



## Greetings from the Department Head, Dr. Geoffrey Vining



Happy New Year! A lot has been going on in the Department this year! Most of it has been pretty exciting.

Eric Smith and Geoff Vining were [named Fellows of the American Statistical Association](#). We now have five Fellows among the active faculty plus four more Fellows among the emeritus faculty. Very few departments of our size have so many Fellows, which is a true testimonial about the strength of our department.

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Corporate Partners Conference 2001

[Bill Woodall winning the Brumbaugh Award](#) from the American Society for Quality was another important highlight for the department. This prestigious award is given annually to recognize the paper published in an ASQ journal which has made the greatest contribution to the development of industrial applications of quality control.

Much of the Department's energy has been focused on our VIGRE grant submission. VIGRE (Vertical Integration of Graduate and Research Education) is a major initiative from the Mathematical Sciences Division of the National Science Foundation designed to revamp how mathematics and statistics departments do business. We are considering a lot of new ideas for getting undergraduates interested in research, for recruiting more students into our Ph.D. program, and for mentoring these students once they are here. We are also looking at how to improve our curriculum. Several exciting ideas include one-hour special topics courses and "tracks," such as industrial, environmental, econometric, and bioinformatics. Jeff Birch has been doing an excellent job leading and coordinating our efforts.

This fall, we held our [initial Corporate Partners Conference](#). Golde Holtzman put a great deal of work into this program, and it was quite successful. Our Corporate Partners provide crucial financial support that allows the department to make enhanced graduate assistantship offers. In addition, the Corporate Partners provide advice and counsel to the department.

Last summer, the Department hosted the SPES-IMS Spring Research Conference at the Hotel Roanoke. Christine Anderson-Cook did a great job as the local organizing chair.

This fall, the department also hosted the Business Meeting for the Southern Regional Council for Statistics, the old SREB. Representatives from the major statistics program across the South came to exchange ideas. Blacksburg proved to be a big hit with this group.

[This spring, the Department is hosting a special conference in honor of Ray Myers](#). You can find details off our web page. Please plan to attend. We would love to see you again here in Blacksburg.

Unfortunately, not every thing is rosy here in Blacksburg. The recession combined with September 11 has taken a toll on the Commonwealth's economy. All of the Universities in Virginia, including Virginia Tech, face a significant callback of funds. Everyone expects the situation to be temporary. Nonetheless, it is somewhat painful.

We hope that all of you are doing well. If you are ever in the area, please drop by and see us. It is always good to visit with our alumni and friends. As well, we encourage you to take advantage of the Alumni News section, which we hope will make keeping up with some of your peers possible. We also enjoy hearing your news and staying in touch.

Geoff

## New Faculty

The Department of Statistics was delighted to welcome 3 new faculty members to our department in the Fall of 2001:



[Samantha Bates](#) joined us after graduating from the Department of Statistics with both her Masters of Sciences and Ph.D. from the University of Washington. Her areas of research include Bayesian inference, Markov chain Monte Carlo methods, deterministic models, model validation and environmental statistics.

She won the Best Paper in Risk Assessment and shared the Best Student Presentation award, at the 2001 meeting of The International Environmetrics Society, and a Student Paper award at the 1998 Annual Meeting of the Society of Risk Analysis. Sam did her undergraduate work at the University of Auckland, New Zealand.

[Dan Spitzner](#) joined the department from the University of North Carolina at Chapel Hill. In 1994, Dan graduated with both a Masters and Bachelor of Sciences from the Virginia Tech Department of Statistics. His dissertation research was in the area of shrinkage estimation under the direction of R.L. Smith. His interests are in linear models, functional data analysis, biased estimation methods, decision theory, and high-dimensional inference. He has published applied research in the areas of particulate matter epidemiology, and the physiology of human tactile perception. He is currently teaching Statistics in Research.



**Philippe Barbe** joined our department from the Centre National de la Recherche Scientifique (CNRS) in France. He obtained his Diploma of Statistician from Ecole Nationale de las Statistique et de l'Administration Economique in Paris in 1998. He has been a visiting professor in recent years at Yale University, Georgia Institute of Technology and Universite' Laval. He has published two books "Cours de Probabilite pour la Licence" and "The Weighted Bootstrap". His areas of research interest are currently an intersection of statistics, probability, asymptotic analysis, and differential geometry.

