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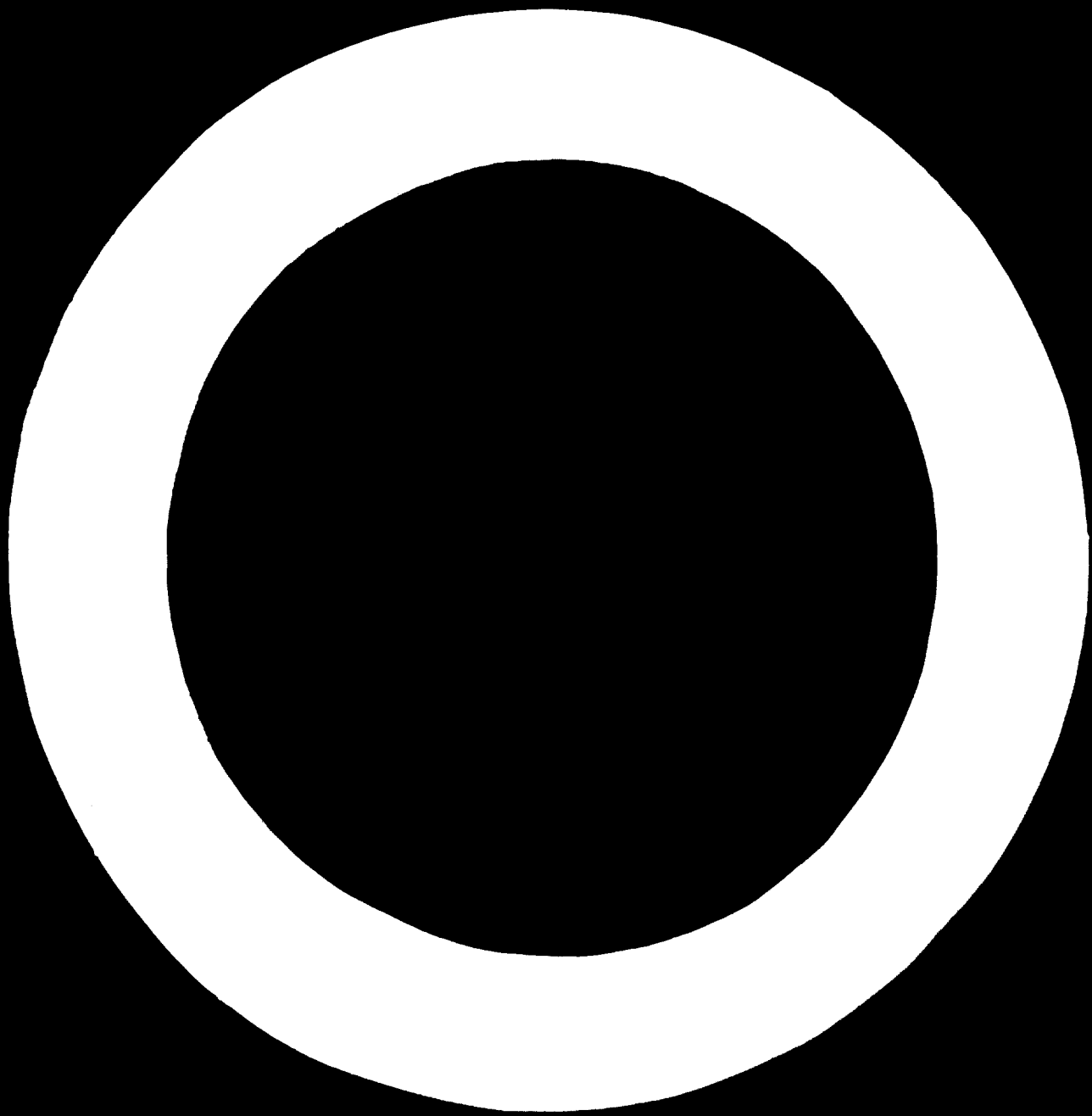
SOME ASPECTS OF INDUSTRIAL DESIGN  
DEVELOPMENT IN NIGERIA <sup>1/</sup>

by

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<sup>1/</sup> The views and opinions expressed in this paper are those of the author and do not necessarily reflect the views of the secretariat of UNIDO. This document has been reproduced without formal editing.

