



# Academy News

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## Link with Foreign Counterparts

### DFG—NAST Accord Signed

The Deutsche Forschungsgemeinschaft (DFG), or German Research Society is a government funded collegial body. It has an annual budget of DM 849 mio (or US \$350) using the UNDP system of "pipeline financing" to various research institutions, universities, individual scientists and scholars for Germany.

According to Mr. Lippert, sub-director of Asia Division, DFG, due to the postwar division of Germany, the West German science community has hesitated to create "academies of sciences" in the two German states. This has resulted in a *de facto* permanent division of the German nation. Although East Germany has an academy of science, there is no single body that can speak for the entire German science community except the DFG.

The NAST and the DFG signed last December 12, 1983 an agreement of collaboration. Both parties expressed their enthusiasm over joint scientific research between laboratories in Germany and the Philippines.

Present at the signing were: Dr. Paulo C. Campos, President, NAST; Dr. Melecio S. Magno, Vice-President, NAST; Dr. Reuben N. Navarro, Science Attache, Embassy of the Philippines in Bonn; and Mr. Ricardo G. Abad, Ambassador, Embassy of the Philippines in Bonn.

Germany side:

Prof. Eugen Seibold, President, DFG; Dr. C.H. Schiel, Secretary-General, DFG; Dr. Joachim Wiercimok, Head of International Division and Director of Asia Division; and Mr. B. Lippert, Sub-Director of Asia Division.

Objectives: To facilitate the cooperation in matters of research of Philippine scientists in Germany and German scientists in the Philippines as well as bilateral projects;

To facilitate collaboration between specialists in the scientific disciplines within their mutual competences.

### More on the Collaboration Agreement

Exchange visits. Visits of postdoctoral in all fields of academic research, especially in the natural sciences and technology. This may be in the form of one to three-week study visits. Purpose: To visit laboratories in the host country for discussion and liaison. Or for longer periods, to carry out research projects or to learn new techniques predominantly in one place, with provisions for brief short visits.

- Selection and nomination of visitors. The sending party will be responsible for selecting and nominating visitors from that country to the host party. In some cases, the host party may ask to consider favorably certain named scientists or certain subject areas.

**Indian Academy  
Signs Exchange  
Accord with NAST**

An Exchange Agreement between the National Academy of Science and Technology and Indian National Science Academy is indeed essential – for cooperation between the scientific academies of the world.

Thus, INSA President Prof. A.K. Sharma said when he came here for the signing of the agreement, which was one of the highlights of the 5th Annual Scientific Meeting of the NAST last July 9. During which time the INSA head discussed at length matters of mutual interest in such collaboration between the two academies with Minister Emil Q. Javier and Dr. Tito A. Mijares.

Incidentally, Prof. Sharma came here together with INSA's executive secretary Mr. A.K. Bose and Dr. T.N. Khoshoo, secretary to Indian Government's Department of Environment.

**The INSA President**

Professor Sharma, of the Department of Botany at the Calcutta University, is known for his contributions to cytogenetics, cytochemistry and chromosome research. His book on chromosome techniques—theory and practice is now widely known, possibly better than the author himself.

The INSA head has established a center of advanced studies in chromosome research, one of the largest in the world and one of its kind in India.

He has behind him 34 years in chromosome study, during which he introduced a new concept for the means of speciation in asexually reproducing plants. He developed a number of study techniques in chromosome research which are now widely used throughout the world.

Presently chairman of the Research Advisory Committee of various national laboratories and research institutions in his country, he likewise heads different science congresses and meetings in India.

With more than 350 researches and published works, he is a fellow of the Indian Academy of Sciences, National Academy of Science of India, Asiatic Society, Indian Science Congress Association, and Indian Botanical Congress Association.

**Dr. T.N. Khoshoo**

As secretary of India's Department of Environment, he is responsible for policy, planning and management of environment in their country.

He has contributed much to cytogenetics in relation to plant evolution and improvement. He is credited with the establishment of the Biomass Research Center, which utilizes marginal land for energy plants, like firewood, agricultural alcohol, petro and rubber plants, and which deals with biologically diverse problems. He has organized active groups on sewage use using algae, pollution tolerant plants, ethno botany, allergenic plants and many others.

**A.K. Bose**

A chemist by training, having started out as a researcher in the chemistry of natural pro-

ducts, A.K. Bose is INSA's executive secretary. After a short stint of editorial work, he was named defense coordinator for monitoring major research projects in the various CSIR and defense R and D laboratories. As head of the CSIR's extra-mural Research Division, he is credited with streamlining procedures for assessing and funding of research projects.

#### **Hughes on Respiratory Adaptation of Invertebrates**

Professor G.M. Hughes who heads the Research Unit for Comparative Animal Respiration of Bristol University, England, was here from August 21-26, on exchange agreement of the Academy with the Royal Society of London.

The English zoology professor gave a lecture on *Respiratory Adaptation During the Transition from Water to Air Breathing Invertebrates* at the Department of Zoology, College of Science, UP Diliman, Q.C., last August 24.

His itinerary while here included meetings with Brother Andrew Gonzalez of the De La Salle University; Dr. J.L. Munro, ICLARM; Laguna Lake Development Authority key officials and IRRI Director General Dr. M.S. Swaminathan.

Prof. Hughes was likewise here to invite Filipino students to train at his laboratory in England. He made preliminary arrangements with the British Council's Office in Manila.

### **International Conventions, Meetings**

#### **Four Academicians to 15th Pacific Science Congress**

The 15th Pacific Science Congress was held February 1 -- 11, 1983 at the University of Otago -- with a substantial number of scientists attending. The Congress theme was conservation, development and utilization of the reserves of the Pacific. This was dealt with in four interdisciplinary symposia, namely: energy in agriculture; high latitude resources -- their assessment and development; resources; science and the laws of the sea and Pacific Island potentials.

NAST President, Dr. Paulo C. Campos, who led the Philippine delegation, aptly described the 15th Pacific Science Congress as "traditionally the biggest and most prestigious general scientific meeting in the Pacific basin and is held only every four years. In 1953, Manila was host.

Dr. Campos reports that there were about 1,800 scientists from all over the Pacific Basin that attended the congress. More than 1,100 papers were presented in the numerous sectoral meetings, and about 12 major papers were presented by Filipinos, who also chaired two of the ten specialty committees.

### **Biomass**

Dr. Banzon is one of the four Academicians who left early this year for the two-week long science congress in New Zealand. The group of four was led by its President. With them was Dr. Gregorio T. Velasquez who presented the "Present State of Freshwater Microorganisms in the Philippines," while Dr. Carmen C. Velasquez read an invited paper on "Fish Parasites and Aquatic Resources Management in the Philippines." Both are National Scientists.

Other salient features of their individual report were:

Dr. Campos chaired one of the symposia in the two-week long meeting, while serving as member of both the governing council of the Pacific Science Association and of the Executive Committee of the Council of the Pacific Science Association. He likewise met with distinguished scientists in preparation for the 5th Inter-Congress of the Pacific Science Association which will be held in Baguio City in 1985; too, with leading scientists from Asian countries regarding Manila meet of the Association for Science Cooperation in Asia (or ASCA) held July, 1983. While Dr. Campos discussed with scientists from ASEAN countries on closer collaboration and possible formation of an ASEAN Academy of Science, he gathered a lot of information on the etiology and epidemiology of disease — those having effects on disease management, training of young health workers and in public health policies.

Dr. Gregorio T. Velasquez served as member of two committees in the congress. The meeting of the Freshwater Communities Standing Committee decided to have Malaysia's Dr. Jose Furtado as Chairman whom he supported to represent the Third World. Commenting that problems on freshwater communities in the Pacific Basin was discussed very well, he felt, however, that those of the Third World can find solutions only if concerted efforts and adequate funding could be obtained.

"The Congress was enlightening in many respects both academically and socially," said Dr. Velasquez, who also visited the Marine Biological Station in Portobello.

He concluded that the discussions on the Law of the Sea gave useful information not only for his university course in marine ecology but also for his participation as a representative to the UNESCO Program on Marine Sciences.

According to Dr. Carmen C. Velasquez, the symposium on "Agricultural Communication and Education Systems Increasing Food Production in the Pacific; Rationalizing Agricultural Aid Projects in the Pacific from the Viewpoint of Recipient Countries and Environmental Problems in New Zealand" were most enlightening and informative.

When she visited the facilities of the University of Otago, she noted that the Department of Zoology maintains parts of its researches in the Portobello Marine Biological Station and that fisheries research and animal research is maintained at high level. Furthermore, quarantine service and conservation are strictly observed in New Zealand.

### Coconut Biomass and Oil

Dr. Banzon upon his return made a couple of recommendations. One, intensify R & D in the use of coconut biomass, as energy source. Two, increase R & D effort in developing coconut oil and its derivations, especially the ethyl esters, as a diesel engine fuel. He said that we are leading, but there appears to be larger efforts in other countries at developing their own domestic oils as fuel.

*Harvestable Energy from the Coconut Palm* was presented by Dr. Banzon, who also participated in the symposium on Energy in Agriculture. He made observations on biogas production, purification, and utilization at the Invermay Research Station of the New Zealand government and in privately owned farms, while exchanging information with knowledgeable persons on research in the use of vegetable oils as diesel engine fuel.

In the South Island of New Zealand, biogas is commercially purified and compressed

in pressure cylinders, Dr. Banzon reports, and that this compressed gas is used to power taxis, cars and agricultural machinery. The purification of the biogas is simple and rather inexpensive and there are regular fuel filling stations for this gaseous automotive fuel.

The Philippines appears abreast of other countries in regards incipient exploitation of biomass as source of energy, reports Dr. Julian A. Banzon. Energy from the coconut is a unique Philippine development. He said that coconut oil as engine fuel, is generally considered as most promising among natural oils. We actually lead in the commercial scale production of biogas.

### **Delhi Meet of Scientists to Tackle Role of Scientific Societies in National Development**

Heads of the scientific academies/societies of eleven Eastern Asian countries are convening in New Delhi from November 15-16 to consider relevant problems and expertise in different countries. Organizers believe that available knowledge of this kind can be pooled for scientific and technological development vis-a-vis the well being of the people in the respective regions.

The Delhi Meet is an offshoot of what has been agreed upon by scientific societies from Malaysia, Indonesia, Singapore, Afghanistan, Sri Lanka, Pakistan, Bangladesh, Philippines, Thailand, Nepal, China and Japan.

Attending the Delhi Meet were heads of academies/scientific societies. Reports highlighting the accomplishments and problems of each country were submitted and will be tackled during implementation and sharing of expertise.

The agenda included such major issues as environment, health and population control, energy, optimum use of resources, including agriculture, technical training and education.

### **India's Savant Here**

A professor at Pittsburgh University, Dr. C.R. Rao is also Jawaharlal Nehru Professor at the Indian Statistical Institute.

He is also either author or co-author of nine books and over 200 research papers which saw print in standard journals.

