

primary consideration with respect to studying the particular action, other research methods might be quite as crucial, particularly in the initial and planning phases.

Emphasis was placed upon the "full-scale" experimental design as the most valuable wherever feasible. This included the use of experimental and control groups in both "before" and "after" surveys. The importance of obtaining experimental and control groups that were nearly homogeneous on initial characteristics was stressed.

Attention was directed primarily to the situation at the outset of an action program. In consequence, the discussion was focused on the pilot study phase of the program. It should be added here, that pilot studies very often are limited in their applicability to other segments of a national population, as they are limited in application to other countries. The experimental characteristic of a given action program remains through the period of initial implementation at a nationwide level. In consequence, just as one may expect to profit from an organic or growth perspective with respect to action, the same perspective applies to the research side. One should aim eventually at a nationwide experimental design in which the cumulative experience and information of

pilot studies would be of primary importance.

Finally, some consideration was given to the now well-known, but not thoroughly studied, problems of the impact of research operations on the action results and the research findings. It was noted that such interaction, while it should be made as explicit as possible, is not necessarily harmful from the point of view of the action program. For instance, while the primary aim of an initial survey is not to educate the recipient population, it may well have this salutary effect. It would be worthwhile documenting this effect, if any, which could be done through the use of an additional control group surveyed only "after" the action program has ended or been well advanced.

Action programs provide the greatest opportunity for the social scientist to contribute to major practical problems of our day, while enjoying a close to ideal experimental conditions as can be hoped for. Moreover, such research promises important rewards for the advancement of the social sciences to mature status. Under these conditions, it is not unreasonable to expect that the social scientist would not only offer his services but would actively engage in selling their importance to administrators and policy-makers.

## The Filipino Mental Make-up and Science

JOSEFINA D. CONSTANTINO

*Development Bank of the Philippines*

The problem of the Filipino mental make-up and science suggests itself in any consideration of such broad subjects as progress and industrialization, or in

a narrower and more specific subject as man-power development and economic growth. The term "mental make-up" suggests several elements of the Filipino sensibility or the thinking behavior of the average Filipino. The phrase may

\* Paper read before the Thursday Seminar, IIRI, College, Los Baños, June 3, 1965.

well cover: typically Filipino ideas or views on many issues, Filipino attitudes, Filipino values, typical Filipino reactions and approaches, Filipino speculative and imaginative sensibility, and summarizingly, the cut of mind, so to speak, of a typical or average Filipino. The word "intellectual" is not more appropriate than "mental make-up." "Intellectual narrowly suggests reasoning and conceptual operation; whereas the latter, "mental make-up," while also having reasoning as one of its elements, covers a wider range of operations and therefore is also necessarily less specialized. "Mental" derives from "mind and yet is not narrowly so; since mental attitudes, for example, already partake of the operation also of the will, the volitional faculty as usually contradistinguished from the cognitive or knowing faculty.

How does one get to shape or draw up an understanding of the Filipino mental make-up? Principally the main source of such a qualitative phenomenon is the corpus of ideas and views on, or a philosophy covering, several areas of reality: life itself, man, human nature, society, the nature of change; ideas of good and

evil, right and wrong, beauty and ugliness, pain and pleasure; ideas on growth, progress, liberty, freedom, duty, etc. Aside from *ideas*, the other shaping forces of the Filipino mental make-up are his attitudes, again, towards such ideas: matters akin to the ones already mentioned. These are attitudes, because while they presuppose opinion or views, they also connote predispositions or inclinations which are tendencies of the will, but rationalized. Similarly, approaches and reactions to things, events and persons form part of a person's make-up. On the whole, the Filipino mental make-up can loosely be summed up as the Filipino's thinking behavior: *the totality of his sense and sensibility.*

This phrase now defined, let me cite some manifestations of such qualitative attributes or sources of such information. To isolate the typical Filipino mental make-up exemplified thru the years, it is logical to suppose that the Filipino maxims and proverbs, sometimes called the heritage of the race, will yield insights on this issue. Examples of these are:

