FRONTAL LOBE FUNCTION AND THE AFRICAN.

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Introduction.

In a previous article—" A Study of Mental Derangement in Africans "—the writer described primitive African culture, thinking and attitude to life, and the types of mental derangement seen in Kenya over a 5-year period, and endeavoured to explain the peculiarities in the incidence and nature of African mental derangement on the basis of cultural factors.

The present article, though complete in itself, is in some ways a development of the earlier one, and arose out of a request by the Kenya Director of Laboratory Services for tests of character which would help him to select *reliable* Africans for work in the Laboratory.

In the course of the investigations that were made as a preliminary to the production of suitable tests certain facts emerged which forced the writer's attention to a striking resemblance between African thinking and that of leucotomized Europeans.

The writer was therefore led to make certain deductions about the neurophysiological basis of African thinking and character, and about the functions of the frontal lobes in general, and to attempt an explanation of the peculiarities of African mental derangement on the basis of these deductions.

The article therefore falls into eight parts as follows:

1. A description of primitive African culture, thinking and attitude to life which is in effect a summary of part of the earlier article. This part is required as a basis of reference and explanation for the later parts of the article and, with a view to carrying greater conviction, it contains much direct quotation from other writers.

2. A description of the more striking peculiarities of mental derangement in the African. This again is largely a summary of the earlier article, but with modifications resulting from a further 5 years' experience.

3. A description of the preliminary investigations for the production of tests of reliability, and the writer's deductions about African thinking that arose from this investigation and from the facts recorded in Parts 1 and 2. (The subsequent test production and application is irrelevant to the present theme and is not described.)

4. A description of the effects of leucotomy on European personality in general.

5. An assessment of the resemblance between the African and the leucotomized European, and the writer's deductions from this.

6. An attempt to apply the deductions in Part 5 to the peculiarities described in Part 2.

7. A general discussion and conclusion.

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1. African Culture, Thinking, and Attitude to Life.

No doubt cultures develop out of the needs of societies, but it is equally true that the peculiarities of thinking and attitude seen in living individuals are largely determined by the particular culture in which they live. So the relevant features of African culture are first described.

(a) *Cultural Factors.*

The primitive African is governed by a large, complex and rigid social organization, based on a wide extension of the family system, and by which a high degree of security for the individual is achieved in face of the manifold hazards of nature. There is a place for everyone within this system and widows and orphans, for example, are never outcast or destitute.

This organization implies and demands the observance of meticulous rules and restraints in regard to manners and behaviour in all departments and at each stage of life and, in Kenyatta's words, " In all tribal education the emphasis lies on a particular act of behaviour in a concrete situation." These rules, though unwritten, are so well known that any infringement implies, and is recognized as having, an unsocial motive. There is no room for free thought nor for misfits, and even secretive, solitary or outstandingly successful people are suspect.

Everyone sooner or later knows the whole culture of the group, there is little specialization and a great equality of knowledge. Status depends on age rather than on intellect, knowledge or achievement and, since actual ages are unknown, on certain landmarks, especially puberty and marriage. Occupations and rules of conduct are strictly arranged according to these landmarks, and the African constantly acquires more rights and duties in an ever-widening field as the social organism of which he is an essential part increases in size with each rise in status.

All primitive Africans are closely attached to particular areas of land; all customs, culture, religion and myths refer to particular localities which are the visible symbols of clan kinship and nurse the ancestral spirits. The rules of behaviour have little or no application outside the limits of the group and tribe or of the tribal land, for there is no general abstract code.

Since each man is heir to the whole knowledge of his group, he is also aware of the limitations of that knowledge and feels a great consciousness of ignorance and awe of the unknown. He recognizes higher powers—higher than the ancestral spirits—who must at times be supplicated and, in Driberg's words, " Every activity has its religious background and sanction, and it would be quite impossible to divorce their religious beliefs from their everyday practices without completely destroying the basis of their society." There is, however, little link between ethics and religion and, as Westermann says, " The gods and ancestors take but a slight interest in the ethical behaviour of their worshippers and are almost indifferent as to the inner attitude in which they are approached. What they demand is offerings and invocations. . . . Ethics, in the sense of civic virtues, are rooted in the traditional rules regulating the behaviour in social groups." Both ethics and religion apply, moreover, only

within the group, and the gods can only be supplicated by the group—not by a lone individual. There is thus no conception of universal truth and justice, or of right and wrong in any general sense and, in Raum's words, " The child becomes conditioned to a morality whose demands become less stringent the remoter they are from the 'initial situation' of the family."

African culture fails to recognize the intrinsic nature of cause and effect and, again to quote Westermann, " The African has never progressed so far as the knowledge of true causal connections or natural laws. He possesses a certain amount of knowledge of nature . . . but for the greater part it is pseudo-science, knowledge mixed with a child-like play of the imagination. . . . The idea of an event happening from an inner natural necessity is difficult for him to grasp. . . . Behind an occurrence there is for him not so much a cause as one who causes. If a tree or a human being dies, then someone, be it a spirit or a person or a ' power,' has made him die. For inner necessity or natural causes a ' personal ' will is substituted."

It is also important to record the almost complete absence of children's toys and of any form of visual symbolism, especially of the written word, in primitive East African culture—facts which probably have important influences on African thinking, as will be shown later.

(b) *Thinking and Attitude.*

This section is in the main a summary of the previous article and is inserted because that article was written without any relation to the present theme of frontal lobe function, and may from that point of view therefore be regarded as an unprejudiced basis of reference.

One cannot do better than start with a series of quotations from Westermann, taken from that article, and which run as follows :

" With the Negro emotional, momentary and explosive thinking predominates . . . dependence on excitement, on external influences and stimuli, is a characteristic sign of primitive mentality. Primitive man's energy is unstable and spasmodic. He is easily fired with enthusiasm for an undertaking and begins his work with great zest ; but his interest dies down quickly and the work is abandoned. . . . Where the stimulus of emotion is lacking the Negro shows little spontaneity and is passive. He waits for what is coming to him and evades what is inconvenient, or adapts himself to it, instead of bravely confronting the obstacles of life and mastering them. . . . The Negro has but few gifts for work which aims at a distant goal and requires tenacity, independence, and foresight."

" The interest which the African takes in things is not an academic one. They concern him in so far as they are useful to him or can do him harm . . . observation is often superficial ; conclusions have been drawn from it in a most uncritical way ; and instead of further thought on the matter, word spinning has seemed sufficient . . . knowledge mixed with a child-like play of the imagination."

" The world of the primitive African is characterized by its unity and coherence. No sharply defined aspect exists by itself ; wish and reality, the

possible and the impossible, knowledge and belief, thought and imagination, the realms of secular and religious life are interwoven and fundamentally one."

"The consciousness of being an organic and well-protected member of a group gives the individual a definite self-consciousness and dignity . . . he is not easily embarrassed. Within his own circle he is never in a position where he does not know how to behave or what to do . . . work is not specialized in the same way as with us and therefore the non-expert 'layman' . . . does not exist. The African is able to enlarge with ease on any subject . . . he does not suffer from social disabilities, for there is hardly any economic dependence, nor is there a distinction between servant and master, rich and poor. Hence nobody suffers from an inferiority complex. . . . It is natural for him to express his real personality, for everybody knows everybody else, and no one can therefore permanently conceal his nature." (Westermann is presumably using the word "self-consciousness" in this paragraph in the sense of social self-confidence—certainly not in the sense of shyness as may be seen by the context, and presumably not in the sense of self-understanding for which in fact the African has little ability or enthusiasm).

"A man does not plan, set himself an aim and exercise his strength in attaining it. The individual as such has no aim in life if his task is to become exactly like the rest. . . . The motives for his actions are predominantly social, not individual, and are deeply influenced by public opinion. . . . Personal responsibility is avoided wherever possible."

In general the primitive African is very close to nature and the realities of life and death. Disease and misfortune are familiar experiences and come unaccountably like bolts from the blue. He feels that what strength and stability he has comes from the fact that he is part of a larger organism, and that he can only preserve this modicum of power by playing most meticulously his special part in this organism. This attitude governs his whole life and results in extreme conformity to tradition, conservatism in thought and fear of innovation. In the absence of any general conception of the inherent nature of cause and effect, he regards the workings of fate as arbitrary and haphazard and, provided he has obeyed the traditional rules, he rarely blames himself for his failures and misfortunes, but is apt to attribute them to the anger of some external agency and believe himself bewitched. Since his rules of behaviour only apply within his group and in relation to his clan land, and since he has no general abstract codes, he is left without a guiding star when he leaves his reserve.

Finally, in the absence of children's toys and written language, the African is highly dependent for his amusement and his learning on the spoken word. This fact seems to the present writer to be of fundamental importance and its implications will be discussed in the conclusion of this article.

2. The Peculiarities of African Mental Derangement.

The previous article included a study of mental derangement in Kenya Africans. This study was based on figures of persons certified insane and

admitted to Mathari Mental Hospital during the 5-year period from the beginning of 1939 to the end of 1943, and the figures so obtained were compared throughout with those for American Negroes and at times with those for Europeans.

The chief peculiarities that emerged from these comparisons can be briefly summarized as follows:

(*a*) There was probably a very low general incidence of insanity among Africans living in their natural environment. This was considered to be due to an absence of problems in the social, sexual and economic spheres.

(*b*) General paralysis was found to be rare in the indigenous population, and this was thought to support the theory that syphilis was a recent introduction to the interior of Kenya. It was also noticed that a large proportion of our cases were of the "expansive" type, and it was thought that this was probably because this type would be most unmanageable and most likely, therefore, to be certified as insane in a country where many insane are known to be looked after at home.

(*c*) Arteriosclerosis was found to be rare, and it was submitted that its rarity was entirely consistent with the primary importance of a mental attitude in its causation, at least in many cases.

(*d*) Paranoia was found to be comparatively rare, and to be associated, in at least 9 cases out of 11, with long-standing exogenous factors, namely prolonged sojourn in an alien or inimical environment. This type of environment rarely occurs in primitive society and in fact 6 of our 11 cases occurred in nomadic Somali traders and immigrant people.

(*e*) Manic-depressive insanity was found to be relatively uncommon and this was mainly accounted for by the absence of psychotic depression. It was observed that a large proportion of the manic cases had been holding responsible positions and appeared to possess an attitude of personal responsibility that is foreign to most Africans. It was surmised, to account for the absence of depression, that the repressing and inhibiting elements of the African's mind have been less exercised and are weaker than these elements in the European. It was considered in general that the attitudes expressed by manic-depressives, and which are usually regarded as secondary to any rationalizations of the mood change, really play a more basic part in the aetiology of the disease. This in turn gave rise to the suggestion that schizophrenia (in which very different attitudes obtain) and affective disorder might be viewed as developments of one basic hereditary tendency to mental instability, but diverging for mainly environmental reasons.

