The place of the newer penicillins in the treatment of any other infections than staphylococcal is more doubtful. Penicillin G exceeds all other penicillins in activity against all other bacteria (except two uncommon species of *Proteus*), the differences being often wide. The nearest approach to the activity of penicillin G against important pathogenic organisms such as haemolytic streptococci and pneumococci is that of penicillin V, which may therefore reasonably claim to retain its place in the oral treatment of sufficiently sensitive infections.

Summary

The minimum concentrations of four penicillins inhibiting the growth of a variety of pathogenic bacteria have been determined, and the differences in activity so revealed are briefly discussed.

I am indebted to Beecham Research Laboratories for kindly furnishing supplies of broxil and celbenin; to Eli Lilly and Co. for supplies of pure potassium penicillin V; to Dr. C. S. Nicol for the specimens from which the strains of gonococci were cultivated; to Dr. Patricia Carpenter for some strains of *P. morgani*; and to Miss Pamela M. Waterworth for her skilled execution of the tests described.

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FURTHER NEUROPSYCHIATRIC OBSERVATIONS IN NIGERIA

WITH COMMENTS ON THE NEED FOR EPIDEMIOLOGICAL STUDY IN AFRICA

BY

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The present study is a supplement to the preliminary survey of neuropsychiatric problems in the Western Region of Nigeria (Lambo, 1955, 1956). Intensive studies (*British Medical Journal*, 1956) have been made in various parts of Nigeria, and the present article is an attempt to present a review of our work.

The need for epidemiological study in Africa, using small but effective samples, is urgent. The field for research in this direction, which has not yet been exploited, remains difficult, yet it is of first and ever-increasing importance (W.H.O., 1959; Lambo, 1959a).

Clinical Findings

I shall attempt to appraise briefly the most important types of neuropsychiatric disorders seen over a five-year period at Aro Hospital, the University Psychiatric Clinic, and the villages around Aro, a rural suburb of Abeokuta town, 60 miles from the Federal capital. In addition, patients have been referred to us from various parts of West Africa. We have therefore been well

placed to see neurological, psychotic, psychosomatic, and neurotic patients of various types and in various subcultural and social settings. A supplementary rural survey (native treatment centres), the first of its type to be carried out in Nigeria, has also proved valuable, while many acute and episodic types have been admitted for study in the hospital (Tables I and II).

In respect of the usual terms "recovered," "improved," and "not improved," in the light of our experience among the rural and semi-primitive population of Africa, it is almost impossible to find any definable criterion on which to base the distinction. Consequently, we have deliberately dropped the term "recovered," as a result of which our "improved" group includes those who have recovered.

TABLE I.—Aro Hospital, Other Mental Health Centres, and Native Treatment Centres (N.T.C.). Admission Data, 1954-8 (Western Nigeria)

Diagnostic Classification	Treated at Aro		Treated at N.T.C.	
	Total	No. Improved	Total	No. Improved
Schizophrenia	960	486	635	452
Schizophreniform reactions	138	93	230	220
Anxiety states	250	210	330	317
Drug addiction	18	1	—	—
Chronic alcoholism	16	3	—	—
Endogenous depression	184	53	280	90
Organic brain syndrome	62	20	28	3
Manic-depressive	117	70	109	—
Psychopathic personalities	39	3	—	—
Involuntal disorders	66	42	29	3
Obsessive-compulsive neuroses	10	2	23	21
Hysteria (conversion)	82	29	67	35
Psychoneuroses of ill-defined patterns	1,236	843	1,807	1,434
Puerperal and post-puerperal psychoses	315	34	211	6
Epilepsies with or without psychosis	219	102	36	2
Mental deficiency	83	53	64	54
Excito-motor syndrome and other unclassified psychoses (e.g., periodic psychosis)	180	146	122	120
Total	3,975	2,190	3,971	2,757

TABLE II.—Classification of Cultural Backgrounds

Diagnostic Categories	Treated at Aro			Treated at N.T.C.		
	Urban and Literate	Urban and Illiterate	Rural	Urban and Literate	Urban and Illiterate	Rural
Schizophrenia	370	320	270	363	180	92
Schizophreniform reactions	49	59	30	72	124	34
Anxiety states	71	93	86	94	170	66
Drug addiction (pethidine and hemp)	15	3	—	—	—	—
Chronic alcoholism	16	—	—	—	—	—
Endogenous depression	100	63	21	127	82	71
Organic brain syndrome	32	27	3	15	10	3
Manic-depressive	63	41	13	47	28	34
Psychopathic personalities	15	23	1	—	—	—
Involuntal disorders	29	35	2	13	11	5
Obsessive-compulsive neuroses	5	3	2	14	9	—
Hysteria (conversion)	19	57	6	13	46	8
Psychoneurosis of ill-defined pattern	643	379	214	206	1,489	112
Puerperal and post-puerperal psychoses	173	110	32	127	63	21
Epilepsies with or without psychosis	41	72	106	4	18	14
Mental deficiency	11	18	54	2	14	48
Excito-motor syndrome and other unclassified psychoses (e.g., periodic psychosis)	—	72	108	2	10	110
Total	1,652	1,375	948	1,099	2,254	618

The mean age of the group of 960 schizophrenic patients at the time of onset of the illness was 23.45 years. There was no appreciable difference between the sex distribution of the major psychoses and well-known psychoneuroses. Excito-motor syndrome and malignant anxiety are, however, exclusively confined to men in rural and primitive areas. On this and other observations it seems that patients from rural, non-literate communities of Africa recover much more readily and quickly from the major mental disorders than the urbanized Africans.

In our clinical practice in Africa the term "improved" is entirely operational and is therefore reserved for those who on discharge have regained *some* capacity for the major social roles in the community. This means much more than the subsiding of the patient's symptoms in the environment which the "hospital" (N.P.T., village system at Aro, etc.) provides.

