Indian Phytopath. **40** (1) : 1-13, (1987)

INDIAN PLANT PATHOLOGY—2000 A.D.[1,2]

Y. L. NENE

Program Director (Legumes)
International Crops Research Institute for the Semi-Arid Tropics
(ICRISAT), Patancheru (A.P.) 502 324

First of all let me sincerely thank the members of the Indian Phytopathological Society (IPS) for having elected me President of the Society for 1986. Our Society took several steps during the year to make it a more dynamic organisation and I am confident that the IPS will emerge in the next few years as one of the more active professional societies in the country.

Modern plant pathology in India has a history of only about 80 years. After a modest beginning at Pusa, Bihar in 1905, with Sir Edwin J. Butler as the "father of Indian plant pathology", plant pathology has made impressive progress. Indian plant pathologists have contributed significantly to the science and art of plant pathology both nationally and internationally. Until about 1960, Indian plant pathology was highly mycology-oriented. However, with the advent of agricultural universities in the sixties, pathology activities in India diversified with a lot more emphasis on disease control in farmer's fields. Today we see a more balanced development of plant pathology than we did a few years ago. Where do we go from here? This question has occupied my mind for some time now and I thought I should use the opportunity that the IPS has provided me today to bring my thoughts together and share them with you. God willing, I hope to be around in 2000 A.D. to be able to read the contents of today's lecture and to evaluate its impact, if any.

It was about four months ago that I communicated the title of my lecture to the Secretary, IPS. I started reading papers that can be considered as the cutting edges of plant pathology today. I was hoping to tell you how Indian plant pathology can quickly catch up with plant pathology in developed countries. However, while I was organising the content of the lecture and struggling to prepare the outline, it occurred to me that currently too many things are going wrong with Indian plant pathology. I felt it would be yet another futile exercise if I painted only a rosy picture about what we can achieve. I therefore decided to discuss the problems we are facing and to offer a few solutions for your consideration. Furthermore, I decided not to change the title of my lecture because I felt we may need the next 14 years to put our house in order. Therefore, it you have come to listen to a scholarly lecture from me today, you are going to be disappointed. Please accept my apologies for that.

There cannot be any doubt that we Indians have the "genetic potential" to excel in any human endeavour, including work on plant pathology. Unfortunately, our country

[1]Presidential Address delivered at the Indian Phytopathological Society Annual Meeting, February 10, 1987, at Marathwada Agricultural University, Parbhani, Maharashtra.

[2]The views expressed in this paper are purely my own and should not involve ICRISAT in any way.

does not provide the "environment" that will bring out the best in our scientists. I am going to discuss mainly this "environment" aspect in today's lecture. We know very well that the results of our actions today will be seen or felt only in the future. I will discuss the present and likely future situations under four main headings; viz., teaching, research, extension, and administration. I must also emphasize that the present situation is not unique to plant pathology, as most disciplines in agriculture have similar problems.

PRESENT SITUATION

Teaching

In the sixties and until mid-seventies, the situation with regard to teaching looked very bright. With new agricultural universities coming up and with the "green revolution" on, there was a lot of enthusiasm in teaching. However, for some reason we lost that initiative and the situation today is rather gloomy. We introduce plant pathology to undergraduate students and we expect to create a genuine interest in plant pathology in the minds of students when they take an introductory course. There are plant pathologists all over the world who chose a career in plant pathology because their first teachers knew how to create interest in the subject. If Dr. L. K. Joshi had not been my first teacher of plant pathology, I am certain I would have chosen some other subject. What do we commonly see today? In most universities, undergraduate teaching is avoided by the more experienced teachers. Bright young teachers are made to feel that undergraduate teaching is some sort of low-level job or possibly a punishment. Undergraduate teaching is more challenging than postgraduate teaching and involves a lot more work. Young teachers who want to do a good job through innovative methods of teaching are often not given the required support and encouragement by the senior teachers.