(*f*) It was considered that involutional melancholia, though atypical, occurred and that this condition fell into a separate class from the manic depressive psychosis proper. Ideas of guilt were consistently absent, though persecutory ideas occurred, and it was submitted that the delusions in *this* illness were secondary to the mood change and that they would be likely to be persecutory in the African for cultural reasons,

(*g*) A condition which the writer entitled "frenzied anxiety" was commonly seen and appeared to be very similar to "Amok" as seen in Malay. It was

considered that this condition arose out of the African's lack of self-criticism and sustained emotion, and that the common tendency to homicide arose (on hysterical lines) out of the general belief in a limited total amount of life force.

(*h*) Obsessional neuroses were never seen, and this was considered to be related to the absence of personally-developed codes of behaviour.

* * * *

A further 5 years' experience at Mathari Mental Hospital, subsequent to 1943, has supported most of these findings, but certain important modifications and additions must be made.

(A) The "expansive" type of general paralysis is undoubtedly relatively common. This point was touched upon in the previous article, but was not sufficiently emphasized.

Curran and Guttmann say the expansive or classical form, by which they mean "a demented euphoria and ideas or delusions of grandeur," is nowadays rare. Henderson and Gillespie say "a state of contented dementia . . . is the most common variety. . . . Grandiose delusions . . . are not so common as has been generally supposed." Russell Brain says that the simple dementing type is the commonest, the grandiose form (with euphoria and grandiose delusions) is less common, and other forms, e.g. depressive, occur; he says "the form taken by the mental disorder doubtless depends upon the patient's constitution."

At Mathari Hospital 35 African cases of general paralysis were seen during the 10-year period. Of these cases, 26 were expansive (with euphoria and grandiose ideas or delusions), 5 were empty of mood, and 4 were somewhat depressed. So the incidence of expansiveness was definitely high and doubtless much higher than in England. Moreover, the previous suggestion that expansive cases are the most unmanageable and therefore most likely to be admitted does not entirely meet the case, since more than a third of our paretics were immigrant Africans who live in townships and are *not* easily able to look after their insane relations, and of our immigrant paretics at least half were euphoric.

So it seems that our high proportion of expansive cases corresponds, at least in part, to a *really* high proportion of the paretic population—a problem which will be further discussed in part 6.

(B) In the previous article a relatively large proportion of admissions of psychopathic persons was recorded, and was explained by the fact that in a young Colony where many mentally abnormal persons are looked after at home these are just the sort of unmanageable cases that are apt to be sent to hospital. At another point in that article it was said that one might argue that *all* primitive Africans are psychopathic by European standards.

The whole question of the "psychopathy" of Africans requires enlargement at this point, more especially since the title has been used in so many senses by different writers that some, for example Kinberg, have even suggested discarding it altogether.

Although, however, there is clearly no general agreement at present as to

the precise application of the title, it is equally clear that few psychiatrists are prepared to discard it and Slater, for instance, says, " If we were to drop the term altogether, we should be obliged to invent an equivalent or to hamper ourselves in the description and categorization of a whole series of clinically very important phenomena." It is also clear that a large number of eccentric personalities, albeit not definitely psychotic or neurotic, can be fitted into well known psychiatric categories (e.g. schizoid, epileptoid, or hysterical personalities, etc.), but that, when this has been done as efficiently as possible, there still remains a large number of eccentric persons who require psychiatric titles since they constitute a fraction of the population for whom medical advice is frequently sought and sometimes given. This remaining group is not clinically homogeneous, but it *includes* a section of the population (variously entitled sociopaths, unstable psychopaths, inadequate persons, etc.) which has been described in such similar terms by so many authorities that it would seem perverse not to recognize its claim to a psychiatric category. Indeed, few writers have failed to do so, no matter how broad or narrow their concept of the title Psychopathy. No doubt many such persons are " moral defectives " but this title is inadequate for the present purpose since, as legally defined, it excludes some of the persons we are now considering. Not all psychopathic persons have " strongly vicious or criminal propensities "—indeed, this is probably true of only a small minority.

The following are examples of descriptions of the group we are considering. Cheney says—" Psychopathic personalities are characterized largely by emotional immaturity or childishness with marked defects of judgment and without evidence of learning by experience. They are prone to impulsive reactions without consideration of others, and to emotional instability with rapid swings from elation to depression, often apparently for trivial causes." Levine says—" The patients of this group do not have specific signs and symptoms of illness as do the neurotic and psychotic. Their disturbance is one of action and social behaviour. The essential patterns of the psychopath are these: They live predominantly in short-term values, i.e. have a predominant need for the immediate satisfaction of their impulses and desires, and are unable to subordinate immediate gratifications for more lasting pleasures. They tend to act out their conflicts in social life, instead of developing symptoms of conflict in themselves." Bullard says—" The commonly accepted conception of a psychopath is a person who cannot learn by experience, who fails to recognize the limiting or restraining influences of reality. Such a person recognizes no law but his own immediate need. . . . They are truly the social misfits. . . . They live in and for the moment, have a keen intuitive empathy which enables them to shift position rapidly, but they have no real alertness to or comprehension of the implications or complications resulting from their behaviour." Norwood East says—" It is characteristic of the different types of psychopathic personalities that they are unable to subordinate a short-term gratification to a long-term advantage." Curran and Guttmann say—" The most prominent features are poverty of will-power and determination." Henderson and Gillespie say—" We include under this description (psychopathic states) persons who have been from childhood or early youth

habitually abnormal in their emotional reactions, but who do not reach, except episodically, a degree of abnormality amounting to certifiable insanity; they show no intellectual defect . . . and they do not benefit under prison treatment. They constitute a rebellious, individualistic group who fail to conform to their social milieu, and whose emotional instability is largely determined by a state of psychological immaturity which prevents them from adapting to reality and profiting from experience. They lack judgment, foresight and ordinary prudence." Curran and Mallinson have summarized Hall's criteria as "Egocentricity; inability to profit by experience; emotional instability; lack of perseverance; unreliability and irresponsibility; defective judgment; suspiciousness," and Sprague's criteria as "Inability to postpone; ineffective consideration of consequences; insufficient learning from experience; faulty synthesis; disproportionate responsiveness; affective dominance over intellect; disvaluation of reality; disregard for truth; insufficient social valuation."

Tredgold regards the title "psychopathic personality" as unnecessary and considers that such persons can be included in other psychiatric categories—notably that of moral defect. If, however, one eliminates from his description of moral defect the "strongly vicious or criminal propensities" required to fulfil the legal definition and which only applies to some cases, one finds his description accords very well with those of the other writers we have quoted. He says, referring to moral defectives, "In my opinion, the mental defect characteristic of this class is a twofold one, namely a defect of that complex quality which has been designated common sense or wisdom, plus a defect of moral sense. Now, as I have already stated, a person may be lacking in both wisdom and moral sense, and yet suffer from no scholastic ineducability, and no obvious incapacity to adapt himself in a seemingly intelligent manner to the requirements of the present moment. Far from being illiterate, he may have a good range of educational acquirements; he may be nimble-witted, a good conversationalist; plausible in argument, and able to give a good account of himself. In short, in his response to many tests, in appearance, manner, and conversation, he may be quite normal and totally different from the ordinary ament. And yet, in spite of all this, his lack of wisdom will cause him to be incapable of adapting himself in a satisfactory manner to his social environment; he will be unable to see actions in their true values, to form sound judgments, to take long views, to make prudent plans, to forego an immediate but transient gain for the sake of a greater and permanent advantage. In addition, his lack of moral sense will cause him to be incapable of experiencing any emotion regarding the rightness or wrongness of his acts; although he may be conceited, he will have no real feeling of self-respect and no sense of personal responsibility or social obligation; he will be incapable of experiencing any urge to moral endeavour and he will almost certainly be unable to control any selfish and anti-social impulses."

Admittedly these examples are selected, but they are complete in themselves, and in such substantial agreement with each other that it is possible to summarize them in a very few words as will be done below. Moreover, a picture emerges which is clear and very familiar to psychiatrists who have any dealings with social misfits.

Though little can be said at present about aetiology or treatment, it seems therefore to the present writer that there does exist in European psychiatric practice a very large group of persons who show certain well-defined characteristics and therefore, for clinical purposes, deserve a psychiatric title—be it psychopath, sociopath or some other. The definition of this title as it is proposed to use it, and as summarized from the quoted descriptions, would run as follows: "These are persons who live in a perpetual here-now and lack the desire or ability to control their passing emotions and so to subordinate immediate gratification to their own long-term interests." *All* the qualities listed in the above quotations are included in or implied by this definition.

Now, to turn to the African, and in regard especially to the African living at home in his reserve, it would seem at first sight that he does *not* fulfil the requirements of a psychopath. Far from "failing to conform to his social milieu," he conforms to it only too completely as has been shown. Nevertheless, in all other respects the resemblance is obvious, his behaviour *is* largely determined by his passing emotions, he *does* lack foresight, perseverance and sustained determination, he *does* evince a "keen intuitive empathy" and a corresponding "disregard for truth," his unreliability and irresponsibility are notorious from a European viewpoint, his ability to learn from experience and adapt to reality is very variable, and his lack of judgment and "faulty synthesis" become apparent in Part 3 of this article.

Since disturbance of social behaviour is one of the cardinal features of the European psychopath, one is led to a further consideration of social conformity in the African. The question as to whether the primitive African possesses a general "social sense" in our meaning of the phrase, however, is no sooner asked than answered—in the negative. Nothing will make him laugh more heartily than to see a blind man slip on a piece of banana, and the attendants of a condemned murderer are quite likely to jest crudely about his future in his presence. So long as the victim is not one of his relations or clansmen, to whom he must by rule be courteous, consideration for others is conspicuous by its absence.

Finally, episodes of antisocial violence, which are so apt to occur in European psychopaths of an aggressive type, find a close parallel in the syndrome we have previously described under the heading of "Frenzied Anxiety," which is a common form of mental disturbance in persons who appear, after the storm has passed, to be perfectly normal Africans.

So the resemblance between the mentality of the normal primitive African and a certain type of aberrant European mentality commonly included under the title psychopathic is found to be very close. When we come to the partially detribalized African the resemblance becomes even more striking. Since he is then left without his tribal rules of behaviour and has acquired no general abstract codes, this fact is hardly surprising. Indeed it is a matter for admiration that he so often makes good in the alien environment, a tribute to his *basic* adaptability, in which he more closely resembles the European child than the European adult psychopath.