It should be pointed out that most of our patients admitted into the village community are accepted for treatment on account of a favourable prognosis; this is not the case in most, if not all, of the native treatment centres. This single corrective would, however, not serve to counterbalance any general inclination to optimism on our part regarding the superior and rewarding method of our approach. Since late 1958 the introduction of psychotropic drugs has added considerably to our "improved" rate, and this tendency has steadily continued, especially in those who have been treated in the village community. In Aro Hospital patients are admitted not only for the likelihood or not of recovery but also on account of their scientific interest for research and teaching.

Lack of space restricts full presentation of quantitative data and their analysis. However, there remains a great need for statistical assessment of these and other data, systematically collected, before a more refined design of inquiries could be made.

Psychoses

Schizophrenia seems to be by far the most common and crippling of all mental diseases in Africa. Shelley and Watson (1936) diagnosed schizophrenia in 30 (35.7%) out of 84 patients at the mental hospital at Zomba. Of the 906 patients treated at Aro in 1957-8, 48.4% were diagnosed as cases of schizophrenia. Carothers (1947) diagnosed it in 30.4% of 609 admissions in Kenya; Tooth (1950) in 19.1% of 173 mentally sick persons he examined in the Gold Coast; Smartt (1956; quoted by Tewfik, 1958) in 34% of 321 admissions to Dodoma; De Wet (1957) in 48% of African new admissions in South Africa; and Forster (1958) in 53.6% of 817 admissions in Ghana in 1956. In 1956 we diagnosed schizophrenia in 60% of 840 new "admissions" into 11 native treatment centres in Abeokuta Province.

In related cultures the findings point to high incidence. Mayer-Gross *et al.* (1958), in a study of 500 patients in Mysore Government Mental Hospital in India, estimated that "schizophrenia accounts for slightly more than three-quarters of the male patients and two-thirds of the females." In most if not all of these cases quoted the diagnosis was made on "conventional" lines.

An important finding in our series was the lack of predominance of any subvariety, in contrast to the popular belief that catatonic schizophrenia is very common among the negro population of Africa. Also the assumption that "paranoia, paraphrenia, and even paranoid schizophrenia are relatively rare in Africans" (Gordon, 1936; Carothers, 1951) is wholly unsupported by our clinical findings.

The most vulnerable class of the population are the African students, whose mental health problems at home and abroad were discussed in a special article (Lambo, 1958).

Mayer-Gross *et al.* (1958), writing on the chronic mental patient in India and in England, stated: "The

vastly different social and cultural backgrounds from which the two groups are drawn suggests that these factors are not of major importance in causation or in preventing chronicity." Our experience in Africa does not confirm this latter observation. We have found that lack of complete regression and of severe chronicity is remarkably noticeable in African schizophrenics, most of whom are ambulatory and are being treated within the community. It may be that institutionalization tends to produce severe chronicity in patients of all races and in all cultures.

Carothers (1953), who has observed that schizophrenia is *par excellence* the *chronic* form of mental disorder in Africans as in Europeans, has emphasized that this fact is reflected in all figures of *institutionalized* patients of African mental hospitals.

With the reservation in mind that it is almost impossible to draw valid comparisons between populations which are not only culturally different but also have completely different psychiatric services, we elicited the fact that comparative lack of severe chronicity or regression of African schizophrenics, as seen in some European hebephrenics, may be partly conditioned by genetic and constitutional factors and partly by the environment, but it is our view that the latter plays an important part in determining the threshold of incapacity or regression.

Our systematic observation over the five-year period has shown that the course of the illness can be modified (and chronicity is certainly preventable) by primary cultural factors inherent in certain environments.

In spite of the fact that our conception of schizophrenia is no broader than that commonly accepted in most countries, we share Tewfik's (1958) experience that "the prognosis of mental illness in Africa is good compared with England." "In Sierra Leone, where there is no psychiatrist, where the patients are only fed, segregated, and left to themselves without any organized activity of any kind, the percentage discharged to those admitted in the years 1948 to 1956 was 56%" (Maclay, 1956).

The general assumption seems to be that the outlook in the constitutionally provoked or genetically determined psychoses is one of recurrence, chronicity, or deterioration. Permanent recovery, however, seems to occur much more readily in African patients, probably more often than has been generally supposed by experienced workers in Western culture. Narrowing down our observation, we feel that, other things being equal, the favourable social and environment factors inherent in the community to which the mentally ill are exposed in Africa influence the threshold of incapacity.

It is our hypothesis that the difference in the course and outcome of the disorders can only be found in the differential cultural conditioning to which these people have been subjected, assuming that genetic endowment, especially in respect of predisposition to schizophrenia, is similar in all ethnic groups. It is an unproved but serviceable assumption.

One of the most important observations made within this five-year period is the comparatively quick recovery, lack of chronicity, and better therapeutic response generally of schizophrenic patients who are treated within the framework of the community. "Even when an unfavourable prognosis is recognized, positive

transfer of affect, under the conditions of the village, may be used to prevent patients from deteriorating" (Lambo, 1959c).

African Periodic Psychosis

Before concluding the chapter on schizophrenia it would be relevant to refer briefly to the interesting subject of periodic psychosis, so well known in Africa. We have fully studied 60 schizophrenic patients, comparing those who have shown primary symptoms and other well-known features of schizophrenia with comparatively progressive course with those well-known short-lived periodic psychoses* characterized by nocturnal agitation and excitement, encountered in the African (Shelley and Watson, 1936; Carothers, 1947; Tooth, 1950; Lambo, 1957a, b). In our experience many such cases are obscure and unclassifiable. The psychotic attacks are often transient, and the symptoms vague and ill defined in many cases. Criminal conduct may take place during one of these transient psychotic attacks, and when the patient is up for examination all symptoms of the psychosis may have disappeared. It is of first importance that the mental disorder should be recognized, so that justice may not miscarry.