## News and Special Honors

**Dr. G. Geoffrey Vining** (below left) and **Dr. Eric Smith** (below right) were named Fellows of the American Statistical Association. It is a great honor to our department for two people to be named Fellow in a single year. Congratulations to Geoff and Eric!



The Virginia Tech Board of Visitors have officially approved **Dr. Oliver Schabenberger's** promotion to Associate Professor with tenure in March 2001. He was also appointed Research Affiliate in the School of Forestry and Environmental Studies at Yale University.

**Bill Woodall** received the Brumbaugh Award from the American Society for Quality (ASQ) for "the paper published in an ASQ journal which has made the greatest contribution to the development of industrial applications of quality control." The paper was Woodall, W. H. (2000), "Controversies and Contradictions in Statistical Process Control," (with discussion), Journal of Quality Technology, 32, 341-378. (available for downloading at <http://www.asq.org/pub/jqt> )

**Angie Patterson (Neff)**, a former graduate of our department, is currently a Visiting Professor in our department, while also continuing her work at General Electric.

**Christine Anderson-Cook** and **Sundar Dorai-Raj** were awarded the 2001 Best Contributed Paper for the American Statistical Association Section on Statistical Education at the Joint Statistical Meetings.

**Christine Anderson-Cook** was awarded the 2001 Best Paper in the Propulsion Section at the American Helicopter Society International Forum. Her co-authors were Karl Sheldon and Walter O'Brien.

Graduate students, **Megan Waterman** and **Seth Clark** were winners of the Best Student Paper and Honorable Mention, respectively, for their presentations at the Virginia Academy of Sciences in Harrisonburg, VA in May 2001.

**Jeff Birch** was named Director of Graduate Programs in Statistics at Virginia Tech (that is the new name for the graduate administrator), replacing **Jesse Arnold** in July, 2001.

**Bill Woodall** is continuing as Editor of the Journal of Quality Technology.

**Christine Anderson-Cook** is the Program-Chair for 2003 for the Section of Quality and Productivity in the American Statistical Association. She is also an Associate Editor of Reviews for the Journal of the American Statistical Association.

**Ina Hoeschele** taught each part of Module 12 (QTL mapping II), an international 3-day short-course, which is part of the Summer Institute in Statistical Genetics at North Carolina State University, offered to graduate students, postgraduate fellows, faculty and industry scientists in the computational and biological sciences.

**Ina Hoeschele** presented an invited lecture in the international 8-day short-course on "Mathematical Approaches to the Analysis of Complex Phenotypes" at the Jackson Laboratory (Bar Harbor, Maine), training mathematicians and biologists in the application of statistics and genetics to the study of human disease.

**Ina Hoeschele** was a co-organizer of the Virginia Tech Workshop on Bioinformatics and Computational Biology, March 19, 2001.

**Klaus Hinkelmann** presented a series of lectures on "Design and Analysis of Factorial Experiments" and a colloquium "Statistik als Wissenschaft, Kunst und Macht" at the Graduate College of the University of Dortmund (Germany).

A number of faculty and graduate students gave presentations at regional and national conferences during the past year as well. Here are some of the highlights:

At the Plant and Animal Genome IX conference (an international conference on the status of plant and animal genome research) in January 2001:

- **Hoeschele, I.** "QTL mapping in complex pedigrees"

At the Spring Meetings of the Eastern North American Region of the International Biometric Society in Charlotte, NC in March 2001:

- **Schabenberger, O.** "Fast estimation in spatial generalized linear models. Composite Likelihood and Generalized Estimating Equations"
- **Dorai-Raj, S.** and **Schabenberger, O.** "The homerange and distribution of birds determined from spatio-temporal point data."

