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# ROOTS AND BEN CLON



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# ROOTS AND TUBERS GALORE

The Story of CIP's Global Research  
Program and the People Who Shaped It

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**To Geraldine, who initially encouraged me to write these memoirs  
and has been my chief critic throughout the project.**

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# Foreword

I have been asked by several of my colleagues, my wife, and others interested in CIP to record the history of the Center. Dr. Richard L. Sawyer, the founder and architect of CIP, is far better qualified than I am to tell this story, and indeed he has plans to do so. I intend however to relate my own association with the Center, which started in February 1976, four years after CIP officially opened its doors, when I arrived to help build the Regional Program.

Even in the early days while planning CIP's research strategy, Richard Sawyer realized that there had to be a vehicle for converting research results into production practices if CIP was to achieve the impact on potato cultivation that it hoped. Thus, the organization of what was to be known as the Regional Program began. Through this Program, CIP was to forge technical collaboration linkages with scientists in developing countries worldwide.

But first, I'll go back to my situation in 1975. A few months before meeting Richard Sawyer I was working as a cotton specialist at Lyallpur, later known as Faisalabad, in the Punjab province of Pakistan. For 18 years I had worked in the same general research area in different countries of Africa. I was 47 years old, and had already decided that a complete change of emphasis would provide more of a challenge than continuing in my current field of work. While in Pakistan, I met Dr. Jose (Pepe) Giles, a Peruvian cotton breeder working for the Food and Agriculture Organization (FAO) at Multan, a town some four hours south of Lyallpur by car. Pepe

Giles was alone and eager for company, and as we were in the same line of work we struck up a close friendship. One day, in the course of discussing career possibilities, he suggested I approach CIP, a relatively new Center whose DG, Richard Sawyer, he knew well. It was not clear to me in what capacity I should offer my services, but Pepe assured me that this was not important.

I wrote to CIP's Director General giving an outline of my experience and waited for a reaction. Nothing happened until six weeks later, when I received a phone call from Fred Palmer, working for the Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT) in Islamabad, the capital city of Pakistan. Apparently Dick Sawyer had tried to get in touch with me by cable; but Lyallpur is described by its own inhabitants as "the biggest village in Asia," and no message ever reached me. The gist of the message received by Fred was that if he could locate this person Brown, to tell him to be in the Oberoi Intercontinental Hotel, New Delhi, India, in about five days, to have an interview with Sawyer.

In 1975, travel between Pakistan and India was still extremely restricted. It was only four years since the war had ended with the separation of the part of Pakistan now known as Bangladesh. All border crossings were still closed to cars, and there were hardly any direct air flights; so, although the nearest route to India was only 30 minutes from nearby Lahore, I could not go by road that way. A call to a friend with a travel agency in Lahore indicated a possible air connection on KLM via Karachi, and reservations were made accordingly. I was due to fly out on Saturday and meet Sawyer on Sunday evening. Friday evening, I received a phone call from Lahore saying that the flight booked did not exist and that

there was no alternative. For an hour or two I was convinced that I had missed my opportunity. However, in Pakistan as in Peru, there is nearly always a solution if one has the right contacts. On Saturday morning I drove up to see Nader, a very good friend in Lahore, and ask what he could suggest. He concluded that the only feasible route given the time restriction was to walk across the border crossing at Wagga, on the road between Lahore and its twin city Amritsar in India. The problem would be getting a pass to cross the frontier on the Pakistani side. Nader remembered an old English police officer who had decided to stay behind after independence and who still worked for the Pakistan Government. A phone call found him at home, in a small government house where he was in semi-retirement. He agreed to give me a road pass which might do the trick, although in reality it had no validity in the prevailing political situation.

Early the following morning, Sunday, Nader drove me to an office where his acquaintance filled out the usual scruffy mimeographed form that seems to be standard throughout the sub-continent. I was impressed by the number and variety of rubber stamps on his desk, and suggested that liberal use of those might make the form more intimidating. I think he managed to get four or five on the pass. We barely had time to thank him before Nader got in the car to drive me the thirty minutes to the border. I was not entirely confident in the effectiveness of my scruffy piece of paper, but it worked like a charm. I was given a courteous reception, though inwardly I felt like a con-man. Within ten minutes I was walking across the border with Nader giving me a triumphant wave. On the Indian side, a decrepit Premier taxi

with square wheels took me into Amritsar and straight to the office of Indian Airlines in half an hour, in time to book the next flight to New Delhi. There was even time to look around Amritsar, see the Golden Temple and get to Delhi that afternoon.

On arrival, I called Richard Sawyer and we arranged to have dinner together that evening in the company of his wife, Norma, as well as Roger Rowe, Ed French and Dick Wurster, senior members of his staff who were traveling with him. It took about thirty minutes before Dick Sawyer and I got into a heated argument over his assertion that all the Brits he had ever had on his staff were immature. I should have been forewarned, as we were to have similar arguments at least once a year for the next 15 years. These generally ended in a draw. Only when Dick pulled rank did he get the better of the argument. I often remembered how in my early years in Africa, a former boss was once so frustrated with a younger colleague who was apparently about to win an argument that he broke off and demanded of his tormenter, "How much do you earn?" On being told the amount, he replied, "I earn three times as much as you do so I must know three times as much. Shut up!"

Nonetheless, the outcome of our "interview" was a promise that if I contacted him on his return to Lima, he would make me an offer. The result: I arrived in Lima in early February 1976, as Coordinator for Regional Research and Training.

# **The International Potato Center**

**T**he International Potato Center (CIP) was created in 1971 through an agreement between the Government of Peru and North Carolina State University (NCSU). At that time, NCSU had a contract from USAID to strengthen research at the Universidad Nacional Agraria (UNA) and other national research organizations. Richard Sawyer was a member of the NCSU team and leader of the potato research program.

The new Center established its headquarters in the district of La Molina on the outskirts of Lima, in a building donated by the Peruvian government. The acronym chosen, CIP, was derived from the name in Spanish, as at that time the English equivalent, IPC, was also the acronym of the International Petroleum Corporation which had associations with unfortunate events that had taken place in South America. Funding by international donors was first received in 1972, and operations began that same year.

The initial task of the Center was to collect and classify native varieties and wild species of potato, so as to establish a comprehensive genebank for the use of scientists worldwide. Even in those early days there was a growing awareness that genetic erosion was steadily eliminating traditional varieties which might contain important genes for disease resistance, of great value in potato improvement. It is interesting to note that even before CIP, other centers such as CIMMYT and the International Rice Research Institute (IRRI) had already embarked on similar conservation programs with their own crops; this is now a standard strategy used by all crop-orientated international centers, culminating with the politicalization of the theme at the Earth Summit in Rio de Janeiro, in 1992.

In this initial task, the Center was fortunate to obtain the services of Ing. Carlos Ochoa, a highly respected Peruvian potato taxonomist who had spent much of his career collecting and classifying potato species. Carlos in later years received several major awards and honors for his lifetime dedication to unraveling the genetic and taxonomic relationships between the numerous cultivated and wild species in CIP's World Collection. Many of the latter he himself discovered in the wild, or he re-discovered living specimens of species previously known only through herbarium collections.

In those early years, before research results began to be generated by CIP scientists, the principal sources of knowledge about the crop resided with scientists in Latin America and the northern industrialized countries. The creation of an efficient organization to establish regular scientific contact with developing countries worldwide and transfer this existing knowledge was considered equally as important as generating research results specific to the conditions of those countries. Thus, a network of regional offices staffed by CIP scientists began. The main task of the scientists staffing these offices was to contact national institutions interested in potato improvement, and to collaborate with them in conducting the research needed to solve local problems.

This important decision made by Richard Sawyer was a considerable departure from the conventional policy of earlier centers, whose strategy was to bring national scientists to center headquarters for training. Perhaps even more important was the decision that the cost of this regional organization would be part of the "core" budget, rather than being financed by additional funds that might be generated for the purpose. This had

*Kenneth J. Brown*

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important consequences in later years, because when the availability of international funding became restricted the CIP Regional Program maintained continuity.

# The Regional Research and Training Program

**M**y first job on arrival in Lima was to help the office secretary, Isabel, decipher a tape recording of the proceedings of the one and only Planning Conference the Regional Program ever organized. It was a complete disaster. Apparently the participants had been given no clear terms of reference, and consequently, they spent two days swapping ideas and reminiscences without much structure to the discussions. I spent several hours with an almost indecipherable recording, trying to extract something concrete from the deliberations but with little useful result. Periodically, the same voice would come through indicating that its owner had a "gut reaction" on some topic or other. I eventually discovered that the voice belonged to Dr. Art Coutu from North Carolina.

It is no wonder that his "gut reaction" was so prominent the whole tape was completely indigestible. About the only clear decision that came out of this exercise was a change of the name from "Outreach Program" to "Regional Research and Training Program." The reason for this change was more political than scientific. At that time donors were suspicious that outreach was extension in another guise, and the Centers were supposed to be centers of excellence for research. To the present day, this ambivalence on the part of donors is unresolved. While insisting on quality research, donors and various review teams spend much of their time requesting evidence of "impact," difficult or impossible to achieve without appropriate technology transfer linkages.

In February 1976, the administration of the Outreach Program was the responsibility of Dr. Richard Wurster. Its transformation into the Regional Research and Training Program, after the famous Planning

Conference, better reflected the philosophy that was then evolving; that is, both the generation and transfer of results in the Regions. The Program's expansion worldwide resulted in my new appointment as Coordinator, and when Dick Wurster resigned in 1978, I became Director.

At headquarters in Lima, I had two colleagues in the Regional Program: Jim Bryan, the Senior Seed Specialist who started with Dick Sawyer when he first came to Peru under the North Carolina project, and Oscar Malamud, in charge of the countries of the South American Region. Jim was in charge of the production of seed for experiments and export-quality tubers from advanced clones and varieties of the breeding program, which were regularly sent to regional locations and national institutions for appraisal. He was always in great demand by regional staff for his wealth of practical knowledge. His blunt comments have endeared him to farmers and colleagues alike. On one occasion in Zimbabwe, during a wrap-up session after a review of local seed inspection procedures, he was asked if he had any comments to make on what we had seen. Jim offered the comment that the inspector, who had not sterilized his knife while classifying the various lots, should be kicked where it hurts. The resulting amusement was enhanced by the fact that the culprit was present in the group, having removed his white coat, and Jim had not recognized him.

Dick Wurster had previously worked at Makerere University in Kampala, Uganda, where he helped organize a successful potato breeding program. Even now, in 1993, some of the varieties produced by his program are widely grown in East Africa. Among Dick's many hob-

bies, he had a private pilot's license. He arrived in Lima with his own plane, which later proved extremely useful for rapid transport to CIP's high altitude station in Huancayo, in the Andes mountains. He used to fly his family home on leave to the U.S. each year getting the plane serviced at the same time. On one of these trips he landed at a small airport in Florida, and while going through immigration formalities glanced out of the window in time to see a trainee pilot taxi out of control straight into his parked plane. As a result of this accident, he purchased a twin engined Cessna which for many years gave excellent service to Huancayo.

When he left CIP in 1978, Dick Wurster sold his plane to the Center. By then, however, more knowledgeable staff such as Orville (Orrie) Page, who had flying experience during the war as a test pilot in Canada, started to realize that the plane's margin of safety when taking off from a sub-standard runway at 3,100m above sea level was practically nil. In one particularly hairy incident, our pilot Jaime, a cowboy if there ever was one, was flying the plane in thick cloud somewhere above the Mantaro Valley with Orrie on board when the wings iced up and the plane lost control. By sheer brute force the two of them managed to regain control. Soon after, the decision was made to replace the plane for a more powerful model. The Cessna was eventually sold to two buyers who walked into the Controller's office with US\$120,000 in cash. No questions were asked, and the transfer of ownership was duly legalized before the plane left CIP. The plane's saga as we know it ended six months later, when it was captured by police on a cocaine-smuggling run in the Amazon area.

# The Regional Offices

# Latin America

## Central America & Mexico

The first Regional Office, located in Mexico, was the direct outcome of the original late-blight research program of the Rockefeller Foundation. This program, started in the 1960s by Dr. John Niederhauser, was inherited by CIP in 1972. John was a close colleague of Dick Sawyer in the late 1960s, and he helped plan the strategy that led to the formation of CIP. Dick has often recounted how CIP's statutes were drafted on the back of an envelope on his kitchen table during a series of shouting matches between him and John. By inclination, John is a field man, never happier than when he is with a group of farmers from a developing country. Dick, on the other hand, is a builder, and he saw the building of the new center as his main ambition.

John is another of the many colorful characters who form an integral part of the CIP history. As a student he traveled the world, at one time meeting—at an exhibition in Moscow—the owner of the most famous name in Russian germplasm research, N.I. Vavilov. Vavilov invited him to work at his institute but after a spell in Russia John decided to return to his home country to study for a Ph.D. Then, as a Rockefeller Foundation employee, he was sent to Mexico as a wheat pathologist. But he chose to go his own route and devoted most of his time to working on potatoes, ignoring the complaints of his fellow wheat scientists and his employer. Finally, the Rockefeller Foundation abandoned any attempt to convince him of becoming a wheat scientist, and he happily spent the rest of his career on the

crop of his choice. In 1972 he left the Rockefeller Foundation and joined CIP as a senior consultant. He remained in Mexico until he retired in 1979. For some years afterwards he was consultant to the potato research network organized by CIP in Central America, and he still retains an active interest in potato research.

