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THE OHIO STATE UNIVERSITY STATISTICS DEPARTMENT NEWS

editor: Mike Fligner

Letter from the Chair
by Bill Notz

This year has been noteworthy in a number of respects. Many faculty are away this year and so we have a large number of visitors in the Department to take their place. We finally have all our students and faculty housed in Cockins Hall. A new initiative is under discussion which will improve undergraduate teaching. These are all discussed below.

Several faculty are on leave or special assignment. Tom Santner, Angela Dean, and Jason Hsu are taking sabbatical leaves. Mark Berliner and Doug Wolfe are on special assignments. More information can be found concerning these faculty later in this Newsletter.

Although Tom Santner is on leave, he has agreed to serve as Department Chair for another four years. In the interim, I am serving as Acting Chair. We also have an Acting Dean for the College of Mathematics and Physical Sciences, Professor Robert Gold, from the Department of Mathematics. A search is underway to replace our former Dean, Professor James Garland, who left to take the position of President of Miami University in Oxford, Ohio. With all these actors on stage, one might be forgiven for thinking that the Department of Theater has been incorporated into the College.

After several years of preparation, the new Biostatistics Program has started. This is a joint venture of the Department of Statistics and the School of Public Health. The Program received special Academic Enrichment funds from the University to hire a permanent Director of the Program and an Administrative Assistant. A search to fill these positions is currently under way.

For at least as long as I have been a member of the Department (dating back to 1984), we have always had a shortage of space. Graduate students have been housed in a variety of temporary locations, perhaps the most unusual being some apartments above Bernie's Bagels on High Street. This past Autumn, Geodetic Science moved out of Cockins Hall and into Bolz Hall, leaving the third and fourth floors of Cockins vacant. We are now working on a plan to move Statistics into this space. This will take place in phases, some of which cannot occur until a new elevator is installed in Cockins. Installation of a new elevator is scheduled to begin in late summer or early autumn 1997. The first phase of our move was simply to find offices for all graduate students, staff, and faculty in Cockins. This was accomplished in December and all members of the Department now have offices in Cockins Hall. Eventually, the bulk of the Department will be located on the third and fourth floors of Cockins with a few offices on the second and first floors. The first and second floors will be shared with Mathematics and the Math/Stat. Learning Center (see below). Completion of the move into new space will depend on when the new elevator is completed and when money is available to remodel space on the third and fourth floors to meet our needs. The next phase is to move the main office to the fourth floor. This will take place this summer, since the new elevator will go through the current location of the main office!

A project to improve undergraduate teaching in Mathematics and Statistics is under discussion. This involves the creation of a Math/Stat Learning Center. This Center is envisioned as a collection of tutor rooms, group study areas, mock teaching rooms, small computer labs for

tutoring, technology resource rooms, a distance learning lab, an honors lounge, a vending machine area, and offices to coordinate these activities. As Statistics vacates the basement of Cockins and possibly portions of the first floor, this space could be used to house the Center. By consolidating the efforts of Mathematics and Statistics, sharing resources, and locating many of the services we provide to support our teaching in a single location (remodeled to be comfortable and convenient for students) we hope to improve the teaching we do that takes place outside the classroom. While still in the planning stages, we are excited about the potential of this project as is the College.

I close this letter with some very good news and some very sad news. The good news is the arrival of a member of the class of 2018. Elizabeth Stasny delivered a baby girl, Rebecca, in November 1996. Rebecca has already visited the Department and rumor has it that Professor Blumenthal (our graduate chair) has offered her a fellowship.

In June, 1996 the Department experienced a tragic loss. Craig Cooley, one of our senior graduate students, was killed in a hit - skip accident on his way to school. The driver of the vehicle which struck his car ran a red light, abandoned their car, and then fled the scene. It took a week to find the driver. Craig had successfully defended his Ph.D. thesis, had accepted a position at Carleton College and was writing the final version of his thesis when the tragedy occurred. The University held a special ceremony at summer graduation to award Craig his Ph.D. posthumously. In memory of Craig, the Department has initiated a new award for our graduate students, The Craig Cooley Memorial Prize, to recognize both scholarly excellence and leadership, as demonstrated by service to the Department or University.

SPOTLIGHT ON RESEARCH

In this section, we focus on the work of one or two faculty members. This year we highlight the work of **Mark Berliner** and joint work of **Tom Santner** and **Bill Notz.**

MARK BERLINER

The Division of Mathematical Sciences of the National Science Foundation is funding a multi-year effort establishing a statistics/ probability program at the National Center for Atmospheric Science in Boulder, Colorado. The result is the NCAR Geophysical Statistics Project (GSP). **Mark Berliner** began a two-year appointment as Project Leader in the Summer of 1995, and will be returning to Ohio State at the end of this summer.

The primary mission of this program is
1) To foster excellence in the use of modern statistical science in the research areas of interest at NCAR.

2) To attract and provide support to university statistical scientists for collaborative research related to the atmospheric sciences.

To fulfill its mission, the GSP engages in research in statistical science and its application to the atmospheric and allied sciences, and supports a variety of collaborative efforts between statistical scientists and disciplinary scientists. Currently, the Project staff includes one Associate Scientist, one administrative assistant, and six postdoctoral fellows. Each postdoc is responsible for one major, collaborative project with an NCAR group. Five current collaborative efforts between NCAR scientists and GSP postdocs are reviewed below.
(1) In modern, large-scale weather forecasting numerical models are combined with observational data to produce basic information used in forecasting. Meteorologists have recently focused on developing "optimal" methods for collecting the requisite data. We are the first research group to approach the problem from a statistical design of experiments view.

(2) We have established a relationship with an ecosystems dynamics group at NCAR. Through this effort we have developed an historical (1895-1993) gridded climate dataset for the conterminous United States. The statistical reconstruction is based on a spatial-temporal analysis of observations (temperature and precipitation). This was a massive undertaking in that the data set is massive (10 million observations), yet irregular. A video of the results has been prepared.

(3) Together with the oceanography group at NCAR, an investigation into the dynamics of sea-surface winds and their role in driving certain ocean features is underway. We are developing a spatial-temporal interpolation scheme for processing information about winds obtained from a satellite device (a scatterometer). This work has also lead to a three-way interaction between GSP, the oceanographers, and a mesoscale numerical modeling group at NCAR.