At the Virginia Academy of Sciences in Harrisonburg, VA in May 2001:

- **Clark, S. , Birch, J.B.** and **Schabenberger, O.** "Model Robust Regression Based on Generalized Estimation Equations"
- **Waterman, M. , Birch, J.B.** and **Schabenberger, O.** "Linear Mixed Model Robust Regression"

At the Spring Research Conference in Roanoke, VA in June 2001:

- **Clark, S. , Birch, J.B.** and **Schabenberger, O.** "Model Robust Regression Based on Generalized Estimation Equations"
- **Waterman, M. , Birch, J.B.** and **Schabenberger, O.** "Linear Mixed Model Robust Regression"

At the SIAM Annual Meeting in San Diego, CA in July 2001:

- **Terrell, G.** "Penalized Minimum Distance Modeling for Data Analysis"

At the Joint Statistical Meetings in Atlanta, GA in August 2001:

- **Clark, S. , Birch, J.B.** and **Schabenberger, O.** "Model Robust Regression Based on Generalized Estimation Equations"
- **Johnson, P., Anderson-Cook, C.M.** and **Dorai-Raj, S.** "Evaluating the Effectiveness of Teaching Statistical Concepts"
- **Myers, R.H.** "Performance Efficiency of Standard Designs when GLMs are Used"
- **Smith, E.P.** "Multivariate Models for Analyzing Environmental Data" (roundtable luncheon)

- **Terrell, G.** "Tail Probabilities by Density Extrapolation"
- **Wang, Y., Smith, E.P., Ye, Y., Anderson-Cook, C.M., Myers, R.H.** "Optimal Designs for Poisson Exponential Models in Impaired Reproduction Systems"
- **Waterman, M., Birch, J.B. and Schabenberger, O.** "Linear Mixed Model Robust Regression"
- **Woodall, W.H., Koudelik, R., Tsui, K.-L., Kim, S.B., Stoumbos, Z.G., and Carvounis, C.P.** "A Review and Analysis of the Mahalanobis-Taguchi System"
- **Ye, K.** "Bayesian methods for Quality Improvement" (roundtable luncheon)

At the American Agricultural Association Meetings in Chicago in August, 2001:

- Spanos, Aris, and **McGuirk, Anya** "The Model Specification Problem from a Probabilistic Reduction Perspective."

At the International Environmetrics Society conference in Portland, Oregon in August 2001:

- **Boone, E., Ye, K., and Smith, E. P.** "Hierarchical spatial modeling to ecological data"

At the Annual Meeting of the Geological Society of America in Boston, MA in November 2001:

- Craig, J., **Birch, J.B.** and **Schabenberger, O.** "Lead Distribution Patterns on Shooting Ranges: Measurement, Analysis, and Interpretation"

## Corporate Partners Conference 2001

The Department of Statistics Corporate Partners Program was conceived last year with the goal of solidifying and formalizing the strong relationships that have flourished between industry and our department over the past 50 years. A most successful step toward that goal was taken early in November--Thursday the 8th through Saturday the 10th --when our faculty and graduate students hosted the first annual Corporate Partners Program Conference. Lodging, meals, and local transportation were provided for two representatives of each corporate partner so that we could make the most of our weekend together. The conference featured:

- one-on-one interviews with Masters and Ph.D. candidates,
- a plenary meeting with the Departmental Advisory Committee,
- an afternoon symposium to present current research projects,
- and plenty of opportunities to develop professional relationships and joint projects.

Representatives from Eli Lilly Pharmaceuticals, Minitab, Inc., DuPont, and General Electric participated. Matt Rotelli and Janet Bernard came from Indianapolis on behalf of Eli Lilly, Gwen Stimely came from University Park, Pennsylvania and Jennifer Roan came from the Research Triangle of North Carolina on behalf of Minitab, Inc. Bill Letsinger came from Delaware on behalf of DuPont, while Angie Neff Patterson, who taught here last fall as a visiting professor, represented General Electric.

The conference started of Thursday evening with a wine-and-cheese social at the home of Geoff Vining. Friday morning some of the partners met with the departmental Advisory Committee, while others began a series of one-on-one interviews with masters and doctoral candidates that continued through Saturday afternoon.



A research colloquium convened Friday afternoon chaired by Professor Bill Woodall. Ina Hoeschele (joint professor of statistics and genetics), and five graduate students--Ed Boone, Seth Clark, Paula Johnson, Rachelle Koudelik, Ilya Lipkovitch, and Megan Waterman--presented brief overviews of their current research projects. The activities culminated Friday evening in a spirited dinner-party attended by nearly the entire department at Anchy's.

The general consensus was that the benefits of the conference were well worth the hard work of all who participated. By the end of the evening Friday, many new relationships had formed among the partners, graduate students and faculty.

