



ACADEMY NEWS

VOL.1 NO. 2



NAST HOLDS First Annual Meeting

The National Academy of Science and Technology held its Annual meeting last May 29th, during which new members to the Academy were elected at the Asian Institute of Tourism in Diliman, Quezon City.

The Academy, composed of competent and outstanding scientists "to serve as a reservoir of scientific and technological manpower for the country," was created in 1978—a year later after the signing of PD 1003-A.

Keynoting the affair was Minister Melecio S. Magno of NSDB and an Academician himself. (See page 2)

Following the Annual Meeting, papers were presented for two days. Climaxing the affair was the investiture of the New Academicians.

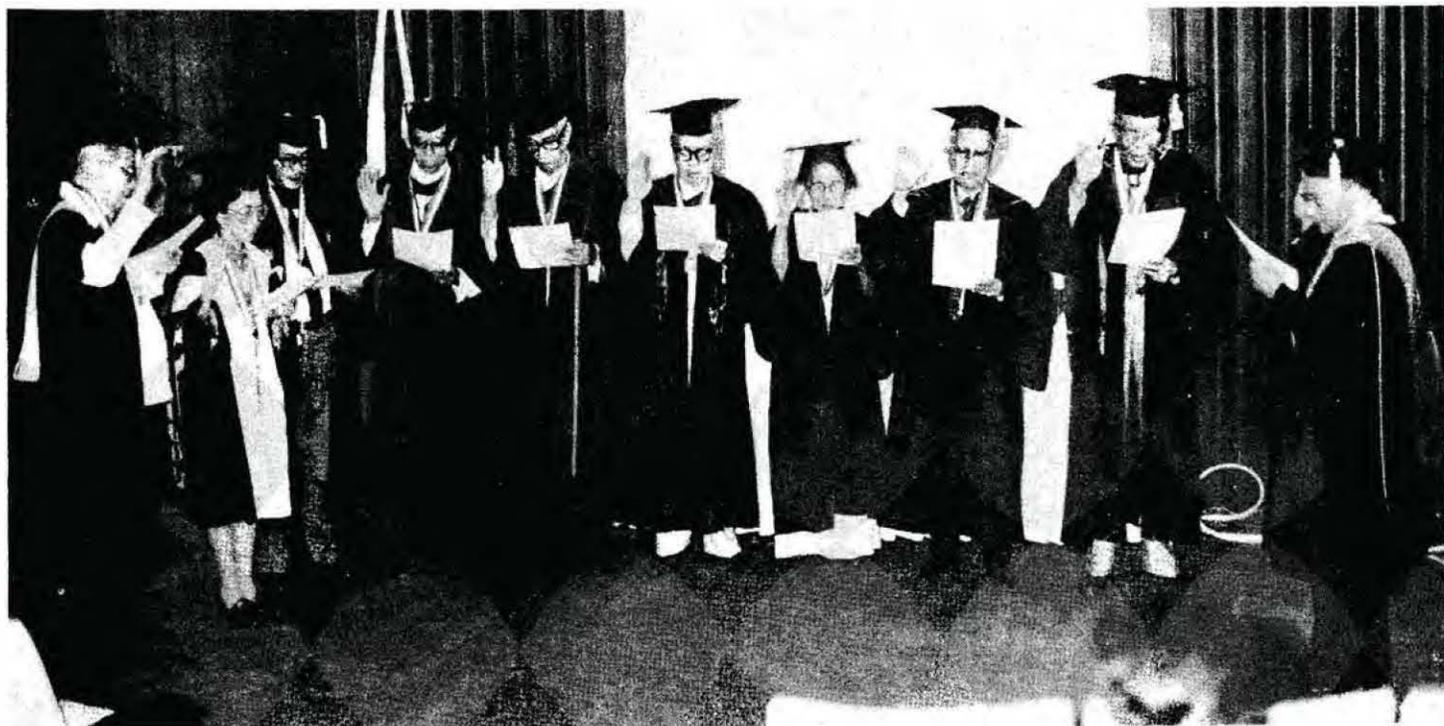
Dr. Paulo Campos, President of the NAST, delivered the following welcome address:

Today our infant Academy holds its first annual meeting. Its creation is a

milestone in the history of science in this country and for that we have to thank our distinguished guest this afternoon, who, as chairman of the NSDB, labored hard for the Presidential Decree establishing the National Academy of Science and Technology.