In 1972, the CIP scientist in Mexico in charge of the Central American Region was Ing. Manuel Villareal. Manuel was trained by John Niederhauser, and to this day they remain very close friends. In 1974, Manuel became the head of the Mexican potato research program and was replaced by Ing. Oscar Hidalgo from Peru. Oscar remained Regional Leader until 1978 when he went to North Carolina State University to study for a Ph.D. After completing his degree, Oscar came back to CIP and has been working in the Regional Program in South America ever since. Oscar is a person who respects authority and order, and to this day is the only colleague who has never addressed me by my first name.

In 1976, Dr. Michael Jackson of the U.K., who had recently completed his Ph.D. research at CIP under Carlos Ochoa, was posted to the Centro Agronómico Tropical de Investigación y Enseñanza (CATIE) in Turrialba, Costa Rica. His main task was to test the feasibility of growing potatoes in lowland tropical climates. Prior to this, CIP had made initial trials in the Amazon zone in Yurimaguas. Although the probability of success was low, the breeders made a number of selections showing some adaptability to these hot conditions, and a few potatoes of low quality had been grown. This achievement was picked up by Richard Sawyer, and shortly the famous "hot potato" article, which even today comes back to haunt us at CIP, appeared in the Readers'

Digest magazine. The objective of working in Costa Rica was to take this concept and test its feasibility in another country. In due course, many more CIP scientists would have the opportunity to work at regional locations, putting their ideas into practice.

While a student at CIP-Lima, Mike had attracted the enmity of the then Administrative Officer. This functionary had a reputation as a prolific producer of forms for every imaginable purpose. One morning, a printed form appeared on the door of the men's room nearest the administrative office. It requested potential users to complete the form in triplicate, one copy for Administration, one for the Departmental files, and one to be flushed down the toilet. Mike never acknowledged his culpability, but remained the prime suspect and incurred the wrath of Administration for many months.

In Costa Rica, Michael planted a number of clones from CIP and the large germplasm collection maintained by the Mexican national program. Within the first season, his crop suffered the ravages of severe bacterial wilt caused by *Pseudomonas solanacearum*. Although CIP had confronted this disease in other places, the combination of hot lowland conditions and a different race of the pathogen wiped out the potato crop at Turrialba. Only one plant survived; this plant was a progeny of Cruza 148, a hybrid produced at one time by the breeding program in Mexico. The tubers of this plant were planted again the following year, and again they survived the wilt attack. In subsequent years, this clone became an important source of resistance to the disease in other parts of the world, particularly in Africa.

In 1978, Mike took over the leadership of the Central America Region when Oscar Hidalgo departed

Mexico to begin Ph.D. studies and the Regional office was relocated to Costa Rica. In that same year, an important new concept emerged aiming at the formation of a regional association of countries committed to pooling their scientific resources in order to solve problems of mutual importance. This concept was of particular significance in Central America where, with the exception of Mexico, the area planted to potatoes did not merit the investment in critical mass of human and financial resources necessary to make a breakthrough in major problem areas. The initiation of the network, the Programa Regional Cooperativo de Papa (PRECODEPA), started a trend which eventually led CIP to establish six similar networks worldwide. The Government of Switzerland has supported the PRECODEPA network since 1979, and continues to take a close interest in its progress.

During the first two years of its existence, the PRECODEPA network Coordinator was provided by CIP in the person of John Niederhauser. By 1981, however, the network was functioning smoothly and a Coordinator was appointed from among the member countries. The first person to hold this post was Ing. Manuel Villareal of Mexico. Mike Jackson resigned from CIP in 1981, and the Regional office was closed. For several years, PRECODEPA remained the main channel for CIP's support to the national programs of the six founding member countries in the area. This network now has ten members: Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama in Central America plus Cuba, Mexico, the Dominican Republic and Haiti.

In 1988, CIP re-established a Regional Office for Central America and the Caribbean in the Dominican

Republic, with Dr. Oscar Malamud, formerly CIP representative in Bogota, Colombia, as the Regional leader. This provided an opportunity to cooperate with the English-speaking countries in the area, particularly in relation to research on sweetpotato, which CIP had included in its mandate in 1985. Research on integrated control of pests also became a major activity in that Region, and continues to be at the present time.

After reorganization of the Center and its Regional Program in 1992, the office in the Dominican Republic was closed and coordination for all Latin America was transferred to Lima.

## **South America**

In Peru, national potato scientists had for several years received extensive support from the team of the North Carolina State University project. Richard Sawyer had originally been the potato specialist in the group, and it was this experience which had stimulated his interest in starting a new research center specifically for this crop. In 1975, CIP initiated its Region for South America with the appointment of Dr. Oscar Malamud of Argentina as Regional Leader. Oscar is a natural salesman, even though his Ph.D. was in plant pathology. He describes how he financed his way through university by selling furniture in his spare time from mail-order catalogues. At CIP he brought the same entrepreneurial talents to bear, selling the idea of CIP's Regional Program to the whole of South America. Within two years, there were joint research activities between CIP and many countries. A big advantage in South America is the high level of training of agricultural scientists in the public and

private sector. Thus there was never a shortage of skilled human resources. At the time of CIP's founding, this was in sharp contrast to the rest of the developing world.

Oscar established his office in Lima, from where he immediately started to contact national institutions of the Andean zone and what are known as the southern-cone countries, Argentina, Brazil, Chile and Uruguay. These two zones have totally different agræcologies, particularly with regard to potato production. The Andean zone, with its 12-hour day, mainly grows varieties of *Solanum tuberosum* subsp. *andigena*, whereas in the other countries the varieties are *S. tuberosum* subsp. *tuberosum* (European type), adapted to long-day summers.

In the case of potatoes, the commonly used "seed" is the tuber itself, a vegetative part of the plant. Because vegetative materials are readily infected by viruses, the production of potato seed needs to be carefully managed to ensure that the propagative material is free of these diseases. Any improvement in potato production depends on the availability and use of good seed. Thus, CIP's participation with the national scientists in the South American Region began with the organization of production courses with emphasis on seed.

In the first few years of this Regional Program, CIP itself organized and conducted the production training courses. But in 1980, a new initiative was tried: the National Agricultural University in Lima was commissioned to run the courses, with CIP scientists taking a role similar to the university instructors. This was a very successful partnership, and in subsequent years universities in Argentina and Chile followed suit.

In 1978 an FAO Associate Expert, Ing. Andre Devaux, joined the South American Region as assistant

to Oscar Malamud. This was the start of a very close relationship between Andre and CIP, but also between Andre and South America. When Andre first joined CIP, he was newly married to Monique. Some time later Sophie, the first addition to their family, arrived. About one year later I had occasion to go to Bolivia, and asked Andre to accompany me. He requested that Monique travel with us, as she had had no opportunity until then to travel outside of Lima. We were in Cochabamba for several days working with Paul Egger, an ex-CIP member then heading a Swiss-financed potato project. Some months after we returned from Bolivia, a casual greeting to Andre and an enquiry about the family brought the response that Monique was expecting again, and that I was to blame. I was mystified, until he pointed out that I had agreed to his taking Monique to Cochabamba. The Cochabambinos always boast that theirs is the city of eternal spring, and this seemed ample confirmation.

Soon after that visit to Cochabamba, one of the frequent coups in Bolivia occurred. At one point Paul Egger's house was surrounded by machine-gun toting soldiers. It was an unpleasant experience, and after the Swiss Ambassador was arrested while driving out of La Paz, the potato project along with other Swiss projects was stopped for several years. However, Andre now directs the successor to this original project, in more peaceful circumstances. He is leading a six-man team in a special project designed to strengthen the national potato program, and family matters seem to have come under control, with no further "surprises."

In 1979, Oscar Malamud moved the South American regional office to Colombia, locating it in the research station of the Instituto Colombiano Agrícola (ICA) at

Tibaitata, near Bogota. This move was made to more closely identify the work of the office with the needs of the Andean countries, and to remove any confusion with the role of CIP headquarters in Lima. For a while, the Bogota office also interacted with the rest of South America, particularly those countries constituting the southern cone. However, in 1982 it was decided to create an additional office for these countries in Brazil, based at the Centro Nacional de Pesquisa de Hortaliças (CNPQ), a station of the Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA) in Brasília. Oscar Hidalgo, recently returned from completing his Ph.D. studies, became the Regional Leader. This office functioned until 1988, when it was clear that the inherent strength of the various national potato programs justified a more arms-length relationship. The office in Bogota continued until 1992, after which responsibility for all Latin America and the Caribbean reverted to CIP headquarters and Oscar Hidalgo returned to Lima to continue his regional duties from there.

National pride was sometimes the cause of misunderstandings during these years, particularly in the southern cone countries where many of the national scientists had gained their Ph.D.s at universities in the U.S. and Europe. An off-the-cuff remark could often be misconstrued, and then needed several interchanges by correspondence, or a personal visit, to remove the source of friction. CIP staff were indeed sometimes at fault, though I feel that generally this was due to a desire on the part of my colleagues to prevent technical errors before they occurred. In retrospect, these incidents can be quite amusing. On one occasion, at a meeting in Brasília, a local scientist, obviously proud of his European ancestry,

opposed a certain course of action, expressing fairly forcibly that "You Latinos are so disorganized that you ruin everything." Dr. Primo Accatino, a CIP staff member who comes from Chile and happens to be one of the most organized persons in CIP, was one of those present at the time. Immediately, there was an explosive reaction from Primo, who told the speaker that he was proud to be a Latino and would back his organizational ability against that of the speaker at any time. I'm happy to say that nowadays those pinpricks are mostly behind us; but then, we all mellow with the years.

Soon after CIP opened its doors, a number of contracts were negotiated with other institutions to do specific research on the Center's behalf. This was considered a cost-effective way to get research answers on some topics for which CIP did not have the necessary critical mass, either in staff or equipment. Generally, the expertise and resources were found in North American and European universities and research institutions, areas where potato production was traditionally important.

However, the high level of expertise existing in national South American potato programs has also been a source of close collaboration with CIP in topics such as breeding and disease control.

The earliest contracts of this kind were in Argentina, with the Instituto Nacional de Tecnología Agropecuaria (INTA), which over a number of years played an important role in developing breeding materials. CIP received materials produced by this program, distributing and evaluating them worldwide. In recent years, several of these clones have been widely adopted in the countries of Asia and Africa. The most well known is the clone B71-240.71, which has been given many local

variety names from China to Africa to South America. The most recent information suggests that this one variety is planted on 200,000 hectares in China alone.

Another example of this type of relationship is with Chile. When CIP started work on true potato seed (TPS), we had no idea how to produce the actual hybrid seed in quantity. It was decided to contract the Instituto Nacional de Investigaciones Agropecuarias (INIA) research organization in Chile to carry out this research for us, with CIP providing the parent cultivars. Within two years, the problem was resolved; the technique that INIA developed has since been used for commercial seed production.

Another initiative piloted in Latin America was the formation of a professional society for the scientists of the region. The Asociación Latinoamericana de Papa (ALAP) held its first conference in Puerto Varas, Chile in 1977. Around 50 scientists from CIP and national programs took part. Representatives of the private sector also participated in this meeting. The Association now periodically publishes its own journal and holds a conference every two or three years; through its regional offices, CIP sponsors the participation of a number of national scientists. ALAP has been the model for the formation of similar associations in Africa and Asia. The importance of these regular conferences is not confined to the presentation of research papers alone; over the years, the camaraderie that has built up among scientists has proven important in promoting free exchange of ideas and materials.

At the initial ALAP meeting in Puerto Varas, an amusing incident took place in the small casino in the hotel. Dr. Parviz Jatala, a CIP nematologist and amateur

magician, was testing his skill on the blackjack table. Parviz is reputed to have spent a summer in Las Vegas when he was a student dealing blackjack. Apparently he was lucky that evening, and mentioned to a colleague, Carlos Martin, that the dealer was helping him with signs known among the fraternity. The following evening Carlos gave Parviz \$100 to play for him. That night the dealer was obviously in a less cooperative mood, as Parviz lost it all.

Recently, several new initiatives have taken place in South America as a result of the process of decentralization, a prominent feature of CIP research. In 1990, a research facility was established near Quito, Ecuador, with the primary purpose of increasing the emphasis on research for late blight, the major disease of potatoes, as well as providing an alternative high altitude research site. In 1991, CIP established an office in Santiago, headed by Dr. Primo Accatino, to exploit the potential for breeding potato clones with adaptation to a range of agroecologies not present in Peru. Chile, with its very long coastline stretching from latitude 18 to 55 degrees south, is ideal for this purpose.

In the past decade, CIP agreed to take on three bilateral projects to support national potato research programs in the Region. All three were supported financially by Cooperación Técnica Suiza (COTESU).

**Bolivia** CIP agreed to undertake a project in Bolivia, and Programa de Investigación de Papa (PROINPA), started in 1989. This project aims at improving all aspects of potato research in a country where the crop is a staple in the diet of a major part of the population. The situation of the national research institute, Instituto Boliviano

de Tecnología Agropecuaria (IBTA), had been precarious for many years and there had been serious attrition of the research staff; as a consequence, the potato research program suffered. There was strong interest both nationally and internationally in correcting this situation, and CIP agreed to recruit a strong team to rebuild the research program and train local staff.

Andre Devaux, originally assistant to Oscar Malamud in the Andean region and who subsequently worked in Rwanda and Pakistan, was recalled to head this project. Nelson Estrada, ex-CIP scientist and probably one of the most successful potato breeders in the Andean region, was recalled from retirement to restart the breeding program. Another major problem of potatoes in Bolivia is infestation by nematodes; Javier Franco, at that time in CIP's nematology department, was assigned to cover that area. Two other disciplines needed reinforcing: pathology and social science. Joanne Parker, who had recently completed her Ph.D. in pathology, and Greta Watson, a human ecologist, took these positions. Andre was fortunate in being assigned an experienced national co-leader in Antonio Gandarillas, who had earlier gained his M.S. in virology working at CIP. At the same time, COTESU assigned a young anthropologist, Nicole Bezancon, to work with the team and gain experience.

