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THE ORDEAL POISONS OF MADAGASCAR AND AFRICA

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INTRODUCTION

THE conception and employment of various ordeals for the determination of guilt or innocence are not restricted to the history of the more primitive present-day cultures, for they were well known to the societies of our European ancestors. The former practice of witch-dunking in England and Colonial America is still remembered as an evolutionary product of medieval witch trials. Under the same general principle falls Medieval Europe's ordeal of the bier, in which a murderer's guilt was said to have been established when his proximity to the victim's body caused its wounds to bleed again.

Although the above customs are physically different from ordeals by plant poisons, they serve as a link between modern cultures and those of the primitive Africans, affording aid in understanding how and why these practices were able to maintain such a powerful influence over the lives and thoughts of the people. Both types of trial were governed by the underlying belief in the presence of a spirit who would distinguish, regardless of circumstances, between the guilty and the innocent.

Ancient Europe's position in relation to this problem is easily sketched. Although occult evil existed in the

form of witchcraft and sorcery, the people held a simple but profound belief in the God of their church, and possessed a strong faith in His ability and promptness to dispel all things contrary to His will.

In direct contrast to this security was the situation of the African jungle-dweller, whose life was ruled by myriad ceremonies, actions, and reactions, all revolving about an equally large number of extra-sensory beings who controlled every facet of his life. Both good and evil, these beings continually required courting or placation in order that the good spirits might make or keep his lot bearable, and that the bad might be prevented from exerting their evil influence. There seems to have been a concept that the good could prevail over the bad, but to accomplish this end, the native had constantly to pit the two factions, as it were, against each other, never allowing the good to be neglected, nor the bad encouraged. Under these circumstances of constant insecurity and tension, it is possible to see how easily the uneducated and superstitious native could adopt the handiest means for discovering the causes of any unfortunate incident.

In several instances, there exist legendary explanations of the beginning of the ordeal. One such is found in the folk-lore of the Kamanga people of the upper Lake Nyassa district. (Young, 1931)

> Long, long ago God told mankind that there were many troubles in the world. He said 'You have chiefs and leaders, freemen and serfs; the fools, the cunning, and those without protectors; *wasanda*. Among you all there are those who are puffed up because of their position; there are deceivers as well as troublers of other sorts?' And God gave us this tree saying, 'If your fellows for any reason do you ill, take this tree as the support of your case; *kujivikirira;* and if the man has truly done evil, he will die.' It was thus that *muavi* came among us.

However, although history and folklore are both relatively silent as to the physical means by which the custom

of ordeals by poison became established and organized in the cultures of the ancient Africans, several hypotheses may be extended as possible explanations.

Assuming that a belief in witchcraft was far older than the natives' knowledge of poisons, it seems possible that, at certain times, the imprecations cast by witch doctors with the purpose of apprehending criminals coincided with deaths resulting from the mishandling of little-known poisons. Over a period of time, a sufficient number of incidents of this sort may have occurred enabling a relationship between the imprecations and the deaths to be noticed. This theory, of course, rests completely upon the possible alacrity of the natives in noticing these events and establishing a directional meaning for them. As tenuous as this may seem, both a faith and a practice in this type of judicial procedure could easily have sprung from the natives' constant search for security among things beyond their comprehension. Concerning the many ramifications of method which evolved, it may only be suggested that experimentation and coincidental success were the dominating factors.

A second hypothesis of development is suggested by the fact that, in view of his complicated religious outlook, the native had no way of knowing in what form or manner some manifestation of witchcraft might strike. It is possible that a group of food-seeking natives mistakenly gathered a heretofore undiscovered poisonous plant instead of one of their standard fare. After ingestion, varying internal factors caused some natives to die and others to live. Circumstances may have led to the feeling that those who died had had some connection, conscious or otherwise, with witchcraft. It is certainly a form of primitive logic to attribute inexplicable occurrences to the influence of supernatural beings. However, such suggestions only illustrate, in some measure, how

the natives may have interpreted certain phenomena, for no means exist by which their worth may be confirmed or rejected.