(c) It was shown in the previous article that paranoia was relatively uncommon, especially among the races that were not pure Hamites, and that

when it did occur it was almost invariably related to unusual environmental factors, namely prolonged sojourn in an alien and inimical environment. It was also shown that, of a total of 174 schizophrenics (not including paranoia) only 11 (or 6·3 per cent.) were considered to be of the paranoid type. Subsequent experience has confirmed the former observation and also the general uncommonness of paranoid schizophrenia.

A further fact has emerged in regard to paranoid types of schizophrenia in general. In the previous article it was concluded to be impossible to assess the degree of education of an African in any exact and scientific manner. This conclusion still holds but, as a rough and ready substitute, the African interpreter of the hospital was requested to prepare a list of all those in-patients on a certain date (5 Jan., 1949) whom *he* considered to be fairly well educated on European lines. One has no reason to doubt that his assessment was as correct as such an assessment can be and it has the great advantage of being independent and unbiased.

All patients diagnosed as schizophrenic or paranoiac and in the hospital on that day were then independently classified in two groups—(*a*) those with a tendency to chronic delusions (persecutory or grandiose) and usually a fairly good preservation of the personality and (*b*) those with no such tendency and usually a marked disintegration of the personality. Group (*a*) includes those cases that are commonly called paranoid schizophrenia, paraphrenia and paranoia, and group (*b*) those called simple, hebephrenic and catatonic schizophrenia.

It was then found that among 119 non-educated cases only 15 (or 13 per cent.) were paranoid in type, whereas among 30 educated cases there were also 15 paranoid patients (or 50 per cent.). The difference is significant in a high degree, with a χ^2 figure of 21, and there seems no reason to doubt that paranoid types of schizophrenia rarely occur in Africans unless they have received some European education. An apparent exception to this rule, and which accounts for no less than 5 of our non-educated paranoid cases, is the high proportion of paranoids among immigrant and Somali patients (7 out of 17 cases), but in both these groups the patients had for long been living in townships and had for long been partly detribalized and it might well be argued that, although they had received little or no formal education, they had nevertheless acquired a type of sophistication that was its equivalent.

(D) In regard to affective disorder, five important modifications of our previous findings must be made.

(1) Mania is somewhat commoner than was previously stated, but many of the cases are far from classical. During the 5-year period 1939 to 1943, 23 cases were diagnosed as mania (or 3·8 per cent. of the total new admissions); whereas in the 5-year period 1944 to 1948, 55 cases were so diagnosed (or 6·1 per cent. of the total admissions). The excess is largely composed of persons who, though excited, restless, noisy and irritable, show little sustained elation, little tendency to develop grandiose schemes, and often show schizophrenic features especially bizarrely exaggerated movements and facial expressions.

(2) Fairly typical retarded depressions have now been seen (though ex-

ceptionally), and the sharp distinction that was made in the previous article between involutional melancholia and other types of depression (on the lines of Henderson and Gillespie) can no longer be upheld.

Henderson and Gillespie believe that " there is a group of cases which we can term involutional melancholia distinct from manic-depressive states " and in which the characteristic features are " depression without retardation, anxiety, a feeling of unreality and hypochondriacal or nihilistic delusions." They reserve the title for patients with such symptoms occurring at the involutional period and who have never previously suffered from any form of mental illness.

In the 10-year period there have been seen only 24 cases definitely suffering from a depressive psychosis of any sort, or 1·6 per cent. of the total admissions. Even allowing for the fact that other cases have doubtless been missed on account of their atypicality, the condition as a whole is relatively rare.

None of the cases fulfilled all Henderson and Gillespie's requirements for involutional melancholia but, allowing for the facts that " feelings of unreality " are difficult to elicit in Africans (who have little ability to analyse and express their feelings) and that persecutory delusions are a characteristic reaction in them, there were about 6 cases that might be classed as involutional melancholia—occurring at the involutional period, with agitation, and hypochondriacal or persecutory delusions. Of the remaining 18 cases, two were agitated depressions in persons aged 30 and 40 years, and 16 were retarded depressions occurring at all ages from 25 to 60 years and again mostly exhibiting hypochondriacal or persecutory delusions.

Admittedly there was a greater incidence of agitation at higher age levels, for the average age of retarded patients was 40 years and of agitated patients was 49 years but, since 5 of the retarded cases occurred about the involutional period and one of the agitated at 30 years, no sharp distinction could be made in this series, and henceforward in this article all depressive psychoses will be classed together.

(3) There is no doubt that classical psychotic depression of any type is relatively rare in the African. Indeed if one confined the diagnosis to cases exhibiting the symptoms described in British text-books of psychiatry one would very seldom make the diagnosis. Yet among European patients admitted to the hospital in the 10-year period, to the number of 222 patients, no less than 22 per cent. were depressives.

Part of the discrepancy can be accounted for by the fact that, in a primitive country, many more manageable insane are looked after at home. This might account for an apparently low incidence of mildly retarded depressives, but would not apply to most agitated, stuporose or persecutory cases. In regard to the question of whether in fact many depressives occur and are not admitted to hospital, the suicide rate in the reserves is quite unknown so one can glean no information from that angle. There is, however, another possible approach to the problem, namely a study of murder from the psychiatric viewpoint and, since murderers are brought to justice in Kenya as in other parts of the world, comparisons can be made. Among a series of 300 Broadmoor homicides referred to by Norward East, the commonest type of mental derangement

found was melancholia, which accounted for over 20 per cent. of the cases. In a comparable series of 57 Kenya homicides who had been found guilty but insane, only 7 per cent. were depressives. Moreover, these figures take no account of the fact that in England roughly 38 per cent. of suspected murderers commit suicide before arrest and it may be assumed that many of these are depressives. In Kenya, where an enquiry was instituted in 5 districts on this point for the year 1946, among 56 Africans suspected of murder *none* committed suicide before arrest. If depression in Africans were clinically similar to this illness in England and many cases occurred in the reserves, one would expect a larger number of depressive homicides and of suicides of persons suspected of homicide. So, for what it is worth, these observations in regard to homicide support the contention that psychotic depression in the African reserves is either rare or atypical or both.

It, is however, believed that a number of cases occur which are not certainly diagnosable but are probably abortive depressives. From time to time patients are seen who are retarded and confused and *look* very miserable yet who cannot *say* whether they are happy or sad, though they commonly admit to vague feelings of bodily ill-health. In the final analysis it would seem that the only valid criterion of psychotic depression is "subjective depression out of proportion in severity or chronicity to exogenous causes." This illness, therefore, is hardly diagnosable unless the patient admits to feeling miserable. Yet it is definitely rare for an African patient at Mathari to make this admission,—few even of the diagnosed cases have done so. Moreover, with the African's superstitious attitude to life, one would expect him to admit more readily to misery than to happiness *if he felt it*. It is believed, however, that the African with his slight ability for introspection and for discrimination between body and mind, would tend to identify a feeling of depression with bodily ill-health, and it is finally deduced that many abortive cases of depression occur, but that classical depressive psychoses are rare.

(4) In the previous article it was argued that affective disorder as a whole was relatively rare since it accounted for only 3·8 per cent. of our admissions, whereas in American negroes it accounted for 8·3 per cent. It is now seen, however, that affective disorder accounts for at least 7·1 per cent. of our admissions, since many cases previously unclassified are now seen to be abortive cases of mania and depression. Moreover, the fact that more than three manics were seen for each depression, contrary to the relative proportions in Europeans, may be partly due to depressives being frequently regarded as *physically* ill and not sent to the *mental* hospital.

(5) The previous observation that many manics were responsible people is now explained in a different way, namely that *classical* cases of mania (with sustained elation and grandiose schemes) and of depression (in which classical cases hardly occur) are seldom seen except on a background of education or sophistication, which is after all a *sine qua non* for the obtaining of most responsible jobs in the European sense. Many abortive cases, not previously recognized as manic-depressive, occur in the more unsophisticated.

(E) It was recorded in the previous article that 12·3 per cent. of the cases admitted were suffering from unclassified psychoses. This high proportion

was explained largely on the grounds that medical histories were usually unobtainable and interpretation of tribal languages was inadequate.

These explanations remain true to-day, but an even more important factor has now become apparent. It was noted under the discussion of affective disorder that many abortive and hardly diagnosable cases occur. It was also noted in regard to schizophrenia that relatively few patients could be classed as paranoid and in fact few were typically catatonic, so that most African schizophrenics must be assigned to the rather ill-defined group called hebephrenics.

In general, therefore, well developed and classical examples of the non-organic psychoses are relatively uncommon in the African ; and even when one has classified abortive forms of these disorders as exhaustively as possible there still remains a number of frankly undiagnosable cases. Such cases are commonly confused, excited, incoherent and emotionally labile and appear to coincide with the mental reaction types seen in European oligophrenics, of whom Tredgold says—" In many cases, indeed, it is impossible to place them in a definite textbook category ; one can only say that the patient is mad." They might best be entitled " primitive psychoses."

It is not, of course, here suggested that the normal Africans we meet are intrinsically deficient. This would be as unfair as to place an Englishman with a bow and arrow in the Kalahari Desert and then certify him as feeble-minded because he required " care, supervision and control " in a Bushman environment. The African may well, for cultural reasons, exhibit a backwardness which is similar in effect. According to Tredgold, backwardness due to extrinsic causes and mounting to a retardation of 15 to 20 per cent. is found in about 3·5 per cent. of the school age population of England and Wales. Such " backward " persons are only separable from the intrinsically " dull " by a study of their background and response to education, and there is no evidence that mental derangement takes other than similar, and amorphous, forms in both. So that the common occurrence of such forms in Africans is not surprising.

It has already been deduced that normal African mentality closely resembles that of European psychopaths as defined in this article, and Tredgold maintains that such persons (in so far as they fall within the class of moral defectives) are " *mentally* defective . . . in fact, feeble-minded according to the definition," since they lack " common sense or wisdom." If Tredgold is correct and, since many certifiable mental defectives are also morally defective, it is clear that the distinction between the two conditions is often a very arbitrary one. As to whether the African can best be defined therefore as " backward " or " psychopathic " is a question which seems of little profit to pursue.

* * * *

One can now summarize the findings in regard to African mental derangement over the whole 10-year period, and such of the above-described peculiarities as are possibly relevant to the present theme are listed below.

(1) There is probably a very low general incidence of insanity among Africans living in their natural environment.