(4) Modeling of various properties of clouds has long been recognized as a crucial, yet incomplete aspect, of large-scale atmospheric modeling. In a joint project with a senior climate modeler and his associates, we are developing a statistical model for cloud processes. A predictive version of the model will be incorporated into a climate model as a stochastic parameterization of subgrid-scale properties of clouds. (That is, cloud properties at spatial scales finer than those rectified by the model will be estimated.)

(5) Modeling and understanding of stratospheric ozone is fundamental in climate and climate change studies. We have developed an ongoing project with an NCAR atmospheric chemistry group. GSP members are developing a variety of space-time statistical analyses of both station vertical profiles and satellite observations.

In addition to the projects discussed above, we are engaged in research activities on the following topics: Bayesian co-Kriging, hierarchical space-time analysis, ensemble forecasting (a cousin to Monte Carlo) in weather prediction, and statistics in climate change studies. Another project involves models for Lagrangian ocean data (data collected from floats)---this is work with **Roger Bilisoly** and **Steve MacEachern** at OSU.

BILL NOTZ AND TOM SANTNER

In a proposal recently funded by the National Institutes of Health, **Bill Notz, Tom Santner** and a group of graduate students will use and develop statistical methodology for designing computer experiments to design better hip and knee prostheses. (for our older alumni and faculty!)

The motivation for this effort is that, in the past two decades, the analysis and design of bone-implant systems has played a fundamental role in orthopedic practice. For example, structural analyses of total knee replacements have explained why some replacements have failed and how design changes in the tibial component, such as the addition of a metal backing, can affect performance. However these studies have been limited in their realism in several ways.

Perhaps the most important of these is that researchers have used simplified structural analyses in their search for better prostheses. The realistic, detailed structural analyses of a bone-implant system is nonlinear. Contact stress problems are inherently nonlinear whether or not one includes the nonlinear stress-strain behavior of the polyethylene in the implant. In particular, the behavior of uncemented fixation stems for total hip replacements is nonlinear because, in the absence of bony attachment, only compressive and frictional shear loads can be transferred across the bone-prosthesis interface. A complex contact problem must be solved to even determine where load is transferred between the bone and the prosthesis.

Thus realistic analyses of a single geometry for an implant in a given environment of loading and bone structure, are computationally expensive and time consuming. In particular, consider the calculation of the stress shielding, the phenomenon in which a stiff implant prevents the bone from supporting the body and hence the bone becomes weakened through disuse. The analysis for a single geometry, loading condition and tissue structure requires one to four hours on an IBM 3090 mainframe

computer and eight to thirty-six hours on an IBM~RS6000 workstation. Similar times are required for the analysis of other implant systems.

As a result of this computational burden, only limited variations in loading conditions and patient factors, such as bone quality, have been included in design analyses of these systems. Important factors being ignored include loads on the system which are quite different between active and sedentary patients and bone tissue properties which change with age and may be altered by diseases such as osteoporosis.

This project is the first to establish methodology that can be applied to a broad range of problems in orthopedic biomechanics that involve computationally expensive, nonlinear analyses and variable patient and loading characteristics. The statistical components include the choice of prosthesis design variables, loading conditions and bone properties at which to run the code. The predictors of the stress shielding will be developed for geometries, loading conditions and bone properties not run. Finally, an appropriate function of the stress shielding or other design objective will be optimized.

WHAT IS HAPPENING IN BIOSTATISTICS

The Biostatistics Program has recently moved into its remodeled offices in Starling Loving Hall. Before the furniture arrived, faculty and other researchers gathered for food, drink and some very quick speeches at an open house on August 28 (including a few well-wishers from the Cleveland Clinic). The new facilities are the hub of the consulting activities which are managed by Dr. Peihua Qiu, a Senior Research Consulting Statistician who joined the Biostat Progaram from the University of Wisconsin at Madison on November 1, 1996. Also joining the program this past year is Dr. Lisa Jones, a Senior Statistician hired to work on two large scale collaborations with researchers in the College of Optometry. These projects deal with identifying risk factors for the development of myopia in children and with refractive error changes in adults over 45 years of age.

In the first couple of months of operation, faculty and staff in the Program have collaborated on a wide range of biostatistical projects - from designing a study of a new treatment for reducing the infection rate associated with catheter placements in dialysis patients to the analysis of a clinical trial to test the use of ant venom in treating arthritis.

Funding for the infrastructure of the Biostat Program was awarded this past year with commitments from The Ohio State University's Office of Research, the Colleges of Medicine and of Mathematical and Physical Sciences, The School of Public Health, The Statistics Department, and the Comprehensive Cancer Center. The Program also won an Academic Enrichment grant to fund an administrative position and to support the salary of a full time Program Director. Finally, a grant from the Ohio Board of Regents provides equipment funds. The Biostat Programs's planning committee includes Interim Director Mel Moeschberger, Deputy Director for Research and Education Hani Doss, Deputy Director for Design and Analysis Dennis Pearl, and Deputy Director for Information Services Sandra Mamrak.

LINKS WITH INDUSTRY AND GOVERNMENT

Over the years, the Department has fostered links with industry and government through its research and seminar programs and its Industrial Advisory Board. An update on the advisory board follows.

Members of the Statistics Department Industrial Advisory Board interact with the faculty on research projects; they help obtain internships for students; they recommend topics to be included in the curriculum for students who intend to work in industry or government, and they facilitate the funding of fellowships for students. This year there have been many changes in the membership of the board. We would like to thank retiring members **Dr. Joseph Chmiel**, Director of the Statistics and Data Management Department of Abbott Labs, **Dr. Robert Tortora**, a Vice President of Gallop, and **Dr. Stephen J. Ruberg**, Global Vice President, Statistics and Clinical Data Management, Hoechst Marion Roussel, Inc., for their support of the department over the past several years. We would also like to welcome our new board members, **Dr. Tommy Wright, Dr. Bob Ahlbrandt** and **Dr. Tony Lachenbruch.**

The current advisory board, including some background information on the members, is given below.

- **Dr. Bob Ahlbrandt,** joining the board this year, is the Director of Biometrics at Hoeschst Marion Roussel. He has been with Hoeschst Marion Roussel since receiving his Ph.D. from Colorado State in 1988.