Once trial by ordeal became established, it experienced an extremely widespread and devoted adoption by a large number of African tribes. Insecurity was undoubtedly a major factor in its success since most of the natives were so awed by the thought of evil spirits that they dared not retaliate for any wrong done to them by a fellow human being. Personal discussion between the offended and the offender was impossible. Fleeing to another village would mean social condemnation and a miserable life. And taking the problem to the head men of the village would result only in the awarding of the case to the defendant who could pay the larger amount. Hence, the native considered the ordeal a valuable means of security, for it afforded definite protection against false accusations and other troublesome situations. It clarified each atmosphere of suspicion and hostility. Moreover, in many tribes there was no personal stigma attached to the loser or his family, since the natives believed that one could be unconsciously controlled by demons.

The applications of the ordeal covered any and all personal and social crimes, but its widest use was in cases of suspected witchcraft. This is understandable when it is remembered how completely life was ruled by extrasensory beings. Every social malady, be it an epidemic, a natural death, bad hunting, or any everyday discomfort, was ascribed to the action of demons. This concept remained abstract in some tribes, notably those of East Africa, but in others it was believed that some member was either consciously or unconsciously responsible for every unfortunate occurrence. It was in this latter type of culture that the ordeal achieved its greatest and most pervading influence. For the only possible way to resist

the efforts of demons was to fight them with a stronger charm, the spirit in the ordeal poison.

The following discussion of the various poisons will be organized according to the locale in which each was used. While there is a certain overlapping between these locations and the geographical distribution of the pertinent plants, this system results in far less confusion than would a classification based either on the families to which the plants belong or on the tribes which used them.

The families which supplied the bulk of the ordeal poisons are the *Loganiaceae*, *Apocynaceae*, *Leguminosae*, and *Solanaceae*. Representatives of the *Leguminosae* and the *Apocynaceae* are found throughout the continent and in Madagascar; the *Solanaceae* are generally distributed in Africa and species of the *Loganiaceae* occur in both East and West Africa. In addition to these, there are a number of families each of which supplied one or more species to the collection of poisonous ordeal plants. Several representatives of this category are the *Combretaceae*, *Sapotaceae*, *Euphorbiaceae*, *Polygalaceae*, and *Asclepiadaceae*.

A classification based on the plants used by individual tribes is not feasible because the majority of early anthropological writings refer only to the local name for a particular poison. This has resulted in an ambiguity of both the nature of the individual poisons and the names which were used in reference to the ordeal in general.

It might also be added that, in many cases, exact information concerning the preparation of the poison and the identity of the particular plant is incomplete, for the native medicine men guarded jealously the secrets of their trade. It was only after much effort on the part of investigators that the small amount now known was discovered.

The methods of employing these poisons in the ordeal

varied considerably from area to area, but the basic procedures for most were similar. A suspect was given some of the poison to eat or drink, depending upon its form; if his stomach rejected it and he vomited, he was usually deemed innocent; conversely, if he retained the poison he was considered guilty, and was either allowed to die from its effects or was disposed of, according to his crime, in a variety of other fashions.

Madagascar

Due to its small size and isolated location, Madagascar is one of the few areas for which there exists a progressive recorded history of ordeals by plant poison.

Native folklore, as would be expected, considered the sorcerers and evil magicians the plague of society. They were responsible for all ills. Flacourt, in the 17th century, was one of the first investigators to write about the natives' methods of apprehending these evil beings. His descriptions, however, are of little value, for he mentions the genus or species of few plants, and seems to have missed the significance of their use in opposition to witchcraft. It remained for Virez to state the essence of the custom in the following excerpt from one of his writings: (Virez, 1822)

> Les Madécasses, comme tous les peuples barbares, croient beaucoup à la sorcellerie: ils s'imaginent qu'on ne peut pas perdre de bestiaux ou essuyer d'autres melheurs sans que des sorciers jaloux en soient cause. De là resulte un grand nombre d'imputations contre des individus dont on se croit victime, et de violents querelles pour lesquelles on invoque l'autorité des arbitres ou des juges.