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The scope of manufacturing activities in Nigeria does not give a clear insight into the extent of the local industrial design effort. The bulk of the new products manufactured in Nigeria and introduced into the market are produced by firms which are frequently the local representatives of some foreign parent organisations. The machinery, and to some degree, parts of the raw material requirements of these firms are imported. What Nigeria seems to provide is the manpower required to keep these firms running. Some of those firms which are jointly owned by Nigerian and foreign capital reveal this same pattern; this last category of firms may exclusively process local raw material like cotton, oil seeds, cocoa, limestones etc. The incidence of local development of new products, design and fabrication of prototypes is still so small, that it is not evident.

A few of the research institutes set up in Nigeria with public funds are actively finding ways of exploiting local raw materials on an industrial scale. In particular the Federal Institute of Industrial Research at Oshodi may be mentioned. In a short space of time, this Institute has developed a high protein food, methods for producing industrial quality alcohol from fermented palm wine, and methods of producing good quality kaolin and limestone products from local sources. A prototype of a machine to peel cassava roots has been designed and is also being fabricated. It may be pointed out that no machine is

available anywhere capable of performing this task for the simple reason that the cassava root has a thick rubbery cortex which must be completely removed if the root is to be used in manufacturing a local staple food product (gari). At the University of Ife it was recently announced that a lecturer had developed two machines, one capable of producing 'pounded yam', and the other capable of shelling melon seeds. These processes were previously performed manually, and frequently under unhygienic conditions. A few years ago, it was publicised that a Nigerian had developed a machine capable of splitting cocoa pods at a speed equivalent to that of 32 skilled hands. In parts of Northern Nigeria, sheet metal workers are producing a wide range of containers and ornate metal ware. Here again the limitation is the cottage scale of production and the absence of high capacity equipment or production

The construction companies in the country are growing at a rather vigorous pace. In this field Nigerian engineers are holding their own frequently at par with their foreign counterparts. While the foreign Civil and Architectural Engineers enjoy the advantages of solid financial base and are able to expand into all phases of civil constructions - roads, bridges, homes, public buildings etc, their Nigerian counterparts tend to specialise in closed areas, housing or roads and bridges. They seldom expand into all phases of the construction business. In general however, the participant in this business, foreign and Nigerian alike, produce results which in design, execution and finish attain high standards.

The limitation in Nigeria in the mechanical and electrical design and fabrication scene is the paucity of a wide range of engineering materials such as - ferrous and non-ferrous metals,

machinable or generally workable plastics of all types, engineering components like bearings, fittings, seals, tubings, moderate capacity equipment etc. This is manifested in the types of manufacturing processes that are undertaken today. As far as it is known to this writer, the first molding and die casting companies which have recently been established in Nigeria are local representatives of foreign parent bodies, importing their machinery and blue prints. The metaloplastic firms producing toys, bottles, containers and culinary hardware are similarly imported. It is thus remarkable that while some of the most upto date industrial activities are going on side by side in Nigeria, the local design content continues to be minimally small.

It is well known that most industrial firms in Nigeria are performing successfully. Their machinery are running round the clock and their finished products are satisfactorily compatible with those manufactured elsewhere. This points to the fact that the Nigerian manpower which often contributes 60 to 90% of the work force used by these organisations at all levels of production and management are sufficiently skilled. Where in-job training is requisite, it can be assumed that those employed for in-job training readily acquire the skills required to enable them to perform effectively. However the total technological manpower available in Nigeria is not large by the standard of the developed nations. The national Manpower Board undertook a continuing programme starting in 1964 to register, among other professions, the number of all types of indigenous engineers working in the country. The record showed 436 engineers in 1964, and when this exercise was repeated in 1966, the registry showed 684, an increase of about 56.9% over the earlier figure. The breakdown of the

