Chemistry and Society in Africa

In his discussion of chemistry and society, Prof. S. O. Wandiga noted that the quality of chemistry in Africa is only as good as the chemists practicing the discipline and the support given to them by society. Chemistry, he said, has been practiced in Africa for a very long time, as can be deduced from ancient stories of wars fought and diseases cured. The old practice of chemistry was limited, however, to the satisfaction of individual needs, the defeat of an enemy, or the performance of cultural rites. The practice of chemistry for commercial purposes is a relatively new phenomenon on the African continent.

Unlike the past, when the art of chemistry was conferred through tutelage by magicians or by divine appointment, the African chemist nowadays is most likely a graduate of a university in Europe, North America, Japan, China, or Africa. He or she is well-versed in conceptual theories and skills and is at ease talking about principles of chemistry or applying cutting-edge analytical techniques.

Why, then does the continent lag behind in development of the chemical industry? Prof. Wandiga suggested the challenges are based on the availability of resources, the knowledge and technical base for the propagation of the industry, market forces, government policy, and general public support for the discipline.

Africa's Resource Base

1) Human resources. Every African country today has a critical mass of well-trained and qualified chemists and chemical engineers. Unfortunately, many of the best brains are leaving the continent because they cannot find employment of their choice or because they lack modern equipment. At the same time, a new crop of chemistry practitioners from the Asian continent is finding opportunities to establish factories in Africa for solvent distillation, emulsion preparation, synthetic fiber fabrication, plastics production, and metals refinement. Prof. Wandiga offered his first recommendation, "We must look afresh at the training of chemists in Africa. We need to include entrepreneurial courses in the syllabus, develop the instinct to take risks, and ensure that African graduates are enabled educationally to initiate industrial projects of their own."

2) The availability of raw materials. Raw materials are widespread within the African continent, and some countries are blessed with great abundance of resources like oil, minerals, or natural products. Unfortunately, the exploitation of such natural resources has rarely benefited the citizens. In most cases, raw materials are extracted and exported unprocessed, while in other cases selfishness, based on insecurity among nations, has prevented countries from sharing, developing, and exploiting national resources together with their neighbors. African resources have continually been exploited by foreigners. Prof. Wandiga advised, "Africa therefore needs to develop mutual trust among nations so that available resources can be used to benefit Africans. As long as greed and self-interest prevail over the common good of society, African resources will never be developed by Africans. Cooperation within and among states is essential for development of the chemical discipline. Africa must strive to encourage cooperation in knowledge and technology sharing. As a start, we need to establish, through market forces, industries for partial refinement of available raw materials in order to create added value for our products."

Africa's Knowledge and Technology Base

The African continent now has many knowledgeable chemists, as was demonstrated at the recently concluded Seventh International Chemistry Congress in Africa, but unfortunately much of those persons' knowledge is wasted. The majority of talented scientists in Africa are subject to extreme economic hardships, leading to their own preoccupation with survival. "Restoration of dignity and self-respect to African scientists will release an enormous reservoir of knowledge and ability," observed Prof. Wandiga.

This is the era of computer technology. Development of information and communication technology (ICT) has greatly reduced the barriers to far-away knowledge for persons conversant with ICT. But, a

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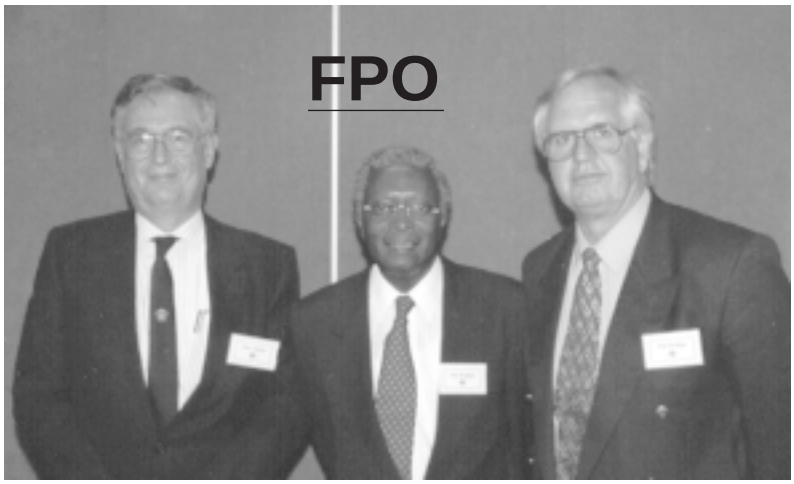

Professors J. Jortner, D. A. Bekoe, and P. S. Steyn

lack of access to computers in Africa is resulting in a failure to develop computer skills. Certainly, training in the use of ICTs is a must for every chemist on the African continent. "Public domain knowledge and technology for chemical processes are available through information and communication technology for the exploitation and development of Africa's resources. More training is needed in tapping and utilizing such knowledge and technology."

Market Forces

Prof. Wandiga informed the group that, although the total population of Kenya, Uganda, and Tanzania, is near 75 million, the per capita income is only $200–300. The buying power of African citizens is currently too small to sustain a dedicated domestic chemical industry. A second strong force arises from the current economic situation that compels African nations to export their resources as raw materials. Compounding these forces are weak marketing networks for African products. Under the circumstances, which include falling commodity prices, inflation of local currency, and few markets for African products, chemical research is not an economically important activity. As long as these current forces are dominant, Africa will not develop a chemical industry. Prof. Wandiga observed, "As a start, African countries must break the barriers that exist between states on the continent. Africa further needs to discard the concept that Africans cannot process their own raw material for competitive global trade. Lastly, Africa must redouble its efforts to train its youth to market African products and to use the latest ICT technology."

Enabling Policies

Dr. Wandiga noted that the African policy-making community and national leaders must understand that they need the discipline of chemistry if they are to succeed as rulers. Moreover, African nations, as in all nations, need to promote the basic principles of quality of life, democracy, and the dignity of and respect for human life. Only through such policies can the majority of citizens excel by applying their intellect, knowledge, and technological skills. "There must be a high-priority policy to develop and enable the chemical industry. Without direct government support for industry, little can be achieved." Dr. Wandiga recommended that "governments set up priority projects for development of chemical research capability, with concomitant incentives for industrial development. These new progressive policies can only emerge if Africans at both local and international levels accept the principle that it is essential for Africa to trade in finished products. Africa must also implore its brothers in developed countries to stop looking at Africa as a supplier of unfinished, unprocessed raw materials for their industry."

General Public Support

Prof. Wandiga expressed the opinion that the African public is very supportive of the chemical industry, provided the industry continues to supply consumer goods and provide jobs. As public awareness increases, it is essential that industry does not negate the public perceptions through use of "non-green" chemistry processes. Given the high unemployment rate on the continent, the industry will find ready support if it promotes quality of life through employment and responsible care for its products. Prof. Wandia concluded, "Ethical considerations by the industry need to play a leading role in its promotion. At all times one should remember that the African continent is ecologically fragile. Preservation of the environment for future generations is part and parcel of the promotion of the chemical industry on the continent. For the industry to continue to enjoy public support, it must regulate itself and it must take the lead in conservation matters."

Liaison Between IUPAC and AAPAC

Prof. Bekoe opened the discussion of the liaison between AAPAC and IUPAC by noting that the objec-