Many teachers, including those who taught earlier generations of students as well as those teaching young students today, inadvertently give the impression that good research is carried out only in the more developed countries, thereby creating an inferiority complex that remains with many scientists for the remainder of their lives.

A large body of students in India have always been more interested in obtaining high marks or grades than in learning their subject matter properly. This besomes very clear when our students go to the USA for studies for they show more than normal interest in grades in contrast to American students. Today student discipline is not managed properly and effectively at different levels with the result that the students 'demand' high marks or grades for the least effort on their part. In such an environment, disciplined, hard-working, sincere, and honest students will somehow manage to do well and later succeed in life, but a large body of students will become only mediocre professionals. What a waste of human resources! Teaching can be considered successful only when it helps the majority of students to upgrade their performance, and not when it only identifies the students who are naturally gifted and who are provided the right environment in their homes.

Research

My overall assessment is that the situation in plant pathology research is static. We have come up to a certain standard, which is neither deteriorating nor improving. There is definite scope to change the situation into a dynamic one. There are several constraints and I will discuss these in the following paragraphs.

Pathologists of my generation as well as our younger colleagues are in a great hurry to publish, truly believing in the 'publish or perish' philosophy. Therefore many publications are poor in quality, i.e., poor in language, illustrations, and/or content.There is a tendency to publish short communications merely to increase the number of papers credited to the author. Sometimes the same data are published in more than one paper. Thesis results are often split up into many short papers. Another undesirable aspect of publication is the pressure seniors put on juniors to give them undeserved coauthorship, or the reverse, i.e., juniors pressurising seniors to co-author, with the main aim of placing seniors under an obligation for a possible favour in future.

There is much to be said about thesis guidance. Some senior staff like to have many students, even though they are unable to give adequate attention to all their requirements. Thesis guidance involves three important training functions: to develop the student's ability to (i) plan and execute experiments, and interpret results, (ii) write well, and (iii) present results to an audience. Students suffer when senior teacher-guides cannot give them adequate attention. So often I am distressed to see young workers failing to write good, acceptable papers and to present them well. Often theses are not examined critically.

In most situations, modern plant pathological research cannot be carried out by an individual in isolation. Team effort is often needed which means that willingness to cooperate with other scientists is essential. However, we see a depressing situation in several plant pathology departments where scientists do not even speak to each other. Guides prevent students from freely consulting other scientists. When such situations occur, the departments cannot possibly expect productive interdisciplinary cooperation. The net result is that the progress of our own profession severely suffers.

Last, but most important, is the lack of adequate financial support for scientists to buy even small items needed for research. Finances are inadequate for travel, supplies, and labour. Recently, I was distressed to hear from a pathologist that even for typing manuscripts, his university expects him to spend his own money.

Extension

Extension activities in plant pathology are much better organized today than they were 25 years ago, but much remains to be done. The whole concept of extension has undergone change. Many agricultural universities hold farmers' fairs and there is no substitute to these fairs for developing close linkages. The questions asked by farmers have forced pathologists to find answers to their problems. I became serious about finding the cause of the Khaira disease of paddy in the early sixties only because farmers criticized me openly for not having found the answer earlier. Challenges posed by farmers are the catalysts to success in research and extension. Today, there is far better

interaction between plant pathologists and farmers. Also there are many more extension-oriented publications related to plant diseases than before.

Administration

Not all that I am going to say about the present situation with regard to administrative support is going to be liked by some administrators, if they read this paper. Whereas the success or failure of vice-chancellors' tenure affects the entire scientific community of the concerned university, successes or failures of deans and/or heads of departments affect the pathologists more directly. The biggest problem today is the lack of support that the administrators are able to extend to scientists. The result is that the community of scientists, particularly the younger generation, suffers, and in spite of having real potential to grow, they never reach the appropriate heights in their professions, plant pathology included.