(2) Among general paretics there is a relatively large proportion of "expansive" cases.

(3) Arteriosclerosis and hyperpiesia are rare and their rarity is consistent with the theory that a mental attitude is often of primary importance in their causation.

(4) Normal African mentality closely resembles the mentality of a section of the European population which is commonly entitled "psychopathic" or "sociopathic."

(5) Paranoid types of schizophrenia, including paraphrenia and paranoia, are relatively much commoner in Africans who have been educated on European lines, or sophisticated by living in townships.

(6) Classical cases of mania, with sustained elation and grandiose schemes, most commonly occur on a basis of European education or sophistication.

(7) No sharp distinction could be made between involutional melancholia and other types of depression, and classical examples of any type of depression are rare. Cases exhibiting hypochondriacal ideas and an appearance of misery but who deny subjective mental depression and ideas of guilt are not very uncommon, however, and are probably abortive depressions.

(8) Obsessional neuroses were never seen, and this was considered to be related to the absence of personally developed codes of behaviour.

(9) The condition entitled "Frenzied Anxiety," and fully described in the previous article, is now considered to be a psychopathic episode (with hysterical elements), and its frequency in otherwise apparently normal Africans is related to the findings described under the fourth heading of this summary.

(10) Many examples of abortive or "primitive" psychoses are seen, which closely resemble the reaction types seen in European oligophrenics.

These are the ten main points, and an attempt will be made to elucidate them further in part 6 of this article in the light of the studies undertaken in parts 3, 4 and 5.

3. A Study of African Reliability.

The writer, as was stated in the introduction, was invited by the Kenya Director of Laboratory Services to prepare tests for the selection of *reliable* Africans for work in the Medical Research Laboratory, Nairobi.

It is a matter of common knowledge to employers of Africans in Kenya that the latter frequently "let one down" in a variety of ways. Moreover, this tendency is not confined to the most unsophisticated, but commonly occurs in the well-educated and apparently most intelligent, to the frequent astonishment and chagrin of their employers. Since the relations of Europeans and Africans are constantly embittered by this tendency in a land where the two must work together it is surely important to try to understand it.

With a view to devising suitable tests (with which the rest of this article is not concerned), it was decided to begin by discovering exactly in what ways the African "lets one down" (or lets himself down) and proves unreliable. With this in mind, three employers of Africans were invited to supply examples,

and I have added some from my own experience. The types of African concerned were domestic servants, mental hospital attendants, laboratory employees and various other persons, and all degrees of sophistication and education were fairly represented. To avoid bias and selection, *all* the examples are quoted (though some are trivial) except in so far as they repeat each other, and it should be noted that the Africans concerned were not feeble-minded or evil, but fair samples of their race.

The examples are quoted below in inverted commas, and my comments follow each quotation.

(1) "My cook often does not tell me he wants more firewood until the latter is quite finished, although I have often told him to warn me *before* it runs out so that I can arrange to get some more."

From the cook's point of view the firewood in the European's house is something to burn and nothing more. He is in any case not used to looking very far ahead, but if he does it is merely to think that the European is all-powerful and can doubtless produce firewood somehow when he needs it, and it is even possible that the sky might rain firewood at any moment.

(2) "I put shoes to be mended in my shopping basket the night before so that I shall remember to take them to the cobbler the next day; the house-boy takes them out, cleans them and puts them elsewhere, though he might assume they had been put in the basket for a purpose."

From the house-boy's point of view a shoe is something to be cleaned and put in a particular place, a completely incomprehensible ritual anyway, and so to be memorized by rote and performed unquestioningly.

(3) "I tell the house-boy not to put my shoes in the shoe-cupboard but I will do so myself, as he is apt to put black shoes on top of white, heavy shoes squashing others underneath, etc. For a few days he will do as I say, after which he reverts to his old habit, and this applies to much that I tell him to do."

This appears to be an example of a tendency common to all of us where meaningless rituals are concerned, namely to revert to a well-established habit before the new habit is stabilized.

(4) "The house-boys cannot put furniture back level with the wall, put the table at right angles to the wall, hang pictures straight, etc."

This requires a type of spatial perception that is foreign to the African; it can be learned in regard to specific positions for particular items, but a general geometrical orderliness is hardly attainable. His attempts to solve, for instance, the Cube Imitation performance test, which requires some spatial apperception, would be pitiful in a European child of eight.

(5) "The cook took a basket of vegetables out of the car and left the back door of the car open, though he should have known I was just going to drive into the garage, and did so in fact and broke the car door."

From the cook's point of view the car door was merely something to open to collect the vegetables; the other aspects of the door's situation in space and time would hardly occur to him.

(6) "The egg-boy brings eggs on Mondays and Thursdays. He failed to come last Thursday on account of the rain, so he did not come again till Monday, though there was nothing to prevent his coming on Friday."

An example of an unreasoning following of a routine.

(7) "A female mental patient escaped, so the head female African attendant sent all the other ten female attendants to look for her, and herself remained alone to look after about a hundred patients. If any others had taken the opportunity to escape, she would have been helpless."

An example of a complete failure to take account of the total situation in a balanced fashion.

(8) "A number of male mental patients and their African attendants were playing football, one patient ran away, *all* the attendants and some of the patients chased him and left the rest of the patients unattended."

My remarks are as for the previous example.

(9) "The African staff of the mental hospital had been warned that a certain patient was likely to attempt suicide by hanging and to see that no strings, straps, etc., were left about. Shortly afterwards the patient tried to cut his throat with a razor-blade and the attendant in charge said he had only been warned that the patient might *hang* himself and that if therefore the patient had asked for a razor-blade he would naturally have given him one."

An example of a failure to envisage the total situation, and of a common tendency to take commands quite literally and unreasoningly.

(10) "There are always two attendants together in any particular block of the mental hospital on night duty, so that if one has to go away to relieve himself there remains one on duty. If the remaining attendant happens to feel the same urge he will probably not await the other's return."

An example of a failure by attendants to realize their responsibility for their patients, and of the constant African failure to subordinate immediate personal needs to more long-term situations.

(11) "A good mental attendant of 15 years' service took his normal home leave and, soon after returning to duty, said a distant relation was ill and he must therefore go home again. This was not allowed and he was told that if he insisted he would be discharged and would sacrifice his high pay and a gratuity for which he was due. He insisted on leaving, but said he would return and begin again at the bottom, and in fact he did so."

This is an example of the precedence accorded to primitive custom even when it may ruin the subject's prospects within the European system, and the latter is treated as quite unimportant and irrelevant when it conflicts with the African.

(12) "Senior laboratory assistants to whom the proper care of a work-room has often been explained—e.g. efficient dusting, putting away of used articles, necessity for all specimens to be examined without delay, clear labelling of all bottles, etc.—are often quite incapable of seeing that either (*a*) they themselves or (*b*) their subordinates maintain these principles."

The African sees his (European) job as a series of isolated responses, not as a co-ordinate and meaningful whole. The attitude, implicit in any responsible job, that one takes certain matters entirely on one's own shoulders, controls one's subordinates, and troubles one's superior officer as little as possible, is foreign to him.

(13) " I constantly find laboratory assistants standing about doing nothing while there are plenty of slides lying ready for examination."

This is largely answered under the 12th example, with the additional comment that a sense of temporal urgency, so universal among Europeans and so necessary in a laboratory, is rarely felt by Africans except in the most directly personal matters.

(14) " Specimens are received at the laboratory, entered in a book, given a number, and labelled ready for examination. The specimen from Mr. X may be given the number of Mr. Y, and that from Mr. Y be given Mr. X's number."

This sort of slip is bound to happen at times if one tries to do two things at once and is due to a lack of system. Europeans, of course, make slips of this type, but, having discovered their error once or twice, they would be likely to develop a better system of their own; it is the continuance of this type of mistake that is striking in the African. Moreover, an inability to cope with more than one thing at a time is almost the crux of the problem as will be seen in other examples.

(15) " Hours of reasonable explanation and demonstration failed to teach an apparently intelligent laboratory assistant the proper use of an autoclave."

It is probable that he did not possess the educational background that would permit of complete understanding of the processes involved, and in any case was probably unused to the reasoning method and could not use it at short notice. Although the rote method of learning is inferior to the reasoning method in general, it is probably more effective with most Africans at the present stage of their development.

(16) " A laboratory assistant has been trained in the use and care of a microscope and *can* in fact handle it deftly, yet the 12th objective gets broken in an amazingly short time." This can be due to inserting a thicker slide without racking up with objective, or to racking down after inserting a thicker slide, and in general to ignoring the safety of the objective while attending to the slides: an example of a failure to attend to more than one matter at a time.

(17) " On being told to fetch, say, 3 blood agar slopes and 1 sterile test-tube, a laboratory assistant may return with, say, 1 blood agar slope and 1 sterile test-tube, or 4 tubes of each, etc., although it is as easy to bring the right items as the wrong, for they are all kept together."

This is unlikely to be due to a failure of retention—there is no evidence that the African's retentive faculty is so feeble. It is doubtless due to a failure of attention and registration, for the African often fails to register a matter if only told it once and without emphasis or emotion; indeed African conversation is highly repetitive and commonly punctuated by a word corresponding to the English word " Listen."

(18) " One calls the African telephone operator to get one Mr. X, he replies he will do so; after an interval of 5 minutes he asks if you wanted Mr. Y."

This appears to be mainly a lack of attention as described in the previous example. It is also probable that a familiar name was substituted for an unfamiliar, an attempt to fit a new experience into a familiar pattern and not keep an open mind. (A further example was given which showed the latter

tendency more clearly, but is not recorded here since it merely repeats the same theme.)

(19) "A laboratory boy is told to empty a certain basket (of used material) every morning. One day the basket is found unemptied and, on enquiry, he states that he thought they were unused materials. This is common in various forms; one often gives an order which sooner or later is not carried out because the boy thinks one has made a mistake. He is, of course, seldom in a position to appreciate the situation and never asks before acting on his own judgment. It is not due to laziness, but he probably sees an unfamiliar element in the situation (e.g. a different item in the basket) and feels that the rule cannot therefore apply."

In the absence of a proper understanding of the situation there must come a point where further alteration of the elements of the stimulus does not call forth the required response and the order is not felt to apply.

(20) "An African employee will suddenly ask for leave (to visit his sick grandmother, etc.) although this disrupts the staff organization, and he will be surprised and pained when permission is not readily granted."