For further details of the 2001 conference and the Corporate Partners Program, please visit the website at <http://www.stat.vt.edu/partners/index.html>. And, if anyone in your company is curious about the possibilities for recruitment, consultation, or collaboration with the statistics department that produced its finest employees (i.e., you), please do not hesitate to contact Geoff Vining ([vining@vt.edu](mailto:vining@vt.edu), 540-231-5657) or Golde Holtzman ([holtzman@vt.edu](mailto:holtzman@vt.edu),

540-231-8356).

## Grant News

The faculty continues to be active in the pursuit of external funding. These efforts are likely to increase in the future. Recent awards include a \$19,016 grant of the Virginia Water Resource Research Center to Eric P. Smith and Keying Ye. The same investigators are also currently working on a \$266,388 grant from the U.S. EPA entitled "Assessing the Effects of Multiple Stressors in Environmental Monitoring Programs". Keying Ye was awarded a Virginia Tech ASPIRES grant in the amount of \$41,852 as co-principal investigator with Dr. Shannon Jarrott of the Department of Human Development. William H. Woodall is completing research on a \$83,932 NSF grant entitled "Collaborative Research: Multivariate Methods for On-Line and Off-Line Quality Control and Improvement".

Continuing the department's storied tradition in experimental design, J. P. Morgan has recently been awarded a National Science Foundation grant in the amount of \$172,500 for his proposal "Block Designs: Advances in Theory and Use." Through a combination of theory and computing, the project will greatly expand the known catalog for optimal block designs. The grant is for three years, of which six months will be spent with collaborators at the University of London.

## Recent Graduates

The year 2000-2001 saw 3 Ph.D. degrees, 13 Masters of Sciences degrees, and 4 Bachelor of Science degrees awarded by the department.

The Ph.D. degrees were granted to the following students:



From left: Dr. Oliver Schabenberger & Sundaras Dorai-Raj

- **Sundaras Dorai-Raj** (Major Professor: Oliver Schabenberger). Sundar joined the Department of Statistics as Auburn University as an Assistant Professor in Fall 2001.

- **Robert B. Noble** (Major Professors: Eric P. Smith and Keying Ye). Bob is currently an Assistant Professor at The University of Miami, Ohio in the Department of Statistics, after briefly working at Dupont.

- **Samuel Wilcock** (Major Professor: George Terrell). Sam is currently a Visiting Assistant Professor at Messiah College in Pennsylvania.

For a complete list of recent dissertation titles, go to [Dissertations](#) on our [Graduate Webpage](#).

The Master of Sciences graduates for 2000-2001 are the following:



From left: Brooke Marshall, Joseph Warfield, Paula Johnson, and Xin Zhong

- **Meghan Dowling**, who is currently working as a Statistical Consultant at Tecolute Research Inc. in the Washington, D.C. area.
- **Bo Jin**, who is continuing his studies in the Department of Statistics here at Virginia Tech pursuing a Ph.D.
- **Paula Johnson**, who is currently working as a Research Associate at the Joint Legislative Audit and Review Commission in Richmond, VA.
- **Kimberly Kimbleton**, who is working as a Statistical Consultant for Capital One, in Richmond, VA.
- **Li Liang**, who is continuing her studies in the Department of Statistics here at Virginia Tech pursuing a Ph.D.
- **Jennifer Brooke Marshall**, who is working as a self-employed Statistical Consultant in the Blacksburg area.
- **John McGraw**, who completed a thesis Master's in Fall 2001.
- **Valentin Parvu**, who is continuing his studies in the Department of Statistics here at Virginia Tech pursuing a Ph.D.
- **Kevin Shropshire**, who is continuing his studies in the Department of Sociology at Clemson University pursuing a Master's Degree.
- **Kathryn Tucker**, who is currently employed as a Statistical Consultant at Statistics Collaborative, Inc. in the Washington, D.C. area.
- **Yanping Wang**, who is continuing her studies in the Department of Psychology here at Virginia Tech pursuing a Ph.D.
- **Joseph Warfield**, who is currently working for the Johns Hopkins Applied Physics Laboratory in Baltimore, MD.
- **Xin Zhong**, who is continuing her studies in the Department of Statistics here at Virginia Tech pursuing a Ph.D.

