SPECIAL ARTICLE

A SECOND LOOK AT THAI PHARMACOLOGY

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SOME TIME AGO

When I was asked to visit Thailand again after my previous brief affiliation in Bangkok with the University of Medical Sciences in 1964, I really did not know how much of a change to expect. I remember my last time there with great foundness because that visit had turned out to be so different from what I had anticipated. I had been granted 8 months sabbatical leave from the George Washington University supported by the Commonwealth Fund to participate in pharmacological research projects in New Zealand and Thailand, and to further my academic development by observing and participating in scientific and teaching activities in those countries. I knew of the enormous efforts being made by the Rockefeller Foundation to build Thailand's strength in education, science and medicine. I had just spent 4 months in Auckland working in Professor R.E.F. Matthew's molecualr biology laboratory where we were able to help elucidate the mechanisms by which plant viruses propagated on plant leaves. I assumed that there would be other research programs underway in Bangkok which I might join even though the 2 months I had available seriously limited what we could accomplish in such a short time span.

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The Rockefeller Foundation in Thailand, then under the leadership of Dr. James S. Dinning, had provided considerable financial support and expertise for the development of basic medical sciences. A most encouraging by-product was the spread of encouragement and enthusiasm to several Thai medical scientists who saw an opportunity for realizing the founding and growth of biomedical research in Bangkok. It rapidly became clear to me that Dr. Stang Mongkolsuk had recognized the role that Thais could and should play in the international efforts of improving medical care and in establishing basic science programs in chemistry and biology as related to health. Obviously, this required imagination, devotion, long range planning and know-how which Dr. Stang undertook with incredible vigor, enthusiasm and success.

Several large, modern and attractive buildings then existed at Sri Ayudhya Road which served as the central focus of the new medical science complex. It housed classrooms, offices and considerable laboratory space but its research facilities remained under-used. There was strong interest in chemistry, and several research projects were in progress on the isolation of natural products. However, the electrical and plumbing facilities were inadequate to cope with the demands of such considerable technology, and were constantly disrupted because of the intense road construction nearby to close the klongs. Most of the professional activity involved teaching, and after I had expressed my readiness to give a few talks on pharmacology, I became rapidly involved in the many programs of instruction at the University of Medical Sciences, the Chulalongkorn School of Pharmacy and Medical School, and neighboring institutions, such as the SEATO and Siriraj Hospitals. I remember particularly developing a series of lectures on the chemical basis of the actions of drugs which I thought might stimulate students interested in applying their background in chemistry. Since I had received my Ph.D. in organic chemistry, I felt that others might also find chemistry a useful and practical introduction to pharmacology.

I discussed the functions of neurohormones and the mechanisms by which drugs interfered with the normal actions of these transmitters. I also reviewed the current thoughts on the chemical mechanisms of action of antibiotics on bacterial growth, the emergence of drug-resistant microorganisms, and the likely basis for patient sensitization to penicillin. One of the young students in that course was Chiravat Sadavongvivad, who now is the Chairman of the Pharmacology Department at Faculty of Science, Mahidol. It is a very unusual experience for a teacher to have evidence that a student was actually listening. I was not only surprised, but also delighted.

In the subsequent years there was extensive activity to broaden the biomedical base of Thailand. The Rockefeller Foundation brought Dr.Albert S.Kuperman to Bangkok to transplant the growing discipline of pharmacology as we had developed it in the United States. He helped introduce modern concepts of teaching and research, and was instrumental in the design and construction of the new Mahidol University complex. Several of the most promising of Thai students, with the help of the Rockefeller Foundation, were dispatched to other countries, mainly the U.S., Britain, Australia and the European continent, where they completed their graduate training and rapidly adopted the concepts, techniques and enthusiasm for research that characterized the laboratories in which they had worked. For example, Amnuay Thithapandha enrolled here at George Washington University Medical Center where he received his M.S. and Ph.D. in pharmacology. Chiravat had gone to the University of Pennsylvania. Both then returned to Thailand and developed their Department in Bangkok.

It was difficult for us to foresee the career of these highly specialized researchers upon their return to their previous environment in Thailand. Regardless of intervening progress, Thai universities were much less geared towards laboratory productivity, were sparsely

equipped with modern research tools, and were skimpily endowed, by American standards. More important, scientific talent was not as readily recognized or appreciated as it had become in the U.S. The differences at that time between our cultures extended also to the attitudes in the classroom. In America, the professor is constantly subject to challenge by alert and often aggressive students who would adore to trap him with difficult questions. The instructor's competence must constantly be reasserted for the student body which will not grant this respect purely because of the teacher's appointed position in the academic hierarchy. Although it occasionally leads to embarrassment and sometimes disaster, there results a closer bond between teacher and student, with less formality, which facilitates learning. I detected little of this egalitarian spirit in Bangkok in 1964, where the professor was still deified by his students. Such a professor system still exists in many parts of Europe and Asia but not in the U.S. Actually, for an American professor, a period of forced glorification is really pleasantly reassuring and heartwarming, but he should not get too firmly accustomed to it if he plans to return to the U.S.