- |                                    |   |
|------------------------------------|---|
| All on<br>human<br>dignity         | <ol style="list-style-type: none"> <li>1. Madali ang maging tao<br/>Mahirap ang magpakatao</li> <li>2. Bahay may palasyo<br/>Kung ang nakatira ay kwago<br/>Buti pa ang kubo<br/>Kung ang nakatira ng tao</li> <li>3. Sa taong may hiya<br/>Ang salita'y panunumpa</li> </ol> |
| On<br>industry                     | <ol style="list-style-type: none"> <li>4. Daig ng maagap ang masipag<br/>Ang kasipagan ay kapatid ng kayamanan</li> <li>5. Ang panahon ay ginto</li> </ol>  |
| On one's<br>predestined<br>fortune | <ol style="list-style-type: none"> <li>6. Ang buhay ng tao'y gulong ang kabagay<br/>Kung minsang mapailalim<br/>Kung minsang maipababaw</li> <li>7. Ang kapalaran ko di ko man hanapin<br/>Lalapit dudulog kung talagang akin</li> </ol>                                      |
| The tragedy<br>of life             | <ol style="list-style-type: none"> <li>8. Walang ligaya sa lupa<br/>Na di dinilig ng luha</li> </ol>  |

Likewise, the sense and sensibility made manifest in the country's spoken and written literature: its epics, ballads, stories, novels, essays, plays, etc., will also afford insights.

Another rich source, of course, would be statements from its more vocal spokesmen: be they scholars, artists or leaders. Another source would be the public consensus expressed in all mass media communication: press, radio, T.V., books. The overt translation of beliefs and views into actual behavior and practices, or even values becoming institutionalized: all these are sources of a possible qualitative assessment of the Filipino mental make-up. To utilize all these sources however is to write volumes on the matter. Understandably I have only been able to utilize a few of these sources for this paper.

"Science" in this topic "The Filipino Mental Make-up and Science" is given its broadest meaning. The meaning is not made to cover what we may term the primitive sense of science, which is "organized thought" and common-sensical reasoning. It does include however the more ordinary meaning: the use of logical reasoning operating within the usual two levels: sense observations and conceptual structures or general principles. In a limited sense it also encompasses the narrower definition of science as the experimental and demonstrable method exemplifying processes of discovering and articulating laws which are *verifiable*; and the processes, involved in the articulation of which, are *repeatable*. Along with all these, "science," in this sense, also covers the discipline and rigour of the scientific method and the total complex of approaches, attitudes and viewpoints dabbed as scientific or recognizable as scientific qualities and effects. In its most contemporary and generically humanistic sense, science has even been termed as a type of culture, specifically as one of C.P. Snow's "Two Cultures."

The key terms defined, the problem must now be re-stated. The problem, for manageable discussion, right may be re-phrased in any or all of these three ways:

1. How does science affect the thinking of the ordinary Filipino?
2. To what extent has science affected the thinking of the typical Filipino?
3. Or how does the average Filipino demonstrate the effect of science in his thinking behavior?

And this leads on to the final problem: Who is the average Filipino? For this problem to have any relevance at all to people for whom it can be expected to have relevance, let us conveniently have the adult Filipino, either college graduate or high school graduate (and therefore has been introduced to science) and who is able to have a job, think with some discernment on national issues, and involved, even in some marginal way, in the ongoing national life of the people.

The Filipino's mental make-up is revealed in many ways. It has often been mentioned that the Filipino is still superstitious, highly emotional, personalistic, sensitive, timid in thought, unreflecting, disinclined to think, unable to sustain interest in ideas apart from personalities, disinclined to deliberate and meditate, and on the whole cannot think big. The more loaded adjectives often used to describe his thinking behavior is that he is petty, trivial, repetitive and longwinded in talk. This general description of his expressive behavior points to one aspect of the average Filipino's mental make-up. It is his *disinterest in and inability to handle ideas profitably*. Briefly, the average Filipino does not enjoy thinking. Why is this so?

Prescinding for the moment from all legitimate pedagogical causes, I should like to single out a non-pedagogical consideration. Is there anything in the psy-

chological make-up of the Filipino that makes him disinterested in ideas or in intellectual preoccupations?

