

The present study was made in healthy infants. The possibility remains that infants with previous brain damage would exhibit a greater incidence of E.E.G. changes or an accentuation of previously existing abnormalities. One case of the present series by coincidence had a pre-existing subclinical epileptogenic focus, but the E.E.G. after the immunization did not change. A larger series of pathological cases would, of course, be necessary to allow any conclusions in this respect. For practical purposes this question is of less importance as, at least in Sweden, vaccination in these brain-damaged infants is usually not recommended, although the opposite opinion has also been expressed regarding the greater hazards for these children if they develop pertussis.

The present series is not large when related to the incidence of clinical manifestations. Ström (1960) reported a total incidence of reversible and permanent complications from the central nervous system to be 1 in 6,000; the British Medical Research Council's (1959) figure for convulsions taking place within three days was 1 in 3,500. Electroencephalography is, however, a laborious and time-consuming procedure and has to be used as a complement to the larger field studies and has necessarily to comprise smaller selected groups.

Such a group, which it seems well worth while to explore with E.E.G. examinations, consists of cases having shown more unusual general reactions, such as high prolonged fever, drowsiness, marked irritability, vomiting, and other symptoms indicating a possible central-nervous-system reaction. Eight such cases, seven of them showing prolonged fever, were examined in this material, all without any E.E.G. evidence of brain affection. In five of them an intercurrent infection was demonstrated as a probable cause of the prolonged fever.

The practical value of the negative results reported from the present investigation as an argument for continued pertussis and triple immunization in Sweden is limited. Other approaches are probably more important, such as a critical evaluation of each suspected case of encephalopathy following immunization by a neuropaediatrician. In such cases electroencephalography, to be performed as soon as possible, is of great value. In Sweden such cases have to be reported to the Royal Swedish Medical Board.

Summary

Eighty-four healthy infants were examined by means of electroencephalography before and at certain intervals after triple immunization. An additional eight cases suspected of an acute cerebral reaction following the vaccination were also investigated. None of the infants showed any significant change in the E.E.G. The variability of the E.E.G. pattern in this age-group is stressed.

Neurological complications of pertussis immunization represent rare and unpredictable immunological accidents, and there is no evidence that the brain is in any way affected by the vast majority of such injections.

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SUICIDE IN WESTERN NIGERIA*

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The study of suicide is instructive from many points of view. It is particularly illuminating in this part of the world, since there is no record of any such previous study. Tooth's (1950) study was limited to his Gold Coast Mental Hospital population, and was mainly concerned with the rarity of depressive illness in that country.

Suicide is often committed by people suffering from mental disorder, and for this reason it can be an index of mental ill-health in a community. Schizophrenia and psychoneurosis, with depressive components, and uncomplicated depression are common causes of suicide, and it is these depressive forms of mental illness that have been reported to be rare in Africans. Laubscher (1951), who made an investigation of suicide in South Africa over a two-year period, found only 14 cases in a population of 870,000—less than 1 per 100,000. Carothers (1953) also found few cases of depression in East Africa. Tooth (1950) reported the same experience from the Gold Coast. Benedict and Jacks (1954), in their review of the psychiatric literature on Africa, pointed out that the rarity of depressive illness was reflected in the extremely low suicide rates (under 1 per 100,000, as compared with rates of 10–16 in the United States and rates as high as 25 per 100,000 in Denmark).

On the other hand, Field (1960) pointed out that depression is the commonest mental illness among Akan rural women, and she explained how the erroneous idea of its rarity originated. Lambo (1956, 1960) described the misleading overlay of psychosomatic symptoms in depressive states. In his earlier paper he stated that suicide "is rare, but in association with certain religions and cults is not uncommon"; in his paper of 1960 he was more cautious.

In view of the controversial views on the prevalence of depression, this study, using suicide as a pointer, may throw further light on the subject.

The most recent work on suicide in Africa is that edited by Bohannan (1960), but this is a sociological study covering a wide geographical area. Furthermore, the only study in West Africa reported in the book was concerned with homicide and not suicide.

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Effect of Socio-economic Change

Socio-economic change has been going on in Nigeria for many years, but it gathered momentum after the second world war, and particularly since the political emancipation. The standard of living has been rising, industrialization and urbanization have been progressing, communication in its different forms is being built up, and the population has been increasing. The old family traditions and extended family groupings are being broken down. Economic and educational competition and rivalry with their accompanying frustrations and disappointments are getting more and more noticeable. The gap between richest and poorest is widening. There is a large amount of unemployment. The place of women in society is improving, and instead of being housewives and petty traders they are now competing with men in wage-earning employment. Not only the men but also the women are moving out into distant places in the region to seek employment.