My comments are as for the eleventh example. The African does not see his work for the European as an essential part of an organization, and it must be admitted that from his point of view his (European) work is *not* such an essential part of *his* situation as we would like it to be, for he is in effect often living two separate lives which he makes little attempt to reconcile, and his European work is often merely a means to earn money so that he can maintain his traditional mode of living in the reserve.

(21) "After doing a certain type of work at a certain required standard for some time, an African employee will one day do something quite inferior, e.g. omit to put forks on the table, salt in the soup, etc., and if he is not continually supervised or reprimanded his standard will probably progressively deteriorate."

Since his work consists of a series of separately memorized and meaningless acts, it is all too easy to forget certain essential items sooner or later and, in the absence of supervision, he will forget more and more of them. Furthermore he considers that most of the items are fatuous and unnecessary and that he might try omitting each in turn to see if his employer really notices and insists upon them. One cannot also ignore the possibility, on occasions when he lets one down in this way, that he has had bad news from home or suffered some other emotional upset, for such upsets disturb his efficiency more thoroughly than they disturb persons whose conscientiousness in their work is more deeply engrained. Finally, all his faults are more marked if he is not supervised; in the presence of his employer they are minimal, and he makes his master's attitude a part of himself in inverse proportion to his distance from him, like a child with its parents.

(22) "If an African employee sees some immediate advantage to himself and thinks he can get away with it, he is apt to behave in an utterly unscrupulous fashion from our point of view, e.g. a highly qualified African surgeon (not in Kenya) in doing hernia operations held the patient's relations to ransom before putting the intestines back. If discovered there is little or no shame."

The African as was seen in part 1 has no general conception of right and

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wrong. Within his own culture he has precise and detailed rules, but these have no application to his life within the European cultural framework.

(23) " If an African in the reserves is walking on the road and one sounds the car-horn he will leap aside after an appreciable interval and then probably wander back onto the road without looking to see if another car is following behind."

The road, when he is walking on it, is a footpath and nothing more. He sees the passing car as an isolated and surprising incident, fails to bear continually in mind that a road is also a place for cars to drive along, and continually shows in certain circumstances, such as the situation here described, a relative lack of distractibility.

(24) " When things go wrong the African notoriously fails to blame himself—the environment conspired against him, it was a matter of fate, the cup slipped out of his hand, the drink made him slaughter his best friend, etc."

He does not see himself as a responsible causal agent, but as a pawn of fate, as was seen in Part 1.

(25) " The African employee is apt to spend his monthly pay in a few days, and then starve or get into debt."

Money is something to be spent and, if one does not spend it, it will probably be lost or stolen. Any other course requires foresight and scheming which is foreign to him.

(26) " If kindness is shown to the African employee, or some relaxation of the usual discipline, he is apt to take advantage of this to see how far he can go."

He has no well-developed code of his own outside his reserve and Europeans vary from person to person, so he must find the length of the chain with each one, as a child does with each parent. Moreover, he believes the European is all-powerful and can grant all his wishes if he has the will.

(27) " After listening to a general scientific lecture, the African student is apt to ask some trivial personal question."

His interest, as has been shown, is mainly egocentric and unacademic.

(28) " Even quite a good boy will come on duty drunk at times."

He lives more vividly in the passing moment and takes little thought for the morrow. If there is drink going, it is there to be drunk, and fills the interest for the time to the exclusion of other interests, duties, etc.

(29) " A head-boy will quarrel with one of his underlings and expect his master to settle the matter; he does not feel it is up to him to settle staff problems himself."

My comments are as for those under the twelfth example. In fact a large proportion of African overseers, sergeant-majors, etc., are accordingly recruited from more or less detribalized peoples (Nubians, Swahilis, etc.,) who have acquired a more responsible attitude.

(30) " The house-boy will dust certain items in the room (as told), but will not keep the room in general clean."

He learns certain explicit rules of behaviour, but fails to develop a general abstract idea, such as cleanliness, tidiness, etc.

(31) " One calls the house-boy to bring dinner but he does not hear,

although it is well known to be dinner time and he is well within hearing distance, because he is talking excitedly to the cook about some small matter of personal interest to him."

He genuinely does not hear the call, an immediate emotional personal interest blots out all awareness of other stimuli. This, like the 23rd example, illustrates the African's lack of distractibility in certain circumstances. The domestic staff's ability to converse interminably and with eloquence and enthusiasm about the most trifling matters and to the exclusion of all other awareness, is also a notorious source of irritation to housewives.

(32) " If one asks any African a question, he is very apt to give the answer that he thinks you want."

From his point of view there is no *one* truth, it varies from moment to moment according to one's mood and that of one's audience.

(33) " An African employee commits a fault and one says one will deduct a shilling from his pay at the end of the month ; comes the end of the month and the fine, and he deeply resents this because the offence happened in the past."

One cannot fine him at once because, except on pay day, he seldom has any money. He feels little responsibility for something he did in the past, and one even wonders at times if he regards himself as having a continuing personality.

* * * *

These are the examples. Individually they are not perhaps very dramatic and occur from time to time, of course, in experience of European employees. The striking thing, however, is that they would only occur frequently in Western European civilization in persons who would be considered thoroughly irresponsible, whereas Africans who do not frequently default in ways like these are rather exceptional people.

It now behoves one to see what common threads run through this patchwork of failures.

The first and most striking point is a failure to see an event as an element in a total situation, and as having a variety of relevant relationships. Only 3 or 4 of the examples do not show evidence of this failure. The relationships that were most frequently ignored in this series were *the causal, functional and temporal*, which are hardly separable, and of which at least 25 of the 33 examples show evidence. Examples of other ignored relationships, e.g. spatial, ethical and occupational, occurred, but less commonly. The inability to attend to two things at once, or at least to keep the second near to the threshold of consciousness while attending to the first, and which frequently accounts for a lack of distractibility, is clearly seen in 4 examples and is part and parcel of the same phenomenon.

The second point is a continual tendency to follow routine procedures in an unreasoning fashion, and of which there were at least 9 examples in this series. This point is closely linked with the first, and their relation to each other will be discussed later.

The third point is a lack of interest and attention unless the situation appeals

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in a directly personal and emotional fashion. Of this again there were at least 9 examples.

A number of minor points arise but, since they were each seen in only one or two examples, it is not proposed to discuss them further. It is worth while noting, however, that there is evidence in at least two examples, 24 and 33) that the African seems to feel little sense of a continuing personality!

* * * *

In regard to the first point one must begin with a qualification, since it is likely that the African's failure to appreciate total situations does not apply in the world of sound.

Thus Biesheuvel says—" The Bantu have a flair for words and a remarkable ability to master languages. Many an African knows a few Bantu languages in addition to his own, while possessing a working knowledge of English and Afrikaans. He does not seem to experience the same difficulty in mastering the quite different structure of the Indo-European languages, as the European has in learning a Bantu tongue. Latin and English are among his best subjects in the High School curriculum. . . . As a group, Africans also excel in musical ability."

M. L. Fick, quoted by Biesheuvel, says—" The speed with which native students learn songs is remarkable. We use the Tonic Sol-fa system in our singing lessons. It takes them about ten minutes to learn an unknown piece of four lines in four parts. It is their custom after study and before they go to bed to sing some familiar hymn. Night after night we hear them singing, but only in two voices, namely bass and tenor. They say that the girls are singing the other two parts and so they need only sing *their* two. It is most remarkable that they succeed in singing in this manner, because the first voice, which introduces the tune, is not heard at all. This makes it difficult for us to make out what hymn they are singing. That it is possible for the native to do this shows that he is capable of representing imaginally the voices which are not sung. If the first two voices were not imaginally present they would not be able to keep their parts. Nearly every native is an amateur composer. Numerous new songs are sung annually here by students in small choirs. It happens sometimes, when they are busy working outside, that one of them hits on a tune—usually one he has made up himself—and after he has repeated it a few times, one after the other of the other students present joins in and, after a while, the simple tune has become a part song with a perfect harmony, sometimes in as many as five parts."

Finally Biesheuvel, referring to this quotation from Fick, makes from our present point of view the profoundly interesting observation that " This shows that at least in the auditory sphere, the African's ability to grasp, work out, remember, and create intricate new relations of a most abstract kind is by no means inferior to that displayed by the European in the visual or conceptual sphere."

The writer has previously referred to the African's dependence on the world of sound and of spoken words, and to his eloquence, and will return to

Biesheuvel's very interesting qualification of the general rule in the conclusion of this article, since it may well have a fundamental bearing on African thinking.

* * * *

To return therefore to our first point in general, it is, of course, pertinent to remark that no one, however brilliant and cultured, can hope always to see the total situation in all its relevant relations, but the attempt is commonly made and, for all practical purposes, is commonly successful. Moreover, the relevant relations of many situations *are* inevitably different for the European and the primitive African, e.g. when the latter departs to see his sick father, his (European) work is a relatively unimportant part of *his* total situation. The question therefore arises whether the African's failure to appreciate the total relevant situation from *our* point of view is (*a*) a mental disability in him, or (*b*) merely *apparent* to us and due to the fact that matters which are important from our point of view are *really* unimportant from his.

No doubt the second possibility is often true, but it is by no means the whole truth. Among the 33 examples there were only two (11 and 20) in which the requirements of the two cultures definitely conflicted. In all the other examples the failures were not directly due to environmental factors although, of course, such factors may explain the mentality that underlay them. Even if the European work is undertaken solely with a view to supporting life in the reserve, which is by no means always true, it should still be an important part of his total situation, and demands a sustained attention which it would receive from more sophisticated people in a like case. Many Europeans, after all, are employed on strange and uncongenial work, yet are efficient. Moreover, the European must and does often adapt himself to very new conditions of life, as when the boy is first sent to boarding school, the youth from the country drifts into the town, or the grown man emigrates.

To return therefore to the first possibility, it remains to discuss whether the disability is innate or acquired. The question is not certainly answerable but if one can show that, for environmental reasons, one could only expect the development of this disability, there is no need to assume it as innate.

Now, as has been shown before, in all African education in the reserves the "emphasis always lies on a particular act in a concrete situation;" he is taught to observe meticulous rules and restraints in a large number of particular and limited situations. Since his social and geographical environment changes little throughout his life, these rules are generally adequate to his needs. He learns no general principles that require directed thinking in their application, and indeed there is little scope and less encouragement for anything in the nature of original thought.