What do we see today? Young plant pathologists are hired and are expected to work in ill-equipped laboratories. If young pathologists show initiative and drive, and in the process reveal independent and critical attitudes, they are immediately "disciplined" by deliberate restriction of their initiatives. Pathologists in some institutions do not have adequate financial support to buy even simple glassware, chemicals, and other supplies. Purchase systems are tedious and full of red tape. Purchase officers think that they are doing a great favour to scientists if they procure any items at all, and often they will tire the scientists out by raising all possible objections to their requests. Several plant pathology departments procure equipments after overcoming many hurdles, but when these equipments require repairs, administrators cannot find enough money. So often do I hear the comment, during my visits to pathology laboratories, that such and such equipment has gone out of order and is awaiting repairs. It is a pity that adequate funds are seldom available for repairs. However, what makes me sad is that money is lavishly spent on non-professional events such as V.I.P. visits.

Several plant pathology departments do not get regular supplies of electricity or even tap water. Pathologists are expected to know the crop disease situation each season in the geographical region in which they are located, but adequate transport facilities are not provided. Library support has been deteriorating in several universities; recently I was pained to hear that one of our well-known universities no longer subscribes to the "Annual Review of Phytopathology" on the ground that the library budget is inadequate to meet the escalating costs of journals and books. Participation in conferences and annual meetings of professional societies is becoming increasingly difficult for many.

Selection of staff is not always on the basis of merit. One of the foremost agricultural educationists of India, Dr. N. K. Anant Rao, a former dean of agriculture at Pantnagar, often used to say that when he selected a new staff member, he looked at him as critically as a father would look at the prospective husband for his daughter. A second-rate candidate is sometimes selected over a first-rate candidate even though they may have M.Sc. (Ag.) and Ph.D. degrees from the same institution, just because the inferior candidate has a B.Sc. (Ag.) degree and the better one does not. I consider the system of inviting outside experts for interviewing candidates to be bad. On the one

hand it is an admission that the staff of the concerned university are incapable of selecting additional staff to suit their requirements and on the other, it allows manipulation in selection through the outside expert, who may not have a genuine interest in the selection anyway. No one seems to worry when the interviews are cancelled because the expert does not turn up on the date of interview. What about the loss of the candidate's time and money? I know at least one University which made excellent staff selections without the help of outside experts until 1975 (after which, unfortunately it followed the practice of other universities), so why can't we do that everywhere?

Similarly, the selection of students on any basis other than merit is yet another undesirable feature. The departments of plant pathology which have maintained an open door policy and recruited on the basis of merit alone have gained stature.

Several plant pathology departments have adopted the system of rotating the headship, even though its utility is not yet proven. Administrators have most often given "higher status" to plant breeders, and treating other disciplines as "supporting" disciplines, thus causing continuing friction. This has adversely affected interdisciplinary research in crop improvement in the country.

FUTURE

Before I proceed further I would like to clarify that, notwithstanding what I have said so far, there are good vice-chancellors, deans, heads of departments, and plant pathologists (teachers, researchers and extension workers) who are providing effective leadership and doing justice to the positions they hold. But to change the situation for the better, we must try to eliminate or reduce the constraints that exist. In the next few paragraphs I would like to share with you my thoughts about how we can handle the situation to provide a better future for plant pathology.

Teaching

This is where we can show measurable progress by the end of this century. I consider that the head of the department/unit of plant pathology is a key person and he must set an example as a fair, selfless, honest, dedicated, and disciplined person. Without these characteristics he cannot command genuine respect from his colleagues and students, and he will fail to create a fair and honest environment for everyone else to be productive. He must capitalise on the energies of younger staff members by providing them as much support and encourangement as he can. Am I saying something new? No! This has been said for centuries by philosophers in all civilisations. However, we have to remind ourselves of these simple principles all the time. Is it really so difficult for every head of department to do this in his own interest as well as in the interest of his profession? The head must develop a kind of group leadership in his unit/department in which participation of all staff members is ensured. This will encourage communication and automatically reduce inter-staff tensions. Once this is achieved, teaching will improve. Teachers when treated fairly and with respect will in turn start treating students fairly and with respect.