This move is usually to relatives and friends. It is only after they have settled to some extent that they move into rented rooms, usually not too distant from friends and relatives. In any case, they soon establish close relationships with co-tenants, and the degree of social isolation is not as great as it might appear. To buffer whatever social isolation there may be, there are usually clan and tribal societies in the activities of which these people participate.

Classical works like those of Durkheim (1951) and Sainsbury (1955) have demonstrated the influence of social disintegration in the causation of suicide. And in view of the rapid changes and the disorganization of the social institutions which El Mahi (1959) has aptly called the spearhead of mental health, this study can only provide a rough baseline of results with which future studies can be compared. There is also a practical aspect to this study. Stengel (1950) and Stengel and Cook (1954) have pointed out that investigations of this kind not only reveal geographical areas where unhealthy social conditions prevail but may also indicate the nature of the social remedies called for.

Sources of Information and Methodology

This study is based on coroners' reports over a four-year period (1957-60) in the Western Region of Nigeria, with a population of 6½ million. It has not been possible to go further back, as early reports are scanty and incomplete. However, in considering certain factors, data available for 1954 to 1956 have been included where they are not likely to distort the general pattern. The zone covered by each coroner is roughly a grouping of contiguous administrative divisions of the region.

Since the main purpose of the coroner's inquest is to find the immediate cause of death, the information recorded will as a rule include only facts directly relevant to that purpose. From psychiatric and sociological points of view this is not satisfactory. Nevertheless, sufficient data have been extracted to make this inquiry worth while.

The population figures and other statistical data used in this inquiry were obtained from the Statistics Department of the Western Region of Nigeria. The figures given for the study period are taken from the 1952 Census, the last one available.

Since 1958 the region has been divided into six coroners' zones, which are either single or a combination

of two administrative provinces. Prior to this, there were four zones, but two of these embraced the two new zones: (1) Abeokuta zone: Abeokuta Province and Ijebu Province. (2) Akure zone: Ondo Province. (3) Benin zone: Benin Province. (4) Ibadan zone: Ibadan Province and Oyo Province. (5) Ikeja zone: Colony Province. (6) Warri zone: Delta Province.

Abeokuta, Akure, Ibadan, and Ikeja coroners' zones cover an area of mainly one ethnic group—Yorubas. Benin coroners' zone includes at least two ethnic groups. The incidence of suicide in the different ethnic groups cannot therefore be accurately calculated, but the incidence among the Yorubas on the one hand and the other ethnic groups on the other can be broadly shown, apart from the zonal distribution.

Are all cases reported? In view of the general fear of a criminal charge which may follow unreported cases, and the fact that an incident of this nature, especially when it is committed by such an obvious method as hanging, attracts much publicity, it is likely that the majority of cases are reported. All studies of this kind have this problem, and there is no indication that the degree of incompleteness of reports is unusual in this research. The fact that in a number of cases it took people more than a day and a lot of trouble to get to the police supports this view.

Incidence

It can be seen from Table I that the highest number of suicides in one year is 55 and the lowest 38, with an average of 46.5 for the whole region; this is less than 1 in 100,000, and lower than the lowest figure recorded

TABLE I.—*Incidence of Suicide (Per 100,000, With Actual Number of Cases in Parentheses)*

Year	Benin	Warri	Abeokuta	Akure	Ibadan	Ikeja	Total
1957	0.7 (7)	1.7 (7)	0.9 (10)	0.4 (5)	0.3 (10)	0.2 (1)	0.4 (40)
1958	0.7 (8)	2.2 (15)	1.4 (16)	0.7 (8)	0.1 (4)	0.4 (2)	0.7 (53)
1959	0.8 (9)	2.3 (16)	0.7 (8)	1.2 (13)	0.2 (7)	0.4 (2)	0.7 (55)
1960	0.9 (10)	0.7 (6)	0.3 (4)	0.8 (9)	0.2 (6)	0.6 (3)	0.5 (38)
Average	0.7 (8.5)	1.7 (11)	0.8 (9.5)	0.7 (8.8)	0.2 (6.8)	0.2 (2)	0.6 (46.5)

anywhere in the world—that of Eire (2.0 in 1954). Admittedly this study covers only a period of four years, but even if we allow for a wide margin of error it still gives us one of the lowest figures recorded.

If we consider suicide rate per coroner's zone, we find that the rate is far higher for Warri and lower for Ibadan than the overall figure. These two extremes, belonging to the non-Yoruba (Warri) and Yoruba (Ibadan) ethnic groups respectively, have tilted the balance too heavily to allow of the conclusion that the suicide rate is higher among the non-Yorubas; it will be of interest to examine these two zones more closely.