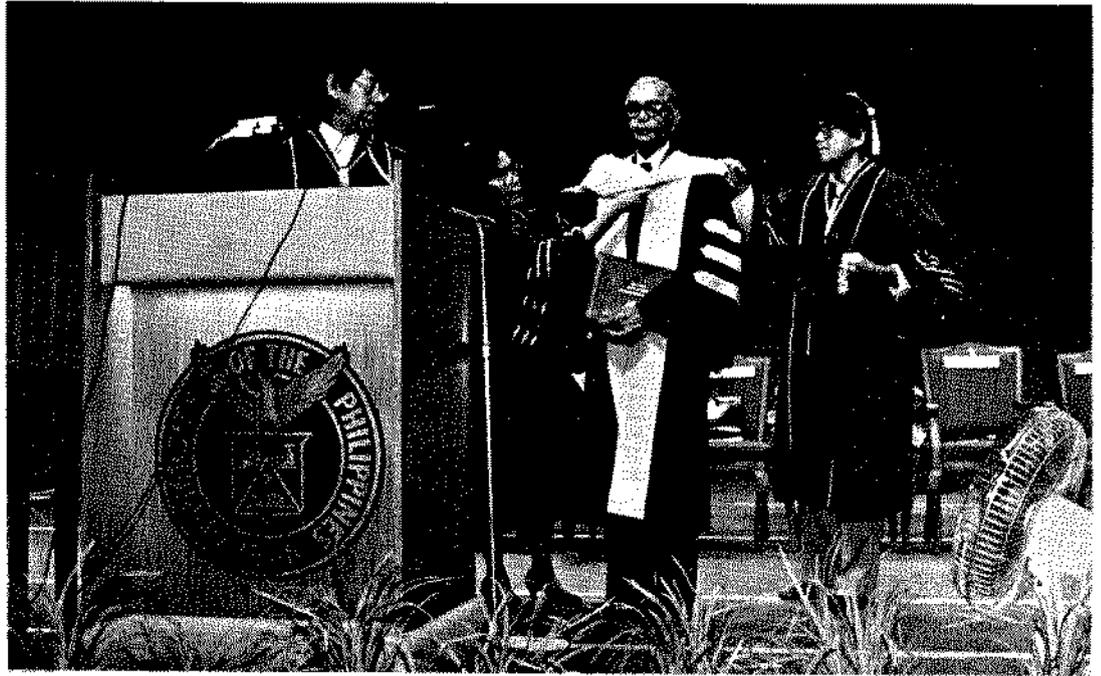
His pioneering contributions to several areas of statistical theory and applications were in estimation, multivariate analysis, design of experiments and combinatorics, characterization of probability distributions, generalized inverse of singular matrices, etc. Most of research studies have already been incorporated in standard textbooks on statistics. Some of them follow:

**Estimation Theory.** Fisher-Rao theorem, Cramer-Rao inequality, Rao-Blackwellization, Second order efficiency, MINQE (minimum norm quadratic estimation) theory for variance components, unified theory of estimation in the Gauss-Markoff model Scheffe-Lehmann-Rao theorem.

**Multivariate Analysis.** Rao's U test, Rao's distance (quadratic differential metric), canonical factor analysis, linked cross sectional (LCS) survey in growth studies, graphical representation on populations by canonical coordinates to study clustering and inter-relationships, F approximation to Wilk's criterion.

**Characterization Problems.** Kagan-Linnik-Rao theorem, Rao's damage . . . Rao-Rubin theorem.

At rostrum is UP President Edgardo Angara as he reads honorary degree conferred by the State University on Dr. C. Rao. Regent Dionisia A. Rola as she bestows hood on Dr. Rao assisted by Regent Emil Q. Javier.



**Combinatorics.** Orthogonal arrays, Hamming-Rao bounds, cyclic generation of hyper-planes in a finite geometry, intra and inter-group balanced designs.

**Matrix Algebra.** g-inverse of singular matrices and applications to statistics. Explicit representation of projection operators.

**Dr. C.R. Rao, Universally Renowned Mathematician and Statistician Here**

Professor Calyampude Radhakrishna Rao was guest of the Philippine scientific community at the invitation of the National Academy of Science and Technology and the Mathematical Society of the Philippines.

An honorary degree of Doctor of Science, *honoris causa* was conferred on Dr. Rao by the University of the Philippines last August 3, 1983 at the Abelardo Hall Auditorium in UP Diliman. The conferment was done by UP President Edgardo J. Angara, who was assisted by Regent Emil O. Javier, Academician and Director General of NSTA and Chancellor UP at Los Baños, Laguna and by Regent D. Rola.

Dr. Rao received his doctorate degree in literature from Delhi University, India and five other doctorate degrees in science: one from Andhra University (1967); another from Osmania University, Hyderabad, both in India; another from the Ohio State University, USA in 1979; one from Athens University in Greece and still another from Leningrad University in USSR.

Professor Rao received a Ph.D. from Cambridge University, England, in 1948 on the basis of a thesis entitled, *Statistical Problems of Biological Classification*. His Doctor of Science in 1965, also from the same university, was conferred on the basis of his works as a whole in Statistics.

**The Proposed Ph. D. Program in Statistics for the Country**

The following was excerpted from the report and suggestion prepared by Dr. C.R. Rao after a series of meetings in Manila. He had discussions with the Filipino staff members involved in teaching statistics, who included the following:

Dr. Tito Mijares, Academician and secretary of the Executive Council of the NAST and head of National Census and Statistics Office and Deputy Director General, NEDA, together with his colleagues at NEDA;

Board members of the National Research Council of the Philippines;

Professors from the UP, La Salle University, Ateneo University and UP Los Baños, including Dr. I. David, Dr. M. Orense and Dr. C. Parel.

He also had useful discussions with Chancellor & NSTA Director General Emil O. Javier, Professor Angeles Buenaventura; Dr. A. Gironella; Bro. A. Gonzales; Dr. Paul Herbert; Rev. Luke R. Moortgart; Fr. A. Samson and Dr. Salvador P. Lopez.

During his stay here, he visited the facilities of UP Diliman and Los Baños, De la Salle and Ateneo Universities, in order to assess whether these are available for a Ph.D. Program in Statistics.

Meanwhile, according to Dr. Rao, the Director General of IRRI, Dr. M.S. Swaminathan expressed great interest in the proposed Ph.D. program and offered to give his advice and assistance towards its realization.

The visit here of Dr. Rao was initiated actually by Dr. Mijares and the Academy, with support from the United Nations Development Program.

To serve as backgrounder, Dr. Rao said

"The UP and UPLB have been offering courses in statistics leading to the Master's degree for over 25 years, but the lack of library facilities and the critical number of qualified teachers to share the burden of teaching and guiding research students have prevented them from starting a Ph.D. Program. The universities have gradually acquired some competent staff members and likewise built up library and computer facilities to an adequate level for advanced courses in statistics. The Statistical Center at the UP has already an approved program for advanced courses and research leading to the Ph.D. degree, and some students are already doing research for the Ph.D. degree. The UPLB has prepared a draft proposal for introducing a Ph.D. program, which I hope will be approved by the appropriate authorities."

#### **Adequate Facilities**

"I believe that the facilities currently available at the UP, UPLB, LU and AU, if properly mobilized, are adequate to start a Ph.D. program at least in some areas of statistics without further delay. A Ph.D. Program is essential for the growth of the statistics department in any university. It provides the proper atmosphere for the staff members to improve their own knowledge and to be abreast with the latest developments in their fields of interest. With more knowledgeable teachers, the quality of teaching will improve, and as a consequence the quality of students produced will be high. Further, a statistics department with a good Ph.D. program will attract good students and also qualified statisticians to accept jobs and work in the department."

#### **Lack of Qualified Statisticians**

The rest of his report follows:

A recent study by Peregrino S. Reyes sponsored by NEDA, entitled *Profile of Statistical Manpower in Government*, showed that there is a serious shortage of qualified statisticians particularly at the Ph.D. level. It envisages an increase in the demand for well-trained statisticians in the coming years to work in government, industry and in academic institutions. There is, therefore, an urgent need to establish Ph.D. programs

in statistics. However, there are a number of issues to be considered to give a good start to the program, to sustain it and to expand it quickly to a full-fledged program covering all areas of statistical theory and applications.

**Pooling Available  
Expertise**

To provide a good start to the Ph.D. program, it may be necessary to pool the expertise and the facilities available not only at the UP and UPLB, but also at La Salle U, Ateneo U and NEDA and the program, as a collaborative effort to the extent feasible, at least until such time as each university develops its own capability to run an independent program. It is envisaged that each university will have its own students in the Ph.D. program, who will receive their Ph.D. degree on the completion of specified requirements. They need only to collaborate in making the facilities available at any university to students from other universities.

**The Need for  
a Task Force**

To evolve a workable plan for this purpose, I suggest the formation of a task force consisting of representatives from the UP, UPLB, La Salle, Ateneo and NEDA to consider the following issues:

- To lay down the minimum qualifications for admission of students to the Ph.D. Program. The determination of prerequisites should depend on the undergraduate and graduate programs available in the individual universities. (It is the practice in many universities to admit students to the Ph.D. program after they receive the Master's Degree in Statistics).
- To determine the core (compulsory) courses to be taken by all Ph.D. students. (Besides some advanced courses in statistics, it would be useful to include advanced courses in real analysis, vector spaces and matrix algebra and computational statistics (use of computers) among the compulsory subjects).
- To make a list of elective subjects and to set up appropriate committees for drafting the course outlines for each subject and suggesting textbooks and other reading materials. (The course outline need not be rigid in the case of elective subjects. It should be sufficiently flexible to give the teacher freedom to cover additional topics of his or her interest. I have seen the proposals made by the Statistical Center at the UP and the Statistics Department at the UPLB for instituting the Ph.D. program at their universities. These proposals contain comprehensive list of courses. I have also made available list of courses given in the graduate program in some of the American Universities. The committee may like to examine all these papers and make a suitable list of compulsory and elective courses. The elective courses offered in any year will depend on the availability of qualified staff members to teach those courses. It will also depend on the demand for statisticians specializing in certain areas of applications of statistics).
- To outline the procedures for allowing the Ph.D. students of one university to take courses offered at other universities.
- To determine the timing and sequence in which the courses are given. (For students in the universities in Manila, taking courses given in different universities in any particular semester or academic term may not be a problem. In view of transportation difficulties, it may not be feasible for students to take some courses at Manila universities and some at the UPLB in any given term. But it should be possible for students to spend a whole term and take all the courses given either at the universities in Manila

or at the UPLB. For this, the timing and sequences of the courses given at each university should be determined to suit the convenience of all the students. If possible, courses given at one university need not be duplicated at another university).

- To evolve common procedures to the extent possible in the assessment of student's performance in the examinations and evaluating the thesis.
- To make an overall plan for the courses to be offered by different universities in any given year and to identify the qualified staff members for giving the various courses.
- To discuss any other academic or administrative problems relevant to the implementation of a Ph.D. degree on a collaborative basis.

A collaborative effort needs a suitable administrative set up to discuss common problems. There is already a consortium for running the Ph.D. programs in Mathematics, Physics, and Chemistry with the participation of the UP, La Salle and Ateneo universities. It appears that a similar arrangement, with all the rules and regulations of the consortium, would be ideal for the statistics program. It is important that statistics be considered as a separate discipline under the consortium. There is also the question of bringing in the UPLB as an additional participant in the statistics program.

#### **Towards a Better Faculty**

In the initial stages of the Ph.D. program, effort may be concentrated on faculty improvement. Members of the faculty who do not have a Ph.D. degree should be encouraged to take the Ph.D. courses and to prepare themselves for writing a dissertation for the Ph.D. degree. For this purpose, the faculty may be given some released time from the regular teaching load. Other possibilities such as study leave may also be considered.