Introductory courses in plant pathology are like the foundations of a building. A strong building needs strong foundations. Why then do many of us treat these courses as routine, uninteresting, and full of drudgery? This attitude must change. If no one else is eager to teach an introductory course, the head should offer to teach it. I assure you that such an action will be most welcome to the students and the concerned head will find it a very stimulating and challenging experience. Practicals or laboratory sessions must be improved. Field trips and assignments must be encouraged. Teaching aids must be produced and used freely. If necessary, some of the funds allotted to other activities of the department should be transferred towards the introductory courses.

I would like to make a special mention of videotapes. Let the use of videotapes be extended to teaching in plant pathology. After having recently produced two videotapes, one on sterility mosaic and the other on phytophthora blight of pigeonpea, I would like to tell you that this task is not at all difficult. All you need is a script, material in field and laboratory, assistance from a professional videographer, and technical input from one or two scientists/technicians. All this will not cost you a fortune. Such videotapes would be immensely useful in undergraduate teaching. Students will enjoy and learn more by seeing an eriophyid mite moving or *Phytophthora* zoospores swimming on the screen than under a microscope lens.

The ability to diagnose plant diseases under field conditions is still far from satisfactory. I have observed that some senior plant pathologists avoid going to the field, not because they are very busy elsewhere, but because they lack confidence in diagnosing different disorders. Teaching plant disease diagnosis needs to be strengthened; a good extension pathologist usually makes a very good teacher of such a course. If our designation has anything to do with plant pathology, then no matter what in-depth research we are doing, we must be able to identify crop diseases confidently; otherwise we lose the right to be called pathologists.

An aspect of teaching that has been controversial for many years now is the evaluation of teaching by students. Just as the success of any product depends on whether the users are satisfied or not, I firmly believe that students must be encouraged to evaluate teaching. I have experienced this and I am convinced that the students' criticisms helped me a great deal in improving my teaching. The evaluation of teaching of all courses by students at the end of a term should prove very useful in improving the standard of teaching. The easy way to implement this is to encourage teachers to volunteer for evaluation by students. I know no more effective way of improving teaching.

Research

Publications

As I said before, there has been a stress on the number of publications that a scientist publishes. While there is nothing seriously wrong with this approach, the quality usually suffers. Indian pathologists are better at writing and presenting papers in English than pathologists of several other nations, but by international standards, we still have to qualify as good writers. Our approach to this problem has been rather casual. If we send

a paper to a non-refereed journal, we say "why bother about the language; it will get published anyhow." On the other hand, if we send a paper to a refereed journal we say "the editors will take care of it, so again why bother?" These attitudes have earned us a very bad reputation in international plant pathology circles. We can easily change this situation. First of all we must educate administrators that in plant pathology, if a full time researcher, who has good facilities available, publishes 2 full papers and 2 short notes in refereed journals in a year with his name as senior author, then his research performance should be considered very good. There is no need to give much importance to those who publish more than this. If less facilities are available, then expectations by way of research papers should be correspondingly less. No paper should go outside unless it is reviewed internally by at least two colleagues in the unit/department and by a statistician and a language editor (a teacher in English will do). Above all, the pathologist concerned must make a conscientious effort to improve his own writing ability. Our training in being quality-conscious should start when we write the thesis for our M.Sc. or Ph.D. and the thesis-guide has a very important role to play. If the guide simply rewrites the thesis for his student, just because he finds it more convenient, he is doing great harm to the student and to our profession.

I have already mentioned the difficulties that some pathologists face in getting their manuscripts properly typed in their departments. Such a situation should not be tolerated. To improve the typing efficiency we must move towards using word processors in our departments.

