New England Section Newsletter

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2001 Spring Meeting of the New England Sections of the American Physical Society and the American Association of Physics Teachers Middlebury College, Middlebury, Vermont, March 30-31, 2001

The Spring 2001 Joint Meeting of the New England Sections of the American Physical Society (NES/APS) and the American Association of Physics Teachers (NES/AAPT) will be held at Middlebury College on Friday and Saturday, March 30-31, 2001. Further information on the conference appears on the site http://cweb.middlebury.edu/nesaps .

The program of Friday afternoon is centered on Chaos, Complexity, and Self-Organization. On Saturday morning the program contains General Physics; Chaos, Complexity, and Self- Organization in the High School and the College Classroom. A reception and banquet will be held Friday evening at 6:30 pm at the Kirk Alumni Center, Middlebury College.

A registration form appears in the January, 2001 issue of Meeting Announcements of the American Physical Society. Local registration begins at 1:00 pm on Friday in Bicentennial Hall, continuing on Saturday from 8:00 am. (It is the bicentennial of the College and a brand new science building.) The early registration deadline is Friday, March 2. Free registration and a travel subsidy up to a maximum of $100 is available to any student attending this meeting.

The organizing committee seeks contributed and poster papers in any area of contemporary physics. Especially welcome are papers on the feature topics of chaos, complexity, and self- organization that will include demonstration of classroom or research apparatus to meeting participants. Parallel oral and poster sessions will be on Saturday morning. Complete abstract submission instructions are found at /meet/meet-abstract.cfm .

The deadline for receipt of abstracts is Friday, March 16. Two ways to submit abstracts are via the web and via e-mail. They are quite detailed and the step-by-step instructions appear in the announcement accompanying the registration form in the issue of Meeting Announcements cited above. Included are instructions for those who

require a third method of submission.

Included in the same meeting announcement are directions to Middlebury College and a list of inns and motels within 6 miles of campus. Make reservations directly with one of them, and it perhaps won't hurt to mention the meeting or the college with your request of a favorable rate. Vermont is a beautiful state, and the Middlebury region has many attractions. In addition to the setting, there are galleries of Vermont arts, crafts, and antiques. If this winter continues into early spring, with luck (good or bad, depending on your outlook) there will be late-season skiing.

The local organizing committee is Stephen Ratcliff, Frank Winkler, Richard Wolfson, and Jeffrey Dunham, whose important numbers are (phone) 802-443-5694, (fax) 802-443-2072, and (e-mail) dunham@middlebury.edu .

Fall 2000 Meeting at Central Connecticut State University

(This description of the meeting is adapted from the extensive minutes prepared by Peter LeMaire, Chair of the local organizing committee.)

The Fall 2000 Meeting of the New England Section of the American Physical Society was held at Central Connecticut State University, New Britain, Connecticut, on Friday and Saturday, November 10-11, 2000. The theme of the meeting was Photonics and Electroactive Materials, but other areas of physics were included. An "Industrial Round Table" had presentations and discussions of issues related to Physics and Industry.

The Section is grateful to the organizing committee of Professors Peter LeMaire (Chair), Ali Antar, Kristine Larsen, Sadanand Nanjundiah, Nimmi Parikh, and Luisito Tongson, all of the Physics and Earth Sciences Department at Central (CCSU). Among many other arrangements, the committee established a web site (**www.physics.ccsu.edu/aps_nes**) designed and published by Prof. LeMaire for the meeting. This site is expected to continue to furnish information. Prof. LeMaire told the Executive Committee of NES/APS he would try to devote the site to notices placed by Section members of meetings and talks they would like others to know about. He is also planning to include historical information about the Section.

