

A S Q C

STATISTICS

D I V I S I O N

Newsletter ©

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Outgoing Chair's Message

by Don Emerling



My year as Chair has passed. I survived the endless administrative duties associated with the job, no worse for the wear. To be honest, the minor administrative headaches are buried in a mountain of memories of wonderful experiences and relationships. Old friendships have grown and I have had to opportunity to begin new friendships this year. I leave with memories that will stay with me a lifetime.

Working in this Division has been the most enjoyable professional experience of my life. I pass on my chairmanship to a leadership team that will do great things in the coming years for the members of our Division. **Don Williams**, the current Chair, will be a strong leader. I am honored to call him my friend. Good luck Don and keep "hittin' them straight!" **Bob Mitchell, Janice Shade, and Jacob Van Bowen** will continue to dedicate their time and talents to the leadership of the Division. I value the time we have spent together, I have never laughed as much as when we work together. Thanks for everything, my friends. I have enjoyed every minute I've spent with you.

There are many other leaders who have helped me during my experience with the Statistics Division. A special thanks to **Beth Propst** for all

of her guidance and leadership as my "mentor" in her year as Division Chair. Beth was a participant (and often instigator) of the many long, yet slightly crazy, meetings I have enjoyed over the past years. A special thanks to **Nancy Belunis** for her friendship and guidance on the "ins" and "outs" of ASQ and the Statistics Division. Nancy knows more about the workings of ASQ than anyone outside of Milwaukee. She always had the answer when I was looking to get something done. A special thanks to **Lynne Hare** for his seemingly endless commitment to the Statistics Division, his counsel, his leadership of the

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Incoming Chair's Message

by Don Williams



During the more than ten years that I have been associated with the Statistics Division, I have had the opportunity to be associated with many hard-working, dedicated members. Their commitment and Herculean efforts have led to the current status of the Division. During this time, I have seen the Division go through long-range planning, strategic planning, and tactical planning. Sometimes I, and I feel sure many

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Disclaimer

The technical content of material published in the ASQ Statistics Division Newsletter may not have been refereed to the same extent as the rigorous refereeing that is undergone for publication in **Technometrics** or **J.Q.T.** The objective of this newsletter is to be a forum for new ideas and to be open to differing points of view. The editor will strive to review all articles and to ask other statistics professionals to provide reviews of all content of this newsletter. We encourage readers with differing points of view to write to the editor and request an opportunity to present their views via a letter to the editor. The views expressed in material published in this newsletter represents the views of the author of the material, and may or may not represent the official views of the Statistics Division of ASQ.

PLEASE NOTE: These are the new Mission, Vision, Desired Division End-State, Principles and Strategy approved at the 1998 AQC. We invite your comments.

MISSION

- I. Promote Statistical Thinking for quality and productivity improvement.
- II. Serve ASQ, business, industry, academia and government as a resource for effective use of Statistical Thinking for quality and productivity improvement.
 - A. Our primary customers are Statistics Division members.
 - B. Other key customers are:
 1. Management
 2. Users and potential users of Statistical Thinking for quality and productivity improvement
 3. Educators of the above customers
- III. Provide a focal point within ASQ for application-driven development and effective use of new statistical methods.
- IV. Support the growth and development of ASQ Statistics division members.

DESIRED DIVISION END-STATE

- I. Our members will be proud to be part of the Division.
- II. Our Division's operations will be a model for other organizations.
- III. We will be a widely influential authority on scientific approaches to quality and productivity improvement.

PRINCIPLES

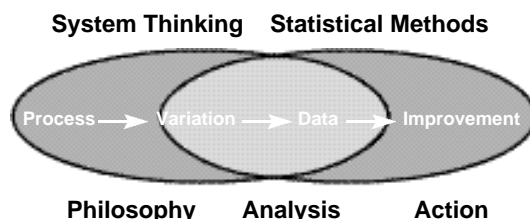
- I. Our customers' needs will be continuously anticipated and met by pro-actively developing and delivering customer-focused activities and products.
- II. Our market focus for products and services is weighted as follows:
 - A. Greatest weight on intermediate level;
 - B. Nearly as much weight on basic level;
 - C. Much less weight on advanced level.
- III. Focus on a few key things.
- IV. Balance short-term and long-term efforts.
- V. Value diversity (including geographical and occupational) of our membership.
- VI. Recognize that we exist for our customers.
- VII. View statistics from the broad view of quality management.
- VIII. Apply Statistical Thinking ourselves; that is, practice what we preach.
- IX. Uphold professional ethics.
- X. Continuously improve Division management, activities, and products.

STRATEGY

- I. Design & deliver selected useable products.
- II. Have a strong and vibrant Division infrastructure.
- III. Demonstrate the broad effectiveness of Statistical Thinking.
- IV. Integrate Statistical Thinking into the educational curricula.
- V. Drive the application of Statistical Thinking in all areas.
- VI. Develop a vibrant information communication system.
- VII. Influence key decision makers.

VISION

Statistical Thinking Everywhere



Criteria for Basic Tools and Mini-Paper Columns

Basic Tools

Purpose: To inform/teach the "quality practitioner" about useful techniques that can be easily understood, applied and explained to others.

Criteria:

1. Application oriented/not theory
2. Non-technical in nature
3. Techniques that can be understood and applied by non-statisticians.
4. Approximately three to five pages or less in length (8 1/2" x 11" typewritten, single spaced.)
5. Should be presented in "how to use it" fashion.
6. Should include applicable examples.

Possible Topics:

New SPC techniques
Graphical techniques
Statistical thinking principles
"Rehash" established methods

Mini-Paper

Purpose: To provide insight into application-oriented techniques of significant value to quality professionals.

Criteria:

1. Application oriented.
2. More technical than Basic Tools, but contains no mathematical derivations.
3. Focus is on insight into why a technique is of value.
4. Approximately six to eight pages or less in length (8 1/2" x 11" typewritten, single spaced.)
Longer articles may be submitted and published in two parts.
5. Not overly controversial.
6. Should include applicable examples.

General Information

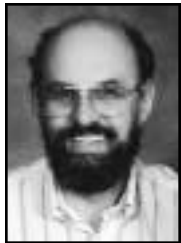
Authors should have a conceptual understanding of the topic and should be willing to answer questions relating to the article through the newsletter. Authors do not have to be members of the Statistics Division.

Submissions may be made at any time to the Statistics Division Newsletter Editor. All articles will be reviewed. The editor reserves discretionary right in determination of which articles are published.

Acceptance of articles does not imply any agreement that a given article will be published.

Editor's Message

by Ralph St. John



STATISTICAL THINKING?? In his Chair's Message in the Spring '98 issue of the Stat Division Newsletter, Don Emerling discussed the interplay between Statistical Methods and Statistical Thinking. Don posed the question: "If our vision is now 'Statistical Thinking Everywhere' does this mean we are abandoning Statistical

Methods?" In response Don made this comment "...the vision 'Statistical Thinking Everywhere' incorporates the interaction and strong interdependence between the philosophy of Statistical Thinking and the body of knowledge called Statistical Methods". As Don pointed out, as the problem solving process moves from the Philosophy phase (Statistical Thinking) to the Analysis phase (the blending point where Statistical Thinking and Statistical Methods meet, interact and synergize), and then on to the Action phase (Statistical Methods), we observe that Statistical Methods now become more dominant. Finally, Don says "I hope this discussion has helped you understand the strong interdependence between Statistical Thinking and Statistical Methods." As I understand Don's message, the Statistics Division's support for improved understanding and application of Statistical Thinking does not represent or imply that the division is abandoning its support of appropriate training in Statistical Theory and Methods. Don's message tells me that good training in Statistical Methods coupled with a good understanding of Statistical Thinking provides the best combination for problem solving.

Some would argue that the interaction between Statistical Thinking and Statistical Methods is much more iterative/interactive than that. At the beginning phases of the problem solving process, the point at which the problem is still being defined, the definition of the problem may depend on what data can be obtained and whether there is an appropriate Statistical Method which can help provide a resolution to the problem. Similarly, the Statistical Methods considered at that stage may depend on the ability of the client to grasp the results of the analysis. Throughout the process, we have an interplay between the context in which the problem exists, the statement of the 'problem', the design of the 'experiment', the data collection, the analysis of the data, the interpretation of the results, and the communication of the results. We may, in fact, cycle through this many times at different stages of the 'project', all the while refining how we resolve the 'problem'. If we choose to restrict ourselves to 'simplified' statistical methods, then we will likely not answer the question correctly.

In the same message Don refers to Lynn Hare's experience that improved and increased use of Statistical Methods followed when his colleagues developed a better understanding of Statistical Thinking. I quote Lynn: "**The**

use of statistical tools is greater and of higher quality in a Statistical Thinking environment". To me, this suggests that as everyone (including statisticians) improves their understanding of processes, of the interconnectedness of processes, of the variability inherent in all processes, of the need to explain, understand, reduce and control variability, then the proper use of Statistical Methods will increase. To a statistician like myself, one of the messages that I heard was that I have to be aware of the interface between me and my customer, and of my customer's ability to apply and use the analysis which I perform. First, I should not treat the problem like a numerical exercise, but must probe the customer's mind to understand the motivation for the study, the purpose for the analysis and the interconnection to other activities in the customer's lab/factory/etc. And, of course, I should ideally be involved in the project from the inception, particularly the process of designing the experiment or the data collection procedures. Good data which answers the wrong question isn't of much value regardless of the statistical methods used. Treating the situation like a numerical exercise was and is a recipe for failure.