Thesis guidance

Much can be done to improve the situation in this regard in the next 10 to 15 years. I have often asked Ph.D. examinees to explain what the word thesis means and why the degree is called doctor of philosophy. I have rarely received satisfactory answers to these questions. One of the difficult things for the young postgraduate student is to select a suitable problem. The guides must avoid assigning the problem, but offer a choice of problems and let the student finally choose one. Encourage the student to freely consult any one if he finds it necessary. He must consult a statistician prior to initiating experiments. Guides must see each experiment in progress. This will give a chance for on-the-spot discussion. Most theses that I have read so far, adequately review the earlier work, but often the reviews tend to be simple narrations without any critical comment. When it comes to writing, let the student himself come up with a revised draft each time. Let him learn to defend each sentence of his thesis grammatically as well as for its meaning. Let him thoroughly understand the meaning of routinely used words such as introduction, review, experiment, discussion, summary, and abstract. All this will help him in developing a critical outlook. Give him reading assignments with the sole purpose of criticizing publications of well-known workers in the field. Encourage the student to read every paper he cites in original and not just remain contented with the abstract. Help the student to become quality-conscious when it comes to the typing, illustrations, and photographs to be included in his thesis. Unfortunately, the notion still persists that the bulkier the thesis the better it is. When the same thesis content can be adequately covered in say 100 pages and 20 illustrations and photographs, it is a waste of paper and time to write 200 pages and provide 40 illustrations. If students are

encouraged to be brief and learn how to write precisely, they will produce a shorter, more readable and more acceptable thesis. Reprimand your students if you find them lifting paragraphs from published literature for inclusion in their writeups. Encourage your student to present at least one paper from his thesis before an audience. Help him to prepare it well through rehearsals. Let him use slides/transparencies only if these are of excellent quality and if they clearly reveal what the student intends to show; it is better to present a paper without slides than to use bad ones.

Some of you may be wondering by now whether I am not wasting your time in telling what you already know and what you are already doing. If that is so, my apologies to you. However, if you recognise any faults I have described in yourself, then please consider these as friendly suggestions. If you think that you need not bother to improve, then I am afraid I must tell you to forget about guiding students; and I would urge students not to waste their time with such guides. There is a tendency amongst students to associate their names with well-established pathologists by choosing such as guides. Even today I am often under pressure from students to agree to be their guide. I have discouraged many but I have a student at present. I feel guilty because I cannot give him adequate attention. I would urge students to avoid working with well-known, senior pathologists unless they are able to give them proper attention. I would like to assure them that they will receive much better training from many young and promising teachers than from well-established professors who cannot allocate adequate time for students' needs.

I would quickly add another piece of advice for students. If you wish to be accepted as plant pathologists of the 21st century, you will have to get used to computers. Please persuade the authorities concerned to get computer courses introduced at the undergraudate level till such time that computers are introduced in the high school curricula.

Interdisciplinary research

In any crop improvement programme, pathologists have to work closely in interdisciplinary teams that are usually led by breeders. From the very beginning of the all-India coordinated crop improvement projects, there has been tension between breeders and other scientists, particularly pathologists. Disease resistance breeding programmes have suffered greatly because of this continuing friction. Many breeders feel they are the only ones who should be the leaders and pathologists are simply there to assist them when required. Pathologists resent this attitude, but they do little to force a change in the situation, except to provoke arguments in meetings and conferences and make sardonic remarks about breeders. This has not helped in alleviating the situation and will not help. There is only one way to correct this situation. Pathologists working in interdisciplinary teams must come out of their 'pathology shell' and make an intensive effort to learn all aspects of the concerned crop. They must learn (i) principles of plant genetics, (ii) breeding methods and why and how those are used, (iii) how breeding materials are handled in the field, (iv) what constitutes the crossing block, (v) all agronomic aspects of the crop, (vi) important pests of the crop, and (vii) anything else relevant to the crop. Then they can start making suggestions to the breeders on how to improve the breeding work. Please do what I have said and I assure you that you will not

feel humiliated by breeders. The simple truth is that the breeders score over others because they have a better overall knowledge of the concerned crops than their colleagues who have specialized in other disciplines. Know as much as the breeders do and you will be treated with respect. While I am suggesting this, please do not forget even for a moment that you are a part of the team and from your side you must not do anything to damage the team spirit.

