rampant. We've since enacted a variety of measures which have brought it back to life. At present we have 70 acres of good agricultural land, which grows corn or beans every year, and about 20 acres of CRP (Conservation Reserve Program) land. Twelve of the CRP acres have been planted to trees, mainly red oak, white pine and walnut. In addition, we have about 23 acres of older forest growth and about 8-10 acres in wetlands, on which we've dug three ponds. Here migratory waterfowl hatch and raise their young. Some people wonder why I bother to plant trees - after all, I will not profit from them. But my descendants will and they may enjoy their shade, too. Quoting Thomas Jefferson at age 83, "too old to plant trees for my own gratification, I shall do it for posterity ... though an old man, I am a young gardner." And there is also a lot of satisfaction in doing something constructive with land. I have been closely associated with several soils organizations. The Interagency Group meets several times a year to go over soils work going on in the state - this includes DNR (Dept. of Natural Resources) reps, U.S. Forest Service soil scientists, NRCS (Natural Resource Conservation Service) people, faculty from other colleges in the state, soil scientists, UW cartographers, private soil consultants, and so on. This is a remarkable group that examines all aspects of soils work that relates to soil survey and I enjoy it very much. I was involved in the organization of the WSPSS (Wisconsin Society of Professional Soil Scientists) and have also become a "Certified Professional Soil Scientist" through the certification program established with the tireless efforts of **Jerry Tyler** and others. I belong to several other groups, such as the Wisconsin Walnut Growers, the Koshkonong Prairie Historical Society, Nordmanns Forbundet (a Norwegian-American group), and attend various UW Extension and other classes. The pleasant part of having taught for so many years, is that every once in awhile someone comes up to me and says "remember me from Soils 325 or Soils 315?" I may not always remember the person (partly because of several strokes), but it still gives me a warm glow. Many of my students were not soil science majors. But that was the idea - to get landscape architecture, geography, geology, archaeology, planners, etc., into these courses where they could hear about and learn how we did things and then use these techniques in their own professions. I also learned a lot from them.

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Marvin T. (Ellouise) Beatty (retired 1988)

- * Wrote the book *Soil Science at the University of Wisconsin-Madison, A History of the Department, 1889-1989*, published by the Department in 1991.
- * Pedology in archaeology: field and lab work with the Center for the Study of the First Americans, Oregon State University. Co-author of five brief papers, one full-length paper, two chapters in monographs; author of two monograph chapters in manuscript awaiting publication. Member of the Center's Advisory Board, 1992-2001, president 1999-2001.
- * Friendship Force of Wisconsin [part of Friendship Force International (FFI)]. With wife, Ellouise, took part in six international exchanges, hosted Friendship Force members from seven nations in our home; president of local club; regional representative for FFI for two years.
- * Other activities: fund raising for Epsilon Sigma Phi (Extension educators professional fraternity), digging out Beatty genealogy, research and writing a book on family history, travel in the US and overseas. Have studied soils of 17 farms in nine states owned by ancestors between 1639 and 1980.

John (Sue) Murdock

So, what has John Murdock been doing since retirement from the Department of Soil Science in 1991? The answer is nothing terribly exciting - not even an occasional golf game or fishing on the rivers and lakes that abound in our area. Shortly after retirement, Sue and I moved to our home area near Murray in the far western tip of Kentucky. We built our own home on our farm near Rick (oldest son), Stacy and their 3 daughters. The basic idea of resting on the porch, watching the cattle graze, the crops grow and Rick work soon disappeared. Rick took a full-time job with an ag service company and later developed his own precision ag company, Ag Connections. After this, farming (not the gentleman farmer type) took an entirely new meaning for the granddad! We now farm 2,500 acres of row crops, have a beef herd and have developed 45 acres of ponds for intensive catfish production.

Shortly after our move to Kentucky, Larry (youngest son), Bonnie and their 3 boys (daughter added later), moved to the farm where he set up a "virtual office" for his computer software business. Soon granddad was rebuilding an old tobacco barn to provide 2,000 sq. ft. of office space for a computer center. Rick liked the idea and moved his company into the facility as well. At any given time we have from 10-15 computer jocks working out here near the end of the world! We have now moved another tobacco barn to the center and remodeled it to provide space for expansion. Rick and Larry now work together in the business with activities nationwide.