- **Dr. Tony Lachenbruch,** joining the board this year, is currently Chief of the Biostatistics Branch of the Division of Biostatistics and Epidemiology Branch of the Food and Drug Administration Previously, he was a member of the Department of Biostatistics at the University of North Carolina (1965-1976), followed by Professor and Head of the Department of Preventative Medicine and Environmental Health at University of Iowa (1976-1985), and Professor and later Chair of the Department of Biostatisics in the School of Public Health, UCLA (1985-1992).

- **Dr. Elizabeth Margosches** is Section Chief of the Epidemiology and Quantitative Methods Health Effects Branch of the EPA. Dr. Margosches has served on the advisory board since 1992.

- **Dr. Daniel Meyer** is Manager of Statistical Services at the Lubrizol Corporation. Dr. Meyer has served on the advisory board since 1992.

- **Dr. Randall Potter**, an alumni of our department, is with the Quality Engineering Department, of Lucent Technologies. Dr. Potter has served on the advisory board since 1992.

- **Dr. Tommy Wright,** joining the board this year, is an alumni of the Statistics Department at Ohio State and is currently Chief, Statistical Research Division for the US Bureau of Census. Before joining the census bureau in 1996, he worked for close to 20 years at Oak Ridge National Laboratory in Tennessee, and has been on the faculties of Knoxville College and the University of Tennessee.

Due to the extensive reorganization of the board and the number of faculty on leave this year, our annual advisory board meeting was not held. The next meeting of the full board is scheduled for Fall of 1997. However, we did have visits to the department by Dr. Margosches and Dr. Meyer. In addition to meetings with faculty and students, each spoke in the Department's Colloquium series. Dr. Margosches visited in the fall quarter and gave a talk on Health Risk Assessment at the US Environmental Protection Agency and Dr. Meyer gave a talk dealing with the Analysis of Large or Complicated Fractional Multi-Factor Experiments during the spring quarter

INDUSTRIAL SUPPORT

Each year the Department of Statistics is able to offer special recruitment Fellowships to some of the very best new applicants to our graduate programs. These Fellowships are funded through the generous support of sponsoring industrial organizations, for which the Department is always grateful. The sponsoring organizations, their Fellow-ship stipend amounts and the 1996-97 student recipients are as follows:

Lubrizol Foundation Fellowships
A single year award in the amount of $1,500, and a two-year award at $1,500 per year are

provided; the 1996-97 recipient of the two-year award is **Steve Goodman** from the University of Dayton and the recipient of the one-year award is **John English** from the University of Toledo.

The Dow Chemical Company Foundation Fellowship
One award in the amount of $1,500 is provided; the 1996-97 recipient is **James Mulik** from Rockhurst College.

Hoechst Marion Roussel Fellowship
One award in the amount of $1,500 is provided; the 1996-97 recipient is **David Hoffman** from Elizabethtown College.

We appreciate all the past support from the Lubrizol Foundation, Hoescht Marion Roussel, and the Dow Chemical Company Foundation.

THANK YOU

We wish to say a special thank you to all of you who help support our Department activities through your donations to the University. You are helping to make lives richer for the students who are following in your footsteps. We encourage you to specify your University donations to be applied to one of the following Statistics Department funds:

525898 Powers Award (teaching awards for graduate students and faculty)

536826 Whitney Scholarship (awards for consulting and research for graduate students)

526245 Rustagi Memorial Lecture

537669 Statistics Support Fund (support for visiting colloquium speakers and conference travel awards for graduate students, Craig Cooley Memorial Award)

WHAT IS HAPPENING IN TEACHING

New Courses and Seminars

H. N. Nagaraja is developing our first undergraduate honors course. The course will be a biostatistics course for upper level honors students, and will be taught for the first time in Spring, 1998 as Stat 318.

Mike Fligner is developing a SAS workshop for our graduate students. An experimental run was done this spring with about 20 students attending. The workshop should be officially in place by the 1997-98 academic year.

Elizabeth Stasny, in conjunction with faculty from seven other departments, received a University grant for an interdisciplinary seminar series, which made possible a Seminar on Survey Methodology which ran both Winter and Spring quarters in 1997. The seminar was jointly offered by the Departments of Statistics, Economics, Sociology, Psychology, Political Science, Marketing, Public Policy, Journalism/Communication, and Agricultural Economics. It covered all aspects of Survey Research including survey design, nonsampling errors, how to ask questions, cognitive aspects of surveys, survey ethics, handling large survey databases, polling and the media, market research, and surveys and political campaigns. During Winter 1997, outside speakers included Robert Groves from the Joint Program in Survey Methods and Graham Kalton from Westat. Another outside speaker was an interviewer with over 20 years experience in conducting personal and telephone interviewers who gave the class a view of surveys from those who do the most important work -- collect the data.

Joe Verducci helped to organize a special joint seminar in Statistical Genetics this fall, with the help of Doug Critchlow, Dennis Pearl, Mark Irwin, Shili Lin, and Steve McEachern. This was attended by a mix of faculty and students, about half of whom came from Molecular Genetics.

Dennis Pearl continued his yearly tradition of constantly revising the Lab and Exercise Manual for Statistics 135. Royalties from the Lab Manual are used to purchase course supplies (like 60 pounds of M&M candies purchased each quarter so that 700 students can each make a confidence interval for the percent that are brown - and then eat the raw data!). This year our TAs were grateful to have an expanded Instructor's Guide which included a section of day-to-day teaching tips written last Spring by former TA Alistair Sutcliffe. A new section on teaching tips for night time graduate student lecturers was written by Laura Salter and added to the guide this Fall. This year Dennis instituted a $50 prize to TAs who suggest significant ways to improve the Stat 135 laboratories. Jason Gordon, John Kindelberger, Jim Rogers, Laura Salter, and Zoltan Szentkiralyi are each $50 richer because of their perceptive ideas.

1996-7 Special Topics Courses

In the Winter Quarter 1997, H. N. Nagaraja offered a course on Record (Breaking) Statistics based on a manuscript he is working on in collaboration with Barry Arnold (UC Riverside) and N. Balakrishnan (McMaster University). The course examined the basic distribution theory associated with statistics such as record values (upper and lower), record times, inter-record times, and the number of records. For the so called classical model that assumes the observations are i.i.d., the records become rarer at an exponentially decreasing rate. This is unrealistic for the study of records from say athletic events and Wall Street. Consequently we examined several alternate record models where the distribution of the observations may change according to certain patterns. We also examined random record models where the observations arrive at random time points (as it happens in shock models). With all the abundant literature on records, we are still waiting for that perfect record model that will predict with perfection the next record high for the Dow Jones industrial average. Stay tuned!