The idea of an academy of scientists have long been nurtured by our scientists and a few concerned

(Continued on next page)



Investiture of New Academicians

At the right is Science Minister Melecio S. Magno as he leads the oath-taking of the new Academicians at the auditorium of the Asian Institute of Tourism, May '79.

The new members as they take their oath, from left are: Eduardo A. Quisumbing, M.D.; Fe Villanueva del Mundo, M.D.; Jose Encarnacion, Jr., Ph.D.; Bienvenido O. Juliano Ph.D.;

Jose N. Rodriguez, M.D.; Geminiano de Ocampo, M.D.; Encarnacion Alzona, Ph.D.; Raymundo A. Favila, Ph.D. and Francisco Fronda, Ph.D.

The Present-Day Commitment of the Scientists

By Minister Melecio S. Magno

(Keynote address which he imparted to the members of the Academy and guests at the annual meet last May, 1979, AIT, Diliman, Q.C.)

* * *

Let me start by expressing my profound appreciation to the organizers of this annual meeting and presentation of papers and the members of the National Academy of Science and Technology, for giving me this opportunity to be with the most eminent scientist of our country and share with you some thoughts on the state of science today. May I also congratulate all of you, the academicians, especially the "National Scientists", and the newly-elected members of the Academy, for having won long-delayed but well-deserved recognition by virtue of your scientific and/or technological achievements.

Speaking before you I feel in a sense what might have been felt by Sir Charles P. Snow lecturing before a Cambridge audience in the late 1950's. In that lecture, which has since become a well-known book, C.P. Snow pointedly described what he saw as the dangerous splitting into two polar groups of the intellectual life of the whole western society.

It is illuminating to use his own words to describe this cleavage:

"Literary intellectuals at one pole—at the other scientists, and as the most representative, the physical scientists. Between the two a gulf of mutual incomprehension—sometimes (particularly among the young) hostility and dislike, but most of all lack of understanding. They have a curious distorted image of each other. Their attitudes are so different that, even on the level of emotion, they can't find much common ground. Non-scientists tend to think

of scientists as brash and boastful . . . that scientists are shallowly optimistic, unaware of man's condition. On the other hand, the scientists believe that the literary intellectuals are totally lacking in foresight, peculiarly unconcerned with their brother men, in a deep sense anti-intellectual, anxious to restrict both art and thought to the existential moment."

After about twenty years, the gulf separating the literary culture from the scientific has not only widened but deepened. What is more appalling, from the point of view of the science community, is that in many countries of the world, many scientists themselves have developed a mistrust in science—an increasing doubt that science and technology can be the principal means to progress.

ANNUAL MEET . . . (Continued from page 1)

statesmen. In fact some years ago an Academy of Science and the Humanities was formed and its roster included some of the most respected names in science in our country. For lack of material support that academy hardly got off the ground. Most of the men and women who conceived and founded it have since then passed to the great beyond or have retired.

The New Society under our beloved President is fully cognizant of the importance of human resources in national development; and particularly the role science and technology play in progressive societies. He has made it, therefore, a part of his gov't. program to provide not only incentives for scientists and technologists, but likewise to extend to them and their efforts full recognitions and reward. In 1976 therefore he promulgated P.D. No. 1003-A creating this Academy and providing among others a lifetime pension and full national recognition for distinguished men and women of science in our country.

It was not however, till 1977 before the screening committee for the initial membership of the academy was formed. This working group submitted its recommendations in June 1978; and the following month the first 10 members of the academy were named

by the President. The members of the executive committee were appointed shortly after.

The process of organization is a little slow; and much of the initial efforts of this executive committee were precisely organizational.

The function of the Academy has so far been largely ceremonial and advisory. The NSDB though, thru Minister Melecio S. Magno, has suggested that the academy be charged with the evaluation of research programs, and that it should actively participate in the formulation of Science programs for the country.

In this direction, our Academy has quietly addressed itself. It initiated and has since then undertaken a series of round table conferences on specific scientific problems which have bearing on national issues. It is publishing a Newsletter to keep its membership and the Science community aware of its undertakings. It has quietly worked for a more concrete secretarial staff with Minister Magno's encouragement and active support for a more substantial budgetary allocation for its programs.

