Pollen Count : Sources of Variation in Pollen Counts Reported Daily During the Pollen Season.

As a service to people suffering from asthma and allergic rhinitis, a daily account of airborne pollen is reported by radio and newspapers during the pollen season.

In 1984, the Aerobiological Group under the Danish Asthma and Allergy Association, responsible for the daily pollen counts, set up a small trial to investigate the reproducibility of the pollen count. Three trained pollen counters independently examined the same specimens from two Burchard pollen traps. The traps were situated at the usual sampling site, the roof of the Meteorological Institute in Copenhagen, and specimens from 20 randomly chosen days during the grass pollen season were selected. A number of species groups were identified in sufficient numbers for statistical analysis. Qualitatively equivalent conclusions were reached for each group. The analysis of a single group has been presented. The expected seasonal variation was identified. The counters contributed significantly to the variation of pollen counts. The traps did not, as such, contribute to the variance, but a day-trap interaction was identified. This interaction was interpreted as a problem of a drift over time of the adjustment of traps. The variance of pollen counts were found to be larger than originally expected.

6096 **J SHERINGTON (ILCA, P O Box 5689, Addis Ababa, Ethiopia), Use of Survival Analysis Methods With Cattle Reproductive Performance Data.**

Poor reproductive performance in cattle is one of the constraints to improved livestock production in sub-Saharan Africa. There is potential to increase reproductive efficiency by better nutrition, disease control and animal breeding. Measures of reproductive performance, such as age at puberty, postpartum ancestrus and the interval from calving to subsequent conception, are frequently censored. This happens when, for example, at the end of a trial some animals are not yet pregnant. Partial information then exists : if it is known that the time to conception is greater than a certain number of days, but it is not known exactly. The methods of survival analysis or failure time data can be used to handle such data. With a calving to conception interval, in the terminology of survival analysis, conception would be a failure and a cow would 'survive' until she became pregnant. An example of using a proportional hazards model to analyse time to conception for a breed by nutrition factorial experiment is described and is seen to be complicated by continuity between the 'treatments' and the weight of animals at the beginning of mating.

6097 **AMN SSEKIBOOBO (Makerere University, Institute of Statistics and Applied Economics, P O Box 7062, Kampala, Uganda), A Comparison of Different Methods and Equipment in Crop Area Estimation.**

This paper gives results of a study carried out to compare the accuracy and time taken to make area measurements by various methods and equipment used for crop area estimation. Three way analysis of variance was used to analyse the data from the two major experiments conducted. The observations were completely randomised to average out any effects that might be correlated with the time and order of the experiments. A review of the theory of three way analysis of variance was done. The equipment/methods in the study were pacing, the standardised rope/cord, leather and metallic tapes, surveyor's chain, the Trumeter or Smith's measuring wheel and the compass. The methods for estimating or calculating area were eye estimation, triangulation, the grid method and the programmable calculator. Tests were done on the data collected for any violation of the basic assumptions of analysis of variance. A computer programme in BASIC to compute area of a given polygon was written. The area of the field was also estimated by a surveyor and it was on the basis of these that the accuracy of the various equipment and methods was judged. Results showed that the combination of Trumeter or Smith's measuring wheel with triangulation and rectangulation gave data of acceptable accuracy in a reasonable period of time. As far as methods of closure of the polygon are concerned shifting vertices on equal basis and on a proportionate basis gave better estimates of area. The field determined method was more accurate than the office constructed method for triangulation and rectangulation. Subjective methods like eye estimation could be fairly accurate depending on the quality and experience of the data collectors.

6098 **KARL STIELAU (University of Natal, Dept of Statistics and Biometry, P O Box 375, Pietermaritzburg, 3200 RSA), Some Aspects of Bootstrapping In Biometrical Consultation Problems.**

Biometricians handling consulting problems need to guard against becoming stereotyped when recommending ananalytical strategy, particularly when the usual underlying assumptions may be in doubt. This paper discusses ways in which the bootstrap may be profitably applied to a wide variety of problems, including multiple regression and hypothesis testing. The bootstrap is shown to perform well in comparison with the usual "classical" approach.