The meeting began Friday at 3:00 with welcoming remarks by Prof. Ali Antar (Chair, Physics and Earth Sciences, CCSU) and Dr. June Higgins (Dean, School of Arts and Sciences,CCSU). There were then invited talks on Photonics that showed the excitement and promise of the science and the applications. These included Microlithography for Electronics and Photonics by Dr. Greg Gallatin, formerly of Lucent Technologies and now at IBM Watson Research Labs, Excitons in Quantum Dots, State Symmetries, and Optical Response by Prof. Sergio Ulloa, Ohio University, and Recent Advances in Optical Communication by Prof. Niloy Dutta, University of Connecticut. A cocktail hour preceded the banquet and gave attendees the opportunity to renew friendships and to

chat with the speakers. The banquet talk on The Physics of Baseball combined the passion for physics with the devotion to (probably still) America's pastime. There were intriguing demonstrations of the "screw ball" and "curve ball" in the presentation given by "Mr. Physics of baseball," Prof. Robert Adair of Yale.

Saturday sessions included contributed papers on Photonics, on General Physics, and on Electroactive Materials and Lasers, and a Poster Session. These were followed by the invited talk The Status of Low and High Temperature Superconducting Wire by Dr. Lescek Motowidlo, an alumnus of CCSU and of UConn, now at IGC Advanced Superconductors. Involving the role of physics in a highly competitive industrial setting, this talk was a natural lead-in to the "Industrial Round Table," a panel presentation concerned with helping to make a better fit between physics education and the anticipated needs of industry. Dr. Steve Davis of Physical Sciences Inc. described photonics R & D at a small company such as his own employer. He suggested steps for better student preparation, including course choices, internships, and technical writing skills. Prof. George Rawitscher of UConn discussed the status of physics majors and the needs of prospective industrial employers. His graphs contrasted the increasing need and financial commitment of industry to the decreasing number of physics majors and their transfer rate into other majors. Prof. Shubhra Gangopadhyay of Texas Tech University offered answers to the questions of retention of physics majors and their improved industrial employment readiness. She described the Masters in Physics with Industrial Internships at her school as a model system with a well-documented rate of success and an upward bound curve of numbers. She invited students and faculty to contact her for more information and update on the Texas Tech program. Fruitful and lively discussion followed.

The two-day program was very well-organized and received positive comments from attendees. It is only every-so-often that physics and employment considerations are combined. Since it is crucial to people who will seek employment, and even to some people who have employment, the attention given to it was appreciated.

This concludes Peter LeMaire's minutes as modified quite a bit by the editor to give credit to people who modestly do not seek it. It gives me a chance to remind readers that to plan, hold, and budget a meeting is no mean feat. The Section and the national organization, the American Physical Society, help a great deal. All the schools and the physics departments that held Section meetings in recent years deserve thanks. Those coming up in 2001 deserve our attendance. I hope lots of people who have not attended recently will decide to do so.

DM

A Message From The Chair of the New England Section

(This message was dated Friday, December 29, 2000.)

Dear members of the Executive Committee of the New England Section,

Unfortunately, my first act as Chair of the NES for 2001 is to inform you that John Walsh died unexpectedly on December 5. I do not know any more details. As you know, he was elected as Vice Chair beginning in 2001. I am thankful that Bill Hersman, who also ran for Vice Chair in the recent election, has agreed to serve as Vice Chair for one year, at which time I hope that he will agree to run for a full term.

I did not have the pleasure of meeting John Walsh, but I had a very enjoyable time speaking with him when he was deciding whether to run for Vice Chair. In the end, he decided that even though he was very busy, he thought that the New England Section was important and he agreed to run. At this time of the passing of the old and the beginning of the new, it is important to be reminded that life is precious and that we are all very fortunate.

Best wishes for the holidays.

Harvey (Harvey Gould, Chair, New England Section, 2001)

Position Announcement
The University of Vermont Faculty Position in Experimental Condensed Matter / Materials Physics

The Physics Department of the University of Vermont invites applications for a tenure-track Assistant Professorship in Physics, starting September, 2001. A doctorate in physics or in a closely related field is required. Background in experimental physics and postdoctoral experience are desirable. The successful candidate must be committed to excellence in teaching at the undergraduate and graduate levels, and will be expected to initiate research in condensed matter physics or materials science. Start-up funds will be available. Applications, consisting of a resume, summary of research interests, and the names of three references should be sent to Dr. David Y. Smith, Chair Search Committee, Department of Physics, University of Vermont, Burlington, VT 05405-0125 [dysmith@zoo.uvm.edu]. The Department will request reference letters independently. Minority and women candidates are especially encouraged to apply. Preliminary screening will begin in mid-January 2001, but applications will be accepted until the position is filled. See (www.uvm.edu/?physics/). The University is an AA/EO employer.