Let's review the first three principles of Statistical Thinking:

1. "All work occurs in a system of interconnected processes".
2. "Variation exists in all processes".
3. "Understanding and reducing variation are keys to success".

There are times when I understand that more than one method of analysis may be **equally appropriate and equally powerful** in getting an appropriate answer for my client. In those cases I should try to provide the simplest correct analysis which meets my client's needs. It would be counterproductive to try to overwhelm my client with a 'high-powered' analysis when a simple, straightforward analysis is appropriate. Similarly, there are times when only a 'high-powered' analysis is appropriate, and it is then imperative that I educate my client in the interpretation of that analysis, that I properly understand the implementation of the results of that analysis, and that I understand the interconnectedness of the results of my analysis with other related activities. In order for me to make these judgements I must have broad training in Statistical Methods and training/understanding of Statistical Thinking.

Unfortunately some have taken the Statistical Thinking argument to mean that one can get by with just a few simple easy-to-implement, easy-to-understand statistical 'tools', as long as the 'process' view is in place and one remembers that variability is everywhere. The emphasis appears to be on 'easy-to-explain', without full consideration for appropriateness or power. In other words, let's get rid of the Statistical Methods educators, 'cause all they know is formulas. Having done that, let's learn just a couple of 'universally applicable' statistical tools, and let's use them all the time. If that's the road we're going down, we become

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OUTGOING CHAIR'S MESSAGE

Continued from page 1

Awards Committee, and most importantly his friendship. A special thanks to **Galen Britz**. Galen is the person who introduced me to the leadership of the Division many years ago at the FTC in Lexington, Kentucky. We have been friends for a long time, and he is one of the real mentors of my life. He has been a leader of this Division for a lot of years and continues to be active as the head the Hunter Award Committee. Thank you Galen.

Thanks to **Lynne Hare, Roger Hoerl, Ron Snee, Janice Shade** and **Galen Britz** for sharing their knowledge and experience about Statistical Thinking. Their leadership in this body of knowledge has changed the way I think about statistics and its application to my daily work. Everyone in the Statistics Division owes them a debt of gratitude.

There are many other contributors to the success of this Division. Thanks to **Dick Kleinknecht** for his leadership of the Statistics Division session at the 1998 AQC. Dick put together a great program and then "jumped through hoops" to pull it off after the luncheon ran well into his session time. Thanks to **Sue Albin** and **Mel Alexander** for their work at the 1997 FTC. Thanks to **Gipsie Ranney** for a great Youden Address at the 1997 FTC. Thanks to **Ralph St. John** for his editorial skills, and delivering a world-class newsletter. Ralph has had to live with the frustration of pulling information out of me on time (or close to on time!) to meet deadlines. Thanks for your dedication and friendship. A special thanks to **Frank Alt** who has retired from his position after many years of service as the Statistics Division liaison to the Deming Conference on Applied Statistics. Thanks to **JL Madrigal** for his innovative leadership as the membership chair and his commitment to developing the concept of Section Liaisons.

Thanks to **Tim Fuller** for volunteering his time to lead the Statistics Division pre-conference workshop at the 1998 AQC. Thanks to **Ed Schilling** for his strong leadership of the Standards Committee. Thanks to **Nick Martino** for his continuing leadership of the Certification Committee. Thanks to **Mark Kiel** for his innovative development of the Statistics Division web page (<http://www.asq.org/about/divisions/stats/>). Thanks to **Ron Fricker, Ha Dao, Jonathan Demarest, Colette Glaeser, Ram**

Sitaraman, Marcey Abate for volunteering to be Technical Paper reviewers for the 1998 AQC. Thanks to **Ha Dao**, and **Colette Glaeser** for volunteering to be Session Managers at the 1998 AQC. Thanks to **Marilyn Hwan** for her leadership of the Education Committee. Thanks to **Bob Perry** for his many years of dedicated service as the Examining Committee Chair. Thanks to **Danny Duhan** who lead our GTC group with knowledge and wisdom.

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INCOMING CHAIR'S MESSAGE

Continued from page 1

others, have thought that we had done a lot of planning without much implementation. In reality, much has been done; yet much remains to be done.

Some of the significant accomplishments include the development of the meaning of "Statistical Thinking" followed by several special publications about statistical thinking. Significant progress has been made toward further demonstrating the broad applications of statistical thinking and integrating statistical thinking into educational curricula. The Division has established our presence on the Internet with a webpage. To better administer the progress on these initiatives, a number of new positions were created. This in turn has created a need for more volunteers to help. If you are interested in getting involved in the Division, please review the Help Wanted section of this newsletter and contact the appropriate person for the job that best fits your interests and talents. Even if you don't see a particular job listed and you want to get involved in Division activities, please contact one

of the officers. We have many areas where we have need for help.

Other key elements of the Division's strategic plan include the developing of a customer information system, designing and delivering new products, and developing a division marketing plan. Anyone possessing skills in these areas and interested in getting involved in the Division is particularly encouraged to volunteer. It should present a great opportunity to make a significant contribution

I especially wish to thank Don Emerling for his leadership as Chair this past year and for his many contributions. We expect him to remain very involved with the Division for many years to come, as have most of our past officers. There are many others who have made very significant contributions. The significant accomplishments for the Division are seldom solely due to one person. Fortunately, the Statistics Division is blessed with many members who are very interested in creating greater value for our member-

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LETTERS TO THE EDITOR:

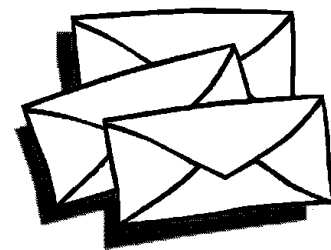
To the Editor:

The article entitled **“Data ‘Sanity’: Statistical Thinking Applied to Everyday Data”** by Davis Balestracci published as a Special Publication by the ASC Statistics Division is long enough and deals with an important enough subject to provoke some serious discussion. Here are my comments.

First, my compliments to the author for an entertaining recital of the difficulties we all have had as a result of inadequately informed people attempting to interpret tables of data. As R. A. Fisher put it in his classic book *The Design of Experiments* “... the subject matter of this book has been regarded from the point of view of an experimenter, who wishes to carry out his work competently, and having done so wishes to safeguard his results, so far as they are validly established, from ignorant criticism by different sorts of superior persons.” Mr. Balestracci is concerned with avoiding ignorant analysis by different sorts of superior persons.

In the course of this tutorial piece the author puts down conventional statistical analysis, for example, “Statistics from Hell 101”. In place of this he proposes to show how simple techniques such as runs tests can be applied to an individuals chart to expose the information it contains. It would seem to me to be more useful to motivate the reader to return to his statistics text now that he has a need for the subject that is both personally real and practical. It is the absence of these two characteristics that probably made the statistics lectures so easy to forget.

The first example (page 8) deals with data from a hospital satisfaction survey. Nineteen months of data are given. Using a run-length test, it is concluded that no change has occurred over the 19 months. But suppose that the data were examined after the first year of attempting to improve customer satisfaction. A linear



regression analysis of the results of the first year shows a significant trend up ($p = 0.004$). The run-length test does not specifically address the question: Is quality of service improving? This test is more aptly applied to the question: Was there a jump (as opposed to a trend) in the quality of service?

Interpreting survey results is a difficult and sometimes dangerous business. But consider this scenario for Example 1: service improved over the first year. By the second year the new level of service had become the average in the eyes of the respondents, and they began to rate it that way.

The second example (page 9) is another instance of a technique driving the analysis rather than a question driving the analysis. A run chart of “Sweat Index” is shown for data after a change (improvement?) following point number 6. A number-of-runs test is applied and found not to be significant (at $\alpha = 0.05$). Case closed. However, suppose we test the hypothesis that no change occurred following the 6th point versus that an improvement occurred. Using the rank sum test (no actual values are given, but ranks can be applied) produces a result significant at the 0.0009 level. Now the conclusion is that there was definitely a reduction in the Sweat Index following point number 6. The number-of-runs test, even with $\alpha = 0.05$, has failed to reveal this result. The statistical test should always be matched to the question.

Despite the fact that the author makes light of using $\alpha = 0.05$ (as well as the 95% confidence interval), he gives Table 4.2 (page 10) which uses $\alpha = 0.05$ (unlabeled) for each of the Lower Limit and Upper Limit for number of runs. (A table for $\alpha = 0.005$,

which is a lot closer to “three sigma” significance, is readily available.)

It is interesting to speculate on why the author uses the 0.05 level of significance for the number-of-runs test. This test has poor efficiency, which relates to its capability to detect a real effect. The frequency with which real effects can be detected can be increased by using a larger significance level (e.g., the 0.05 level instead of the 3-sigma level of 0.00135). But the price to pay for this is an increase in the frequency with which an effect is declared real when it is not. A poor test cannot be made into a good one by simply changing the level of significance.

Plotting data is essential. The simple run chart (individuals plotted in time sequence) provides a very useful first look. But automatically applying runs tests to test whatever hypothesis is of interest is not good statistical practice. “Statistical Thinking” gives one the correct viewpoint. But, this thinking combined with two runs tests does not constitute much of a set of tools. Anyone who wishes to do general statistical analysis had better look a little more kindly on Statistics 101 and refresh his memory on the wonderful array of tools that is available.