In spring quarter 1997, **Joe Verducci** taught a special topics course on Conditional Inference with **Xiaotong Shen.** An important step in analyzing data is to decompose it into three parts: one to estimate the parameter or feature of interest in a statistical model, one to indicate the accuracy of the estimator, and one to check on the model. Recent work by Barndorff-Nielsen and Cox now provides asymptotic approximations (accurate up to $O(n^{-3/2})$) to the conditional distribution of the first component given the second. Conditional inference is perhaps most important in situations where many nuisance parameters affect the distribution of the MLE. Practical examples include tree-structured dependency models, such as occur in statistical genetics, and semi-parametric models, such as occur in survival analysis.

About the Consulting Service

Many thanks go to the graduate students who worked in the Consulting Service this year. Without their hard work, devotion, and high level of professionalism, we could not have responded to the increase in demand that we faced. Both the number and extent of projects handled by the Service have been on the rise. In addition to the many projects originating from within the Ohio State community, we had the opportunity to work with a wide selection of clients from industry and State agencies. Interest-wise, the scope of these projects ranged from superabrasives, to banking and credit industry, planning for school facilities, and gene mapping. Geographically, the scope extended to cross-border trade in Ghana, in a fascinating study originated by the International Business Initiative. Hot political issues have also been a recurring theme in many of our recent projects. An ongoing project with the Ohio Department of Health involves the study of health care coverage patterns as they vary across the State. The lack of suitable data and the complexity emerging from combining multiple (and often inconsistent) sources of information have made this problem challenging enough to require an extraordinary amount of effort and creativity. We look

forward to working with the Department of Health as the project continues into its second year. In another study originated by the office of criminal justice we investigate spatial patterns and time trends in juvenile crime. Incomplete data records have also made this problem both challenging and interesting from the statistical methodology point of view. Finally in two separate studies associated with the Ohio Department of Transportation, we have been studying stream flow patterns and pavement evaluation systems. For more information on our consulting activities, we invite you to visit our web site at scs.stat.ohio-state.edu.

AWARDS

POWERS TEACHING AWARDS

The **Thomas and Jean Powers Teaching Awards** are presented each year to (i) an outstanding instructor from among the assistant and associate professors in the Department, (ii) an excellent graduate student lecturer (with sole responsibility for a class), (iii) an excellent recitation instructor. These awards were instituted in 1986, via a generous donation to the Statistics Development Fund by Tom and Jean Powers.

In 1996, the faculty award was presented to **Elizabeth Stasny,** and in 1997 the award was presented to **Doug Critchlow**. Both now join the ranks of our multi-year winners which include Mark Berliner and Bill Notz. Other past award winners include Steve MacEachern and H. N. Nagaraja.

The Department is lucky to have a large number of excellent Graduate Teaching Associates. The selection of "the" best instructor is never an easy task, and there are always a number of extremely good teachers who are runners-up for the award. In 1996, the award for best lecturer was presented to **Srinath Sampath**. The best recitation instructor awards were presented to **Jennifer Holdcraft** and **Alistair Sutcliffe**. In 1997, the award for best lecturer was presented to **John Kindelberger**. The best recitation instructor awards were presented to **Justin Kubatko** and **Jennifer Rossi**. Each of these TA's made an outstanding contribution to the teaching mission of the Department.

WHITNEY AWARDS

In 1992, Professor Emeritus **Ransom Whitney** and his wife **Marian Whitney** made a generous donation to the Statistics Development Fund to institute three new awards for graduate students. These awards are for Statistical Consulting, performance as a Graduate Research Associate, and for Ph.D. research. In 1996 the winner of the best consultant in the Statistical Consulting Service was **Jim Colton** and the 1997 winner is **Steve Bortnick**. The award for the best consultant working as a research associate on a research grant was presented to **Greg Elfring** in 1996 and to **Nicole Demers** in 1997. The award for the best research leading to the Ph.D. was presented to **Glenn Hofman** for 1997. Glenn presented his research in the Department's winter colloquium series, after which he was formally presented with the award. We congratulate these people and thank them for their hard work.

UNIVERSITY GRADUATE ASSOCIATE TEACHING AWARD

Laura Salter was winner of the University graduate associate teaching award. This award is given to the top 10 graduate teaching associates throughout the university, and includes a $1500 check. Laura was also selected as a Provost Teaching Fellow, an additional honor awarded to six of the Teaching Award winners. Congratulations and thanks for your contributions to the department's teaching mission over the past several years.

PRESIDENTIAL FELLOWSHIP

Joan Hu has been awarded a University Presidential Fellowship for her dissertation research. Joan is working under the direction of **Professor Stasny**. Joan's dissertation research is concerned primarily with handling missing data in logistic regression models using a modeling approach for the missing data mechanism. An example of a data set to motivate the methodology is a pension coverage data set in which about 10% of the subjects "don't know" their pension status. Such nonresponse (not knowing) may be related to pension status in that people without a plan may be more likely to know their status. In general, if nonresponse is related to the unobserved variable, as in the pension coverage data set, then the incomplete data is said to have a nonignorable missing data mechanism. Maximum likelihood estimation and a general formulation of Bayesian estimation are being developed for such nonresponse models. Iterative computation algorithms, such as the EM algorithm and the Newton-Raphson method, are necessary for fitting these models.

Doug Wolfe was given the Outstanding Service Award from the Council of Graduate Students. This award was given in recognition of special initiatives undertaken by Prof. Wolfe while serving as an Associate Dean in the Graduate School.

In memoriam: *Craig Cooley Memorial Prize*

Craig Cooley was killed in a tragic hit-and-run automobile accident on June 14, 1996. At the time of the accident he was about to recieve his Ph.D. and take a teaching position in Minnesota. To honor his memory the department has created the *Craig Cooley Memorial Prize* to be presented annually to a graduate student in the department. The first award was presented to **Kathleen Fritsch** at the Spring picnic. The criteria for the award are scholarly excellence and leadership, two qualities that Craig embodied throughout his graduate career. Donations for the award can be sent to the Statistics Support Fund (537669), with an indication that the contribution is to be applied to the *Craig Cooley Memorial Prize.*

NEW GRANTS AWARDED TO FACULTY

Bill Notz and **Tom Santner** have received a grant from the NIH to work on developing better hip and knee prostheses. More details of this work can be found in the Spotlight on Research.