Report of the Section Advisor/Councillor

The Council of the American Physical Society met in Washington, DC, November 19, 2000. The following brief report borrows prose from the minutes sent to all participants at the Council meeting. However, the

responsibility for this report is mine in my capacity as Section Advisor, partly because the minutes have not been approved, and partly because I have freely edited the draft to highlight items I think are of most interest to the Section.

President James Langer welcomed everyone to the meeting. He then reported on a trip he and Irving Lerch, Director of International Affairs, made recently to India. The purposes of the trip were 1. to increase communication with the scientific community of India, and 2. to explore ways the APS could help individual scientists in India on issues such as travel visas, exchanges and collaborations. It was neither a diplomatic mission nor an official APS visit, but was instead an exposure to views on important issues, including security and India's nuclear program. Langer gave several scientific talks and met with a number of Indian officials from a variety of scientific organizations.

Executive Officer Judy Franz spoke briefly about a project of the Committee on Membership. Faculty members in physics departments are asked to become local spokespersons, keeping APS members informed of new activities and urging non-members to join. The Committee hopes to broaden the program to include national and industrial laboratories.

Franz reported that a new Section is forming in California. She recently attended an enthusiastic meeting of the Section steering committee, during which provisional officers were selected and plans for a first Sectional meeting were discussed.

Franz mentioned the new email forwarding service that would soon be instituted as a member benefit. As members move about, changing jobs or internet providers, this service would give each participating member a single constant email address. All email sent to a specific address would automatically be forwarded to the member's current email address. It would be up to the member to insure the forwarding address is current, but the forwarding would be transparent to the sender.

A new web-based Faculty Industrial Leave Program will be announced soon. The APS acts as a clearinghouse for university faculty seeking short stays in industry and for industrial labs seeking faculty visitors. More information is available at www.aps.org/industrialleave.

A complete report of some of the statements adopted by the APS can be found on the web site (**/statements/index.cfm**). They include the Statements on Energy, on Protection Against Discrimination, and on K-12 Education. There should also be a report on the action taken by the APS in a study of the Nuclear Missile Defense issue.

Franz announced that the new physics web site for the public, PhysicsCentral, has now been launched and is available on the web. Alan Chodos, Associate Executive Officer, described the features of the site and noted that the more people link to it from other sites, the easier it will be to get a favorable priority ranking and listing on various search engines.

Frederick Stein, Director of Education and Outreach, reported on the

current activities of PhysTEC, the physics teacher education coalition program. The first phase, work done with planning grants from NSF and FIPSE (Department of Education), is moving towards completion. A short while ago representatives of eight schools along with other education experts met in College Park to discuss components of the program and to plan for the future. Soon an updated proposal will be submitted to the NSF, FIPSE, and the Carnegie Foundation, applying for additional funding to initiate phase two of the program. When the full project is completed, it will have cost about five million dollars.

Submitted by K. Jagannathan, Physics Department, Amherst College

WebCT for faculty and students at the University of Connecticut

WebCT stands for Web Course Tools, a product designed to allow instructors to create and manage web-based or web-enhanced courses. It is not unique to UConn and the ideas and methods should be easy to institute at schools with extensive information technology. There are much better people than me to consult, as you will see.

The newspaper of UConn, The Advance, gives one way to keep up with trends on campus. The web site is **http://www.advance.uconn.edu**. The September 25, 2000 issue (Vol. 19, No. 5) has two articles of interest. On page 1 begins High-Tech Classrooms Add Pizzazz. On page 4 appears More Faculty, Students Using WebCT. Naturally the physics department is up there with others giving the most use and the most imaginative use.

