

science and technology in the developing world. As important, we need visionary leaders who understand the problems of the have-nots and are deeply committed to political and economic fairness.

What will wealthy countries receive in return for the help they give to the have-nots? The first reward lies in the moral dimension. The psychological value derived from being a generous global neighbor should not be underestimated. Even on a personal level, most of us do try to help one another and all major religions encourage and legitimize helping the needy. It is also difficult to ignore that the prosperity of the developed world is in part due to natural and human resources from the developing world and its markets.

The second reason for helping is to maintain bridges of continuity between civilizations. By looking back in time and by thinking about the future, one can see that reciprocity between civilizations has been a natural and necessary component for scientific advancement. Islamic civilization gave a great deal to Europe, especially during the Dark Ages. The Arab and Islamic civilizations, which at one time were the world's foremost economic and scientific powers, were major contributors to the European Renaissance. Today it is the Muslim world that is in need of help and it is appropriate that the United States, Europe, Japan, and other developed nations should in turn lend a hand as a modest gesture to the changing fortunes of history.

Finally, there is a more practical, self-centered consideration based on the time-tested importance of having an adequate insurance policy. In the United States, we pay a great deal for insurance to protect our families against the high cost of medical care, to protect our houses against fire and theft, and to protect our cars against accidents. Similarly, the developed world needs to invest in an insurance policy to help it live in a safer and more secure world.

The choice for the haves is clear—to help in a genuine and sincere manner. Neither hegemony nor shields and missiles will provide adequate security in a world with 4.8 billion people classified as developing or underdeveloped. The choice for the have-nots is also clear—to first get their house in order and build the confidence for a transition to a developed-world status. The developed and developing worlds can achieve their objectives by participating as partners in a dialogue for the sake of global peace and stability. Such a dialogue among civilizations and cultures should not be confused with slogans theorizing about conflicts between religions or cultures.

At its core, we should nurture a dialogue between the haves and have-nots. What is needed is visionary leadership, economic progress, and perspectives that rely on rational thinking. And if we truly believe in fostering democracies around the globe, science is the best vehicle for engendering that democracy. Global science unites citizens of the world through one common language and empowers them with the critical thinking needed to overcome dogmas and misconceptions. Only with knowledge and rationality can we hope for a genuine global peace.

The Arab and Islamic civilizations, ... at one time were the world's foremost economic and scientific powers

The status of physics teaching and research in Palestine

*Y.I. Salamin and N.M. Jisrawi,
Dept. of Physics, Birzeit University, West Bank, Palestine*

More than ten years ago, one of us (YIS) listened, at the International Center for Theoretical Physics in Trieste, Italy, to a distinguished African mathematician lecture about “the future of mathematics in Africa”. The lecturer started by saying, in almost as many words, that he could describe the future of mathematics in Africa by a single word: “bleak”, and that we, his audience, could go home immediately. Unfortunately, the same thing can be said today about physics in Palestine. Strangely enough, physics in Palestine suffers from pretty much the same symptoms that are prevalent in other developing countries when you expected it to be uniquely bad. Let us illustrate:

Money, or rather lack of it, is issue number one! The problems start at the school level. Schoolteachers are not well paid, their schools can not afford to have adequately equipped labs, and they teach outdated curricula to often very large classes. As a consequence, a high-school physics-teaching job is not what most bright young men and women would like to consider training for. All bright young kids (their parents acquiescing) would like to become doctors, engineers, or lawyers, to the detriment of those professions in a shambled economy that seems to barely sustain a corrupt clan of politicians who, mostly without college degrees and hence ignorant of the role of education in development, have naturally opted for preserving the status quo in schools, colleges and universities.

Palestinian colleges and universities, (there are eight of them in the West Bank and two in Gaza with a total student population of a little more than 70,000) grew during, or should we say in spite of, the Israeli occupation. With conditions here slightly better for teaching, physicists aspire to realize their potential in another demanding sphere: research. Unfortunately, lack of the necessary infrastructure and funding to do research puts to rest the research careers of most scientists in a developing nation, rather prematurely. At our institution, for example, we can confidently assert that no money is set aside to doing research in physics in the overall annual budget. Worse yet, the institution stopped paying for journal subscriptions a long time ago (e.g., we stopped getting the *Physical Reviews* in 1992). We don't have any hope of getting publication charges paid by the institution (one of us was advised at a certain point in time by a highly-ranking official to avoid publishing in journals that require such charges, and recommended a few, rather obscure, alternatives!). Talk about building research laboratories with institutional funds is a luxury.

At institutions like ours, a semi-paradox prevails. Faculty members are required to produce, admittedly little, publishable research work in order to be promoted to the higher professorial ranks. To help them in the process, the institutions contribute next to nothing. If they are to do any meaningful research, they often do it on top of heavy teaching responsibilities. For example, requests of a twenty-five percent release from teaching, by one of us, have all been turned down at the beginning of every one of the past few years.