Shili Lin received an NSF Research Planning Grant which provides funding to develop statistical methods for summarizing and combining gene maps. For a more unusual source of funding, together with Barbara Licht and Mark Licht, they have received funding for their Poodle Project (genetic mechanisms of idiopathic epilepsy in poodles) from the Poodle Club of American (PCA) and the American Kennel Club (AKC).

Prem Goel and **Elizabeth Stasny's** grant from the USDA has been renewed for another year. They are continuing their work on county estimation of crop production. Currently they are investigating methods of obtaining estimates for counties with little or no data in the sample of farms.

VISITORS AND SEMINARS

Yuh-Ing Chen is visiting the Department for the 1996-1997 academic year. She received her Ph.D. from OSU in 1989, and wrote her dissertation under the direction of Doug Wolfe. She is currently on leave from the National Central University in Taiwan. While here Yuh-Ing is teaching and working jointly with Doug Wolfe on developing umbrella tests for right-censored data.

Ashish Das, from the Indian Statistical Institute of Calcutta, completed a two year visit with the department this past summer. While here, he taught and collaborated on several papers with Angela Dean and Bill Notz. One of the papers involved optimal designs for experiments in which the block size is not fixed. Others involved block designs in which treatments are not replicated equally.

Mark Farmen is visiting the Department for the 1996-1997 academic year. He is interested in the implications of nonparametric smoothing results in use of statistical inference in "mining" large data sets. The trade off between bias and variance is important in setting tuning parameters. He is also interested in the assessment of performance of data-mining applications. He is involved in some collaborative work with the Chemical Abstract Service of the American Chemical Society on a project aimed at validating a large statistically based method for assigning key words to articles.

Constantinos Fokianos is visiting the Department for the 1996-1997 academic year. He received his Ph.D. from the Department of Mathematics at the University of Maryland at College Park. His area of research is in the field of integer-valued time series. While here, he teaches full time and is involved in research projects with Joe Verducci and Xiaotong Shen.

Panickos Palettas our first Visiting Professor in Statistical Education, is in the second year of a multi-year visit. While here, Panickos is directing the Statistical Consulting Service, teaching the consulting courses, Stat 600 and 601 in the Applied Masters Program, and continuing to develop computer lab based undergraduate courses for engineers.

Keven Ryan is visiting the Department for the 1996-97 academic year. He came to us from the Statistics Department at the University of Durban-Westville in Natal, South Africa. While here he taught Statistics 135, 145 and 635 (Time Series). His research interests involve patterns in replicated experiments.

Kay Tatsuoka, a graduate of Rutgers University, is visiting the Department for the 1996-97 academic year. While here, he taught full-time and conducted research in robustness and discriminant analysis.

Dong Hoon Lim from Gyeongsang University in South Korea, is visiting the department from January 1, 1997 through December 31, 1997. He is supported by a grant from KOSEF, which is the Korean equivalent of NSF, and will be working with Doug Wolfe on some problems in nonparametric statistics.

In addition, there were a number of short term visitors this past year who contributed to the teaching and research missions of the Department. **Joseph Ginebra**, from the University of Barcelona in Spain, visited the Department during the Autumn quarter, 1996. **Chandra Gulati,** of the University of Wollongong in Australia, visited the Department in December 1996 and January 1997. **Catherine Scipione Forbes**, one of our recent graduates, visited the Department in April. She is currently working in the Department of Econometrics and Business Statistics at Monash University in Melbourne, Australia. While Catherine was here we all finally got to meet her son, Jeremy Ezra Forbes. **Professor N. Balakrishnan,** from McMaster University, Canada visited during Autumn, 1996. He is coauthoring a book on Records with B. C. Arnold of UC, Riverside and H. N. Nagaraja.

The following is a list of colloquium speakers for this academic year and their affiliations:

N. Balalkrishnan, McMaster University
Kathryn Chaloner, University of Minnesota
Kostas Fokianos, Ohio State University
Ben Hillberry, Purdue University
Kay Tatsuoka, Ohio State University
Paul Kvam, Georgia Tech
M.L. Aggarwal, University of Delhi
James Berger, Purdue University
Barry Nelson, Northwestern University
Augustine Kong, University ofChicago
Robert Groves, University of Michigan
Thaddeus Tarpey, Wright State University
Graham Kalton, Westat Inc.
Mark Farmen, Ohio State University
Ashok Krishnamurty, Ohio State University
James Albert, Bowling Green University
Keven Ryan, Univ. of Durban Westville
Chap Le, University of Minnesota
Omer Ozturk, Ohio State University
Michael Miller, Washington U, St. Louis
Elizabeth Margosches, EPA
David Scott, Rice University
Elke Weber, Ohio State University
Glenn Hoffman, Ohio State University
Nandini Raghavan, Ohio State University
Jeff Helterbrand, Eli Lilly
Catherine Scipione Forbes, Monash Univ.
Dan Meyer, Lubrizol Corporation
Shangang Zhou, Ohio State University
Christopher Portier, NIEHS
Theodore Allen, Ohio State University
J. Huston McCulloch, Ohio State University
Andrew Nobel, Univ. of North Carolina
Benjamin Kedem, University of Maryland
Roger Tourangeau, NORC
Edward Wegman, George Mason Univ.
Michael Meredith, Proctor and Gamble
Jorge G. Morel, Proctor and Gamble

THE FACULTY AND STAFF

New Faculty

Omer Ozturk received his Ph.D. from the Pennsylvania State University in 1994. He then spent two years at Portland State University at Portland, Oregon as a Visiting Assistant Professor before joining the department in Autumn 1996. Omer is teaching at the Marion Branch. He is interested in robust estimation and testing, nonparametric procedures and ranked set sampling. His current research projects include developing optimal designs for ranked set sampling, and the continued development of a general framework for minimum distance and nonparametric estimation and testing procedures. Additionally, he is co-authoring a section for a new book "Asymptotics, Nonparametrics and Time Series" to be published by Marcel and Dekker Inc..