Ah, yes, the catfish. Four years ago a local county resource agent asked me to lead a study team to look at potential alternatives for tobacco production. Since tobacco is the basic cash crop for this area there is no easy solution for the possible loss of income from this crop. However, there is an excellent natural resource base in this area for aquaculture and we decided on intensive catfish production as the alternative of choice. After all you can't convert all the tobacco barns in the area into computer centers! Since the study was completed we have organized a 50-member producers cooperative, arranged financing and constructed a \$1.5 million processing facility, and will produce, process and market 2 million lbs of fish in 2003. Our present goal is to double our sales by 2005.

We still have a strong interest in things international. I still go to Brazil every year or so and Sue and I make the long voyage to Indonesia every other year. Needless to say, one of the motivating factors in this trip is the fact that Cindy (our daughter), Harry and their 4 children live in Bogor! To keep working on my foreign language skills, I teach Bible classes for Mexican migrant workers on Sundays.

Anyone having an opportunity to be in the area, drop by to see us at 1440 Killdeer Trail, Murray, KY. Call (270)435-4032 so we can lead you in! ■

Cultivating Urban Agriculture

The College's Center for Integrated Agriculture Systems will help promote urban agriculture in Milwaukee, thanks to the legacy of two UW-Madison administrators who believed strongly that university resources should be used to improve the lives of people throughout the world. Faculty and students will partner with Growing Power, a Milwaukee group that promotes urban agricultural enterprises and food systems and agricultural education for inner-city youth. The program will provide internships at Growing Power for UW-Madison students and learning opportunities for middle- and high-school students. Soil Scientist **Leslie Cooperband** leads the College team. Funds for the effort come from the Reilly Baldwin Wisconsin Idea Endowment, established through an \$18 million gift from the estate of Ira and Ineva Reilly Baldwin. Ira Baldwin, professor emeritus of bacteriology and former dean of the College, died in 1999 at 103. His wife, Ineva, who served as UW-Madison assistant dean of women for the College of Letters and Science, died in 2000 at 96.

Alumni Updates/Address Changes

Mike Bertram, BS '97, is assistant superintendent of the Marshfield Agricultural Research Station. As assistant superintendent and research agronomist, his duties include coordinating and managing field crops research at the station; managing crops grown for the research animals; assisting with administrative responsibilities; and publications relation and outreach.
303 W. 17th St. Apt. 201
Marshfield, WI 54449
mbertram@wisc.edu

Todd Bonnin, BS '94, and his wife recently moved to Shawano, WI, where, in addition to working for Hoard's Dairyman, he is involved with the Shawano County citizens advisory council. A current concern of the council is promoting the use of phosphorus-free fertilizers.
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Phillip M. Chalk, PhD '73, is now with the International Atomic Energy Agency in Vienna, Austria. He is Head, Soil and Water Management & Crop Nutrition Section, Joint FAO/IAEA Div. of Nuclear Techniques in Food and Agriculture.
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Jaslyn Dobrahner, BS '01, MS '03, is an environmental protection specialist with the US EPA in Denver, CO. She commented to us that "only after leaving (UW Madison) have I realized what a 'first class' university it really is."

Henry A. Fribourg, BS'49, retired in June 2001 after 45 years as a Crop Ecologist in the Department of Plant and Soil Sciences at the University of Tennessee. He still goes to work at the office 3 or 4 days a week, writing up some of the latest grazing studies in which he was a project co-leader with colleagues in animal science and veterinary medicine, laboring to unravel the tall fescue toxicosis problem.
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Springdale, AR 72762

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68 County Road 76
Wabasha, MN 55981

Daniel Hallock
159 Nixon's Beach Road
Edenton, NC 27932

Walter (Wally) Mack, BS '81, is an environmental scientist with the Kansas Dept. of Health and Environment, Bureau of Waste Management where he works in the hydrogeologic unit of the solid waste permits section. This after 14 years with the USGS in Kansas and then 3 years with the KDHE's Bureau of Environmental Remediation.
600 Butterfield
Manhattan, KS 66502
wmack@kdhe.state.ks.us

Francis A. Ogunlana, MS '77, writes that he worked with the Federal Dept. of Agriculture (FDA), Nigeria, upon leaving UW-Madison. He transferred to Ogun-Oshun River Basin Development Authority, a federal government agency engaged in the development and

management of water resources and rose to the position of Executive Director (Operations) in 1993. Since his retirement in 1999 he has been the Managing Director/Chief Executive Officer of Roymax Limited, a private firm engaged in agricultural and water resources management consultancy.
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Ted Peck, BS '57, MS '58, PhD '62, is recipient of the first WILL Award in Education. The award pays tribute to "...people whose vision, creativity, and dedication make central Illinois a better place in which to live...". Peck is professor of soil chemistry at the Univ. of Illinois; WILL is the broadcasting service of the university.