It is implicit in this that his attitude must be: "I may do anything that is not specifically and explicitly prohibited," whereas the European's attitude (ideally) is "I must refer my problems to the arbitration of my mind as a whole, working on the basis of a few general principles, and taking into account all possibly relevant aspects of the situation." The African attitude implies that, apart from certain swift and almost automatic responses and inhibitions,

he can do what he likes from moment to moment and feels little need to think of the future or indeed of any other than the immediately presenting aspect of the situation. So he feels free to exercise his most egotistic and emotional impulses (within well-defined limits) and such mental organization as he evinces is imposed from without and not self-developed. He is hardly in fact an individual in our sense of the word, but a series of reactions.

Cultural factors thus fully explain the ways in which the African lets one down, and lets himself down in our eyes. They explain his failure to take cognizance of the total situation, his lack of interest and attention except in directly personal and emotional situations, his continual tendency to revert to more simplified routines, and the disastrous failure of his infrequent attempts to think for himself.

More generally, and virtually implicit in this, such factors explain what are in our eyes his unreliability, his irresponsibility, his unconscientiousness, his lack of method and concentration, his impersistent moods, and his relative inability to keep more than one item in mind at once. His lack of self-consciousness seems also to be explained, since this faculty appears to be a by-product of mental synthesis.

The question as to whether the African's failure on these lines is due to a lack of ability or a lack of incentive and urge to use his potential powers is largely answered by this analysis, for it can be fully explained as due to the latter. Indeed it is notorious that many Africans who are brilliant by any short-term tests will commonly default in real life situations in such ways as described, and the failure appears to be one of total personality development rather than one of pure intelligence as measured by tests. One cannot, however, ignore the possibility that anatomical differences also exist, but this point will be discussed in the conclusion of this article.

4. The Effects of Leucotomy on European Personality.

Relatively few leucotomies have so far been performed in Kenya, but many writers in Europe and America have noted personality changes after leucotomy as compared with the prepsychotic personality of the patients concerned, and the following is a summary of the findings of each writer whose observations are available to me.

Jan Frank, in a study of 200 cases, found no impairment of cognition or intellect in patients under 55 years of age, but there was a poverty or absence of dreams and daydreams, an inability to be abstractly angry in a sustained fashion, a tendency to become more plain and matter-of-fact due to emotional asymbolia, a dislike of adventure with a desire to remain in a more or less stereotyped routine of activities, and a reduction of learning ability.

C. S. Parker, in a study of 100 cases, found a tendency to placidity and laziness and for the patients to consider less the effect of their remarks and to say what they think.

E. L. Hutton, in a study of 10 cases, noted a diminution of self-consciousness with less shyness and reserve, a greater indifference to adverse criticism, less preoccupation with bodily functions, decreased awareness of other people's

feelings, emotional shallowness and no tendency to make new friends. In general there was an increase of self-indulgence and egoism, but with a wider range of interest in the environment. Some of the patients were less truthful, reliable, scrupulous and religious. Intelligence seemed unimpaired, but the sense of personal responsibility was reduced, and worry about the future was rare though the reaction to immediate situations was normal. She found the most outstanding feature in the *pre*-psychotic personality of these cases was an excessive social self-consciousness, and most of them were conscientious and meticulous. In another article she stresses the importance after leucotomy (if not before) of a regular disciplined routine—a matter of considerable relevance to our present theme. Hutton is elsewhere quoted by Henderson and Gillespie as saying that reproductive memory is replaced by associative memory so that the leucotomized patient lives in a perpetual present.

Sargant and Slater describe hastiness of temper, irritability, egotism, increased extraversion, an incapacity for sympathy to others, tactlessness, a lack of self-criticism, a loss of worry about the future and a tendency to live more for the present.

Hutton and Bassett record a loss of creative activity and deduce that this is due to a lack of ability or desire to re-organize images of perceived parts into new imaginary wholes.*

Meyer and McLardy, in a study of 95 leucotomized patients, found that the severer degrees of personality change were usually associated with a posterior position of the cuts, and that general restlessness was confined to such cuts.

Frankl and Mayer-Gross are quoted by Raven as finding the typical discharged leucotomy patient cheerful and contented, not worrying, having a high opinion of himself and his abilities, active and restless, with varied and variable interests especially for light entertainment and superficial pastimes, easy-going and sociable but without depth of feeling and with little sympathy or consideration for others, and without regrets. He may also be headstrong and tends to quickly passing outbursts of temper.

Freeman and Watts are quoted by Henderson and Gillespie and elsewhere by Garmany, as observing euphoria, tactlessness, lack of initiative, laziness, a tendency to be content with inferior performance socially and intellectually, a diminution in foresight and care for the future, talkativeness, poor judgment, and fundamentally a diminution of self-consciousness.

Golla is quoted by Garmany as finding an increased objectivity and response to environmental variations associated with little interest in remote possibilities, some rudeness and loss of sensitivity to other's feelings, and especially a loss of anxious self-questioning as to the ethical rightness of projected activity; and as finding the patients guided by a conventional moral code which is not coloured by the usual emotional concomitants.

* Ashby and Bassett have since concluded that "creative ability is not markedly impaired by prefrontal leucotomy," but this conclusion was based on comparison with psychotic patients who, as the writers show, have a significant lack of such ability as compared with normal persons. So that their study *does* probably demonstrate a loss of creative ability as compared with the *pre*-psychotic personality, which is here our sole concern.

Freudenberg and Robertson's study appears to demonstrate that there is no loss of rote memory (as shown in the immediate and delayed recall of a number of seen objects), but that there is a reduction of meaningful memory and capacity to learn from experience as shown in the Paired Associates, Kohs Blocks, and Sorting Tests). They also noted a diminished punctiliousness and a diminished capacity to deal with spatial relations, and considered finally that all these changes were due to a mixture of cognitive and conative factors, and could not be explained on the basis of either factor alone.

Spurling's case of bilateral frontal lobotomy, as quoted by Garmany, was subsequently explosively irritable, given to vulgarity, and showed difficulty in synthesizing or in remembering more than one detail at a time.

Russell Brain considers from the evidence of leucotomy that the frontal lobes are concerned with foresight, imagination, the apperception of the self, and the adjustment of the personality as a whole to future contingencies.

Earl Walker, as quoted by Fleming, finds an inability to synthesize the problems or situations of the external world.

Brickner, as quoted by Brain and Strauss, observed (in a stockbroker leucotomized at the age of 40 years) euphoria, lack of insight and initiative, distractibility, selfishness, tactlessness, sexual disinhibition, and a virtual absence of new learning, and considered that the fundamental defect lay in his powers of synthesis—in his power to assemble groups of percepts into groups of a higher order.

Cobb, as quoted by Meyer and elsewhere by Garmany, is opposed to regarding the frontal lobes as centres for specific traits (e.g. foresight or imagination) and believes they merely permit of long-circuiting actions, and that the effect of leucotomy is simply to reduce the number of possible circuits of association.

Petrie's comparisons were made with the pre-leucotomy, not the pre-psychotic, personality and so are not strictly relevant to the present study. Nevertheless they are too important to ignore and, in so far as they are likely to be relevant, are here recorded. She found a loss of persistence and of cautiousness, of capacity to generalize and to plan (as seen in mazes), a diminution of self-blame and a tendency to leave the past behind, live largely in the present and look hopefully to the future, a loss of comprehension and of social sense, a lessened distractibility, a lost appreciation of the finer distinctions of language with a decrease of critical attitude in its use, and a loss of learning ability (as shown by an increase of double mistakes in mazes) with an increased facility in the performance of routine tasks which had once been learned.

Finally, it is only fair to record that various authors, for example Garmany, maintain that there need be no permanent personality change ascribable to the operation alone, especially if the assessment is made after a considerable time. Nevertheless, it is clear that personality changes on the lines described, are frequent ; and it is most probable that their degree is roughly proportional (other things being equal) to the completeness with which the frontal cortex is separated from the rest of the brain, as evidenced especially by Meyer and McLardy's studies.

* * * *

A summary of these findings would run as follows:

The prevailing mood is one of cheerful self-satisfaction, and emotions are more directly egotistical and transitory and little felt in more altruistic and abstract situations. Interest in the environment is more varied and variable, wider but more superficial, and concerned with its more immediately utilitarian aspects. There is a lack of self-criticism and self-consciousness (social and probably personal), and a lack of sympathy for the feelings of others. There is an inability to envisage, or a lack of interest in, the future implications of a course of action, a lack of regret for past actions, and a tendency to live more in the present. There is a lack of sense of right and wrong in any general sense, though a conventional religiousness is common. There is a lost appreciation of the finer distinctions of language and a decreased critical attitude in its use. There is a difficulty in synthesizing or in remembering more than one detail at a time, a lessened distractibility, a loss of creative activity due to a lost ability or urge to reintegrate images, and a preference for stereotyped routines. The reduction of learning ability may or may not be dependent on conative factors included above, and the hyperactivity seen in some patients appears to be a quite inessential result of the operation and dependent on abnormal incisions. All the other qualities mentioned are directly consequent upon or implicit in those mentioned.

On analysis it appears that, when the leucotomized patient shows a personality change at all, it is in the direction of a *failure to see an event as an element in a total situation and as having a variety of relevant relationships*. The relations referred to by the above-quoted writers were causal, functional, spatial, temporal, verbal, social, ethical and aesthetic. Interest in the environment is accordingly more superficial and concerned with its more immediate and directly utilitarian aspects, emotions are transitory and the emotions described by Thouless as sympathetic and disinterested are hardly felt. A preference for stereotyped routines is also common and probably related to the inability to integrate for oneself, and the reduction of self-consciousness is probably a direct result of reduced integration. Finally, a reduction of learning ability has been described and this is probably partly a natural consequence of the self-satisfaction and lack of incentive, but may also be an independent disability.

5. An Assessment of the Resemblance Between the African and the Leucotomized European, and Some Deductions.

Except in so far as the African's ritual training mitigates some of the more socially flagrant symptoms (e.g. rudeness and tactlessness), and except that the African shows no lack of verbal ability or of phantasy, the resemblance of the leucotomized European patient to the primitive African is, in many cases, *complete*.

It would have been possible to write the analysis of the leucotomized European's mentality in words that echoed the analysis of the African's; but it would have made wearisome reading. The writer has, indeed, often been struck by the fact that words and phrases used with reference to leucoto-

mized patients were equally applicable to most East Africans. It seems also not without significance that at least one of the few Europeans leucotomized in Kenya has, since his operation, consorted much more happily with Africans than with Europeans, in marked distinction from his previous behaviour, and to the great embarrassment of his relations.