Books

Robert Bartoszynski (jointly with M. Niewiadowska-Bugaj) have written *Probability and Statistical Inference* published by Wiley, 1996.

Jason Hsu's book entitled *Multiple Comparisons: Theory and Methods* was published by Chapman and Hall, 1996.

Promotions

We are pleased to report that **Dennis Pearl** has been promoted to Full Professor and **Mario Peruggia** has been promoted to Associate Professor with tenure, both effective Autumn Quarter 1997.

Staff news

Peg Steigerwald was promoted and her title reclassified to Office Associate due to the increase in her responsibilities as graduate admissions assistant and general office support person. Congratulations, Peg! One of our student employees left the Department Fall Quarter. Amy Magri, student employee in the main office for the past 2-1/2 years, graduated and plans to pursue a degree in Veterinary Medicine. However, the same quarter we welcomed two new undergraduate student

employees to the main office: Kristin Palmentera and Andy Kihm. Kristin is a sophmore in pre-med and Andy is a freshman in engineering. We hope to expand the number of office staff this summer by hiring a full-time, permanent secretary/receptionist.

Faculty Research and Activities

The recent research and activities of the faculty not reported on elsewhere in the newsletter are described below.

Robert Bartoszynski was an invited speaker at a Statistical Conference in Cairo, Egypt, where he gave a talk on new goodness-of-fit tests for multivariate data. These results were joint with Dennis Pearl and John Lawrence.

Mark Berliner is completing the second of a two year leave at NCAR. His work is highlighted in the Spotlight on Research.

Michael Browne spent September in Japan in the Institute of Mathematics at the University of Tsukuba in their Gaikokujin Kenkyuin (foreign researcher) program. During this time he also gave lectures at the Joint Meeting of the Behaviormetric Society of Japan and the Japanese Statistical Association, the Department of Educational Psychology of the University of Tokyo, the Institute of Statistical Mathematics, the Department of Informatics and Mathematical Science of Osaka University and the Department of Information Engineering of Osaka Electro Technical University. He spent a morning with the Research Division of the National Center for University Entrance Examinations. He returned with a very favourable impression not only of the general level of research in Psychometrics and Multivariate Analysis in Japan but also of the courtesy and warm hospitality of his hosts.

His current research is in developing a non-iterative method of interbattery factor analysis. This technique may be used to investigate relationships between sets of measurements rather than within sets as in standard factor analysis. He is also involved in research on methods for the analysis of longitudinal data.

Doug Critchlow and **Dennis Pearl** are continuing their work with Paul Fuerst (Molecular Genetics) and Statistics Ph.D. students Xiong Hu, Min-Hui Wang, and Qiang Wang on methods of statistical inference for phylogenetic trees and nucleotide sequence data. Also Shuying Li and K. Nourijelyani have recently completed their Ph.D. dissertations in this area.

Angela Dean is on sabbatical for the academic year 1996-97 and is visiting the University of Southampton in England. She is working on a problem of grouping factors in industrial screening experiments with Dr. Susan Lewis of Southampton. Other recent work includes designs for cross-over experiments with Ken Russell of University of Wollongong, Australia. Angela talked about this work at the ASA conference in Chicago, at the Bernouilli conference in Vienna, Austria, and at the University of Reading, England. Angela also worked on designs for partial diallel cross experiments with Ashish Das while he was visiting the department.

Angela Dean became an Associate Editor of the Journal of the Royal Statistical Society series B, in September, 1996.

Mike Fligner is now vice-chair of the deparment. Together with **Bill Notz** and John Bart from Zoology, a first draft of the book, *Statistical Methods in Behaviorial Ecology* has been completed. It is to be published by Cambridge University Press. Mike has also been keeping busy playing alto saxophone with a band for the last year. The group, called the Glen Echo Quartet, has been playing locally at coffee shops and festivals. If there's ever a national tour, keep your spare bedrooms available!

Jason Hsu was invited to write, with Roger Berger of North Carolina State University, a survey article on "bioequivalence," with application in (but not limited to) the approval of generic drugs via the ANDA (Abbreviated New Drug Application) process.

Mark Irwin is continuing his collaboration with Patricia Parker of the Zoology department investigating breeding habits of sea turtles. He has also become President of the Columbus Chapter of the American Statistical Association.

Shili Lin is continuing her work in developing statistical methods for summarizing and combining genetic linkage maps (with Terry Speed), and in studying the genetic mechanism of idiopathic epilepsy in poodles (with Barbara Licht and Mark Licht). Her current research projects also include the development of Markov chain Monte Carlo methods for genetic pedigree analysis, such as modelling complex genetic traits and model selection (with John Lawrence).

Steve MacEachern is continuing to work on the development and use of simulation methods for fitting complex Bayesian models. A particularly interesting direction, taken in joint work with **Mario Peruggia**, has been to transform the output of a simulation to achieve a reduction in the variance of estimators.

As advisor to the late Craig Cooley, Steve became involved in the classification problem. Craig developed a nonparametric version of classification, based on density estimation, which compares quite favorably to parametric methods.

H. N. Nagaraja continues his research work in the area of record values (with Ph.D. student Glenn Hofmann), concomitants of order statistics (with Ph.D. student Scott Linder). In addition, as a Professor of Medicine and Biostatistician at General Clinical Research Center at the OSU College of Medicine, he collaborates with numerous researchers on modelling and analyzing medical data.

Bill Notz has been Acting Chair of the Department this year. His joint work with Tom Santner is highlighted in the Spotlight on Research.

Dennis Pearl is continuing his funded collaborations with neuro-oncology researchers. He currently serves on the national coordinating body overseeing the NCI's inter-institutional Glioma Marker Network which seeks to find laboratory markers of brain tumor prognosis.

Nandini Raghavan has completed the work that was proposed for the NSF grant on the investigation of frequentist properties of Bayesian procedures for inference in the nonparametric logistic regression setting. Another project, developing an efficient algorithm for doing adaptive importance sampling from mixture distributions has also been completed.

A collaborative research effort was initiated by **Prem Goel** and Nandini Raghavan with Somnath Ghosh, Associate Professor in the Department of Aeronautics Engineering, Applied Mechanics and Aviation for developing stochastic models to model microstructure data using marked spatial point processes. In our work to date, we have developed models for spatial point processes for realistically depicting actual micrographs that we are interested in characterizing. We have also identified and studied functionals of spatial locations which discriminate between various spatial point processes. We have further shown the feasibility of a pattern recognition procedure, based on these functionals, for classifying realizations of spatial point processes into any of several underlying processes.