Ladies and Gentlemen, the National Academy of Science and Technology welcomes you to this series of scientific papers to be shared with you by some of our most distinguished scientists here and abroad.

Thus, science has come under attack by both non-scientists and scientists. The biologist and science writer Adriano Buzzati-Traverso summarizes the criticisms that have been raised against science:¹

(1) *Science is not evil but is too limited*: Many problems of the world and of men escape scientific analysis. . . .

(2) *The analytical approach of science (reductionism) leads to a distorted sense of reality* . . . this approach cannot be used effectively when dealing with complex objects such as living things because the whole is more than the sum of its parts ; . . .

(3) *Science is not objective* . . . Science, it is claimed, is not objective because it does not progress "scientifically." Ideas come first and data are then used to support the hypothesis . . . As the progression Kepler-Newton-Einstein shows, widely different versions of the truth are all allowable. Moreover, the nature of reality as revealed by science is questioned. What particle physicists now have to say about the nature of matter is clearly a long way from "real" reality. They can talk only about mathematical abstractions formulated by an extreme form of reductionism . . . Science does not reveal the "truth" because it sees only what its techniques allow it to see. But what it does see is as valid as the nature of the truth revealed by other techniques of disciplined inquiry. Whether it is more valid is debatable.

(4) *Science has become an ideology of its own-Scientism*. While recognizing that science is not merely ideology, it is considered to be ideology as well . . .

(5) *Science cannot claim to be at the same time a dispassionate search for truth and serve as a paradigm of human values*. — It is claimed that scientists are often at fault confusing the two motives for

Science Minister Magno keynoting the first Annual Meet of the NAST.



their work. To satisfy their personal interest, they may claim it is in the cause of society when it is not or when its implications may in fact be malevolent. Similarly, they often try to justify their applied work on the ground that the search for new knowledge must go on. The conflict between detachment and values appears particularly clear in the social sciences. Is a dispassionate social science possible at all?

(6) *A distinction between science and technology is hardly feasible* . . . The general law that whatever is possible is in fact applied means that scientific activity almost inevitably leads to technology. The distinction often heard in scientific circles that science is pure and clear of sin, while technology is the culprit, finds no support in today's world. Both science and technology are a part of the fabric of modern society and it would be artificial to draw a line between the two: both represent a continuum—and indeed many scientific advances have become possible thanks to technological progress . . .

(7) *All large-scale application of technology involve some internal contradiction* . . .

(8) *Science is directly responsible for the majority of the unapproachable problems of modern society and also for the rate at which they worsen*:

(9) *Science is not neutral*. If points 5 to 7 are accepted, then science cannot be neutral, and the scientist is responsible for what happens for the use of his discoveries . . .

(10) *Science control people* . . .

(11) *Science has not helped solved the problems of the developing countries*. Too often the forms of science and technology used in international aid have carried with them Western values and attitudes, totally disrupting the societies and cultures they have met, without replacing them with any viable alternative."

I would like to consider a few of these criticisms.

Regarding the assertion that science is not evil as such but is of rather limited applicability, I believe we cannot disagree with it. In fact, within science itself this limitation exists: The experimental method developed in the physical or biological sciences cannot be applied in the social sciences. As the French anthropologist Claude Levi-Strauss expressed it:²

1/ A. Buzzati-Traverso, *The Scientific Enterprise*, Today and Tomorrow, UNESCO 1977

2/ C. Levi-Strauss "Science, forever incomplete", *John Hopkins Magazine*, July, 1978

The Academy Conducts Round Table Conference on Nuclear Issue

To make recommendations on policy formulations on current issues and revitalize areas believed to be weak at present, on some points, such as Mathematics, Physics, and Chemistry, a Roundtable Conference was conducted by members of the National Academy on Science and Technology. That one on nuclear plant construction was held at the NSDB chairman's office, NIST building in Herran, Manila last July 17, 1979. Experts were invited including the then NSDB Chairman Gen. Florencio Medina.

A free-wheeling session, they went through strictly following guidelines the members they themselves have drawn, that is confine the discussion on the scientific and technological considerations. Getting around the nuclear issue, political as well as the economic aspects of its plant and construction were not touched during the length of the session.

After Gen. Medina read his paper, the deliberation boiled down: the advantages and disadvantages of nuclear energy as a source of power for the Philippines. Working within this framework, they dealt on the sources of raw materials for nuclear energy, the present technical capability as well as its environmental soundness.