In the section entitled “How Many Standard Deviations” (page 23), the author quotes “Shewhart, Ott, Deming, Joiner, Wheeler, and Hacquebord” as recommending “three standard deviations”. This is an impressive list of names but is misleading because the author is referring to the Analysis of Means; whereas Shewhart, Ott, and Deming were referring to the Shewhart control chart. The Analysis of Means is exactly analogous to the

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LETTERS, LETTERS, LETTERS

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one-way Analysis of Variance; it has nothing to do with control charting. One might just as well recommend that the critical value of 3 always be used for Student's t test, which the Analysis of Means becomes when there are only two means. The significance level (and hence the critical value) for a statistical test is chosen according to the consequences of wrongly rejecting the null hypothesis. This is why Ott and others have published tables of critical values for a variety of significance levels for the Analysis of Means.

The author has done a service in his presentation and explication of numerous real-life examples. But I think he has also done a disservice by illustrating applications of "quick and easy" statistical tests using examples for which they are not appropriate, for misrepresenting the Analysis of Means technique, and by presenting the idea that essentially nothing is lost if one has forgotten what was presented in statistics 101. People would be better advised to renew their acquaintance with basic statistics. Statistical Thinking is only the prelude.

Dr. Lloyd S. Nelson
Londonderry, NH

To the Editor:

I just finished reading the **latest Special Publication** (I'm probably a bit behind everyone else being half way around the world) and wanted to pass on my appreciation to the Division (as well as to Davis Balestracci) for another excellent contribution to field.

I have used and abused the "Statistical Thinking" publication as well as all the peripheral material that has grown from it to enhance the education of technology students here at Massey University. I believe they now walk away from 6 weeks (yes, only six weeks! EEEKs) of SPC with a better understanding of varia-

tion and the real world of processes. I was elated to read the latest publication and feel I have even more material to share with these students who are destined to become managers, engineers and quality professionals.

Karen Lawrence
K.A.Lawrence@massey.ac.nz

To the Editor:

In the Spring 1998 issue of the Stat Division newsletter, Robert Watkins **asked how to calculate standard normal probabilities on a computer**. This can be done in Microsoft Excel, using the built-in statistical functions. Choose "Insert," "Function" from the main menu and select the "Statistical" group on the left side of the dialog box. The functions appear on the right. Use the "NORMSINV" function to return standard normal z-values for a given tail-area probability. Use the "NORMINV" function to return quantiles for any normal distribution, given the probability, mean, and standard deviation. The "NORMSDIST" function returns normal probability values, given a particular z- value. The "NORMDIST" function returns normal probabilities, given a measured value, mean, and standard deviation.

There are similar functions for other distributions, such as t, chi-square, and F. They can be used to find critical values and p-values.

Brendan Duffy
mbduffy@aol.com

To the Editor:

I read the letter from Robert Watkins in the ASQ Stat Division Spring 98 Newsletter asking **how to calculate Standard Normal Table** values yourself. Here is how to do it using statistical functions built into Microsoft Excel:

Use the "Insert" command in Microsoft Excel to insert a statistical

function NORMSDIST. In the specified cell, enter the function as follows: =NORMSDIST(z) where z is the specified z value or a reference to another cell containing the z value. Use Microsoft Help for more help. For example, = NORMDIST(1.333333) equals 0.908789. Or if cell A1 of the spreadsheet contains the z value of 1.5, the formula in the cell to output Normal Standard Distribution is: ==NORMSDIST(A1), which equals 0.93319. I hope this helps.

Vinay Daver
vinay.daver@lamrc.com

To the Editor:

I am a new member of the ASQ Statistics Division. I just received the Spring 1998 issue of the Statistics Division Newsletter and found most of the articles very interesting. I'd like to get **back issues of the Newsletter**. Would you please tell me how I can get them? Your assistance is appreciated.

James Jia
jnj2@chrysler.com

James:

Your question coincides with work we are doing to post old issues of the newsletter on the web. Thanks to a **generous grant from James Velayes of Southwestern Bell** and the diligent work of three graduate students (Leilei Ying, Fang Zhong and Emory Merriman), we have posted the first five years of newsletters at the URL <http://www.cba.bgsu.edu/asor/asqnews/letter.htm>. We will soon have newsletters from 1980 to 1987 completed, and we will continue until all past newsletters are posted. We will be adding a link to this resource from the Stat Division webpage at <http://www.asq.org/about/divisions/stats/>. We hope you find this of interest, and we invite your comments after you visit. I should add that my department at BGSU is providing space on its web

LETTERS, LETTERS, LETTERS

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site and graduate student support to create and maintain the files.

On a related note, we are considering posting an abbreviated **Spanish version of the Newsletter** on the web. Is there interest in this? Please respond to rstjohn@cba.bgsu.edu .

Editor

To the Editor:

I noted a reference to the Special Publication "STATISTICAL THINKING" in the Chair's Message in the Spring, 1998 issue of the ASQ Stat. Division Newsletter. How can I get a copy? If it is available to purchase, please tell me what the price is. Thanks.

Kirit Shah
kirit.shah@sv.sc.philips.com

Kirit:

The Special Publication "STATISTICAL THINKING" can be purchased from ASQ for a modest fee (\$8 includes shipping). Call ASQ at 1-800-248-1946 and ask for QIC at X8693. Ask for item #S0707. Give them your member number and your credit card number and you'll receive "STATISTICAL THINKING" within a few days. By the way, you can also purchase a set of Powerpoint slides that can be used to make a presentation on Statistical Thinking. This is item #S0707DP (\$10 includes shipping).

Editor

To the Editor:

I would like to get a PowerPoint slide of the **"statistical thinking/methods" sketch** shown on page 1 of the spring 1998 Stat. Div. newsletter. Is this available? Thanks.

Harry White
hwhite@raychem.com

Harry:

The image is available on my web site. The file name is vision.jpg and it is in the directory <http://www.cba.bgsu.edu/asor/asqnews/index.htm>. Once you get to that index click on the file name to see the image and click on 'file' and 'save as' to download the image.

Editor

To the Editor:

I have a summer intern who is interested in attending the 1998 FTC. She is working on her MS in Statistics from Iowa State, and may be working on a thesis project begun here during her internship with 3M. How does she submit an application for one of the student grants to the FTC? To whom? What are the criteria? Is there an official application form? Are letters of recommendation required?

I think this FTC Student Grant Award and the Gordon Research Conference scholarship details (criteria, application forms, key dates, etc.) should be posted on our website along with the Ellis R. Ott Scholarship Award info.

Bob Mitchell
rhmitchell@mmm.com

Bob:

As I am writing this, our webmaster Mark Kiel is adding this information to the Stat Division web page. Mark has made a number of upgrades to our web page. Please visit the site (<http://www.asq.org/about/divisions/stats/>) and send Mark your comments.

Editor

To the editor:

I believe the question regarding **sample size** posed by Harband Grewal in the Spring '98 newsletter does have a possible answer. The solution might follow Hahn and Meeker's text titled "Statistical Intervals" (see page 56 for using a Normal Assumption and page 84 using a distribution-free approach). Using the historic values of the mean and standard deviation can then give an estimate of a sample size that might meet the standards required. The sample selected, however, may have a different mean and standard deviation so that there would be no guarantees.

Richard Post
richard.post@intel.com

To the Editor

I saw Harband Grewal's question about a sample size calculation in ASQ's Statistics Division Newsletter (Spring '98). You may have already gotten responses on this, but, as I understand the question, he is talking about a "tolerance interval".

"A tolerance interval is an interval that one can claim to contain at least a specified proportion, p , of the population with a specified degree of confidence, $100(1-\alpha)\%$ [see "Statistical Intervals" by G. Hahn & W. Meeker, p 34.]

Offhand I do not know how to calculate the sample size to achieve a stated tolerance interval, but if you first learned how to calculate the appropriate tolerance interval for your situation, you may then be able to work back to an appropriated "n". Generally you would want to find a piece of software to do this type of calculation for you. Hope this helps.

John Long
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EDITOR'S MESSAGE

Continued from page 3

just like the one trick pony who taps his hoof three times to any question. At mid-afternoon, the pony astounds everyone with his response to "What time is it?" At other times.....

From a statistical perspective, we can think of Statistical Thinking and Statistical Methods as two factors in a response surface study. As Don Emerling and Lynne Hare have pointed out, there's a lot of synergism/interaction/interdependence between the two. We have long ago agreed that one-factor-at-a-time experimentation is bad practice in this type of situation, yet we find that some now advocate restricting Statistical Methods (holding it fixed) while studying the full range of Statistical Thinking. What would R.A. Fisher say?

Remember the third principle of Statistical Thinking: "Understanding and reducing variation are keys to success". Those who would always use the same test for many different applications, even if the test explains very little of the variation (has low power), are forgetting about the need to identify and reduce variation. A 'simple' analysis, even if 'unbiased', can often do an inadequate job of explaining the variability in the data, and thus the random error term in the tests used would be needlessly larger than it should be. For example, using a simple runs test for a time series process which has both an autoregressive order one (with a negative parameter) component and a linear trend component will often not detect the trend because the "noise" due to the autoregressive component has not been identified and removed from the 'random' error.