6099 **E TSURO and J SIMAKANI (CSO, P O Box 8063, Causeway, Harare, Zimbabwe), Mortality Trends in Zimbabwe.**

In this paper the inadequacy of mortality data in Zimbabwe is pointed out. In order to get a clear picture of mortality, two methods of standardisation are used namely DIRECT and INDIRECT as improvement on the Crude rate. The indirectly standardised rate is illustrated using the area comparability factor (ACF). To further highlight significant points, the proportionate mortality ratio (PMR) is also illustrated.

The following are the papers presented at the 1991 annual meeting of the third spanish Biometric Conference

6100 **BEGOÑA ORGAZ BAZ Y GERARDO PRIETO ADÁNEZ, (Dpto, de Psicología Básica, Psicobiología y Metodología Facultad de Psicologia, Universidad de Salamanca, Salamanca), Acquisition of Automation in a Visual Search Task when unfamiliar stimuli are used.**

In this work, we intend to analyze development of automaticity in visual search tasks when unfamiliar stimuli are used. In most previous studies, familiar stimuli were used, and unfamiliar stimuli which were more complex than alphanumeric characters because they involved other processes in discrimination (spatial rotation, characteristic integration, etc.). In our case, we used unfamiliar stimuli, which were comparable to alphanumeric characters, and differentiated between them on the degree of familiarity. Our purpose was to analyze if practice yields profits on performance and the factors that affect development of the automaticity. In this sense, we attempt to throw light on the question which consistency or discriminability between stimuli was the factor that favours automaticity development. For that, we designed a characteristic visual search task, we used abstract shapes as stimuli, and we considered the different levels of consistency and discriminability. This task was created using HyperTalk language from HyperCard programme. We used Macintosh SE computers connected to the AppleTalk mains to apply it. Once results were collected and analyzed we obtained reaction times were reduced after the training. Furthermore, in this case, perceptive aspects, as discriminability between targets and distractors affected on the development of a parallel processing.

6101 **CARMEN SANTISTEBAN-REQUEÑA, (Departmento de Metodologia de las Ciencias del Comportamiento Universidad Complutense. Facultad de Psicologia. Campus de Somosaguas. 28023-Madrid, Spain), The problems of Sampling in Analysis of Signals.**

This paper concern with a discussion about the smoothed spectral estimator and the choice of a suitable window function, depending on the nature of the signal and on the type of the information to be extracted from its spectrum.

The problems in computing the Fourier Transform and its solutions are developed in several representative cases, specially in experiments of sounds signals and spectral EEG components.

6102 **FAUQUET ARS, JORDI, RIBA LLORET, M^{a}DOLORS, VILADRICH SEGUES, M^{a}CARCME (Departament de Psicologia de la Salut Universitat Autonoma de Barcelona), Relaxation and Generalization of Conjoint Measurement Axioms.**

Two-outcome lotteries are usually used as stimuli in the modeling of risk perception. The empirical evidence about generalization of these results to multiple-outcome lotteries is still limited. In spite of that, the interest for general models is growing. The comparability of risk evaluations is analyzed with two sets of lotteries : multiple-outcome for wins and loses and their transformation in two-outcome lotteries with the same expected value. The scaling of risky judgments is based in the fuzzy sets methodology. By means of optimal cut-point the concordance of judgements is evaluated and the relaxation of axiomatic assumptions is studied. The results show that the extent of concordance is not high, even though the number of axiom's violations decreases with this method.

The major conclusion concerns to the lack of capability of general models to account the results obtained with simple lotteries.

6103 M[a] VISITACION GARCIA JIMENEZ, DEPARTAMENTO DE METODOLOGIA DE LAS CIENCIAS DEL COMPORTAMIENTO, (Facultad De Psicologia, Universidad Complutense, Campus De Somosaguas, 28023 MADRID, ESPANA), Graeco-Latin Square design with Double Grouping Compared with Factorial AxB Latin Square Design.