* * * *

From all this it is inferred that the main function of the frontal lobes is the integration of stimuli arriving from other parts of the brain (thalamus and cortex), and that the African uses his frontal lobes but little for this purpose. The specific rules and taboos that govern his life are learned unreasoningly and retained in mind as feats of memory. It is likely that rote memory is little if at all affected by leucotomy, so one must assume that this faculty is served by more posterior parts of the brain. Now since much of African learning appears to fall into the class of rote rather than meaningful learning, since "meaningful" signifies "related in a consequent fashion to previous experience," and since the chief demonstrable function of the frontal cortex is synthetic, it seems most likely that meaningful learning is a function of the frontal lobes and rote learning of other parts of the brain. If this is true, then it is seldom necessary for the African to use his frontal cortex except for verbal synthesis, and he seldom directly (as opposed to phantastically) does so.

* * * *

It is assumed in this article that leucotomy is similar in effect to lobectomy. This assumption is probably not quite legitimate though, in those cases where the operation of leucotomy has really been confined to a severance of the thalamo-frontal tract, it is likely to be true. In fact, however, as shown by autopsies, it has seldom been so confined and has at times almost amounted to lobectomy.

Moreover, the described effects of lobectomy are closely similar to those of leucotomy. Halstead, for instance, in a study of 26 frontal lobectomies, found an impairment of four factors: a central integrative factor, a factor of abstraction, a power factor (which "operates to counterbalance or regulate the affective forces") and a directional factor, factors which might well be used to describe the shortcomings of leucotomized patients.

Admittedly Halstead found that an index based on these factors did "not appear to be altered significantly by prefrontal lobotomy" (leucotomy), but he based this finding on comparison with the *pre-operative* personality and it is clear from his own figures that *these* subjects showed a substantial impairment of the index *before* operation.

* * * *

One is led at this point to see if these deductions have any bearing on African psychiatry and if the peculiarities observed in the latter can be explained on these lines, and part 6 therefore consists of an attempt to answer three questions.

6. An Attempt to Apply the Deductions Made in Part 5 to the Peculiarities Described in Part 2.

Each peculiarity listed in the summary at the end of Part 2 will be discussed in turn.

(*a*) "There is probably a very low incidence of insanity among Africans living in their natural environment."

This was previously explained as being due to an absence of problems in the social, sexual and economic spheres. There is therefore little need for original personal thinking, and if our theory is correct, little need to use the frontal lobes. So that certain types of mental derangement which, as it is hoped to show later, are dependent on the use of these lobes, are unlikely to occur. Their absence or rarity largely accounts for the low general incidence of insanity.

(*b*) "Among general paretics there is a relatively large proportion of expansive cases."

This was previously thought to be due to an unmanageability of this type of case at home, and this may partly account for the phenomenon, but another possibility now arises. In general paralysis the chief impact of the disease, as observed at autopsy, is upon the frontal lobes. It was recorded in the previous article that the cases "were all in an advanced stage of the disease at the time of their admission." If the African seldom uses his frontal lobes, one would expect the disease to advance to a very complete destruction of the frontal cortex without his showing much mental abnormality, always provided the rest of the brain were little affected. So that one is led to wonder if expansive symptoms are frequently simply a late expression of the disease and occur when the latter has seriously involved more posterior parts of the brain. It may be that such late cases, though previously common, are now seldom seen in England, or that in England the picture in late stages is now altered by early treatment.

(*c*) "Arteriosclerosis and hyperpiesia are rare and their rarity is consistent with the theory that a mental attitude is often of primary importance in their causation."

These conditions are all too frequent in Western Europe and their frequency, as was shown in the previous article, may well be due in many cases to mental attitudes that are seldom seen in Africans. Since, from a neuro-physiological angle, the chief difference between these peoples seems to be that the former more habitually use their frontal cortex, one wonders if these vascular abnormalities are in some way dependant on frontal lobe use or misuse. If so, one would expect leucotomized hyperpietics frequently to show a fall of blood pressure. This expectation is fulfilled in the finding of Donovan, Galbraith and Jackson who, in describing "some of the apparent alterations in vegetative functions after leucotomy," observe that "a fall in blood-pressure seems to be invariable. . . . Frequently the fall seems to be in direct proportion to the preoperative level, i.e. the most extensive lowering of systolic pressure generally occurs where the initial reading is comparatively high." From a

study of figures kindly supplied to me by one of these writers it appears that, in those (14) cases whose preoperative systolic blood pressure was 160 mm. or higher and who were re-examined not less than four months after the operation, the average decrease at the final reading was 22 mm. (or 11 per cent.). Moreover, Tibbetts has recently described a case in which the blood-pressure during the three weeks before leucotomy varied from 170/100 to 260/160, whereas for the 16 months during which the patient was examined afterwards the blood-pressure remained stabilized between 140/95 and 160/100.

(*d*) "Normal African mentality closely resembles the mentality of a section of the European population which is commonly entitled psychopathic or sociopathic."

It is clear from the study of this subject in Parts 2 and 3 that the only difference between the normal primitive African's behaviour and that of Europeans who are "psychopathic" (as defined in this article) can be explained as due to the mitigation of the more anti-social symptoms in the former by the fact that their lives are completely governed by meticulous rules of manners and behaviour. In circumstances where these rules no longer apply, or in the uncommon cases where the rules have not been learned, the African is apt to become frankly "psychopathic."

Now it has already been inferred that the African uses his frontal lobes very little, so the further inference is now made that psychopathy as defined is due to the non-use of these lobes. This deduction must imply firstly that the operation of leucotomy tends to convert patients into psychopaths, and secondly that it is useless to attempt to cure "psychopathic" cases by leucotomy. So one is led to ask if these implications are true.

As far as the first point is concerned there seems little doubt that this is just what leucotomy often does do. Leucotomy is an imprecise operation and, since it is well known that not all leucotomized patients show the full anti-social tendencies that many do, it may well be that the best results often occur where the operation is not complete. Having regard also to the previous remarks about primitive African education and its effect in governing his social behaviour, one has been profoundly interested by Hutton's discussion of the management of leucotomized patients. The following quotations are from this writer, but the italics are my own. Hutton says: "There is some evidence that after leucotomy the patients become more extraverted, are more susceptible to external influences, and more objective and materialistic in their outlook. If this be true, then any desired change in the patient's behaviour must to an increasing extent be conditioned from *without*, and opportunities must be provided for the re-establishment of previous good habits, and strenuous efforts made to replace bad habits by some satisfactory ones. . . . If many good habits had previously been formed, the sooner the patient can be returned to his normal surroundings the better. . . . As far as possible, old interests should be revived and new ones introduced, and a *regular disciplined routine adopted in order that stable habits of a satisfactory kind may be formed.*"

The second implication has to meet the objection that Mackay leucotomized 19 psychopaths and found that 7 were remarkably improved or recovered.

However, Frank found only one social recovery among eleven leucotomized psychopaths, Henderson found no social recovery in four cases, and Engler among 38 mental defectives selected for severe conduct disorder found only three who showed considerable improvement. So that if one summarizes these findings one only finds about 15 per cent. of social recoveries. It must be admitted, however, that symptoms of tension and aggression are frequently ameliorated by leucotomy, but these symptoms are by no means a universal concomitant of psychopathy as Curran and Mallinson have clearly shown. Indeed, it is probable that aggressive tendencies are not positively correlated with psychopathy as defined in this article, though they are doubtless more likely to achieve overt expression in such people. Probably the great majority of psychopathic persons fall under the heading described by Henderson and Gillespie as "Inadequate" as opposed to "Aggressive," and I have found no evidence that leucotomy can cure the former.

So these implications of the argument seem to be true and the argument itself is supported.

(*e*) "Paranoid types of schizophrenia, including paraphrenia and paranoia, are relatively much commoner in Africans who have been educated on European lines, or sophisticated by living in townships."

The criteria used in separating paranoid from other types of schizophrenia were a tendency to chronicity in the delusions and a fairly good preservation of the personality in the former.

Although systemization of the delusions was not demonstrated in all the paranoid cases, it certainly occurred in some degree in most and was obvious in many. Among the non-paranoid cases on the other hand, systematization was not seen. There is clearly a high positive correlation between delusional chronicity and personality preservation on the one hand, and delusional systematization on the other. This is, of course, well known and not surprising. Preservation of the personality after all simply means that the subject's reactions are related in an obviously continuous manner to his experience as a whole, and do not vary in an apparently haphazard manner from moment to moment, and delusions in these circumstances can hardly be other than chronic.

So that the preservation of the personality and chronic delusions must usually be based on some degree of systematization, and it is precisely this quality which the primitive African and the leucotomized European tend to lack.

If the previous inference that the ability or desire to see events in a wide setting is a European acquisition, it is therefore not surprising that paranoid types of schizophrenia would mainly occur in Africans educated or sophisticated on European lines.

Finally, if as seems true, systematization is essentially a function of the frontal lobes, one would expect leucotomy to be more effective in paranoid than in other types of schizophrenia, and this is borne out by the records. Thus Frank found a social recovery in 48 per cent. of 80 cases of paranoid schizophrenia, but only 12 per cent. of 52 other schizophrenics; Henderson found social recovery in 41 per cent. of 22 paranoid cases, but only 24 per cent.

of 50 other schizophrenics ; and Garmany found social recovery in 50 per cent. of 10 paranoid cases, but only 11 per cent. of 27 other schizophrenics.

(*f*) " Classical cases of mania, with sustained elation and grandiose schemes, most commonly occur on a basis of European education or sophistication."

In leucotomized patients emotions are transitory, and the ability to sustain emotions appears to depend on the integrity and active functioning of the frontal lobes.

Grandiose scheming is highly characteristic of many manic Europeans but scheming implies concern with the future which, on the evidence of leucotomy, is essentially a function of the frontal cortex.

So that, if the African seldom uses these lobes, one would expect mania in him to show the peculiarities described.

(*g*) " No sharp distinction could be made between involutional melancholia and other types of depression, and classical examples of any type of depression are rare. Cases exhibiting hypochondriacal ideas and an appearance of misery but who deny subjective mental depression and ideas of guilt are not very uncommon, however, and are probably abortive Depressions."

It is well known that the retardation exhibited by many depressives is more apparent than real and that in fact many " retarded " depressives do not experience a reduction of thought processes but, on the contrary, experience so many conflicting lines of thought which they vainly attempt to reconcile that they become unable to make decisions, or even at times to express themselves except after much delay. It seems likely that one of the factors in the production of the syndrome known as psychotic depression is an *excessive* tendency to view the situation as a whole, and one is sometimes led into arguments of phantastic intricacy when conversing with these patients. If this tendency is a function of the frontal cortex as is likely from the evidence of leucotomy, and if the African seldom uses this cortex as the evidence indicates, then one would not expect depression, at least in classical forms, to be common in the African.