Sex Distribution

Since sex distribution in the general population both at zonal and at regional levels is even, it has not been thought necessary to work out the rate per 100,000 of each sex. The sex ratio is therefore based on the raw figures. Table II shows that there are far more males than females involved in suicide. At the regional level, for every one female that commits suicide 3.6 males do so. This ratio is similar to the average world ratio, which is 3 to 1—varying from more than 4 to 1 in Norway to less than 2 to 1 in Japan.

The range is far wider at the zonal level, that of Abeokuta and Benin being over 5 to 1 and Warri a little more than 2 to 1. The number of suicides is very low in Ikeja, where no females committed suicide. But this zone has the smallest population and has the

TABLE II.—Sex Distribution (Actual Number of Suicides)

Year	Benin		Warri		Abeokuta		Akure		Ibadan		Ikeja		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1957	7	0	4	3	10	0	2	3	8	2	1	0	32	8
1958	7	1	8	7	15	1	7	1	3	1	2	0	42	11
1959	7	2	12	4	3	5	10	3	5	2	2	0	39	16
1960	8	2	6	0	4	0	6	3	6	0	3	0	33	5
Av.	7.3	1.3	7.5	3.5	8	1.5	6.3	2.5	5.5	1.3	2	0	36.5	10

peculiarity of having more than twice the number of males than of females. The Yoruba sex ratio is a little over 4 to 1, and that of the non-Yoruba group 3 to 1.

Age Distribution

Registration of births has not been a strict practice in this country, and consequently ages are guessed at rather than known definitely. For this reason the margin of error will be less if a very broad age-grouping is used. Only two groups have been distinguished—for example, 15 to 49 and from 50 upwards. The age-group 0 to 15 has been left out as there is no suicide record for it.

TABLE III.—Distribution by Age-groups (Incidence of Suicide per 100,000)

Year	Benin		Warri		Abeokuta		Akure		Ibadan		Ikeja		Total	
	-49	50+	-49	50+	-49	50+	-49	50+	-49	50+	-49	50+	-49	50+
1957	1.3	1.5	2.3	—	1.6	2.1	0.8	1.3	0.8	0.5	0.7	—	1.1	0.9
1958	1.3	2.9	3.5	7.1	2.3	4.0	1.2	2.6	0.3	0.4	1.4	—	1.3	2.4
1959	1.5	2.8	4.7	1.7	1.3	1.0	2.4	1.3	0.6	—	0.7	5.3	1.6	1.1
1960	1.5	4.1	1.2	3.4	0.7	—	1.7	1.3	0.5	—	2.0	—	1.1	1.1
Av.	1.4	2.8	2.9	3.1	1.5	1.7	1.5	1.6	0.6	0.2	1.2	1.3	1.2	1.4

Table III shows the suicide rates per 100,000 of each age-group. The numerical relationship between the two groups is the same for the whole region. Only the zones of Benin and Ibadan depart from this pattern. The rate was higher in the older age-group (50+) in Benin and in the lower age-group in Ibadan. The other zones show no significant differences between the age-groups; neither do the ethnic groups Yoruba and non-Yoruba.

These observations do not conform with those reported by Read (1936), Gruhle (1940, 1941), and others, who found the highest rate in old age. The study by McGeorge (1942) of 523 potential suicides in Australia, however, showed that 70% of the cases belonged to the age-group 20 to 50.

This difference cannot be explained in terms of shorter expectation of life. It is more likely due to the fact that old age still commands great respect, and the extended family grouping provides support—emotional and physical—for the old. It appears, therefore, that the two age-groups are exposed to the same amount of suicide-producing factors, which may be of different quality.

Social Isolation

Indicators of social isolation are: "residence outside native place"; "living outside the family circle"; and "living alone." The degree to which these items can be regarded as indicative of social isolation has to be

considered from the following points of view. When a person moves away from his home town he very soon gets to know other people from his native place with whom he develops such close relationship that he describes these new-found people as "brothers" and "sisters." Apart from this individual contact, very often he is introduced to clubs, membership of which is based purely on geographic origin.

Thanks to the generosity and hospitality of Africans, a stranger is fairly readily accepted and absorbed into a new community, especially if he speaks the same language. On the whole he may not be as isolated as one may imagine. What makes a person move from his environment to another is a different matter, but this cannot be ascertained from such a retrospective study as this. In this connexion one has to bear in mind Ødegard's (1932) study on immigrants.

Again, living alone in Nigeria does not necessarily imply the same degree and quality of isolation as living alone in temperate countries. The design of houses, the climatic conditions, and the pattern of life do not favour social isolation. There are no boarding-houses. Doors and windows of houses are kept wide open. Living is more an outdoor than an indoor affair.