NOW

When I arrived in Bangkok in the end of November, 1981, I was amazed at the changes which had taken place in the intervening 17 years. An enormous building program made it very difficult to recognize most of the familiar city landmarks. Even the temples, which formerly could be seen from a great distance, had become submerged in the new skyline. The traffic and noise, which were already incredible years ago, are now so exaggerated that it appears they can no longer be contained in the streets. New hospitals and medical centers have arisen which compare quite favorable with those in our cities, and the level of medical care has increased enormously. Contact with many of the Thai clinicians reveals how many have returned following additional training in other countries, and how small the world has become.

Undoubtedly, one of the biggest changes has been in the field of pharmacology. Housed in a modern, beautifully designed and convenient structure, sufficiently spacious to permit laboratory work for all staff members and students, the Mahidol Department of Pharmacology resembles that of a fine middle-sized American medical center. More important than the physical attributes, however, is the composition of the group. I found each of the staff members to be research-minded, with a respectable record of scientific accomplishments, and busy with a variety of laboratory and teaching projects. This is especially impressive considering the problems of carrying out research with the relatively limited technical and finacial support available. It is far more difficult to be productive when the scientific environment is not as populated, well stocked and competitive as was undoubtedly the case when these investigators received their training overseas. All the more credit therefore should go to these pioneers in the hope they will not give in to frustration. Equally rewarding was the sizeable group of well-trained students who are receiving broadly based didactic and laboratory experience. The training programs for students, as I saw them, not only cover the many scientific disciplines required for understanding pharmacology but also permit the extensive opportunity for independence of thought. Most important, the system is based on individual challenges and questioning, which is a great step from the dependence on rote memory so common years ago. The reliance on English throughout the entire training program, which represents the additional challenge of a foreign language while mastering so many new fields of knowledge simultaneously, certainly increases the versatility of the students once they are finished.

As a consequence, the new graduates should be universally adaptable for further research work or postgraduate training. Although it is unrealistic to expect that each graduate will colonize his or her own research center, in a few years many can be expected to demonstrate their own scientific independence in their own country. They can be expected

to compete internationally for scientific programs and to publish in international journals.

I was also very pleased to observe that so many of the graduate students were simultaneously occupying important positions in governmental and industrial organizations. It is excellent foresight for employers to recognize the value for their employees of additional academic training, which permits professional growth and increased productivity. At my own institution, located in our nation's capital, we have had considerable success with select individuals who are pursuing graduate studies in our Department and who are members of outstanding governmental laboratories.

The three weeks I spent in Thailand went quickly but allowed me to interact with many individuals and groups. Most of my contacts were with young students and faculty members. I provided a series of talks on the basis of cancer chemotherapy, the pharmacology of the aged patient and details on some of our laboratory studies on antitumor agents, at several institutions. In addition to my stay at Mahidol, I visited Siriraj Hospital and Chulalongkorn University and various other laboratories and hospitals in Bangkok and later in Chiang Mai. I was especially glad to renew old friendships with colleagues who had spent some time at George Washington University years ago. I also had plenty of chances to go sightseeing through a considerable area of the country. Thai hospitality without exception was outstandingly generous, thoughtful and imaginative and made our family's trip exciting and most rewarding.

FOR THE FUTURE

Several problems undoubtedly limit the scientific opportunities in Thailand. The tradition for carrying out a career in biomedical

research is still more recent in Thailand compared to other countries. In considerable measure this difference rests on a national economy which has not been able to afford extensive expenditures on basic research. Even under the best of circumstances it is difficult to convince governmental leaderships to view research as a basic investment which will generate enough practical rewards to recover it own costs in the long run, even though this is what usually happens. Thailand, of course, is not alone in this predicament. In the United States, for example, it required World War II to materially advance a national interest in research and to demonstrate the practical values of scientific accomplishment. The success of a Soviet Sputnik finally was required to convince us that scientific competition was not only more than desirable but absolutely necessary. Especially in times of an unfavorable economic climate, such as we are experiencing right now, we tend to put aside the vast opportunity that scientific research offers from point of view of improved human health, increased business opportunities, higher living standards and enhancement in the quality of life. Assistance in a national defense effort is mentioned more readily because it is more politically apparent.

Thai scientists should make every effort to approach the members of their government and to explain the practical achievements of research, since many political leaders are unaware of the almost unlimited new opportunities that arise from successful research discoveries. Scientists over the whole world usually are too uninterested, shy or politically inexperienced to assist their governments in formulating a strong policy for basic research. Certainly in other Asian countries, enormous progress has followed the recognition of the value of research and development, and these countries are now providing excellent scientific leadership and remarkable economic gains due in large part to scientific innovation.

One valuable means of increasing the "visibility" of scientists is by boosting the emphasis on communications between members of the same or closely allied disciplines. Greater cooperation among Thai pharmacologists undoubtedly can be established through the Thai pharmacology society which should be used to facilitate the statement of national goals. At the same time, since many pharmacologists in countries near Thailand may share similar views, aspirations and also problems, closer associations with such regional colleagues (similar to the recent Southeast Asian and Western Pacific Regional Meeting of Pharmacologists) may again clarify issues of professional interest which may be tackled more effectively as a collaborative effort.

