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The Natural History of Academies of Sciences in Africa (**)

The well established Academies of Science, those that have been in continuous functional state for 50 years or more, fall into three recognizable models:

— *First*, there is the type exemplified by the Royal Society of London, the French Academy of Sciences, and the Italian Academy of Sciences of the 40's. These academies are purely honour societies, which primarily exist to accord special recognition to those scientists who have made outstanding contribution to the advancement of knowledge. Undoubtedly, these academies also perform other tasks — such as acting as a forum for the discussion of sciences; the dissemination of knowledge through publication of learned journals, the exchange of scientific visits, etc. — nevertheless, their most noteworthy significance is in the organization of an award system for recognizing scientific achievement, and in the election of eminent scientists to their number, which is fairly restricted.

— *Secondly*, there are academies whose major role is in the establishment, organization, and coordination of high-level research in the country, apart from playing other roles such as exemplified in the first type of academies. Academies in the second category are large, have an equally large governmental role in their functioning, and command considerable resources for their extensive work programme. The USSR Academy of Sciences and, indeed, the academies of science in the Socialist Republics of Eastern Europe exemplify this model.

— *Thirdly*, there are those academies that, while playing the role of an honour society, do also play a role in carrying out research in certain specified

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(**) Lecture presented at the Colloquium on "The Academies of Sciences toward the year 2000" (Rome 20-22 September 1982).

areas. For instance, the Royal Swedish Academy of Sciences, while being an eminent honour society, is at the same time engaged in directly promoting and organizing research in astronomy, oceanography, and energy by running research institutions in these fields.

We cannot assume that the Academies of Science that have sprung up in Africa strictly follow any of these three major models *in toto*. For instance, the entity now known as the Ghana Academy of Sciences has gone — in less than 25 years, since its first manifestations in 1959 — through the whole gamut of a purely honour society (first type of academies) as the Ghana Academy of Learning (1959), to the second type in 1963 (as the Ghana Academy of Sciences, having absorbed the National Research Council and its associated research institutes); and finally, to the third type in 1968 (the present Ghana Academy of Arts and Sciences). Nor have any of them acted simply as a scientific club of eminent scientists. Indeed, the most characteristic feature of the academy scene in Africa is that they are very few, with most nations not having any institution which could be considered in this category of learned institutions. The few that exist have taken their inspiration from diverse sources; and all seem to be in a transitional stage of experimentation, including the idea of employing academies as an important instrument for national development. This is a fascinating epoch in the development of the African scientific community — and the natural history of the existing Academies of Science in Africa could provide new insights into their achievement and the emerging problems.

The Emergence of Academies in Africa

One could say that, as a historical fact, Academies of Science have emerged in particular nations in the continent as their scientific communities had reached a sizeable level of activity and they needed to begin to focus their attention on quality, discovery in research, and innovation in technological development. We could say with Greenberg (1967) that the national scientific community at this stage needed to give recognition to its own "established church" as a way of giving necessary motivation to scientific endeavour. In his words: "What is the National Academy? For the American scientific community, it is, in part, the Established Church, the House of Lords, the Supreme Court, and headquarters of the politics of science". We will attempt to examine this phenomenon of the emergence of academies in Africa through the development of these institutions in three countries where these creations represent rather different sources of inspiration and have taken a course of development seemingly indigenous to the country concerned — Ghana, Nigeria, and Kenya.

1. *Ghana Academy of Arts and Sciences*

The Ghana Academy of Arts and Sciences had, by December 1980, 60 Fellows and had grown from a small nucleus of 20 Fellows when it was established by Government fiat in 1959. It is probably the one Academy of Science in Africa that has consistently received direct and massive governmental support from its very inception. Indeed, its very formation was inspired by government.