At present, even with the pooled resources of all the universities, there will be shortage of qualified staff in some areas of statistics. Attempts can be made to meet the deficiency by inviting professors from abroad to teach at one of the universities, and also by sending faculty members abroad for specializing in certain areas. Of course, greater benefit will accrue by bringing specialists from abroad and asking them to give courses to advanced students and faculty members. The funding of the visiting professors program will be a difficult problem, but the following possibilities may be explored:

— The NAST has agreements with the Royal Society in the U.K. and the Indian National Science Academy (INSA) in India for exchange of scientists. Presumably it has agreements with other foreign academies. Under this program, the universities can identify the scientists they wish to have from abroad and request the NAST to sponsor their visits under the exchange program. (Generally, such visitors would be available for a short period of time. Arrangements may be made by previous correspondence so that they give short intensive courses in specific areas of statistics for the benefit of staff members and advanced students. They could also be available for consultation by research students).

— Provision may be made in the budget of one university on or a pooled basis to invite one or more professors from abroad to spend one or two whole semesters to give advanced courses in the Ph.D. Program. Professors who are on sabbatical leave will be willing to accept such assignments for one or two terms on modest remuneration. It should be possible to have a continuous stream of visiting professors on such a basis.

(Dr. Reyes had already talked to some professors in the U.S.A. who will be on sabbatical leave in the academic year 84-85 about their availability for visiting Manila and teaching at one of the universities in the Ph.D. program. Several have expressed their willingness to do so. The actual terms under which they would be willing to come can be negotiated in each individual case).

— The IRRI invites experts from time to time to advise them in their research projects and to teach in their training programs. The universities may request them during their stay at IRRI to give short intensive courses or conduct weekly seminars for the benefit of research students. The expenses involved in such cases will be minimal. (Dr. D.J. Finney from the U.K. will be visiting the IRRI for a whole year beginning from January 84. He may be invited to give lectures and also help in the development of the Ph.D. program).

— Some international organizations like the ADB and WHO are located in Manila and they usually have experts in statistics regularly working with them or visiting them for short periods of time. Some of them may like to give regular courses at the universities. They may also be willing to guide research students in their special areas of interest. (Dr. I. David, now working at the ADB, will be giving a course on sample surveys at the Statistical Center of the UP. Efforts may be made to locate such experts to give similar courses).

— There are also possibilities of obtaining grants from organizations like the UNDP to invite visitors for short or long periods on a continuing basis, which should be explored.

— Under the consortium for Mathematics, Physics and Chemistry, provision already exists for inviting professors from the universities in Australia, Singapore, and Japan and the U.K. (under the British Council Program), and to send scholars from the Philippines to spend short periods of time in these countries. This program could be extended to cover statistics.

— When a visitor gives a course of lectures it would be useful to designate one or two staff members and advanced students to attend the course and prepare notes of the lectures, with some details added from original sources in consultation with the visitor. Such notes would be useful for future reference by the students and the staff.

The Indian Statistical Institute usually offers scholarships to students from abroad for study and research. Some of the staff members and advanced students, who are prepared to spend three to four years abroad, may be encouraged to apply for admission and financial assistance for study and research leading to a Ph.D. degree at the Indian Statistical Institute. Several universities in the U.S.A. admit good students to graduate programs leading to a Ph.D. degree and also offer assistantships (of the order of 600 dollars per month). Interested students and staff members may write to the universities in the U.S.A. for further information and application forms.

As mentioned in the beginning of this report, facilities already exist at the UP Diliman and UPLB for giving the core courses and starting the Ph.D. program in certain areas of statistics. For instance, at the UPLB and IRRI there are specialists in design of experiments, biometrics and genetics who can give advanced courses in these areas and also guide research students. At the UP, with the assistance of the specialists in NEDA and other organizations, special courses can be offered in econometrics, economic statistics and sample surveys. Candidates receiving Ph.D. degrees with a research thesis in econometrics or economic statistics or sample surveys will be in great demand for work

in the government and international agencies in Manila. It would be appropriate to give some emphasis to these areas in the initial stages of the Ph.D. program. Other subjects of specialization could be introduced as when qualified staff members are available.

Every student in the Ph.D. program should be familiar with the use of computers. The ability to use the existing computer package programs and to write their own programs when necessary greatly enhances the scope of research work in statistics. The existing computer facilities may have to be strengthened as the Ph.D. program develops. (Most of the theses in statistics written by the students in the U.S.A. report simulation results to supplement the theoretical investigations).

#### **Essential Oils From Apitong**

Novel use for Essential Oils: Supplement to Diesel Oils, Gasoline International Congress Underlines Demand for Spice Oils, Patchouli Oil, Citronella Oil, Eucalyptus Oil, Anise Seed Oil and Peppermint Oil

That essential oils from *apitong* can be used as a supplement to diesel oil and possibly to gasoline was revealed in a paper presented at the 9th International Congress of Essential Oils in Singapore last March 3–17, 1983.

The uses of essential oil in a paper, "Essential Oil of *Dipterocarpus grandiflorus* Blanco\*: Chemistry and Possible Source of Energy Oils" were discussed by Dr. Luz Oliveros-Belardo, Academician, who undertook the research mainly at the Philippine Women's University together with Brian M. Lawrence, Armando Coronel and Maria Fe Mata.

Many noted that the paper deviated from the usual discussions on flavor and fragrance materials to which essential oil congresses are often oriented.

#### **Commercial Session**

This 9th Congress embraced such topics as commercial program covering global outlook in supply and demand, opportunities in essential oils for the least developed countries and technical cooperation with developed as well as developing countries. Previous essential oils congresses stressed the scientific and technical topics; this year's touched on the commercial aspect.

At the same time, the commercial session of this Congress underlined the demand for spice oils, patchouli oil, citronella oil, eucalyptic oil, anise seed oil and peppermint oil. And, according to Dr. Belardo, practically all the plants from which these oils are extracted can be grown in the Philippines. A classic case, she added, is the patchouli plant that thrive well under coconut trees.

Both the agricultural and commercial sessions, she observed, drew big audiences showing the growing importance of increased productivity and trade in essential oils for national development.

Asked to comment on the essential oil industry, she asserted that it is time that the National Science and Technology Authority encourage and support to the full the establishment of an essential oil industry in the Philippines.

Considering geographical conditions, the Philippines can parallel, if not surpass, the agro-industrial achievements of other essential oil-producing countries, such as India,

\*Apitong

Indonesia, Taiwan, Thailand and many others. Each of these southeast-asian countries has a national essential oil association and several essential oil industrial companies. Finally, Dr. Oliveros-Belardo voiced concern over the state of our essential oil industry saying — “Perhaps, it would help to expedite implementation of the government’s plan to establish the essential oil training institute in Palawan.”

### **Singapore: Garden City**

Many refer to Singapore as Garden City, all because of the abundance of trees and flowers in the city and its striking cleanliness.

Thus commented Dr. L. Belardo and continuing —

It is only 617.8 sq. km, island republic but its forward thinking has made it a most progressive commercial and industrial center with modern facilities. Its port is said to be the second busiest in the world today.

In describing the economic growth and progress of Singapore, she said, it has been phenomenal. She even borrowed the words of L. Karr of Fortune Magazine who wrote:

Singapore, an island bereft of oil or minerals, has so thrived as center of banking and export manufacturing that it has run a foreign exchange surplus in each of the last 18 years.

While the socio-economic needs of the people are carefully and efficiently attended to. In return, she explained, each inhabitant strives to help maintain Singapore as a truly prosperous and a happy city.

Educational thrust, on the other hand, focuses on the scientific and technical training as well as development and mastery of skills, she concluded.

### **International Workshop on Essential Oils**

Dr. Magdalena C. Cantoria, Academician, presented her paper at the 13th International Workshop on Essential Oils at the University of Wuesburg in Germany early part of this year.

Wrapping up her impressions about her little over a month study visits in the United Kingdom, she said, “Emphasis in government-supported institutions even in developed countries is shifting gradually more towards applied rather than basic research”.

Her lecture on *Philippine Medicinal Plants and Plants Yielding Volatile Oils, Flavorings and Pigments* was made at the Faculty of Pharmaceutical Sciences in Sunderland Polytechnic School. The same lecture was presented before the School of Pharmacy at the University of London in a joint seminar with the Department of Pharmacy in Chelsea College in London.

She likewise went on study visits to UK institutions, including laboratories undertaking volatile oils and alkaloids research. This was arranged by the Royal Society of London, with which the NAST has an existing exchange program.

She made some observations on the:

- 1) Elucidation of the biosynthesis of volatile oil components and of alkaloids using tissue cultures;
- 2) isolation, structure elucidation, and identification of compounds from plants using sensitive equipment and the latest techniques;

- 3) use of computers in storing and retrieving information pertaining to this such as published works, formulas, absorption and mass spectra, biological activity, available products, etc.;
- 4) comparison of constituents of plants belonging to the same taxonomic groups, for example, same genus, same tribe, same family, same order;
- 5) investigation of plants not previously studied, particularly plants from Africa and South America;
- 6) reinvestigation of well-established drug plant such as Cinchona, Aloe, Strychnos, Podophyllum, etc. applying more sensitive techniques and sophisticated equipment than were originally used.

**Caucus on ASEAN  
Organization on  
S and T for  
Development**

In a continuing effort by ASEAN member nations to establish closer relations in science and technology, delegates to the ASEAN Association of S & T convened in Manila last July 12 – 15, 1983.

Toward this end, NSTA Deputy Director General Quintin L. Kintanar, in welcoming the delegates, likewise acknowledged the efforts exerted by both the private and government sectors, most specially in economics, politics, and social development. He reiterated that it is indeed about time that closer cooperation be made in S & T.

NAST President, Dr. Paulo C. Campos, presided over the meeting, recalling that this ASEAN move was initiated by Malaysia. Representatives of various scientific organizations in the region met two years ago in Kuala Lumpur during which certain agreements were reached.

The background paper on this was presented by Dr. Pacita Zara of the Philippine Council on Health Research and Development. This covered such topics as the need to form a non-governmental association, unresolved issues, a draft constitution, Pro-tem committee and future meetings.

**Membership.** After the organizational meeting, it went on record that membership in the ASEAN Association of S & T shall either be scientific associations/institutions or individual scientists. According to the organizers, this is in an effort to encourage maximum participation of scientists. In addition, the membership pattern was looked upon to invite individuals whose associations/organizations exist so that they may organize themselves into a federation and eventually become subscribing members to the ASEAN association of S & T.

**Role of member individuals/associations.** In the management of the association, it was agreed that institutions/federations should serve as the national point of contact and charged with the responsibility of receiving and disseminating information and advice.

**Governing Body and Meetings.** Three representatives from each country (election of which would be internal) will compose the equal number of representatives to the Governing Body which shall meet once every two years, in order to avoid frequent meetings which may easily drain finances.

**Officials.** It was suggested that the secretary and treasurer shall come from the same country as the President for purposes of easier coordination. These officials may come from members who may not necessarily be a part of the official delegation.

**Funding.** Fees of member individual, it was agreed, shall be lower than that of mem-

ber institutions/associations, in order to keep to a minimum the fees paid by individuals who are already paying to their associations.

### Participants

From Malaysia, Dr. M.K. Rajakumar, Dr. Augustine Ong, Dr. Moud Salleh Ismail and Dr. M. Mohinder Singh.

And coming from Singapore were Dr. Tan Wee Hin Leo, secretary of the Singapore National Academy of Science and Dr. Theng Chye-Yan of the Singapore Institute of Food Science and Technology.

Three came from Thailand: Prof. Kamchorn Manunapichu of the Chemistry Department, Mahidol University; Dr. Kamchad Mongkolkul from the Science Society of Thailand Chulalongkorn University and Dr. Sleamlarp Wasuwat, president of the Agricultural Science Society of Thailand.