Mary Rasmussen, BS '89, and **Karl Jennrich, BS '90** met and fell in love in soil science classes and have been married for 12 years, living in the "northwoods" of Conover, WI. They're wondering how many other couples met in soils classes [see p. 3 for some we know of] Mary is a recreation planner with the USDA Forest Service and Karl is Assistant Zoning Director for Oneida County Planning and Zoning. They extend an invitation to visit them if you find yourself in the northwoods, where the hospitality is excellent and the beer is always cold!!
4480 Church Road
Conover, WI 54519

Congratulations to **Tom Sauer, MS '85, PhD '93**, who has been named Midwest Early Career Scientist of the Year by the Agricultural Research Service! Tom works in the National Soil Tilth Lab in Ames, IA in the soil and water quality area.
5215 Maryland St.
Ames, IA 50014

Samuel E. Shehadeh, BS '96, is now a patent attorney (Brinks Hofer Gilson & Lione, Chicago) with a focus on litigation

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Retirements

Dr. Jaya G. Iyer retired in January 2003 after 35 years of service in the Department. Jaya's contributions to the Department were unique in many ways. For one, she had great breadth of knowledge garnered from having earned two M.S. and two Ph.D. degrees, first in Botany from the University of Bombay and then in Forest Soil Science at the University of Wisconsin (under the direction of "Doc" Wilde). Professor Iyer used this background effectively in teaching courses that ranged from sustainable management of agricultural soils, to soil biology, a general course in plant nutrition management, and a course focused on nutrient management in nursery tree crops. She ably used her knowledge and experience to develop an applied research program in forest and nursery tree management that captured international as well as national and state

attention. One of her most recent accomplishments in which she took pride was not only demonstrating through research that by going to polymer encapsulated fertilizer tree nursery managers could reduce their annual nitrogen inputs nearly 5-fold, but seeing this practice adopted throughout the upper Midwest and on into Canada. Jaya also brought to the Department, college and university a unique personality. She could be understanding and sympathetic, but also direct and forceful in a way that did not offend students, faculty or administrators. She will be forever remembered by her undergraduate advisees for her deep and genuine concern for them, her willingness to meet with them at a moment's notice whatever the reason, and for "chewing" them out if the situation warranted. These personable attributes made Jaya much sought



after as a faculty member to serve on committees that dealt with the issues of undergraduate curriculum, policies and procedures, gender equity, and sexual harassment. Jaya's retirement has left a large void in undergraduate recruitment and advising that will be difficult for the Department to fill.



Gary W. Jackson, former director of the national Farm*A*Syst/Home*A*Syst office and Professor in the Dept. of Soil

Science retired in September 2002 — sort of! Gary continues to consult with the office, (now the Farm and Home Environmental Management Systems Programs) bringing his experience and considerable energy to bear on projects associated with the assessment and management of environmental impacts associated with agriculture. As co-principal investigator of a nine state project funded by the USDA's Initiative for Future Agriculture and Food Systems beginning in 2000, Gary worked on developing livestock environmental

management systems. As Director of the National Farm*A*Syst/Home*A*Syst Program, from 1991 to 2002, Gary provided national leadership for states developing Farm*A*Syst and Home*A*Syst environmental assessment programs; including the development of resource materials and coordination with research and Extension faculty, and related agencies and organizations across the country. These efforts resulted in the Farm*A*Syst Program being selected as the 1995 national winner of the pollution prevention division of the Renew America Environmental Sustainability Award, the 1996 USDA Group Honor Award, and a 1997 Vice President's Hammer Award. Prior to this position, Gary served as the UW Extension Water Quality Education Coordinator for 13 years, Area Water Quality Agent for 2 years and a County

Extension Agent for 3 years. Other awards received include the Mid America Crop Protection Association Educator of the Year in 1996; a USDA Certificate of Merit in 1994 for "development and national expansion of Farm*A*Syst to help rural residents protect their family health and water resources;" a UW Administrative Leadership recognition Certificate in 1994, and in 1992, an EPA Bronze Medal for Commendable Service for "advancing pollution prevention practices to protect rural water quality."