Joanne left the team after two years and was replaced by Enrique Fernandez-Northcote, an experienced and highly respected pathologist who at that time was a professor at the Universidad Agraria in Lima. Two of the Bolivian staff were selected to study at CIP and the Universidad Agraria; they have recently completed their M.S. degrees, and have now been reincorporated into the

team. A third Bolivian scientist is currently studying in Colombia. Antonio Gandarillas departed for Wisconsin, in early 1993 to start his Ph.D. studies, and his role as co-leader with Andre has been taken up by Gino Aguirre, who gained his M.S. in Belgium.

With this strong team the project got off to a flying start. Technical progress has been impressive but more than that, PROINPA is seen by authorities in Bolivia as the model for other commodity research programs currently being planned by IBTA with financing from the World Bank. One senses the dynamism when visiting this team; it is well organized, and everyone, down to the technical assistants, knows his role and can confidently explain details of research in progress. With practical results already demonstrated, such as new varieties and control measures for late blight and nematodes, the potato industry in Bolivia is getting an injection of scientific support that it has not known for many years.

**Ecuador** This is the latest of the three bilateral projects in the Andean area; it started in 1991. The objectives in Ecuador are rather different from those of Bolivia and Peru. Technical improvements have been generated for many years by the national program but have had little impact on the agriculture of the majority of potato farmers. For this reason, a deeper understanding of the problems associated with generation of technology appropriate to the actual socio-economic circumstances of farmers in Ecuador is a prerequisite for successful transfer. Alberic Hibon, an agricultural economist with considerable experience in Latin America, was appointed to lead this project.

The first year was mainly devoted to designing a research strategy, developing a plan of action for the project and building a national team. A series of trials with farmer participation have already been conducted during the past season, and based on these results, the team will prioritize problem areas and formulate its approach to technology generation and transfer for the coming years.

**Peru** The first of these three bilateral projects, *Semilla e Investigación en Papa (SEINPA)*, started in Peru in 1982. The main objective was to improve the quality of seed available to small and medium producers using the best rapid multiplication and disease-prevention techniques available. The SEINPA headquarters was sited in the INIAA experiment station, adjacent to CIP's boundary. Cesar Vittorelli, previously in charge of CIP's research station in Huancayo, was contracted to implement the project. Cesar is an extremely practical person and the project got off to a racing start. If there was a hold-up in construction of the screenhouses, he personally went to the timberyard, bought the wood and came back and supervised the work. All proven rapid multiplication techniques were tried, and consequently, Jim Bryan, CIP's seed specialist, was very busy in the early days advising the project. Juan Aguilar, another ex-member of CIP's national staff, was brought in to supervise the screenhouse work and Efraim Franco, an agricultural economist, examined seed demand and prioritized the varieties to be included in the multiplication program.

After the first 18 months, in terms of the production of planting material, the project was well ahead of its three-year target. Cesar was then needed at CIP head-

quarters, and Efrain took over the leadership of the project. He was later joined by Jorge Recharte, an anthropologist, and Tommy Fairlie, an agronomist.

At the present time, the project is supplying pre-basic seed of both improved and native varieties. In the original proposal it was planned to hand over the management of the project as soon as possible to the national institution, INIAA. However, during the course of the project there have been radical changes in the public sector in Peru and privatization is the current government policy. Consequently, SEINPA is exploring a number of strategies for involving farmers in the multiplication of basic seed in order to ensure the continuity of the program. So far, there has been an enthusiastic response from farmer organization but it is too early to see if this will be sustained. Perhaps it is worth mentioning that during the 11 years of the life of this project, it has been managed entirely by Peruvian staff, all of them at one time associated with CIP. This illustrates the high level of technical competence available in Peru, in contrast to other parts of the world.

# Middle East & North Africa

This Region was established in 1974 when CIP opened an office in Lebanon, a country that had always exported small amounts of ware potatoes to neighboring Arab countries. The main reason for choosing Lebanon was that the Ford Foundation had its regional office in Beirut and was willing to provide the necessary infrastructural support to get CIP established in the Region. Primo Accatino was the first production specialist posted there; he started by studying the production of seed potatoes in the Bekaa Valley. According to John Niederhauser, the day after Primo arrived in Beirut a meeting was held with the then Minister of Agriculture; John as the senior CIP representative introduced Primo. Out of politeness, the Minister turned to Primo and asked, "Well, Dr. Accatino, what do you think you can do to help us?" Primo then proceeded to bend the Minister's ear for several minutes with examples of fertilizer trials, seed schemes, and all the other technical features that he intended to introduce. According to John, the Minister, in an aside to his aide, is said to have remarked in French, "Good God, the Romans are back."

At this meeting, John insisted that Primo would need a Lebanese scientific counterpart if the program was to have a real impact on local agriculture. There was no obvious candidate, but a few days later the Minister asked John what kind of person he had in mind. The reply was, "I'll take any warm body, even an economist will do." Whereby the Minister replied, "That is exactly what you are going to get." And so, Dr. Roger Cortbaoui, newly returned to the country from his Ph.D. studies in France, was appointed.

A regional workshop was held in 1975 in Cairo, in which representatives of nine Arab countries participated. Through this workshop the first contacts were made; these became the foundation for the collaborative activities that were to follow. Civil unrest had started by this time in Lebanon, and in 1975 the office had to be moved to Tunisia. Several countries in North Africa, including Tunisia, are substantial importers of European seed potatoes. In exchange, they sell early spring ware potatoes to European markets. However, there are three growing seasons in Tunisia and imported seed is only available for the main crop in January; for the plantings in September and November, farmers used to rely on home-grown seed which was poor quality. It was, therefore, decided to help the country develop a seed scheme to supply better quality seed for the other two seasons. The Canadian International Development Agency (CIDA) agreed to fund a three-year project. In 1976, Roger Cortbaoui who had remained in Lebanon, was recruited to manage this project, as his work at home had halted.

That same year, Primo Accatino moved to Turkey to establish a new Regional Office at the Aegean Research Institute in Menemen, Izmir. The main Middle Eastern and North African countries with which CIP regional staff were interacting at this time were Algeria, Egypt, Jordan, Lebanon, Morocco, Syria, Tunisia and Turkey. Partly in jest but also to test the reaction, Primo suggested to Richard Sawyer that since Izmir was on the Mediterranean coast it might be a good idea to buy a yacht for the office and visit the other countries by sea. Dick did not appreciate that sense of humor, and the idea was not broached again.

Izmir was an ideal location in many ways, with good communications and more than adequate laboratory facilities. The principal drawback was that the local agricultural area was not representative of the main potato production areas of the Anatolian plateau, and therefore the impact of much of the work was limited. In Turkey, the main emphasis was on improving local seed production and breeding and selection to find high-yielding varieties with virus resistance. Many of the varieties grown at that time were very old European varieties and thoroughly degenerated. Turkey, unlike other countries in the Region, imports relatively small amounts of commercial seed and gets most of its seed from certain areas of the country where growing conditions are suitable. With the appointments in 1976 of Mr. Brian Honess, a seed specialist, and Ir. Wim Schrage, a Netherlands Associate Expert, this work was considerably strengthened. Both devoted a good portion of their time to helping the emerging Turkish program develop a seed scheme in Bosdag, a highland area with a suitable climate. Wim in particular worked closely with his Turkish colleagues, whereas Brian had regional duties in addition.

Wim, as a bachelor, relaxed at weekends by helping a local farmer overhaul his combine harvester and other equipment. As a result, he acquired a working knowledge of the Turkish language, not an easy task. On one occasion, during a visit by myself and other colleagues from Lima, he was coerced into demonstrating his language proficiency with one of the young Turkish female assistants riding back with us to Izmir in his car. He was asked to explain to her that she was a friend of all those present. When Wim translated, she asked to stop the car and get out immediately. It was discovered

later that the sort of friend unwittingly suggested by Wim had rather liberal morals. In 1977, Primo Accatino returned to Lima to work in the Department of Physiology and was replaced in Turkey by Dr. Patricio Malagamba.

In Tunisia, meanwhile, the seed project had defined its strategy. Roger Cortbaoui had decided that the most immediately effective approach would be to solve the problem of seed for the September planting, or *arrière* season. European seed normally becomes available in late November or early December. Even at that time of the year, the tubers of most varieties have not completed their natural dormancy period and will not sprout unless specially treated with highly toxic chemicals. Consequently, the only recourse for the Tunisian farmer for the September season is to use tubers saved from his late July harvest. These show partial dormancy: only apical buds germinate and the fields are full of single-stemmed plants which give only moderate yields. Clean seed at least one month older was needed to improve this situation.

Another important factor considered was the epidemiology of the aphid population. Aphids are the main vectors of virus. A study revealed that populations only start to explode in the second week of July. If the crop was harvested by the end of the first week, virus infection could be avoided. At the same time, the extra three weeks gained by early harvest coupled with the high temperature conditions during the summer storage period overcame the dormancy problem, and seed tubers with multiple sprouts were achieved. Also, the seed used to plant this main crop in January was imported from Europe and thus started with low virus levels.

This strategy was implemented as a result of close cooperation among the various Tunisian institutions involved in research, training, seed production and extension. A coordinating committee was formed, and still operates to date. Within six years, the project had provided sufficient seed for the September planting, and with the resulting higher yields, imports of ware potatoes during the harvest period (December to January) were virtually eliminated. In 1979, Roger Cortbaoui came to Lima for a period of two years; the project in Tunisia was then supervised by Wim Schrage, who was transferred from Turkey.

Schrage was replaced in Turkey by another Netherlands Associate, Ir. Anton Haverkort, who like Wim rapidly acquired a good working knowledge of the language, as far as I know without confusing the local staff. Anton, like Andre Devaux, established a long-standing association with CIP eventually moving to Rwanda with Andre to participate in the development of the national potato program. In 1979, Patricio Malagamba returned to Lima to work in the Physiology Department at CIP; Ing. Marciano Morales Bermudez then took charge of the Regional Office in Turkey.

Since 1977, CIP had become increasingly aware of crop losses in the field and stores caused by various species of potato tuber moth (PTM). Although at that time this pest was not considered serious in the Andes, it was reported to be severe in parts of Central America and, according to a report prepared by a consultant, was probably of considerable significance worldwide. Several species appeared to be involved, but their relative importance was not clear. In 1979, a young Indian scientist, Rama Rao, was posted to Turkey to assess the extent of

the problem in the Region. He fairly quickly established that PTM was a major pest in the countries of North Africa and generally throughout the Region, and the species involved, *Phthorimaea operculella*, had also been identified in other places. The problem was particularly important in the traditional farmers' stores or *nawallahs*, where losses could easily reach 90% if precautions were not taken. In Tunisia, the most frequently used control measure was to dust the crop in the store with Parathion, an extremely toxic organophosphorus insecticide. In the markets, white-coated potatoes would be on sale from August on. It was decided to intensify research to come up with alternative, less toxic control methods. In 1982, Rama Rao resigned and for a while the entomological investigations slowed down.

Many changes in the regional boundaries and staffing took place in 1982. Roger Cortbaoui returned to Tunis after his two-year stint in Lima. He was joined by Jurgen Benz, a young Swiss agronomist. Jurg Benz took specific responsibility for all aspects of storage. In that year, the Tunis headquarters again took on regional responsibilities, extending its coverage to include the countries of West Africa. Up to that time, CIP had made only occasional contact with West Africa. In 1983, it was decided to transfer the Turkish regional office to Egypt. Dr. Sidki Sadik, previously Head of CIP's Physiology Department, became the new Regional Leader. At the same time, this office was given responsibility for the Near and Middle East. Together with a local colleague, Dr. Ramzy El-Bedewy, Sidki developed a research station at Kafr-el-Zayat, near Tanta, in the Nile Delta. On this station, they started an intensive research program on the use of true potato seed. By then, CIP had been studying this new

system of potato production for about six years. In deciding on priorities for work in Egypt, it was felt that TPS was ideally suited for the many low-resource, small-holder farmers who could not afford to buy expensive seed tubers. Primo Accatino had been working on this subject in Lima and the U.S.; he selected the first hybrids supplied to Egypt.

The early experiments in Egypt were not particularly promising; there were difficulties in deciding on a suitable substrate to germinate the seed and some of the hybrids were not adapted to local conditions. However, within two years CIP personnel were more optimistic. By 1987, CIP decided to encourage participation of the private sector and entered into agreement with a private company, ESCAgenetics. This company was shown the technique devised by INIA in Chile to produce the TPS seed in quantity. They were also given parents of CIP hybrids for production of seed in the 1989 season. In 1990, ESCAgenetics made an arrangement with the Pioneer Seed Company to grow TPS in Egypt on a large scale, with the aim of producing low-cost seed tubers for planting. The first season was not successful for a number of reasons, principally irregular soils and poor water supply. But in 1992, with a different managerial arrangement, the venture seemed to hold greater promise. About 28 ha were grown and the crop looked extremely vigorous. However, ESCAgenetics was not satisfied with the result, and in 1993 placed a strong team of its own staff in Egypt to supervise the project. The crop is still being harvested so it is too soon to know whether there has been an improvement, but a successful season will ensure the future of this technology.