The Philippine delegation was composed of the following: NAST president, Dr. P.C. Campos; NSTA Deputy Director General, Dr. Quintin L. Kintanar; Asst. Director General, NSTA and Secretary General, Association for Science Cooperation in Asia, Atty. Dominador O. Reyes; Prof. Emeritus, Dr. Carmen C. Velasquez, National Scientist from UP Department of Zoology, and Dr. Alfredo C. Santos, National Scientist, and NAST Secretary Dr. Tito A. Mijares.

Ms. Lydia Tansinsin, chief, special projects staff, NSTA; Dr. Pacita Zara, deputy executive director, PCHRD and Engr. Eluderio Salvo, chairman of the Philippine Technological Council, also participated in the meeting.

### ASEAN Association of Science and Technology

Plans are afoot to organize the ASEAN Federation/Academy of Science and Technology. Representatives from ASEAN countries met here in Manila on July 9–12. This period coincided with the silver anniversary celebration of the National Science and Technology Authority.

“It is high time to set up a scientific and technological organization that would carry out the S & T activities of the region, such as development of an indigenous scientific and technology base, promotion of technological innovation and R & D programs, training, information system, among others,” NAST head Dr. P.C. Campos said when asked to give the significance of the forthcoming ASEAN conclave here, after he had met with some members of the Philippine scientific community.

It was suggested that the federation be headed by a Chairman with a specified term, say for two years; the chairmanship, however, should be rotated within the member countries. For initial operation, it was proposed that the Philippines chair the ASEAN Federation/Academy.

**Proposed Organization.** The organization will treat members individually. One who is already a member of the National Committee of the member state, may become a member of the ASEAN federation/academy. To avoid too many members from one country, a ceiling of membership for each will be set initially. That is, about 100 members initially, distributed equally among member states.

**Funding.** Initially, each country, it was proposed, should contribute to a common

fund for the operations of the ASEAN federation/academy, the amount to be decided during the meeting in Manila. It was proposed that each member state contribute \$6,000.00 to the initial fund. In the report signed by Dr. Campos, the RP group suggested that the amount may be shouldered by the government and/or private institutions, or that the National Committee may invite its members to share in contributing to the funds.

It was strongly suggested that, in order to facilitate ASEAN recognition of the organization, representatives bring and clear the matter up with their respective governments.

### **The New Academicians**

Six were named new members of the Academy after the election. Their investiture was held in July during the National Science and Technology Week celebration. This brought the number of Academicians to 35. They are:

#### **Gelia T. Castillo**

Her professional life has been devoted to research on the Filipino farmer and his family, Philippine agricultural and rural problems and the impact of agricultural technology on the patterns of rural life. Her research work has indeed given us some insights into our own rural development efforts to reach the farmer and the rural poor.

In the field of rural sociology, Dr. Gelia Castillo is quite outstanding.

She is an A.B. Psychology graduate (*magna cum laude*) from the U.P. For her M.S. in rural sociology, she went to Pennsylvania State University. She obtained her Ph.D. in rural sociology from Cornell University.

Lately, she has been a special consultant of the Filipino-American Bicol Basin Development Program and the Group on Research and Planning of the Local Resources Management Committee, NEDA and USAID. She has also served a score of other national and international committees. Earlier, she was named Research Adviser of ASEAN Population Project on women in development. The Ford Foundation invited her to serve as consultant on rural development.

With 66 research papers to her credit, including a number of conference papers and speeches, she has been a recipient of awards such as one of the Ten Outstanding Women (1968) in recognition of her research works and writings; distinguished professional award in 1975 by the UP Alumni Association; and Rizal Pro Patria Presidential Award (1976) as outstanding agricultural scientist.

An associate professor of Rural Sociology of the Department of Agricultural Education, College of Agriculture, UP (1963–68) she has risen to the rank of full professor.

Starting out in 1955–57 as instructor in Psychology and Sociology, Department of Agricultural Education, UP College of Agriculture, she became supervisor of women students, and a teaching and research assistant of the Department of Rural Sociology in Cornell University.

In 1960–66, she went to the Social Research Division, UPLB, this time as assistant professor, and later in-charge of the Division.

Born in Pagsanjan, Laguna on March 3, 1928, she is married to Dr. Leopoldo Castillo, also of UP at Los Baños.

**Jose O. Juliano** Nuclear physics, nuclear chemistry, sugar technology and industrial engineering are Dr. Juliano's specialized interests.

Some of his more important researches are:

A unique method for non-destructive testing of calcium and sulfur was proposed in the paper of Dr. J. O. Juliano with S. Amiel. The method is described as simple with minimal interference from other elements. The research paper also showed an application in the analysis of sulfur in mineral oil.

Dr. J.O. Juliano also worked on Disintegration of Iron-52 and Iron-53, which considered the nuclear structure of CR 52 and Mn 53, as obtained from the decay of  $Fe^{52}$  and  $Fe^{53}$ , respectively. Previous contradictions on these shortlived nuclides have been clarified and explained.

A more reasonable nuclear structure of  $T_e^{124}$  was suggested in an article he co-authored titled "Disintegration of  $I^{124}$  and  $I^{123}$ ," where the complicated decay of  $I^{124}$  and  $I^{123}$  using scintillation and magnetic spectrometer techniques was studied.

Decay of Europium 154 is another research paper of which he was senior author and which resolved the controversial and complicated decay to Gd 154. His peers commented that this problem indeed was a mystery before the use of the new equipment he constructed. The study dealt with Europium 154 together with the other fission products of europium. A newly-constructed double magnetic spectrometer converted back-to-back to perform electron-electron as well as gamma-electron counting.

With an overpowerful professional background and experience like this, in 1959, he was named a TOYM awardee for Nuclear Science. Likewise, he was Outstanding Alumnus Award for Nuclear Science given by the UP College of Agriculture and earlier in 1952, a Fullbright scholar.

His international affiliations include his being a member of Sigma XI Honor Society, University of California, and Phi Lambda, Louisiana State University, and in 1964, he served as Fellow of the International Atomic Energy Agency.

**Hilario D. Lara** Dr. Lara devoted more than 50 years of his life to the dissemination and application of knowledge on epidemiology, prevention and control of diseases, promotion and conservation of health, sanitation of the environment.

Two researches contributed heavily to quantitative methodology in epidemiological research. One *The Epidemiological Study of a Cholera Outbreak in Capaclan, Romblon Island*, and, the other, *Epidemiological Importance of Oiphtheria Carriers (1925)*, appeared in the American Journal of Hygiene.

The results of his earlier epidemiological research were published in *The Epidemiological and Prevention of Cholera in the Capital of the Philippines*, which he presented before the medical Science Division of the 3rd Pan Pacific Science Congress in Japan in 1926.

A pioneering contribution to methodology in sanitary science and public health is explored in his study. *The Epidemiology and Prevention of Cholera Asiatica in the Capital of the Philippines*, which came out in January 1931 issue of the American Journal of Public Health.

Here, he revealed significant discoveries when he made an epidemic logical investigation of cholera epidemic in 1925 in Manila as well as Malabon and Navotas. This turned out to be another pioneering contribution to methodology-epidemiological research. Its significance cannot be overlooked for it saved thousands of lives in Manila.

It is also in the same gathering that he read *Studies of the Prevalence and Control of Typhoid Fever in Manila, During These Times (1913–24)*. The government had to construct an additional typhoid pavillion for the isolation and treatment of this disease alone at the Philippine General Hospital.

On another research, he tried to answer a century-old puzzle in the medical world: Epidemics appear in recurrent waves occurring at intervals of 12, 20 or more years. He dealt with this in his *The Unitary Hypothesis of  $C = xy^2$  Quantum Mechanism of Epidemicity* (*Acta Medica Philippina*, Jun—March, 1948 issue).

In 1959, the UP designated him *Emeritus Professor* and Dean of the Institute of Public Health, which he founded in 1927.

Briefly, his accomplishments in other areas of medical science are these, he

- \* Pioneered in the training and development of sanitary engineers in the Philippines, using an apprenticeship and scholarship system.
- \* Opened a way for advance training of Public Health nurses.
- \* Established in 1930 the first medical library in the Philippines with funding from the Rockefeller Foundation.
- \* Established in the same year the Philippine Public Health Association.
- \* He founded with Dean Antonio G. Sison, the *Acta Medica Philippina*, a prestigious medical publication.
- \* Established community health demonstration centers, one in Paco, Manila and the other, in Binangonan, Rizal.

His name was included in the 8th Edition (1949) of the "Book of the American Men of Science" and the 4th edition of "Book of World Biography" (1948).

**Bienvenido  
Florendo Nebres**

Fr. Nebres, who specializes in logic and algebra, majored in philosophy for his bachelor's degree in Cebu City. He went to Stanford University, California, U.S.A., to pursue mathematics for his master's and doctorate degrees. Then in 1970, he went to the Loyola House of Studies in Quezon City for theology studies. He was ordained to the Society of Jesus after three years.

Application of many-sorted consistency properties to  $L_{w1, w2}$  preservations theorems and a proof of Cudnovshii's theorem in universal  $L_{k,k}$  formulas are two of his recent

researches that will appear in the *Journal of Symbolic Logic* and *Nanta Mathematics*, respectively.

He was a mathematics teacher from 1963–65 at the high school department of the Ateneo de Manila University. After he was ordained, he became assistant professor for three years, after which he was named dean of the School of Arts & Sciences, 1973–80. He was vice-president in 1974–77 of Loyola Heights Campus. He has been associate professor since 1974.

In the latter part of 1977, he went to Monash University, Australia, for three months and to Sophia University in Tokyo for the next two months.

In 1980, he was appointed Rector of the Loyola House of Studies. Likewise, as a delegate, Philippine Province, Society of Jesus and as chairman, Special Studies Commission, Philippine Province Society of Jesus.

Seven of his technical mathematics papers appeared mostly in foreign publications such as *Notices of the Americal Mathematical Society*, *Journal of the Mathematics of Japan* and the *Journal of Symbolic Logic*.

With such an impressive educational and professional background, he was awarded a Fulbright-Hays Grant and graduate assistantship, Stanford University. His professional and civic participation and memberships are as diverse as they are prestigious with the Regional Center for Mathematics in Southeast Asia, Nanyang University, Singapore; the Scientific Council of the International Council for Pure and Applied Mathematics in France and Program Committee, International Congress on Mathematics in Berkeley (1980) and another one is scheduled for 1984 in Adelaide.

He heads the Mathematical Society of the Philippines and the Kilusan ng Siyentipikong Pilipino; he is also chairman of the Executive Committee, UP-Ateneo-De La Salle Consortium Program for the Ph.D. in Mathematics, is member of the American Mathematical Society Association for Symbolic Logic, Philippine Statistical Association and a number of other prestigious professional groups.

Fr. Nebres was born on March 15, 1940, in Baguio City.

**Faustino T. Orillo** His researches in plant pathology made significant contributions to society. He believes that by combating diseases that attack food crops, we can raise food production. During the major part of his researches, he devoted his time looking for ways to minimize losses experienced by our crop producers ensuing from plant diseases.

Consequently and to an appreciable degree, his studies aimed at this, have increased knowledge of Philippine phytopathology according to his some colleagues.

While a professor of plant pathology, he was also dean of the graduate school, UPLB, 1973–1979, as well as of the College of Agriculture, UP, 1970–73. In 1979–81, he was named deputy director, Center on Integrated Rural Development for Asia and the Pacific (CIRDAP) in Bangladesh.

Earlier, he started out as student laborer, student assistant, instructor, he rose to full professorship (1940–70) — all at the Department of Plant Pathology, UP College of Agriculture.