Thus, the action of poisons, which were incomprehensible to the people, came to be employed in the judging of equally inexplicable problems, the constantly recurring unfortunate incidents of life.

The use of these poisons continued without interrup-

tion until the early part of the 19th century, when some of the more civilized leaders of the people became horrified at the spectacle of the mass ordeals. An early attempt at regulating was made in 1828, but the first sign of response came in the 1840's when dogs or chickens were occasionally substituted for human participants. This substitution, however, was employed only in the judging of minor offenses, with the loser falling subject to a fine. Direct usage of humans was still practiced in the greater crimes, the most serious of which was suspicion of witchcraft.

The situation continued as such until 1865, when the practice of ordeal by poison was officially condemned and prohibited throughout the island. The immediate effect of this edict was to curtail the practice in the environs of large population centers which had adequate governmental supervision. Outside these areas, however, the practice continued to flourish, and began to lose popularity only in the latter years of the 19th century, when the combined efforts of officials and missionaries effectively reduced its incidence. Several occurrences in 1911 showed that it still had a small, clandestine following, but the practice is believed to have been entirely effaced by 1920.

Tanghinia venenifera Poir

The most common and widely used poison was the so-called "Tanghin of Madagascar." This plant is a member of the *Apocynaceae;* it has been known by various generic and specific names. Among these are *Cerbera venenifera* Steud. and *Cerbera Tanghin* Hook. It was known in the vernacular as *tangin, tangena,* the tangena nut, and *manréchetsé.*

According to Lasnet and Boyé (1911), the plant is a large tree, ten to twelve meters high, which grows mainly

in the forests of the eastern coast. All parts contain poison to a greater or lesser degree, but the nuts or kernels are most toxic. This toxicity results from the presence of a cardiac glycoside, tanghinin ($C_{27}H_{40}O_8$), whose physiological properties resemble those of strophanthin and ouabain. Its action produces dyspnea, restlessness, and vomiting, followed by slackening of the heartbeat and the abolition of voluntary movements. Convulsions and exaggeration of the reflexes precede death, which is caused by the halting of respiration.

Tanghin was employed in the judgement of all crimes, including those of conspiracy, poisoning, and stealing, but its main use was in the apprehending of those believed to be in league with, or controlled by, sorcery. Since there existed, as in many societies, a group of people upon whom suspicion was most likely to fall, constant persecution and subjection to the poison were common. However, during times of stress, this situation was magnified so that all groups in a community were viewed as possible contributors to evil, and, hence, as candidates for the ordeal.

For example, a series of epidemics and evil occurrences in the year 1830 spurred the sovereign into issuing a resolution to "purge the country and kill the rats," meaning to rid it of its sorcerers. Tanghin was the judge; no class was exempt. The slightest suspicion was a valid indictment. Trials of this sort, with the highest and lowest submitting together, resulted occasionally in the annihilation of 6000 people at a time.

After a while, the frequency of these massacres abated, and the ordeal came to be applied almost exclusively to the lower classes. Although the medicine men were often corruptible, the poverty of these groups rendered this a small factor to all but the occasional wealthy person who was called to participate.

This corruption was possible because the medicine men had methods of varying the strength of the poison according to the size of the bribe, or to their own judgements of the person's guilt or innocence. Thus, in a dispute between two parties, both were served poison, but the toxicity of one dose was often altered by the decision of the administrator. Slaves who were not royal property were usually given non-toxic doses. Then, when they had partially succumbed, they were removed, revived, and carried to distant villages where they were sold. However, royal slaves were customarily forced to endure the entire ordeal, and usually died.