To make a sports analogy, in baseball we hear of players with 'physical skills' and players with a 'head for the game'. Think of the 'physical skills' as Statistical Tools and Methods, and think of the 'head for the game' as Statistical Thinking. In baseball, champions are players who have and continue to develop both the physical skills **and** the head for the game.

Folks, we have a wonderful opportunity to work together to integrate Statistical Methods and Statistical Thinking into something we can call "Problem Solving". First, we have to understand that the synergism between Statistical Thinking and Statistical Methods will make the 'bonded' resulting product much stronger than the separate parts. But we must also understand that if we persist in tearing down one or the other of these siamese elements, we will have nothing. We cannot implement Statistical Thinking fully without a mature understanding and appreciation for Statistical Methods. We cannot fully comprehend and use the tools of Statistical Methods unless we have an understanding of the interconnectedness of processes and the nature of variability which Statistical Thinking helps develop in us. We can focus on tearing down the "other guys" or we can work together to build.

OUTGOING CHAIR'S MESSAGE

Continued from page 4

There are probably others whom I have forgotten to mention, and I apologize if your name is not listed above. Everyone I have worked with deserves my personal thanks for a job done with dedication and enthusiasm.

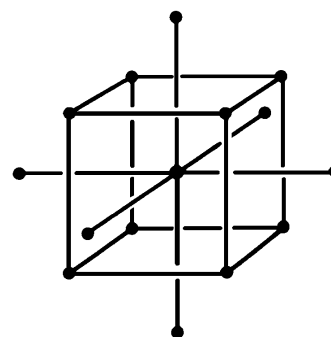
And finally a very special thank you to **Jenna Villareal** from ASQ, who kept me out of trouble, answered my endless questions with a 'smile in her voice' and helped me 'through the maze' of requests and requirements of ASQ.

It's been a great year, and really a great many years of active involvement in a great organization. I have never enjoyed myself as much as when I was working with the great people listed above. I encourage every member of the Division to reach out and become involved in the activities of the Division. You too will find it a rewarding experience.

INCOMING CHAIR'S MESSAGE

Continued from page 4

ship. If I were to name them individually, the newsletter would need to be extended at least three or four pages. Ralph St. John, newsletter editor, would not permit me to do that. There would also be the risk that I omit some who have made significant contributions. So I simply say "Thank you" to each of you who have in any way assisted the furthering of the Division's vision and mission. Please keep up the good work.



STATISTICS DIVISION MEETINGS AT THE ANNUAL QUALITY CONGRESS

Philadelphia Marriott Philadelphia, PA May 2-6, 1998

OPEN BUSINESS MEETING

Sunday, May 3, 1998 8:30pm - 9:30pm

Major Agenda Items discussed were:

A. Revised Mission, Vision, Strategy, Principles were reviewed by Don Emerling. (see page 2)

B. Membership Report presented by J.L. Madrigal: We had 10,442 members as of 3/31/98. A March survey of 100 'Unpaid' members revealed that the major reason for members discontinuing was a change in job assignment. Only 4% expressed dissatisfaction with the division as a reason for dropping. Section dues of \$8 was given as a reason by 11%.

C. Treasurer's Report presented by Janice Shade: Current Assets include \$78,291 in cash and \$4,295 in accounts receivable. Current Liabilities are \$11,335. So our balance was \$71,247. The Ott Scholarship account has a balance of \$294,351 (Note: these funds are administered by the Stat Division on behalf of the Ott Foundation, but are not available for other expenses.) We awarded four Ott Scholarships (\$5,000 each) last year.

D. Information Sharing:

1. '98 FTC Short Courses. The Stat Division had hoped to offer 4 Short Courses at the FTC, but space and planning limitations only allow 2 courses.

2. Standards Committee. Ed Schilling reported that the Stat Division has gained another ASQC/ANSI Standard to shepherd: Q3 "Sampling for Isolated Lots by Attributes." The division now owns B1, B2, and B3 standards and shepherds S1, S2, Z1.4, Z1.9, and Q3.

3. Newsletter. If there is interest in a Spanish language version of the newsletter, Ralph St. John may work with J.L. Madrigal's wife (ESL instructor at BYU) to post a short translation on the Web Page.

4. Section Liaisons. (J.L. Madrigal) Two Regional Councilor positions were recently filled (Ha Dao in Region 9 and John Jennings in Region 14). Two RC positions remain open: Regions 1 and 5. Twenty-six Section Liaison positions are filled (out of 259 sections).

5. Web Page. Mark Kiel gave a demo of the Stat Division web page at a technical session during the AQC. Response has been very favorable.

6. Booth Activities centered around two things:

- * A Jeopardy game based on Statistical Tools and Thinking, developed by J.L. Madrigal.
- * A "History Board" (developed by Bob Mitchell) celebrated our 20th birthday. It featured previous chairs and their accomplishments.

7. The '98 FTC will be held in Corning, NY.

8. Open Positions- Open positions within the Division will be posted in the booth.

E. 1998-1999 Officers were introduced (see article on page 15): Chair - Don Williams; Chair-Elect - Bob Mitchell; Treasurer - Janice Shade; Secretary - Van Bowen; Past Chair - Don Emerling.

F. Don Emerling's last official act was to pass the gavel to Don Williams.

COUNCIL MEETING

Monday, May 4, 1998 7:00 pm - 9:00 pm

A. Revised Mission, Vision, Principles and Strategy were approved (see page 2).

B. Membership Report: See Business Meeting.

C. Treasurer's Report: See Business Meeting.

D. 1998-1999 Budget:

- 1. Forecasted income: \$134,000
 - 2. Proposed expenses: \$120,000
 - 3. Motion to add \$10,000 for Marketing approved.
 - 4. Net Income/Loss: + \$ 4,000
- 1998-1998 Budget was approved.

E. Recognitions

1. For the **Fourth Straight Year** the Stat Division Achieved Level III (the top level) of the McDermond Award for section management. Past Chair Beth Propst accepted the award on behalf of all who contributed.

2. Don Emerling recognized these contributions:

- Jenna Villarreal - ASQ Electronics Division Award
- Frank Alt - Liaison to Deming Conference
- Mel Alexander - '97 FTC Short Course Chair
- Sue Albin - 2 yr. FTC Program Rep
- Larry Haugh - '97 AQC Session Manager
- Beth Propst - Past Chair

F. Information Sharing

1. ASQ has developed a self-directed learning kit for CQM and CQA certifications, and has proposed a self-directed primer for the CQE. ASQ divisions contributing to the CQE body of knowledge are asked to support this. Nick Martino, Certification Chair, will be notified.

2. The Stat Division hoped to have 4 Short Courses for the FTC; but, the agreement only allows 2, and facilities are limited. Two courses will be presented.

Continued on page 11

ANNUAL QUALITY CONGRESS

Continued from page 10

3. Ed Schilling reported on standards the division is responsible for (see Business Meeting). Motion made, seconded and approved: "The Statistics Division Council affirms the results of the working groups that the ANSI/ASQC Z1.9, Z1.4, and Q3 standards be revised subject to appropriate editorial revision."

4. Information (see Business Meeting) was shared, regarding the Newsletter, Section Liaison positions, activity at our booth, and the web page.

5. Twenty-nine people attended the AQC short course on Saturday. From all reports Tim Fuller did a fine job teaching the "Theory of Constraints."

STRATEGIC PLANNING MEETING

Saturday and Sunday, May 2-3, 1998

Purpose: To focus / align the efforts of our "product generating" committees to deliver the maximum vision-focused value to our customers in the next year.

Current Situation: Products and services are not coordinated around a common theme. We find it difficult to identify and utilize volunteers. Committees are not asked to deliver yearly products/service plans. Tactical planning teams often don't make significant progress. We're in the infancy of electronic communications. We don't hold non-performers accountable. Printing and mailing the Newsletter accounts for 65-70% of our budget. None of our products, except the Newsletter, reach a large % of customers. Low incentive to create new products. QIC-stocked products generate income. Opportunities to get members involved and be empowered. Net loss (turnover) of 500 members per year. Poor information on what we sell, how much, and to whom. Lack of measurement systems. Starting to address marketing issues. We have clear direction (surveys) from new members on what they expect: more local short courses, mini papers, case studies.

Desired Future State: Statistical Thinking Everywhere. New products/services that are natural progression of a clear master plan. Growing customer base gives highest marks for our products. Our product/service delivery system is a model for others. Our products/services generate working capital. Members use more than one of our products/services. We sponsor R&D and fund new applications. Extensive portfolio of products and services. Have a good information database/system that is actively used. Identified partners. Clearly stated goals, objectives, timelines for each tactical plan. Networked subject matter experts to implement plans.

Presentation from Renee Janscha from ASQ's QIC

Group: QIC wants "Information Packets" on given subjects, similar to current Six Sigma and ISO-9000. The Stat Division could package materials on Statistical Thinking into such a package. QIC wants suggestions from our Division for referral of Statistics-related questions: guidance on subject matter experts; Stat Division targeted response times; media preference (phone calls, email); etc.

