

SCIENCE AND TRIBAL ART

By WILLIAM FAGG

AN exhibition of "Traditional Art from the Imperial Colonies", held recently in the Art Gallery of the Imperial Institute, London, was, for the discerning public, an outstanding achievement of the Festival Year, even though it was too modestly advertised; its interest lay not only in the fact that it was the best display of tribal (and especially African) art, selected and arranged as 'art', that has ever been held in Great Britain, but also in the many problems which it offered for solution by scientific disciplines that have no normal connexion with the world of art. I am not now thinking of ethnology and archaeology, in which aesthetic studies have, or ought to have, a key place, and which are not sciences in the full sense, but rather of some of the natural sciences, from which important—and perhaps in some cases as yet unsuspected—contributions may be demanded in the next few years.

There is a sense in which all true art—all art, that is to say, which fulfils art's immemorial function of improving upon and 'harmonizing' Nature (in the spirit of the Indo-Aryan root from which both 'art' and 'harmony' are derived)—is, like science itself, inductive. I mean that it proceeds from the particular to the general, beginning from human and other forms and stylizing or generalizing them. It is doubtful whether the *trompe l'œil* schools of art, the photographic realists who aim at nothing more than precise recording of the object, can be called artists at all in any strict sense; some of them, indeed, seek on the contrary to crystallize general ideas in terms of the particular, using purely naturalistic representations to illustrate 'literary' concepts (such as "Love Locked Out") in a manner which we may perhaps term deductive. The method of true art, as of poetry and music, is surely to bring the mind's centres of association into play, and this it does by generalizing things to a point where the spectator is reminded, subconsciously, of other more-or-less related things. Of all kinds of art none demonstrates this aim more clearly than that of the tribal peoples, among whom disciplined stylization is most highly developed; an ancestor figure from Africa may show not a mere portraiture of the deceased individual's features, but rather an abstraction of some of the qualities which are conventionally attributed to the tribal elders, alive or dead; and this quality of generalization is, of course, also found in the finest classical and renaissance art, transcending the naturalism which is their most obvious characteristic.

A further lesson which may be drawn from such an exhibition as the one at the Imperial Institute is that, whereas in the classical tradition of art only one kind of image, a broadly naturalistic one, is permissible, in tribal art no such single canon can be postulated. The possibilities of stylization are clearly unlimited, and in this exhibition there were well over a hundred different styles, in each of which a whole new world of art has been created, internally coherent and completely convincing even to the uncomprehending Western eye; it is meaningless to try to arrange them in order of artistic value or to suppose that there can be an ideal method of stylization.

The greatest problems involved in the scientific study of tribal art are those concerned with its origins

and the historical processes by which it is developed (a task in which study of the social milieu of present-day tribal art is by no means irrelevant). The most obvious way in which the natural and physical sciences can be of use is in the dating of excavated pieces, and here geology is naturally most prominent. In the whole field in which African sculpture is found—a field bounded roughly by the Sahara, the Great Lakes and the Kalahari—the oldest art form to which any date has been assigned on reasonably scientific grounds is the terra-cotta sculpture of which traces have been coming to light during the past eight years around the village of Nok, south of the Central Plateau of Nigeria; the few examples in the exhibition were enough to show that sculpture was in a highly developed state in Northern Nigeria many centuries ago. The pottery figurines, most of them fragmentary, are generally found at a depth of about 25 ft. in alluvial tin-bearing deposits which geologists have recently dated provisionally to the second half of the first millennium B.C. Geological dating is still very difficult in West Africa, whereas in North, East and South Africa elaborate successions have been drawn up with fairly general agreement and are being constantly refined. The dating of the Nok culture is based on a correlation of the deposits in which it is found with the Nakuru Wet Phase of East Africa; but much further pure research in West African geology is needed before the theory can be considered established, and it must also be noted that even a fully successful correlation of East and West African deposits in a geological sense would not necessarily establish synchronism. There is a good prospect that archaeology will prove as helpful to geology as geology to archaeology.

The great majority of the exhibited sculptures were in wood, and we may note the possibility that dendrochronology, developed with such success in the south-western part of the United States, may be found to work in West Africa also; but little or no study of the formation of tree rings seems to have been carried out there as yet. Simple identifications of the woods used by carvers may, however, be of great value in technological study and also, no doubt, in the identification of styles. It may be worth mentioning that an effort is to be made to test the application of the radiocarbon method of dating to fossil trees found in the Nok deposits with the terra-cotta sculptures.

Metallurgy and chemistry are of particular importance in West African studies because of our dependence on bronze castings for most of our knowledge of art traditions older than about a hundred years (a life span seldom exceeded by wood carvings). The exhibition at the Imperial Institute included some of the most important pieces of bronze and brass work from the Guinea coast, including several of the famous bronze heads from Ife (flowed from Nigeria) and representatives of all periods of the related work of Benin, beginning almost certainly before the first arrival of the Portuguese. Already it appears probable that brass (copper alloyed with lead or zinc or both) or virtually pure copper was normally used until the Portuguese introduced the true tin bronze. The

opportunity afforded by the brief presence in Britain of these Nigerian treasures has been taken to carry out further scientific research upon them in the research laboratory of the British Museum.