We are reprinting here below the paper of Gen. Medina:

RISK AND THE ATOM

Since there's some risk in all we do; We must accept a bit of woe.

**The risk in fact can be— Real
Or it can be just— Imagined
It can still be very— Soft
And yet it can be— Killing.**

**Is nuclear power— Reliable
And its hazards just— Imagined?
Can the atom be our— Slave,
Or is it our tyrant— King?**

**Do we simply want a — Reactor?
Is it a must that we have— It?
Is Bataan the only— Site
Where quakes can't make the
atom — Kill?**

**The atom can be our slave; Let's have
it; but, we must be brave.**

The First Philippine Nuclear Power Plant (PNPP-1)

Background Information

The two atomic explosions that leveled Hiroshima and Nagasaki, Japan, in August 1945 were announcements to the world that the United States of America was holding the key to a wealth of classified information on atomic energy and nuclear science. They also abruptly terminated the Second World War; there was peace, although as of now we have been having an uneasy peace.

The explosions also proved that tremendous amounts of energy, imprisoned in the atom that could be packed in a 20-kiloton atomic bomb. One bomb, one city! Today nuclear bombs are in the order of megatons. Atomic energy was thus used first for destruction just as iron was first used as a spear. Later, however, iron was used as a ploughshare. Why can't atomic energy, buried deep in the heat of the atom, be released, controlled and used to benefit mankind?

It was humanitarian on the part of the United States of America to share her classified information on nuclear science with the rest of the world. In 1955 President Dwight D. Eisenhower announced the declassification of most of America's nuclear information. The USA started an Atoms for Peace program and invited engineers and scientists from West Europe, Africa, Latin America, Australia, Canada, Asia and the Far East to participate in that program. Oak Ridge National

Laboratory (ORNL) in Oak Ridge, Tenn offered courses in radioisotopes techniques and Argonne National Laboratory (ANL) in Lemont, Illinois conducted courses in nuclear science and engineering. Later several universities joined the bandwagon in the promotion of the peaceful uses of the atom. Among these were the University of Tennessee, the University of Chicago, the Pennsylvania State University, and the North Carolina State University.

Simultaneously the United States also sponsored the creation in the United Nations family of organizations an agency for the promotion of the peaceful uses of atomic energy. The International Atomic Energy Agency was established in Vienna, Austria. Among its many functions and responsibilities, the IAEA provides technical assistance in terms of fellowships, expert services, research funds and equipment in the various fields of atomic energy and nuclear science to developing member states; maintains an International Nuclear Information Service (INIS); and regulates/monitors the production of nuclear fuels in nuclear reactors to prevent the proliferation of nuclear materials for purposes other than their peaceful uses.

Since 1955 the Philippines has been sending scientists and engineers to the United States to participate in the Atoms for Peace program in order to lift the level of scientific and technological know-how in the country. She organized the Philippine Atomic Energy Commission in 1958 and accepted a financial assistance from the United States to build the First Philippine Research Reactor (PRR-1) in Diliman, Q.C. Atomic research is now being undertaken by Filipino scientists and engineers who had been trained under the training programs of the USAID, UNDP, the Colombo Plan, and the IAEA, besides our country-to-country bilateral

training arrangements with Israel, India, Japan, Germany, and others. Now, there are 93 Filipinos trained in the various fields of atomic energy and nuclear science, including 10 who have earned their Ph D's in the United States, India, Austria, Spain, and others. Out of these, nine are now in the National Power Corporation. Certainly, we cannot but admit that training in nuclear science and atomic energy has raised the scientific and technological level of the Filipino.

When the PRR-1 was contracted with the General Electric Co., the contract was not of the turnkey type. We sent an architect and some engineers to the United States to actively participate in the design of the facility and receive training in reactor operation and maintenance both in San Jose, California and in Oak Ridge, Tenn. They also visited research reactors, operating and under construction, in the United States, Taiwan, and Spain. The construction of the PRR-1 in Diliman was done by Filipinos under the supervision of Filipinos and two Americans from the General Electric Co. The start-up and initial operation were done by trained Filipinos assisted by one American from the General Electric Co. and one from the University of Virginia under our Sister Laboratory arrangement. This was actual transfer of technology. At the same time we knew what equipment or parts of equipment went under the concrete.