Review Previous Long Range Tactical Plans:

1. Design & Deliver Selected Useable Products.
 - * Put old Newsletter articles on the web.
 - * Develop a Clearinghouse of statistical stuff.
 - * Identify and start no more than 3 new publications.
2. Demonstrate the Broad Effectiveness of Statistical Thinking.
 - * Beef up Short Courses (more variety, venues).
 - * Collect more Statistical Thinking case studies.
3. Integrate Statistical Thinking into Education.
 - * Pilot the Dallas, TX, area "Pegasus" project.
4. Develop a Vibrant Information & Communication System.
5. Develop a Division marketing process.
6. Develop a member nurturing process (retention).

1998 Objective: To focus and align our product-generating committees to deliver the maximum vision-focused value to our customers in the next year; to design and deliver one new product this year.

Key Elements for our 1998 Objective:

Develop/implement specific web-delivered products.
Develop a metric system to evaluate effectiveness.
Develop a network of experts to deliver our products.
Develop a customer information system/database.
Develop a strategic partnership with QIC.
Develop a marketing plan for our products.
Collect additional Statistical Thinking case studies.
Implement Section Liaison strategy to deliver products.
Design and Deliver selected new products.

**Specify *success criteria* for each key element.
Identify *barriers to implementation* of each.**

Summary: We will design and develop **selected/focused** new products which are **consistent** with our Mission and Vision. We will define **success criteria** for these initiatives and we will develop a **measurement system** to determine if these criteria are being met. **Unsuccessful** initiatives will be **discontinued**.

QUALITY IMPROVEMENTS

1978

**William G. Hunter
1979 - 1980**

- Statistics Division organizational meeting on November 1, 1979.
- Division members began working on statistical standards.
- Publication of a "Reference Series" of booklets discussed.
- First Council meeting on May 19, 1980 in Atlanta at the 34th Technical Conference & QA Show.
- Sponsored one day course on "How to Perform Continuous Sampling."



**Otto Dykstra
1980 - 1981**

- Bill Hunter was Chair and I was Chair-elect in the first year of the Statistics Division. Bill took a one year sabbatical from the University of Wisconsin to get the Statistics Division rolling. As Chair my job was to keep the momentum going, maintaining and nurturing the organizational framework set up by Bill. The Statistics Division survived!

**Douglas C. Montgomery
1981 - 1982**

- Membership reached 2,000.
- Sponsored three sessions at the 1982 Annual Quality Congress.
- Three "How To" booklets were published.
- Division involved in the Annual Conference on Applied Statistics and the Fall Technical Conference.



**John S. Ramberg
1983 - 1984**

- Membership grew to 4,668.
- Division co-sponsored a conference on the Statistical Education of Engineers.
- Participated in education programs with the Minnesota and Akron-Canton sections.
- Continued to participate in the Fall Technical Conference.

**Frank B. Alt
1982 - 1983**

- Membership survey conducted. Mini papers and unique implementation of statistical QC techniques identified as the most desired part of the Newsletter.
- Four more "How To" booklets were published.
- Sponsored a session at the Fall Technical Conference.



**William B. Mead
1984 - 1985**

- Membership increased to 5,700.
- First **Speakers List** developed.
- Volumes 8 and 9 of the "How To" series were published.
- Adopted the Central Composite Design as the division logo.



**Peter J. Jacobs
1985 - 1986**

- Initiated the Statistics Division strategic planning process.
- Established the Statistics Division as a co-sponsor of the Fall Technical Conference.
- Strengthened the Division's infrastructure (e.g., committee assignments, liaisons with other organizations, quality of newsletter...) to ensure the needs of its growing membership.
- Membership few at over 30% from 5,700 to 7,500.

**Edward F. Mykytka
1986 - 1987**

- First major strategic planning exercise, which clearly defined the Division's mission, short- and long-range objectives, products, and customers.
- The 1987 Fall Technical Conference was dedicated to his memory and the William G. Hunter Award was established shortly thereafter.
- The Statistician's Role in Quality Management.
- Statistical Consulting Workshop.
- Using Values to Improve the Effectiveness of Statisticians.
- Case Studies in Quality and Productivity.
- Division membership experienced rapid growth, surpassing 10,000 by June 1987.



**Ron Ask
1987 - 19**

- Became the largest division in ASQ with 10,000 members
- First year that it had the lead role Fall Technical Conference.
- Assisted with the Conference on Engineering Edu



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**Roger W. Hoerl
1990 - 1991**

- Extended Strategic Planning to develop division strategy, values, ground rules, and managing processes.
- Worked to ASQ Headquarters and American Supplier Institute (ASI) to publish clarification of ASI's views on statisticians.
- Continued to develop the Division Operating Manual.
- Initiated Annual Tactical Planning Process.



**Steven P. Bailey
1989 - 1990**

- Signed a new five year agreement to co-sponsor the Fall Technical Conference.
- Conducted a long range planning meeting prior to AQC.
- Participated in a Congressional quality study.
- Initiated development of the Statistics Division Operation Manual.



**Conrad Fung
1991 - 1992**

- White paper on Survival Skills for Statisticians completed.
- Statistics Division Operating Manual completed.
- Statistics Division Membership Survey
- Upgrade the Statistics Questions in the CQE Exam.
- Build a QFD "House of Quality" for Educational Needs.
- More Proactive Role for Statistics Division in Selecting Papers for the AQC.



**Joseph O. Voelkel
1992 - 1993**

- The Operating Manual was created. One of its goals, to be a model for other organizations, seems to have been fulfilled, as numerous groups have requested copies of it.
- The first professional membership survey was completed, using the survey firm of Gordon Black, Inc. They reported that 500 out of 501 of the members they contacted took part in the phone survey, a result that astonished them.
- The Division is asked to review the statistics questions of the CQE exam.
- An annual formal evaluation of the Division begins, thereby filling in the "check" part of the PDCA cycle.
- The building of the House of Education model begins.
- The newsletter gets a facelift, with a more modern look and the addition of the CCD logo.
- The update of the Glossary of Statistical Terms begins.



**Galen Britz
1993 - 1994**

- Developed a 5 year plan at the Long Range Planning meeting.
 - Decided we want to influence the world rather than being influenced by it.
 - Decided we wanted to spread the application of Statistical Thinking and Techniques to all areas.
- Published a Special Edition Newsletters describing the House of Quality Education.
- Constructed a gigantic affinity diagram in the booth at the AQC by asking our members the question: The Statistics Division wants to be the most responsive organization in the universe. What would it take to make this statement real for you?
- The Division achieved McDermond Level 3 recognition for the first time.



**Richard A. Lewis
1994 - 1995**

- Signed a new 5-year Fall Technical Conference agreement.
- Began implementing the long-range plan.
- Achieved McDermond Level 3 recognition for the second time.
- Revised, updated the Division's logo and color scheme.
- Decided not to develop a Certified Quality Statistician exam.



**Nancy E. Belunis
1995 - 1996**

- Established a Bulletin Board Editor.
- The 3rd Edition of the Glossary was published.
- The Statistical Thinking **Special Publication** was issued.
- A PowerPoint presentation on Statistical Thinking was developed.
- The Division achieved McDermond Level 3 recognition.



**Beth Propst
1996 - 1997**

- Continued to implement our plan to spread Statistical Thinking by publishing "How to Teach Others to Apply Statistical Thinking" in Quality Progress.
- Established a Statistics Division web page. It included the first modules of the "Statistical Thinking Virtual Academy."
- Sponsored a session at the Rocky Mountain Quality Conference for the first time.
- Achieved McDermond Level 3 recognition.



**Don Emerling
1997 - 1998**

- Long Range Planning in Baltimore.
- First 4 Ott Scholarships awarded \$5,000.00 each.
- Developed an Operational Planning Calendar.

1998

PHILADELPHIA AQC '98 COLLAGE



Passing the gavel from Don E. to Don W.



The Statistics Division booth was the busiest and best!! Note the Jeopardy Game in the background (what is Cpk?)



Bob Mitchell and the 20th Anniversary "History Board."



Don Emerling grounds us in our Mission, Vision and Principles before we begin the Strategic Planning Meeting.



J.L. Madrigal quizzes two smiling players in the Jeopardy Game.



Beth Propst, Nancy Belunis, Janice Shade and Don Williams at the Open Business Meeting.

NEW STAT DIVISION OFFICERS



Don Williams Chair

Don Williams is founder, president, and senior consultant of Process

Improvement Consultants, a management consulting firm (located in Denton, TX) specializing in assisting clients in continuous improvement of their processes, products and services. He was previously a senior consultant with Process Management International, and prior to that a faculty member at the University of North Texas, where he founded and was the director of the Center for Quality and Productivity.

Don received a Ph.D. in Mathematics and Statistics from Oklahoma State University. He is a Senior Member of ASQ and has previously served the Statistics Division as Certification Chair and Treasurer. Don has recently led the Statistics Division's activities aimed at working with public schools to introduce the principles of statistical thinking into the curriculum.



Robert Mitchell Chair-Elect

Bob Mitchell is a 17 year employee of 3M Company. He is currently a Quality

Specialist for 3M's Personal Care & Related Products Division, located at 3M's world headquarters in St. Paul, Minnesota. Bob has previously held positions in Quality Assurance, New Product Development, Process Development, Supplier Management, Statistical Consulting, and Technical Supervision, all within 3M. Bob is

also active in his community as a quality management consultant.