It is contrasted by means of a practical case, the different efficacy from two block designs with identical requirements in his basic structure : "Graeco-latin square with double grouping" and "factorial AxB Latin square". The blockade matrix was in both cases 4x4 = 16 cells, wich came in the Greco-latin one from two factors with 4 levels each (factorial 4x4); and in the Latin one, with the same number of factors with two levels each (factorial 2x2), so as from two bockated variables with 4 values each in both designs. We suppose a ligger testing efficacy for the Graeco-latin one, beginning with the advantages and inconvenients that this one presents compared with the Latin one; these are the following : the possibility of proving the effect of 16 treatments compared with the 4 from the Latin one, and the impossibility of the statistical calculation of the effect from the interaction AxB. After the fullfilment of two simultaneous experiments about immediate memory with the same number of individuals (64 in each case; 4 in each cell), adjusted to the basic accomplishments from the respective designs, the hypothesis was confirmed, resulting more effectiveness of the Graeco-latin square design.

6104 PUILKMO VALLEJA SEIO, PAULO FERINA'S DR GARÚA, JAVIER HERRERO DIEZ, (Dto de Psicologia Univ. Oviedo, 3305 Oviedo, Spain), (Title not Supplied).

The repeated measures designs have been traditionally analyzed using the univariate mixed model of AVAR, however when the treatments are not presented in a randomized order, the sequence of observations introduce correlation in the errors of model. Under the asumption that the serial correlation can be modeled through relatively simple ARMA processes, this paper considers the problem of obtaining efficient and consistent estimators. Finally, a example that illustrates the process that has been described is presented.

6105 DEL PINO PÉREZ, A., GAOS MEIZOSO, M.T. & HERNÁNDEZ CABRERA, J. (Facultad de Psicología de la Universidad de La Laguna, La Laguna, Tenerife, España), The Problem of the Factorial Structure of Bortner's Scale.

In this paper we intend to prove by the confirmatory factor analysis of the structures of the covariances, if there is a factorial structure of Bortner's Scale for the measurement of the pattern A behaviour. An exploratory factor analysis was used first with a sample of healthy and coronary heart ill people all together and then separately in order to show a theoretical factorial structure. Then, to display the underlying theoretical construct of the Type A behaviour pattern when it is measured by the Bortner's Scale was tried by the confirmatory factor analysis. Outcome show that there are two first order factor and one factor of the second order. The latter may be considered as the Type A behaviour in two independent sample (247 ill and 322 healthy people).

6106 ERNESTO JUAN DARIAS MORALES, VICENTE PELECHANO BARBERÁ (Facultad de Psicología, Universidad de La Laguna, Tenerife, Spain), Computer Processing of Personality Questionaires.

This paper is a description of the main module of a QuickBASIC program (4.5 version) applied to five questionaires (Secondary modules) that evaluate basic dimensions of personality (extraversion, neuroticism, rigidity), extreme motivational factors (extreme self-valuation and extreme work-valuation), locus of control and situational factors. A file is saved including the identification number of the participant, his/her responses, the scores obtained in each factor, the number of decision changes, and global time of response.

6107 CARMEN ROSA SANCHEZ LÓPEZ, ERNESTO JUAN DARIAS MORALES, CONCEPCION SAN LUIS COSTAS (Facultad de Psicología Universidad de La Laguna, Tenerife, Spain), Expectancy, Status, Sex of Experimenters, and Effect of Deceiving in Psychological Research.

This paper analyses the "artifactual behavior", by means of a 2x2x2x2 between subjects factorial design (expectation x status x sex of experimenter x deceit use), being the dependent variables the degree of the conditioning awareness and number of conditioned responses of the experimental subjects. Results don't show main effects, or significant interaction between experimenter and experimental subject. Confussion effects are probably created in special conditions only.

6108 MORENO V, MARTÍN ML, CARNÉ X (Laboratorio de Bioestadistica y Epidemiología. Facultad de Medicina. Universidad Autonoma de Barcelona. 08193 Bellaterra. Barcelona, Spain), Design and Analysis of Case-Control Studies using Sequential Methods.

Case-control studies may benefit from the application of sequential methods in some situations. The sequential method based on the triangular test described by J. Whitehead (*Biometrics* 1983; 39: 227-36) has been studied through computer simulation. It behaves correctly respect to the statistical specifications defined in the design except when the reference risk is high (Ψ=6), being more conservative, but with a small loss in statistical power (1-2%). This method also works correctly when an adjusted analysis of possible confounders is used. Both stratified analysis and logistic regresion have been tested and can be used sequentialy. In average, the number of patients used always is smaller than the number needed with the fixed sample size design. The savings in patients is important when the real risk is greater than the minimum that should be detected (less than 60% of patients are needed). Case-control studies to be analyzed sequentialy should be very carefuly designed. All potential confounder factors should be anticipated and adjusted from the beginning of the study.