In conjunction with the widespread corruption of witch doctors was the fact that cruelty in dealing with the accused persons was ever present. In 1831, an officer suspected of sorcery was "keeping the watch" by his father's body when his captors arrived. In spite of his pleas that his action was an innocent custom, he was carried off to the ordeal. In another case, a man who was unable to rise because of a fever was taken on his bed to the place of administration where his dose was doubled "to clear up the fever." So strict was this lack of mercy, that few friends or relatives of the accused ever dared dispute the summons lest they be forced to submit on suspicion of complicity. (Chatin, 1873)

However, in spite of these corrupt practices, the people usually had an unswerving faith in the ordeal's inherent justice, and drank the poison with willingness and assurance. They believed that there was a good spirit present who would strike the hearts of the guilty, and pass by those of the innocent.

Aside from the earlier practice of executing criminals by pricking them with a lance dipped in the juice of the kernel, the normal method of administration was as follows: While present before the judge(s), the person was

given an amount of rice soup or rice water to drink. When this had been done, he was given three pieces of chicken skin to swallow without chewing, each piece approximately the size of a silver dollar. Then he was fed the tanghin, which had been mashed and mixed with the juice of bananas and either the leaves or the juice of cardamons. Since the poison acted rapidly, one of the judges would immediately place his hands on the head of the accused and utter these or similar incantations to the genie of the nut: (Perrot and Vogt, 1913)

> Listen! Listen! Listen!
> And be attentive,
> Rainimanamango?
> You are a round egg
> Which God has made perfectly.
> Although you do not have ears, listen!
> Although you have no mouth, respond!
> Listen! Listen! Listen!
> And be attentive
> O Rainimanamango!''

The prayer continues, but it is largely repetitive, requesting that if the accused is innocent, he should vomit the three pieces of chicken skin. There are also imprecations which were to apply if he were guilty. During or after the prayer, the accused usually vomited. If this were delayed, he was fed more rice water or soup. When he did vomit, the egested material was examined closely for the three pieces of skin, the evidence of his innocence. If all three were not found, or if the subject's stomach failed to reject the mixture, he was immediately pronounced guilty. Often the person who was thus deemed guilty died before the end of the test. But more often, the poison was not allowed to complete its work. Instead, as soon as these condemning effects became established, the people fell on the convicted one and shortly dispatched him. The relatives of the person executed in

this manner were often compelled to undergo a public washing to cleanse themselves of all possible implication before they were again accepted by the village.

The natives' explanation of sorcery clarifies the need for locating all three pieces of skin. It was their belief that certain evil spirits caused all human ills. These spirits, however, invariably assumed a human form. Thus, any member of the society might even from birth have been dominated by one of these beings. So firmly entrenched was this belief, that a husband might unquestioningly turn upon his wife, if her guilt were established by ordeal, and mutilate her along with the crowd. The peculiar significance of the skin was contained in the fact that these spirits were thought to survive on the flesh of their human victims. The retention of the symbolic chicken skin, therefore, signified the nature of that person's food, while the expulsion of the flesh naturally exonerated him from all suspicion.

In different regions of the island, various modifications of the basic procedure were introduced. In certain cases, the accused merely swallowed two pieces of the kernel wrapped in skin. Then without the rest of the standard ceremony, i.e., rice soup, etc., the effects were awaited. Another modification involved the pulverizing of the kernels on a rock. This debris was then made into an infusion with water and was fed to the accused. At times, the quantity of rice water or soup was strictly limited, a practice which resulted in increasing the toxicity of the poison. Finally, one of the most ancient methods consisted in attaching the victim to two poles in the ground, and presenting him with two cups of the expressed juice. The accused had to drink these rapidly, and usually died quickly. As in later practices, those who vomited were declared innocent. This latter method indicates the contrast between the early trials and the

highly ceremonious procedures which later evolved.