Out of 30 patients in the latter category, 14 had committed capital offences before being seen, and in all of them symptoms simulating schizophrenic excitement or acute mania were observed or described during the phase when the offences were committed. The possibility of organic syndromes, amnesic fugues with or without mental confusion, and epilepsy was found to be strong; all the 30 patients had a history of at least one previous episode. The main differences observed are as follows: "periodic or transient psychosis" in the African is much more subject to spontaneous recovery than schizophrenia; affective reaction is evident even when there is evidence of schizophrenic process—that is, schizo-affective disorder; and evidence of chronicity is rare, even though it is also not commonly encountered in our ambulatory schizophrenics. Periodic psychosis seems to be predominantly, if not wholly, confined to the primitive African and is more frequent in rural and primitive surroundings than in urban areas.

The subject of this confusional psychotic state, which has been reported by many observers in Africa, is *sub judice*, as intensive study (psychological, clinical, and E.E.G.) is now being conducted in one or two centres in Africa. We suspect that this syndrome is an organic one, possibly an epileptic (and migrainous) variant. It is also not unlikely that some of the mental defectives with transient psychotic attacks recently identified by us may well belong to this group. In view of its obvious clinical and medico-legal importance, further details are desirable before any definite statement can be made.

Mental Disorders in Children

Our experience in Africa has shown that African children are not exempted from the various forms of mental disorder. In this cultural setting it is difficult to estimate the proportion of cases of schizophrenia in

children, since quite a large majority of mentally ill children are treated at home for "bewitchment," etc. A further difficulty arises in the fact that, more particularly in this culture, no sharp line can be drawn between childhood and puberty; each case must be taken on its merits, and an examination for the presence of secondary sexual characteristics undertaken in every instance. This is not often easy to assess, since premature sexual development in African children may exist without the associated bodily changes. Furthermore, as in adults, it is often extremely difficult to estimate the boundary between normal and morbid.

In one case picked up in a village the psychosis developed from an already existing abnormality of make-up—autism. Mental symptoms occurring in the course of, or as sequels to, the infectious and contagious diseases and other fevers of childhood are not uncommon, though infrequent.

The clinical picture of the personality disorders which follow sporadic encephalitis in children is more or less protean in character, but certain psychotic and mental symptoms are characteristic and are discussed under "organic syndromes." There are impulsive, purposeless motor acts, aggression, destructive propensity, marked irritability, distractibility, attention disorder, variable and unstable emotional reaction, disorders of sleep, and, not infrequently, intense eroticism.

Psychotic reaction associated with pregnancy and childbirth is common among African women, more especially the latter category. Most of the psychotic reactions in this class run a malignant course with unfavourable outcome. Many such patients fail to recover from the first or second attack.

Affective Disorders

A recent follow-up study of 187 selected patients has shown that many mild depressives or manic-depressives had been seen and erroneously diagnosed as cases of psychoneurosis in the early stages, and it is our view that many more non-progressive endogenous depressives remain concealed by the label "neurasthenia" and never reach us. Also, most so-called "intractable psychoneurotics" are in fact endogenous depressives.

Depression is not invariably complained of—more particularly is this so when the condition has been one of slow development in a comparatively young individual. In 10 selected patients of the manic-depressive type recently observed it took an average of 26 weeks for four patients in this series to pass from this atypical depression into a manic phase.

Endogenous depression has a distinct clinical picture in Africans, characterized by periodic asthenia, multiple hypochondriacal symptoms of varying degrees of severity, mild but demonstrable sadness of mood, agitation and anxiety, lack of concentration, slight retardation, and general mental inertia. This mild clinical syndrome with predominantly psychosomatic overlay is usually the only feature of endogenous depression in Africans for years.

Phobic and obsessional symptoms and other neurotic features not only at the initial phase but throughout the course of illness are very common, whereas the depressive mood may not be very obvious. This seeming psychoneurotic syndrome in one or other form may be the most striking, if not the only, manifestation

* "The African is evidently prone to develop a type of twilight or confusional state—sometimes brief (a matter of hours), sometimes more prolonged (a matter of weeks)—but always tending to spontaneous recovery within a limited time" (Carothers, 1951). All our patients observed in this category recovered, usually within a short time, ranging from a few hours to a few weeks, and also showed schizophrenic-like symptoms with destructive tendencies outwardly directed.

of an attack of endogenous depression. Another characteristic feature of the disorder is its association with the almost constant loss of libido and of sexual power. This association is too frequent to be a mere coincidence. The cautious provisional recognition of the disorder in this way has proved of immense practical value in our clinical practice in Africa.

The patient is invariably preoccupied with vague somatic complaints and looks more anxious and agitated than depressed, even though the anxiety is a benign type of reaction. Insomnia of varying degrees is a most constant finding. A subjective feeling of difficulty in thinking may occasionally be complained of. Ideas of self-accusation or ruin, of fear for the future, of regret, and a profound sense of sorrow are often completely lacking or may feature in the terminal stages of the illness. Whenever the latter symptoms are prominent in the early stages organic depressive syndrome must be suspected. Functional sensory disturbances of a vague and ill-defined nature may be a prominent feature.