It is not surprising, therefore, that Table IV shows a higher overall suicide rate among those resident in their native places than among those who have moved out

TABLE IV.—Percentage of Those Who Committed Suicide Who Lived in Native Place, in Isolation, or with Family

Year	Living in Native Place			Living Alone			Living with Family		
	Yes	No	N.A.	Yes	No	N.A.	Yes	No	N.A.
1957	72.5	17.5	10.0	2.5	80.0	17.5	72.5	10.0	17.5
1958	71.5	17.0	10.7	13.2	71.7	15.1	62.3	17.0	20.7
1959	65.5	23.8	10.7	5.4	76.4	18.2	61.8	14.5	23.6
1960	73.7	15.8	10.5	12.8	66.7	20.5	61.2	21.2	17.6
Av.	70.4	18.9	10.7	8.6	73.7	17.7	63.9	15.7	20.4

N.A. = No answer.

(70.4% and 18.9% respectively); a higher incidence of suicide among those not living alone than among those living alone (73.7% and 8.6%); and a higher proportion of suicides among those living with their families than among those living elsewhere (63.9% and 15.7%). Even though there are few individual zonal variations from this pattern, it is quite obvious that the factor of social isolation does not seem to play the same aetiological part in Western Nigeria as Sainsbury (1955) found in his London study. We have to look in another direction for aetiological factors.

Religious Distribution

Before considering this factor it is necessary to point out that, apart from a very few adherents of the two main religious groups—Moslems and Christians—affiliation to either does not stop most people from practising pagan or idolatrous rituals. It is not very rare to have an individual professing Islam and Christianity to suit the occasion. In times of stress some people professing one of the formal religions also resort to consultation of oracles, etc.

Christianity is represented by many sects—Catholic, Methodist, Anglican, Baptist, Seventh Day Adventists, Cherubim and Seraphim, etc.—and not a few of these have a very large following—but it has not been possible to split the category of Christians into the different sects.

In the court of law they all take their oath on the Bible, and the court is usually satisfied so long as the person describes himself as a Christian.

Table V shows that the suicide rate among Christians (0.9 per 100,000 Christians) and "others" (0.7 per 100,000)—a group largely made up of animists or so-called pagans—is slightly higher than among Moslems (0.3 per 100,000) in the region.

TABLE V.—*Religious Groups. Proportion per 100,000 of Each Group*

	Religion	1957	1958	1959	1960	Average
Benin	Christian	1.6	—	1.6	2.7	1.5
	Moslem	—	1.4	—	—	0.3
	Others	0.3	1.0	0.7	0.4	0.6
Warri	Christian	2.9	3.6	4.1	0.7	2.8
	Moslem	—	—	—	—	—
	Others	0.6	1.9	1.9	0.9	1.3
Abeokuta	Christian	0.8	3.3	1.0	0.2	1.3
	Moslem	1.0	0.6	0.4	0.6	0.6
	Others	1.1	—	1.0	—	0.5
Akure	Christian	0.7	1.0	1.2	0.9	1.0
	Moslem	—	—	0.8	0.8	0.4
	Others	—	0.4	1.3	0.4	0.5
Ibadan	Christian	0.9	0.1	0.1	0.2	0.6
	Moslem	0.2	0.1	0.2	0.1	0.1
	Others	0.2	0.6	0.6	0.4	0.4
Ikeja	Christian	—	2.3	1.1	—	0.8
	Moslem	—	—	—	1.3	0.3
	Others	3.2	—	3.0	3.0	2.3
Total	Christian	1.0	1.1	1.0	0.6	0.9
	Moslem	0.3	0.3	0.3	0.3	0.3
	Others	0.4	0.9	1.1	0.6	0.7

While the reasons for such a distribution cannot be definitely ascertained from our data, it is possible to point out some likely factors. Christianity deviates more widely from indigenous animism than does Islam. Not only was Christianity propagated mostly by non-Africans in the region but the method of proselytization was also different. Islam infiltrated by spreading within groups rather than by active evangelization typical of the spread of Christianity. Also, the Christian philosophy is more alien to indigenous customs than that of Islam, which, apart from the mandatory daily prayers, demands fewer changes in the people's customary traditions than does Christianity, with its Trinity, sacraments, monogamy, taboo on amulets, etc. All of this means that there is more status-striving, as well as guilt-feeling and other stresses, associated with the Christian faith than with Islam. This could explain the higher suicide incidence among Christians compared with Moslems. But what of the almost equally higher incidence among pagans?