Perhaps we can say that it is often admitted that Filipinos display typically Asian or Oriental psychological traits that bear upon this issue. Culled from the Oriental's differing modes of reverential worship—whether of their ancestors, spirits, worship—whether of their ancestors, spirits, sacred animals, reincarnated divinities, or a semi-pagan and superstitious folksy kind of Christianity—it can be said that the typical Oriental mind is a deifying or worshipping mind. While the average, therefore, Christian, Filipino has the faith and an understanding of Christ as God, nevertheless very much of superstition and semi-pagan practices have been absorbed into his kind of folksy Christianity. The Filipino loves a sense of Oriental mysticism: a kind of exotic, secret darkness conducive to a sense of mystery. But a whole enveloping sense of the supernatural needs a continuing intellectualization in order to render the vagueness of Oriental faith more coherently luminous and intellectualized. In general, therefore, one can say that the Oriental deification of natural forces prevents their analytical and objective study of forces apart from their faith.

Another point: It has also been asserted that the Filipino or Oriental sensibility is essentially *integrative*: that it finds itself always as part of another. Therefore it has a weak sense of singularity and integrity. It sees itself constantly as part of the cosmos or part of nature. For example, Oriental paintings often reveal nature scenes—grandiose and enveloping while a person, lodged inconspicuously in a corner, views the vastness. Nature and person however are made integrally one, harmoniously one with his natural surroundings.

Professor F.S.C. Northrop, famed scholar of East-West Values, has this to say in his book *The Meeting of East and West*.

The Oriental portion of the world has concentrated its attention upon the nature of all things in their emotional and aesthetic, purely empirical and positivistic immediacy. It has tended to take as the sum total of the nature of things that *totality of immediately apprehended fact* which in this text has been termed the differentiated *aesthetic continuum*. Whereas the traditional West began with this continuum and still returns to local portions of it to confirm its syntactically formulated, postulationally prescribed theories of structures and objects, of which the items of the complex aesthetic continuum are mere correlates or signs, the East tends to concentrate its attention upon this differentiated aesthetic continuum in and for itself for its own sake. (Italics mine)

The weak sense of singularity and uniqueness true to the Filipino or Oriental sensibility is due to his weak sense of *the other*; hence a weak sense of identity, of itselfness, of himselfness as self, apart from the other. This weak sense of *the other* explains the Filipino's weak sense of objectivity so crucially important in science. This is also why we say the Filipino is often subjective. The extended implication of this in the social sciences can partly be used to explain, likewise, the lack of a vibrant sense not only of human solidarity but even much more immediate of a civic-spiritedness (of a loyalty to a community or nation). This arises from a weak sense of self-identity and of the other, who in this instance would be the brotherhood of men or the community.

The Filipino, like any Oriental or for that matter like any new or developing race, has a strong myth-making power. He has a strong mythopoeic imagination. This is clearly seen from the early li-

terature of the race both oral and written. The epics, ballads, and what is often termed early literary pre-Spanish heritage reflect this myth-making power vividly. The modern myth-making proclivity of the Filipinos, however, is seen even in the way contemporary political figures and events are legendized. Yet even here, the Filipino myth-making power is wedded closely to everyday reality. The average Filipino's sense of immediacy, of concreteness, of preoccupation principally in the here and now—or in the other extreme, in the “anywhere but here and anywhere but now” (I refer to the Filipino's sense of escapism or day-dreaming)—this myth-making power has not been developed systematically and philosophically so that it might cover the crucial areas in the life of the people.

Compare this to the Westerner's use of their myth-making faculty. Paul Tillich distinguishes myth as cosmological, anthropological, soteriological and eschatological. Johannes Hempel classifies myth as cosmogenic, soteriological and revelation myth. Rene Largement classifies myths as myths of origins, myths of the quest of life, and myths of deliverance. All three authorities define myth to cover the whole of man's existence and the meaning of life, death, and reality.

On the other hand, the myth-making proclivity of the Filipino answers to the imperative that Cassirer sets up as the difference between scientific thinking and mythical imagination. Cassirer thinks that the unique preoccupation with individual events in their discreteness, against the generalizations built around them distinguishes mythical from scientific thought: the concept of cause and effect is so different in mythical thinking from what it is in philosophy and science.

Isolating abstraction, which singles out a specific factor in a total complex as a “condition,” is alien to myth-

ical thinking. Here every simultaneity, every spatial coexistence and contact, provide a real causal “sequence.” It has even been called a principle of mythical causality and of the “physics” based on it that one take every contact in time and space as an immediate relation of cause and effect.