6109 E.A. CARBONELL Y M.J. ASINS, (IVIA, Apartado Official, 46113 Moncada, Valencia, Spain), Estimation of Genetic Parameters of Quantitative Trait Loci by the EM Algorithm.

This paper presents a method for detecting the linkage between an interval defined by a pair of markers and a QTL showing dominance using F2 populations, and to estimate its genetic effects. The method is based on a computationally simple implementation of the EM algorithm that is suitable for use on a PC computer with low memory capacity.

6110 S. VICENTE TAVERA, M.P. GALINDO VILLARDON (Dpto. Estadistica y Matemática Aplicadas. Univ. de Salamanca, España), The Biplot Analysis as a Basis for Ascending hierarchical Classification.

The present work is a generalization of the inertia criterion used by BENZECRI, (1985), ALAWIEH, (1985), MOURAD, (1986), DIMARA, (1989), etc. as a basis for ascending hierarchical classification. In the work, we propose as the basis for the inertia criterion the information afforded by plotting the OTUS according to a GALINDO-type HJ-Biplot (1986) since this procedure allows one to plot any data matrix with a maximum quality of representation and affords the best β baricentric plots. The proposed method is applied to the classification of 12 countries of the E.C. according to the corresponding general indices of industrial production over the period from 1978 to 1989. The starting Biplot representation also furnishes information about the variables responsible for the configuration, which is an important advantage with respect to the solution obtained with any other procedure of hierarchical classification.

6111 S. VICENTE TAVERA, M.P. GALINDO VILLARDON (Dpto. Estadistica y Matematica Aplicadas. Univ. de Salamanca, España), Simultaneous Representation techniques as a Basis for the Analysis of the Development over time of the Industrial Production Indices (by areas of Activity) in the EEC.

The aim of the present work is to highlight the great importance of graphic multivariate techniques in the study of economic and population variables as regards temporal moments.

The study was carried out considering countries of the EEC, analyzing the different types of Industrial Production by areas of activity from 1978 to 1989. The indices were obtained from the Journal *Coyuntura Industrial*, November 1990 issue, published by E.U.R.O.S.T.A.T. The multidimensional descriptive analysis in a sequential form of variables and populations has been developed in several articles by BENZECRI *et al*, using Correspondences Analysis. The initial basis of this work was Factor Analysis of Correspondences, the GABRIEL BIPLOT methods (1981) and the generalization of this latter as described by GALINDO (1986). A comparative study of the results obtained with all three was made.

6112 I. BARRERA: M.J. FERNANDEZ-GOMEZ: P. GALINDO: J.L. VICENTE-VILLARDON (Facultad de Biología, Univ. de Salamanca, España), Ordination of Ecological Communities : A Comparative Study.

The aim of the present work is to attempt to demonstrate the importance of the choice of the most suitable technique for achieving satisfactory results in the study of ecological communities, comparing the results obtained with the family of techniques based in Factor Analysis. To do so, a set of 20 grassland communities that had been well-differentiated in an initial field survey was chosen. The 20 communities sampled belonged to one of the following groups and are referred to with ordinary names: ephemeral grasslands, poor grass, normal grass, humid grass, hay grass, grazing grass and semiarid grass. In view of the characteristics of the study, it is seen that the Correspondence Analysis does not afford a configuration coherent with the trophic gradient known *a priori*. The causes of this are analyzed, demonstrating the suitability of the HJ-Biplot (GALINDO, 1985) for full coverage of the objective of the study.

6113 M.J. FERNANDEZ-GOMEZ, I. BARRERA, P. GALINDO, J.L. VICENTE-VILLARDON (Facultad de Biología. Univ. de Salamanca, España), Direct Multivariate Analysis of Gradient in Pasture Communities.