An entirely different set of factors may be operative in the case of pagan suicides. Ikeja, where only 1% of the population are pagan, yields the highest pagan suicides (2.3 per 100,000). One would expect this for a minority group. However, 72% of the people in Warri zone are pagan ("other"), whereas its pagan suicide rate (1.3 per 100,000) ranks next after Ikeja. Benin, with a similar (69%) pagan population, has only 0.6 pagan suicides per 100,000—about the same as for other zones. In fact, pagans form the minority group in the other zones with the exception of Akure, where Christians (67%) are in the majority and Moslems (11%) in the minority. The high incidence of suicides in Warri alone cannot be explained by the available data.

The reason for the high suicide rate among pagans may be connected with the fact that their practice does not involve deep interpersonal emotional relationships

as does formal religion. Even though they may have many festivals in a year, there seem to be no continuous emotional ties among the members. Furthermore, while Christianity and Islam expressly forbid suicide, there is no indication that this is so among the pagans. It is significant that the early Yoruba kings, who were mostly pagans, were obliged to commit suicide if there was an indication that they had fallen into disfavour.

Civil Status

This factor cannot be defined in terms applicable in a monogamous society with only one or two ways of contracting marriage. Even though there are traditional patterns of marriage, the irregular system tends to be accepted in time, socially at least, especially if there are children from the union. Furthermore, marriage by traditional custom is just as easily broken as it is contracted. It has also been suggested that because of the rather low position of women in some areas of social activities the idea of marriage does not necessarily imply partnership.

Very few remain separated or divorced for long. In any case, in a polygamous setting a man may still have other wives when he is separated or divorced. On the other hand the woman who is separated or divorced is likely to remain unattached.

Table VI shows that suicides reported as married represent a greater percentage than any of the other

TABLE VI.—*Marital Status (Percentage of Total Incidence)*

Civil Status	Benin	Warri	Abeokuta	Akure	Ibadan	Ikeja	Tota
Married	50.0	43.2	52.6	60.0	51.8	62.5	51.1
Single. Mistress	11.8	20.5	13.2	22.9	—	47.5	14.5
Separated. Widowed.	—	—	—	—	—	—	—
Divorced	8.5	2.2	—	—	—	—	2.2
Unknown	29.7	34.1	34.2	17.1	48.2	—	32.2

states. In the "unknown" groups the percentages are rather large, but even so do not appear to upset the pattern no matter how they are distributed. This is the only inference that can be drawn, as no data are available concerning the distribution of civil status in the Western Region population.

Durkheim (1951) believed that marriage had a protective influence against suicide, and this view was supported by Wicksell (1934) and Dahlberg (1944) for Sweden, as well as by Yap for Hong Kong. It does not seem to be true for Western Nigeria, and this may be due to the different attitude to and the general effect of marriage: in Sainsbury's (1955) samples of suicides in London the married as a whole had a higher suicide rate than the single.

Occupational Distribution

The occupational distribution of the whole population is available, and the figures given in Table VII represent the actual number and the incidence per 100,000 of each occupational group. It can be seen that the category "other occupations," with 4.4 (male), shows a higher suicide rate for either sex than any other occupational group. "Administration, professional, and technical" ranks about the same with "trading and clerical" as well as "crafts" at about 1.0.

Farming in this country is minimally mechanized, if at all, and apart from some cocoa farms most holdings are small. Furthermore, the occupation is much less

precarious in terms of weather conditions compared with some temperate countries. Trading is mostly retail on a small-to-medium scale, and the crafts are not as demanding as in highly technical industries.

TABLE VII.—Occupational Groups—Regional Totals (Incidence per 100,000 of Each Occupational Group with Actual Number in Parentheses)

Occupation	1957	1958	1959	1960	Average
<i>Males</i>					
Agriculture and fishing	1.7 (20)	1.9 (22)	1.0 (11)	1.0 (12)	1.4 (16)
Crafts	— (0)	0.8 (1)	0.8 (1)	1.7 (2)	0.8 (1)
Trading and clerical	— (0)	2.1 (3)	0.8 (1)	2.1 (3)	1.0 (1.5)
Admin., prof., tech.	1.8 (1)	3.7 (2)	7.4 (4)	3.7 (2)	4.2 (2.3)
Other occupations	2.4 (3)	1.6 (2)	9.6 (12)	4.0 (5)	4.4 (5.5)
All others	0.6 (8)	0.9 (13)	0.7 (10)	0.6 (8)	0.7 (9.8)
<i>Females</i>					
Agriculture and fishing	0.08 (1)	0.08 (1)	0.25 (3)	0.08 (1)	0.13 (1.5)
Trading and clerical	— (0)	0.33 (1)	0.67 (2)	0.33 (1)	0.33 (1)
All others	1.4 (7)	1.7 (8)	2.3 (11)	0.6 (3)	1.5 (7.3)

However, the suicide rate among males in agriculture and fishing groups (1.4) is sufficiently higher than for crafts (0.8) and trading and clerical (1.0) to deserve special attention. One would have expected the reverse according to the literature (Gruble, 1940 ; Yap, 1958).