Tom Santner is spending his sabbatical year on a Fulbright Fellowship at the Institut fuer Statistik, Lugwig-Maximilians-Universitat Muenchen, Germany. He has begun work with faculty in the institute and the medical school analyzing functional magnetic resonance images of haemodynamic brain function (as the brain receives certain types of cognitive stimulation). This type of imaging method is very new; it has been in use for less than 4 years. FMRI is non-invasive and can be used to produce essentially real-time "movies" of blood flow in the brain. His joint work with Bill Notz is highlighted in the Spotlight on Research.

Xiaotong Shen is currently working on the random sieve method. He has been working with **Doug Wolfe** and Ph.D. student Shanggang Zhou on inference with regression splines. He also continues to work with Wing H. Wong from UCLA on dimension reduction techniques in high dimensional curve fitting.

Elizabeth Stasny has been involved in the creation of an interdisciplinary Survey Research Unit within the College of Social and Behavioral Science. It is designed to bring together existing survey research expertise from throughout the University. Faculty members from Psychology, Sociology, Political Science, Economics, and Journalism/Communication were also involved in developing the unit.

The Unit started operations in Fall 1996. The Unit's offices and computers for computer-assisted telephone interviewing (CATI) and for data management are located in Derby Hall. The Unit employs 14 graduate students (none from Statistics yet) and has hired 60 undergraduates to conduct interviews.

A significant accomplishment was obtaining a contract with The Columbus Dispatch for the Buckeye State Poll. This is a monthly telephone survey of approximately 1000 Ohio adults, with an over-sampling from the central Ohio area. The survey will probe Ohioans attitudes on a wide range of topics: money, religion, popular culture, sports, health and medicine, topical issues of the day, and, of course, politics. Surveys have been conducted monthly since November, 1996 and results were reported in the Columbus Dispatch. Each month the survey includes a core set of questions on consumer confidence, economic conditions, and personal finance matters. Other topics are included on a rotating basis. The first survey focused on holiday spending patterns. Other topics of the polls to date have included consumer debt, attitudes about a proposed Franklin county stadium/arena and religious affiliations, beliefs, and practices.

Doug Wolfe was appointed as Associate Dean in the Graduate School in Autumn 1995. He is returning to the Statistics Department in Autumn, 1997. While assigned to the graduate school, he has continued to be active. He is in the final stages of a major revision of the textbook, *Nonparametric Statistical Methods*, written jointly with M. Hollander. The department continues to host visitors who are doing collaborative research with Doug. This year, Yuh-Ing Chen and Dong Hoon Lim are both spending their sabbatical years visiting the department and working on joint projects with Doug in nonparametrics. Next year Professor Brad Hartlaub, an OSU alumni, will be spending his sabbatical year at Ohio State to work with Doug on extending ranked-set samples methodology to the k-sample setting with umbrella configured treatment effects. This work is being done jointly with Lora Bohn, at the University of Florida, another OSU alumni.

Joe Verducci continues his work in Psychiatric Statistics. He presented the paper "Longitudinal Analysis of Depressive Symptoms in Children and Adolescents" at the Annual Ohio Statistics Conference held at the Cleveland Clinic last November. He has three Ph.D. students, Dionne Swift, Nicole Demers, and Halsey Boyd working on various aspects of longitudinal analyses, including imputation of missing data, concomittant modelling, sibling correlation, and empirical likelihood inference. Another student, Qing Liu, being jointly advised by Joe Verducci and Angela Dean, has made some progress in devising an optimal sequential design for paired comparisons.

Joe is scheduled to testify in two court cases this spring, one involving alleged age discrimination, and another involving allegedly unreliable grading practices at a leading Medical School. He is also busy consulting with colleagues from Agriculture, Business, and Surgery.

THE GRADUATE STUDENTS

Sports Update

In Fall'96 the Statistics department's much-proclaimed athletic program got off to a flying start with the men's and co-rec volleyball teams demolishing all opponents in the pre-season games. Both teams seemed sure shots for their respective championships. However, disaster

struck the co-rec team "Spike This" (led by Amy Stai) when they missed a crucial playoff game, courtesy of the master bunglers at Larkins. Needless to say, the team was unceremoniously dumped from the tournament with their 1997 championship hopes dashed to the ground. The men's team "Blue Sox" (led by Steve Goodman) continued on with their valiant march before meeting their untimely demise in the semifinals.

The winter quarter saw our hoopsters "One Average Team" go all the way to the "Elite Eight" before losing to a vastly superior team. This was an enormous improvement over last year's showings when our team bowed out in the first round of the playoffs. Kudos to the entire basketball team (led by Jim Mulik) and especially to the first year students for their enthusiasm and talent. The future looks bright for the Stats basketball program! Our department also had teams in the men's and co-rec wallyball tournament which also eventually bowed out in the semifinal stage. The high point for our dept was when Sanjeev Chaudhuri made it to the men's singles final in the Badminton tournament.

In Spring, our dept has teams participating in men's soccer, men's and co-rec softball, hockey, and 4-on-4 volleyball. Hopefully this will be the quarter when our athletes break the semifinal barrier and get the big wins. Good luck to each of these teams.

Jim Rodgers was elected president of the Statisitics Graduate Student Organization for 1996-97.

John Kindelberger has been editing the monthly department newsletter's this year and has been doing a great job keeping us informed of all the late breaking Stat news.

Weddings and Births.

Congratulations to **Jennifer Kosa,** who said "I do" to Jay Sparks on March 22, 1997 (the day after she graduated).

Best wishes also go out to **Teresa Papa** on her upcoming marriage to Derrick Stern which will take place on June 21, 1997.

Congratulations to **Steve Bornick** and wife Denise on the birth of their daughter Mia Rose on November 9, 1996.

Kati Maharry and **Min-hiu Wang** are both expecting soon.

CONGRATULATIONS to the following students who earned degrees in Winter 1996 through Spring 1997!

1996 - 97 M.A.S..