In biological research it is often necessary to infer the relationships between species and environmental variables from data concerning the composition of the community and habitat-associated measurements. All species show a common characteristic; namely, their presence is limited to a given range of habitats, the composition of the community changing along environmental gradients with a particular environmental optimum within these. TER BRAAK (1986) proposed Canonical Analysis of Correspondences (CAC) as a direct method for analyzing gradients. GALINDO et al. (1989) have proposed an alternative to CAC based on the HJ-BIPLOT method (GALINDO, 1986). In the present work we offer an application of the technique to data taken from the work of LUIS (1976), which from the methodological point of view is a representative work on the ordination of ecological communities. The optima of the species are deetermined with respect to the soil variables studied and the ranking of the species is determined with respect to the gradient for such variables.

6114 M. MARTIN CASADO, M. MARTIN MARCOS, A. MARTIN CASADO(*), M.P. GALINDO VILLARDON(*) (Facultad de Medicina. Universidad de Salamanca, España), An Application of the Use of Decision Trees in Clinical Practice.

Currently, technological advances and the increasing use of computers suggest that in the future decision analysis will become a powerful tool in medicine (BORING and FRANCIS, 1984; HABBEMA *et al.* 1990; SCHNEIDER, 1991). In the present work a decision tree is used as a means for presenting the logical sequence, a clinical decision derived from the discovery in a 75 year-old man of an large sealed-ring cell stomach adenocarcinoma extending up to 2 cm form the cardia who had no obstructive or bleeding lesions nor evidence of metastasis. The problem observed, which was therapeutic, essentially posed the problem of deciding between three possibilities: surgery, chemotherapy and palliative treatment (MARTIN CASADO, 1991).

6115 J. MARTIN VALLEJO; J. GARCIA FERNANDEZ*, V. PEREZ MELLADO*; I. BARRERA MELLADO; R. VILLARROEL BAJO (Dpto. de Estadistica y Matemática Aplicadas. Univ. de Salamanca. España. *Dpto. de Biologia Animal. Univ. de Salamança, España), Analysis of the Latent Structures in Habitat Selection by Two Species of Lacertid Lizards of the Genus PODARCIS.

The differential occupation of habitat by two lacertid lizards of the same genus-*Podarcis* muralis and *Podarcis hispanica*-was studied in the Sierra de Guadarrama (Spain). In this work 29 variables are analyzed; these are grouped in four categories: substrate, microhabitat, slope and orientation. According to the GH-bigeometry, the two-dimensional plot evidenced that the latent structure in the choice of habitat is strongly related with orientation, the type of substrate and slope. The specimens of both species occupy well-differentiated positions except in the cases in which both species are found in strict synonymy.

6116 R. VILLARROEL, F. LORENTE*, P. GALINDO, M.J. FERNANDEZ, F.J. MARTIN VALLEJO (Facultad de Medicina, Univ. de Salamanca, España. Dpto. de Obstetricia, Ginecologia y Pediatria. Univ. Salamanca, España), Construction of a Pathological Map of Allergy in Salamanca by Multidimensional Scale Analysis.

The aim of the present work was to construct a map that would reflect the different basic health zones of Salamanca (city and province) by multidimensional scale analysis (MDSA), a technique that permits the spatial representation of proximities among objects (DAVISON, 1983). The study was conducted on 2054 children (0-14 years of age) residing in the province that attended the Paediatric immunoallergy service of the University Hospital in Salamanca during the 1988-1990 period who were diagnosed as suffering from some kind of allergy. The correlations matrix among the different zones, calculated from the information afforded by the symptoms and the sensitivity to the commonest allergens, was used. To interpret the maps, the technique known as "property fitting" was employed; this allows one to add to the map oriented vectors, such that a property of the data grows in the direction of the vector (SCHIFFMAN, REYNOLDS and YOUNG, 1981).

6117 J.L. VICENTE-VILLARDON, M.P. GALINDO VILLARDON (Dpto de Estadistica y Matemática Aplicadas. Facultad de Economicas. Universidad de Salamanca) A Contribution to Canonical Variate analysis: Searching for Important variables for Separation.

In many experimental situations one has a data matrix X of n variables by p variables. One wishes to study the configuration of individuals. In some cases, the total set of n individuals is divided into k groups of subsets of sizes $n_1, ..., n_k$ ($n_1+.... n_k = n$) and the aim is to describe the separation among groups. The classical solution is "canonical variate analysis". However, this method is not widely used because its interpretation is difficult. In the present work we propose a graphic generalization of the Biplot method for these cases. The graphic display is useful for assessing the separation pattern among groups and for searching for the most important variables in the configuration with the maximum discriminant power.