Nuclear Power in the Philippines

As early as 1961, the Philippines, in a UN Special Fund project assisted by the UNDP through the IAEA, conducted a Study on Power including Nuclear Power on the Island of Luzon. The Report on this study was presented to the President of the Philippines personally by the Director General of the IAEA himself in 1967. It carried a recommendation for the Philippines to put up a nuclear power plant in the order of about 350 MWe to be connected to the Luzon grid. IAEA siting missions came to the Philippines and conducted surveys and studies of

potential sites for the nuclear power plant. Nuclear power reactor suppliers were contacted, but the recommendation in 1967 to put up a nuclear power plant was not implemented due to lack of financial capability.

Without giving up hope to go nuclear, however, the Philippines continued to assess and review the studies. It was even published in a local daily that the Philippines has a program of constructing ten nuclear power plants. In connection with the review of the 1967 study, the PAEC requested the IAEA twice for safety missions, which the IAEA sent as part of its technical assistance program for the Philippines. The first safety mission came in 1977; the second, in March 1978. It was the second safety mission that looked specifically at the geological/seismological aspects of the site in Napot Point, Morong, Bataan.

Convinced that nuclear power is the cheapest and most suitable power source for the country's urgent development projects, the National Power Corporation (NPC) entered into a contract with Westinghouse Electric Corporation for the latter to supply to the Philippines a safe and reliable plant on a turnkey basis. Design, construction, subcontracting, start-up, initial operation, bringing the reactor to power, and training of Filipinos in the various phases of reactor operation, servicing and maintenance would be responsibilities of the Westinghouse.

The National Power Corp. would be fully responsible for the complete safety and adequacy of the station, of quality assurance, and its operation. Reliance on the regulations, code and standards of the Philippines and of the United States is made systematically throughout the project, including design, procurement, construction, quality assurance, test, start-up and operation of the plant. Also, National Power Corp. will implement during construction, start-up and operation the guidelines and recommendations of IAEA and the Republic of the Philippines for the application of safeguards.

The Philippine Nuclear Power Plant No. 1 (PNPP-1) is planned to be in commercial operation in 1983. It is similar in its design concept to the Nuclear Power Plant (NPP) in Krsko, Yugoslavia, designed also by Westinghouse Electric Corp. on a turnkey basis and has been under construction since 1974. It is said also the PNPP-1 is similar in design to the nuclear power reactors under construction in Korea, Egypt, Brazil, and Puerto Rico. There is information that construction of this last-named nuclear power plant in Puerto Rico was terminated in 1972 because of seismologic problems on the site.

The PNPP-1 is a pressurized water reactors with two coolant loops. The Nuclear Steam Supply System (NSSS) and initial cores with 16 by 16 fuel assemblies are designed, fabricated and supplied by Westinghouse together with the turbine generators. The containment consists of a free standing cylindrical steel shell enclosed by a separate reinforced concrete reactor building designed by Burns and Roe, Inc.

The reactor is designed to operate at core power level 615 MWe. This is to be connected to the Luzon grid by 4 power lines:

2 of them (345 Kv) toward Sapang Palay, Bulacan; and
2 others (230Kv) toward Prado, Pampanga.

For start-up and emergency operations, the plant can be connected to either the 230 Kv grid or to the 345 Kv grid; power can also be supplied during emergency by the diesel driven generators.

The Plant

The plant is designed to withstand loading conditions, including loss of coolant accident, earthquakes, typhoons, pipe ruptures, missiles. The circulating water structures (intake and discharge) are in the China Sea including a sea water facility which pumps supply water to the HVAC chillers and cooling heat exchangers. The plant consists of six major structures:

(To be continued)

"The great superiority of the physical or biological sciences inheres in the fact that any hypothesis set forth anywhere in the world can be immediately subject to an experiment, or to numerous experiments, which can verify or refute the hypothesis. Obviously, for moral and practical reasons, we cannot experiment with human societies, and even if we had the power to do so, it would take too much time."