1966 figure by professional specialisation is as follows:-

<u>Branch of Engineering</u>	<u>Number of registered Nigerian Engineers</u>	<u>% of total registered Engineers</u>
Civil	290	42.4
Mechanical	100	14.6
Electrical	86	12.6
Telecommunication	81	11.8
Mining	25	3.7
Chemical	7	1.0
Petroleum	11	1.6
Aeronautical	10	1.5
Agricultural	7	1.0
Automobile	23	3.4
Marine	24	3.5
Industrial	4	0.6
Others	16	2.3
<b>T o t a l</b>	<u>684</u>	<u>100.0</u>

The National Manpower Board however comments '.... a good number of professionals still failed to appreciate the value of the exercise and so could not be persuaded to register. This is most apparent among self-employed professionals and new graduates who were seeking employment during the time of registration.' The National Manpower Board figures are not available for 1967-1970 for reason of the civil war. It is hoped that as the manpower registration programme comes to the generally accepted, accurate figures may be available. It should be appreciated that this registration was carried out principally for professionals with the equivalent of one or more university degrees. The Manpower Board published records are at present silent on the figures of the bulk of the technicians turned out by the trade schools, technical



institutions and colleges of technology. It is this group of technicians who are actually responsible for the day to day operation of equipment; while their number is unknown exactly, it is presumably in the hundreds.

The growth of Universities in Nigeria in the last ten years has given an added impetus to the steady growth of Nigerian technological manpower. Of the five Universities in Nigeria today, three have successfully established thorough-going engineering departments, albeit with limited fields of specialisation; University of Ife, a young institution, is presently developing its Chemical Technology department while University of Ibadan is now planning to set up its own Institute of Technology. Meanwhile Nigeria has continued to use the facilities for technological training provided by institutions abroad. Although a College of Technology in Nigeria has been training Engineers as far back as twenty years ago, institutions abroad have trained the bulk of Nigeria's technical and engineering manpower. The following table is culled from the National Universities Commission Annual Review for 1966-67.

	<u>Subject Group Enrolment Trend</u>				
	1962-63	1963-64	1964-65	1965-66	1966-67
New Entrants	-	231	205	235	372
Total in Enrolment	312	435	514	660	780

In the 1966-67 academic year, 61 students were graduated from all the branches of engineering, this is as against 165 graduates (one quarter of the total enrolled in 1965-66 academic year) who would have been expected to graduate in the 1966-67 year. This suggests a high casualty rate, that is, a significant fraction of the total number of students enrolled in engineering departments drop out or transfer to other

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departments before the conclusion of their education programmes. It was also indicated in this review that 277 of the 1260 students reported to be arriving in Nigeria in 1966-67 from foreign institutions had one or more engineering degrees. It is significant that in the 1966-67 Year, foreign institutions produced over four times the rate of local institutions.