The inability of the African depressive to recognize his depression as a mental rather than as a physical state seems to be simply a part of his general lack of introspective ability and developed self-consciousness, which again are probably by-products of the habit of synthesis.

The absence of ideas of guilt and unworthiness is again predictable since he seldom views himself as other than a pawn of fate, and can hardly do otherwise in the absence of a developed sense of continuous personality.

Finally, leucotomy has scored one of its greatest triumphs in the treatment of chronic depression. If one summarizes the results described by Frank, Garmany, Henderson and Parker, one finds that among 103 patients leucotomized for depression a social recovery was obtained in 67·9 per cent. So that this illness appears to be highly dependent on frontal lobe function and, in general, the peculiarities seen in African depressives are such as one would expect in persons whose frontal lobes are dormant.

(*h*) " Obsessional neuroses were never seen, and this was considered to be related to the absence of personally developed codes of behaviour."

It is clear that obsessional neuroses are highly dependent on frontal lobe

function since leucotomy has been more consistently successful in the treatment of this condition than in that of any other.

The theme was developed in the previous article that the growth of personal standards of conduct is highly characteristic of Western European as opposed to primitive societies, and that the latter are governed by a host of precise rules—externally imposed and learned by rote. These rules are presumably stored as memories in posterior parts of the brain since it seems that leucotomy hardly interferes with memory. The correlation of memories and experiences which is required for the development of personal codes appears to be a function of the frontal lobes. So that the previous argument that obsessional neuroses can only occur on a basis of personally developed codes of behaviour is now supported by the neurophysiological considerations developed in this article and by the facts of leucotomy.

(*i*) "The condition entitled 'Frenzied Anxiety,' and fully described in the previous article, is now considered to be a psychopathic episode (with hysterical elements), and its frequency in otherwise apparently normal Africans is related to the findings described under the fourth heading of this summary."

African mentality in general, as has been shown elsewhere in this article, closely resembles the mentality of a group of Europeans commonly called psychopathic.

For the most part Bantu Africans are very happy-go-lucky and inaggressive and would fall into the class of psychopaths called "Inadequate." The distinction between inadequate and aggressive psychopaths is, however, a very arbitrary one, and in effect merely depends on the fact that the former (unlike the latter) have not *so far* exhibited aggressive episodes. In the face of severe frustration, episodic reactions of the type described as psychopathic are clearly most likely to occur in "persons who live in a perpetual here-now and lack the desire or ability to control their passing emotions and so to subordinate immediate gratifications to their own long-term interests."

Severe degrees of frustration occur frequently enough in primitive life. Behind the carefree façade and constantly restricting behaviour there lies the ever-present fear of bewitchment. So long as all goes well it lies dormant, but when things go wrong this fear inevitably develops side by side with the more obvious misfortune, and the subject frequently reaches a pitch of helpless terror which cannot be mitigated by a larger understanding to the total situation. In these circumstances an explosive reaction must result and the frequent occurrence of frenzied anxiety is explained.

The commonly superadded hysterical elements seem to require no special explanation in this context since, as Lewis says, "The occurrence of hysterical mechanisms in children, and their frequency in healthy adults, especially after calamities or in unendurable conditions . . . suggest . . . that hysteria is potentially present in most people." In other forms it is certainly not uncommon in Africans.

(*j*) "Many examples of abortive or 'primitive' psychoses are seen, which closely resemble the reaction types seen in European aments."

In general there is a marked difficulty in making a differential diagnosis between various types of psychoses in primitive Africans and some of the

more characteristic symptoms, especially the delusional systems and sustained mood changes, are conspicuous for their absence or unobtrusiveness.

These symptoms in general appear to depend on the full functioning of the frontal lobes and, in the absence of this, insanity takes a somewhat amorphous form.

It has already been suggested that the African exhibits a backwardness which must be similar in effect to intrinsic dullness and likely to result in similar types of mental derangement.

If the function of the frontal lobes is essentially synthetic and if the African (for cultural reasons) makes little use of these lobes, he must show a lack of "wisdom and commonsense" and, if intelligence *is* the ability to educe and apply relations, a lack of intelligence.

So that African backwardness and the occurrence of "primitive" psychoses can well be linked with frontal idleness.

7. Discussion and Conclusion.

The main function of the frontal cortex seems to be the correlation and synthesis of stimuli from other parts of the brain—cortex and thalamus. It is at least one further remove from direct environmental experience than is any other part of the brain, and only has direct experience of other mental events. From a utilitarian point of view it delays reaction until comprehension of a relatively total situation (cognitive and orectic) has been encompassed. As by-products this entails a high degree of self-consciousness and a well-developed sense of personal continuity.

On the evidence of normal African behaviour, and supported by our psychiatric findings, it seems that these functions are markedly lacking in the primitive African and it is accordingly inferred that he uses his frontal lobes but little.

* * * *

There, is however, another possible inference, and which may explain certain facts more adequately. On Gestalt theory, seeing aspects of the environment as organized wholes is a function of most if not all of the cerebral cortex. Synthesis may well be a function of all areas of the cortex, and the effects of leucotomy may be largely quantitative and result from a reduction of total cortical volume.

On this theory, the slight effect of leucotomy in many Europeans and the apparently *complete* recovery of others might be most simply explained, and the peculiarities of primitive African mentality might also be seen as a failure of development or lack of function of the cortex *in general*, an approach which would accord with Vint's observation that "the cortex of the native brain was found to be narrower than that of the European."

It is to be noted, however, that this alternative theory is not flatly contradictory to the first, and its acceptance would not invalidate the general argument. Whether or not more posterior parts of the cortex also have *general* synthetic functions, it is very clear that the various posterior areas have

particular (synthetic or other) functions. Whereas the frontal cortex appears to have *no other* than general synthetic functions. So that a lack of general synthesis, such as is seen in primitive Africans, must leave the frontal lobes in *relative* idleness.

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However this may be, there is one striking exception to the general rule (of African synthetic lack), namely, that there is no lack of auditory synthesis, and it behoves one, therefore, to consider what might be the implications of this in mental development.

The primitive African, as has been seen in Part I, lives to a relatively large extent in a world of *sound*. This world, in a primitive environment consists of a limited number of items; the wind in the trees; the burble of running water and the hissing of rain; the crackling of fire; thunder; the noises of animals, and the voice and music of man. Now it is to be noted that all these sounds usually carry implications of direct importance to the hearer and are charged with emotional value. Indeed, they are all common subjects of poetic inspiration within our own culture. Even words *as spoken*, and in contra-distinction to the written word, are usually of direct importance to the hearer. Moreover, they are hardly separable from the speaker, and commonly convey emotional impressions and indications of attitudes in the latter which are in no way contained in the words themselves.

The Western European, on the other hand, lives largely in a world of *sight*. From an early age he is introduced to reading and writing, a wealth of toys (building blocks, jigsaws, etc.), ball games, and a variety of mechanical devices. Comprehension of all these items depends upon a high degree of visual awareness and leads inevitably to a well developed sense of spatial and temporal relations. This visual awareness, moreover, introduces man to a highly *irrelevant* world—a multitude of objects of which at any moment only a few are of the slightest direct interest to the observer. Even the printed word, as compared with the spoken, is impersonal and lacking in emotional value. Finally, the visual world has a quality of *continuity* quite lacking in the world of sound, and the combination of relative objectivity with a sense of inevitable continuity in space and time must deal a death blow to the world of " personal will " and pave the way for the development of a sense of the *inherent nature of cause and effect*.

At first sight it might not seem important whether mankind is introduced more insistently to the world of sight or the world of sound, but on further consideration it seems that its importance can hardly be overstressed. An understanding of the world we live in, and the development of an objective attitude and of mature responsibility depend on a well-developed sense of spatial, temporal and causal relationships and these in turn on a habit of visual, as opposed to auditory, synthesis. In whatever degree the world of " things in themselves " is real, there seems little doubt that the *visual* qualities of these " things " form the most valuable part of *our* " *behavioural* environment." It is by no accident that the word " foresight " has a visual connotation, and by no accident that vision unlike hearing is dependent on *cortical*

integrity, and it is clear that verbal and musical ability alone must fail to develop most of those faculties that make man pre-eminent, must leave him grossly dependent on aspects of the world which are of directly personal interest and emotional appeal, and must leave the frontal lobes in relative idleness.

* * * *

It has been suggested throughout this article that African thinking is conditioned by his culture, and by the limitations of this culture. Such factors can indeed explain his limitations, but it is also possible to argue that societies have the culture they deserve. There is no reason to assume that the African has a constitutional deficiency since environmental factors can entirely account for it. Nevertheless there *may* be anatomical differences. In view of various other bodily differences it would be rather surprising if the African brain were identical with the European. The field is largely unexplored and calls for expert study. Vint's studies in this field were mainly concerned with the cortex, but it would also seem most profitable to examine the optic thalamus and the long frontal association tracts. Anatomical differences might not be wholly flattering to the European. In view of the African's highly developed powers of auditory synthesis, it is, for instance, possible that his uncinate fasciculi may be relatively large, though it is surmised that his occipito-frontal tracts are small. Admittedly such differences, if found, might throw no light on the nature-nurture issue since, as Tredgold says, "The medullation of the fibres concerned in association takes place still later; and there is evidence that this, and possibly also an increase in their number and complexity, may be continued for many years of life. Thus it was shown by Kaes that a progressive increase in the number of these fibres takes place up to middle age, after which growth ceases and eventually a gradual diminution occurs. *Doubtless the amount of increase is dependent to some extent upon the stimulus afforded by education,** and it is an important factor in intellectual capacity." Nevertheless such studies might throw light on the limitations of African adult mentality and, if made on infants, might supply more fundamental information.

Finally, on the basis of the African's resemblance to a certain type of European psychopath, one is led to wonder if there is in the latter also a failure of frontal function. Since in these cases environmental factors are usually less obvious and certainly *less uniform*, it seems even more likely that anatomical studies might here be fruitful than in the case of the African.

Summary.

This article sets out to study normal mentality and mental derangement in the African, especially in regard to their peculiarities as compared with their counterparts in the Western European.

It is considered, on the evidence of leucotomy in Europeans, that all the observed African peculiarities can be explained as due to a relative idleness of his frontal lobes.

* The italics are my own.

This frontal idleness in turn can be accounted for on cultural grounds alone, but the possibility of anatomical differences, is not thereby excluded.

Finally, a plea is voiced for expert anatomical study of the African brain and, in view of his resemblance to a certain type of European psychopath, of the brains of the latter also.

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