In Memoriam, from p. 6

Clyde E. Bay, BS '37, died in Paraguay, South America on May 19, 2003. Clyde was a soil scientist with the USDA and an agricultural advisor with US-AID. After participating in "Baby Lift" (evacu-

ation of 160 Vietnamese babies and children from Saigon), he joined the Peace Corps. In 1998, Clyde and his wife, Ellie, built a health clinic in rural Paraguay.■

Current Research Projects

Developing Comprehensive Nutrient Management Tools

An easy-to-use nutrient management planning software package that integrates the record-keeping, conservation plan, nutrient management plan, and manure/waste water management requirements for preparation of a USDA-Natural Resources Conservation Service (NRCS) Comprehensive Nutrient Management Plan (CNMP) is being developed under the direction of **Larry Bundy**. The Wisconsin DNR and the NRCS are providing funding for the project. A prototype integrated CNMP package will be released for field testing in the Fall of 2003. One component of the package will be the Wisconsin Phosphorus Index, a site-specific assessment tool for identifying the risks of phosphorus losses in runoff from fields under different manure and crop management systems. The results of ongoing soil phosphorus concentration research under the direction of **Phil Barak** and field runoff monitoring conducted by **John Norman**'s laboratory will be used to calibrate the P Index model. More information about the Wisconsin P index is on the web at: <http://wpindex.soils.wisc.edu>.

A Highland Adventure - the Memory of Soils

Few places are as ruggedly lovely and romanticized as the Highlands of Scotland. It is a land of high windswept hills and deep wooded glens, dotted with stone-walled pastures and neatly stuccoed crofter farmhouses. Woven within a glacier-scoured metamorphosed landscape is a tale of ancient land-use that dates back many centuries, expressed as subtle features carved onto the hillsides and only evident to a practiced eye.



Assistant Professor **Cynthia Stiles** and graduate student **Gordon Robertson** (PhD, Geography) are on the track of these ancient field systems, pursuing a research effort on the Knoydart Peninsula of western Scotland, near the Isle of Skye. One of the most remote and inaccessible places in the British Isles, Knoydart is the destination of many European outdoor enthusiasts in search of wild lands with a distinct Highland flavor and almost total absence of development. Once supporting a substantial number of farmers and herdsman, the peninsula was largely cleared of its population in the late 1700's and has remained relatively undisturbed since. Excellent survey records exist on location and productivity of farms (township districts) prior to the clearances and after. Recent interest in ecotourism and wilderness recovery efforts has renewed interest in this remote and rugged landscape,

particularly with regard to sustainable land-use practices. There is also considerable interest in how large populations could produce enough food to be self-sustaining in a landscape that is dominated by steep slopes and peaty accumulations upon low-nutrient supplying rock.

On a recent field trip to Knoydart, Stiles and Robertson were able to locate several fairly complex field systems near historically documented farm sites on both the north and south coasts. The fields consisted of three tiers of raised beds (6 ft wide by 65-85 ft long) running roughly parallel to the slope direction (above), referred to in historic documents as lazy beds or finnegans. It is not unusual for the peninsula to receive in excess of 100 inches of rainfall per year, so drainage is a major issue, as is augmenting fertility of the soils. The main crops of oats, barley and later potatoes require better drainage than is naturally available, and were probably planted in the mid-slope position, where the largest fields occurred. Less valuable crops were planted nearer the sea, or at the top of the slope, where natural conditions were harsher. The low natural fertility of the soil required amendments, and crofters would have hauled such amendments as seaweed, shell sand, and manure to the fields to boost yields, rendering the term 'lazybed' very misleading indeed. Stiles and Robertson sampled several areas extensively, and are examining the soils for nutrient levels and for evidence of high inputs of animal waste products. One location sampled yielded a buried organic horizon at around 30 inch depth, representing the original soil surface prior to material addition to build the raised bed (right). This is an excellent marker for dating the features, with the broader goal being assessment of the long-term effects of human landscape manipulation on recovery ecology.