Whereas empirical thinking speaks of “change” and seeks to understand it on the basis of a *universal rule*, mythical thinking knows only a *simple metamorphosis*. . . . When scientific thinking considers the fact of change, it is not essentially concerned with the transformation of a single given *thing* into another; on the contrary, it regards this transformation as possible and admissible only insofar as a *universal law* is expressed in it, insofar as it is based on certain functional relations and determinations which can be regarded as valid, independently of the mere here and now, and of the constellation of things in the here and now. Mythical “metamorphosis,” on the other hand, is always the record of an individual event—the change from one individual and concrete material form to another. Science is content if it succeeds in apprehending the *individual event in space and time* as a special instance of a general law but asks no further “why” regarding the individualization as such, regarding the here and now. The mythical consciousness, on the other hand, applies its “why” precisely to the particular and unique. It “explains” the individual event by postulating individual acts of the will.”

The average Filipino assigns causality as part of his mythical views on life. Causality in mythical thought is the intuition of a cosmic event which is reflected in the succession of events in the phenomenal world. While modern myth-makers accept the limitation of a perceived phenomenal world, the average Filipino, who is not even acquainted with the phenomenological explanation of reality, accepts causality in the order of the real or actual. The contribution of the scientific discipline on the Filipino's

naturally mythical thinking can provide the conceptualizing rigour to this rich mythopoeic subsoil.

This preoccupation of the Filipino in the concrete and the individual partly explains the emotional personalism of the average Filipino. Much has already been written of how negative personalism as a national trait does greatly account for violations of fairness, objectivity and the merit system.

Intellectual or positive personalism however can be a virtue. For intellectual personalism becomes the logical offshoot of a deep sense of personal human dignity—a regard for the human person. But the emotional personalism of the average Filipino is degraded by his use of personal concern and pressure of personal solicitation that often violates objective evaluation. This is also why discipline in routing official matters breaks down.

The emotional personalism of Filipinos is also what accounts for his being interested in personalities than in ideas. Seldom can the average Filipino evaluate ideas and principles apart from the person expressing them. What is obviously needed is greater objectivity and greater discipline. These are best achieved through a training in science.

Many articles have been written describing the Filipino's sense of values. Researches in fact have already raised to respectability what previously were bandied about as opinions and impressions. The researches done on such concepts as "hiya," "utang na loob," "pakikisama," and "bahala na," among a few, establish the fact that Filipinos are greatly governed by these values in their interpersonal relations.

For our purposes, however, it would be helpful merely to single out one value and to explore further the "bahala na" attitude. This best lends itself to being

related to a scientific problem. The "bahala na" attitude while seemingly only a personal inclination and a predisposition of the will actually implies a cosmogonic assumption: a type of belief, or a cosmological opinion. It actually presupposes either a beneficent force or a Providence in whose care a person can abandon himself. Either this, or a pagan, fatalistic and deterministic view of life. The value concept suggests a world-view which while demonstrating *mythological causal relation* also however partakes of a type of knowledge called *rational faith*.

While on this point, it might be pertinent, of course, to state that the average Filipino or the majority of Filipinos, being Christians, should logically be Providence-oriented in their *bahala na* attitude. It is fair to state however that the average Christian may be hard put to explain intellectually the doctrine supporting his belief. In this sense therefore we have an unintellectualized attitude. The obvious effect of logical or scientific reasoning is missing. The scientific basis of a "bahala na" attitude would involve a metaphysical theory at least. Moreover the "bahala na" attitude as a response to alternatives of behavior demonstrates likewise a refusal to consider the issue on hand intellectually. This limitation of alternatives, as a trait of the Filipino thinking behavior, will be explained further, later in this paper.

While on this point of a world-view, it might be pertinent to mention that the average Filipino has a deep sense of the eternal and the temporal; he realizes that the existence of two orders, perhaps too separately and uniquely: the order of nature and the order of grace. The average Filipino has a deep sense of the supernatural and a personalized (if anthropomorphic) idea of a Creator and Ruler of the universe. But the non-scientific aspect of such a faith lies in its lack of an intellectualized explanation.