The Academy started life as the *Ghana Academy of Learning*, through an Instrument of Incorporation signed by the first Governor-General of the new State of Ghana, The Earl of Listowel, on 21st November 1959. The academy idea was proposed by the first Prime Minister of Ghana, the late Dr. Kwame Nkrumah, towards the end of 1959; and he then established a small working party on 2nd November to select the 20 persons to be invited as the Foundation Members of the Academy; and to consider the officers of the new body, and the constitution to govern it. These 20 included the whole range of academic pursuits — from law to chemistry, from political science to biology, and from economics to plant protection. Furthermore, it had a considerable number of foreign residents in its body (e.g. the late Lady Barbara Jackson, the economist and author; Professor R.W.H. Wright, Professor of Physics at the then University College of Ghana; the late Mr. Geoffrey Bing, the then Attorney General of Ghana; and Mr. J. Lamb, then Director of the Cocoa Research Institute at Tafo, Ghana). Within six days of the Academy being incorporated, Prince Philip, the Duke of Edinburgh, inaugurated the Academy at a colourful ceremony — almost a state occasion — in the Great Hall of the University College of Ghana, at Legon.

The first President of the Academy, an honorific title, became Prince Philip; while the actively functional position of Chairman was occupied by Dr. Nkrumah. The secretariat of the Academy was housed in the Law School building in Accra, although the executive meetings were held as a matter of course at Flagstone House, the Prime Minister's official government offices.

Under the active direction of Dr. Nkrumah, the Academy rapidly acquired a position of both eminence and authority in the next four years. In November 1961, three conceptually significant decisions were taken:

— The Academy's name was changed to: the *Ghana Academy of Sciences*, because the original name "tended to convey the mistaken impression that the Academy was only concerned with the abstract pursuit of knowledge".

— The title of "Member" of the Academy was changed to "Fellow".

— Prince Philip was elevated to the newly created position of Patron of the Academy; while Dr. Nkrumah was appointed President and Chairman of the Academy.

These changes were followed in 1963 by a major structural change of the entire scientific organization and policy direction in Ghana. There was already

in existence, before Ghana became an independent nation, a National Research Council (NRC) which was primarily "responsible for research of an applied nature related to national development". It had been Dr. Nkrumah's wish for some time to see the NRC and the Academy work more closely together and eventually to merge, although there was considerable opposition to the idea by some members of the NRC — not so much because of inherent conceptual reasons, but because of the fear of eventual domination by the Academy. Nevertheless, in January 1963, after the Government's consideration of the idea, the Government decided on a merger of the two bodies through the publication of an Executive Instrument to effect the merger, with a full-time Secretary in executive control of the Academy.

The merger had a dramatic effect. It completely transformed the role of the Academy and its very nature in the country:

— The Academy immediately assumed the responsibility for 10 research institutes and 4 units and projects. The Fellows became closely associated with the work of these organizations.

— An entirely new organizational structure became operational, assuming somewhat the structure evident in the USSR and Eastern Europe: a Praesidium replaced the Council of the Academy; and the Praesidium assumed powerful functions, while the General Meeting of Fellows which erstwhile had a voice of authority (and, indeed, final authority), became a diminished voice in the running of the Academy.

— The activities of the research institutes and units came under more positive and continuing coordination and monitoring by the Praesidium than had been effective before.

Change of government in Ghana in 1966, the result of a *coup d'etat* against the Nkrumah Government, led to an entirely different scenario unfolding. The new Military Government appointed an Expert Committee, under the chairmanship of a distinguished British physicist (Sir John Cockroft), "to review the role and structure of the Academy". The Cockroft Committee submitted its report in January 1967. Its recommendations were swiftly accepted, and a Decree (National Liberation Council Decree 291 of 1968) was published in February 1968 to establish the Academy as we know it today:

— The previous "merged" Academy was split into two organizations: The *Council for Scientific and Industrial Research* (CSIR), concerned with research of an applied nature related to national needs; and the *Ghana Academy of Arts and Sciences*, operating as a purely learned society.

— The new name of the Academy implied that it was concerned with three areas of learning: the sciences, the humanities, and the fine arts.

— The original aims of the old Ghana Academy of Learning (1959) were adopted once again as the core of the Academy's mandate: to promote the study and the extension and dissemination of knowledge of all the sciences and of

learning; to establish and maintain proper standards of endeavour in all fields of science and learning in Ghana;

— and to recognize outstanding contributions to the advancement of sciences and learning in Ghana.