On the claim that science, after all, is not objective, I think we have to clarify what we mean by the term "objectivity of science." By this, we do not mean "that there exists one and only one reality, the nature of which can be discovered uniquely through scientific procedures."³ "reality" has many facets and there are different ways of approaching it. But, quoting Buzzati-Traverso again, "the kind of reality that science reveals has one peculiar trait: it is the same and equally valid for any person that takes the trouble to go through the process of acquiring knowledge in that particular way."⁴ In other words, science is interpersonal knowledge and it is this quality that its objectivity consists of. It was also pointed out by the physicist, Prof. John Ziman⁵ that "science is not merely published knowledge or information. Anyone may make an observation, or conceive an hypothesis, and, if he has the financial means, get it printed and distributed for other persons to read. Scientific knowledge is more than this. Its facts and theories must survive a period of critical study and testing by other competent and disinterested individuals, and must have been found so persuasive that they are almost universally accepted. The objective of science is not just to acquire information nor to utter all non-contradictory notions; its goal is

consensus of rational opinion over the widest possible field."

On objectivity, Ziman says: "Objectivity and logical rationality, the supreme characteristics of the Scientific Attitude, are meaningless for the isolated individual: they imply a strong social context, and the sharing of experience and opinion . . . The rationale of the "scientific attitude" is not that there is a set of angelic qualities of mind possessed by individual scientists that guarantees the validity of their every thought-as if they were, so to speak, well tuned computing machines whose logical circuits precluded them from error-but that scientists learn to communicate with one another in such terms as to further the sensible end to which they are all striving and eventually train themselves to construct their own internal dialogue in the same language. A private psychological censor takes over from the public policeman or parent and conforms out behavior to social norms. But he does not keep whispering into our ear, "Be honest, be truthful, be objective," in a chorus of pious aspirations; he says, "Have you checked for instrumental errors? Is that series convergent? What is the present status of that old bit of theory? and so on".

On the charge that scientific research is reductionistic in approach, it may be argued that reductionism or its opposite-wholism-is not an article of faith but merely a procedure through which we may reach interpersonal knowledge. It is not correct to say that the analytical approach is inadequate to explain complex systems, since such an approach is the only one that leads to the advancement of scientific knowledge, as has been shown in the history of science. As Buzzati Traverso says: "If it appears that the properties of a complex system are "more" than the sum of the properties of its parts we have a clear indication that we do

In line with the government's concern for countryside development, the Executive Council of NAST approved during its meeting held recently, put into resolution the need for efficient transfer of relevant technology to rural communities.

Considering the impact of science, particularly biological education and research in rural areas, the Council recognizes that although institutions of higher learning have been productive in pure and applied research in this aspect, there is somehow a lack of dissemination system of public information for science and technology that are beneficial to people

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not know enough about the system to identify what that "more. consist of."⁶

On the matter of complexity of the things that are the subject matter of the social sciences, Levi-Strauss suggests that social scientists, instead of looking at the things themselves, should look at the relations prevailing between them, for "these relations are altogether more simple and less numerous than the things themselves, and that they can give . . . a firmer basis for investigation."⁷

Finally, may I say just a few words on the question of science and ethics. Although it has been claimed that there are ethical principles inherent in scientific practice, and that the ethics of science can and must become the ethics of humanity⁸, there is no general agreement on this assertion. It is generally agreed, however, that scientists must work with philosophers, writers, humanists, the religious and laymen in the formulation of a new ethical system for humankind, for the alternative could well be the collapse of our civilization itself.

I invite the members of the Academy to participate in this very important as well as very urgent task.

Again, congratulations!

^{3/} A. Buzzati-Traverso, op. cit.

^{4/} A. Bussati-Traverso, op. cit.

^{5/} J. Ziman, *Public Knowledge, The Social Dimensions of Science*, 1968. Cambridge U. Press.

^{6/} A. Buzzati-Traverso, op. cit.

^{7/} C. Levi-Strauss, op. cit.

^{8/} A. Rapoport, "Scientific Approach to Ethics", *Science* Vol. 125, 1957, pp. 796-9

The New Academicians —

(The bio-sketch of all the New Academicians starts with this issue and we are featuring them alphabetically — ED.)

TEODORO A. AGONCILLO Litt. D. (Hon.)

Professor Teodoro A. Agoncillo was born on Nov. 9, 1912 in Lemery, Batangas. He finished his Ph. B. in 1934 and M. A. in 1935 at the University of the Philippines. In 1969, he was conferred by Central Philippine University a Litt. D. *honoris causa*, for achievements in history and literature.

Prof. Agoncillo was connected with the University of the Philippines as Professor of History from 1958 to 1976. He was Chairman of the Department of History in 1963-69.