The dictum of faith is not interiorized as an *idea* that fits into a *system of thought*. The average Filipino's lack of a system of thought that demonstrates logical and causal relations between and among ideas within the system is what accounts for much of the non-scientific elements in the religious faith of many Christians.

The fear to offend another by opposing views and the lack of appreciation for another's intellectual effort (since goodwill and fellow-feeling or *pakikisama* rates as a greater virtue than intellectual integrity) account for the timidity of the average Filipino mind. The Filipino's timidity of thought, or lack of intellectual excitement and intellectual aggressiveness, is partly the result of the country's long colonial history, the dogmatic authoritativeness of the Spanish rulers, the patriarchal family, and parental dominance in a family. The usual explanation that the dogmatism of the average Filipino's faith accounts for the Filipino's lack of intellectual aggressiveness does not really rate much as an explanation. I say this because in the first place, as I have already said, whether by nature or by geographic and climatic considerations, it seems the average Filipino is unreflecting. But more than this, from my twenty years of teaching experience, I know that the ordinary Filipino student and the average Filipino citizen for that matter, is mentally lazy. The basic reason for this I think is still perhaps the biggest factor we must reckon with in considering this problem of the Filipino mental make-up, and this factor is *language*.

Language is so intimately related to thought. And learning is as intimately related to language. The size and power of one's working vocabulary greatly conditions the quantity and quality of one's thinking. The correlation between language and thought is very high. Logic

and language is only another way of phrasing the same problem. I even suspect that the psychological timidity of the average Filipino not only in speech but even in mannerism is traceable to language. Even his feeling of inferiority or insecurity. Words have a way of shaping a person's expansive personality. Thinking in Tagalog and expressing oneself in English not only leads to a lack of power in expression, but even to imprecision, and necessarily to lack of self-confidence. More telling than all these, however, is the resulting stunted growth of one's intellectual powers.

Necessarily, unless one thinks in English and increasingly develops his tools to a disciplined use of them, the unique rigour scientific reasoning exacts of its practitioners will be long in coming to Filipinos. Without being able to use language intelligently, thought at the most abstract level seems impossible—although language is not the only factor involved in thinking.

Simple and complex sentence forms, likewise, demonstrate levels of assertions which display degrees of concreteness and directness and/or abstractness and subtlety, representing thought processes.

Indeed, the highest tribute paid to thinking was made by Plato when he said: "In thinking, the soul is talking to itself." If up to now we are still trying to grasp, define, and isolate in vain the so-called Filipino soul, our failures in this may well be because no such real "talking to itself" has as yet occurred—or if there is, is not sustained nor widely participated in.

There is one point I have mentioned casually in the preceding paragraphs which I should now like to focus attention on. And this is the average Filipino's lack of a keen sense of observation. Try this on your friend or your student.

Walk some meters with him along a shady path on this lovely campus. After a few minutes, ask him if there was anything he noticed on the way. You'd find out, that while he was actually uninvolved in talk or thought all during the talk, he had not really been attentive to anything nor observant of anything.

It seems fair to say that the average Filipino's lack of a keen sense of observation springs from a lack of a vibrant self-propelling initiative. He is by nature perhaps passive, and by colonial history, apathetic. This lack of an interior probing instrument, which ordinarily we term intellectual curiosity or even only sensitivity to the outer world, to the *other*, as we mentioned earlier, accounts for this intellectual dormancy. Yet a sense of concreteness fed by one's senses, by the details that make up a bit of reality, is crucial to sense knowledge. And in St. Thomas Aquinas's theory of ideogenesis (the birth of an idea) observation is an imperative in conceptualization. One in fact can go back to Aristotle for this, for Aristotle had said earlier: "Nothing can be in the intellect without it first being in the senses." And to span the years from Aristotle to the contemporary philosophers, we can rightfully say that even in the positivism of the Vienna philosophers and the constructionalism of the logico-linguistic empiricists, sense data is crucial in explaining knowledge.

Yet sense data and whatever else is made of them are necessarily the result of keen powers of observation. The average Filipino does not have this; or if he is fortunate to have it, has only often times been gifted with it. Very little conscious and systematic training in this is given even in our schools.