Thus, while the Academy reverted to its original role in national scientific endeavour, (i) its offices continued to remain where they were housed, which it shares with the CSIR; (ii) it maintains a secretariat with full-time staff, with a full-time Administrative Secretary, and headed by an Honorary Secretary (a Fellow of the Academy); and (iii) its dominant activities are now the convening of seminars and lectures (the most prestigious being the J.B. Danquah Memorial Lectures), the anniversary celebrations (in November and February of each year, which tend to be State occasions), the selection of recipients of awards and prizes (e.g. the Prince Philip Gold and Silver Medals, Undergraduate Essay Prize, and Ghanaian Language Prizes), the sponsorship of publications (the Academy publishes *The Proceedings* and the J.B. Danquah Memorial Lectures), organization of specialist meetings, and the selection of new Fellows.

The change in the functional role of the Academy seems to have resolved some of the conflicts that were evident when the Academy was merged with the NRC: these conflicts extended beyond the NRC, and embraced the university institutions who felt uneasy about the apparent encroachment of the Academy into their own legitimate spheres of endeavour, especially, in research. However, the Government — even after the Cockroft Report, and the fact that the Head of State was no longer necessarily the head of the Academy — gave unstinted support to the Academy. This is evident, for instance, in the fact that (i) the Academy could enjoy the assistance of a full time secretariat; and (ii) that the Government, through the Ghana Academy of Arts and Sciences (Amendment) Act of 1971 (signed on 8th December 1971) exempted the Academy from the payment of income tax and rates.

An interesting innovation of the Ghana Academy is that it has a provision, in its constitution, for learned and professional societies to be affiliated to it. This affiliation is of considerable promotional assistance to these societies, as the Academy is then able to grant them subventions for supporting their own professional activities, such as the publication of society journals and the organization of disciplinary conferences. There are already 10 such societies affiliated to the Ghana Academy, ranging from the Ghana Institute of Architects to the Ghana Theological Association, from the Classical Association of Ghana to the Ghana Medical Association.

The historical development of the Ghana Academy is of especial interest in the experimental phase the African continent is undergoing in science institutional building. The features of greatest interest are those concerned with experience of direct governmental intervention in sponsoring our "science cathedrals"; the magnetic interest in bringing science necessary for national development within the ambit of these science cathedrals; and the attempt to view

science in a holist sense, rather than confining the idea of an academy of science strictly to the so-called exact sciences. We are encouraged by the fact that the Government allowed changes to take place; but we feel it significant to observe that the indigenous Ghanaian scientific community did not seem to take an obvious pioneering, interactive role in the formulation and promotion of their Academy: the Government, and foreigners with a knowledge and interest in Ghana, seemed to have played a seminal role.

Not so, in the case of Nigeria.

2. Nigerian Academy of Science

The effort to establish an Academy of Science in Nigeria emanated from the Nigerian scientific community itself, and had a relatively long gestation period of ten years from the late 1960's, until it was actually inaugurated on 8th January 1977, at Trenchard Hall, of the University of Ibadan. The critical move which eventually led to the successful outcome was initiated by the Science Association of Nigeria (SAN), which appointed a *Committee of Fellows* of SAN in March 1974 of eminent Nigerian scientists, and charged them with "the immediate task of taking steps to initiate the formation of the Academy", an idea first mooted in 1972 to SAN Council by Dr. Ajovi B. Scott-Emuakpor, then the Honorary Assistant Secretary of SAN, "to institute a scheme of Fellowship to honour deserving Nigerian scientists". The Committee of Fellows worked hard for two years, meeting, studying the objectives and workings of foreign academies (particularly, the Royal Society of London, the U.S. National Academy of Sciences, and the Australian Academy of Science), and sampling the opinion of the Nigerian academic and scientific communities.

The events which led to the establishment of the Committee of Fellows, and the subsequent actions they took, is instructive of the manner in which the Nigerian scientific community was intimately involved in the creation of the Academy from a pre-existing mass-movement national association of science — and how the Government took very little part in the whole enterprise:

— 1972: Dr. Ajovi B. Scott-Emuakpor sent a memorandum to the Council of SAN in which he proposed the establishment of a scheme of Fellowship "to honour deserving Nigerian scientists".