The field systems identified and sampled on Knoydart may represent a relict feature on the landscape undisturbed since their attendant farmers left the land nearly two centuries before. This system of land-use was very important in medieval times throughout northern Europe and the fields of Knoydart are a reminder of the difficulties faced by subsistence farmers, in many cases our distant ancestors. The effects of the fields on the present day ecology is one of the main topics of research for Gordon Robertson, who originally hails from Arbroath, Scotland, and for Dr. Stiles, who harbors a keen interest in the role of humans as soil-forming and landscape-altering agents. Both researchers will be submitting requests for further research funding from the National Science Foundation and National Geographic. The results promise to be interesting and will be shared with both the John Muir Trust and the Knoydart Foundation, agencies striving for the ecologically responsible sustainable activities in the region. ■

Making a World of Difference!

Three of our international alumni have recently been in the headlines.



In September 2002, **Iajuddin Ahmed MS'58, PhD'62** took office as the seventeenth president of Bangladesh. The Bangladesh National Party (BNP) nominated the retired professor when the previous president, Badruddoza Chowdhury, stepped down in June. In 1991, Ahmed acted as an adviser to the nation's first caretaker government, credited at that time with conducting the most free and fair elections in the nation's history. He also served as chair of the Bangladesh Public Service Commission and on the University Grants Commission. Before being declared the country's next president, he was the vice chancellor at the private State University of Bangladesh. Ahmed's goals include positioning the parliament to play a constructive role in the development of all parties. "I intend to push the country toward progress," he told the *News India Times*, adding, "The literacy rate should be raised and fresh employment opportunities created." Ahmed, whose UW degrees are in soil science, joined Dhaka University in 1963 as an assistant soil science professor. He has published some 125 research papers and worked on a process that allows soil to preserve and then time-release nutrients. Ahmed's advisor for both his MS (Caking of fertilizer as affected by coating with various materials) and PhD (Encapsulation for controlled release of fertilizer) was Prof. **O.J. Attoe**.*

*Portion reprinted from *On Wisconsin*, Spring 2003

Salai Tun Than, PhD '59, of Myanmar (formerly Burma) who was jailed in November 2001 for criticizing the government of Myanmar was released along with 17 other political prisoners on May 4, 2003. He launched a hunger strike on April 27 to protest the cruel and inhuman treatment of some 1,400 political prisoners and to demand their release. While there is no evidence to suggest that the government has addressed those concerns, the international campaign to gain his release has helped bring to light the plight of political prisoners in Myanmar. Than was released with the condition that if he breaks the country's laws against criticizing the government again, his current 7-year sentence will be added to his next sentence. Dr. Than earned his PhD (Effect of pH on the uptake of native and applied N, P and K) under the tutelage of Prof. **Art Peterson**. He later became rector of one of Burma's major agricultural institutions.

Nai-feng Chang, MS '31, was born on March 31, 1904 and celebrated his 100th birthday, based on Chinese tradition, with a party in Beijing, China, hosted by the Chinese Academy of Agricultural Sciences and the Farmers and Workers Democrat Party Committee. Mr. Chang received his MS degree under the supervision of Prof. **Emil Truog**. He then returned to China where he conducted the first national scale soil fertilization program in China, becoming known as the Father of Soil Fertility in China. In 1988-91 Mr. Chang served on the PhD Committee for Dr. Ming Chen, now of the University of Florida, who graciously provided us with this information. Mr. Chang is blessed with good health and a good memory, also - he recalls rooming with **Adolph Mehlich** (MS, 1933), developer of the Mehlich-1 soil extractant. ■

Contributors to the Department of Soil Science (2002)

Emily S. Collins
Nils P. Dahlstrand
LuAnn Engelbert
Susan E. Fischer
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Ronald F. Hensler
Brian G. Hess
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George J. Staidl
Joseph J. Stellato
James B. Swan
Tsuneo Tamura
James C. Vanherwynen
Stephen J. Ventura
and Margaret Krome
David L. Wenzel
Steven R. Werlein
Joe L. White
Gary M. Zwirlein

*matched gift

We thank you all!!

Degrees Granted

BS–Agricultural Sciences–Production

- 2001 Berge, Jon D.
Palmer, Joshua C.
Palmer (Schofield), Anna H.
Todd, Zachary S.
- 2002 Baus, Jonathan T.
Doyle, Robert P.
Hanlon, Joel P.
Hearden, Sean P.
Hoff, Michael J.
Pyszka, Brian J.
- 2003 Harms, Grayson T.
Houlihan, Steven M.