To plagiarize from a colleague who presented much of the information to the department, I will reprint here part of the synopsis for the UConn Physics Colloquium, Why All Physics Courses Should Be On Line and How This Can Be Achieved, by George Gibson, given on November 17, 2000. In summary he wrote: Much progress has been made in understanding how to teach physics more effectively. There has also been rapid development in computer technology. These new ideas and capabilities have not been widely exploited because of the great effort required of the instructor to change teaching style and overcome technical barriers. An additional large step is needed to allow instruction to change without extra effort. The talk will show a plan of action to improve individual courses, to coordinate sets of courses, and to aid all faculty who wish it. Specifically the discussion will include the use of WebCT, interactive homework, and physlets, all of which are used in my course, The Physics of Music. (This is the course George Gibson designed for music majors and others who know music but not physics. It helps them satisfy the lab science requirement for graduation in a way most meaningful and lasting to them. It contrasts with a course, which could have the same name, taught in some schools for students who know physics but perhaps not music.)

What are the main attributes and advantages of WebCT? They are twofold, being pedagogic and administrative. The teacher can pose questions leading students to think about material for the next class. This

will reach any student with web access, for example any student in a UConn dorm. Students can ask questions at any time. They are accessed and answered by another student or the instructor at a later time. Diagrams and tables can be displayed and discussed that are too involved for other means. Practice tests allow students to time themselves before the real test. Grades and evaluations of students are secure. A unique password is known to a student and the instructor. How the student is doing is continuously accessible. Lists, averages and other class data are available. Bookkeeping and updating are made easy. So how do you do all this? Your school has to have it. And you need the handbook WebCT 3.1: Getting Started Tutorial. I have a copy I would be glad to give you. You just have to ask.

DM

Profile of a Successful Small Department at a Small School

The following description was sent to me by Ed Deveney, Assistant Professor of Physics, Bridgewater State College, Bridgewater, Massachusetts. I received it in September of 2000 but Ed told me it is still up to date. A large well-funded department at a large school plays a different ballgame. I receive the newsletters from MIT Physics and University of Illinois Physics and also Engineering. Their faculty are on the forefront of highly technical research and application. Noone is surprised when MIT people win major awards and become presidential advisors. They are justly acclaimed and earn every bit of it. What about the littler guy? Ed wrote:

Exciting times are taking place at Bridgewater State College (BSC) where a "new look" physics department is coming together with deep New England roots (Clark University, UConn, Tufts University, and U. of New Hampshire). Over the past two years the physics department has had a complete turnover in its faculty. Four new hires replace three retirees and one who left for industry. These new faculty have brought a revitalized perspective and invigorating energy into the department, sparking excitement and innovation in research and curriculum. Similarly the chemistry and biology departments have undergone major restructuring.

BSC is sandwiched between Boston and Cape Cod with a "T stop" commuter train to Boston right in the middle of campus. BSC has 28 undergraduate programs and more than 90 majors and minors in three schools: Arts and Sciences, Education and Allied Studies, and Management and Aviation Science. There are approximately 9,200 undergraduate and graduate students (2,500 live on campus) and over 260 faculty members. Founded in 1840 by Horace Mann as one of the nation's first teachers' colleges with the support of John Quincy Adams and Daniel Webster, BSC today is the largest of the nine state colleges (and tenth largest college overall) in Massachusetts, with a strong reputation for academic excellence and teacher innovation. BSC is the institution preparing the largest number of teachers for grades K-12 in the

Commonwealth of Massachusetts.

Retiring professors George Weygand (42 years at BSC), Richard Claussdian (35 years at BSC), and industry-bound Matt Kohler left behind a strong department known for producing fine K-12 physics teachers and many others who have gone on to graduate school and into industry. Jeff Williams, former Assistant Dean of Academic Affairs at Wheeling Jesuit College in West Virginia and a solid state physics Ph.D. from Clark University in Worcester, took the helm as physics department head and immediately boosted the number of physics majors and minors by generating new enthusiasm for physics in the college community. Jeff arranged the hiring of three new faculty in the last two years and set the "vision" for the new look department. Ed Deveney, a UConn Ph.D. in atomic and molecular physics, was hired after he filled visiting positions at Amherst College and Wheaton College in Norton Mass. following his post-docs at Oak Ridge National Lab and at Cern. Ed's role has been to establish experimental research programs. (He and Jeff play sets with the tennis team; both have NTRP rankings of 4.5 to 5, placing them in good competition.) So far he has secured money to build a tunable diode laser for spectroscopy and cooling and trapping experiments. He has several pending research proposals, including one with his wife, Dr. Melissa Mazan, head of Sports Medicine at Tufts University School of Veterinary Medicine.