Sidki Sadik resigned from CIP in 1988. Since then, Ramzy El-Bedewy has been in charge of the work in Egypt under the regional leadership of Roger Cortbaoui. Once again, the Regional Office has gone back to Tunis where, in the past few years, the work on improving *na-wallah* stores and the use of bio-control measures for PTM have taken on added importance. The most promising measure to be thoroughly tested is the use of the naturally-occurring baculovirus used in Lima and elsewhere. With the help of a French research team from ORSTOM, a probe and antisera to identify the virus have been produced, and these will aid the work of monitoring the spread and persistence of the organism.

In 1984, a young Swiss entomologist, Dr. Roland von Arx, had joined the team in Tunisia, where he started several lines of work to address both short-term and long-term priorities. In the short term, he identified the use of less toxic insecticides to replace Parathion for the control of PTM. Soon after, the Government banned the importation and use of Parathion. Cultural methods were being tested to control the pest by reducing the number of eggs deposited on potatoes in the field before they entered the stores. The epidemiology of the moth populations was better understood, and improvements to storage were being introduced.

By now, CIP had obtained a synthetic female sex pheromone to help monitor populations. Ongoing work in Lima on biological control methods also included use of a naturally-occurring baculovirus, and of *Bacillus thuringiensis* (Bt). In Tunisia, the use of Bt in stores showed great promise. When for family reasons Roland had to leave, this Region was becoming a leader in the practical application of biological control measures. This line of

work is continuing, and other entomologists such as Olivier Roux, as well as agricultural economists such as Peter Ewell and Keith Fuglie, have contributed greatly to the understanding of the problem of tuber moth. In 1992, Abdulaziz Lagnaoui, an entomologist from Morocco, joined the team in Tunis to continue this work, now considered the top priority for North Africa.

In 1985, as it's been said, CIP added sweetpotato improvement to its research objectives. Egypt is the only country in North Africa where this crop is important, and consumer preference is for very sweet sweetpotatoes. CIP took advantage of a contract with North Carolina State University. NCSU has a strong sweetpotato breeding program, and several of their best clones were introduced by Ramzy for trial in Egypt. Within two years, it was obvious that these clones were going to be highly successful, as they suited the local taste and gave more than twice the yield of the degenerated local varieties. Once again, the private sector in the country was quick to take advantage of the improved crop, and the first 1.2 ha of clean material to produce cuttings for sale and distribution are already planted. By 1992, several local companies were multiplying virus-free planting material and more than 300 ha were reported growing in the Delta; in 1993 this figure is close to 1,000 ha. The high productivity of this variety will aid in its rapid diffusion.

The case of sweetpotatoes is a good example of the need to take careful note of local consumer preferences with respect to taste and other characteristics. The North American and Peruvian varieties are soft and quite sweet. During one of the annual meetings at CIP headquarters, breeder Ted Carey organized a tasting panel with staff from Peru, Africa, and Ramzy from

Egypt. The sweet Peruvian varieties were judged adequate by the Peruvian staff, too sweet by staff from Africa, and Ramzy commented that in Egypt they would add a lot of sugar.

# Sub-Saharan Africa

## East Africa

The history of this Region goes back to before CIP had its own staff stationed in Nairobi. In 1972, when CIP started there, the Overseas Development Administration (ODA) of the British Government had a six-person team located in Kenya specifically to build up the potato research program. This team was headed by William Black, a highly respected potato breeder from Scotland. Bill Black introduced a lot of his own breeding materials, which proved to be well adapted to East Africa and became the forerunners of the successful Roslyn varieties. In 1974, CIP joined forces with the ODA team to hold a seed production training course in Nairobi for participants from the surrounding countries. The following year, Sylvester Nganga, a Kenyan Ph.D. from Makerere University in Uganda, was appointed by CIP to establish the Regional Office in Nairobi. He was joined by Siert Wiersema, at that time the first Netherlands Associate Expert assigned to CIP.

Initially, Sylvester concentrated on receiving and evaluating germplasm, much of which was sent from the Mexican collection. It was not until several years later that clones bred at CIP were ready for evaluation. To facilitate the introduction of new germplasm, CIP had excellent collaboration from the Kenyan Plant Quarantine Station at Muguga. CIP was given permission by the Ministry of Agriculture to set up a multiplication unit at Muguga for distribution of certified tubers of improved clones to surrounding countries.

During his time in Kenya, Siert Wiersema specialized in developing and testing simple storage structures for ware potatoes. He designed several models suitable for use by smallholder farmers, which could hold up to two tons of tubers with minimum weight loss for several months in the highlands. Siert had a very strong independent streak, and would argue fiercely on technical points with even the most senior of his colleagues. He was good at training, and helped a lot in such countries as Madagascar. After two years, which was the usual length of assignment of associate experts, he was given a post by CIP to work on TPS in Lima. The eventual outcome of this work became the thesis of his Ph.D.

Siert was replaced in Kenya by another Associate, Eisse Luitgens. Eisse continued the work started by Siert, and at the same time became involved in other activities such as designing seed production schemes for several national programs. Eisse never had any trouble in East Africa or elsewhere. At 1.95 m height and built proportionally he gave an instant feeling of security when walking beside you. To see Eisse on the dance floor during the annual fiesta in Lima was like watching a perpetual motion machine, and you gave him a wide berth when he was really swinging if you did not want a bruised hip or worse. Eisse stayed until 1981, when he left CIP to work with a project financed by the Netherlands Government in Bangladesh. He has since gone back to the Netherlands, where he is now a potato seed farmer.

In the 1980s, the size of the team at the Nairobi headquarters was increased in response to increasing demand by neighboring countries, and also because decentralization of research from Lima was accelerating. A breeder, Haile-Michael Kidane-Mariam, was located in

Nairobi to breed potato varieties specifically adapted to the conditions of East Africa. His strategy was to incorporate the best of the resistant materials sent by CIP-Lima into a background of locally adapted parents. By now, it was apparent that the expression of resistance was incomplete if the genetic makeup of clones was unadapted to local growing conditions.

Another member of the team was George Hunt, who was first employed in Kenya by ODA and subsequently seconded to CIP. George was an agricultural engineer who during the years in East Africa specialized in potato storage. Unlike his predecessors, he carried out much of his research on storage in warm climates, as the tropical potato was still at that time a priority at CIP. By inclination George was an extensionist and frequently traveled around the Region advising, setting up experiments and running training courses. Having started his overseas career in Tanzania, where standard dress consisted of a shirt and khaki shorts, George was determined not to let the rarified atmosphere of Nairobi intimidate him and until the time he left he always appeared at the office in shorts even though air temperatures at that altitude were generally quite cool. In later years, the team was joined by Linnea Skoglund, a pathologist, Carlo Carli, a seed production specialist, and Peter Ewell, an economist particularly interested in demand and use of sweetpotatoes.

In spite of Kenya being the location of CIP's regional headquarters for 17 years, it has been the country in East Africa where CIP has achieved least in terms of technical achievement. Over the years, we have seen the main research stations at Tigoni and the Quarantine Station at Muguga steadily decline with a consequent

increase in the levels of infection of seed stocks. One would have expected that the well-being of the potato crop would be a priority, as it is one of the most important cash crops in the highlands after the export crops, tea and coffee. However, in the past five years any material improvements in these stations have been at CIP expense. Unless there is a concerted official effort to invest in the research program, it is difficult to see what more CIP can do to help.

By contrast, the attitude of the farming community has been very positive. Since the time of the British ODA team in the 1970s, few new varieties were released by the national potato program. However, by the mid-1980s CIP staff noticed many new varieties on sale in local markets, which in appearance bore little resemblance to established varieties. Two surveys conducted by CIP social scientists concluded that many varieties widely grown in the highlands had never been officially released. These bore close resemblance to the type of germplasm CIP had been introducing for evaluation over the past 15 years. Some had even kept the original names, such as the variety Mariva from Peru; others were just known as America. There had been no deliberate action by CIP scientists to bypass the official distribution system but apparently laborers and technicians working on trials and national performance evaluations throughout the country had privately been making their own selections and planting them on their farms. What better recommendation for these varieties was needed?

**Rwanda** In 1978, CIP initiated the first of its "special projects," in Africa. This was the terminology used for a project not funded from CIP's core budget, but by a

bilateral source. In this case, the project was funded by the Administration Générale de la Coopération au Développement (AGCD) of Belgium for improving potato production in Rwanda. The first scientist on the project was Denis Goffinet but the program proper started when Peter Vander Zaag arrived in Ruhengeri as project leader. This was a case of starting from scratch, as no infrastructure existed. Peter, a Canadian by birth and brought up on a potato farm, was in his element. Although a soil scientist by training, he reveled in building. Within a week, he had close to one hundred laborers with wheelbarrows moving sand from the river, and buildings started to shoot up rapidly. In order to cut costs, CIP had bought two prefabricated wooden staff houses from a manufacturer in Nairobi. The manufacturer was supposed to have provided the technical details needed to erect them in Ruhengeri. Peter found that the plans were deficient and some of the vital metal bolts seemed to be missing. While Peter was sorting out the plans and building his own house, he and his wife Carla lived in a fairly rustic house in the local town. The development of the research site was rapidly followed by the seed farm at Kinigi, further up the volcano. Again, constructions for storage of crops and equipment went up in record time. Richard Sawyer, while admiring what he constantly called "the farm boy approach," nevertheless sometimes worried that this young man might be addicted to building rather than research.

But within two years, the program was producing clean seed of the most sought-after variety, Sangema, and by 1982 five new varieties had been selected. They were named in the following year, and multiplied and tested not only in Rwanda but also in Burundi and Zaire.

Two of these were subsequently dropped, but others are still in cultivation. The main reason for their acceptability was their high yield and resistance to disease.

In 1983, Peter accepted the post of CIP Regional Leader based in the Philippines. In Rwanda, he was succeeded by Anton Haverkort, transferred from Turkey, and Andre Devaux, from Lima. These two young men also threw themselves into the job with boundless enthusiasm. They were both barely thirty years old, full of the pioneering spirit, and this was a project where they had complete charge and ample funds to accomplish the work. In management style they are very different. Anton leads out front and resolves problems as they appear, whereas Andre is a planner.

Because of the importance of late blight in that agroecological zone, Andre concentrated on that specific area of work together with the on-farm testing of new technologies. Anton concentrated on seed production, agronomy and varietal selection. These lines of research were eventually the basis of their respective Ph.D. theses. They were an ideal team, complementing each other's abilities to the overall benefit of the research program. In their social life they also combined their strengths; Anton installed solar panels to supply water heaters for their houses and became an expert at smoking ham and sausages, while Andre contributed Gallic expertise in wine-making, principally from rhubarb of which there was an abundance. Thus, they were well adapted to the rural environment. Anton worked at full stretch all the time. He drove furiously and managed to wear out his Toyota pickup within two years. At that time the new highway to the capital, Kigali, was still under construction, and the earth roads were frequently impassable during the

wet season. He used a foam bed mattress over the seat in his car to cushion the shocks, but I recall traveling with him on one occasion and wishing that the roof was padded with the same material.

Anton was never content unless he knew his next step. When he was in England to finish his Ph.D. and had just submitted his thesis, he was more than usually unsettled. One day he went out; and when he came back he was relaxed once again. He told his wife Dingana, "Now that I have my plane ticket to the Netherlands in my pocket I feel better." Andre recalls how one Saturday when he was home on leave in Belgium, Anton rang him from the Netherlands to say that he would drive over the following day with the family to visit him. Andre assumed that, as usual, they would arrive about midday for lunch, and planned accordingly. At 9 a.m. the doorbell rang. Anton had arrived with his family while the Devauxs were still in their nightwear.

The attitude of the Institut de Science Agronomique de Rwanda (ISAR) towards CIP staff was quite astonishing; they were given carte-blanche to get the job done. When Peter Vander Zaag met the Minister, he asked for two trainee graduate students for the research program; they were immediately assigned, and he was told to select the leader within a year. On another occasion, I met Anton and other of his Rwandese colleagues, Martin Bicamumpaka, driving around the capital, Kigali, checkbooks-in-hand, with \$100,000 to spend on tractors, welding machinery and other equipment needed to set up a seed farm at Gishwati, near the President's home. Apparently, as soon as the decision had been made to expand seed production the money was deposited in a bank in Ruhengeri, and these two young men were

given the checkbook and told to get on with it. When I expressed my doubts about the inherent dangers of handling so much money in such an informal way, they were undeterred. The farm was duly constructed, with Anton designing and supervising the building of a large store and several other structures. Recalling the experience with Peter Vander Zaag, I surmised that all Dutch scientists or those of Dutch extraction were in reality frustrated construction engineers. By 1985, it was time to hand over the leadership of the program to ISAR. Andre Devaux had left for Pakistan in 1984, Anton Haverkort resigned to go back to complete his Ph.D. and Martin Bicomupaka, one of the original two trainee graduates, took over the leadership of the potato program.

In barely six years, the project in Rwanda proved to be an outstanding success. One reason for this could be the excellent public relations radiated by the whole team, both CIP and local staff. Le Programme National de l'Amélioration de la Pomme de Terre, or PNAP as the project was known, was a household name throughout Rwanda. One of the Rwandese technicians, who was an amateur songwriter, composed a ditty about PNAP. Somehow this song was broadcast over the local radio and became a hit on the local pop show. Thus, driving along the road one would be greeted by small children singing the praises of PNAP. Other CIP scientists also contributed to the success of PNAP, notably Angelique Haugerud, an anthropologist who worked with farmers in evaluating the various technical improvements that the project recommended. There was also excellent technical backup from the CIP team in Nairobi. It is worth recording that up to the time of the recent internal disturbances, PNAP was operating very effectively

under the guidance of Dr. Pierre Tegera, the second of the two trainee graduates originally assigned to Peter Vander Zaag. During the riots many of the buildings and equipment were ransacked and will need replacing as soon as the situation is stable. ISAR has taken emergency measures and some research activities have resumed in the south of the country.