The course of endogenous depression, masquerading as psychoneurosis and treated as such, is a chronic one, but some of these cases often remit, and remit slowly, but frequently relapse. Response to superficial psychotherapy with sedatives, which often suffice in true psychoneurosis, are known to fail in this group of depressives. The response to electroplexy is dramatic. At the time of writing a trial use of mono-amino-oxidase inhibitors and/or regulators such as iproniazid ("marsilid"), nialamide ("niamid"), isocarboxazid ("marplan"), phenelzine ("nardil"), as well as imipramine ("tofranil") and other psychic energizers is in progress. The preliminary results, together with those of electroplexy and other antidepressant drugs, are of considerable importance, for they seem to confirm in a most conclusive manner that we are dealing with a clinical entity, the essential nature of which is one of depression, even though depression itself is not a pre-eminent symptom.

The recognition of the frequency of this group of disorders enables us to differentiate such cases and exclude them from the heterogeneous mass of clinical material generally labelled "hysterical," a procedure which might help us towards a clearer view of the influence of cultural factors on endogenous depression. Laubscher (1937), without realizing the full clinical implications, has casually observed that among the Temba tribe, "all disturbances in the psychomotor sphere are attributed to stomach-ache, headache, and bodily pains, as do all psychotics." This indicates the cultural susceptibility of the ever-receptive mind to supernaturalism, and at the same time emphasizes that these familiar "bodily complaints" are never isolated phenomena, but are essentially a part of one "reaction." Thus we consider these unusual symptom-complexes to be of great diagnostic and prognostic value.

The importance of recognizing this aspect of the "reaction" as an index of the severity and depth of the illness, and for a proper understanding of the abnormal attitudes, does not seem to have been fully appreciated by previous authors.

In view of the marked psychosomatic overlay, behaviour of an African endogenous depressive gives at best a rough *quantitative* indication of the severity of the illness. Consideration of the clinical features, cited somewhat briefly above, has shown, I believe

conclusively, that in most instances the outward affective state by no means corresponds to the patient's real feelings. Through some years of research we have found that our efforts to correlate symptoms with signs in the African have proved this to be a very difficult problem.

The diagnostic grouping of psychotic or psychoneurotic symptoms is no doubt useful; yet this tends to give the student too much the idea that mental diseases are cut-and-dried entities. We find that it is very important, in our practice in this culture, to avoid diagnostic words that give a false sense of knowledge.

Ackerknecht (1943) recognizes the importance of these cultural factors in epidemiological survey and clinical practice in primitive cultures when he states, "In a culture where there are a number of 'native' forms of mental disease and a lack of its Western forms, two observers may come to opposite results, the one including, the other excluding, the former cases. The main source of misunderstanding is probably the fact that the primitive not only does not separate disease of the body and the mind in his medical concepts but also does not recognize such separate units. His '*body ailments may very often hide very strong 'mental' elements which may have escaped some observers.*'" This is not to be compared in any way with those patients in Europe and America who show, over a varying length of time, multiple hypochondriacal and other somatic preoccupations as a latent manifestation of psychotic or severe psychoneurotic disorder, because, in Africa, witchcraft and supernatural forces play a major part in the psychodynamics.

This important observation of Ackerknecht is not confined to the primitives but cuts across the entire African society, irrespective of social status, class, or level of sophistication (Westernization). In fact, paradoxically, witchcraft and supernaturalism, producing massive "psychosomatic" problems, is more rampant among detribalized, urbanized Africans. Hallowell (1936) has well emphasized the importance of certain cultural factors inherent in primitive or simpler societies: "It is quite possible that the decline of supernaturalism in Western society has forever undermined the status of a genetic culture pattern which, in a multitude of forms, has been an effective, although to us naive authority, previously available to the individual as a means of resolving various forms of psychic stresses."

Our next consideration bears on the related problem of suicide. The question arises whether suicide exists to any considerable extent among primitives. With certain reservations, suicide as a symptom of psychiatric illness is rare, but in association with certain religions or cults is not uncommon. In recent years we have noted that suicidal attempts are very common among urbanized Africans, especially women who take poison.

Manic or hypomanic illness (or excitement generally) is apparently the most commonly encountered of all the affective disorders. Since it was the experience of most earlier authors that manic illness is much more frequent in negroes than in other races, it now becomes necessary to inquire into what really obtains.

Apart from the fact that mania, because of its social aspect, comes to notice much more readily than depression, we believe that cultural factors which give a subtle twist to the manifestation of depression also enhance or exaggerate excitement.

The preponderance of pathological excitement is real but has not been long recognized. In our observation on the forms and types of mental illness in Africans over a ten-year period, we have noted that most psychoses in our series showed a moderate to a marked degree of excitement with little or no prognostic or diagnostic significance. Acute excitement, apart from being a very common clinical entity, is frequently found in association with many neuropsychiatric conditions—namely, epilepsy, schizophrenia, post-encephalitic conditions, and in certain organic reaction types and hysteria, all of which are common in Africans. The *excitomotor syndrome* in one or another form may be the most striking, if not the only, manifestation of an attack of psychosis, which remits spontaneously, leaving the clinician in a dilemma.

Our present observations furnish strong evidence for the hypothesis that environmental causes (social ideals and customs—all of which have a hygienic or pathogenic effect) themselves tend to produce a group of cases within certain races or cultural groups, in excess of theoretical expectation.

The theory advanced above is further strengthened by the fact that many mental diseases in Africans have no typical or integrated constitutional aspect, but have, on the other hand, a demonstrably psychogenic basis. I commented: "In most of the endogenous psychoses occurring in Africans, especially primitives, psychical agents often seem to be pathogenetic while the constitutional factors fall into the background" (Lambo, 1956), since precipitating factors associated with emotional experience of considerable intensity are frequent—for example, grief. It has been found that the onset of affective disorders, especially endogenous depression, is always determined by an external cause—for example, the loss of a love-object, or the reverses of fortune. But, in spite of this, fundamental endogenous abnormalities of disposition can frequently be established.