Mycology

Even though the pathology departments of some agricultural universities are not strong in mycology, adequate attention is being paid to mycology in several botany departments in general universities. Not only must this continue, but plant pathologists must encourage and support mycologists in their research in whatever way they can. In this way I am hopeful that much of the required fungus identification work will be carried out in India. That will reduce the load we have been putting on the Commonwealth Mycological Institute in U.K. With the food and feed processing industries in India growing very quickly, mycologists are bound to have several challenging mycotoxin problems by the end of this century. I have no doubts that Indian mycologists are capable of meeting this challenge.

Fungal and bacterial pathology

We have made good progress in this area in the last 15 years and I hope that the research in the next 15 years will be even more spectacular. We should now move into the area of epidemiological modeling with computers for the forecast of crop diseases that require application of fungicides and bactericides. Continued effort is required to understand how pathogens perpetuate, for our knowledge in several cases is still inadequate.

We have made significant contributions in the last two decades in developing efficient resistance screening techniques for several crop diseases. We will have to continue these efforts and work more closely with breeders to produce disease resistant cultivars. Durability of resistance must receive our attention all the time. We must not forget that in nature crops are not attacked severely by only one disease or pest; thus we will be expected to work closely not only with breeders, but also with entomologists.

Solarisation of soil (heating soil by covering with polythene sheets for 6-8 weeks during summer) is bound to receive more attention in relation to the control of soilborne diseases. We must involve our plastics industry in developing polythenes that will be cheap and durable under our conditions. We routinely state that deep ploughing and turning the soil in hot summer in India reduces the incidence of soilborne diseases, but I have not seen hard, experimental evidence to substantiate this belief. It is possible that we can develop a technology to expose the soil to sun to obtain effective control of at least some soilborne diseases without having to spend money on polythene. We need to get together with agronomists and carry out field trials to control diseases through tillage in summer. Another area of disease control which has shown considerable promise in the recent past is biological control. I clearly see a bright future for this area of research and practical applications will emerge by the turn of this century. Fortunately, we have the capability to move into this area of research in a big way.

With the pressure of increasing population, our cropping systems are going to become more intensive. We must work closely with agronomists and monitor disease situations in any newly emerging system of intercropping and cropping sequence. I personally find this area of research very exciting and in the long run it should prove gratifying and rewarding.

Virology

Our progress in viral disease research has been satisfactory, but it has been unsatisfactory in the basic virology related to crop diseases of importance to us. Basic research in virology is a costly affair. We need expensive chemicals and equipments and the latter need continuous maintenance by way of repairs and replacement of old parts. I have often wondered if it is necessary that every department of plant pathology in the country should have a virus research laboratory. Should we not consider regional laboratories, the facilities of which could be freely available to plant pathology and botany departments in the region? We would be able to maintain such laboratories to a high standard. Such laboratories would be identified as purely service laboratories, and would not have scientists of their own doing active research; otherwise they would compete with others and the spirit of service would be lost. If something like this is not done, I am afraid we will continue to lag behind in basic virus research.

Nematology

Indian nematologists have been in the forefront internationally in taxonomic work and we should be proud of this achievement. However, we need to direct and intensify research on practical aspects such as developing nematode resistant cultivars and understanding the dynamics of pathogenic nematode populations as influenced by (i) physical, chemical and biological treatments of soils and (ii) changing cropping systems. I am convinced that we shall be hearing of more successes in the field of plant nematology within the next 10 years.

Forest pathology

Serious concern is being expressed about the loss of our forest wealth. With more and more ecology consciousness, we are bound to go in for agroforestry on a large scale. Any loss of forest trees due to diseases will attract the attention of the public and I expect we will be challenged to meet such situations. I feel this is the right time for some of our pathologists to make a career in forest pathology.