The Bachelor of Science graduates for 2000-2001 with a major in statistics are **Branden Elizabeth Boe**, **Scott Edward Glesner**, **Daniel Joseph Mazza**, and **Jeffrey Grayson Miller**. Daniel Mazza has continued his studies in our department as he is pursuing a Master of Science degree.



From left: Jeffrey Grayson Miller, Scott Edward Glesner, Michele Marini, Branden Elizabeth Boe, and Daniel Joseph Mazza.

## Recent Publications

### Books (2001)

- Douglas C. Montgomery, Elizabeth A. Peck & G. GEOFFREY VINING. Introduction to Linear Regression Analysis. Third Edition. Wiley & Sons.
- RAYMOND H. MYERS, Douglas C. Montgomery & G. GEOFFREY VINING. Generalized Linear Models with Applications in Engineering and the Sciences. Wiley & Sons.
- OLIVER SCHABENBERGER & Francis J. Pierce. Contemporary Statistical Models for the Plant and Soil Sciences. CRC Press.

### Articles (2001)

- CHRISTINE ANDERSON-COOK. Understanding the Influence of Several Factors on a Cylindrical Response. Journal of Quality Technology 33.
- CHRISTINE ANDERSON-COOK & Sundar Dorai-Raj. An Active Learning In-Class Demonstration of Good Experimental Design. Journal of Statistical Education 9.
- CHRISTINE ANDERSON-COOK & Robert B. Noble. An Alternate Model for Cylindrical Data. Nonlinear Analysis. Series A 47.
- Chung Yen Chen, GOLDE I. HOLTZMAN and Raga M. Bakhit. High-Genistin Isoflavone Supplementation Modulated Erythrocyte Antioxidant Enzymes and increased Running Endurance in Rats Undergoing one Session of Exhausting Exercise. Pakistan Journal of Nutrition.
- Dennis Gilliland, OLIVER SCHABENBERGER & Hongyu Liu. Intercluster Correlations for Binomial Data: An Application to Seed Testing. Journal of Agricultural, Biological, and Environmental Statistics 6.
- I.J. GOOD. Murder, fraud or plagiarism? Mensa Bulletin 444.
- I.J. GOOD. A Correction to One of Einstein's Derivations of the Lorentz Transformation. Physics Essays 13.
- Stephen L. Hill, MD & GOLDE HOLTZMAN. Vascular Surgeons - Do They Make a Difference in Peripheral Vascular Disease? Surgery.
- KLAUS HINKELMANN. Remembering Oscar Kempthorne (1919-2000). Statistical Science 16.
- KLAUS HINKELMANN. Oscar Kempthorne, Amstat News 291
- D.R. JENSEN. Properties of Selected Subset Diagnostics in Regression. Statistics and Probability Letters 51.
- D.R. JENSEN. Recovering Information from Incremental Responses. Australian and New Zealand Journal of Statistics 43.
- Sharon L. Lewis, Douglas C. Montgomery & RAYMOND H. MYERS. Confidence Interval Coverage for Designed Experiments Analyzed with GLMs. Journal of Quality Technology 33.
- Kenneth W. Linna & WILLIAM H. WOODALL. Effect of Measurement Error On Shewhart Control Charts. Journal of Quality Technology 33.
- Kenneth W. Linna, WILLIAM H. WOODALL & Kevin L. Busby. The Performance of Multivariate Control Charts in the Presence of Measurement Error. Journal of Quality Technology 33.
- Kitchin, P.L. and FOUTZ, R.V. A New Method for Comparing Experiments and Measuring Information. Communications in Statistics: Simulations 30.
- James E. Mays, JEFFREY B. BIRCH and B. Alden Starnes. Model Robust Regression: Combining Parametric, Nonparametric and Semiparametric Methods. Nonparametric Statistics 13.
- J. P. MORGAN, D.A.Preece, and D.H. Rees. Nested Balanced Incomplete Block Designs. Discrete Mathematics 231, 351-389.