Recurrent mania is often met with, and until the advent of psychotropic and ataractic drugs, especially phenothiazine, tranquillizers, and reserpine, recovery was very slow and uncertain, and recurrences were frequent. The cautious and judicious use of these drugs has revolutionized the management of psychiatric disorders in Africa. "Three years of Day Hospital work at Aro which necessitated the boarding of our patients in the surrounding villages showed that without these drugs, which reduced tension, excitement, and aggression in many of our patients, this scheme could not have been successful" (Lambo, 1957c).

Apart from the principal problem of therapeutics, there still remain certain questions, less essential, yet of considerable importance for the practice of psychological medicine, concerning which, I am afraid, we are still in the dark. These questions, which concern the need and use of psychotropic drugs in different cultures, still claim special studies for their definite position.

Psychoneuroses

Of all forms of mental-health impairment and psychiatric disorders, psychoneurosis is the most fascinating to study in this type of culture, which is partly primitive, partly transitional, and partly Westernized.

Our experience is based on the detailed examination and treatment of 1,578 cases of psychoneuroses (anxiety

states, hysterical conversions, phobia, obsessive-compulsive neurosis, and mixed syndromes) drawn from these three classes of our population. Detailed information has been obtained about the onset, clinical course, and psychopathology of the illnesses. With regard to the question of their distribution in the community, conversion hysteria is rarely seen in rural Africans, while phobic states are often encountered only in sophisticated urbanized Africans.

Some observers believe that psychoneurosis is rare in primitive societies. Laubscher (1937) observed, "In view of the superficiality of repression, psychoneuroses, as understood by us, must be rare." Seligman (1911) expresses the view that hysteria or other psychoneuroses may be entirely absent in the tribe where ritual possession is practised.

It is *a priori* possible that certain races or cultures differ in the incidence of mental disorder by virtue of either an inherited constitution or a difference in the incidence of one or more exogenous factors, or by virtue of both these causes. Thus Ackerknecht (1943) says: "These reports on the scarcity of mental disease in certain primitive societies may partly be due to the fact that for social or biological reasons some cultures actually enjoy a greater mental health (with some it seems to be just the opposite). In others it may be due to a more effective psychotherapy (the wealth of psychotherapeutic methods in primitive medicine, although such methods are, of course, also efficient in 'pure' bodily disease, nevertheless suggests a certain amount of mental disease)."

We have found that not only do mental conflicts of various types and degrees exist in primitive cultures, but that their healthy solution is perhaps only too infrequent, this being due partly to supernaturalism and partly to the fact that in exotic cultures hard solidarity, which should merely act as a balance-wheel, in practice is a locked brake. We have found, too, that physical disturbances due to illness or incidental to the period of life have sometimes been found to be starting-points of neurosis, and, in few instances, of delusions.

We have been able to estimate that more than one-half of the persons who seek relief at the out-patient department of general hospitals in most African countries, and as many as 75% of people consulting native treatment centres in West Africa are suffering from psychoneurosis of varying degrees of severity and of one type or another. Among the more recognizable features of psychoneuroses in Africans are various forms of disturbances of the normal sleep rhythm. Inversion of the normal cycle of sleep and wakefulness, retardation of the sleep hour, and nocturnal excitement at fixed hours in the evening are not uncommon, but, by and large, restless sleep is the most common of all types of insomnia associated with psychoneurosis in Africans.

In this culture, where emotional components of physical diseases are also very common, practising physicians often hopelessly fail to identify symptoms depending not upon irreparable damage to fixed structures but upon the reaction of labile forces of personality to environmental stresses. Here is a challenge to diagnostic skill, and at the same time a therapeutic problem of great difficulty.

Anxiety States

There is probably no question which offers greater difficulties than that which concerns the treatment of

anxiety states in Africans. We know that in most cases symptoms may be removed and suffering relieved by rational psychotherapy, yet at the majority of general hospitals facilities for such treatment are sadly lacking. There is a steadily extending belief that these patients need something more than a bottle of medicine and a few words of reassurance.

This illness is the commonest emotional disturbance of the more chronic kind in the African student population (Lambo, 1958), as well as in detribalized and urbanized Africans. In primitive Africans it runs an acute course, in contrast to its tendency towards chronicity in literate Africans. Phobia is the basic factor in the psychoneurosis of the primitive.

Malignant anxiety states,* which are often met with in primitive Africans, have been described under most varied terms. I should like to describe briefly and in general terms the main types in relation to specific cultural factors.

Clinical examination, however, of 29 patients showed that the processes to be described are subject to such variations of development in different individuals, in some cases being so "imperfect" as to constitute a distinct psychological defect, that for our present purpose it is convenient, and indeed justifiable, to regard them as psychopathological entities. The most commonly encountered is *frenzied anxiety* (*bouffée confusionnelle délirante*). This condition has been regarded by some observers as a culturally provoked (autonormal) condition and genetically related to *possession*.

The alleged genetic relationship between these two conditions is based on a theory that both conditions (*frenzied anxiety* and *possession*) can be *self-induced*. The predominant symptom is acute fear with homicidal tendencies, not associated with *possession*† which is still widespread in Africa. In a series of seven capital cases studied for the purpose of giving medical evidence, the clinical conditions resembled very closely hysterical "twilight state," or actual fugue.

Symptomatically, fear and apprehension with somato-psychic delusions are characteristic. The same fear of bewitchment may also lead to *thanatomania* (Ackerknecht, 1943)—death from magic and auto-suggestion without any demonstrable pathological cause at necropsy.

With regard to the aetiology of those states, obviously more than one theory of pathogenesis can be entertained. The matter of constitutional predisposition and heredity has been gone into with care. In our series of 29 cases such diversity of constitutional backgrounds was found as to make any causal connexion between them and the abnormal behaviour unlikely. We now believe that *frenzied anxiety* is an affair of the individual, in relation to his environment, and not of the stock.