Dennis Kuhl is a condensed matter experimentalist with a Ph.D. from Michigan State University. He came to BSC from a staff position and post-doc with Ronald Thornton at the Center for Science and Math Teaching at Tufts. When not using his trombone in class to make a memorable point, he conducts research on the effectiveness of realtime computer data acquisition in labs and interactive lecture demonstrations. One of Dennis' students presented a related research project at last spring's NES/APS NES/AAPT joint meeting. That summer at BSC he presented several well- attended well-received workshops for in-service teachers, including a Massachusetts Department of Education content institute with Jeff.

Last spring Martina Arndt, a University of New Hampshire Ph.D., became the fourth new faculty member, adding outstanding teaching and research versatility to the department. She is an astrophysicist specializing in solar physics. With plans for a new telescope, skating with the women's hockey team, and proposals to take students around the world to view solar eclipses, Martina is sure to attract and excite new majors into physics.

The department is completed with Marcia Webb, a Ph.D. in physics education from Boston College who takes on much of the introductory laboratory workload. She specializes in science with toys and science for special needs and holds popular summer classes and workshops on these topics. Jim Munise is our half-time technician of great value and dependability. As is always the case, the place would collapse without the best secretary: Patty Benson.

We have 22 majors and six minors in physics. Historically roughly 20% of BSC physics students proceed to graduate work, 30% to K-12

teaching, and 50% right into industry. Due to a spurt of excitement in BSC physics, a strong Society of Physics Students (SPS) club began. With leadership by SPS President Lisa DeFalco, the club now bids for campus-wide recognition and support. It even pulled to a second place finish in the annual Homecoming parade float competition last year. SPS members hold weekly meetings for activities that include sponsoring local physics talks, constructing a Tesla coil, and fund raising. They hold tutoring sessions for introductory students and socialize to discuss physics news. The students benefited when the department hosted Michio Kaku from CUNY, the author of Visions: How Science Will Revolutionize the 21st Century, as part of the Class of '42 lecture series.

At a time when only two of the nine state colleges in Massachusetts have managed to keep alive the physics major program, we are a growing department making new and exciting strides in curriculum and research. Our students are able to have an impact on their own educational experiences and to play important roles in the look of the new look department. We continue to reach for more students who desire a small close-knit flexible department with a lot of student- faculty teaching and research contact.

Is It Physics or Is It Metaphysics?

There is a popular genre in non-fiction, the generational battle and detente when a prodigal son comes home to spend the last days of his dying father. The most famous recent case is that of Philip Roth, whose fight was lifelong. Lesser known is the new book by Dan McGraw, First and Last Seasons. On page 195 he writes: "I thought about it in terms of physics. My father was like a huge celestial body that was always pulling me with his gravitational field. My usual response was to push away. And even when we had achieved some equilibrium, his power still affected my orbit. The good part of this new equation is that I felt free to find my own orbit in the galaxy. The disturbing part is that I had no idea where the orbit would take me." But then on page 247: "I had an inkling now. The mysterious becomes more meaningful the less we try to understand. When we try to understand on an intellectual level, the meaningful becomes trivial. Better to believe and not understand than to understand and not believe. Or so I was telling myself." When death is the outcome, it seems the problem and the solution are at war with each other.

DM

Living in a Land Way Down Under

My wife, Carol, and I spent most of January enjoying the scene and hiking among the animals from our tent on the plain in Patagonia. The reader is justified in asking why and also wondering whether there is any

physics in this account. So be patient.

This venture was one of the annual intersession trips of UConn and to a lesser extent of other American universities and a Chilean university. Your globe will tell you a number of things. The southernmost region of South America, shared by Chile and Argentina, is Patagonia. We stayed on the Chilean side. The Andes separate the two long countries for thousands of miles, but not in southern Patagonia. The two have not always gotten along. I think they do now, but the military is a presence and there are still minefields off-limits to civilians near the border.