An infrequent visitor to Thailand, like myself, probably does not see enough of a cross section of research to make a completely valid assessment of Thai pharmacology. At Mahidol I perceived extensive interest in research, with considerable expertise, opportunity and enthusiasm. In other teaching centers emphasis was directed almost exclusively towards didactic training for students, and the search for new information was limited. A strong effort to challenge current scientific hypotheses and to provide new information is essential to keep the teaching staff abreast of new developments and critical in the acceptance of textbook dogmas.

I believe that certain natural advantages in Thailand have not been adequately exploited. For example, there is extensive folklore about natural products with pharmacological action. Yet, in pursuing these beliefs, one rapidly is forced to conclude that there is very little published information on either the chemical basis of the products in question, or on their biological effectiveness in either animals or man. I am sure that many such studies have been carried out in the past twenty years, but unless these results are formally recorded in the lit-

erature they cannot be accepted by the scientific community. Even though many of these natural products may not pass more careful scrutiny, some undoubtedly will survive to have useful properties. I was pleased to learn that the FDA of Thailand is encouraging scientists to test some of these substances against appropriate biological systems, or to make suitable arrangements to have them evaluated elsewhere in laboratories experienced in such screening. Such test systems include the treatment of hookworm and other helminth infestations, snake bite and even cancer. There is a golden opportunity here for the identification and development of useful products which are native to Thailand. It must be emphasized, however, that these products must be fully acceptable for therapy, since they may also possess toxicity, and their application may deny optimal drug treatment if the natural products can be demonstrated to be inferior to other available drugs. I feel there is sufficient local pharmacological talent available to carry out well-coordinated programs investigating these long-held beliefs, which may provide the needed answers. Such approaches need not be that costly in terms of money, time or laboratory resources.

There still exist extensive under-utilized opportunities for improving the scientific approach toward patient care in the clinical use of drugs. Providing there is interest, confidence and trust, therapeutic teams of physicians, pharmacologists and clinically trained pharmacists should be able to work together with greater ease in Thailand compared to other countries where generations of professional divisions, traditional hospital regulations and lack of contact have hampered cooperation between these disciplines. This collaboration has been growing considerably in the last decade in the U.S., and should permit the more effective use of drugs in the clinic, while providing an additional scientific data base on human pharmacology. Because of the fewer restrictions, Thailand could make significant contributions to our new knowledge in this important area.

Major efforts should be made to encourage the Thai Universities, as well as the government, to support their scientific community more generously. Even relatively small research grants will permit more eligible investigators to continue to carry out their basic studies. Once published, these successful accomplishments will attract the attention of scientists in other countries. Without such a financial start it is virtually impossible to compete in international scientific programs. It should also be mentioned that investment in biomedical research can be expected to bring rewards not only in terms of better well being for the people, but also the increased earnings of a healthier society will permit the return of additional tax revenue to the treasury.

Greater emphasis could then be placed on exchange of scientific personnel with other countries. Thai researchers who in the opinions of their professional peers have distinguished themselves early in their careers should be awarded fellowships to spend a year abroad in a laboratory of their choice. They should then impart their newly acquired knowledge and experiences upon their return to Thailand. These sabbatical experiences or even brief international visits will provide Thai scientists a better opportunity to keep up with their counterparts in other countries and to establish cooperative scientific ventures which will benefit all participants. Similar opportunities for physicians have produced dramatic benefits for the practice of medicine in Thailand, and I was most impressed with how successful and widespread this practice has been.

At the same time, additional opportunities should be created to invite active scientists to Thailand where they might introduce specific techniques or research ideas to their local counterparts, and where they act as stimulants with new suggestions for research or the initiation

of collaborative projects. These personnel exchanges need not be very costly, and industrial and private organizations should be urged to participate with the Thai government and the universities in these international exchanges.

Perhaps our American Society for Pharmacology and Experimental Therapeutics (ASPET) can be of greater assistance to Thai pharmacologists. Although regular membership requires permanent residency in North America, Thai pharmacologists may become Affiliate Members of ASPET subsequent to nomination and election by the ASPET membership. The current annual dues are $ 50.00. Affiliate Members receive the Pharmacologist, Federation Proceedings and various mailings regarding information on future meetings and other news of importance to our discipline. Occasionally there may be travel fellowships to meetings available to members and nonmembers, but Affiliate Members will have easier access to announcements about those opportunities. Affiliate Members can also receive ASPET journals at member subscription rates substantially less than those for other subscribers. Depending on demand, bulk air mail rates may be offered for more rapid delivery to the Far East.

Lastly, but by no means least, it is my perception that Thai scientists should display more confidence in their abilities, accomplishments and creativity. They should feel that they can compete with their counterparts anywhere, and they should be sure to retain their Thai identity. They should give credit to other Thai laboratories, where appropriate, to help develop greater esprit, collegiality and visibility for Thai scientists. The international scientific community respects the impressive role that these individuals have played, often under difficult and unrewarding circumstances, and would be glad to extend a helping hand. Certainly, many of these distinguished and pioneering Thai scientists have been most valuable and helpful to us in our careers.