This condition, the onset of which is associated with some concealed source of anxiety ("perhaps only real to an African") and which can become "a very real type of insanity," is the commonest source of capital

cases in Africa, though schizophrenia, in our experience, exhibits a collection of more bizarre crimes. Schizophrenics were found to constitute nearly two-fifths of the insane criminals in four large asylums in Nigeria.

In all these cases, what constitutes *criminal responsibility* is still a moot point. In practice, we have found that what is required in psychiatric testimony before the court in these cases is a proof that the patient (defendant) meets the requirements of one of the "tests" of irresponsibility ("tests" which are based on the Western criminal law). In Western jurisdiction it can be recognized that it is the *act* and not the individual which is the crux of the matter, in contrast to the "law of primitive society" in which the offender himself and not the crime itself receives the main attention of the law. Thus, paradoxically, "primitive law and justice" takes great care that a "crime is not divorced from the background or setting in which it occurs."

In some of these cases the patient "believes in his heart of hearts that any death will appease the gods, and that his own life can only be saved in this way" (Le Myth du Mpaka Fo of Madagascar (L. F. Marx, personal communication)).

Hysteria

The most striking feature of the 82 patients fully studied was the individual life-history, which disclosed many neurotic manifestations. A much greater proportion of our patients came from urban than from rural communities. In the Westernized African the disease has a low improvement rate and a very high chronicity rate, but is less severe among men than among women.

The major clinical manifestations of hysteria in *this* culture vary from various types of conversion symptoms, usually in women and young individuals, to behaviour aberrations that may simulate psychopathic personality and transient psychotic disorder. Hysterical fits are very common in urbanized schoolgirls between the ages of 12 and 17 years.

Periodic somatic disabilities—for example, paralysis, paraesthesia, anaesthesia, aphonia, deafness, etc.—are not uncommon among urbanized illiterate Africans. Massive hysterical disabilities of fluctuating intensity are typical of the primitive African suffering from hysteria in contrast to the monosymptomatic type of hysterical reaction of the Westernized African. The disease is uncommon in non-literate rural Africans, in whom acute but recent emotional difficulties can usually be easily unravelled and when, on occasion, there is only one major symptom—such a symptom in the primitive African seems bizarre and usually does not lend itself readily to formal interpretations.

There are, of course, in the primitive patients some symptoms which are susceptible to simple interpretations. For example, a non-literate woman aged 43 from a village suddenly felt that she could not retract her tongue after protrusion. She held her tongue out mainly during waking hours with copious salivation for nearly two weeks, during which she lost about 10 lb. (4.5 kg.) in weight. She maintained the protrusion to some extent during sleep. It was with great difficulty and under constant persuasion that she "managed" to take fluids. It was later discovered that a week before her admission she had quarrelled with her aged mother-in-law, who was known in the village to be an "aggressive witch." (For further information on the

*This is a term I coined to describe a group of clinical phenomena, the predominant feature of which is one of acute anxiety with or without aggressive behaviour. The most common of these is *frenzied anxiety*; however, it would seem inappropriate to classify this with anxiety states, and therefore its discussion under psychoneurosis is entirely provisional.

†Ackerknecht (1943) has, however, stated that "possession can be a mental disease among primitives, truly autopathological and most often compared with our hysteria."

clinical manifestations of hysteria among Africans, see Lambo, 1955, 1956.)

On the whole, the disease is more prevalent among women than among men. In Africa to-day women are gradually taking to untraditional habits, as the present-day social and economic conditions hamper them more and more in the exercise of their maternal and other traditional roles.

Menopausal symptoms and uterine fibroids are not uncommonly associated with pseudocyesis of long duration in African women from the rural area. In this culture pseudocyesis would seem to be culturally sanctioned with primitive sympathy of the group in married women who have failed to have children. (The chief end of marriage in most African cultures is procreation, and the "failure to accomplish this function seems to be the key to the understanding of some of the neurotic conflicts that would otherwise be puzzling to a European observer" (Lambo, 1956).) The treatment in these cases is one of *laissez-faire*, as personal experience has shown that the risk of precipitating a psychosis or severe anxiety state when the symptom is removed is not remote. Two such patients are still undergoing treatment, which was started in 1958 for a severe depressive illness that immediately followed what seemed to be successful treatment of pseudocyesis with severe anxiety state. Seven such cases were successfully treated during 1958. Four have since recurred, and two had a psychotic breakdown with depressive features two weeks later and are still under treatment. The last patient could not be traced.

One of the most important aspects of this subject that I should like to touch upon is the hysterical habit-continuation of physical illness. This is more commonly met with in Africans, and on many occasions has proved resistant to treatment.

As a result of culturally prescribed affective processes, suggestibility plays a very important part, and forms the basis of such neurotic reactions as the hysterical habit-continuation of physical illness. Also, in most African cultures the division between psyche and soma is arbitrary and ill defined. "There is no limit between the natural and the supernatural. The natural is supernatural and the supernatural is quite natural." Thus in this culture, more so than in others, every physical symptom seems to have its reverberation in the mind of the patient.

It is our experience that a "functional" addition to a previously existing organic lesion or habit-continuation of physical symptoms is common in those physical diseases that produce physical disabilities and severe emotional experiences—for example, severe malnutrition in childhood, encephalitis, post-operative conditions, and head injuries.

Organic Syndromes

One of the commonest causes of organic psychosis in the adult is trypanosomiasis. It is not unusual for this illness to manifest itself by mental symptoms alone, at least for a considerable time before the appearance of the more usually recognized features of the disease. In most cases sleeping precedes the onset of mental symptoms by many months or even years. Tooth (1950) observed the similarity between schizophrenia and organic psychosis due to trypanosomiasis. This

observation has been confirmed in a number of cases of trypanosomiasis with predominantly mental symptoms.