You may enjoy a book by David Noland, Travels Along the Edge, with forty ultimate adventures for the modern nomad, from crossing the Sahara to bicycling through Vietnam. The US is in there, for example Florida and Arizona, and not for golf courses. One chapter is Patagonia, crossing the ice cap. We did not cross the ice cap but we did approach it. This chapter alerts you to the foremost feature of the area: the incessant powerful wind. Some call the sound a locomotive's rumble, the howl of a jet engine, or (Paul Theroux) the rasp of sand in a chute. The World Survey of Climatology documents the windspeed variation and other effects.

You may also like Bruce Chatwin's classic In Patagonia. It is filled with history, geography, folklore, and the rigors of daily life. More recently a Frenchman followed Chatwin's route; I saw his book in Spanish. Many famous people have explored, endured, or enjoyed Patagonia. They include Ferdinand Magellan, Charles Darwin, Butch Cassidy and the Sundance Kid. My favorite former President, who gets better and better, Jimmy Carter, has traveled through the world to do fishing as well as diplomacy and humanitarian work. He has written articles for Fly Fisherman Magazine, including one on Patagonia, which apparently is a prime area for the sport. (Thanks to Phil Gould, our department's expert fisherman, for giving me the article from Dec., 2000.)

We learned about this January trip at a slideshow for the Connecticut State Museum of Natural History on the Storrs campus. The speaker and leader of the research, Prof. Morty Ortega, grew up and was educated in Chile, has pursued studies of Patagonia for some years, and is in the College of Agriculture and Natural Resources at UConn. He speaks Spanish, English and (I believe) the language of the large mammals he loves. My wife has pursued photography in challenging places around the world and, more or less, I have pursued my wife. We are waiting for a few thousand slides to return from Fuji developing.

Polls show 100% of scientists (and not many other Americans) know that it is high summer in January in the southern hemisphere. We flew directly from JFK to Santiago and then half the length of Chile to Punta Arenas. South of there is the sea. Ships travel in the austral summer from there to Antarctica. One was docked and ready for boarding. Not far away is Tierra del Fuego (Land of Fire). One can fly to more remote places, like the Falklands. (Save for future.) There are twenty hours of daylight in a 24 hour day at this latitude of 53 south..

We bounced in a van on rocky roads into Torres del Paine National Park, the region beckoning for scientific research. My Spanish hardly exceeds

the two crucial expressions, "Donde esta la bano" and "Una cerveza mas," but the Towers (los Torres) are monoliths almost 3,000 meters high. We pitched our tents at low altitude on the Meadows (las Vegas; aha! it does not mean the casinos). There were a couple of dozen people primarily in two-person tents by The North Face company. These were sturdy and withstood the wind. There were faculty, students, postdocs, and none of the above. In the campground, and they were there before us, were a male guanaco who chased other males away, a family of foxes, a family of skunks, and others unseen. A puma is deadly but knows how to hide. You will see paw prints and scat and know that he knows where you are.

You may not anticipate what part of a challenging trip will trip you up. Will it be the food, the water, the sleep, the (lack of) bathroom, the climbing, the thorny vegetation, your back? Actually the needs of daily life were well met. The Chilean cook was great; strict vegetarians sometimes had trouble. The water was pure; glacially fed springs are good for potability but not for washability, but there were showers at an official park campground. The outhouse door did not quite close and faced the Towers; this I called "a room with a view." The ubiquitous two-sided sign "Libre/ Occupado" had a humorous property. In a high wind with frequent gusts, it flipped unpredictably maybe 50% of the time and formed a model system for a binary random variable.

The land is a bit puzzling. There are many wetlands, ponds and streams, but the vegetation declares it to be semi-arid, consisting largely of succulents. Indeed, the recorded rainfall is low but not all the time. Past summers were dominated by "el nino" and "la nina" but not this one. We had what seemed like a large percentage of the year's allotment of rainfall. When the clouds dispersed, the sun was dazzling and burning but the air temperature stayed between 40 and 60 Fahrenheit degrees. Note that the much publicized and feared ozone hole is above the Antarctic and vicinity. We used sunscreen liberally. But my hands (due to windburn?) still resemble poorly wrapped slabs with freezer burn. Think of Florida sunshine and Icelandic wind. If you want to quickly experience Patagonia, here's what you do. Turn on a cold shower. Flip your fan on to high. Also turn on an ultraviolet lamp. Step in.