— December 1973: The Council of SAN appointed the SAN Fellowship Panel, consisting of 4 scientists, to examine Dr. Scott-Emuakpor's proposal.

— January 1974: The Panel proposed that a Society of Fellows of SAN be formed, to spearhead the institution of an all-embracing Academy of Science.

— February 1974: The Council of SAN adopted the Panel's recommendation, and decided to propose a slate of 20 Fellows of SAN. This slate was confirmed at the subsequent meeting of the Council in March 1974; furthermore, the meeting agreed to ask these Fellows to establish the "Rules and Regulations" for the election, subsequently, of new Fellows.

— March 1974: The Annual General Meeting of SAN adopted its Council's recommendations, and therefore formally elected the first 20 Fellows to form the *Committee of Fellows of SAN*. This Committee was inaugurated on 21st December 1974 at the Queen Elizabeth Hall of the University of Ibadan.

— December 1974 to March 1976: The Committee of Fellows held four meetings, under the chairmanship of the late Professor V. A. Oyenuga. They unequivocally recommended the establishment of the Academy, selected a list of 45 prospective Foundation Fellows, drafted Statutes and By-Laws, for the Academy, and appointed a steering committee to launch the Academy.

— 8th January 1977: The *Nigerian Academy of Science* was inaugurated, with 45 scientists ("the cream and cross-section of the Nigerian scientific elite...") taking part as the first and Foundation Fellows of the new Academy. The maximum number of fellows is established at 100, with not more than 5 new Fellows elected each year.

It can be seen that the Nigerian Government played little part in the formation of the Nigerian Academy of Science. The whole impetus, and direction it took, emanated from the Nigerian scientific community itself — although it did seek ideas from the Government and from outside the country. In this respect, it is of germane interest to note that a Workshop, co-sponsored by the U.S. National Academy of Sciences, the U.S. Agency for International Development, and the Rockefeller Foundation, convened as the result of a request from Nigerian scientists, was held in Bellagio in Italy in August 1965, "for guidance in organizing a Nigerian Academy of Sciences, a Nigerian Research Council, and a scientific policy for Nigeria. Nigerian scientists and government leaders attended it, as well as representatives of the three American institutions and the Royal Society of London. The workshop recommended the establishment of two separate institutions (a national research council and an academy), but recommended the arrangement for an "interlocking membership" of the two institutions to achieve complementarity and coordination. Thus, while the research council "is responsible for the statement of needs and the ordering of priorities in relation to the facilities available...", the Academy "has the duty of ensuring the integrity of scientific effort in the context of the community".

In the event, the Nigerian Academy of Science has chosen for itself, with the consensus of the Nigerian scientific community — a pivotal innovation — to be the highest "honour society" in science in Nigeria "by establishing and maintaining the highest standards of scientific endeavour and achievement in Nigeria". Apart from this characteristic feature, this Academy has a number of features of commanding attention:

— It is restricted to the sciences only: it is organized around biological sciences (including medical and agricultural sciences), and physical and mathematical sciences (including engineering sciences).

— Part of its overall goal is to facilitate the use of scientific knowledge

"in the solution of major problems of national interest". It does so by two main means: (i) "by providing advice on specific problems of a scientific and technological nature, presented to it by the government and its agencies as well as by private organizations"; and (ii) "by bringing to the attention of the government and its agencies problems of national interest that science and technology can help solve...".

— It does not have a secretariat of full-time or paid staff, although it has provision for an Executive Secretary who would be appointed in the near future.

One could say that the two Academies of Science in Ghana and Nigeria represent two extremes of a spectrum. Certainly, it seems that the *Kenya National Academy of Sciences* is not one or the other, and has a historical development of a distinct character of its own and without parallel anywhere in Africa.