Bob is a Senior Member of ASQ and a Certified Quality Engineer. Bob has served the Statistics Division over the last five years, first as Membership Chair, and most recently he served a two-year term as secretary. During his term as Membership Chair he initiated and led several tactical plans aimed at improving our service to our members, including "Assessing Membership Needs" (a detailed survey of members) and "Improving Local Involvement" at the section level.

Bob has a B.S. in Chemistry from the University of Minnesota-Morris, and is an inaugural member of 3M's Statistical Practitioners' Forum.



Janice Shade Treasurer

Janice Shade has worked for Nabisco for the past 14 years. She is currently

Manager of Continuous Improvement for the US Foods Group in Parsippany, New Jersey. Janice has experience in several areas of Quality, including Vendor Quality, Specification Development, Packaging Design, Quality Systems Analysis and Statistical Process Control.

Janice has a B.S. in Biology from the College of New Jersey, an MBA in Quantitative Analysis from Fairleigh Dickinson University in New Jersey, and is currently enrolled at Rutgers University in the M.S. in Applied Statistics Program.

Janice is a Senior Member of ASQ. She has previously served the Statistics Division as Newsletter Editor, as one of the authors of the Special Publication on Statistical Thinking, and most recently she completed the first year of her two-year term as treasurer. She is also listed in Strathmore's "Who's Who for Business Leaders".



Jacob Van Bowen, Jr. Secretary

Van is currently Chair of the Department of Mathematics and

Computer Science at the University of Richmond, where he has been a faculty member since 1968. In recognition of his contributions he was recently appointed Richardson Professor of Math & C.S. by the University. Van has published and consulted in the areas of applied statistics, quality applications, TQM, control charts, statistics and the legal profession, and catalyzing change with data.

Van received a B.S. in Math from Richmond and an M.S. and Ph.D. in Statistics from V.P.I. & S.U. At Richmond Van has taught a variety of statistics courses to undergraduate and graduate students, and to non-students through continuing education courses. Van's secret passion is that he plays tuba for a faculty jazz band that has toured the world.

Most recently Van served as program chair for the Fall Technical Conference. He now begins a two year term as secretary. He is also a member of the American Statistical Association.

DEMING CONFERENCE ON APPLIED STATISTICS

December 7 to 11, 1998 Resorts Casino Hotel in Atlantic City, NJ

Jointly sponsored by the Biopharmaceutical Section of the American Statistical Association and the Statistics Division of the American Society for Quality, this conference was cofounded by Dr. W. Edwards Deming, and for the last 20 years has consisted of 3 days of 3-hour tutorials followed by 2 days of short courses. Separate registration is permitted for individual days or parts of the Conference.

Among the tutorial speakers this year are:

Norman Draper on Regression Analysis
Dennis Cook on Regression Graphics
Daniel Zelterman on Coordinate Free Loglinear Models
Dallas Johnson on Mixed Models Analysis of Repeated Measures Experiments
Dan Carr on Graphics
James Berger on Bayesian Hypothesis Testing and Model Selection.

There are also several talks by statisticians from the Pharmaceutical Industry on a variety of Biopharmaceutical issues ranging from Equivalence Trials to Pharmacoeconomic Studies.

The two short courses are:

Peter Westfall and Dror Rom on Multiple Comparisons: Applications and Case Studies
Richard Deveaux and Lyle Ungar on Data Mining and Knowledge Discovery: A Practical Introduction.

Both these courses have been well-received when they were presented at recent ASA Annual Meetings and bring to participants the latest developments in these exciting areas of modern, computer-intensive methods.

The variety of applied topics presented by well-known experts, moderate cost, flexibility of registration, and learning-friendly tutorial format makes this a truly outstanding conference for applied statisticians who want to stay current in their field. To get more info and obtain registration materials, check the conference website at: <http://nimbus.temple.edu/~kghosh/deming98/>

Bert Gunter
Merck & Company

43RD ANNUAL FALL TECHNICAL CONFERENCE

October 13-15, 1999

Applied Statistics in the 21st Century

Wyndham/Greenspoint Hotel Houston, Texas

Co-sponsored by:

American Society for Quality: Chemical and Process Industry Division
Statistics Division

American Statistical Association: Section on Physical and Engineering Sciences

As the 21st century dawns what will be the role played by applied statisticians in industry and education? This year's theme is forward looking. From today's perspective what new and perhaps different types of problems will we be working on in the future? What new methodologies will we be expected to use? How will the profession need to change to remain a value added component to corporate and academic life?

If you are interested in presenting an applied or expository paper in any of three parallel sessions (Statistics, Quality Control or Tutorial/Case Studies) contact any of the individuals listed below, preferably by e-mail, and they will send you the instructions for authors. Work should be strongly justified by application to a problem in engineering, process/chemical industry or physical sciences and it should be relevant to the theme state above. The mathematical level of the papers may range from none to what is used in the Journal of Quality Technology or Technometrics.

Submission deadline is January 15, 1999.

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MINI PAPER

Left Brained and Right Out of Touch

By Ryan D. Monson
Advanced Silicon Materials, Inc. Moses Lake, WA 98837

In the recent Youden Address G.B Ranney¹ states

One quality characteristic of statistical services might be whether the plan for a study, or the discussion of findings, or the description of how to use a method is designed to be understood by the user.

Also from Ranney's address:

The right to be consulted is earned and re-earned, by demonstrating the capacity to be helpful.

As technical types, do we maintain an outward, customer focus in providing services? I, like most (if not all) members of this division, am fascinated by the mathematics associated with statistical analysis. Equations are there to ponder, reflect upon, utilize wherever I can. In engineer/scientist heaven, the streets are paved with... equations.

Common complaints from the left...

- n They don't read the report
- n They don't use the data
- n They want graphs and pictures
- n They want it all on one page
- n They're not mathematically inclined

Funny thing is, nobody else at my company thinks this way. The people who are actually making the money, the equipment operators, have a different point of view. They aren't interested in equations. For the most part, they're interested in just going home. Why? One reason is I haven't helped make their work environment pleasant. They're interested in having fewer angry customers, being confident in their ability to make parts correctly, having fewer hassles. Equations don't do that for them.

In general, have we made life easier for our moneymakers? Probably not. Why? Because most engineers/scientists are uncomfortable with the 4th element of the System of

Profound Knowledge: psychology.² People are unpredictable, unlike our equations. We entered the hard sciences (mathematics, statistics, physics, etc.) because of their logic, their a priori predictive capability. We undervalue the soft sciences (physiology, biology, agronomy, etc.), thinking they aren't sciences at all because of their weak forecasting capability and unsophisticated math. We struggle with people (including ourselves) because they're unpredictable.

In my career, I've spent 8 years in the quality profession and the past year in a combined organizational development/quality assurance (OD/QA) group. I've learned much about what's necessary to bring about continuous quality improvement in the last year. The head of OD/QA (a psychologist) has clearly pointed out where the breakdowns occur in our left brain improvement efforts. Whole brain thinking is an essential foundation to catalyzing change in any organization. And we are change agents. Every analysis, experiment, audit, control chart, etc. should drive change. Our companies don't need us to tell them everything is okay. They need us to tell them how to make things better, then to help, really help, implement and check the improvements.

How do we overcome our personal uneasiness to dealing with human behavior? Here are some thoughts:

and from the right...

- n All this analysis is confusing
- n Why don't they have an idea of what to do about this problem?
- n They're boring

How statisticians help

- n Clarify the muck
- n See through the fog
- n Pinpoint "what's happening here" for the operators so they can keep things moving

Continued on page 18

MINI-PAPER

Continued from page 17

1. **Read a different kind of book.** Instead of investigating only technical topics, how about exploring human behavior? What about Shakespeare? The Bible? Koran? Fiction? What makes literature great is the core-to-core human conflict, the deep exploration of the psyche. Reading generates knowledge. There's no way to effectively address human behavior without knowing something about it. And there's no way to effectively implement our technical solutions without understanding the causes for human behavior.

2. **Observe.** Have you learned to read non verbal communication? Do you look behind the verbal communication to get at the needs and concerns of others? A marriage counselor friend of mine said that within 5 minutes of conversation a therapist can know everything needed to help an individual. Are we that astute? My current boss pointed out to me the volumes of negativity I communicated nonverbally in meetings. I changed my ways, and benefited greatly from his candid observations. Are we doing that for our subordinates and co workers? (By the way, my negative body language came from knowing no one cared about the marvelous study I had completed!)

3. **Listen.** We have 2 ears and 1 mouth for a good reason. We need to use them in their intended proportions. And remember, listening isn't silence. It requires 2 way interaction, with the listener asking clarifying questions and probing for understanding.

4. **Take an anti-pride pill.** In my 12 years as an engineer, a common complaint from the "laymen" is the technical types won't listen. Why don't we listen? One root cause is probably arrogance. Arrogance is so damaging I wonder if it merits being a scientific discipline (Arroganomics, the study of fat heads). As I reflect back on my egocentricity from the past it makes me cringe. Do we look down on those who struggle with basic math? I sure did in my college days. Do we dislike people, not wanting to participate in social activities with them? I sure have. Do we think fun is totally frivolous and has no business in the workplace? Our OD/QA department is a looney bin (shoes optional, Led Zeppelin often, impromptu parties always), yet we are effective in our corporate role. To combat pride, let's add a little humility as part of our "intrapersonal" tool box.