**Burundi** In 1983, a project similar to the one in Rwanda was started in the neighboring country of Burundi with the appointment of Mike Potts. Once again, the source of funding was AGCD of Belgium. Mike had previously been a post-doctoral scientist with CIP in the Philippines, where his main studies covered the adoption of new ideas on seed and ware potato storage. The task in Burundi was essentially the same as in Rwanda, thus Mike was able to use the experience of his colleagues across the border to make a quick start. Although late blight was as important as in Rwanda, the overriding problem was bacterial wilt, a disease so severe that the potato area had decreased drastically as disillusioned farmers abandoned the crop. Conventional wisdom indicated that clean seed would be the first step in restoring confidence.

A virgin forest area at Mwokora, in the north of the country, was selected to ensure freedom from soil infection and developed as the first seed farm. This is an area of low fertility, with acid red soils which need careful treatment if they are to yield adequately. Like any good farmer, Mike first put in his erosion controls before clearing and ploughing the land, and rapidly the farm took shape. He decided that cattle would be essential for maintaining and improving soil fertility, and asked for

about 20 young bullocks to start the herd. This was unheard of at the Institut des Sciences Agronomiques du Burundi (ISABU), the local research institute; and equally mystified CIP Directors. But when Mike guaranteed to return the cattle in two years in better condition than they arrived, he got his way. A number of different fodder and arable crops were tested in a five-course rotation, both to feed the cattle and improve soil texture and sure enough the fat bullocks that he produced after two years were in great demand as draft animals.

Another important aspect of Mike's work was the choice of potato varieties. All potatoes grown in Burundi at that time were old varieties introduced during the colonial era. Large amounts of germplasm material were sent by CIP from Nairobi and Lima for screening. Rwanda also contributed with varieties selected there. Many of these were of Mexican origin, amongst which was the clone Cruza 148, mentioned earlier as having been selected by Mike Jackson in Costa Rica for bacterial wilt resistance and practically ignored since then. It showed the same apparent resistance in Burundi and was immediately selected for multiplication.

During the dry season, farmers cultivate the swamp areas as they are drying out; Cruza found instant demand in these areas. It was subsequently discovered that the variety could carry latent infection, and the strategy had to be modified. Nonetheless, Ndinamagara, as it was subsequently named, now occupies around 70% of the total acreage under potatoes in Burundi. Several other varieties have since been selected and distributed, but more than any other factor what made a name for the project was clean seed of this variety.

Mike was completely dedicated to his work, and not having a local counterpart he worked very long hours, seven days a week, frequently getting home from up-country travel after dark. His wife, Anthea, a school teacher by profession, took it upon herself to teach their two boys Ian and Alister. Gizozzi, where they were living at that time, was two hours drive from the capital Bujumbura, so there was little chance of regular schooling. Anthea herself had been brought up on a farm near Eldoret in Kenya and revelled in being back in Africa. All the same, it was very hard on her and Mike, and at one point while visiting Burundi Dick Sawyer ordered them to take two weeks holiday on the Kenya coast to force Mike to slow down.

When Mike left in 1988 to become the Regional Leader in Indonesia, he was succeeded by Jose Luis Rueda, known by his friends as Pepe Lucho. Pepe Lucho had previously worked as assistant to Primo Accatino on TPS research in Lima. He had left CIP to study for an M.S. at Wisconsin, where he met his future wife Martha, and he later worked for some years on a large commercial farm in Mexico, Martha's homeland. When approached, Pepe jumped at the opportunity to get back to potatoes, even in the middle of Africa.

He took over from Mike and continued to improve the seed system. One problem that had to be solved was the latent infection by bacterial wilt in seed tubers, particularly of the variety Ndinamagara. Somehow, bacterial wilt had entered the seed farm at Mwokora and very high levels of infection were being recorded. Analyzing the problem, it seemed to be caused by repeated seed multiplications without detection of latent infection in the cool conditions at Mwokora.

Latent-infected tubers were spreading the disease into all the fields, even though good rotation was practiced. A new system was introduced, starting with plants produced in-vitro. These plants, guaranteed to be free from infection, were multiplied in screenhouses at Gizoji to produce tubers which were then planted in another seed farm at Munanira. This last farm was slightly lower and warmer than Mwokora, and any latent infection immediately manifested itself in wilting plants; all plants within a certain radius could then be rogued out. Only seed of the clean stocks were replanted at Mwokora, to be multiplied once for immediate distribution to other seed producers. As a result of these measures, the infection level dropped to less than 1% and confidence in the program rapidly recovered.

The program also received help during this period from a young British scientist, Caroline Turner, funded by ODA, U.K. She concentrated on on-farm experimentation in collaboration with a number of rural development projects, which it was hoped would be the prime agencies for extension of the technologies generated. Also involved in the project was Jaap de Vries, an FAO Associate Expert who carried out similar work to that being conducted by Caroline.

Pepe stayed until early 1990. When he departed to complete his Ph.D. he left behind several Spanish-speaking gas station attendants. His place was taken by Donald Berrios, another Peruvian CIP research assistant. Donald consolidated the work of his predecessors, and has added his own refinements. During a recent evaluation, it was apparent that the combined efforts of the past and present staff have built one of the most effective national programs in East Africa. A recent analysis of the

economic success of the investment in this program indicated that since startup, the Internal Rate of Return has been close to 90%.

**Ethiopia** When I first joined CIP, one strategy used to initiate contacts with the countries of a region was to have a workshop in which each of the countries was invited to present a paper on the main problems they faced in improving potato production. Such a workshop took place in 1977 in Nairobi. Previous to the meeting, CIP staff visited several countries to make on-the-spot assessments of the situation. I was assigned to visit Ethiopia and Tanzania with Primo Accatino, while Jim Bryan went to Malawi and Zambia. For the visit to Ethiopia, our main contact was Dr. Haile-Michael Kidane-Mariam, a potato breeder based at Aleymeya Agricultural College who had studied at Madison, Wisconsin with Primo and was an old friend. He had recently released four new varieties, so our concern was to help him prepare a proposal for financing the development of the necessary seed scheme. It took about 18 months to prepare the proposal and it was sent to the German Government, which had been seen as a potential donor. Unfortunately, shortly thereafter, the Ethiopian authorities declared the German Ambassador *persona non grata*, and the proposal disappeared without trace.

At the time of our visit to Ethiopia, political conditions did not offer much optimism for fruitful collaboration. There was no real desire to develop a potato research program; the official emphasis was on state farms and Haile was really working on his own, as potatoes had been the crop on which he had done his Ph.D. at Wisconsin. The outstanding memory of that visit was

a night spent with Haile at a local restaurant in Addis Ababa, where a folk singer playing a one-string riddle made up improvised songs with a rather hypnotic rhythm. After several hours of music, njera wot, a stew that grabbed the throat and unlimited quantities of tej (honey beer), the whole place was jumping up and down on the wooden floor and one could hardly see the room for dust. An FAO Dutch expert was trying to ignore the excitement and concentrate on his food until a thump between the shoulder blades and the command of "Dance!" from Primo had him leaping like a Masai warrior. At a later date, Haile came to CIP on study leave. This was followed by a two years appointment at Wisconsin University. In 1986, Haile rejoined CIP's staff as a breeder in Nairobi, and in due course his professional links with his own country were renewed.

In late 1987, quite unexpectedly, CIP was offered funding by the Japanese Government to help restart Ethiopia's potato research program, which had been virtually abandoned during the previous ten years. Though this funding was limited, it was sufficient to build basic laboratory and greenhouse facilities and provide a CIP staff member, Patricio Callejas, who in 1988 joined the team of local scientists at the Institute for Agricultural Research (IAR). Progress was initially slow, since most materials had to be imported. The CIP office in Nairobi proved invaluable in providing this service.

By 1990, the basic facilities had been completed and a start had been made on organizing the seed production scheme. When the funds terminated after three years, a team of five well qualified Ethiopian scientists had been put together and it seemed that the program was ready to move ahead rapidly. Haile-Kidane, now in

Nairobi, was able to give valuable technical advice. Progress was interrupted from time to time in the past few years, but now that the civil war has finished the research momentum is starting to pick up again. Optimistically, since the national staff are still in place, it should not take long to recoup lost ground, particularly if external funding is forthcoming.

The other recollection of that 1977 visit to East Africa was a memorable drive from Nairobi to Dar Es Salaam, in Tanzania, to see Ministry officials. The distance is close to 1,000 km, and Primo insisted on driving all the way ignoring my repeated offers to give him a break. I had no alternative but to concentrate on keeping him awake. The only food we had was a bunch of bananas bought on the roadside and we were told that no fuel was sold on Sundays, the day we were traveling. I didn't know Primo well then, nor his driving, but became less concerned as I realized that he had missed his vocation and should have taken up rally driving as a profession. He drove on earth roads that were in poor condition at a steady 120 km per hour for about 10 hours. I reclined in my seat, relaxed, and proceeded to recall every joke I had ever heard to keep my companion from sleeping at the wheel.

My immediate impression of Dar Es Salaam (Haven of Peace) was shock. I had last visited the city in 1961, before Independence, when it was a garden city surrounding its beautiful harbor. Now it was seedy, shops closed and the roads in such an appalling state that Primo could not get out of second gear. Notices in the hotel warned guests not to leave the premises after dark. Light relief was provided by our encounter with Los Uruguayos who were playing in the hotel. We met

them in the café and they regaled us with more than an hour of socialist rhetoric. Finally Primo asked them when they would be going back to Uruguay, which provoked the immediate response, "No way, there is no money to be made there."

After two days with agricultural officials in Dar Es Salaam, we made the return journey over again, and although by then my stock of stories was completely exhausted, we got back to Nairobi on time and in one piece. All praise to Primo's driving ability.

**PRAPAC** I would like to say a few words about the research network CIP sponsored in East Africa. The Programme Régional d'Amélioration de la Culture de la Pomme de Terre en Afrique Centrale (PRAPAC) was first established in 1982. The three countries involved were Burundi, Rwanda and Zaire (North Kivu). They were all francophone, and their potato-growing areas shared common agroecological conditions found along the so-called Nile Crest. At that time, as a result of CIP's project there, Rwanda had the strongest research program and took the lead for several major projects, particularly seed production and breeding for late-blight resistance. Funding from the U.S. Agency for International Development (USAID) became available in 1986; during the interim period, individual bilateral programs of Burundi and Rwanda were the main sources of support. Zaire later received some limited bilateral support from USAID; but throughout, the Zaire program benefited from constant help in training and supplies of clean seed from the other two partners. In 1990, Uganda applied for membership and was accepted. This changed, to some extent, the character of the association as it now included a country

where the official language is English. Two other changes of note have recently taken place, the first being the inclusion, in 1991, of sweetpotatoes in the research program; and in 1992, the group approved the membership of Kenya and Ethiopia.

When the PRAPAC network was set up, there were many negative comments from outsiders that it would be unmanageable because of the political differences between some of the countries. CIP was convinced that this would not be a major impediment, since after all PRECODEPA in Central America had functioned well with such diverse participants as Cuba and Nicaragua on the one side, and Mexico, Guatemala and Panama on the other. Our optimism was borne out as Rwanda freely supplied seed and varieties to Burundi and Zaire. Another positive development was the emergence of leadership capacity in other national programs. Burundi has become a major contributor to research and exchange of technology with the other partners, particularly in the fields of bacterial wilt control, postharvest practices and nematode surveys.

Uganda in particular, when it became a member, benefited from the support of PRAPAC. When first admitted to the network, one of the early results was that the program received two tons of basic seed from Rwanda to get its first seed scheme started. Since then, a basic seed scheme has started near Kibale and the first locally selected varieties have been issued. Suddenly potatoes were readily available on local markets and in Kampala, the capital, all within three years.

The PRAPAC coordination budget permitted CIP to place a staff member, Mr. Lyle Sikka, in western Uganda to help build the research program. Lyle Sikka is one

of the outstanding personalities to have worked for CIP. Originally, he was the All-India Coordinator for seed production. He retired and then came out of retirement on at least three occasions, most recently to help Uganda. Lyle is a single-minded potato scientist who constantly surprises his colleagues with his depth of practical experience. He has the ability to adapt any new idea that emerges from CIP research to the actual conditions where he happens to be working at the time, and has been one of the most fervent advocates of TPS. Lyle always becomes rather vague when the subject of his age comes up and he claims that records were lost when he had to relocate from Pakistan to India, after partition. However, nowadays the subject is not quite so sensitive and it is admitted even by Lyle that he must be in his early seventies. All the more amazing, then, that when one visits Lyle he will program your day from 7 a.m. to 7 p.m. and outwalk those of us at least ten years younger. He plans to retire once again in 1993. Let's see what happens.

## **West Africa**

Since the 1970s, Sylvester Nganga occasionally visited countries in West Africa to offer advice and training opportunities. Some germplasm was also supplied, particularly to Nigeria which named at least one variety. However, it was impossible to give intensive support from the other side of the continent. In 1982, when Roger Cortbaoui returned to Tunis from Lima, he took responsibility for most of North and West Africa. He would visit several countries in West Africa twice a year, and many scientists from the region participated in the

annual francophone seed production course held in Tunisia. One country which appeared promising with regard to research cooperation was Senegal. There was an FAO vegetable project always willing to assist; staff on this project also gave logistical support for work in the Cape Verde islands. Cameroon as well showed interest in working with CIP on potato improvement; at that time there were a number of well-run agricultural projects in the northwest of that country with its natural climate for potatoes. Thus, when it was decided to open a new Region in West Africa, both Senegal and Cameroon were candidates for the location of the office. By then, a number of profound changes were taking place in the national research organization of Senegal and for nearly two years there was no response to our communications regarding a bilateral agreement. For a long period the institute had no Director General and there was uncertainty whether the whole organization would be disbanded. Finally, after much delay, Bamenda, Cameroon was chosen as the regional location with the Institut de Recherche Agronomique (IRA), offering all necessary collaboration. In 1988, Carlos Martin, a pathologist, was posted to Bamenda to start the program.