6118 J.L. VICENTE-VILLARDON, M.P. GALINDO VILLARDON (Dpto de Estadistica y Matemática Aplicadas, Facultad de Economicas, Universidad de Salamanca), Biplot Interpretation of Vector Models for Inclusion of External Variables in MDS.

A very important advantage of MDS is that the method is useful over a wide range of experimental situations. However, interpretation of the dimensions obtained is subjective and rather difficult. It is useful to include some additional information about the relationships between the dimensions and cetain external variables.

Some authors have proposed several methods for clarifying this problem; in this sense the vector method is a well known technique. In the present work we propose an extension of the classical procedures. The method is based on Biplot methods. The extension permits the simultaneous inclusions of several external (or internal) variables in the space obtained in MDS.

6119 A. MARTIN CASADO; M.P. GALINDO VILLARDON (Dpto de Estadistica y Matemática Aplicadas. Univ. Salamanca, España), An Extension of the Simes Method for Multiple Contrasts based on the Mahalanobis Space.

The Bonferroni method is one of those most widely employed but is too conservative a technique and is not sufficiently robust for highly correlated statistical tests. In 1979 HOLMS introduced a modification of the Bonferroni method that provides an increase in the power of the test; in some situations this can be further improved, as demonstrated by SHAFFER (1986) and HOLLAND and DIPONZIO COPENHAVER (1987). In 1986 SIMES proposed another modification to the Bonferroni method whose level of significance is closer to the nominal level and which therefore has a lower type II risk. The procedure proposed by SIMES, however, is not always satisfactory and has prompted HOCIIDENO (1986) and HOMMEL (1989) to investigate it.

MARTIN CASADO *et al.* (1990) proposed a multiple contrast procedure using an approach similar to that employed by HOLMS that is at least as powerful as the previous procedures and, sometimes more so.

In this work we propose the use of the different procedures mentioned above in multivariate MANOVAS based on BIPLOT analyses, which implies a clear advantage in cases in which the MANOVA proves to be non-significant with respect to the BIPLOT.

6120 A. ORTEGA RODRIGUEZ, P.G. VILLARDON, F. RODRIGUEZ ZURDO, J.A. IZQUIERDO DE LATORRE (Dpto. de Psiqulatría y Psicología Medica. Univ. de Salamanca, España Facultad de Medicina. Univ. de Salamanca, España), Multivariate study of

Different types of Drinkers, Receiving treatment and Abstaining, and of Population Control.

In the present work, performed on 104 alcoholic patients, our aim was to discover the psychological profile of the patients by analyzing the values on the different M.M.P.I. scales and studying the differences among them, classified according to the patients' drinking habits (alcoholic drinkers on treatment, regular excessive drinkers on treatment, rehabilitated alcoholic drinkers and rehabilitated regular excessive drinkers) and the control group. The analysis is performed using the HJ-BIPLOT simultaneous multidimensional data plotting technique (GALINDO, 1986). It is seen that the axis with the greatest absorbance of inertia clearly discriminates the control group from the subgroups of drinkers undergoing treatment, the rehabilitated alcoholic occupying intermediate positions. It also shows which scales have the greatest discriminatory power between the drinkers receiving treatment the healthy controls. Axis II reveals the differences between the symptomatic patients and the rest, and also the residual differences between the controls and the gamma and delta rehabilitated groups.

6121 A. ORTEGA RODRIGUEZ, P.G. VILLARDON, F. RODRIGUEZ ZURDO, J.A. IZQUIERDO DE LA TORRE (Dpto. de Psiquiatria y Psicologia Medica. Univ. de Salamanca, Espana. Facultad de Medicina. Univ. de Salamanca, Espana), Multivariate Characterization of the Personality Development of Rehabilitated Alcoholics Classified According to their Drinking Habits.