It has been said likewise that all thinking oscillates between two poles—*realistic* and *imaginative* thinking. Realistic thinking may well be conveniently

equalled with thinking based on facts, brute irreducibles, concrete data. On the other hand, it is also fair to say that imaginative thinking *builds* or *creates* from concrete sense data. It operates on basic irreducibles and creates therefrom. The average Filipino may seem to exemplify such dual powers. We have said that the Filipino on the average is a *concrete* thinker, if you may use such a term. He finds it difficult to deal with anything abstract or conceptual. He is always inclined to sense ideas within situational context or never apart from person. He often is only able to grasp things concrete. One might call this a type of realism.

Then again easily some people may think Filipinos are also highly imaginative. Yet if one studies closely the manifestations of this so-called imaginative-ness, one notes that it is either the air-castle-building kind of thinking or is typical only of such Filipino traits of decorativeness or the prettifying of something imitated or the crude if clever ingenuity of so-called inventive devices. Either the so-called "imaginative thinking" is manifested this way; or it takes the form of what we may, more precisely, term "autistic thinking." This is the proclivity of the ordinary Filipino to indulge in fantasy, reverie, day-dreaming, wishful thinking. Autistic thinking, it has been found out is largely determined by needs, wishes and conflicts as distinct from external stimuli. Again our long colonial history and the underdeveloped conditions for the country seem to explain this adequately.

Obviously, we can say that raw material for the Filipino imaginative power is there. The latent power for real imaginative thinking is there. But we have not had enough scientific discipline in our studies, in our training and in our everyday practice of our professions or

our life to institutionalize the discipline—and in our schools, to systematically train our latent powers.

While we are still on this subject of the needed scientific discipline to cultivate the natural powers of sensibility, let me cite another cause for the frustration of the growth of our intellectual powers. And this is the tragic lack in our schools and even in our colleges—and definitely in our contemporary milieu—of a knowledge of metaphysics and a discipline knowledge of epistemology—both being tools for developing intellectual discipline.

Philosophical thinking before it had retrogressed into or degraded itself merely to linguistic analysis was a discipline in itself. The Renaissance and even the advent of modern science in the 17th century and which precipitated the phenomenal advance of science and technology in our age, would all have been impossible (meaning the rate of progress in science happening as it did happen) were it not for the early philosophers. Butterfield himself in his book *Metaphysical Foundations of Modern Science* credits the rigid scholastic discipline as what made possible the outburst of Renaissance aggressive thinking which in turn led to modern philosophy and modern science.

Since philosophy has not become a furniture of our contemporary mind, the speculative and conceptualizing processes imperative in science have not also become standard mental equipment of the average Filipino. Yet metaphysics provides the analysis of the first principle of knowledge: being. And epistemology provides a theory of learning and knowledge, so crucial to scientific culture. Cosmology which offers an explanation of the universe makes possible a logical world-view for anyone who cares to think. And an understanding of the uni-

verse and its laws is an imperative in science. One only has to see the modern scientific-philosophical theories of reality advanced by Whitehead, Bergson, Samuel Alexander, Emil Meyerson, Einstein and Teilhard de Chardin, the most exciting of contemporary thinkers.

In this connection, we said earlier that the naturally integrative quality of the Filipino mind accounts for his weak sense of *other*; and this, in turn, accounts for his weak idea of the cosmos and his own unique relation to it. We also said that the reason the average Filipino has very little of a vibrant sense of human solidarity is because he has little understanding of the inter-relatedness of all lives, even as he affirms his own unique integrity. This, finally, can be accounted for by the Filipino's weak sense of *relation*, aside from the naturally integrative nature of the Filipino mind. All this is due, as I just mentioned now, to his lack of training in philosophical thinking.

This lack of a strong sense of relation, finally, accounts largely for the average Filipino's lack of a facility in abstracting or postulating relational entities. Yet science is fast becoming a mathematics of relations. Nothing in Filipino culture provides a rationale in the abstract of the discipline which a calculus of relations can produce. Even the old definitions of induction and deduction are now re-stated in terms of relations thus: deductive logic is concerned primarily with a relation between statements (namely the *consequence* relation) independent of their truth or validity; inductive logic is concerned with a comparable relation of confirmation between statements. The need therefore is for training in the *definition* and *qualification* of the relation between statements: a highly conceptualizing process.