Carlos had always worked at headquarters in Lima, but his knowledge of the Regional Program was extensive. He was delighted to get the chance to develop a program from scratch and rapidly organized a local team. After a year he was assisted by Thomas Gass, a Swiss associate scientist assigned to CIP. Between them they established excellent cooperation with other countries, particularly Ghana, Mali, Togo as well as Nigeria. A seed farm was started at Bambui near Bamenda and IRA

provided the funds to rebuild and convert an old office building into office/laboratories. A functioning tissue culture laboratory, to produce pathogen-free plants, and two screenhouses to multiply them were built. Four clones with improved resistance to late-blight as well as bacterial wilt tolerance were named in October 1992 and are ready for issue to farmers. Potentially, it seems as if Carlos and his team were ready to make a big impact. At the time of writing, these varieties are under multiplication.

The reality, however, is somewhat different; CIP is financing this work 100 percent. Since the financial contribution by IRA to the new office, there has been no local financial support to keep the program moving. This situation is aggravated by the fixed exchange rate between the CFA, used throughout francophone West Africa, and the French franc. Though this rate has been constant for 45 years, with the now weak exchange rate for the US\$ with which CIP operates, the budget allocated to the Region is monthly buying fewer services. The unstable political and economic situation in the country and the constant strikes of IRA staff, at times unpaid for nearly one year, frustrate efforts to capitalize on the significant research advances.

Carlos encountered another totally unforeseen problem during the course of the research program when various technologies were ready for testing in on-farm trials. It was then realized that the research institute, IRA, was part of the Ministry of Science and Technology and prohibited from working with farmers; this was the province of the Ministry of Agriculture with whom CIP had no agreement. A special understanding had to be made to permit these activities to continue, without

which much of the on-going work would have been paralyzed. This was even more important in the case of the social science work of Adhiambo Odaga, who worked mainly with farmers and small scale enterprises. Fortunately, in her case she was cooperating closely with the FAO postharvest project, which was within the Ministry of Agriculture.

In retrospect, CIP chose an unfortunate time to establish a new Region in West Africa, as events in many of the countries led to changes that frustrated most of our efforts toward collaboration. Mali, an excellent place to work where everyone was extremely cooperative, is one example. Within the past two years the situation has changed, and it is now difficult even to get replies from our erstwhile collaborators. At the time CIP started in 1988, there was every prospect of rapid progress in Bamenda, Cameroon, where the Regional headquarters was located. Then, there were technical assistance projects of other organizations, such as FAO and ODA of the United Kingdom, that collaborated in joint activities. Most of these projects have now left Bamenda or severely curtailed their activities, and there seems little prospect of a reinitiation in the near future until more stable conditions return.

# Asia

## Pakistan, Afghanistan & Iran

When CIP was initially setting up its regional offices, the Near East was supported from Lebanon and the Indian sub-continent from New Delhi, but the Middle East was not covered by either of these headquarters. Thus, it was decided to establish another base in Pakistan which would also attend to Afghanistan and Iran.

In 1976, Gary Robertson was located in Islamabad, Pakistan, to set up this Region. At that time there was considerable interest in improving production of potatoes in these three countries. Iran in particular was investing large sums in research facilities, at Karagh near Teheran. Gary, an ex-ODA virologist from Kenya, offered training in seed production techniques to all three countries. In Pakistan he worked with the provincial research stations. However, the political situation in the area deteriorated very rapidly and it soon became impossible to continue work in Afghanistan or Iran. By 1981, CIP could no longer justify the cost of a Regional Office for only one country, and it was decided to close down. Gary came back to CIP-Lima and was the Senior Training Officer for several years, putting order into our then rather ad-hoc system of programming training activities. Eventually he resigned to return to U.K., where he is a free-lance consultant.

To enable Pakistan to improve its own program, Gary prepared a proposal for bilateral support. This project was eventually accepted by the Swiss Development Cooperation which contracted another technical assistance agency, Intercooperation, to implement the project.

Andre Devaux was transferred from Rwanda to Pakistan as the team agronomist for five years, from 1984 to 1988. This project still continues, and several Pakistani scientists have been to Lima for training. Although the logical CIP regional headquarters to attend the needs of Pakistan is India, current political frictions render this impractical. Though alternatives such as working out of Tunisia or Indonesia have been considered, none of these is satisfactory and for the present contacts are on an ad-hoc basis. Andre went back to Belgium in 1988 to complete his Ph.D. studies but rejoined CIP in 1989, to become leader of the Bolivian project previously mentioned.

## **South Asia**

In November 1975, when I first met Dick Sawyer in New Delhi, he had just signed an agreement with the Indian Council for Agricultural Research (ICAR). The ICAR is the central organization for coordinating agricultural research in the public sector. Under this agreement, CIP was permitted to set up an office in India to work with institutes under the umbrella of ICAR, such as the Central Potato Research Institute, headquartered at Shimla, in the foothills of the Himalayas. There was no mention of regional work outside India, although in practice this has never impeded activities of the various CIP regional staff.

The agreement signed with ICAR, however, was limited as it did not grant CIP the privileges usually accorded to an international center. This was a common fault of most of our agreements drafted in the early days, as they were prepared without expert advice. As long as

some public body was prepared to sign, the Center in its innocence concluded that for the rest a gentlemen's agreement would prevail. Unfortunately, as subsequent experience has shown, when staff are posted off-campus the agreement should cover as many legal angles as possible, or their hands are tied when dealing with entities such as customs authorities, or with banks in countries that have exchange control regulations. In the specific case of India, this deficiency has precluded tax-free importation of scientific equipment and created difficulties in gaining access to foreign exchange, consequently making it impractical to locate non-Indian scientists to the Region.

In 1975, there were two possible candidates for the post of Regional Leader, both retired CPRI staff. Hari Kishore had been the senior potato breeder at Shimla and was credited with several important varieties; and Lyle Sikka had been the All-India Seed Coordinator until his retirement. Both were excellent candidates, but with very different personalities. Hari was the quiet, introspective type, highly respected for his achievements in the field of potato breeding. A scholar in Sanskrit and religion, he was at times almost mystical. Walking along the street he would explain the auras he could see surrounding people according to their mood and temperament. Lyle, on the other hand, is a dynamic and very practical personality, a born leader. We have often discussed his background as he is a Punjabi, born and raised in the town of Jhang, which I often visited when I worked in Pakistan. Prepared to lead from the front and drag reluctant participants along with him, Lyle commands the respect of farmers as he always focuses on the practical outcomes of his work. Some years ago, the Indian Potato Farmers

honored him with a silver plaque in recognition of his contribution to potato improvement and, although he was not a resident of the State of Himachal Pradesh, in recognition of his services to the farmers of that State he was granted a gift of land at Kufri near Shimla, where he continues to grow seed potatoes. I once asked him how he got the name of Lyle, which is not an Indian name. He told me that his real name was Lal, but when he started working with foreigners they could not remember his proper name and came out with Lyle, which he adopted to avoid problems.

The decision was taken to appoint Hari Kishore to lead the Region because of his expertise as a breeder. At that time, CIP was convinced that it would soon be flooding the developing world with germplasm from its breeding program, and that very rapidly these countries would be selecting new varieties. In the case of India, this was another misconception, as plant quarantine regulations are extremely strict. Initially it took two years to get pathogen-tested germplasm through quarantine procedures into the hands of breeders at CPRI. Later, this procedure was shortened but to date there is no record of an Indian variety selected from CIP germplasm, although there must have been many crosses made with these materials.

Hari was very concerned about the public image of CIP in Delhi. He felt that a low-profile policy did not command the respect of his peers in the public sector nor did it project the proper image of an international center. He was probably right as far as his home country was concerned, but it has always been CIP policy not to compete with national institutions and a low profile is one aspect of doing this. However, Hari never ceased trying,

and to the end of his time in CIP he put in his annual budget the Mercedes car he felt was necessary for Dr. Sawyer to be received properly when he visited the country. Each year this was turned down, and to the day he died I'm sure Hari felt CIP showed a lack of understanding of the special circumstances in his country.

On one occasion during a visit of Dick Sawyer to Delhi, Hari gave a dinner in his house, which he shared with his nephew and family. Hari did not drink alcohol and entrusted serving the drinks to a member of his office staff. This person, like the popular image of a good majordomo, served drinks very efficiently to the guests at the same time taking a quick nip himself each time he went out of the room. Towards the end of the meal and after several nips, he insisted on serving Dick Sawyer a second helping of curry, which he tried to refuse. In the fracas, a full ladle of curry shot in the air descending on Dick's trousers and suede shoes. Roger Rowe, who was also present, said that the look of horror on Hari's face and annoyance on Dick's were so hilarious, that he was hurting to avoid laughing out loud. When the said staff member appeared next day, he was very chastened; presumably Hari had had a few strong words to say on the subject of his disrespect to Dr. Sawyer.

**India** During the period that Hari was CIP representative, he had limited success in initiating worthwhile research projects in India; his productivity was much greater outside his home country. In India, he tried to get local institutions involved with solar drying, one aspect of the overall processing technology CIP was testing in the Andes. Unfortunately, low-cost, rustic processing was not a concept easily compatible with the philosophy

at the National Physical Laboratories; the scientists there were used to a higher level of sophistication. On one occasion, I was taken to see their solar energy project and was shown a large parabolic mirror tracking the sun. At the focal point, it had a small dish with a chappati frying in oil. The same philosophy was applied to low-cost storage; they had constructed cold stores powered by solar energy. All of these models functioned quite well, but the cost and maintenance were well beyond the resources of the small farmer who was CIP's principal client.

Hari began making contacts with other countries of his Region, notably Bangladesh, Bhutan, Nepal and Sri Lanka. His efforts in Bhutan and Nepal were instrumental in generating strong support for the potato research program from senior government officials. The respect for his age and experience enabled him to persuade officials to visit the field and see the research being carried out by their staff. On one occasion in Bhutan, he had three ministers digging potatoes; the one who got the biggest yield won a prize. It was all taken lightly, but had a stimulating effect on junior staff.

In 1981, Hari retired on account of age and increasingly poor health. He suffered from Parkinson's disease, from which he eventually died in 1986. His successor was Dr. Mahesh Upadhyia, another potato breeder/geneticist. Mahesh brought a new scientific direction to CIP activities and personally directed a program of TPS breeding and agronomy. He gathered together an excellent team of young assistants, several of whom completed their Ph.D. theses under him. His enthusiasm for TPS was initially opposed by some scientists at CPRI, Shimla. They were not entirely alone in this, as there were reservations expressed by others

outside India. However, Mahesh continued with his own breeding program and eventually convinced ICAR that the concept had great potential for certain sections of the Indian farming community who either could not obtain good tuber seed or for whom it was too expensive. He was nominated by ICAR as All-India Coordinator for TPS, and his excellent hybrids are adapted throughout Asia.

**Nepal** In 1976, about the same time as work started in India, CIP hired Paul Egger who at that time was working for a Swiss highland development project. Paul started a national potato program for the highlands, where potato is the staple crop. He stayed in that post for two years, during which time he tested a large range of CIP germplasm with the objective of finding a variety with resistances to the multiple problems of the highlands. Much of this early germplasm originated from the collection of the Mexican national program. It found ready acceptance in Nepal, as agricultural conditions in the Himalayas are harsh and Mexican and Andean germplasm is generally well adapted to these conditions. Late blight and wart are severe in the Himalayas and at times decimate the mountain crop, but among the new materials were some with good resistance to these diseases. This was also the first time that many of us realized that the ability to recover from hail damage might be important. Many Andean varieties had this trait, and would resprout sufficiently to give a reasonable yield even after being defoliated. Such devastation only hit the crop in Peru occasionally, whereas in Nepal it was an annual occurrence.

Paul stayed for two years and then accepted the leadership of a Swiss-financed potato project in Bolivia. He was replaced, in 1978, by Peter Schmiediche who continued with the evaluation of new genetic materials but eventually had to call a halt as the quantities available in the country were more than the national program could handle. Peter stayed until the end of 1979, when the work was taken over by a Swiss technical project still working there.

In Nepal, the available human resources were never sufficient to conduct the research needed to have a significant impact. There also has always been the complication of internal rivalries that made it difficult to maintain continuity of senior local personnel. As soon as a person showed initiative, he was transferred sideways or simply left to stagnate in a dead-end situation. Therefore, in spite of all the promise of new germplasm, CIP never had the impact that it had expected and even today, after more than 15 years of CIP and Swiss technical support, there is little visible benefit to the hill farmers.

**Bhutan** It is worth a slight digression here to describe briefly some details of Bhutan. This small, autonomous kingdom is unique. Tucked away in the Himalayas between India and China and little known by the outside world until 20 years ago, it could have been the model for the classical film about the legendary Shangri-la. The indigenous Bhutanese population are of Tibetan origin and speak Dzonka, a Tibetan dialect. Much of the country is covered by forest, the preservation of which concerns experts working there. Having seen the disastrous results of what land clearance has done to Nepal—where

the highlands are now completely denuded and erosion is rife—gives them every reason for concern as the rate of depletion is accelerating to accommodate the burgeoning immigrant population of Nepalese origin.