Cerebral cysticercosis was found in less than 2% of a series of 60 consecutive cases of organic psychoses. Severe degrees of avitaminosis B with psychotic and neurological manifestations were also treated. Ancylostomiasis is a constant complication of all chronic mental disorders in Africa. This and other nematodal infections were responsible for 32% of cases of "hypochondriasis" referred to our clinic in 1959.

In a continent where encephalitis is endemic and physical diseases are common it is manifestly difficult to assess correctly many neuropsychiatric disorders from the pathological standpoint, especially in determining the primacy of either environmental or internal factors. One particular example here is the question of pathogenetic factors in the inception of brain damage in African children on the one hand, and the relationship of this to specific neuropsychiatric disorders in later years on the other (Lambo, 1957a).

During 1954–8 we saw and treated over 84 children in this category. In 33 (39%) of these we obtained definite evidence of brain injury of various kinds in the antenatal period and also during birth. The most constant findings were epilepsy, paresis, and some degrees of mental retardation. The latter finding is variable, and in some patients studied in 1950–2 the degree of behaviour changes was quite independent of intellectual impairment. In this series 38 (45%) had a definite history of "severe illness with or without convulsions," after which hemiplegia, epilepsy, and/or behaviour disorder, including marked retardation of mental development, were noticed. Histories of tuberculous meningitis and encephalitis were obtained from the clinical records of nine children with organic psychoses who were treated in various hospitals during the acute stage of the illness. In two others we were able to obtain a history of ill-defined illness characterized by pyrexia, and a rash in one, after which sudden changes in personality and behaviour were noticed.

It is generally believed that women living in primitive cultures, as do most indigenous Africans, go through pregnancy and delivery with comparative ease and with little inconvenience, but unfortunately there is still no record of the frequency of infantile morbidity—for example, brain damage—associated with these apparently easy deliveries.

Among some interesting organic syndromes we have seen and treated in African were psychoses associated with hypothyroidism, various native (medicine) toxic remedies, and filariasis. Three patients with severe psychotic manifestation with hypothyroidism were treated during 1958 and 1959. Two of these had the illness for two years without the usual and more easily recognizable manifestations of hypothyroidism.

The case which interested us most in this subject was that of a woman of 42 whose psychosis started insidiously and proved intractable to orthodox psychiatric treatment over a period of one and a half years. At the outset the illness closely simulated schizo-affective disorder with compulsive acts. In the course of time the symptoms became even more significant; she was taciturn, sluggish, and indifferent. Later she gradually started to put on excessive weight, mental sluggishness became more pronounced, and she

was losing the hair on the eyebrows. For diagnostic purposes, she was immediately put on thyroid (total 9–10 gr. (0.58–0.65 g.) daily) with astonishing results.

Discussion

I have attempted to present a cross-section of neuro-psychiatric problems in Africa and to indicate the field of knowledge waiting to be materially widened, to the enduring advantage of physician and patient alike. In doing this, the usual and unusual features of some of the clinical entities have been enlarged upon and "explained" in terms of the social environment and the cultural setting in which the patient lives and reacts.

However, no other conclusion is permissible than that there is, throughout our comparative analysis, a fundamental similarity between the major mental disorders occurring in Africa and those occurring in other parts of the world. Most of the major psychoses and psychoneuroses have been seen. Others have been encountered which seem peculiar to Africa, and the clinical fact remains, and supports the view, that most of these do not fit into the existing nosological framework but are nevertheless susceptible to interpretation in terms of observable cultural factors. For example, most of the excito-motor syndromes are now known to be much more prevalent in the primitive areas and most common in certain religious (subcultural) groups within the community of Western Nigeria. We have, however, been unable to confirm the findings of earlier observers that endogenous depressions are rare among Africans. The latter, indeed, might be taken as a genuine rarity if we judge by the presence of the classical features of depression.

For a number of years we have given close attention to the interrelation of certain mental disorders and identifiable cultural factors (Lambo, 1955), and a series of cases have been kept under observation for a lengthy period. These patients have recently been re-examined, and the results are now given in a general form.

There is strong evidence in support of the notion of "a dynamic conception of both illness and its therapy," especially in a cultural setting actually or potentially loaded with variables that have never been satisfactorily understood or defined. Our present efforts are in aid of testing the criteria which have been based on Western culture. It is very easy to be so influenced by these theories that we find in them a place for each new observation, with never a pause for analysis and a fresh survey of facts. Even though the universality of these theories appears to us very doubtful in the light of our clinical work in Africa, the possibility of detecting in it general trends characteristic of human reactions as a whole appears very strong. The need for research work in Africa along these lines is urgent, and, in addition to giving rise to new problems, should help to throw light upon factors already known but imperfectly understood.

Our present approach is indispensable in the initial stages, since descriptive data are indispensable to clinical practice. It therefore becomes a matter of prime importance that clinicians, especially those working in the "back of beyond," should marshal their experiences, and set down their observations, with as much care and exactness as possible, and this while the question of the assessment of the relative importance of the factors in the aetiological structure awaits the results of further synthesis.

The dynamic state of most of the African societies and the perpetual social changes would seem in many places to lead to those deviations of behaviour which are usually merely considered from ethical or legal standpoints. New medico-social problems are rearing their heads in Africa, and the most important ones are those of alcoholism, prostitution and character disorder, sociopathies of various types, drug addiction (hemp, pethidine), delinquency, etc. A survey of these problems has been deliberately omitted from this article, as it is most inopportune to discuss them at present, since their nature and scope have yet to be scientifically assessed. Time, geography, culture, and social conditions are but a few of the factors which influence community health and the standard by which it can be measured.