Outside of the State University, he had served as commissioner, National Historical Commission; member, Manila Bonifacio Memorial Commission, and consultant, National Library. He was past editor of three literary magazines namely: *Metropolitan*, 1935, *The Philippines*, 1936-37 and *Malaya*, 1937-41; He was chief, Research and Translation Division, 1948-51 and Linguistic assistant, 1951-54 at the Institute of National Language. He was also instructor of Tagalog Language and Literature at FEU, 1948-54 and MLQ U in 1952-54.

Prof. Agoncillo has to his credit, 20 titles of published books on historical researches. Among them are: the *Revolt of the Masses* (awarded first prize in the Republic's contest on Bonifacio); *Philippine History* (which was adopted as official textbook in the Philippine History for public high schools); and *One World, Old and New*, (adopted as textbook in Social Science); *Malolos, the Crisis of the Republic*; *The Fateful Years, Japan's Adventure in the Philippines, 1941-45*; *The Philippines, A Handbook of Information*; *Magandang Pananagalog*; and *Kasaysayan ng Pilipinas*.

A linguist, he writes in both English and Pilipino. His published articles are so numerous covering a period of more than forty years. Prof. Isagani Medina of UP has prepared in 1977 a bibliography in pamphlet form of Agoncillo's work in English and in Pilipino.

ENCARNACION ALZONA, Ph. D.

Dr. Encarnacion Alzona was born on March 25, 1895 in Biñan Laguna. She finished her B. S. degree at the University of the Philippines. She obtained her M.A. at Radcliffe College, an A.M. at Harvard University and Ph.D. at Columbia University. Her field of specialization is Philippine History.

Dr. Alzona's professional experience included among others as: Regent of the University of the Philippines, 1959-66; Chairman, National Historical Commission, 1966-1967; Professor Emeritus, UP, 1963; professor of History, UP, 1938-45; Executive Officer & Member, National Commission on Educational Scientific and Cultural Matters, 1947-50; and Member, Board of Textbooks, 1945-51.

Most significant of her researches are her studies in the history of education in the Philippines which she compiled and published in book form in 1932. She has to her credit several publications which mostly on important people and events in Philippine history. She had also translated several works of our national heroes from Spanish to English.

She has been recipient of several awards, such as the Rizal Pro Patria Medal given by the Philippine Government in 1971; LI D *honoris causa*, given by PWU in 1971; Apolinario Mabini Centennial Award given by the National Heroes Commission in 1964; Distinguished Alumnus Award given by Columbia University Alumni Association of the Philippines and Republic Cultural Heritage Award for Historical Writing in 1966.

Prof. Agoncillo has been recipient of 36 awards such as the Republic Cultural Heritage Award (1967); Araw ng Maynila Award (1969); First Commonwealth Literary Contests in History, 1940; Palanca First Prize for Short Story (1940); diploma of merit by the National Defense College for his lectures on Filipino nationalism, (1966); and Professional Award for Achievement in Letter and History, 1975, and many others.

JOSE ENCARNACION, Jr., Ph.D.

Dr. Jose Encarnacion, Jr. was born on November 1, 1928 in Manila. He obtained his Ph. B. and M. A. (Philosophy) at the University of the Philippines and A. M. and Ph.D. (Economics) at Princeton University.

Dr. Encarnacion is at present Professor (since 1960) and Dean (since 1974) at the School of Economics, University of the Philippines. He is also Executive Director, Philippine Center for Economic Development, 1975-; Chairman, Council for Asia Manpower Studies, 1974-; Chairman, Economic Research Associates, 1975-; Member, International Review Group of Social Research on Population and Development, 1976-; Member of Advisory Board, Population and Development, 1976-; Member of Advisory Board, Population and Development Review, 1977-; and Member, Committee for Development Planning, Economic and Social Council, United Nations, 1978-;

He has been recipient of the University of the Philippines Distinguished Scholar Award, 1968; Philippine Ten Outstanding Young Men Award, 1963; Honor Society of Phi Kappa Phi, 1955; Fullbright, 1956) and Rockefeller Foundation, (1965-66 grantee.)