I venture to think that the principal reason for the average Filipino's lack of a conceptualizing mind is that the average Filipino, even a college graduate, has not been *trained* sufficiently to deal with ideas as ideas. He has not been sufficiently taught and helped to acquire mental or intellectual discipline. Again why is this so?

Prescinding from the reality of poor teachers and poor school facilities, I shall mention only, for now, a few causes that relate thinking to learning.

First, I think the *processes* of learning have not been *interiorized* by the learner. Thinking of course is greatly dependent on learning.

Second, I don't think students are made to appreciate the nature and growth of the different aspects of their own intellectual development. Students have no vivid sense of how their reasoning powers are sharpened, how their memory is disciplined, and how their imagination is utilized and enriched. Not many Filipinos are sufficiently aware of the operations of these faculties: of intellectual reasoning, memory, imagination. Thus they have not developed a keenness in cultivating, preserving and utilizing their intellectual powers.

Third, the ordinary student and the average Filipino have not been made self-consciously aware of the different levels of thinking behavior and degrees of knowledge. Few Filipinos might be found who can self-consciously appreciate the discriminating powers of their mind in distinguishing sense knowledge, conceptual knowledge, intuitive knowledge and knowledge by faith.

All this of course boils down to one point: *order in knowledge*.

Modern man can ill afford a chaotic mind. The explosion of knowledge and the unmitigated barrage of releases from mass media communications in themselves are enough to make even an intelligent man flounder.

Order in knowledge is of primary importance. And order is possible only thru an acceptance of the fact that man can manipulate his powers and use his categorizing and conceptual powers in accordance with his vision of reality and his theory of knowledge and learning. The great imperative is that a person should be intellectually self-manipulating. Without these imperatives of equipment he cannot order his sense data, interpret, and synthesize them into a coherent and intelligible matter. The discipline of order we should impose on our faculties is scientific, necessarily. Our natural powers seek their perfect expression not only in theology, philosophy or aesthetics. They also seek perfection of their natural powers thru the scientific discipline. Rigour, objectivity and precision should become natural attributes of the mind.

Some people have said that science and the scientific method is a Western, imported phenomenon in the Philippines. I don't think this is true. Long before the Spaniards came, we knew how to build boats and produce gunpowder. Surely scientific principles were involved in such work. People worked out these things using their minds and hands. They may not have known they were working these out scientifically. The word "science" was probably unknown to them. But they knew what they were doing. They were using common sense and logic: they were being scientific.

No, science is a universal mode of perfecting the natural powers of man. Whatever there is of natural power, if it has received such training and discipline so that the growth of such powers has advanced and the use of such powers is made precise, efficient and economical, then we can safely say such natural powers have received the benefits of scientific training.

One need not reiterate the potential greatness of our people. We are a race

quick to learn and ingenious at certain levels. We have a warm and even an abundantly roseate sensibility. We have rich imaginative powers, but all in potentiality. If the Filipino people must come to a realization of their powers, they must institutionalize science in their culture—and this can be done primarily and initially in our schools. This indeed is the only way of going about this problem scientifically.

## Demographic and Cultural Aspects of Economic Development

FRANK LORIMER  
*University of the Philippines*

Culture, reproduction, health and economics are intimately related. A fundamental change in any of these factors tends to bring about changes in the others. As yet no nation has ever achieved a clear "take-off" in economic development under demographic, cultural and political conditions similar to those in the Philippines today. The difficulties to be overcome in achieving a sustained increase in the general level of living in this country are formidable and they are

not always taken squarely into account in current planning.

Compare the demographic situation in the Philippines today with that in Western Europe or Japan during the critical early phases of their economic development, Sweden is selected in treating the situation in Europe because its advance was relatively late and effected without imperial advantages. The demographic contrast can be summarized on three indices:

Year	Sweden	Japan	Phils.
	1850	1920	1960
<i>Total Fertility</i> (number of children born alive per woman living through the childbearing years)	5.0	5.3	6.7
<i>Growth rate</i> (percentage increase of the population per year)	1.0-1.2	1.0-1.5	3.2
<i>Dependency ratio</i> (persons under 15 plus those 65 and over per 100 persons 15-64 years)	60	68	97