It was known among the people that the quantities of rice water and spices might radically alter or strengthen the toxicity of the poison. Thus, they believed that a strict adherence to the ceremonies of gathering and preparation had to be maintained lest the slightest error cause the death of an innocent or the salvation of a guilty person. This belief gave the witch doctors full power to direct each ordeal as they desired, for they maintained that they were the only members of the society sufficiently versed in the correct procedures to perform the various ceremonies without making errors which could lead to a miscarriage of justice. An interesting point, however, is that the people realized the existence of this control. Their tolerance can be explained only by supposing that they believed it possible for the genie of the plant partially to work through these men.

Chatin (1873) summarized the physical factors which could control the outcome of the trial. The items illustrate the necessity for the strict laws governing the ceremonies.

The controlling factors were:

1. An ignorance of the true fruit.
2. The inherent ability of the fruit to kill or to save.
3. The victim's possession of a charm to protect him.
4. The presence at the trial of a person with a similar talisman.
5. The presence of an evil genie who could grasp the person and destroy him.
6. The impure state of the person who would have committed some wrong.
7. The varying maturity of different fruits.

The last factor was the only one controlled by the people, for it was known that the red color deepened with

maturity, and that maturity brought an increase in the toxicity of the poison. A dark-red fruit indicated almost inevitable death. To accomodate this factor, the victim's relatives had the right to request the replacement of the dark fruit with a lighter one.

There is little written about the effects of the poison, for the accused was usually attacked and killed when he showed signs of succumbing. It is thought, however, that soon after ingestion, nausea appeared and was followed by a partial paralysis which soon developed into an exaggeration of the reflexes. Convulsions, weakness, and a halting of the heart and respiration then brought a swift death.

Menabea venenata Baill.

Similar in usage, but overshadowed by its powerful ally, was ***Ksopo***, *Menabea venenata* Baill. of the *Asclepiadaceae*. This plant grows exclusively in the arid regions of the west and northwest parts of the island, where it was used as an ordeal poison by the Sakalave tribe. According to the area, it was known by the additional vernacular names *kissoumpo*, *kisoumpa*, *psokoy*, *tanghin de menabé*, *tanghin femelle*, and rarely, *kimanga*.

The chemical nature of this plant's active principle has not been conclusively determined, but it is known to be a powerful cardiac glycoside.

The poison was administered by having the accused chew the plant's root or drink a decoction of it in water.

Its physiological effects were rapid. Soon after ingestion, the victim experienced violent and persistent vomiting. During this time, the participant gradually lost consciousness. The heart would accelerate wildly several times, but would then slow down and remain passively irregular. At about this point, slight convulsions and contractions of the muscles of the anterior members

began. A failure of coordination over the whole body preceded violent trembling. Then the convulsions disappeared and paralysis took place. Just before death, groups of heartbeats paralleled the respiratory rhythm. As death approached, this rhythm changed, and a final convulsion wracked the body as the heart stopped beating, approximately one-half hour after ingestion. (Perrot and Vogt, 1913)

Although Perrot has written twice of this plant, at neither time does he mention the ceremonies and conditions of the ordeal. What indicated innocence? And what were the signs of guilt? In answer to these questions, it may only be assumed that the above account was the experience of a guilty person, for no significance was attached to vomiting, the usual criterion of innocence. Furthermore, it must be assumed, from the evidence at hand, that death was the differentiating factor. This indicates a highly toxic active principle, for among the majority of plants used in the ordeal, the act of vomiting was sufficient to save the participant's life.

Erythrophleum Couminga Baill.

The third and last of the known Madagascar ordeal poisons came from *Erythrophleum Couminga* Baill., a member of the *Leguminosae*. This great tree was known by the vernacular names *komanga*, *kiminga*, *kimanga*, *koumanga*, *koumango*, and *kimango* in addition to the most common appellation, *couminga*. Its highly toxic bark was used as an accessory poison in ordeal trials throughout Madagascar and the Seychelles. In certain areas, however, it was regarded even above *tanghin*.