Management of interaction between abiotic and biotic stresses

One again research in this area has to be interdisciplinary and cooperation between pathologists, entomologists, physiologists, agronomists, soil physicists and chemists, and breeders will be essential. Abiotic stress factors are mostly sublethal and include compacted soil, occasional oxygen deficiency in roots, low plant water potential, extended periods of temperatures above and below the optimum required for plant growth, mineral deficiencies or toxicities, air pollutants, misused pesticides, quality of irrigation water, etc. These abiotic stress factors may affect the microflora associated

with plants and, thereby, influence disease development. Stressed plants may allow weak pathogens to become major ones and diseased plants may suffer more if they are under abiotic stress. We need to know about these interactions much more in non-irrigated situations than in irrigated situations. If you have good personal friends who are agronomists, entomologists, soil scientists, and breeders, then invite them to develop an interdisciplinary project. This is the time to initiate such research which in the long run will enable us to manage diseases better.

Fungicides

Research programmes on the field use of fungicides to control crop diseases are now well-established in India. Perhaps the time has come when university researchers should concentrate on the basic aspects of chemistry, interactions, and efficacy of fungicides in the wide range of environments in India, leaving the field-testing to extension workers including those who work with the pesticide industry. In the last 20 years, the pesticide industry has also grown, and I expect it to move steadily into research on discovering new chemicals. I believe that our pesticide industry has the required dynamism and I hope that the universities and industry will interact more fruitfully than before by the end of the century.

Extension

Extension pathologists of today are doing very meaningful and valuable work. Those who are working in universities are in touch with the latest developments in the science of plant pathology. However, extension pathologists posted in small townships feel the need to update their knowledge. While refresher courses are held for the benefit of these pathologists, often the teachers who are involved do not themselves have a strong field orientation. Some extension pathologists who have attended such courses have told me that they returned without adding much to their knowledge. I am sure we can easily correct this situation by careful selection of teachers to operate such courses. Extension pathologists are often made to feel that their status is inferior to that of researchers and teachers. Let me tell them what I heard from Professor J. K. Galbraith, former U. S. ambassador to India, when in 1961 he addressed the staff and students of the newly created, first agricultural university at Pantnagar. He said, and possibly he was quoting someone else, that "the life of an agricultural scientist should be considered successful if even one farmer lays a bouquet over his grave." Extension pathologists have a better chance of leading a "successful" and gratifying' life than teachers and research workers!

Plant disorder diagnosis service

Often many of our active pathologists find it difficult to occupy their time after they retire from active professional positions. This is more so if they are physically fit. How about getting together with fellow retirees of the same town who are entomologists and agronomists to form a private company offering services in diagnosing plant disorders? I have no doubt that such a consultancy service would be successful both financially and professionally. It would also provide much needed satisfaction of doing useful work even after retirement.

Administration

Support to scientists

As I have already indicated, the heads of plant pathology units/departments have to play a more dynamic role in ensuring support for their scientists. One will not suffer in one's own personal career if he is fighting selflessly for the rights of his colleagues and his profession. The heads have to ensure that each scientist in their departments gets at least the minimum facilities required to carry out his work. They can persuade the higher authorities to have an instrument repair shop right in the institution. If the power supply is erratic, spend money on buying generators. If the water supply is erratic, threaten your dean or director that you will organize a film show to raise funds to get a borewell and a pump for the department. Provide your scientists with the necessary help to type their reports and manuscripts and do not expect them to spend money from their own pockets for these jobs. I despair when there is talk of establishing departments/units for biotechnology research in some institutions where even a regular supply of electricity, water, and gas to the existing laboratories is not ensured.