Dr. Encarnacion has participated in 33 meetings abroad, some which he had papers/studies presented. He has published 42 articles, most important of which are on researches on Lexicographic utility. Among them are: *A Note on Lexicographic Preference*, 1964; *Optimum Saving and the Social Choice Function*, 1964; *On Decision Under Uncertainty*, 1965; *On Independence Postulates Concerning Choice*, 1966; *Groups Decisions Involving*, 1972; *Some Implications of Lexicographic Utility in Development Planning*; 1970; and *Specification of Social Functions*, 1976.

He is married to the former Patricia Jean Kearney and has four children: Paul, John, Mark and Riza.

Why the Change?

In May, 1979 the first issue of the NAST Newsletter in a 6" x 9" format came out, that was shortly before the Annual Meeting of the NAST at the Asian Institute of Tourism in Diliman. It did carry news about the Academy, its activities as well as its future plans and features on our three National Scientists.

We have 21 Academicians at present. Come March, next year, probably another 10 new members will be chosen. The decree creating the NAST though provides for only 50 members, at the most.

Because we feel we cannot move freely in a 6" x 9" format, so we thought of giving it the 8 1/2" x 11" treatment. Why not "Academy News" inasmuch as they fit in heads just as a NAST Newsletter would? It is one thing to resort to something previously started as the best of a bad situation, but it seems there is no point in trying to cramp everything in that size.

But just as previously planned, the Academy News will be coming every quarter. We will go along and hold out where the first issue of the NAST Newsletter stopped and carry on and come to keep you posted on the activities and aspirations of the Academy.

Technology for the Rural . . .

(Continued fr. p. 6)

particularly in economically deprived areas. A number of government and private science institutions have accumulated a considerable wealth of studies which when translated for public consumption could greatly improve the peoples' lives for self-reliance.

The Council through the Minister of Science, NSDB, has urged broadcast media authorities on television and radio stations to allocate two hours daily of prime time staggered through the day and early evening for education in science and technology using local materials and results of relevant researches. The specific details of the program are to be determined by the Minister of Science utilizing resources of various units of government, institutions of higher learning as well as the private sector.

Cecilio F. Lopez, Dr. phil, Dies at 81

Cited "Father of Philippine Linguistics by the Pambansang Samahan sa Linguistikang Pilipino, Ink. on August 30, 1970. Dr. Cecilio Francisco Lopez died Wednesday (September 5, 1979) in his residence and interred after four days. Doctors attributed his death to a stroke. He was one of the first 10 members of the Academy, appointed by President Ferdinand E. Marcos himself.

Until his death he was a member of the International Editorial Advisory Committee on the Thorndike-Barnhart Dictionaries. And simultaneously occupying a seat in the Editorial Board of the Journal Oceanic Linguistics of

the University of Hawaii.

In January 9-30, 1970, he was honored on the occasion of his 72nd birthday by a series of lectures and an exhibit of pictures and articles of the cultural minorities of the Philippines sponsored by the Department Oriental Languages and Linguistics and the Department of Pilipino and Philippine Literature of the UP, the Linguistics Circle of Diliman, and the Ang Katipunang Pilipino of U.P. Diliman, Quezon City. The same year, the U.P. Alumni Association awarded him a plaque and gold medal as Outstanding and Distinguished Alumnus.

Dr. C. Velasquez Attends Pacific Science Congress as Member Scientist

The XIVth Pacific Congress was held in Khabarovski, Russia from August 19 to September 2, 1979.

The Pacific Science Congress convenes every five years where participating countries come with common interest. While it

advocates advances in science, it hopes to keep its natural resources safe and not to divest the Pacific Ocean from its environmental values.

It was found out that marine fishes caught in the Pacific Ocean are contaminated. This was traced to pollution activities in the country as well as outside sources like the United States.

On invitation of the Russian government, our very own Dr. Carmen C. Velasquez, a member of the Executive Council of the NAST attended this congress. A member scientist, she was invited to act as a convener of the Inter-Committee Symposium on "Natural Resources of Oceanic Islands: fresh and sea water."

A well-known parasitologist, Dr. Velasquez presented her papers on the "Effects of changing ecology on some invertebrates of Puerto Galera Bay and its vicinity: Mindoro Island, Philippines" and "Contributions to the ecology of some parasitic helminths of Philippine fishes."

Advanced researches on inland water were unfolded by delegates from Russia, Japan and the United States.



Dr. Velasquez is shown while presiding over symposium on Biological Productivity of the XIV Pacific Science Congress, Khavarovski, Russia. With her is a Russian lady interpreter.