So greatly did its toxicity impress the natives, that they attributed great power to all parts of the tree. The mere odor of its blossoms, the rain water that washed its leaves, and the smoke from burning parts of the plant

were all supposed to be fatal. Native folklore abounds with tales of people and cattle dying from the slightest contact with any of these elements. However, it is difficult to surmise how these stories became established, for scientific investigation has disclosed that, although the active principles erythrophlein and coumingine ($C_{29}H_{47}NO_6$) are present in varying concentrations throughout the plant, it is hardly likely that death would result from any action other than that of ingesting the bark.

These active principles are extremely powerful in their normal concentration, and join the glycosides strophanthin and ouabain in having the effect of digitalis poisoning. Upon ingestion of a decoction of the root or stem bark, the victim experienced purging and/or vomiting. The heartbeat slowed, then quickened. Respiration became labored. Finally, as the individual was losing consciousness, the heart and respiration stopped simultaneously.

Africa

The ordeal poisons of the African continent were far more abundant than those of Madagascar, yet the great majority of trials by ordeal occurred in the area between the 20th northern and the 20th southern parallels.

The toxic plants from which these poisons were obtained are common and well-distributed throughout this area, although their individual use as ordeal poisons was often restricted to certain locations.

Since the abundance of poisonous plants and the many possible means of employing them were continually in the natives' minds, security from poisoning was unknown. Consequently, a number of insurance measures cropped up. Among the more interesting and common of these was the custom of a host, when entertaining a guest, to sample all the food placed before that person,

thus ascertaining that none of it had been poisoned.

There were a limited number of poisons which were used throughout Africa either as parts of a mixture or as accessory instruments when the standard was unavailable. The white flowers of the atropine-containing *Datura* species of the family *Solanaceae* were one of the most common poisons. Another was the cassava, *Manihot esculenta* Crantz, of the *Euphorbiaceae*. The juice of this plant is highly toxic due to the presence of its active principles, hydrocyanic acid and manihotoxine. Several other plants of this general type were used occasionally, but the above two seem to have been the most common.

East Africa

There existed a distinct difference between the use of the ordeal in East Africa and its employment in the rest of Africa and Madagascar. There was usually less solemnity and depth associated with the trial. In many tribes, the medicine man was either put to death or severely punished if one of the participants died. Because of this lighter approach, strict adherence to certain ceremonies of gathering, preparing and administering the poison was relatively rare. Consequently, the mixture fed to the accused often consisted of many toxic substances which varied according to the administrator and the individual. Frequently, this mixture contained no poisonous ingredients, but was made, instead, from numerous and repugnant organic materials. In this type of ordeal, guilt was established by a lack of revulsion indicated by the participant.

With this lack of specialization came the rise of different uses for the poison. It is significant in the following examples that, although unrelated to the detection of criminals or witches, the poison still performed a function of honor between the world of man and the world of good spirits.

The rituals of ear-boring and the flour ball, both of which were used to decide upon a site for a village, illustrate this. In the first rite, a small boy was seated at the proposed site. A medicine man then pierced his ear lobe with a poison-smeared needle. If the piercing proceeded easily, the site was supposedly approved by the spirits. If not, the people were supposed to search further. In the rite of the flour ball, water, flour, and poison were rolled together. If the mixture adhered, the site was approved. When it flaked, however, ancestral consent was lacking and another area was sought. (Young, 1931)

The general term, *muavi*, was used throughout East Africa as an appellation for all ordeal poisons. This must not be confused with *moavi*, for the latter specifically designated *Erythrophleum guineense* G. Don.

Parkia Bussei Harms

The most important *muavi* poison was obtained by the East Africans from *Parkia Bussei* Harms of the *Leguminosae*.