There is consensus among most authors concerning the importance of personality development in alcoholics, be this the cause or the result of alcohol dependence. In the present work, carried out on 104 alcoholics, our aim was to discover which personality traits remitted with abstinence, which were modified, and which ones persisted, analyzing the results of the psychological tests and, within these, those that can be called trait tests, in particular the M.M.P.I. or Multiphase Personality Inventory. The HJ-BIPLOT proposed by GALINDO (1986) was used for the multivariate characterization; this is a generalization of the GABRIEL BIPLOT Analysis (GABRIEL, 1971; GABRIEL and ODOROFF, 1991) and has clear advantages over it. It is seen that the first axis discriminates the groups of alcoholics receiving treatment from the rehabilitated alcoholics. Axis II reveals the differences between the different drinking habits of rehabilitated alcoholics and shows scales display the greatest variability in the study, which ones are responsible for the differentiation among the different groups and in which groups the highest mean values for each scale are found.

(contd. from page 2)

editorship as the physical facilities and infrastructural support in my part of the world may not be comparable to that of the previous editors. However, with good amount of support from all corners, I now feel reasonably confident in taking up this responsibility, though the members may have to bear on account of certain initial problems in communication facilities like Fax and e-mail. My feeling that the *Bulletin* is strong enough to withstand the hardships associated with the third world countries, gave me the courage to take it up as a challenge. I hope that with the valued support of members and correspondents, production of the *Bulletin* from India in the next two years, will certainly further the cause of Biometry especially in the Asian countries. The future looks quite promising. Very shortly we shall see the Spanish group becoming a region.

The policy regarding the content and publication is likely to remain unchanged, although some limit may have to be imposed on the size of the *Bulletin* owing to increase in mailing cost. However, this should not deter anyone who has anything meaningful to contribute to the *Bulletin*. Please do feel free to send your correspondence through your local correspondent, or directly to me, if you so desire. In case you are using Fax and face some problem, try again, and preferably on the next day.

I take this opportunity to thank all my friends in India and abroad, without whose support the production would run into considerable amount of difficulty. My special thanks are due to Gaurang Mishra and Sundar Rajan for editorial assistance and to Nurul Islam for secretarial help.

I shall close with the words of the former President, Professor Pierre Dagnelie, who said that this *Bulletin* will only be what you make of it.

(contd. from page 4)

Other recent research projects have included using nonparametric regression (generalized additive models and the ACE algorithm) to predict water level changes in temporary ponds, developing two stage sampling designs for rare events, and evaluating statistical characteristics of nonlinear growth curves. Some of our projects have applied biostatistical techniques in new fields. For example, we have used Cox proportional hazards models to estimate genetic effects in acute toxicity experiments and conditional logistic regression to compare the success of different types of lizard traps.

Our consulting activities at SREL can include anything from statistical computing, sampling, experimental design, to choosing and interpreting an analysis. SAS is the most commonly used statistical package, but other packages and some specialized programs are also used. We teach a series of short courses on statistical methods, but we rarely need to teach basic statistics. Most of the researchers at SREL have taken a year course in statistical methods, and many have taken additional course in multivariate statistics, experimental design and nonparametrics. Among the more frequent consulting topics are design and analysis of experiments with nested error structures (e.g. a split-plot experiment), analysis of covariance, dealing with missing data, nonlinear regression, and sampling problems.

What sort of background is needed to effectively provide statistical support at a diverse lab like SREL? The most important thing is the ability to solve problems. Consultees frequently show us papers that use or develop new techniques. We try to evaluate the technique, then help the consultee implement and interpret the analysis. To do this effectively requires a good background in statistical theory, a good background in statistical methods, and proficiency in a statistical programming language. We regularly use methods from three subfields in statistics: agricultural statistics, biostatistics, and ecological statistics. Because of this diversity, I think it is impossible for any M.S. or Ph.D. program to prepare a student to answer any possible question. Instead, it is practical to know where to find the answers to diverse questions. Our library has built up a good collection in statistics and we frequently make use of it.

Working at a place like SREL has some real benefits. Because the field work is often done out the back door, it is easy to go, look at field sites, understand the goals and limitations of a particular study, and sometimes even help collect the data. We interact closely with other researchers and are often involved with a research project from start to finish. We help with the research design, assist with the data analysis, and often coauthor papers. We feel this close interaction improves the quality of research at SREL. ■