- T.G. Mueller, F.J. Pierce, O. SCHABENBERGER, and D.D. Warncke. Map Quality for Site-Specific Fertility Management. Soil Science Society of America Journal 65.
- OLIVER SCHABENBERGER & JEFFREY B. BIRCH. Statistical Dose-Response Models with Hormetic Effects. Human and Ecological Risk Assessment 7.
- ERIC P. SMITH, KEYING YE, Chris Hughes & Leonard Shabman. Statistical Assessment of Violations of Water Quality Standards under Section 303(d) of the Clean Water Act. Environmental Science & Technology 35.
- Spanos, Aris, and MCGUIRK, Anya. The Model Specification Problem from a Probabilistic Reduction Perspective. American Journal of Agricultural Economics 83.
- Zachary G. Stoumbos & MARION R. REYNOLDS, JR. The SPRT Control Chart for the Process Mean with Samples Starting at Fixed Times. Nonlinear Analysis: Real World Applications 2.
- Zachary G. Stoumbos, L. Allison Jones, WILLIAM H. WOODALL & MARION R. REYNOLDS, JR. On Nonparametric Multivariate Control Charts Based on Data Depth. Frontiers in Statistical Quality Control 6.
- S. K. Srivastav and J. P. MORGAN. Construction of generalized group divisible designs in settings admitting symmetry. American Journal of Mathematical and Management Sciences 21, 69-88.
- Cleveland D. Turner, Jr., Joe H. Sullivan, Robert G. Batson & WILLIAM H. WOODALL. A Program for Retrospective Change-Point Analysis of Individual Observations. Journal of Quality Technology 33.
- C.E. Zipper, G.I. HOLTZMAN, P.F. Darken, J.J. Gildea, and R.E. Stewart. Virginia USA Water-Quality, 1978-1995: Regional Interpretation. Journal of the American Water Resources Association.
- C. E. Zipper, G.I. HOLTZMAN, P.F. Darken, R.E. Stewart, P. J. Thomas, J.J. Gildea (2001). Surface-Water Quality Trend Analysis: A Multiple-Site Application, in Younos, Tamim (ed.), Advances in Water Monitoring Research

#### Book Reviews (2001)

- OLIVER SCHABENBERGER. The Analysis of Variance: Fixed, Random and Mixed Models by H. Sahai and M.I. Ageel. Journal of the American Statistical Association.

## Upcoming Events

The Department of Statistics is planning to hold a "Workshop on Response Surface Methodology: Theory and Application" in honor of Dr. Raymond H. Myers for his 40 years of contribution and dedication in research and education to the Department of Statistics and to the statistical societies and industry. The workshop will be held April 19-20, 2002 at the Hotel Four Points by Sheraton, 900 Prices Fork Road, Blacksburg, VA 24060. For more information about the workshop, please check the [workshop homepage](#).

The Department of Statistics will be holding its second annual program of Virginia Tech Seminars on Statistics during the week of May 13-17, 2002. Courses will be offered in two sessions:

Statistical Methods  
Linear and Nonlinear Regression  
Bayesian Methods  
Design of Experiments

#### May 13-15

Instructor: Robert S. Schulman  
Instructor: Jeffrey B. Birch  
Instructor: Keying Ye  
Instructor: Christine Anderson-Cook

Multivariate Methods  
Advanced Regression  
Design and Analysis of Sample Surveys  
Response Surface Methodology  
Spatial Statistics

#### May 15-17

Instructor: Eric P. Smith  
Instructor: Jeffrey B. Birch  
Instructor: Jesse C. Arnold  
Instructor: G. Geoffrey Vining  
Instructor: Oliver Schabenberger

The program will be held at the Hilton Garden Inn, Washington DC Franklin Square, 815 14th Street, N.W., Washington D.C. To receive a brochure or registration information, contact Beverly Turner at: (540) 231-2188 or e-mail at: [bevturner@vt.edu](mailto:bevturner@vt.edu).

For more detailed information visit our website at: <http://www.conted.vt.edu/stat.htm>

Registration deadline is April 26, 2002.

#### "From Consultant to Effective Leader"

This conference is designed to enhance the effectiveness of statisticians in business and industry, particularly as it relates to exhibiting leadership. The goal is to help statisticians transition from being viewed as passive consultants to being viewed as proactive leaders within their organizations. In preparation for this conference, several senior business leaders, CEOs and other executives were interviewed to obtain their insights into how statisticians can have more impact. These insights will be shared and discussed at the conference.

Tell me more: [www.conted.vt.edu/quality.htm](http://www.conted.vt.edu/quality.htm)  
Where: Hotel Roanoke in Roanoke, Virginia  
When: April 26-27, 2002

For further information about the conference please contact:  
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