This tall tree, which grows in height from 20 to 26 meters, has an extremely poisonous bark which was used especially by the tribes inhabiting the Lake Nyassa district. It was normally employed in the non-fatal manner characteristic of its locale.

In certain cases, however, as will be mentioned later, death was not excluded from the proceedings. Among the Kaonde people, the poison was given internally, mixed with beer. Vomiting and death were the criteria for guilt or innocence. The person undergoing the trial had to sit on a scaffold in such a manner that no part of his body touched the ground. Anyone might administer the poison. If he vomited, his relatives fought with the person who administered the poison. If he died, his relatives ran away with the corpse, burned it, ground the

bones, and put some of the powder on their faces. The rest was used as a powerful poison. The sorcerer's children were put into slavery.

Detailed information concerning this plant's active principle is lacking, although it is known to have been highly toxic.

The preparation of the poison was as simple as its application. Without the aid of a witch doctor or other official, the disputing parties went to the nearest tree and stripped off some of its bark. This was dried and ground to a fine powder, which was then stored until the time of the trial.

Administration normally took place by proxy, the poison being given to a fowl, dog, or serf, who represented the accused. In a civil case involving two persons, a proxy for each was tried. If one proxy showed adverse effects while the other did not, the case was decided against that party.

The usual treatment of humans was similar. If one retained the poison (which was mixed to be non-fatal) while the other rejected it by vomiting, the first was declared culpable, and paid damages according to his crime. Such were the methods of the normal trial by ordeal in East Africa.

However, there were tribes, particularly in the western Lake Nyassa district, among whom death was an integral part of the procedure. It is interesting to note that with this renewed stress an increased corruption of witch doctors appeared, relating the method to the more brutal ordeals of Madagascar and the rest of Africa.

In these tribes, the two disputants in a civil case took their grievances to a witch doctor. He then assigned a piece of *muavi* bark to each, raised these in the air, and let them fall to the ground. The one whose bark turned in falling was the offender, and his poison would be sub-

stantially stronger at its administration the next day.

Partiality in procedure is further illustrated by the method of dealing with cases in which no individual had been directly accused, a situation which usually arose from suspicion of witchcraft throughout a village. The people stood in a ring while a witch detective walked about, feeling the hands of each. Dressed in the full ceremonial regalia of his calling, this person chanted incantations and mystic imprecations until, after touching the hands of one person, he would jump back in horror and scream condemnations denouncing that person as the offender. If the tribe's affliction had been ascribed to sorcery, the medicine man would then go to a spot in the village, mutter several spells while standing there, and dig up the person's horns (which had been previously buried by the chief witch doctor). Since this piece of evidence was considered incontrovertible proof of guilt, an ordeal was scheduled immediately.

Detection in this manner was sometimes unnecessary, for it was often felt that a particular person, because of his actions or past record, was a likely suspect. This individual would usually be informed of this suspicion and would publicly request the ordeal to vindicate himself. In his situation, there was a chance of survival. But if he had been singled out by the witch detective in the ceremony of the hands, a liaison between the detective and the poison mixer resulted in an especially heavy dose of poison. This procedure was inevitable, for if the person lived it would have implied that the witch doctor had been mistaken. (Duff, 1906)

The poison's administration took place at the chief's hut or the center of the village, and was directed by the head man or, in civil cases, by an intermediate whom both parties had agreed upon. The poison was swallowed raw and rinsed down with water from a small bowl. The

following account by Young (1931) is a typical example of procedure in a civil case.

Before drinking, the accused said:

> If I am guilty of the charge made
> against me (here reciting the details
> of the case), then may you reject
> the medicine; *iwe wa!* And I may
> retain it; *ine pa!*

This party then drank.

The accuser then said:

> If I have accused you falsely
> of (the details of the charge),
> then may you reject the medicine;
> *iwe wa!* and I retain it; *ine pa!*

Then he drank.