Cooperation from well-known non-resident Indian plant pathologists

In the past we have been shy of seeking help from Indian pathologists working abroad. Our attitude must change and we must not hesitate in seeking their help. I have met several Indian plant pathologists settled abroad. They are very willing to serve their motherland. By developing cooperative projects with them we will benefit in many ways. Our young plant pathologists can receive training in most modern techniques. Some small items of equipment can be obtained. Is it really too much trouble to get one or two well known non-resident Indian plant pathologists appointed as honorary professors in each of our universities? In future I hope to see many non-resident Indian plant pathologists spend some time in India to help our students and staff.

INDIAN PHYTOPATHOLOGICAL SOCIETY (IPS)

Let me now make a few remarks about our Society. I have been a member of the Society for 21 years. During this period, I have seen the membership increase from 405 (1966) to 1290 (1986), a 3 fold increase in 2 decades. Our membership is spread over 30 countries, though the bulk is from India. The society has weathered many storms in the past, and today it is a viable society doing its best to serve the cause of plant pathology. The IPS is the only real national-level society we have and it belongs to all of us.

Let me now turn to what the IPS can and must do in the next 10 to 15 years. The IPS must do everything possible to make Indian Phytopathology a journal of high international standard. Its standard has been mediocre and it has earned little respect from the international community of plant pathologists. However, starting with number 1 of volume 39 (1986), Indian Phytopathology appears so good that it will not be too long before our journal finds itself to be truly international in its readership. Our newly constituted Editorial Board (EB) deserves to be commended for giving a new look to the Journal. I hope the EB will now make every effort to publish the numbers on time.

Our Society needs to be more liberal in extending recognition to deserving plant pathologists. At the moment we have one award for young scientists, one award for

authors of the 'best paper' and two awards for senior scientists. Why can't we have awards for outstanding undergraduate teachers, outstanding postgraduate teachers, and outstanding extension pathologists? Why can't we recognize young pathologists who have done useful basic and/or applied research? Recognition by our professional society in the first ten years of a pathologist's career will go a long way in sustaining his productivity. I hope this proposal will be considered seriously. I am convinced that many outstanding young pathologists are looking for professional recognition and not monetary benefit. Thus the society office-bearers should have no worry about lack of funds for instituting awards. This is one activity that IPS must carry out soon and we should see positive effects of this step in the next 10 years.

TAILPIECE

Plant pathology has made many significant and praiseworthy contributions towards the goal of increasing food production in India. I have no doubts it will continue to do so. The other day someone asked me "how can anyone do any research in plant pathology when he is not provided even a microscope and an autoclave?" I could not answer the question satisfactorily at the time, but I kept on thinking and then finally came up with this answer: Whenever I have time, I will visit each day a crop on the University/Institute farm or a nearby farmer's field. I will study the crop growth and look for any disease occurring. I will buy a hand lens and use it whenever required. I will note down whatever I see even if it is something trivial. I will collect weather data (temperatures, rainfall, relative humidity, wind direction) each day. I will collect data on disease incidence and severity. I will also make notes on tillage, use of fertilizers and other chemicals, irrigations, weeding, etc. I will go on doing this as long as the crop is in the field. I will then do the same exercise with the following crop, and I will continue doing this for at least 3 years or as long as I do not have facilities for some other more important research work. This could go on for 10 years. In the meantime I will keep on critically analysing and checking my observations. I will write down all my observations and make all efforts to get these published. I have no doubt that my research will be valued by posterity because even if we enter the computer age fully by 2000 AD, the need to observe diseases in the fields will always continue. Friends, we may be denied facilities, but no one can take away from us our power of observation, no one can really stop us from doing research, no one can really kill our professional spirit, and above all no one should be allowed to subdue our pride in being plant pathologists.

Thank you!

ACKNOWLEDGEMENTS

I am grateful to the following colleagues for their help during the preparation of this manuscript: Mrs. V. K. Sheila, Drs. W. Reed, M. V. Reddy, S. B. Sharma, and D. McDonald, and Mr. R. L. N. Sastry.