It is now accepted that science has a great part to play in the critical study and treatment of European art; one may instance Dr. H. J. Plenderleith's part in the detection of the van Meegeren forgeries of Vermeer, or the elaborate techniques used in the cleaning of old paintings. Tribal art demands comparable methods: difficulties are involved in the cleaning and preservation of such things as ancient bronzes of superb patination or recent wood-carvings painted in earth colours or infested with woodworm; and forgeries are far from uncommon in the European market (though they are fast being lost to the United States). Science has yet to say the final word on the authenticity of what is probably the most famous of all West African bronzes, the "Olokun" head of Ife in Yorubaland; the results of a preliminary critical examination were given in *Man* of January 1949, and it is hoped that it may soon be sent to England again for a further period of study; meanwhile, it appears to be a skilful replica of the head seen by Frobenius in 1910.

There is, however, one form of scientific investigation—involving biology and applied mathematics—which, so far as I know, has never yet been attempted in the field of tribal art, or probably in any artistic field at all, and one can only briefly mention it in this article. It is concerned with what I may call the mathematical basis of distortion in the interests of art, and for that reason tribal art is clearly the most promising field, and classical art, in which distortion of natural forms is practically excluded, the least promising. There is, indeed, one minor form of European art—caricature—in which distortion and exaggeration play almost as characteristic a part as they do in tribal art; and in the best caricature it would doubtless be found that the exaggerations of a given physiognomy bear a definite and coherent (though not an absolutely precise) mathematical relation to its natural proportions—for example, a politician with a prominent forehead and chin and a somewhat 'dished' profile might find these features carried by the caricaturist's pen to lengths impossible in Nature, and yet, because the relation between the parts remains the same, the distortions render him more rather than less recognizable by the general public. It is possible to express this phenomenon mathematically by means of a series of exponentially curved co-ordinates similar to those employed by Mr. R. Guley Lewis in an article on "Co-ordinates as a Clue to the Morphology of Human Profiles" in *Man* of April 1949 (though that article had no reference to art). The same principles could be profitably applied to much tribal sculpture, in which exponential curves may be found directly represented, besides being followed, unconsciously, in the distortion of other forms. It might be found that the carvers who conformed most closely to D'Arcy Thompson's principles of growth and form were also those recognized as the greatest masters both by their own people and by European critics, and in that case a great step forward in objective criticism would have been taken. I looked forward to some guidance in this connexion when the Institute of Contemporary Arts recently held an exhibition entitled "Growth and Form" and inspired by D'Arcy Thompson's book; but I was disappointed to find that little serious effort had been made to relate his work to the world of art, though it is cer-

tainly of great interest that it should be brought to the attention of artists at all. Yet anyone with a scientific as well as an artistic bent who went on from that exhibition to the display of tribal art at the Imperial Institute might well find many a bell rung in his mind by their exotic forms and volumes.

A PHILOSOPHY OF NUTRITION

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ON many occasions in recent years attention has been directed to the increasing food requirements of the world following the rapid and continuing growth in population and the desire in all countries for a higher standard of living. The dangers arising from soil erosion have also been stressed, leading as it does to a substantial decline in food production. Several writers have presented a dismal picture of progressive starvation in some regions of the world. Others have adopted a less pessimistic point of view and have suggested that the way to safety lies in an active programme for the efficient conservation and the fuller utilization of the natural resources of the world, together with the development of sparsely populated countries.

In relation to this last point, a question of great importance is whether or not there are sources of foods indigenous to certain countries but perhaps little known in Western Europe or on the North American continent. This is a problem which for the past eight years has been the subject of investigations by Dr. R. H. Harris and his colleagues at the Massachusetts Institute of Technology, who set themselves the task of analysing the foods grown and eaten in Mexico and other countries of Central America. The research programme involved: (i) the collection and analysis of a large number of edible plants; (ii) the examination of methods of food preparation and the determination of the composition of prepared foods; (iii) a survey of dietary habits; and (iv) a clinical and biochemical investigation of nutritional status.

The work of the Massachusetts group has been characterized by its thoroughness and by the range of analyses carried out over a very wide area; it has already had far-reaching consequences and has led to a new outlook on nutritional problems in the countries concerned. In Mexico City, laboratories have been established at the National Institute of Nutrition for the development of a food analysis programme to be integrated with clinical surveys. Even more striking is the foundation of an Institute of Nutrition of Central America and Panama, an experiment in international co-operation of prime importance in that the central laboratories opened in Guatemala City in 1949 will serve all the countries of the region.

The purpose of the present review is to outline some of the findings of the American group and to relate them to results of investigations in Africa and Asia.

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