5. **Stop believing the "facts only" lie.** Our external and personal worlds have a perception that we are emotionless, exclusively objective, and only interested in the raw facts and the scientific conclusions drawn therefrom. That is not true. We have emotions and feelings. Let's accept that. And let's accept that others do also, and any decision that anyone makes has a strong emotional element. If we are going to influence decision makers, we must touch their emotions.

We technical types have a lot to offer. Engineers/scientists really benefit the world, but the world doesn't know it because our PR is pretty poor. If we can develop a personal touch, coupled with our logical skills, we can be powerful instruments in serving others.

¹Ranney, G.B. "Context of Statistical Practice", ASQ Statistics Division Newsletter, Vol. 17, No. 1.

²Britz, G., Emerling, D., Hare, L. Hoerl, R., Shade, J. "Statistical Thinking" Special Publication, ASQC Statistics Division, Spring 1996.

42nd Annual Fall Technical Conference

Management Analytics: Statistics, Quality, and Decision-Making

Radisson Hotel, Corning, New York

October 22-23, 1998

The “best value” technical conference around will be held this year at the Radisson Hotel in Corning, New York, known as the Crystal City for its association with glass and, especially with, Corning Inc. The conference is sponsored by the Chemical and Process Industries Division and the Statistics Division of the American Society for Quality and by the Section on Physical and Engineering Sciences of the American Statistical Association.

Program Three parallel sessions will offer the latest developments in statistical methods as they relate to quality improvement and quality decision making. The chemical and process industries and the physical and engineering sciences are the application areas widely represented on the program. You'll have the chance to meet informally and exchange views with speakers and colleagues during breaks and in the friendly hospitality suite. The program is reproduced on the following pages. Readers with web access can visit www.sas.com/ftc98 to read abstracts for each presentation. Thanks go out to Randy Tobias (SPES), Malcolm Hazel (CPID), and Bob Brill (Stat) for their excellent work in developing this program. Registration for the conference is \$150 for a single day, or \$190 for both days (+ \$10 after Sept 15), and should be mailed to Marianne Abercrombie, P.O. Box 1205, Corning, NY 14830.

Awards Four awards sponsored by ASQ divisions will be presented at the conference: The Shewell Award for the best presentation at the 1997 Fall Technical Conference, the Wilcoxon Prize for the best practical application paper, and the Youden Prize for the best expository paper published in the previous year's Technometrics. On Thursday afternoon, at the W.J.Youden Memorial Address, the Hunter Award will be presented to a recipient who has demonstrated creative development and application of statistical techniques to problem solving in the quality field.

Pre-Conference Short Courses The Statistics Division will sponsor two short courses on Tuesday and Wednesday before the conference, October 20 and 21.

Statistical Control by Monitoring and Feedback Adjustment (George Box and Stuart Hunter).† (2 day course, Oct. 20-21). The cost is \$300. CANCELLED DUE TO HEALTH PROBLEMS. The following Substitution is being offered:
Response Surfaces and Experiments with Mixtures (John Cornell) (1 day course on Tuesday, Oct. 20). The cost is \$175.

Robust Parameter Designs and Statistically Based Alternatives (Jeff Vining). This course is intended for people who want to know more about robust parameter methods. The morning session will cover Taguchi's basic approach to robust parameter design. The afternoon will concentrate on statistical alternatives. (1 day course on Wednesday, Oct. 21). The cost is \$175.

Special Discount: Shortcourse registrants may take **both courses** for the special price of \$300. Courses run from 8:30 AM to 5:30 PM; the fee includes coffee breaks and lunch.

Council Meetings On Wednesday, October 21, the Chemical & Process Industries Division and the Section on Physical & Engineering Sciences will hold council meetings from 7:30 to 9:30 p.m. The Statistics Division council meeting will be Thursday, October 22 at 7:30 p.m.. These open meetings are an opportunity for those who wish to become involved in the activities of the societies to become better informed. Check your registration package for room locations and other meetings of interest.

Continued on page 20

42ND ANNUAL FALL TECHNICAL CONFERENCE

Continued from page 19

Hospitality Suite The Fall Technical Conference and the officers of the sponsoring organizations host a hospitality suite. This plays a vital role in the strategic operation of the divisions. We welcome new faces and new perspectives on division operations as well as share technical insights with colleagues, in a friendly, informal atmosphere. Please come meet us in Corning!

Non-Technical Program Two wonderful days in and around the “Crystal City” have been planned.

Thursday: Board the bus at 8:30am. First stop is the Corning Glass Center including the Hot Glass Show. Then it’s on to the Benjamin Patterson Inn where demonstrations of frontier life will highlight open hearth cooking. Following lunch at Limey’s, you will proceed to The Studio where you will create your own piece of glass art using a variety of glassworking techniques. Cost is \$48.

Friday: You will enjoy a guided walking tour of historic Market Street, including shops with hot glass blowing demonstrations and a stop at the Rockwell Museum. Lunch is at London Underground, after which we will take a ride to one of the Finger Lakes and optionally tour a local winery. Cost is \$50, plus \$37 for the optional wine tour.

Accommodations A block of rooms has been saved at the Radisson Hotel in Corning. Conference rates are \$95 plus tax, single or double. These rates apply October 20-23. The room block will be held until September 28. Reservations can be made by calling the hotel directly at (607) 962-5000. Mention the ASQ Fall Technical Conference to receive the special conference rate. Reservations must be guaranteed with a valid credit card, and are subject to a 48-hour cancellation policy. Check-in: 3:00 p.m.; check out: 1 p.m.

Travel Information By plane, the closest airport is the Elmira-Corning Airport, 12 miles from the Radisson. Take the shuttle bus: you probably won’t need a car in Corning. By car, Corning is located on Route 17. Take the exit for Route 352 to Downtown Corning. The Radisson is at 125 Denison Parkway (Route 352).

1998 Fall Technical Conference Committee: Dorothy Sempolinski, General and Local Conference Chair; Brenda Niccum, Treasurer; Marianne Abercrombie, Registrar; Carolyn Clark, Jan Johnson and Dean Neubauer, Host Committee. All are employed by Corning, Inc.

Officers of Sponsoring Organizations

ASQ - C&PID	ASQ – Stat	ASA – SPES
<p>Chair: Kymm Hockman, DuPont Chair-Elect: Dorothy Sempolinski, Corning Secretary: William Cox, TQM Consulting Treasurer: Jim Stuart</p>	<p>Chair: Don Williams, Process Improvement Consultants Chair-Elect: Robert Mitchell, 3M Secretary: Jacob Van Bowen, University of Richmond Secretary: Janice Shade, Nabisco</p>	<p>Chair: John Cornell, University of Florida Chair-Elect: Janet Buckingham, Southwest Research Institute Secretary/Treasurer: Perry Haaland, Becton Dickinson Research Center</p>

Thursday, October 22, 1998

Thursday 7:30-	Registration Desk Opens		
Thursday 8:00-9:00	WELCOME / PLENARY SESSION Topic: Management Analytics: What Is This All About? Speaker: Patrick P. Donnelly, Drexel University Welcome: Dorothy Sempolinski, Corning Inc.		
Thursday 9:15-10:00	A. Wavelets and Statistical Process Control	B. Multiresponse Optimization	C. Quality Management Case Study
1	Multiscale Statistical Process Control Using Wavelets Bhavik Bakshi, Ohio State University Moderator: TBA	A Hierarchical Method for Multiresponse Experiments Where Some Outcomes are Assessed by Sensory Panel Data Flavio S. Fogliatto Federal Univ. of Rio Grande do Sul, Brazil Moderator: Mary Ann Koskinen Campbell Soup Company	Quality Management and Quality Assurance in the Manufacturing of Nuclear Fuel Elements: Trends and Challenges Yves Grize, AICOS Technologies AG Moderator: Heidi Servilla, Corning Inc.
Thursday 10:00-10:30	BREAK		
Thursday 10:30-12:00	A. Small Sample SPC	B. Special Invited Session on Chemometrics	C. Screening Designs
2	Small Sample Theory for Change Detection Using 'Time Between' Data Richard E. Kleinknecht Weyerhaeuser Company Small Sample Properties of an Adaptive Filter with Application to Low Volume Statistical Process Control Stephen Crowder Sandia National Laboratories Moderator: Dean Neubauer, Corning Glass Inc.	Making Money for The Dow Chemical Company Using Chemometrics Mary Beth Seasholtz The Dow Chemical Company The Potential of the Wavelet Transform for Data Processing in Analytical Chemistry Christian MitterMayr University of Delaware Moderator: Geoff Vining, Editor, JQT University of Florida	Use of Replication in Almost Unreplicated Factorials Kinley Lartz, University of Minnesota Minimizing Prediction Error in Models Fitted to Experiments with 16 Factorial Points and 0 to 6 Center Point Arthur Holms, Private Consultant Moderator: Ralph St. John, Bowling Green State Univ.
Thursday 12:15-1:45	LUNCHEON Topic: Manufacturing Process Control & Discipline Speaker: John Rathmail, Manager of Manufacturing Process Engineering, Corning Inc. Presiding: Kymm K. Hockman, DuPont Company, ASQ-C&PID Chair		
Thursday 2:00-3:30	A. Multivariate Control Charts	B. JQT Session	C. Case Studies
3	Robust Multivariate Control Charts Vivek Ajmani, University of Florida Run-to-Run Batch Process Monitoring Using Real-Time Data Todd Nelson, 3M Moderator: Robert Brill, Solutia, Inc.	What I Think Response Surface Methods Are All About George Box, University of Wisconsin-Madison Response Surface Methodology: Reflections of the Past and Future Directions Raymond Myers Virginia Polytechnic Ins. & State University Moderator: Geoff Vining, Editor, JQT University of Florida	Regression Control Charts Revisited: Methodology and Case Study Bryan Olin, The Proctor and Gamble Company Uncertainties in Quantitative Measures of Statistical Reliability of a Fatigue Loaded Component Donald Neal, SRRC Moderator: Athan Marion, Campbell Soup Co.
Thursday 4:00-5:00	W. J. YOUDEN ADDRESS Topic: "A Perspective on Models and the Quality Sciences: Some Challenges and Future Directions" Speaker: Douglas C. Montgomery, Arizona State University Presiding: Don Williams, Process Improvement Consultants, ASQ-STAT Chair		