The research conducted in Patagonia is still in an early stage and is primarily in ecology. What animals and plants are there and in what numbers? Are the numbers growing or declining? Is there an endangered species? Is there a difference between the national park and the nearby range used by ranchers and farmers? Then there are all the questions about animal behavior; how do they interact with each other, with their offspring, with the environment, which now includes us (not what Heisenberg had in mind, but the measurer affects the measurement). The most striking animal species we saw in great numbers were the stately plump guanaco (a camelid, the wild version of the domesticated llama) and the condor (hanggliding on the thermals). Most participants on the trip did biology. A few did chemistry and brought back many samples for further study (pH, conductivity, salt content, and other properties of the water and land environment). The US Department of Agriculture is one of the agencies that greets you upon return, being interested in the living things, and their products, you are transporting. (Another researcher was

carrying tiny invertebrates from ponds.) All the US officials were curious about our trip and completely supportive of it. (Amusingly, the only hitch was diversion in Miami Airport while JFK was closed due to snow.)

So here's the plug for physics, including geophysics and meteorology. It appears to be a wide open area for study. Hardly anyone is doing it. We had one grad student using GPS equipment to map important physical features of the park. A small group made wind velocity and temperature comparisons at various locations. That's a start. The terrain is everything. We were in a valley swept by frosty wind from any direction. Why? To the north is the Andes and the edge of an ice sheet hundreds of miles long plus individual glaciers. In other directions lie the oceans with their unlimited amount of cold moisture. We saw new snow most mornings on the permanently snowcapped peaks and we heard the avalanches. We trekked to a beach where great chunks calved from glaciers pile up. Here is a puzzle: There is virtually no thunder or lightning in Patagonia. In other semi-arid places (New Mexico, say) there is a lot of it. What's the difference? We saw exceptional cloud formations. They came in and left rapidly. The sky was like a blue bowl with clouds of many hues painted on. You have to be there to believe them. The land is folded every which way by the restless earth. Layers are vertical and at many other angles. They curve around in unusual shapes. We saw an almost complete vertical circle of radius hundreds of meters from the road between campgrounds. What made it?

It was a great experience challenging ourselves in Patagonia. We enjoyed being with young students for their freshness and enthusiasm. They are braver than I was at their age (or at any age). The most indomitable of them would make a good run for the million dollars on the TV Survivor. The faculty and students are devoted to doing good work and to doing good in the world. The leader, Morty Ortega, is getting Chilean officials to take a greater interest in this vast area of their country. They have been almost ignoring an asset to their economy. Ecuador and Peru are thriving due to the interest and finances of "eco-tourism" and Chile is almost missing out. (Northern Chile is popular with travelers for its warm beaches and resort areas.) Patagonia is a tough region but so is the jungle and the former has no snakes.

I hope physicists with interest in geology, meteorology, and oceanography will travel to Patagonia. There is a lifetime of work to do there. The Chileans we met, as well as shopkeepers, restaurateurs, and so on, were friendly helpful people. Punta Arenas is a fine little city, quite European, with many visitors from all over. If you live in the park, make sure you are very well funded. Then you can stay at one of the nice lodges and not have to tent out. That's unless tenting is your bag. It wasn't mine but I survived.

DM

News of a New Textbook

Mechanics, Heat, and the Human Body (an introduction to physics) by Howard Goldick of the University of Hartford has been published by Prentice-Hall. It is a first course of the physics and applications needed particularly by students in physical therapy or related fields. Since I helped the author and editor in a small way, I have a small prejudice in favor of the book. But I hope teachers in the appropriate courses will not take my word but examine the book for themselves.