BS–Natural Resources

- 2002 Crosby, Ann E.
Palmer, Emery J.
Palmer, Lily R.
Steglich, Alison M.

BS–Natural Sciences

- 2002 Meyer, Juliane M.
Pellitteri, Molly C.
Stensvold, Krista A.

MS

–2001

Mueller, Sabrina R.–Relationships of soil microbial population parameters to sand-based putting green quality. (Kussow)

–2002

Dobrahner, Jaslyn J.–Evaluation of nitrogen fertilizer in bareroot nursery production to reduce nitrate leaching. (Iyer, Lowery)

Erickson, Jennifer L.–Soil oxygen levels surrounding wastewater infiltration surfaces. (Tyler)

Fujinuma, Ryosuke–Base-cation cycling by individual tree species in old-growth hardwood-hemlock forests of Sylvania Recreation Area, Upper Michigan. (Bockheim)

Lyne, James W.–The vertical redistribution of phosphorus due to long-term nutrient management practices. (Barak)

Newman, Christopher M.–Papermill residuals and compost effects on particulate organic matter in a sandy soil. (Cooperband)

Richmond, James E.–Characterization of surface runoff contributing areas using ceramic beads, simulated rainfall, and magnetic susceptibility. (Lowery)

–2003

Arrington, Kathleen E.–Tools to support the protection of cold water streams from the thermal impact of development in Dane County, Wisconsin. (Ventura) (*see Current Research, p. 12*)

Curless, Meghan A.–The use of dairy manure in potato production systems. (Kelling)

Roberson, Tiffany–Phosphorus losses from alfalfa and grasses after freezing and drying. (Bundy)

PhD

–2002

Brown, David. J.–Solving the Catena problem: geography, geomorphology and geochemistry on the landscape of origin in Uganda. (Helmke)

Good, Laura Ward–Mechanisms controlling phosphorus loss to water from animal manures and manure-amended soils. (Cooperband)

–2003

Boerth, Thomas J.–Enzymatic hydrolysis of organic phosphorus in soils and manure. (Helmke) ■

Alumni Updates, from p. 5

and biotechnology and says that his background in soil science is serving him well.

sshehadeh@brinkshofer.com

Melanize Szulczewski, MS 96, PhD 99, is an agricultural extension agent in Cameroon, Africa. The best way to reach her, though, is at this address:
1109 Sarah St
Bethel Park, PA 15102-2653

After 5+ years as Ecologist and Research Coordinator at the Nevada Desert FACE Facility (Univ. Nevada-Reno), **Stephen Zitzer, BS '74**, is now an Assistant Research Professor with the Desert Research Institute in Las Vegas, NV. The

High School Intern Wins Science Fair Scholarship

My name is **Menachem Tabanpour**, a high school student from Brooklyn New York. I first learned about UW-Madison when I was accepted to the NASA SHARP PLUS program, which is a summer internship program that focuses on promoting interest in scientific careers. After the first week in the program I received a letter



saying that my lab assignment was in the Department of Soil Science with Dr. **Phillip Barak**. My first question was what is soil science? I soon found out that it was a real science, which covers a broad range of subjects—from Martian soils to nutrient water quality in terrestrial soil to microorganisms that affect soil quality. A week or two into the program, my curiosity was definitely stimulated by this field of science.

Not feeling clear about what my summer held in store for me I had a meeting with my mentor to discuss different topics of research. The following week, Dr. Barak then proposed one of his own ideas that had been in the back of his mind for many years. This is what began my exploration of how to efficiently nucleate struvite crystals for collection in wastewater and manure treatment facilities. Struvite is a crystalline mineral composed of magnesium, ammonium, and phosphate that occurs naturally in the environment and has been used as a slow release fertilizer for about one hundred years. Recently it has become a problem in wastewater treatment plants because of uncontrolled nucleation.

continued on p. 11

major new area of research he will pursue concerns evaluating the impacts of wild horses on the soils and vegetation of the Nevada Test and Training Range, which includes the infamous “Area 51.”
8150 Sandy Creek Drive
Las Vegas, NV 89123-0246 ■

Club News



The **UW Badger Turf and Grounds Club** and advisor, Wayne Kussow, received a Mayoral Commendation for designing and constructing the turf areas around the Capital Square. At left is the crew and some of their finished work!