Friday, October 23, 1998

Friday 8:00	Registration Desk Opens			
Friday 8:30-10:00	A. Frontiers in Modelling	B. Quality Assessment	C. CUSUM Control Charts	
1	<p>Joint Estimation of Location, Dispersion, and Random Effects in Robust Design</p> <p>Russ Wolfinger, SAS Institute, Inc.</p> <p>Latent Variable Multivariate Regression Modeling</p> <p>Alison Burnham, McMaster University</p> <p>Moderator: John Cornell, Univ. of Florida</p>	<p>Computer Simulation: A Decision Tool for Quality Planning</p> <p>Soumaya Yacout, Universite de Moncton</p> <p>Process Indices for Certain Non-Stable Processes</p> <p>Joseph Voelkel Rochester Institute of Technology</p> <p>Moderator: Raymond Brown, Drexel University</p>	<p>Using CUSUM Charts to Identify the Start of a Problem</p> <p>Wayne Taylor Baxter Healthcare Corporation</p> <p>Unified CUSUM Charts for Monitoring Process Mean and Variability Under Univariate and Multivariate Processes</p> <p>Chandramouliswaran Venkataramani Bowling Green State University</p> <p>Moderator: Michael Saccucci, BBN Software, Inc.</p>	
COFFEE BREAK				
Friday 10:00-10:30	A. Technometrics Session	B. Massive Data Sets	C. Extensions to Control Charts	
Friday 10:30-12:00	2	<p>Constructing Split Lot Designs</p> <p>Robert Mee, University of Tennessee</p> <p>Cost Driven Parameter Design</p> <p>C.F.J. Wu, University of Michigan</p> <p>Moderator: Max D. Morris, Editor Technometrics, Oak Ridge National Laboratory</p>	<p>Process Partitions for Massive Datasets</p> <p>George Runger, Arizona State University</p> <p>An Embarrassment of Riches: Design and Analysis of a 4000 Run Experiment</p> <p>Bert Gunter, Merck and Company</p> <p>Moderator: Robin Wurl, Rutgers University</p>	<p>The Box-Chart: A New Variable Control Chart for Univariate and Multivariate Processes</p> <p>Arthur Yeh Bowling Green State University</p> <p>Control Limits for CV Control Charts Via Simulation</p> <p>Joseph Conklin, General Motors</p> <p>Moderator: Jonathan Burton, Drexel University</p>
<p>LUNCHEON</p> <p>Topic: Quality, Statisticians, and Universities</p> <p>Speaker: David S. Moore, ASA President, Purdue University</p> <p>Presiding: John Cornell, University of Florida, ASA-SPES Chair</p>				
Friday 12:15-1:45				
Friday 2:00-3:30	A. Special Issues in DOE	B. Reliability	C. Special Issues in SPC	
3	<p>Optimal Design Strategies for Experiments Involving Noise Variables</p> <p>Connie Borrer, Arizona State University</p> <p>Designing Two-Level Factorial Experiments in Blocks When Effects May Change Over Time</p> <p>Mary Leitnaker, University of Tennessee</p> <p>Moderator: James Stuart, Eastman Kodak, Inc.</p>	<p>Analysis of Product Repair Data</p> <p>Wayne Nelson, Consultant</p> <p>Statistical Tolerance Analysis with Time Effects</p> <p>Nicholas Zaino, Reliability Consultant</p> <p>Moderator: John Heitmann, Corning Inc.</p>	<p>Monitoring Processes with Censored Data</p> <p>Stefan Steiner, University of Waterloo</p> <p>Some Guidelines for the Application of Adaptive Control Charting Schemes</p> <p>Lora Zimmer, Arizona State University</p> <p>Moderator: Jay S. Kim, Loma Linda University</p>	

STATISTICAL CLEARINGHOUSE UPDATE

Marcey Abate & Jim Lenhart

Current Features of Statistical Clearinghouse

- Publications area includes descriptions and links to helpful statistical journals, electronic texts, books, How To series, book reviews.
- Events area includes links to statistical and quality related conferences, seminars, and courses.
- Software area includes descriptions and links to statistical software, recently published reviews.
- Definitions area includes links to electronic statistical glossaries.
- Links area includes links to other helpful statistical sites.
- Dynamic “trivia and statistical facts” (e.g. famous people in statistics) area to encourage repeat visits.
- Dynamic “important events and news” area to keep visitors informed of current and special events in the statistical community.
- “Coming soon” area to encourage repeat visits.
- “Black & White” colorscheme to allow for quick loading of pages.

Tasks Completed

- Design and programming of homepage and navigation scheme.

- Identified links to include in publications, events, software, definitions, and links areas.
- Designed format for on-line book and software reviews.

Tasks in Progress

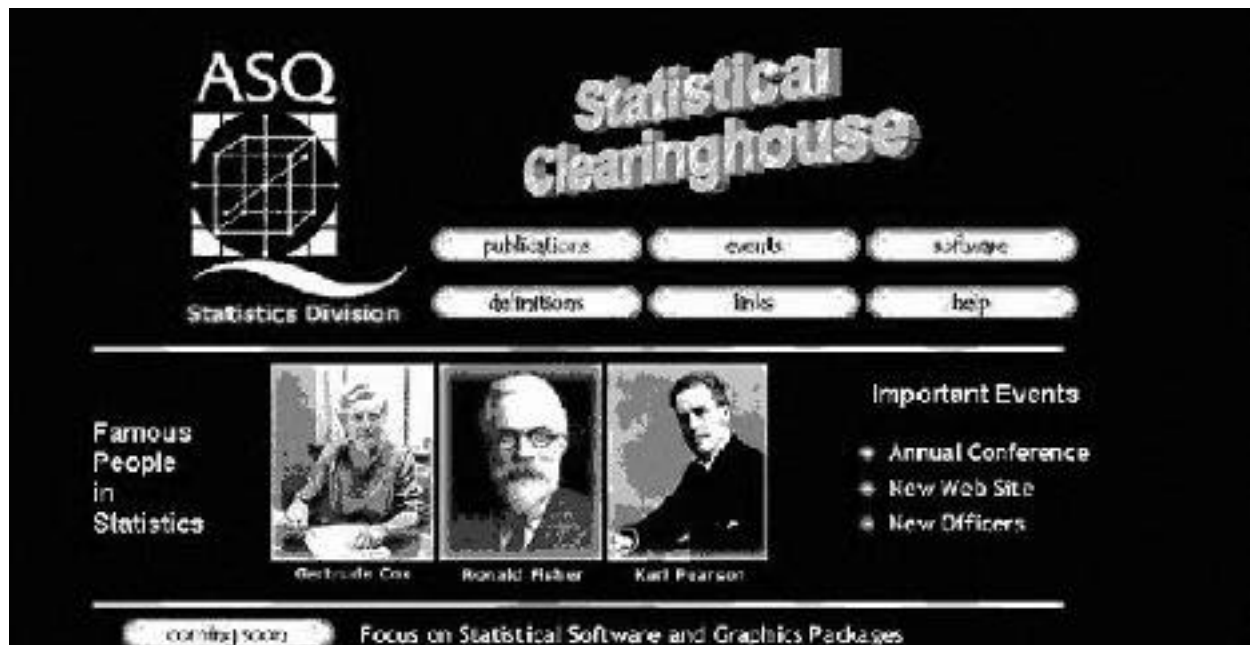
- Collecting book reviews.
- Programming to include links for publications, events, software, definitions, and links areas.
- Programming for on-line book reviews.
- Collecting FAQs.

Future Tasks

- Programming to allow on-line book and software reviews.
- Collect and include software reviews.
- Compiling and posting answers to FAQs.

Ongoing/Maintenance Tasks

- Update “trivia and statistical facts” on a quarterly basis.
- Update “important events and news” and “coming soon” areas on an as-needed basis.
- Update various links on an as-needed basis.
- Update FAQs on an as-needed basis.





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AMERICAN SOCIETY FOR
QUALITY**
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Bowling Green, OH 43403-0267

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This will change the address for all publications you receive from ASQ including the newsletter. You can also handle this by phone (414) 272-8575 or (800) 248-1946.

**UPCOMING NEWSLETTER
DEADLINES**

Issue	Vol.	No.	Due Date
Winter '99	18	1	Dec. 15, 1998
Spring '99	18	2	Mar. 15, 1999

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