A participant in a number of conferences both here and abroad, he has about 43 technical papers, 25 popular pieces appearing mostly in monthly bulletin of their college. Dr. Orillo has unpublished researches in 30 more topics, an example of which is the "Effects of Irradiation with Polonium 210 and Ultra Violet Light on the "Nata" Producing Bacterium."

Postdoctoral grants for him meant studying the agricultural uses of atomic energy especially in plant disease control. He studied radioisotopes techniques at Oak Ridge Institute of Nuclear Studies, Tennessee, and did studies on the effects of irradiation on microorganism at the Institute of Agriculture, Minnesota.

With an impressive professional background, he has been awarded several distinctions by different professional groups namely:

In recognition of research work on isolation of Arabica coffee strains resistant to the coffee rust diseases, awarded by the Secretary of Agriculture and Natural Resources, July 1959;

For outstanding contributions to Philippine Plant Pathology research and administration by the Philippine Pathological Society, 1971;

For assistance rendered in the promotion of scientific pest control program through seminars by the Pest Control Association of the Philippines, 1971.

Born in Los Baños, Laguna on February 16, 1921, he is married to Conchita D. Alonto-Orillo, with whom he has three children.

**Jose  
R. Velasco**

It was pioneering work of Dr. J.R. Velasco, plant physiologist, that provided the basis of some important crop production management practices as well as research directions for the U.P. College of Agriculture.

Even in areas of manpower development, the majority of the present crop of outstanding plant physiologists in the country owe their early training with him.

A Ph.D. holder from the University of California in 1949, his love for plant nutrition as well as plant growth and development, paved way for him to head the NIST for some ten years.

Dr. Velasco established a better basis for the diagnostic analysis and interpretation of the nitrogen status of plants in his *Studies on Foliar Diagnosis*. In another paper *Effect of Time of Application of Ammonium Sulfate on the Growth and Yield of Rice*, he underscored the importance of timing of fertilizer application to ensure maximum nutrient utilization by plants.

His *Growth of Young Coconut Plants in Sand Culture* represents the first, and most likely the only, controlled experiment on coconut nutrition. This study likewise provided a comprehensive description of the more important deficiency symptoms in coconuts. Indeed, many have referred to it for the foliar diagnosis of the nutritional status of coconut. His paper on the *Photoperiodic Response of Elongated Rice* dealt with variations in the reproduction behavior of rice plants planted at different seasons of the year. Providing a documented alternative opinion on *cadang-cadang*, his paper

on *Soil Aspect of Cadang-Cadang of Coconuts*, also provided evidence that "soil associated factors may possess causal factors." All these articles appeared in the Philippine Agriculturist.

In the world of academe, he started out as assistant instructor for five years and became instructor for another four years; the following six years he was assistant professor until he became chairman of the Department of Agricultural Botany, College of Agriculture. He went to the Graduate School of Arts & Sciences, UP and served as Botany professor for one year.

Born in Imus, Cavite on February 4, 1916, he is married to Felicidad Ibañez, with whom he has eight children.

### Scientific Meeting at the Philippine Science Community

Plans for the 5th Annual Scientific Meeting have been finalized: 9 July, Saturday, 1983 at the Executive Lounge of the National Science and Technology Authority Administration building in Bicutan, Taguig.

Four simultaneous scientific sessions were tabled for the day, which started at 10:30 in the morning and wound up to 4 in the afternoon.

Chairing the different sessions were academicians, some of them presented their papers. Outstanding young scientist awardees (in a contest held yearly, launched and sponsored by the NAST) also read papers.

### Social Sciences and Mathematics

Session A covered social sciences and mathematics. The social sciences was chaired by Dr. José Encarnación, Jr., Dr. Amando M. Dalisay, another academician, presented *Agrarian Reform Revisited: Some Policy Implications*. The discussion brought together people with impressive credentials like Dr. Pedro Sandoval, Dr. Ramon Nasol and Dr. Tomas Flores.

Another outstanding young scientist awardee, Dr. Alejandro N. Herrin, read *Demographic Impact of Rural Development Progress: The Case of Rural Electrification in Misamis Oriental, Philippines*. Dr. Vicente Paqueo served as discussant for this paper.

Dr. Raymundo A. Favila chaired the session on mathematics. The lone paper: *A Structural Characterization of Finite Graphs* was read by Dr. Severino Gervacio. Serving as discussants were Dr. Pablo Manalastas and Dr. Rolando Ramos.

### Medicine

NAST head, Dr. Paulo C. Campos, chaired session B on medicine. The national scientists headed the list of presentors. Dr. Fe del Mundo on *Rubella Antibody Status of Adolescent Girls in Philippine Rural and Urban Communities (1981-1982)*. Dr. Hilda Kleiner and Dr. Urbano Mendoza served as discussants.

Dr. Geminiano T. de Ocampo read *Strategy for Medical Research in the Philippines*. Discussants for the paper of the leading eye specialist was PCHRD Director Dr. Alberto Romualdez, another outstanding young scientist awardee and Dr. Angelina Lantonio.

*A Comparative Study on the Effect of Mass Treatment of Children on the Total Prevalence of Soil-Transmitted Helminthiasis in Two Communities, Mindoro, Philippines;*

was presented by Dr. Benjamin D. Cabrera, Academician. The discussion scene for this session was led by Dr. Edito G. Garcia, Dr. John Cross and Dr. Bonifacio Dazo.

While Dr. Clara Y. Lim-Syllianco, Academician, read *Mutagenicity and Clastogenicity Potential of Mexaform*.

*Migration, Modernization and Hypertension: Blood Pressure Levels in Four Philippine Communities* read by outstanding young scientist awardee, Dr. Esperanza Icasas-Cabral. Dr. Ricardo Abad and Dr. Santiago Guzman made the comments.

Another outstanding young scientist awardee, Dr. Carmelo A. Alfiler presented *Clinical Spectra of Primary Glomerulopathies: A Comparative Analysis Based on 102 Biopsied Children*. Discussants were Dr. Marieta de Luna and Dr. Benjamin Canlas.

### Biological Sciences

The biological sciences (session C) was presided by Dr. Carmen C. Velasquez, a member of the Executive Council of the Academy.

Two academicians, Dr. Joventino D. Soriano and Dr. Alfredo V. Lagmay, read *Influence of Chromosome Number on Caffeine Inhibition of DNA Repair* and *Experiments on Pacing Under Fixed-Ratio and Variable-Interval Schedules of Reinforcement*, respectively. No other than IRRI Director General M.S. Swaminathan headed the discussion on the paper of Dr. Soriano together with Dr. Adoracion Arañez, while Dr. F.G. David, Dr. Horacio Estrada and Dr. Mariano Obias served as discussants for the paper of Dr. Lagmay.

Dr. Paciente A. Cordero, outstanding young scientist awardee gave the *Assessment of the Sea Vegetable Resources and Potentials in Panay Island*. National Scientist Dr. Gregorio T. Velasquez led the discussion along with Dr. Magdalena C. Cantoria, Academician.

*A Comparative Study on the Cage Culture of Tilapia nilotica x Tilapia aurea Hybrid in Laguna de Bay* was read by Dr. Rafael Guerrero III, and discussion was shared by Dr. Antonio Ma. Bautista and Mr. Tereso Abella.

Likewise, along the field on food production was the paper of Dr. Florian M. Orejana on *The Use of Appropriate Technology in Fish Processing*. Dr. Estrella Alabastro and Dr. Alicia Lustre acted as discussants.

### Chemistry

Session D was chaired by Dr. Bienvenido O. Juliano from IRRI. Responding to the urgent need for a more socially responsible researches in energy are two academicians. From UP Los Baños, Dr. Julian A. Banzon presented *Projections on Coconut as Source of Liquid Fuel*. This brought together Dr. Ramon I. Nasol and Prof. Juan Quesada in the ensuing discussion.

While *Essential Oil of Dipterocarpus grandiflorus Blanco: Chemistry Study of its Energy Content* was presented by Dr. Luz Oliveros-Belardo. Dr. Banzon was discussant along with Dr. M. Cantoria.

This was followed by papers of outstanding young scientist awardees like Dr. Lourdes Cruz on *Conotoxins Acting on the Acetylcholine Receptor: A Review*; Dr. Victoria A. Vicente on the *Recent Trends in Electroanalytical Chemistry*; Dr. Ernesto J. del

Rosario talked on *Laboratory Scale Production of Cellulase, Glucoamylase and Alpha-Amylase* and *Studies in the Biomenthanation of Rice Straw* was read by Dr. William G. Padolina.

The Investiture of New Academicians was held shortly before the Annual Scientific Session at the NSTA Executive Lounge and was led by Dr. Paulo C. Campos, president. The new academicians took their solemn affirmation before Minister Emil Q. Javier, Academician and director-general, NSTA.

Guest speaker was Dr. M.S. Swaminathan, Director General of the International Rice Research Institute at Los Baños.

**June 9 is Election Day of Academicians; Academy Creates Committee on Election**

Members of the National Academy of Science and Technology convened last June 9 to cast their votes for the new academicians.

Earlier, created was a Committee on Elections headed by Dr. Conrado S. Dayrit, Dr. Julian A. Banzon, and Dr. Joventino D. Soriano, were named members.

The Academy COMELEC (Commission on Elections) which met last May 27, 1983 came out with a new election procedure for the academicians. This procedure was approved by the Executive Council and later passed on for the approval of all academicians.

Asked on the implication of a new procedure, NAST Secretary, Dr. Tito Mijares, remarked that this will enable academicians to hear further the accomplishments of the individual candidates. Likewise, this gives the academicians a suitable and fitting occasion to submit further questions on the nominee's works. The latter, he said, is not feasible under the previous procedures. He added that this new set of procedures will allow for open discussions as well as make it easy for academicians to clarify issues, specially on unfamiliar fields entirely different from voting members' specialization.

The procedure for members voting at the meeting was described by Dr. Dayrit in his report to the Executive Council as follows:

For members voting at the meeting, the procedure is:

- 1) call to order; 2) roll call; 3) reading of the list of candidates for membership to the Academy; 4) open forum, clarification of possible questions regarding the candidate; 5) certification of write-in votes for members abroad and or sick 6) distribution of ballots; 7) counting of votes, write-in votes included; 8) announcement of election results and 9) confirmation of the results by the Academy.

#### **Getting Votes of Sick Members and those Abroad**

In preparation for the 1983 election, Dr. Amando M. Dalisay, Dr. Francisco M. Fronda, Dr. Eduardo M. Quisumbing and Dr. Juan S. Salcedo, Jr. were among those who are sick and the Committee ruled that they would be unable to attend the meeting. According to the Academy Comelec, at least one member on the Committee was designated to bring the numbered ballot to each of these sick members.

The Committee ruled that the sick member encircle his votes, as prescribed in the ballot, sign and put his thumbmark in the envelop containing the ballot. The ballot is

then sealed. The Academy Comelec member keeps the ballot for later presentation in the meeting.

On the other hand, Dr. Bienvenido O. Juliano, Dr. Alfredo V. Lagmay, Dr. Clara Y. Lim-Sylianco were academicians identified to be abroad. It was learned that Dr. Pedro B. Escuro would still be around during the May 27 meeting of the Academy Comelec but was scheduled to leave for abroad by June 19 Academy meeting. Cablegrams were sent them individually, requesting them to submit their votes via telex, accompanied by the code name assigned to them.

#### **Umali Named Member of Executive Council**

The appointment of Dr. Dioscoro L. Umali as member of the Executive Council of the Academy, was announced by Dr. P.C. Campos, president. He is one of the original ten members of the NAST.

Emeritus professor in Plant Breeding, College of Agriculture, UPLB, since 1977, Dr. Umali is back from Thailand, where he served as assistant director—general and regional representative for Asia and Pacific of the FAO from 1977 up to until recently.