The subject of health survey in Africa is manifestly complicated, especially in attempting to elicit some correlations, as this vast continent contains so many diverse cultures in varying degrees of acculturation. Cicely Williams (1958) says: "The indices of health are not only of rates of mortality and morbidity but also the incidence of violence, crime, alcoholism, delinquency, and inadequacy. If the medical services in developing countries were more aware of their social functions, they would become more respected as instruments of social policy." A demonstration of a correlation, if any, between such disease incidence and environmental factors would be of inestimable worth to medical administration in Africa. This line of research is being energetically explored by us.

In planning and organizing mental health services, psychiatry in underdeveloped countries could profit considerably from avoiding the mistakes already committed in very advanced countries of the world. When we, however, try to abstract a lesson from European and American experience we must make sure that it will apply in the contemporary African situation. "This is no easy matter, and we are getting more and more convinced that an independent diagnosis of our position may prove more profitable in the end than a borrowed remedy" (Lambo, 1959b).

Conclusion

Our present clinical observations in Africa have shown that, although in mental illness there may be some essentially basic factor in the onset of the illness (in endogenous psychoses, for example, the constitutional and genetic factors may be the *sine qua non* of their inception), yet the interplay between man and his physical and social environment would seem to influence considerably the evolution of the disorder—that is, its property of remaining latent or manifest, its later course, and its final outcome.

It must be emphasized that for a truly scientific understanding of human behaviour, especially that aspect of medicine relating to human ecology, man has to be studied at various stages of his social evolution—that is, at different times, in different cultures, and under various circumstances.

I wish to thank my former teachers, Professor Sir Aubrey Lewis, of the Institute of Psychiatry, University of London, for his advice and guidance on all matters concerning mental health in Africa, and Professor E. Stengel, of Sheffield University, for his most helpful suggestions and invaluable advice in preparing this paper. I also thank my colleagues in Africa to whom I have written on many occasions to exchange views on clinical problems. I am grateful to

Professor Alexander Brown, of the University College, Ibadan, and to the Chief Medical Officer, Ministry of Health, Western Region, Nigeria, for permission to use the clinical materials of the University College Hospital and Aro Hospital respectively.

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CALCIUM DEFICIENCY IN RATS FED UPON MEAT

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Skeletal fractures resulting from a fall often cause the death of elderly people. Buhr and Cooke (1959) have collected much valuable information about the incidence of various types of fractures in the population of this country. In a pilot survey of fractures of upper parts of the femur, which commonly result from falls, they have found much higher incidences in elderly people than in young people, and in women than in men. During the past twenty years the incidence of these femoral fractures has increased. Opinions still differ, however, about the relative importance of the various factors which are concerned in their causation. According to one school of thought old people usually have poor sight and poor powers of balance. They therefore tend to fall more often and more heavily than younger subjects. Fractures may be incurred, therefore, without any preliminary weakening of the bones. Others believe that the bones break because they are

abnormally fragile. This fragility may be due to hormonal imbalance—for example, in woman after the menopause. Dietary inadequacy of the nutrients responsible for the growth and maintenance of bone is another possible cause of fragility.

In practice it seems probable that the accident, and its fatal outcome, may be due to a combination of various causes. Undoubtedly many old people are unsteady in their gait. Examination of senile bones often reveals osteoporosis, which decreases their strength. Old age inevitably causes abnormalities in the supply and balance of hormones, which can weaken the bones and which also probably reduce the ability of the subject to recover from the injury. Finally, old people may lose their appetite for food, may be unable to obtain enough food, or may choose a diet which is inadequate in nutrients concerned with the health of the bones. This article reports experiments on rats, in the hope that the results may help us to assess the importance of this last factor in the human subject.

In the clinical study of skeletal diseases rickets has presented the most important problem. The control of this formerly common disease, by vitamin D and adequate and properly balanced supplies of calcium and phosphorus, has been a major triumph for medical research. As seen in infants and young children, rickets was usually associated with diets which included a high proportion of cheap farinaceous foods that were shown to be rachitogenic in proportion to their content of phytic acid (Bruce and Callow, 1934; Harrison and Mellanby, 1939). The possibility of diets rich in meat giving rise to skeletal abnormalities did not arise, at least in this country, since such diets are not regarded as suitable for young children. Moreover, among children of the poorer classes, with a high incidence of rickets, such diets would have been ruled out for reasons of expense.

For at least a century, however, it has been known that carnivorous animals develop skeletal deformities when they are kept in captivity and are fed on a diet of boneless meat. Thus Röhl (1860) reported that young leopards developed rickets when they were given meat without bones, but not if bones were allowed. Later Bland Sutton (1889) observed that lion cubs in the London Zoo always had deformed bones when they were reared upon lean meat. The deformities could be prevented by the inclusion of crushed bones and cod-liver oil in the diet. Greaves, Scott, and Scott (1959) have described deformities of the bones in domestic cats fed on ox heart. The lesions were presumably caused by the low-calcium content of the heart-meat, since they could be prevented by the inclusion of calcium in the diet.

These observations of Greaves *et al.* seem important in approaching the problem of skeletal fragility from an angle which has long been neglected. We decided, therefore, to undertake investigations with a view to answering the following questions: (1) Can the skeletal lesions caused by meat-eating be produced outside the carnivora—for example, in the omnivorous rat? This question seems pertinent, because it is well known that the dietary conditions which give rise to rickets differ according to species. (2) Has heart muscle, used by Greaves *et al.*, any special significance? Can other forms of meat also cause skeletal lesions? (3) Are the lesions due to deficiency of calcium only? Or is meat injurious to the bones for other reasons as well?