3. *The Kenya National Academy of Sciences*

The first impetus for the creation of an Academy of Sciences was first expressed by East African scientists training in Britain at the beginning of the 1960's. After a series of meetings amongst themselves, and communication with the more established scientists back home in East Africa, involving a great deal of thought and planning, the *East African Academy* was eventually established in early 1963, with headquarters in Nairobi (Kenya), as a "forum for East Africa's active research workers and scholars of all disciplines" and as a body in close "touch with the general public". The Academy was inaugurated with a meeting of scientists and scholars and the First Symposium between 14th and 17th June 1963 held at the then Makerere University College, in Uganda (East African Academy, 1964).

Apart from its all-embracing fields of scholarship and science, just like the original Ghana Academy of Learning established 4 years earlier, the East African Academy had a number of unusual characteristics:

— It was a regional organization, with branches in Uganda, Tanzania, and Kenya.

— It was not an honour society, although later on it did establish a class of membership, called "Fellows", which was meant to honour those East Africans who had rendered distinguished service for the cause of science. This category of membership threw open to honouring distinguished research scientists and scholars, as well as persons in other walks of life who had promoted science, technology, and scholarship in East Africa. Only four persons ever attained this status in the life of the Academy until its demise some six years ago, with the death of the East African Community (which brought together Uganda, Tanzania and Kenya in a regional common market).

— It had student membership, and foreign residents enjoyed membership of the Academy.

Although a non-governmental body, the Academy was able to attract modest grants from the state governments, the East African Community, private sources of finance (including non-profit foundations), and aid agencies. In this way, the Academy took on a fairly vigorous programme of publications, scientific conferences, exchange of scientific visits with foreign academies, and documentation in the social sciences. In regard to the latter, there still exists a considerable documentation centre under the umbrella of the successor body of the East African Academy. This entrepreneurial activity has not extended to the coordination of research and, indeed, there has not been any basis for doing this since the three state governments have their own well established National Councils for Science and Technology who have responsibility for this function.

The demise of the East African Community in June 1977, the immediate closure of the border between Tanzania and Kenya which severely restricted communication, and the civil unrest in Uganda which reigned throughout the 1970's, brought in new circumstances which radically changed the science institutional building activity in the whole region. Earlier, the Academy had greatly championed the idea of establishing a national research council to coordinate science and technology policies and to coordinate research at national level. The demise of the community led to three major developments. Firstly, the Academy withered away because of the regional structural arrangements that supported it and the lack of easy communication on which its strength was based. It died unsung; but, in Kenya, two new bodies sprung up to inherit its mantle (of this, more later). Secondly, each of the three states, brought in new legislation to establish, with the advisory and technical assistance of UNESCO, National Councils for Science and Technology, to oversee and coordinate the research effort as a whole. Thirdly, the erstwhile regional research institutions became "nationalised", and it was no longer easy to think and work in pan-East African fashion. Although scientists and scholars individually continued to maintain close and easy communication (and even continued to carry on collaborative efforts in research and other areas of scientific endeavour), it became almost impossible to undertake cooperative efforts at institutional level.

The academy idea seems to have died in Uganda and Tanzania. In Kenya, a new successor organization, the *Kenya National Academy for Advancement of Arts and Sciences* (KNAAAS) was established immediately in July 1977, and took over the functions and assets (including the documentation centre) in Kenya of the former East African Academy. It received substantial government subvention to carry on its functions, in addition to its other funds derived from membership subscriptions, private sources, and aid agencies. Its constitution was very much modelled on that of the former Academy, except that it put considerable emphasis on the promotion of science to the general public. In this respect, it has published over a number of years a general-interest magazine

(POST), which is distributed to schools and colleges; it supports an annual science exhibition and competition among high schools; and it sponsors a TV science quiz show from time to time. All these programme activities are resource-demanding; there is therefore a small complement of full-time staff to support them.

While KNAAAS took over the populist facets of the functions of the former East African Academy, an entirely new body was created to specifically cater to the need of an honour society.

The *Kenya Academy of Sciences* (KAS) was established on 25th October 1977 under the Companies Act (Chapter 486 of the Laws of Kenya), as a company limited by guarantee and without a share capital. Nine Kenyan senior scientists, including two social scientists, formed themselves into this new body "to act as a body of scientists of eminence for the promotion and development of science and technology, and to foster the practical application of such science and technology to the problems of national welfare in Kenya". It had only one category of membership, that of Fellows, and it did not pretend to be a mass-movement science body.