He is a graduate of the UPLB with a bachelor's degree in agriculture, obtaining his Ph.D. in genetics from Cornell University, USA, in 1949.

He started out as research professor, UP College of Agriculture in 1955—58. The year following, he was appointed dean of the College of Agriculture, which he held for 10 years. Simultaneous with this, he was a professor of Plant Breeding from 1959—73. Likewise for three years, he was vice president of the UPLB.

In 1966—69, he was undersecretary for agriculture, Department of Agriculture and Natural Resources. It was during his incumbency as undersecretary that the Philippines became self-sufficient in rice in two years time. It will be recalled that the Philippines had been importing rice for the past fifty years.

Prior to this, he held other government posts: chairman of the Philippine Seedboard from 1955—59; member of the Rice and Corn Survey Team Committee, 1962—65, chairman of the Cabinet Committee on National Food Production Campaign, and member of the Board of Trustees of the SAMAKA Service Center of the Abaca Development Corporation of the Philippines, 1966.

With the Board of Trustees of the Ramon Magsaysay Award Foundation, he served as chairman for seven years.

He was also member of the Governing Board of the International Institute for Tropical Agriculture, Ibadan, Nigeria, 1967—69. He was director of the 5th FAO Farm Development Center 1968—71, and the Southeast Asian Regional Center for Graduate Study and Research in Agriculture, College, Laguna 1960. Six years after, he was named chairman of Commission III, People in Rural Development, World Food Congress, and head of the Philippine delegation to the Hague, Netherlands.

" . . . In the spirit of scientific services and social cooperation," Dr. Umali received an outstanding achievement and leadership award in rice and corn research from President C.P. Garcia in December, 1953.

From the Philippine Chamber of Wood Industry, he was a recipient of another award: for his valued support, cooperation and contributions to wood industries. The others: Philcost Award, in recognition of his outstanding achievement in the improvement of rice and corn and other economic plants through plant breeding and exemplary leadership in agricultural research; PCARR's PANTAS Award, for his contribution to the advancement of agricultural research in the country and many others.

**Memorial Lectures  
in Honor of  
Dr. Casimiro del  
Rosario**

An eminent Filipino physicist and consistent scholar "he took over the ruins of a weather bureau that was really out of date . . ."

"He too had nothing with which he could compete with the growth of air traffic and the demand for weather knowledge."

"He had foreseen the present situation of forecasting before he returned. But he carried the burden very well in a transition stage that only the future historian can appreciate."

These were the words of Fr. Francis Heyden, S.J. of the Manila Observatory, Ateneo de Manila University.

Last April 20, this year the NAST commemorated Dr. Casimiro del Rosario with memorial lectures at the UP's National Science Research Center in Diliman, Q.C. It was co-sponsored by the Philippine Atmospheric Geophysical and Astronomical Services Administration, UPNSRC, Philippine Astronomical Society, Philippine Meteorological Society and Samahang Pisika ng Pilipinas.



*The appreciative audience at the conference hall of the UP Natural Science Research Center in Diliman, Quezon City.*



Dr. Campos as he gives the opening remarks during the memorial lecture, while the daughter of Dr. C. del Rosario, at far right for the response.

The paper of Dr. Del Rosario on *Tropospheric Wind Shear Oscillations as a Characteristic of the Southwest Monsoon Atmosphere* was read by C.V.P. Raman, former senior most Deputy Director General of the Indian Meteorological Service.

Dr. Casimiro del Rosario, Academician, was named National Scientist in July, 1982 during the celebration of the National Science and Technology Week. Two months after, on September 15th, he passed away.

Many people will remember the Filipino physicist, who had won international fame for his researches in *Velocity Distribution among Thermionic Electrons (Physics Review, 1927)*; *Effect of Radioactive Radiations on Euglens*; *High Voltage Electrical Discharge in Very High Vacuum (1926)*; *Effect of Ultra Violet Light of Different Wave Length on Euglens (1930)* — the last three all appeared in the *Journal of the Franklin Institute*.

Dr. del Rosario received a Presidential Award in 1965 and the Junior Sterling Research and Bartol Foundation Research Fellowships for his researches in physics, astronomy and meteorology.

He was director of the Philippine Weather Bureau from 1947—1959 and served as first Vice-Chairman of the National Science Development Board.

In 1918, he pursued his bachelor's degree from the University of the Philippines. Then he went to Yale University for his masters degree in Physics in 1924. In 1932, he obtained his Ph.D. in Physics from the University of Pennsylvania.

He became Physics professor at the UP and much later, was named chairman of its physics department. He was accorded the University Alumni Award in 1965.

**The History of the  
Philippine Weather  
Bureau**  
By Fr. Francis J.  
Heyden, S.J.

In the middle of the nineteenth century the traders of the seven seas had accustomed themselves to the fact that one out of every three vessels that put out to sea usually never come back. The bell in Lloyds of London tolled for the ship and the money lost. The family of the crews went on singing, "Many a stormy wind shall blow when Jack comes home again".

Despite the quip by Mark Twain that "Everyone talks about the weather, but no one does anything about it", the captain of the clipper ships kept their "glass" that we now call a Cape Cod barometer and noted its rise and fall with a weather-eye that told them from experience what lay ahead. This was better than the old saying that was not true universally, "Sky red in morning sailors take warning, sky red at night, sailor delight". For before the beginning of the nineteenth century Benjamin Franklin had noticed the systematic winds of the northern hemisphere in low and highs. Around 1840 officers of the U.S. Naval Observatory began plotting the winds on a map of the area so that they could locate the centers of the extratropical cyclones. A set of these maps are in the archives of Georgetown University in Washington.

By the middle of the last century the steep decrement of the barometric pressure in the edges of tropical storms was well known from bitter experience. When the water rose in the spout of the Cape Cod barometer the crew would batten down hatches and lash sails to yardarms. The change did not have to be very great but the broken clouds seemed to foretell the tension of a trap that was about to spring. The mercury barometers were better and the young Jesuits in the Ateneo de Manila, then in Intramuros near the old muralia with three cannon mounts still in place, had the courage to send a warning to the officials of the city of Manila that a typhoon was approaching the city. The value of this warning was appreciated. It saved a lot of money for the merchants, a lot of damage to ships and a lot of lives of the people who took advantage of the advice to take shelter. The little weather bureau of the Ateneo Physics department received some financial help. The Jesuits felt that this was an essential part of their missionary work, and they appointed young men to study weather and its adjunct sciences of astronomy and geophysics.

One of the first of these was Federico Faura who studied the hard sciences of mathematics and physics before coming to Manila, and later toured the observatories of Europe for a first hand look at the equipment and methods used. One of his first challenges was the arrival of the Secchi Meteorograph that recorded on two sheets of graph paper the barometric pressure, temperature, wind-velocities and directions, rainfall and hours of the day. These records were of tremendous value for the research planned by the young Faura. There is a story that the meteorograph arrived from Rome where it had been built by Father Angelo Secchi, the Director of the Vatican Observatory, in about four hundred small parcels. The instruction manual was missing. Father Faura managed to assemble the complete instrument and put it into operation without the instruction book. There is little wonder that he was recommended as a genius by Father Secchi. This instrument after its retirement stood in the tower of Manila Observatory on Padre Faura Street until it was consumed in the last fires of the battle of Manila in 1945. The Secchi meteorograph was a beautiful piece of furniture done in a mahogany with a neat railing around it.

Father Faura was one of the first to develop a calibration for the aneroid barometer that could be applied to weather conditions prevailing in the tropical far east. These conditions are remarkable in their similarity to those of other tropical areas at the west ends of the trade winds. The hurricanes of the Caribbean have common properties with the storms in the Philippines, in Australia and the horn of East Africa. The man who capitalized on these common features was Jose Algue who came to Manila in 1894 as astronomer but after the death of Father Faura three years later took

over the task of analyzing the data on typhoon accumulated over the years under Father Faura.

Algue succeeded in creating an idealized typhoon that fitted into the atmosphere like an hour glass with its narrow link between a wider area on the ground and its image in the upper air. The tremendous energy was developed in this very small vortex that fed on the latent heat of water. A projection of this vortex provided him further with an idea of an instrument on which wind directions and barometric readings could tell the distance and direction of a typhoon. This barocyclonometer, as it was named, was the only instrument available to many a ship at sea that rode out a storm without radio communications.

The world of weather forecasting was changing also. In the early part of the twentieth century Jose Coronas introduced the weather map on which the barometric readings from the many substations of the weather bureau were plotted. A line was traced through all of the stations with the same readings. These lines were the isobars and they showed by unmistakable inference the general direction and approach of a typhoon.

Of course when there was a suspicion of an approaching storm, the meteorologists had to ask all of the substations for later readings, and very often the storm hit the east coast of Luzon before these readings could arrive. This became a problem all over the world, and weather bureaus kept a staff ready to visit ships in port so that the barometric readings made at sea could be transcribed and added to the missing data on the storm after it had passed. This was part of the research that went along with the weather service.

In 1915 Miguel Selga arrived carrying a silver disk pyrheliometer in his hand as he disembarked from a ship. He too was to be an astronomer, and he began with the time service that was becoming more important as the use of wireless on ships became more common. The observatory had the clocks and transit-instrument for a first class station, comparable with the U.S. Naval Observatory in Washington. The second ticks from Manila were broadcast over the U.S. Naval radio at Cavite, over the radio and telegraph of the Bureau of Posts and over the signal systems of the Philippine Railroad, on a schedule of 12 noon and 10 o'clock at night. Errors were always kept within 0.1 second.

It was not long before the aging Jose Algue handed over the meteorology to Miguel Selga. Jose Coronas had left for several years to live in Arizona because he suffered so much from asthma. He returned only in 1931 and retired shortly afterwards.

Miguel Selga was a prolific writer of reports. He did not go beyond the theoretical speculations of Jose Algue on the nature of a typhoon but he contributed a vast amount of observational data for future reference. Fortunately most of this was mailed to other observatories around the world so that practically all of it can be reproduced.

In 1926 Charles Deppermann arrived to take over astronomy from Juan Comellas who was ready for retirement. Deppermann had studied high dispersion spectroscopy at Johns Hopkins and was ready to put into use his knowledges of Zeeman effect in stars with the 19 inch Merz refractor. The spectroscopes purchased by Jose Algue needed a lot of modifying before they could meet the standards of modern stellar spectroscopy, and before this could be done, Charles E. Deppermann became the chief meteorologist under Miguel Selga as Director. It was then that the physicist of the Ateneo de Manila, Francis J. Heyden became the chief astronomer. To quote a superior, "There's going to be a new astronomer here in two weeks and he is not ten thousand miles away". Besides being physicist, Francis Heyden had been a "ham" radio operator since he was twelve years old. He could manage radio equipment and circuitry for the master clocks and

make the simple transit observations of the star for the time-service. Charles Deppermann had developed the service to the tops in efficiency with the addition of a Short Synchronome master clock and a good update on the tables for corrections to the star position.

Charles Deppermann went off to Oslo in Norway to spend a year with the newest ideas in meteorology, called at that time frontology. He returned with a determination to apply the same principles from extra-tropical latitudes to the tropical air masses. He was so occupied with this new concept that he turned over the routine weather map work to Bernard F. Doucette, newly arrived from M.I.T. and continued to develop his theory of tropical fronts. He spoke constantly about the confluence of the Siberian Northers, now the Northeast Monsoon, the Monsoon from the Indian Ocean and the Trades. He liked to note that they always met in a tripple point or a region where winds from all three masses came together. This point still exists in a modified form with the Intertropical Covergent Zone.