Urban and Rural Distribution

Unfortunately the data for this factor in the general population are not known, and consequently the comparative incidence of suicides in urban and rural communities cannot be worked out. But, taking a comprehensive list of towns based on minimum population of 30,000 from *Investment in Nigeria* (U.S. Department of Commerce, 1957), which is much shorter than the list of towns used in this study, the proportion of people living in towns is estimated conservatively at about one-third of the total population. It can be seen from Table VIII that 134 cases occurred in rural and 52 in urban areas. It is obvious that the rural group accounts for more than its share of suicides

TABLE VIII.—Urban-Rural Distribution (Actual Number of Cases)

	Benin	Warri	Abeokuta	Akure	Abadan	Ikeja	Total
Rural	37	27	26	26	16	2	134
Urban	7	7	12	9	11	6	52

This is a very striking finding, as it is contrary to the observations made in temperate countries (Cavan, 1928 ; Faris, 1948 ; Durkheim, 1951 ; Sainsbury, 1955) and in Hong Kong (Yap, 1958).

Type of Suicide

The figures here include all available material for 1954 to 1960. Table IX shows that hanging is the commonest mode of suicide ; it accounts for about

TABLE IX.—Types of Suicide (Actual Number of Cases)

Types of Suicide	Benin		Warri		Abeokuta		Akure		Ibadan		Ikeja		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Hanging	22	5	24	11	18	2	13	8	7	0	2	0	86	26
Shooting	17	0	4	0	12	0	5	0	11	0	0	0	49	0
Poison	0	1	4	1	2	3	2	2	1	2	1	0	10	9
Cut throat	0	0	0	0	4	0	1	0	1	1	1	0	7	1
" stomach	0	0	0	0	1	0	1	0	1	0	0	0	3	0
Stabbed	1	0	0	0	3	0	0	0	2	0	0	0	6	0
Strangulation	0	0	0	0	0	0	1	0	0	1	0	0	1	1
Drowning	2	2	3	3	2	0	1	0	0	0	4	0	12	5
Starvation	0	0	1	0	0	0	0	0	0	0	0	0	1	0
Jumped	2	0	0	0	0	0	0	0	0	0	0	0	2	0
Unknown	1	0	0	0	0	0	0	0	1	0	0	0	2	0

50% of the total. It is significant that this form of suicide occurs in Yoruba mythology, when Sango, the god of thunder and lightning, hanged himself in despair (Abraham, 1958). This is not necessarily suggestive of a specific cultural factor, as hanging also tops the list in other areas—for example, Sainsbury (1955) in London and Yap (1958) in Hong Kong. Of the 179 male suicides 47% (86) committed the act by hanging, as did 62% (26) of the 42 female suicides. This is an unusual finding when compared with those of other workers, but when other " active " and " violent " methods like shooting, stabbing, cut throat are included the percentage of men using these is higher than the percentage of women, which is in accord with the findings of other workers.

Poisoning, on the other hand, was commoner among women (21%) than among men (5.5%). It is worthy of note that all the poisons taken were imported chemicals like disinfectants, acids, and agricultural sprays. That no female shot herself has some cultural explanation, since women in this region do not hunt and hardly ever handle guns.

In the region as a whole, hanging, shooting, poisoning, and drowning headed the list in that order. On a zonal level the lists of methods were not significantly different.

Apparent Precipitating Factors

Only the facts that came to light during the inquests were available. They can hardly represent the whole picture. In any case, some of the factors are so intertwined and interdependent that it may be misleading to stress any of them. This applies particularly to the social and psychological factors.

Even in cases of definite psychoses the role of social factors cannot be ignored. On the other hand, in some cases self-inflicted social adversities have their origin in the abnormal personalities of the individuals, although they may not have been psychotic.