Spring 1996

Virginia Agresti
Mary Busam
John Edwards
Jennifer Holdcraft
Kyle Matschke
Matt Palmgren
Patricia Swank
Joseph Whitmore

Autumn 1996

Marilyn Cooper
Melissa Smith

Winter 1997

Jennifer Kosa

Spring 1997

Stephen Goodman
Jason Gordon
Lisa Kim
John Kindelberger
Shannon Markiewicz
Jennifer Rossi
Judd Seals
Asawari Vengurlekar
Side Yu

1996 - 97 M.S.

Winter 1996

Brian Millen
Brian Williams

Spring 1996

Jonathan Baker
Parthena Katsaounis
Kristine Kuzora
Alistair Sutcliffe
Peng-Fang Yen

Summer 1996

Steven Bortnick
Jackie Miller
Iyue Sung
Min-Hui Wang

Autumn 1996

Laura Salter

Winter 1997

Tong Li
Zachary Skrivanek

Spring 1997

Colleen Brensinger
Gardar Johannesson
James Rogers
Gregory Stark
Michael Starsinic
Zoltan Szentkiralyi
Vivek Venkatachalam
Zheng Zhou

1996 - 97 Ph.D.

Spring 1996

Laura Adkins
David Donley

Summer 1996

Craig Cooley
John Lawrence

Autumn 1996

Shuying Li
Joe Pultz

Winter 1997

K. Nourijelyani

Spring 1997

Baoshe An
Peggy Hwang

ALUMNI NEWS

Deb Rumsey (Ph.D., 1993) was married on June 15, 1996, to Eric Johnson in Burlingon, WI. Eric is from Galena, OH, and they're both living in Manhattan KS where Deb is an assistant prof in the Statistics Department. Good luck to the newlyweds!

Jay Harrison (M.A.S., 1990) and **Lora Bohn** (Ph.D., 1992) are happy to announce the birth of their daughter, Michelle Amanda Harrison, on March 11. She weighs 9 lb. 3 oz. and is 20.5 in. tall. Mom and baby are reportedly doing fine, although the Dad is exhausted! Congratulations to the new parents!

Lie-Jane Kao (Ph.D., 1994) is an associate professor in the Department of Management Science at Ming-Hsin University Taiwan. In 1996, she won an excellence award from the National Science Foundation of Taiwan for her OSU Ph.D. dissertation. Congratulations!

Bob Price (M.S., 1989) is completing his Ph.D. at the University of Wyoming in June 1997, and has taken a position as an Assistant Professor in the Mathematics Department at East Tennessee State. Bob was married to Laura Clawson in 1993 and had a baby daughter named Julia on April 4, 1997. Good luck in your new jobs as a father and a Professor!! Bob will be back in Columbus for the summer to join his old friends in a few rounds of golf.

Lisa Elderbrock (M.S., 1989) completed her Ph.D. (in Number Theory) at BGSU in the summer of 1996. She is now in a tenure-track position at Northern Kentucky University, where she is teaching statistics and math.

Amy (Crase) Rosen (M.S., 1994) had a baby girl on Nov. 24. Her name is Hannah Elizabeth Rosen and she weighs 7 lbs. and 15 ozs and is 20 inches long. Congratulations!

Rumor has it that **Dan Cotton** (M.A.S., 1993) will be tying the knot this summer. Further details will be appearing in next year's newsletter.

Trish (Bennett) Myers (M.A.S., 1993) had a baby boy, Benjamin Davis Myers on August 30, 1996. Congratulations!

Eric Eastmo (M.A.S., 1993) and wife Dionne had a baby boy, Mathhew Stener Eastmo on Dec. 19th. Congratulations to the new parents!

Srinath Sampath (M.S., 1993 - Ph.D. 20??) is now working at Nationwide Insurance in the Annuity and Pension Section as an Actuarial Assistant. (Few know what he is actually up to, but rumor has it is very important high security type stuff). Although, there have been occasional Srinath sightings in the department over the last year, they are becoming rare.

Alumni Reply Form

Please complete this form for our files.

Name _____ Degree(s) and Year(s) _____

Home Address _____ Home Phone _____

City, State, Zip _____

Current Professional Title _____

Institution/Company _____

Business Address _____ Business Phone _____

_____ Fax Number _____

City, State, Zip _____

E-mail address _____

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Personal and/or Professional News - Please share some information about yourself with us. (Unless you request otherwise, we will assume it may be mentioned in future Newsletters).

Your comments about the Newsletter

Items I liked -

Other types of information to be included in future newsletters -

Further suggestions or comments -

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John Bunge (Ph.D., 1989) was promoted to Associate Professor with tenure in the Department of Social Statistics, Cornell University

Amy (Luginbuhl) Phelps (M.A.S., 1985) is finishing her doctoral dissertation in the Department of Biostatistics in the School of Public Health at the University of Pittsburgh.

Derrick Rollins, (M.S., 1989) Professor of Chemical Engineering at Iowa State University has been given the 1996 AAAS Mentor Award, which recognizes his dedication in mentoring and advising underrepresented graduate and undergraduate students in chemical engineering. The award honors individuals who demonstrate extraordinary leadership to increase the participation of women of all racial/ethnic groups in science and engineering fields.

ASA MEETINGS IN ANAHEIM

The ASA meetings this year are in Anaheim from August 10-14. If you plan to be at the meetings and would like to attend an Ohio State Alumni dinner, let Bill Notz know. You may e-mail information to him at win@stat.mps.ohio-state.edu. Be sure to indicate what evenings are convenient for you. If anyone familiar with the area has ideas about a place to eat or would like to help with the organization, please let Bill know that as well.

25th ANNIVERSARY OF THE STATISTICS DEPARTMENT

The department will be celebrating it's 25th Anniversary in 1999. We hope to organize a conference in Columbus to celebrate the occasion. Keep your calendars open!! More information will be coming out in next year's newsletter.

KEEP IN TOUCH

We are including an easy to complete postcard at the end of the newsletter to keep us up to date on your address, place of employment and activities. Just write out a few comments about yourselves, fold and drop in the mail=. Your old friends from graduate school and the faculty are interested to see how you're doing. If you prefer, you can send e-mail to maf@stat.mps.ohio-state.edu.

***If you know of any alumni who have not received a copy of this newsletter, please ask them to drop us a line, or you can e-mail Mike Fligner at maf@stat.mps.ohio-state.edu. ***

Please browse The Ohio State University, Department of Statistics Website at

http://www.stat.ohio-state.edu

and send us your comments. Should we be adding an alumni news page to the website?