Charles Deppermann without a doubt contributed more to the knowledge of tropical weather than all of his predecessors among the Jesuits in Cuba, Shanghai and Madagascar. In fact, during the war, he was embarrassed by a compliment from a Japanese meteorologist who assured him that his publications were of great value to the Imperial Navy. At the end of the war Charles Deppermann was on the list of those who were to be picked up and brought back to the Pentagon for immediate consultation.

I met him at that time and sat at the meetings with General Yates presiding. The United States was frantically looking for a formula that would open the Pandora's Box from which the future weather could be found for the Pacific. One of the scientists present said to me that he wished he could get a complete set of Father Depperman's papers so that he could get some idea of the whole problem. But Charles Deppermann had to admit he had no key for the Pandora's Box.

Like all of the astronomers of Manila Observatory, I learned during the war while still a graduate student in astronomy at Harvard that astronomers could contribute very little to the war effort. One worked with the Navy degaussing ships against magnetic mines others joined up with the radiation laboratory for the further development of radar; another with good fluency in languages monitored the first Voice of America broadcasts from a Harvard studio. He could handle thirty languages and others concentrated on teaching navigation to the Young Navy students and to the officers of the newly formed "Amphibian Command". After two years with navigation Francis Heyden found himself in Washington helping to draw the weather map for the country every day. All Manila Observatory astronomers end up in meteorology.

During the year or more in that work, I became aware of the changes in meteorology. Forecasts had been good guesses after a few hours and yet the war effort demanded much longer forecasts, of two to five days at least. Several teams set to work on the problem. One team dug out all available data from records of forty years and succeeded despite large hiatuses especially over Siberia. From these successive charts the highs and lows were tabulated by position and put on punch cards. When a weather map showed a series of highs and lows, the memory of the computer was culled for all of the similar locations of storm or circulation center for the past forty years. Perhaps at least ten would be found for more careful scrutiny and the preparation of a five day forecast. This analog method did not always work but it was inefficient because of its data.

A second approach to the long range forecast was developed by a young meteorologist named Namias who used five day means of barometric pressures on individual charts. By avoiding running means he was able to treat each five day mean weather

map as an independent unit and forecast from it to the next five day map.

In the meantime new parameters were entering the weather picture. The jet stream had been found, first by the Japanese who used it for sending their fire bombs over the western United States by balloons. This was a nuisance hazard, but the jet stream made the world aware of a different circulation pattern from the prevailing winds of the square rigger days. The air mass problem became even more complicated.

There was the innovation of the radiosonde that looked formidable for a country like the United States but next to impossible for one like the Philippines. Pilot balloons were tried here under Bernard Doucette and the upper winds within visible range were valuable for the transoceanic airlines that were just coming into regular service. But there were a far cry from the ones that were crossing the Pacific and the Atlantic at the end of the war in 1945. The ocean liner was ready for the luxury cruise or the Love-Boat era. Canton Island and others like it were being taken over from the gooney birds and the Holiday Inns were in blue print.

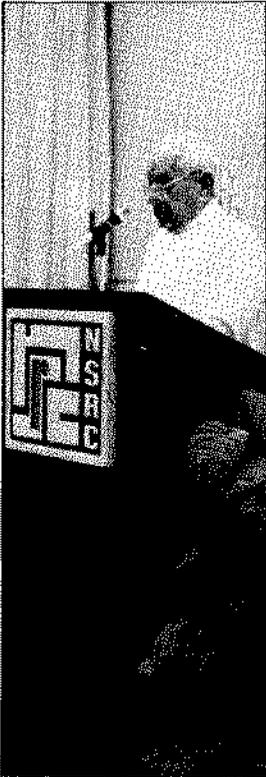
Weather was an entirely different task. There was no more time for a weather map that depended on several hours of data acquisition by telegraph or radio from remote stations. The new planes were moving at three hundred miles per hour. Routes were changed with a wide range of security and weather stations were established by the airlines. The salaries they offered tempted and won over the government scientists. But the real research remained with the government weather bureaus.

In 1896, Jose Algue obtained some very nice cameras on altazimuth mounts for photographing clouds. He took an active part in the International Cloud Year. The result of this work went unnoticed except for the beauty of the pictures.

In 1933, Charles Deppermann decided that the clouds were definite forecasters and with enough information on them a picture could be worth a thousand barometers. He purchased a Leica camera with a fish-eye lens and began photographing the sky from horizon to horizon. Over nearly eight years he gathered several thousand photographs of cloud formations with the meteorological data that fitted each. These were all destroyed during the last days of Manila Observatory. The only survivor was the Leica camera which was reconditioned and provided the one great incentive for Deppermann's continuation of his work after the war.

It was decided after the conference in the Pentagon that a weather bureau of the future was a lot more complicated in speed and technical equipment than a series of remote stations with barometers ever was. Charles Deppermann wanted his research work with clouds seismology; solar work with a spectro-heliograph and an ionosphere station that was offered to him by the U.S. government for a continuation of the work that had been going on before the war. The Weather Bureau was handed to the Philippine Republic that entrusted it to the chairman of the Physics Department of the University of the Philippines.

Dr. Del Rosario whom we commemorate today took over the ruins of a weather bureau that was really out of date and he had the backing of the U.S. Weather Bureau under Dr. Richelderfer through a Mr. Higgs who was to see that everything possible was provided for the future. For one thing, he had more than all of the other countries in this area because they too had all lost their weather bureaus. The armed forces of the U.S.A. were doing everything and the airlines were providing their own men as they expanded from Military Air Transport into Pan American and all of the other airlines we have today.



*Fr. Heyden*

Needless to add, Dr. Del Rosario had nothing with which he could compete with the growth of air traffic and the demand for weather knowledge. Forecasting narrowed down from continental dimensions to local areas within reach of quick forecasts. Everything was tried and even great mathematicians like Von Neuman were called in to study all the variables for a possible function from which a forecast could be molded in a computer. We have it on his good authority that this is not possible at present.

As the number of planes per unit area of the earth grew, the International Geophysical Year was producing not only new data but a lot of new ideas. One of these was the launching of an artificial satellite to be called the Vanguard. Several million dollars were allotted to a limited number of trials. The small satellite was to be about as large as a basketball which would send back information on the ionization, the temperature in space, the intensity of the solar irradiance, and some other data. Before the complete set of trials were exhausted the Russians surprised everyone with a satellite that was truly in orbit. The Yankee pride was put to shame, as the press screamed about the Space Gap until a rocket for defense purposes was launched with a satellite that sent greetings to all of the world.

Some of the scientists who watched this gamut with satellites, had other ideas in mind. There were those who wanted probes to the stars after visiting the planets. There were others who realized the advantages of space stations for many purposes. Television signals cannot be sent through undersea cables and microwave steps are troublesome to maintain. A satellite could make instant transmission of television, telephone, telegraph and all else very simple. A communications satellite would be without competition. A satellite could also look down on cloud formations and show the weather under the guise of the water and ice crystals that made the typhoons and tornados of the past.

The first weather satellites were sent up in the early part of the 1960 decade and by the early part of the 1970 decade the weather satellite was an established tool for the pilot of both ship and plane. Despite the complaints about expense there is no doubt that more people use the weather now than did in the past. Forecasting is not so much a need for long range as it is for the next few hour or less.

Present satellite, two in stationary orbits and three in polar orbits are serving the world's weather demands. There is a discrimination to about six kilometers and an embracement of a hemisphere for area. Television stations in connection with the weather satellite stations can show the cloud formation over a map of the region covered by the station as a feature of the weather forecast.

All this is going to be expensive in the future because of the maintenance and the replacements. Weather satellites need expert designers and technicians for their construction. The read out equipment is not like any radio or television set. It is very complicated. Replacements have to be ready so that there will not be any lack of weather information in a world full of flying jets.

The nation responsible for these satellites is considering it necessary to turn over the earth resources and weather forecasting of these satellites to the commercial entities that need them. Then data will be on sale by COMSAT, and it will not be available to the country that cannot afford. Furthermore, COMSAT will provide simply the essential forecast data, while the research work that can be obtained may go wanting for a berth or laboratory. One can see how well the past at Manila conserved the knowledge of tropical weather for research and it is hoped that there will be enough interest and inspiration from the present needs of the Philippines in its weather service to ask for

more than a package from COMSAT.

I am not sure how much of this present situation was foreseen by Dr. Del Rosario before his retirement. But he carried the burden very well in a transition stage that only the future historians can appreciate.

**Dr. Francisco O. Santos, Academician Passes Away**

Recognized for his contributions to nutrition and agricultural chemistry, Dr. F.O. Santos was professor emeritus of Agricultural Chemistry, College of Agriculture, University of the Philippines at Los Baños, Laguna when he died last February 19, 1983.

Prior to this, he was dean of the College of Agriculture in 1943-45, starting out as assistant instructor in mathematics in 1915. He then went to New York City Bellevue Hospital Children's Division where he worked as biochemist for another three years. On his return to U.P., he served as assistant professor of Agricultural Chemistry for the next 29 years, during which time he served as head of the Department of Agricultural Chemistry for 26 years. He was also, at one time, a professorial lecturer on Nutrition at the UP School of Hygiene and Public Health and School of Public Health Nursing and the Bataan Enriched Rice Project, Department of Health and Welfare.

He became member of the New York Academy of Science for his researches in biochemistry and nutrition.

As pioneer of the nutrition movement in the Philippines he has published researches on 1) the future of nutrition in the Philippines; 2) food utilization; 3) the present status of nutrition work in the Philippines (1939); 4) studies on the plan of nutrition of families of laborers in Calamba; 5) an inventory of the Ilocano diet (1936); 6) some probable effects on the one-sided diets (1932); 7) amount of nutrients in Philippine food materials.

He initiated and lead the organization which became the forerunner of the present Food and Nutrition Research Institute, an implementing arm of the NSTA.

He obtained his Ph.D. in Chemistry from Yale University in 1922.

**Wilson Here on Fruits Storage Life Study**

Dr. John M. Wilson from the School of Plant Biology, University College of North Wales, Bangor, was here last June-September. He went on a four-month research at the ASEAN PostHarvest Training Research Center, Department of Horticulture University of the Philippines at Los Baños, Laguna.

He did research on the prevention of chilling-injury and extension of storage life of tropical fruits. Earlier, he had been communicating with Dr. Ernesto B. Pantastico, director of the center, whom Dr. Wilson considers as one of the world's leading experts in this field.

The biology professor from Great Britain was nominated by the Royal Society of London for fellowship visit under the exchange agreement with the NAST.

He pursued two areas of research: First on the behavior of the stomata of tropical fruits at low temperatures, locking open of the stomata and hastening water loss, browning of the tissue and entry of pathogens and therefore reducing storage life. Second, chlorophyll fluorescence analysis of ripening fruits as an aid to prolonging life.

## Outstanding Young Scientists '83

### Luzvisminda U. Rivero

The specialization of Dr. Wilson is on chilling—injury ( $0-10^{\circ}$ ) to tropical plants and fruits, changes in membrane permeability and composition, water relations, respiration, photosynthesis, fluorescence and ultrastructure.

Once more, the NAST launched the Search for the Outstanding Young Scientists for 1983 at the start of the year.

Each awardee received a trophy and a P10,000 cash prize for the Academy. Making it to the 1983's reputable award are:

Because of her outstanding contribution in chemistry education in the Philippines as a professor, researcher and author of books and laboratory manuals; on instrumentation and chemical analysis, and in environmental chemistry — she was named one of the 1983 Outstanding Young Scientists Awardees by the NAST.