Bhutan is a country of immense hydro-electric power potential, but as the population is small—around one million inhabitants—and industry is practically non-existent, there is no demand. India has collaborated in tapping some of this potential and Bhutan now exports power to that country.

The national sport, surprisingly, is not football but archery, practiced by the King himself. At weekends, every available flat piece of land has two enthusiastic teams of archers facing each other, shooting at flat wooden targets about 150 meters apart. There is a great difference from how the sport is practiced in the West: team members at the receiving end jump up and down next to the target, scrambling to get out of the way at the last second as the arrows come winging over. Apparently, this game of "chicken" adds spice to the sport. I was told of an amusing instance which took place at an archery exhibition on the occasion of the present King's coronation. Some of the distinguished guests were invited to test their skill, but the invitation was promptly withdrawn after the British Ambassador released his arrow and scored a bull's-eye in the leg of one of the bystanders.

Hari decided to explore possibilities for collaboration with this remote mountain kingdom. There had been a Swiss technical team in Bhutan for many years, and one agronomist had shown interest in potatoes, a crop ideally suited to its mountain climate. CIP was approached to give assistance in all aspects of potato improvement. Financial support would be provided by the

Swiss Development Cooperation (SDC) and administered through the Helvetas organization. A Nepalese scientist, Bharat Karmacharya, was contracted for the position in 1981; he spoke one of the two local languages and had worked under similar conditions in his home country.

Bharat began in the same way as his colleague in Nepal, introducing new germplasm with resistance to late blight and clearing land for a seed farm in an isolated valley at Phubjika. Within two years, the farm was operative, with the first seed crop of a few promising clones planted. Working conditions were very rudimentary in Bhutan, and trained agricultural assistants were nonexistent. In spite of this, staff were trained to use rudimentary laboratory facilities, run field trials and supervise the seed farm. By 1986, 123 tons of basic seed were harvested and registered growers produced 670 tons of improved seed. This project was then taken over by the Helvetas team, thus concluding CIP's direct involvement. Bharat returned to his home in Kathmandu and subsequently took on a number of FAO assignments. The latest news is that he is now in Sana'a, Yemen as a potato agronomist.

**Sri Lanka** In Sri Lanka, there was a good opportunity to introduce new germplasm: the main disease problem was bacterial wilt, which at that time CIP thought it had the answer to. As more experience was gained, it became clear that the problem was far more complex than first thought; even today, only a partial solution has been found. New clones were being selected in the CIP breeding program and through a contract we had with the University of Wisconsin. With the selection of new

varieties, a seed farm was needed; a high altitude site at Nuria Eliya, above the city of Kandy, was chosen.

Several CIP staff have visited Sri Lanka to advise the national program on the technology of diffuse-light storage of seed, which rapidly caught on. Sri Lanka was also one of the first countries to introduce the use of TPS as an alternative, low-cost planting material. This project, run by the Department of Agriculture, at one time involved many farmers. In the past few years the promotion of this technology has lapsed; one can assume that this is principally because the technique for producing hybrid seed was not developed concurrently with the agronomy, and thus when farmers' enthusiasm was at its highest, the seed was unavailable.

CIP had a policy at that time of granting sabbatical leave to its Lima scientists for work spent in developing countries. Under this arrangement, Ed. French, Head of Pathology, spent 1980-81 working with the Ministry of Agriculture on disease-related problems. Subsequently the civil war intensified, for a while curtailing opportunities for active collaboration. However, contacts have been maintained and national staff continue to participate in CIP-sponsored activities. Sri Lanka is a member of the Southeast Asian Program for Potato Research and Development (SAPPRAD), a research network similar to PRE-CODEPA, described earlier.

**Bangladesh** The other important country of the Region is Bangladesh. Since the 1960s, the area under potato had rapidly expanded. This expansion is in part a reaction to increasing demand for this food by the middle-class population, but also the result of a modified cropping cycle that enables potatoes to fit neatly into the

mid-November to mid-February period, which had traditionally been planted to wheat or irrigated rice. There was also another factor: potatoes consume less water than rice, a considerable advantage at that period of the year. In order to diversify agriculture, the Ministry was actively encouraging the production of potatoes. This new development was further aided by a Dutch project which supplied seed for one season multiplication to be used as seed for a ware crop in the following season.

The better availability of good potatoes generated its own demand, and production increased rapidly (by an annual 5.6%) between 1961 and 1982. In 1979, CIP was approached to place a consultant in Bangladesh, and Lyle Sikka was sent for an initial period of eight months. Eventually, this stretched into several years, as Australia, which financed the consultancy, continued to support his work until mid-1988 when the project finally ended. Throughout this time, Lyle displayed his genius at convincing donor representatives that their money invested was well spent. Thus, he was never short of operating funds.

During his time in Bangladesh, Lyle concentrated on two main areas of work. The first of these was seed production. He determined that the northwest had similar conditions both climatically and in low aphid populations, to those areas in northern India where seed potatoes are produced during the September-to-December period. In Bangladesh, the only feasible time to grow potatoes was between November and the end of January, when temperatures are moderate and the aphid population is very low following the summer heat. Lyle proceeded to organize a basic seed farm at Debiganj, a

site belonging to the Bangladesh Agricultural Research Institute (BARI). In a very few years, he demonstrated that seed with very low virus content could be produced and maintained for several generations, thus allowing the selection of new varieties locally as they could now be maintained and multiplied in the country.

The other research in which he had a personal interest was the use of true potato seed as an alternative to conventional seed tubers. There was a lot of skepticism about this technology, particularly amongst those national colleagues involved in the traditional type seed scheme. In my opinion, over the years Lyle demonstrated quite conclusively the high potential for this low-cost technology in Bangladesh. I was present at a meeting where farmers who had tried the technique gave vivid accounts of what they had done and the success or failures they had achieved. Unfortunately, when Lyle left the drive to continue this work was lacking, and there has been little follow-up although the potential still exists. There is a move to reinitiate this project but action depends on the availability of external funding.

The major drawback at that time wherever TPS was introduced was the lack of a reliable source of seed; CIP had to find a solution. We had the hybrids but not the means to produce TPS in quantity. Soon after Lyle left Bangladesh, a contract was signed between CIP and INIA-Chile; research there enabled the problem to be solved in two seasons. By 1990, several kilos of TPS seed were available through this contract and from Mahesh Upadhy in India.

**Training** Throughout the Region, training was a very important element in building national capability to

run a research program. However, CIP preferred to use available local expertise where it existed rather than organize training courses independently. By agreement with ICAR, CIP was allowed to sponsor several candidates from the Region to participate in the annual potato production courses organized by CPRI, Shimla. It has been a great advantage to have a regional base in India, for without this facility far fewer scientists from the Region would have received practical training.

## **Southeast Asia**

The program in Southeast Asia began in 1975, the year before I joined CIP. Through various contacts in Australia, Dick Sawyer had met Lindsay Harmsworth who had worked for the Plant Research Institute, Victoria, and had been instrumental in developing their basic seed potato farm. Lindsay joined CIP to work in Southeast Asia in 1975 and it was decided to base the Regional office in South Korea. An agreement was signed with the Office of Rural Development (ORD) under which the CIP Representative would be named leader of the Korean national potato program.

Why CIP's base was established in South Korea is not clear. The climate in the main potato zone is more typical of temperate northern climates than those of the Center's developing-country clients. In fact, the main seed station is known as the Alpine Station. There are, however, some areas of the country where growing conditions are much warmer and more typical of subtropical climates. In the early days, CIP had a very flexible policy dictated by need and opportunity. In this case, the need was clear: the country was making a major

effort to expand potato production and reduce the imports of ware and seed potatoes. The opportunity was provided by USAID, which had a major technical assistance program in the country and was prepared to fund a scientist to take over the direction of national potato research from Lindsay. As a result, Jerry Franckowiak, a potato breeder in Lima on a post-doctoral assignment, was appointed by USAID in 1976 to work in Korea. This change permitted Lindsay to relinquish leadership of the national program and initiate more activities on a regional basis. He moved his headquarters to the Philippines in 1977 and established his regional base at the offices of the Philippine Council for Agriculture and Resources Research Development (PCARRD), in Los Baños.

From the standpoint of impact, the collaboration in South Korea was fruitful. When CIP arrived, the dominant potato variety was Irish Cobbler, an old variety preferred for its rapid bulking characteristics. The rice crop in Korea has priority, and irrespective of what crop is in the ground rice has to be planted by mid-May. This is made possible by premature harvesting of the potato crop, and Irish Cobbler is a variety which bulks sufficiently early to give a worthwhile yield in the time available. It is planted around late January after the frost hazard is over and harvested prematurely in late April. However, it has many disadvantages, not least being the difficulties in obtaining good seed of an old variety.

After Lindsay moved to the Philippines, CIP contributed to the development of the Korean program through intensive training and advisory visits by its staff to help establish a clean seed scheme based at the Alpine Research Station. There had been an earlier attempt to produce seed, but the high level of aphid incidence and

consequent rapid degeneration rate of the seed had frustrated these efforts. A modified scheme was started, in which the early generations were protected in large screenhouses using nucleus stock derived from in-vitro plants. Very rapidly this scheme became the most efficient in Asia, and it still maintains a high standard. New varieties were tried, and the old Irish Cobbler has now been largely superseded.

When Lindsay moved to the Philippines, he was literally in a different climate. CIP-Lima had been testing the feasibility of growing lowland tropical potatoes at Yurimaguas, a site in the Amazon basin. This concept was relatively untried and considered to have a low probability of success by most authorities. At Yurimaguas, some success had been achieved by the breeders in selecting heat-tolerant clones. David Midmore had shown that simple cultural measures could reduce the soil temperature by a few degrees, thus improving the microclimate for potatoes. Lindsay chose to test these ideas on a nearby sugar cane estate at Canlumbang. His trials were wiped out the first year, just as had happened to Mike Jackson in Costa Rica and by the same culprit, bacterial wilt. Lindsay may have been unfortunate, as it was later discovered that planting after a long rotation crop such as sugar cane or after the anaerobic soil conditions created by paddy rice reduced considerably the initial soil inoculum of the pathogen. If clean seed is available to start with, the level of bacterial wilt infection in the crop is quite low, enabling farmers to get a worthwhile harvest.

The major potato-producing area in the Philippines is the highland area of central Luzon, with Baguio as the state capital. Lin dedicated part of his time to

helping that area improve its seed production. He also established collaboration with the Mountain State Agricultural College (MSAC), Baguio, for the evaluation of new germplasm and development of rapid multiplication methods of seed production. Concurrently, a technical assistance project for seed production in the highlands was in progress in Baguio, financed by GTZ of Germany. This project had installed the necessary greenhouse and laboratory facilities but ran into early trouble when their seed farm in the mountains was threatened by local insurgents and had to be abandoned. As a result, the project was unable to make a significant impact, and the only seed produced was in the greenhouses. A certain degree of frustration developed, which manifested itself in verbal attacks on CIP and its staff. These were particularly evident when Lin started to help the Ministry of Agriculture, Mindanao, produce seed, as this was seen as a direct threat to the lucrative Mountain State trade. The relationship improved with changes in GTZ personnel, but eventually that project folded.

Lindsay also travelled and advised extensively throughout the Region, particularly in Burma, Indonesia, Papua New Guinea, South Korea and Thailand. As a result of his contacts with national programs, he decided that the Region needed a network such as CIP had organized in Central America, and so the Southeast Asian Program for Potato Research and Development (SAPPRAD) came into being in 1982. The five original members were Indonesia, Papua New Guinea, the Philippines, Sri Lanka and Thailand. Lin acted as coordinator for the network until 1984, when Pons Batugal from PCARRD, the Philippines, was appointed. Some years later, Malaysia became the sixth member of the network.

In 1991, Dr. Eufemio Rasco from the University of the Philippines in Los Baños was appointed Coordinator by the Directors Committee and holds this office at the time of writing. Australia funded SAPPRAD from the outset, and continues to do so.

In 1979, Michael Potts was appointed on a post-doctoral assignment to Baguio to examine the seed production system and study the adoption of a "new" technology, diffuse-light storage. DLS, as it became known, was a technique that had long been used in temperate countries to improve the sprouting of seed tubers. In the new application, it was seen as a technology to maintain seed tubers in good condition under sub-optimum warm-climate conditions which would normally cause the tubers to develop long sprouts and lose vigor. This technology had been demonstrated in the Philippines during the previous three years; Mike's project was to examine socio-agronomic aspects of its adoption and spread throughout the highlands. It was an interesting study, which has been amply documented elsewhere. In essence, farmers did not adopt the CIP system per se; they adopted the principles and adapted them to their own store designs. Within a few years, more than 1000 stores incorporating this principle had been found mostly near the main road where dissemination was likely to be more rapid.

Lin was a very colorful character, extremely extroverted, who kept his long-suffering wife Marg in a constant state of tension due to his habit of frequently coming up with new schemes that were going to make their fortune. Most of these ventures ended with Lin losing part of his hard-earned savings on some fool-proof enterprise. He made friends very easily but was too

trusting and taken in by sharp operators on more than one occasion. In South Korea, official functions are rather formal so one can imagine the shock when at a cocktail in honor of Dick Sawyer, Lin burst into the room dressed in a Peruvian poncho and a rice farmer's conical straw hat, with his bare bony legs clad in a pair of open sandals. It was probably Lin's idea of Santa Claus Korean style, and he pranced around the room giving out presents to all the distinguished guests. After some minutes of initial shocked silence, the Korean hosts applauded warmly while probably doubting his sanity. My last memory of Lin was shortly before he packed up to go back to Australia. His living room was full of folk art which he had collected from around the Far East and with which he intended to start a handicrafts shop in Melbourne. Once again poor Marg looked quite depressed.