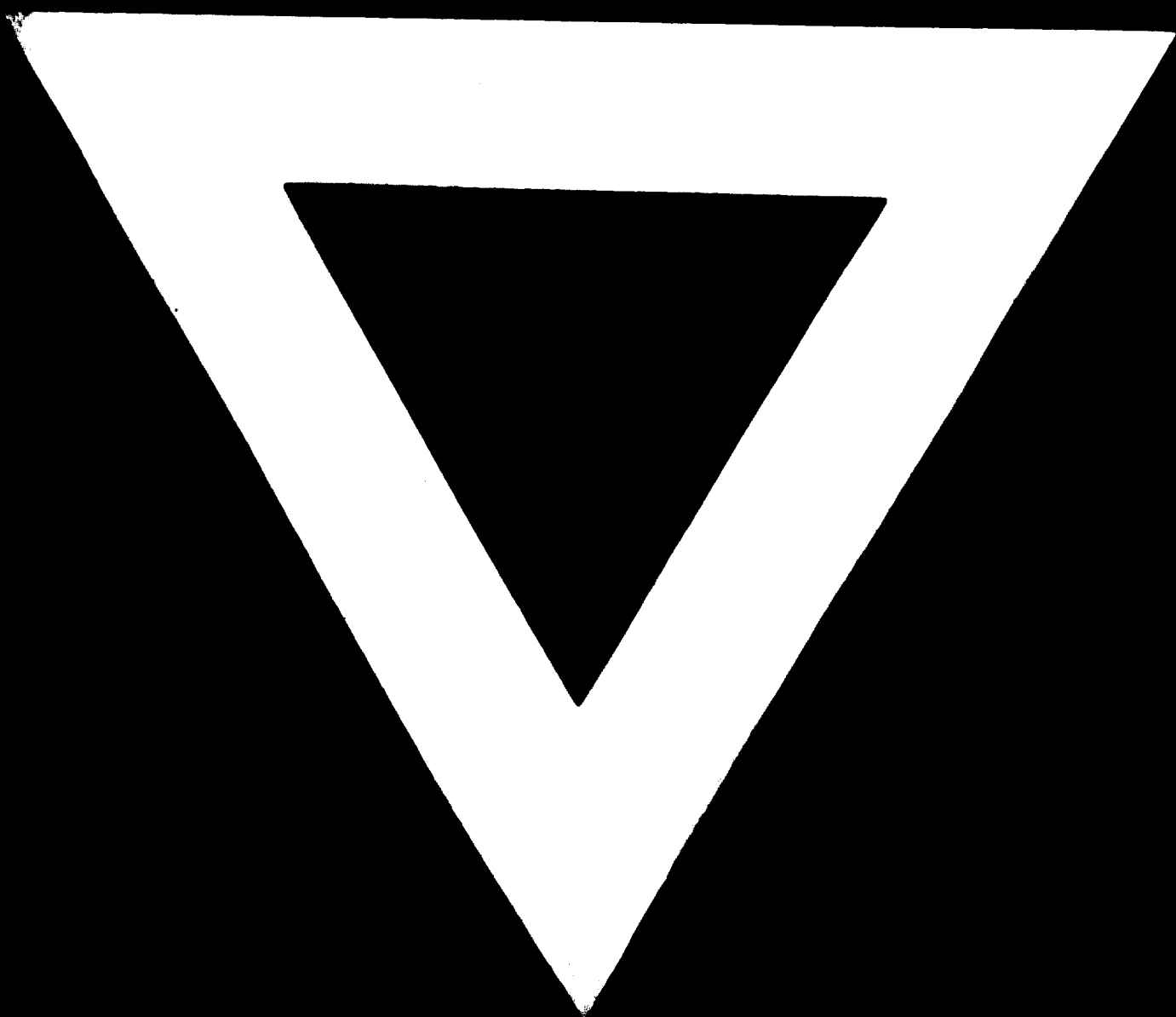
It is reasonable to conclude that, based on the annual rate of production of engineers from the home universities, and their rate of return from overseas, the 1966 figure of the National Manpower Board has underestimated the real technological manpower situation in the country. And given the concentration of engineering specialists in the major urban areas in this country one may assume that experts are available who can undertake creative industrial design activities in group or individually.

The establishment of a center for creative industrial design with the corresponding workshops and laboratories for testing models and prototypes in a developing country like Nigeria will give a decided impetus to this creative activity. What will be gained is the forward integration of the skills and the exposure gained from such a center into the social activity of industrial designing, fabricating and testing of new products.

In setting up such a center, advantage may be taken of the existing facilities which when augmented will be capable of attaining maximum scope and coverage of the local industrial scene. The Federal Institute of Industrial Research, Oshodi already possesses such facilities for thorough investigation of design problems. It maintains a design section, which although starved of funds for equipment, has succeeded in identifying and tackling fundamental design problems. If on the other hand, such a center is created separately, it will have the initial disadvantages of costs, and a long range

effect of committing the United Nations Organization to a protracted presence. An area Industrial Design Center catering for the needs of several adjacent nations will curtail the undue proliferation of such centers in a small geographical region, and enjoy the advantages of scale and economy of costs. And where such a center is to be operated for a judicious length of time under the auspices of the United Nation Organisation, the suggestion that such a center be set up within an established Research Institution becomes compelling.





**74.10.16**