So, how do scientists in a developing nation survive professionally? Well, the few that do, manage at the expense of their sleep, the time they are expected to spend with their families, and at times using part of what they earn as salaries that are little to live on, and often too late to come in full! With regard to funding research projects, the lucky/competent ones maintain contact with their colleagues in (mostly) Europe and North America. With almost no support from their institutions, these individuals manage to make short summer visits to their colleagues, allowing them the luxury of working in modern labs and/or using state-of-the-art computing facilities.

The “less fortunate” follow a more modest path. They stay at home, produce work that is often not publishable in the “good” journals and publish it locally, to be seen by very few, if at all, outside their home institutions. At some places, this is considered work good enough to be used for promotional purposes. Speaking of promotion, we are certain that, in most cases, it hardly adds a thing to the scientist’s fortunes, apart from the (often hollow) change of title. Unfortunately, many use this as an argument to defend their lack of enthusiasm to do any meaningful research work.

The Oslo accords

However, Palestinians are still unique among peoples of the developing nations: most of their country is still under the yoke of Israeli occupation. Reeling from years of direct rule in which the closure of institutions of higher learning used to be one of the favorite pastimes of the Israeli military, Palestinian academics found themselves face to face with the mirage of the Oslo agreements and the subsequent devastation of the second Intifada. The Oslo accords brought an era which witnessed the migration of academics, including physicists, to assume political positions with the self-rule “government”, dwindling resources, and chronic financial difficulties. Attempts to create scientific institutions like a Palestinian Physical Society and a National Research Council, although partially successful, resulted immediately in the turning of those institutions into inept, politically oriented, bodies with no track record of achievement. Research infrastructure simply does not exist. No infrastructure exists for experimental research, and even support for theoretical science is meager.

No infrastructure exists for experimental research, and even support for theoretical science is meager.

The attempt to establish an academic network faltered due to political haggling and even the establishment of a Palestinian ‘internet top level domain’ was mired in years of controversy in which the academics played no role, but stood to suffer from its consequences. Inter-university collaboration is absent, and something as simple as a West Bank wide ‘inter-library loan system’ does not exist.

The worst was yet to come. The recent re-occupation of the West Bank brought severe travel restrictions, turning simple trips like the one from nearby Ramallah to Birzeit University, easily made in ten civilized minutes under normal conditions, into a horrendous life-threatening 40-60 minute adventure. Worse yet, in order to travel abroad, and therefore benefit from the opportunities briefly allud-

ed to above, one is required to obtain all kinds of permits from three different authorities: Palestinian, Israeli and Jordanian, and that is on top of the usually restrictive regulations of the European countries and the US. Getting those permits and making the arduous trip to take a flight from Amman, Jordan, can easily strain the pocket book, not to mention nerves, of the most resourceful scientist. At present, Israeli airports, like many roads and exits in the West Bank and the Gaza strip, are off limits to Palestinians, including academics. Attempting to buy equipment and consumables is a nightmare, given the fact that the regular mail system is rarely allowed to work, as part of the measures of collective punishment the Israelis have been imposing.

Some international funds are available, at least in theory, mostly from Europe. Some of those have been lending support to projects that came as a result of the peace process. The benefits for basic science, however, have been minimal, because most funds seem to have been earmarked for projects with direct societal involvement. We hear, in this context, that the tri-lateral projects involving European, Israeli and Palestinian scientists have either been blocked for political reasons (like at Birzeit University) or have produced minimal Palestinian contribution. Even when funds are made available, the travel restrictions, poor infrastructure, and inability to buy equipment and materials are usually enough to degrade the project.

Young faculty members can also benefit from a host of European, Arab, and sometimes US research opportunities. Again, more of these are available for the humanities than for physics and the other basic sciences. Administrative ineptitude, however, has made most of those opportunities part of the corrupt system.

A ‘tribal system of rules’

Some sort of a ‘tribal system of rules’ characteristic of this part of the world finds its way into academia. When adhered to, rules are often applied selectively. Selective appointments to administrative positions are almost always made that discourage dissent and free expression of ideas and certainly whistle blowing. Consider, for example, how administrators handle issues like fellowships, prizes and the funding of short visits abroad. By the time the announcement for one of these filters down to the faculty, administrators would have diverted it to benefit their clients or the deadline for such an announcement would have already passed. Fortunately, many prestigious funding agencies do not follow that path. The German Academic Exchange Program (DAAD) and the Alexander von Humboldt Foundation are but two of the examples that stand out in offering their services directly to the scientists and based on merit. We both owe survival of our research careers, in large measure, to these agencies.

In summary, we tend to believe that problems stemming from the socio-political developments do exist and are pretty bad. But, most of the troubles facing research and teaching of physics in Palestine have their roots in the lack of adequate funding, the absence of real, mostly material, incentives, in addition to negative competition and the lack of visionary administration. Unfortunately, the government has not been able to do much to improve the working and living conditions of the school teachers. Neither have the universities been able to lift themselves from their chronic financial troubles. Programs continue to shrink (the physics major has recently been scrapped at Birzeit University) and physicists, like many others in academia, keep looking for foreign aid to help them survive professionally. What is needed is a real effort aimed at building a local research infrastructure (labs, libraries, computing facilities, and so on) and initiatives to forge strong collaborations with scientists in the developed nations.