The data in Table X include all recorded cases from 1954 to 1960. The verdicts gave many reasons for suicide, but only the important and more common reasons are presented here. In a certain number no reasons were given. Of the total of 221 cases there was evidence of psychosis in 54. This proportion can be

TABLE X.—Precipitating Factors (Actual Number of Cases)

	Benin	Warri	Abeokuta	Akure	Ibadan	Ikeja	Total
Psychoses	14	15	11	8	4	2	54
Debt	2	1	0	1	1	1	6
Chronic illness	6	3	6	2	2	1	20
No children	1	0	0	1	0	0	2
Low libido*	3	1	3	1	0	0	8
Separation quarrel†	3	4	2	2	2	1	14
Death of kin†	1	2	0	2	1	0	6

* Includes impotence. † Interpersonal.

compared with Gruhle's 10-20% of mental illness, Yap's 20% insanity, and Sainsbury's 37% mental disorders. Next in order is physical illness, which includes tuberculosis, leprosy, deafness, and other chronic illnesses. But also in this category are symptoms such as abdominal pains, pains all over the body, etc., which may well be of neurotic origin. This constitutes 9% of the total, as compared with Sainsbury's 18%. Interpersonal conflicts, such as quarrels, litigation, divorce, and separation, account for 6%. In a small number the reasons given were childlessness, impotence, bereavement, and debts.

Seasonal Occurrence

The seasonal findings (Table XI) are at variance with the findings of Yap (1958) in Hong Kong and of workers in temperate countries (Dublin and Bunzel (1933), U.S.; Dahlgren (1945), Sweden; Sainsbury (1955), London;

TABLE XI.—*Monthly Distribution (Actual Number of Cases)*

	J.	F.	M.	A.	M.	J.	J.	A.	S.	O.	N.	D.
Benin ..	0	4	5	4	1	7	2	1	3	4	1	1
Warri ..	2	4	4	3	4	2	4	12	4	0	2	3
Abeokuta ..	4	3	5	3	0	3	2	2	4	2	3	4
Akure ..	3	4	2	4	2	0	2	5	3	4	2	5
Ibadan ..	3	2	1	2	3	1	2	1	3	1	2	6
Ikeja ..	0	0	1	0	1	1	1	0	2	1	1	0
Total ..	12	17	18	16	11	14	13	21	19	12	11	19

The exact month of suicide was not known in three cases.

McGeorge (1942, Australia), who found the peak to be in spring and early summer. This is perhaps not surprising, as the climate here is not divided into the four seasons of temperate zones, but into two seasons—wet and dry—and the temperature is not much different between the two. Yap remarked that even though Hong Kong lies just within the tropics there is a distinct seasonal change, with a moderately cold winter.

It seems that in Western Nigeria the suicide rate is lower during the peak of the two rainy seasons—the major rains of May to July and the late rains of October and November.

Conclusions

It has been found that the suicide rate in Western Nigeria is very low. If it be true that suicide reflects the incidence of depressive illness and of other forms of psychiatric disturbance with depressive components, then we have to agree with investigators who state that depression is rare in Africa, provided that depressive illness in this country does not manifest itself by feelings of guilt, unworthiness, and self-reproach, with the consequent tendency to self-destruction. That this is more likely the case is supported by my own clinical experience and the findings of the Cornell-Aro Research Project, not yet published.

On the other hand, depressive illness is not always disturbing to other persons; if a depressed patient commits suicide he may not be described as having shown signs of mental illness. Therefore the percentage of suicides with psychosis as the apparent underlying cause is likely to appear lower than it is. This may also apply to studies done elsewhere.

In temperate countries depressive illness and suicide are at their peak in late spring and early summer. In Western Nigeria the incidence of suicide has been found to be at its lowest during May to July. The cycle

of suicide may well follow a different pattern in this region.

The finding that the incidence of suicide is higher in rural areas recalls Henderson and Gillespie's (1956) observation that involuntal depression is commoner in rural than in urban parts of Scotland, but the age incidence of suicide in the present study is the same for under 50 as for over 50. The higher incidence in rural areas cannot therefore be related to involuntal depression.

Some of the social factors studied in this research do not seem to play the same part in the suicide rate as elsewhere. The most striking feature is the low suicide rate found in connexion with social isolation. This difference may be explained in terms of cultural factors. It was not possible to measure the degree of social disorganization in the region, but the political and economic developments there are bound to create a considerable amount of social disorganization, which elsewhere has been found to have a high correlation with suicide.

Low density of population and rural occupation have been regarded as favouring a low suicide rate, but they do not seem to have this effect in Western Nigeria. Maybe there are other factors, still unknown, which upset the correlation to be expected. Possibly the changes occurring in the region are more disturbing to rural than to urban communities: the elders are beginning to lose their grip on the young and the young are becoming dissatisfied with the old; and traditional ways of life and extended family grouping, which are stronger and deeper in the rural areas, have been breaking up.

The high rate of suicide in Warri could not be explained. This and other problems mentioned above suggest areas for future research. This would be greatly aided by the co-operation of the coroners, especially if full details of every case that came before them were recorded.