When Lin left in 1984, he was replaced by Peter Vander Zaag who transferred from Rwanda. Peter came from Canada, and his family had been growing potato seed since his parents emigrated there from the Netherlands after the war. Unfortunately for him, he has a very well-known family name; his uncle, Date Vander Zaag, is highly respected in Netherlands potato-seed circles and he traveled widely on consultancy visits for the seed industry. He was an old acquaintance of Dick Sawyer, and because they were from opposite camps in the seed business they regularly got into strong arguments when they met at various international meetings. Over the many years he worked for CIP, Peter had to get used to being greeted by Dick with, "That uncle of yours....!" or "You can tell your uncle that...!" His only recourse was to keep quiet or occasionally point out that he was in no way his

uncle's keeper, especially as he had been born and brought up in Canada. Also, as the family business was to produce potato seed, he certainly was not a sales representative for Dutch seed. Even so, he had to bear that cross throughout his time in CIP.

By discipline, Peter is a soil scientist; by background a farmer; and by inclination a builder, as was mentioned in the case of the Rwanda program. By conviction, he is an evangelist, and he somehow managed to combine all these attributes while he was working in the Far East. CIP needed an experimental base in the Philippines. To this end, Lindsay Harmsworth had rented land near Los Baños on Mount Banahaw. Lin's first building attempt met with disaster when one of the frequent typhoons crossing the Philippines wrecked the screenhouse just as it was completed. When Peter arrived, he erected another screenhouse, but this time it was slightly below the top of the valley and managed to avoid the full force of the winds. Peter put everyone to work for the program: visitors, relations, friends, students. Once, when visiting his program, I met a cousin who, with a friend, had come to visit him. The two of them had been assigned the task of building a house to serve as office and dormitories for the students and staff working at St. Lucia.

There was always a large number of CIP-sponsored students in the Philippines. Many came simply to learn practical skills, others to get higher training. Peter likes teaching and was accredited by the University of Philippines, Los Baños. He thus had the opportunity to enable many students from the Region to study different aspects of the work which would enable them to build potato research programs in their home countries.

Peter obviously had some favorite countries, and among these China, the Philippines, and Vietnam got the bulk of the scholarships. The amazing thing was that most of the Vietnamese and Chinese students arrived with practically no ability to communicate in English, the language of instruction, yet all of them left with a working knowledge of the language and several with an M.S. or Ph.D. Apart from the dedication of the students themselves, some of the credit should go to Peter who was exceptionally patient with students, who probably had never before been exposed to a foreign environment.

Peter traveled a lot throughout Asia and the Pacific Islands looking for new opportunities to develop potato production in the warmer tropical climates. The problem of bacterial wilt was always present and he used a site on Mindanao Island to study its control. He was particularly successful in developing and adapting novel ways to apply CIP rapid multiplication methods for producing potato seed in rustic situations. In the St. Lucia station there was no electricity so sophisticated equipment for meristem culture was of little value. In the initial stages of tissue culture, the small meristems are normally aerated by placing them in a nutritive liquid and gently shaking them mechanically. The answer in the Philippines was to suspend the tubes of culture in a hanging basket, and it was obligatory for everyone who entered or left the screenhouse to give the cradle a shake. This model was improved after a visit by Jim Bryan, who attached a light spring to one end of the cradle so that the tubes continued to oscillate for several seconds after pushing it. The racks of tubes stood on shelves along the windows where they got adequate diffuse light.

All these innovations put Peter in good stead when he finally left CIP in 1990 to go back to Canada and grow potato seed. He established the same type of rapid multiplication system in his home, with his wife Carla and son Andy, specializing in the laboratory side of the operation. He even brought some of his ex-Vietnamese and Filipino staff to Canada for a period to help get the scheme started.

Peter's evangelistic tendencies sometimes caused concern within CIP, when they became associated with his work. One could see this in the fervent prayers at lunch in St. Lucia, by extracurricular bible classes for the students, and in the story of his distributing bibles when visiting China. Peter never denied that this was his calling and admitted that he could not in conscience stop it. He could not see that it might cause CIP problems that he, as CIP's representative, was carrying out such activities. In this respect, he was rather blind to the politics of the situation even though he was acutely sensitive to the needs of the developing countries for improving their agriculture. At the time that he was leaving CIP, he saw a ripe plum for picking in North Korea, a country that had been denied any form of religious expression for several decades.

In 1987, Mike Potts, who by this time had started the project in Burundi, established a new research project in Bandung, Indonesia. Mike was joined by Greta Watson, a Rockefeller Foundation Research Fellow who had conducted her thesis studies in Indonesia. Greta knew the local scene well and spoke the language. Together, they decided to try a new approach in participatory research: the farmers would do the research according to their method, with CIP and local research

staff giving the barest essential details, but on call should they be needed. The vehicle chosen for this new approach was the production of potatoes from true potato seed.

With the help of an extension agent, a group of farmers in the close-knit community of Ciparas was contacted. These farmers were basically vegetable growers who supplied Jakarta and major towns. They were shown samples of TPS and recognized it as a smaller version of tomato seed, which they were accustomed to. Mike and Greta explained the various ways it could be used: for direct planting, to produce small plants for transplanting, or to produce small tubers for replanting. The farmers were then left to think out their own strategy and to decide, on the basis of their own experiments, what they wanted to do. Within one season they had eliminated the majority of the variables and decided to go for seedling transplants. The segregation for skin color in TPS progeny caused no difficulty, as the potatoes were separated by color at harvest and sold separately.

This is one of the most interesting innovative approaches that CIP made in the past several years. The project continues, and from this study two Indonesian scientists, an agronomist and an economist, will get their Ph.D.s. Source of seed is and continues to be a major problem, which is best solved by purchasing from Chile, where CIP has had a standing contract for several years. An alternative, rapidly increasing source could also be India, where the private sector is expanding in this field. If the source of TPS can be assured this technology is likely to be rapidly adopted, as it is the only dependable source of clean planting material available in Indonesia.

Mike took over additional duties as Regional Representative for Southeast Asia and the Pacific when Peter Vander Zaag left the Philippines in 1990. He was particularly active in helping CIP staff in China. In Indonesia, he was much respected for his dedication to work and his integrity. When he decided to resign in 1992 to seek a farming career in New Zealand, we all felt a sense of loss. His place has now been taken by Peter Schmediche, who has been with CIP for more than 18 years, first as a Ph.D. student and later in a number of research positions in the Center. With the increasing emphasis on sweetpotato research, headquarters has shifted from Bandung to Bogor, a warm, lowland site.

The program in this region of the world has experienced the greatest increase in staff of any of the CIP Regions. From initial start-up in 1975 with only Lin Harmsworth, there are now three international scientists in the Philippines, three more at the Regional headquarters in Indonesia, and one in China, plus all their local support staff. There are plans to place two more scientists in Indonesia in 1993, to concentrate on postharvest problems, in particular industrialization of sweetpotato, and on control of sweetpotato weevil, the most important pest of the Region. This large concentration of scientists is justified if one considers that approximately 30% of the world's population lives in this Region, and that 95% of the sweetpotato is grown there.

## China

For many years, the economic information on China was limited to data published by FAO. There was no independent source but even so it was obvious that

production of all crops, including potatoes, was huge. Positive indications of the real statistics emerged from the first official visit to CIP by a delegation of Chinese scientists in 1978. This delegation differed from visits of other developing-country scientists, as it was thorough and lasted one month. During that time, the group met with nearly every scientist in Lima and despite the painful process of communicating through an interpreter recorded every scrap of information it could extract. CIP for its part started to verify the immensity of agriculture in China, particularly in those crops where we had a special interest.

The scientists visited our homes, our experimental stations, and even had an opportunity for a weekend with my wife Geraldine and myself in Huaraz, probably the most beautiful mountain scenery in Peru. On this occasion wild potatoes were in full bloom, and for sure some of the tubers found their way back to China in their pockets. The leader of the delegation was Dr. Shen Jinpu, who later became a member of CIP's Board of Trustees.

There were some humorous incidents which the Chinese themselves appreciated, such as the time they all came to my house for dinner dressed in the standard "Chairman Mao" dark blue trousers and jacket they had been issued with. It was a warm evening, so everyone removed their jackets and left them on a sofa in the study. When it came time to leave there was chaos, as every jacket was identical; only by checking the contents of the pockets and trying them on for size could they be identified.

On several occasions before the arrival of the Chinese, Orrie Page, Director of Research, had speculated about the technological revolution that could take place if

instead of planting potato tubers with all their accompanying disease problems we were to use botanical seed from the flowers. Mention of this sacrilege in the presence of Dick Sawyer brought instant rebuttal. The first important outcome from the visit of the Chinese was the discovery that they had been using this technique for many years to help overcome their logistical problems of seed production and transportation. With that announcement it became acceptable to talk about the subject, and CIP took up this study with enthusiasm.

The visitors returned to China with a large selection of the best clones and varieties available at CIP. Since that time, those materials and other newer clones have been thoroughly studied by potato scientists throughout China. One of the original clones carried back in 1978 was selected by scientists in northern China and, finding ready acceptance with farmers, its cultivation spread rapidly. This was the clone B71-240.2 which CIP had received originally through our breeding contract with the Argentine national program. In China it was named CIP-24, and according to the latest information it is now cultivated on more than 200,000 ha. The breeder who originally selected it, Dr. Americo Mendiburu, died in 1991, but not before he knew that his baby had proved an outstanding success in China and several other countries.

Dick Sawyer, John Niederhauser and Orrie Page paid a month-long visit to China in 1979. Arrangements were under way to formalize technical cooperation between CIP and China. The Chinese Academy for Agricultural Sciences (CAAS), Beijing, was the host for the visit of Sawyer and company. Three more groups of Chinese scientists visited CIP for several months, in 1980,

1983, and 1984. As a result of these interchanges, it was agreed to establish an office in Beijing to coordinate scientific collaboration between China and CIP. The agreement was signed with CAAS in 1985 and the person appointed to head this office was Song Bofu, a potato breeder who had spent time at CIP in 1983, had worked on TPS in China, and was a senior scientist of the Academy. Collaboration was rapidly initiated with several institutions across the country, and many senior CIP scientists have subsequently visited China.

In 1987, the triennial meeting of the Asian Potato Association was held in Kunming, Yunnan Province, in the southwest. Yunnan was then one of the least developed areas of the country. The province contains a large number of ethnic tribes, many of whom are closely related to the hill tribes of Burma, with which the province borders. On a two-day field trip to this area, we were exposed to a typical subsistence-type agriculture in which potatoes were very important. The conference brought together scientists from many countries in Asia in a setting which was novel to all of us. It was also a very valuable experience for the Chinese scientists, the majority of whom had been working in complete isolation from the international scientific community. The interest created in Kunming by the arrival of all these foreigners was notable. Young students would stop you in the street with their English textbook asking for the correct pronunciation. This may have been no more than a pretext to talk to the foreigner, but they were anxious to communicate with us. Another memory was of the two conference rooms in the hotel. One had air-conditioning, which functioned at about 17 °C, while the other sweltered in 27 °C or higher. Most of the time there were concurrent

sessions, so we were constantly alternating between the two rooms, requiring the use of a woolen jacket to counteract the alpine climate in the first room, and practically beach-wear in the second. As might be expected, nearly everyone went down with a raging sore throat and runny nose after the first days.

Another amazing sight was to see the level of consumption of cigarettes by the Chinese delegates. At every break they flocked to the lounge area, which in a matter of minutes was filled with a blue fog. This, added to the sulphurous atmosphere of Kunming from burning soft coal, must have contributed to population control in a substantial way. In a more humorous vein, the lack of hot water in the hotel except for about two hours in the evening had its consequences. One morning before the meeting began, there was a great commotion along my corridor. It turned out to be John Niederhauser, who had somehow got under an icy shower, something he obviously did not appreciate. John left the meeting early for Beijing; whether it was for another commitment or to find hot showers was never quite clear.

I have made two visits to China since the Kunming meeting, and it is impressive how quickly the numerous collaborating scientists have adopted the various technologies that CIP has shared through research projects. The potato breeding programs use large amounts of CIP parental lines in their pedigrees, not to mention the success of CIP-24. The University of Hohot in Inner Mongolia is now producing virus antisera for the rest of the country and is rapidly moving into more advanced technology.

With a country the size of China and with the numerical weight of competent scientists, CIP should eval-

uate the benefit to the Center of its present style of direct technical collaboration and what are the alternatives. The current advances in China justify our previous approach, but now the time has come to think out a new strategy in which CIP might take a step back from the present direct intervention.

# Postscript

This is my personal account of 17 years' participation in the evolution of CIP's Regional Program. Regional work still continues, of course, although it is now fully integrated into CIP's Research Programs, and as a result some degree of autonomy has been lost. Personally, mine has been a most rewarding experience. Time and time again, CIP has been commended for its excellent relations with NARS and the way it has decentralized its research through the Regional Program. To have played a role in this development has been very gratifying, and I see many of you continuing to get the same personal and professional satisfaction that I have.

I wrote this short account of the Regional Program not just to record part of CIP's history, but also to provide some diversion from the usual round of reports and technical publications that are always dropping on your desks. Working with the Regions is enjoyable, and I hope that those of you who did not participate during the early years will find these notes of interest. As all who know me are aware, I enjoy the humorous side of life as well as its serious aspects, so if I have been too free with my memories please accept my apologies. To all of you who are part of this story I want to say thank you and wish you every success in the coming years.

K. J. Brown  
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