A Doctor of Science holder from the University of Bonn, West Germany, she finished her B.S. Chemistry (*cum laude*) and M.S. Chemistry from the University of San Carlos.

Dr. Rivero's more important published researches include:

A Study on the Metal Ion Intake of *Ipomoea aquatica* (Kangkong) 1979–80. Kangkong growing in polluted bodies of water assimilate the heavy metal ions contained in the water, hence the people must be warned to be careful not to harvest kangkong grown in the vicinity of factories whose effluents may contain metal ions.

Metal ions assimilated by algae may be harmful to human beings hence, the extent of assimilation must be studied. This is discussed in her research, *A Study on the Metal Ion Intake of Algae and the Metal Ion Content of Benthic Algae as Indication of Pollution, 1980–81.*

Another research, *Synthesis of Selected Inorganic Complexes and the Construction of a Gouy Balance, 1980–81.* The preparation of coordination compounds must be a part of the laboratory experience of graduate students. This project attempted to prepare selected inorganic compounds under non-sophisticated laboratory conditions.



The awardees with President Marcos after the ceremonies at Malacanang. From left: Representative of Dr. Rivero, Dr. Halos, NAST President Dr. Campos, Minister Javier, Dr. Paqueo and Dr. Olveda.

**Ponciano  
S.M. Halos**

His various researches in plant pathology -- his study on mango fruit rots helped pave the way for the exportation of blemish-free mangoes. His researches touched off the economic fever in 1982. Dr. Halos' contributions in the scientific field to a large measure have extended help to earn dollar reserve for the country by exporting blemish-free mangoes.

In the actual field application of his various researches in plant pathology -- specially, endomycorrhizas, rhizobia and other projects over a wide scale mean savings on fertilizer, pesticides including energy. Not only that, his researches are also ecologically-sound specially those integrated plant disease and weed control measures he had been observing.

He edited Philippine Phytopathology. It contains invaluable and authoritative information in this field. Many researchers, decision-makers as well as students find it a useful reference in preventing, reducing millions of pesos worth of plant disease losses among our major crops.

With 28 articles in scientific and technological publications, and completing on five more, he has completed about five researches and studies, including another set of five contributions in laboratory manual and books.

Having attended a number of conferences, he is also a member of some eleven prestigious societies and groups. Sigma XI, University of California, Berkeley chapter and the International Society of Plant Pathology, among others.

An assistant professor of Plant Pathology in U.P. Los Baños, from May, 1975 up to the present, he started as instructor in Plant Pathology.

In the administrative chore, he serves as chairman of the three different committees at the Department of Plant Pathology, also at UPLB and likewise a number of other committees.

A SEARCA Professorial Chair holder in Plant Pathology from 1975 up to the present, he was also elected president of the Phi Sigma, Biological Sciences Honor Society, Alpha Chi chapter, in addition to his being a fellow of the International Foundation for Science, the NRCP and other professional groups.

Obtaining his Ph.D. in March 1975 from the University of California, Berkeley, California, USA, earning his M.S. and B.S. (*magna cum laude*) in agriculture -- both from the UPLB.

Born December 2, 1946, Dr. Halos is married to Dr. Saturnina de la Cruz.

**Remigio  
M. Olveda,**

Selected as one of the 1983 Outstanding Young Scientists launched early this year by the Academy, let us glean briefly at the professional background of Dr. Olveda. To his name are researches of Parasitic Diseases as well as the development and establishment of a modern laboratory to investigate the various immunologic aspects of schistosomiasis japonica and other parasitic diseases at the Research Institute for Tropical Medicine in Alabang, Muntinlupa.

A diplomate in Internal Medicine and Gastroenterology, Dr. Olveda likewise is the head of the Department of Parasitic Diseases at the Research Institute for Tropical Medicine, Ministry of Health.

While he obtained the degree of Doctor of Medicine from UERMMC, he finished his bachelor's degree from UST. With twelve published technical papers in different medical journals, he is working on eleven researches for the present: the Effects of schistosomiasis japonica on drug metabolism; Quantification, dynamics and mechanisms of pulmonary inflammatory response around Schistosomula of *Schistosoma japonicum* and *Effects of propanalop on esophageal varices among hepatoslenic schistosomiasis japonica*.

He completed his training in Internal Medicine and Gastroenterology at the Department of Medicine of the UP-PGH Medical Center. After working for two years in the laboratory of Dr. Adeil A.F. Mahmoud, he came up with six publications. When he returned home, he was appointed to head the Department of Parasitic Diseases of the RITM. From here, he was able to develop a modern immunology laboratory to investigate several aspects of schistosomiasis japonica.

As coordinator of the study on the morbidity and control of schistosomiasis japonica with the Division of Geographic Medicine of the Western Reserve University, the first portion of which he has already completed and presented at the annual meeting of the American Society of Tropical Medicine and Hygiene held in Cleveland and will be published in their journal.

Born in Mulanay, Quezon on March 11, 1948, he is married to Teresita Uy.

**Vicente  
B. Paqueo**

He had contributed in the field of demographic and human resource economics: in demographic modelling and socio-economic analysis of fertility, mortality, labor force participation, education and health.

He is executive director of the Council for Asian Manpower Studies, chief consultant of Household and School Matching Surveys of PRODED, EDPITAF.

A member of the Technical Committee of PCHRD, he is also an occasional consultant of the Population Center Foundation since 1976, the Research for Development Academy of the Philippines, 1981 and Population Development Planning and Research Project, NEDA from 1982. The same year, he was appointed San Miguel Corporation's associate professor of Economics, School of Economics, UP, up to the present.

Prior to these positions, he was instructor, 1973-75; an assistant professor, 1975-81, School of Economics, UP. Serving in various capacities, the rest includes:

consultant, Special Committee to Review the Philippine Population Program, 1978; and the World Bank, Washington D.C., 1980-81.

– UN Economics and Social Commission for Asia and Pacific (ESCAP), Family Planning Resource Allocation Project, 1976-77;

– ICP Smithsonian Institutions 1975;

– Population Center Foundation, (1974-75)

– National Economic Council (1971-72)

He was a visiting fellow of the Office of Population Research in Princeton University

(1979-80); a research associate of the Social Indicators Project, DAP (1973-74); a research assistant of the Economic Research Institute, from 1972-74 and many others.

A holder of Ph. D. in Economics, 1977; M.A., 1972 and AB, (*cum laude*), Economics in 1969 -- all from University of the Philippines.

A Population Council Post Doctoral Fellow, 1979-80, he was also a fellow of the UP Economics Development Research in 1981, he received third prize of the Philippine Economics Doctoral Dissertation Award.

He is from Cantilla, Surigao del Sur, where he was born on April 5, 1947 and married to former Nida Cortes, with whom he has two children.

**Dr. Gregorio Y. Zara  
National Scientist  
Remembered**

A brilliant scientist, Dr. Gregorio V. Zara, National Scientist, was also author, administrator and a prolific inventor. He was later proclaimed a National Scientist on July, 1978. He died at the age of 76 on October 15, 1978.

To science, he made several various contributions, including 1) an aircraft engine designed to fly on plain alcohol instead of gasoline; 2) a Philippine-made airplane propeller consisting of local wood material; 3) a picture telephone; 4) general marex x-10, an electronic robot which can talk, walk and obey demands 5) Philippines' first spectroscope; 6) the world's simplest cloud chamber-the drinking glass vapor chamber; 7) solar-sorber, which cooks eggs, soups including your favorite leche flan and 8) a microscope made out of Philippine wood. He thought a good deal on problems of cheap energy production.

Born on March 8, 1902 in Lipa, Batangas, he graduated valedictorian in elementary and high school, was awarded by President Quezon a scholarship at Massachusetts Institute of Technology, where he earned his B.S. in Mechanical Engineering and M.S. in Aeronautical Engineering. He obtained his doctor of science in Physics in 1930 from the University of Paris in Sorbonne, France.

He served the government in various capacities: as junior mechanical engineer of the Bureau of Public Works for two years, as acting chairman of the National Science Development Board (now the National Science and Technology Authority) and, later, as chairman of the National Research Council of the Philippines in 1977, aside from the many executive and teaching positions he held in private universities and enterprises.

**Bringing Back  
Dr. Cecilio F. Lopez**

As one of our foremost academicians in the fields of linguistics, ethnology, and phonetics we remember Dr. Cecilio F. Lopez, who died on September 5, 1979.

He was honorary adviser to the Second Conferences on Asian languages in 1973-74, consultant in Oriental studies and linguistics, UP, and member of the Advisory Committee to the First International Conference on Comparative Austronesian Linguistics in Hawaii.

He became Emeritus Professor of Linguistics and Oriental Studies in 1963. Earlier, he was acting dean, College of Liberal Arts, UP, in 1957, while serving as chairman of the Humanities. While serving as chairman of the Social Science Research Center, he was also Secretary of the Committee on Graduate Studies of UP, and member of the National Council of Education of the Philippines.

He started out as assistant instructor in Zoology, in 1921-23 at the College of Liberal Arts in UP, where he became instructor in French for the next three years. In 1945, he became professor and head of the Department of Oriental Languages.

He wrote a *Handbook in Comparative Austronesian, The Archives of the Philippine Languages and Dialects* and the *Philippine Linguistics Circle*, in 1978, UP. Along with this he wrote, *Literature des iles Philippines*, in the *Encyclopedia de la Plejade Histoire des Literature*, Paris France, Edition, 1977. N.V.M. Gonzales served as co-author in this work. These are among the close to fifty articles and book he had published.

A series of lectures, an exhibit of pictures and artifacts of the cultural minorities were held to honor his 72nd birthday. These were sponsored by the Department of Oriental Languages and Linguistics and the Department of Pilipino and Philippine Literature of the University of the Philippines along with the Linguistics Circle of Diliman and the Ang Katipunan ng Pilipino ng UP.

While the Pambansang Samahan sa Linguistikang Pilipino, Ink. on the occasion of his 75th birthday honored him by monograph titled *Parangal kay Cecilio Lopez*, he was awarded a plaque and gold medal as Outstanding and Distinguished Alumnus for 1970 by the UP Alumni Association.

Dr. Cecilio F. Lopez, Dr. phil. Linguistics, obtained his degree from the University of Hamburg in Germany.

### Book Review

#### Progress in Leaf Protein Study is Topic of New Book

One of the most promising new sources of protein is the leaf, and LEAF PROTEIN CONCENTRATES by Lehel Telek and Horace D. Graham presents the first complete collection of all researches being done worldwide on this topic.

This text represents a critical review of the findings, opinions, and projections of research groups around the world. Divided into four major parts, the many international contributors to this text discuss various plant sources of leaf protein concentrates (LPC), the chemistry and nutrition of LPC, factors and preparation techniques of LPC, and ten chapters describe LPC research worldwide, in tropical as well as temperate countries.

Research into the utilization of the world's most renewable resource grapples with problems arising from the use of leaf proteins for animal feed and for human consumption. The goal for the use of LPC in human food is to combat hunger, protein deficiency, and starvation. Food scientists, biochemists, nutritionists, plant scientists and librarians are among those who will benefit from this exciting and diverse collection of information.

Lehel Telek is the head of tropical leaf protein research at the Tropical Agricultural Research Station in Mayaguez, Puerto Rico. Dr. Horace Graham is professor of Chemistry at the University of Puerto Rico in Mayaguez.

The clothbound text of approximately 950 pages can be purchased from booksellers everywhere or ordered directly from AVI Publishing Company P.O. Box 831 Westport CT 06881 for \$85 in the U.S. and \$93.50 elsewhere.

# Academy News

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