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AN ABNORMAL CHROMOSOME IN CHRONIC LYMPHOCYTIC LEUKAEMIA*

BY

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The somatic chromosomes of patients with chronic lymphocytic leukaemia have hitherto not been extensively studied, and there are no published accounts of any consistent abnormalities in this disease. This contrasts with the chronic granulocytic variety in which a characteristic defect of one of the small acrocentrics,

In this investigation all the chromosomes examined were derived from blood cultures made by the method of Moorhead *et al.* (1960). Direct bone-marrow preparations were also studied, but because of the paucity of mitoses in marrows heavily infiltrated with lymphocytes these were unsatisfactory.

The C. Family

The pedigree of this family is shown in Fig. 1. No. 1, the father, died in 1926 from "sarcoma of the mediastinum," but no records survive of his illness, other than the death certificate, and a necropsy was not performed. The mother, No. 2, died in 1943 from a cerebrovascular accident. The propositus, No. 4, aged 67, was found to have chronic lymphocytic leukaemia in February, 1962. Cultures of her blood were made before the institution of her treatment. Her brother, No. 6, aged 64, had been known to have chronic lymphocytic leukaemia since 1954 and had been treated first with splenic x-irradiation and subsequently with chlorambucil ("leukeran"). His blood was cultured in 1962. One sister, No. 5, died in Australia, aged 50, from carcinoma of the uterus; she was said to have had pernicious anaemia. The other siblings are alive and well, but one, No. 7, now aged 60, is mentally defective, and another, No. 3, has recently had severe trigeminal herpes zoster. All members of the next two generations are healthy.

The Chromosome Abnormality

Cultures were prepared from the blood of Nos. 3, 4, 6, 7, 8, 9, 15, and 16. The modal chromosome number in all cases was 46. The abnormal chromosome, Ch¹, was present in the two patients with leukaemia, and in Nos. 3, 7, and 15 (Fig. 1). In the positive cases it was found in nearly all cells which could be clearly analysed; it was doubtfully present in a few cells, but definitely absent in none. We conclude that its true incidence was 100%.

The chromosome is shown in Figs. 2 and 3. It was one of the four small acrocentrics, and the abnormality consisted in the complete or almost complete loss of the short arm, with apparent preservation of the centromere and long arm. The effect was to give the chromosome the appearance of a horseshoe or, in slightly contracted specimens, of a dumb-bell. In still more contracted figures the two arms became oval knobs lying either side by side or sometimes at 180 degrees to each other.

The Ch¹ chromosome was not found in nine other patients with chronic lymphocytic leukaemia whose blood was cultured. This abnormality, or a closely related one, was, however, present in the cells cultured from the blood of another patient with chronic lymphocytic leukaemia whose brother had died in January, 1962, from the same disease. The defective acrocentric chromosomes in this case showed a small remnant of the short arm, whereas no such remnant could be seen in those of the members of the C. family.

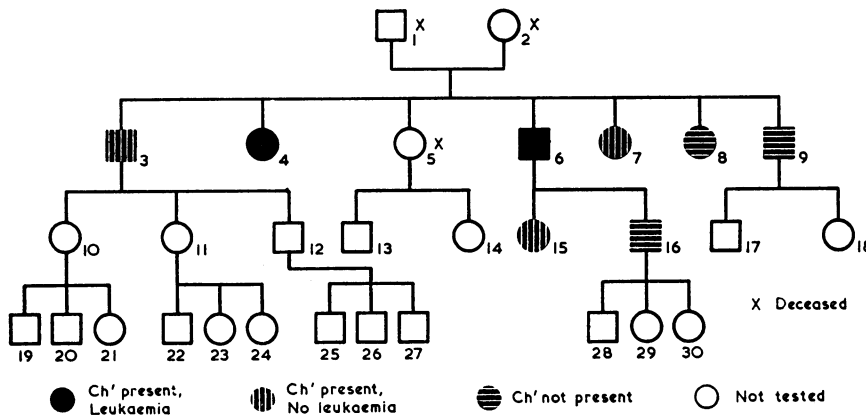


FIG. 1.—Pedigree of the C. family.

the so-called Ph¹, has been found in most if not all cases (Baikie *et al.*, 1960; Nowell and Hungerford, 1960, 1961; Tough *et al.*, 1961). We now report the discovery of a new chromosome abnormality differing from the Ph¹ but also affecting a small acrocentric, probably No. 21 in the Denver classification (*Lancet*, 1960). This occurred in a family in which two of the members have chronic lymphocytic leukaemia. In addition, we have found a similar abnormality in another individual with chronic lymphocytic leukaemia whose brother had died of the same disease. In accordance with the convention adopted at the Denver meeting, we propose the term Ch¹ for the abnormal chromosome.

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