The book pays a lot of attention to forces and torques in healthy bodies and in injured bodies. I relate to Examples 2.13, 2.14, and 2.15 which show the same man walking normally, then walking with an injury, then walking with a cane to compensate for the injury. In his case it is a problem hip. From time to time I have a problem knee. In either case, the use of the cane is not what students first expect. It is not on the injured side but on the opposite side. Analysis by techniques of statics shows why. See for yourself.

If this book is successful, then there should be a market for a sequel, something like Electricity, Optics, and the Human Body. Of course, included in that would be magnetism to the extent that it appears in the body. The magnetic force which befuddles students trying to unravel helical orbits need not appear. Some attention should be paid to behavior on the molecular level and to nuclear radiations. In combination the two books would form the basis for a one-year course for health studnts. There is a question of whether schools of allied health want that. Some settle for one term but they could change their minds about that.

DM

New England Section Executive Committee Membership 2001

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The Last Bang or How Long, Oh Lord?

The tweetle beetle bottle paddle battle goes on, or that's what it seems like in this Dr. Seuss world. A recent installment occurred in early January (perhaps encouraged by election results). The Hartford Courant, that also publishes pieces by astrologers, printed an op-ed article that argued that physics, chiefly through the Second Law of Thermodynamics, supported "creation science" and contradicted evolutionary biology. The argument is old and omits all the important features of physics of the last century. Its author does not know about open systems, quantum mechanics, or Stuart Kaufman's fruitful idea of "order for free" coming from no more than obeying natural laws or simple rules of a game. Running up and down the email circuits at UConn were suggestions for formal rebuttal on the basis of physics, chemistry and biology if someone could gather the material for submission to the Courant. It won't satisfy faith healers but it should clarify things for most readers of the newspaper.

After my fall 2000 newsletter, I received an email from a reader named Pieder Beeli bearing on questions of science, religion and evidence. He wrote in part, "May I suggest that you read Warrant and Proper Function by Alvin Plantinga. I especially had the chapter Is Naturalism Rational? in mind after finishing your editorial. There are multiple usages of the word "science." One of the senses in which you used it is more appropriately called "naturalism." Of course science is bigger than naturalism and should be able to bear on it. E.g. "Is naturalism rational?" etc..." So I dutifully bought the book by Plantinga, who is a philosopher at Notre Dame. Reading it is a punishment for a crime I did not commit. I'll save you the trouble.

Plantinga has three long books, I believe, on the question, What do you need along with truth and belief that is sufficient for knowledge? (No, I don't claim to understand this question but I plowed through a few thousand of his answers.) Oldest is Warrant: The Current Debate and

newest is one he promised in the others, a Christian Warrant and Proper Function Structure. A friend pointed me to the pronouncement of the bellman in The Hunting of the Snark: "Everything I say three times is right." Now I don't want to get off on a rant here but it seems that Plantinga has pulled off the same scam that the Supreme Court did (5 out of 9 justices), deciding who the winner is on page 1 and then justifying it at length in the remainder. They all should have known better or been better fakers. Justifying what? In Plantinga's case, the meanings of a few words. Through the dense fog you can see that "warrant" means "justification" as in "Is my belief warranted?" and "proper function" means "doing what you're designed for."

In his discussion the author tortures reason beyond all bounds with numerous obvious crackpot cases like: Suppose I'm crazy, or Suppose I'm sick, or Suppose I'm dreaming. My legs should run but they hurt. I should recognize you but I don't. My personal favorites are items like: My toaster burns the toast but opens the garage door; is that proper? Just rename it, buddy; it's a garage door opener, not a toaster. In fact, that is the essence of evolution, a new skill coming into being by modifying the function of a device or organ. Light-sensitive skin perhaps became eventually a basic eye. Plantinga never heard of coevolution. The competition hastens evolution with time to spare. The garage door had to be invented too. Get it? I recall a Hitchcock drama in which a blind society surgically blinds a sighted visitor, obviously a case of improper function.

Plantinga reveals his need for the supernatural to govern the natural, the inexplicable explaining. But we already have perfectly good unseen bases for the seen: selection pressure in biology and the wave function in physics. The wave function is weird but it makes the dials settle on certain values, and that's good enough. Of course that's just my opinion. I could be wrong.

DM