The KAS has had considerable success in convening evening science discourses, arranging for public lectures by eminent scientists (mostly of Kenyans but also of a few foreign scientists), and in working closely with other Academies of Science. It has, for instance, maintained close relations with the Royal Swedish Academy of Sciences (who participated officially in the colourful ceremonies for the inauguration of the Academy in October 1977) and the Indian National Science Academy, with whom the KAS has been discussing plans for the establishment of a Giant Equatorial Radiotelescope (GERT), possibly on the Equator in Kenya.

In late 1981, serious moves were initiated by the National Council for Science and Technology (NCST) in Kenya to find a common ground for merging the two Kenyan academies, and to form a single academy with an agreed mandate. The scientific community was consulted by a special sub-committee of the NCST for finding a solution to this problem, after which it developed a broad constitutional framework under which the new Academy, with the full backing of the Government would be established. In general outlines, the new Academy was to have the following features:

— Its broad mandate was defined as "to establish and maintain standards of scientific and technological endeavour and achievement in Kenya and to recognize outstanding contributions in the field of science and technology".

— It would have a special category of membership, "Fellows", who would be elected into this position by the Governing Council of the Academy, whose members had this category alone from the Council. Fellowship is conferred by the Governing Council of the Academy on scientists "Who have made outstanding contribution in the field of science and technology". The first 10 Fellows would be appointed by the NCST after nomination by and consultation with the

Kenyan scientific community. This body of scientists would be self-perpetuating after this initial event. Ordinary members would be elected according to the by-laws of the Academy.

— The Academy would be confined to the exact sciences, technology and engineering, and social sciences.

— It would become a focal point for disciplinary and professional societies, by in some way affiliating them to the Academy.

— The government would give the Academy an annual subvention, would provide some physical means for its work, but would expect it to seek other sources elsewhere. Once launched, the Government would leave it free to pursue its goals as it saw fit, except for one senior representative (the Secretary of the NCST) in its Governing Council.

The *Kenya National Academy of Sciences* (KNAS) is now a reality. On 8th September 1983, a crucial gathering in the NCST (National Council of Science and Technology) headquarters, of the Chairman and Secretary of the NCST, a senior representative of the Ministry of Regional Development, Science and Technology, and of 20 senior scientists, led to the endorsement of the NCST plans for the birth of a new Academy. It was followed immediately by the nomination by the NCST of the first ten Founding Fellows, and the subsequent election of 5 more Fellows to constitute the initial body of Fellows of the KNAS and its Governing Council. The new Academy is now functional — having taken over the assets of the former KNAAAS, and with the agreement of the latter and KAS they are initiating steps to phase out their existence without further delay (*).

Prospects and the Future

Will the academy plant take root and flourish in Africa? We believe so. The problems met and the changes sustained by the scientific communities in Ghana and Kenya, as a result of the quick-sands of affairs of Africa, give credence to the resilience of these communities. The crucial question then is not whether they wish to survive, but what direction each national group will take.

Will they all be nationalistic, or will they make another attempt at a regional grouping? Will they emphasize the application end of the spectrum more and more as national development programmes recognize science as an important instrument for development? Will social sciences gradually play a principal role in academy affairs? These are important questions, and we need to appreciate the fact that these bodies, as they aim to reach their goals, will rely to a considerable extent on governmental financial assistance. But they are

(*) Added in proofs.

all sensitive to the importance of their keeping their autonomy, if they are to maintain their standards, and it is fortunate that their host governments are equally sensitive.

We look forward into the future with some optimism and excitement!

References

East African Academy (1964) - *Proceedings of the East African Academy*. First Symposium, Makerere University College, June 1963. Longmans, Nairobi.

Greenberg D.S. (1967) - *The National Academy of Sciences: Profile of an Institution*. « Science », *156*, 222.

National Academy of Sciences (1965) - *Science and Nigerian Development*. Report of a Workshop, 19-25 August 1965. NAS, Washington D.C.