T-shirts are still available from the **UW Soils Club** in assorted sizes and colors - short-sleeve shirts are \$12.00 and long-sleeve shirts are \$17.00. Contact Jeff Osterhaus (jtosterhaus@wisc.edu) or Juli Meyer (julianemeyer@wisc.edu) to place your order.

High School Intern, from p. 10

The research was a quick success because the nucleation time for struvite was reduced to less than half in a controlled environment using monomolecular and polymer membranes. Upon returning to New York I was happy that my summer had gone so well and signed up for the New York City Science and Engineering Fair, competing in the first round with 700 other projects. I was accepted to go to the second round where the competition was reduced to 200. Although I did not make it to the final round, I won a full

four-year scholarship to the City College of New York and the regional award of the Stockholm Junior Water Prize. I was happy that the research has brought me the scholarship and that it was also recognized as having the potential for helping purify wastewater. The purification comes in because when the crystals nucleate they remove the phosphate from the water, thus complying with EPA regulation of removing phosphates from wastewater to reduce eutrophication of bodies of water.

My experience at UW-Madison has been very enlightening. It has given me the opportunity to explore various areas of science while having access to the amazing amount of resources UW-Madison has to offer. This summer I am back at UW-Madison continuing the research started last summer through a program called Project SEED created by the American Chemical Society. I am hoping to be able to do my undergraduate studies at UW-Madison because it is a great university and it would allow me to continue this research.

ALUMNI UPDATE — Let us know about you!

Name: _____

Degree and Date(s): BS (_____) MS (_____) PhD (_____) _____

Home Address: _____

Position: _____

Employer: _____

News to share: _____

Return to: Dept of Soil Science Newsletter OR Email to: slspeth@wisc.edu
 University of Wisconsin-Madison
 1525 Observatory Drive
 Madison, WI 53706-1299

Current Research Projects

Trout Get Hot, Too!

Kathleen Arrington, MS '2003, was commended by Dane County Executive Kathleen Falk for work on thermal impacts to streams done in collaboration with the Dane County Land Conservation Department (LCD). Falk noted that "Thanks to you, developers, local government staff, and interested citizens can go to the Dane County website to determine the location of these thermally sensitive waters."

Under the supervision of Professor **Steve Ventura**, Kathleen calibrated and validated a model predicting the temperature of runoff from summer thunderstorms. Particularly in urbanizing areas, runoff from impervious surfaces may raise the temperature of small cold-water streams, threatening trout and other sensitive species.

The model was developed by Professor **John Norman**, in collaboration with **Aicardo Roa** (PhD '89, Ag Engr major, Soil Sci minor) of the Dane County LCD. Kathleen also developed web pages for the LCD that explained how to use the thermal impact model, whether developers were in areas of the county affected

by thermal provisions of the county's stormwater ordinance, and how developers could mitigate thermal impacts of new projects (see <http://www.co.dane.wi.us/landconservation/datapg.htm>).



On the Trail of Chronic Wasting Disease

Joel Pedersen, Assistant Professor of Soil Biochemistry and Environmental Toxicology, in collaboration with researchers in Animal Health and Biomedical Sciences, has received a \$2.4 million Department of Defense grant to study the behavior and persistence in soils of the agent believed responsible for chronic wasting disease (CWD). Chronic wasting disease of deer and elk belongs to the family of transmissible spongiform encephalopathies, which includes bovine spongiform encephalopathy ("mad cow" disease) and sheep scrapie. The putative causative agent of these invariably fatal neurodegenerative disorders is an infectious, self-replicating prion protein (PrP^{Sc}).

Strong circumstantial evidence suggests that soil may serve as an environmental reservoir for the infectious agent in both CWD and scrapie. Dr. Pedersen's laboratory is investigating the preservation of prion protein in soils. His research group is examining the association of PrP^{Sc} with well-defined soil components and the degree to which sorption influences the stability of the infectious agent in the environment.



Key aspects of this study include determining the extent to which sorbed PrP^{Sc} retains its infectivity, and whether association with soil components protects prion proteins from microbial degradation. These results have important implications for the mobility and bioaccessibility of the infectious agent in soil environments.

more current research on p. 8

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