While waiting for the poison to take effect, the village would form sides and, amid the shuffling of feet, shouting, and dancing, each group would chant a song whose words expressed the hope that the other, and not their man, would be taken by the poison.

If both vomited (*iwe wa*), the case was dissolved, for there had been no grounds for dispute. If both died (*ine pa*), both had been lying. But if one died, the other was congratulated for his survival and praised for his virtue either in being innocent or in his truthful accusation of a wrongdoer.

When a person of the lower class died in this manner, his body was thrown to the hyenas, and all felt that they were free from a malign influence. But if a wealthy person succumbed, his relatives either paid heavy damages to the accuser or to the village, or, if they were unable to meet the assessment, sold themselves into servitude, usually to the winner.

At times it became necessary for a group of tribes to ferret out a troublemaker. In this situation, a representative from each village was sent to a central meeting place

to take *muavi* with his coordinates from the other villages. If a particular man vomited, he vindicated both himself and his village from suspicion. But if he retained the poison, it meant that either he or someone in his village was the guilty party. A local ordeal then located the troublemaker.

Acokanthera venenata G. Don

One of the less important *muavi* plants was *Acokanthera venenata* G. Don of the *Apocynaceae*. This plant contains several active principles, the most toxic of which is a crystalline cardiac glycoside called ouabain (or acocantherin). In addition to this principle there are amorphous ouabain (also known as acocanthin, abyssinin, or G-strophanthin) and a third active ingredient, oxalic acid.

This plant, whose active principles occur in all parts, produced death by heart failure several minutes after the ingestion of a concentrated decoction.

The major principle, ouabain, is a crystallized strophanthin ($C_{29}H_{44}O_{12}\cdot 8H_2O$) with about twice the toxicity of normal strophanthin. Its action on the heart and respiratory tract is similar to the effects of digitalis poisoning. Amorphous ouabain ($C_{32}H_{50}O_{12}$) has much the same effect.

Oxalic acid ($C_2H_2O_4$) acts merely as an irritant in small doses and as a corrosive agent in larger amounts, having but a remote inhibitory action on the respiratory and cardiac centers. However, it is still toxic even after dilution has inhibited its corrosive and irritative effects.

Significant to their function in the ordeal is the fact that both ouabain and strophanthin are absorbed irregularly by the digestive tract. There is no means of predicting the amount that an individual will absorb at a given time. Consequently, a dose which was non-fatal to a person on one day might later cause his death. Under such

circumstances, the ordeal's judgement could hardly have failed to gain credence.

The native usage, which consisted of making a decoction in water from the different parts of the plant, produced primarily extreme nausea. This was soon followed by retching and violent vomiting, heavy purging, and complete exhaustion. Immediately before death, several small convulsions signified the halting of the heart and respiration. Upon *post mortem* examination, there was found considerable congestion at the bases of both lungs, a fatty degeneration of the heart muscle, and severe gastro-intestinal inflammation.

Other Ordeal Poisons

There were several other toxic plants often used as ordeal poisons by the natives of East Africa. But because of their small importance, little or nothing has been written concerning their gathering, methods of employment, or physiological effects.

The first of these is *Strychnos spinosa* Lam. of the *Loganiaceae*, the active principle of which is the alkaloid strychnine. This principle acts on the central nervous system producing a halting of respiration immediately followed by heart failure. This plant was employed primarily in Mozambique, where the natives made a decoction in water from the bark.

The second is *Strophanthus Courmonti* Sacl. of the *Apocynaceae*. The active principle in this plant, the cardiac glycoside strophanthin, was obtained from the grains. Its action in small doses is similar to digitalis poisoning, the difference in effects being primarily quantitive rather than qualitative. Large doses cause general tetanus, and leave the heart muscle in a state of contraction resembling *rigor mortis*. (Potter, 1913)

The strophanthin in this plant exists both in the form

$C_{30}H_{44}O_9$ (cymarin), and in the form $C_{36}H_{54}O_{14}$ (K-strophanthin *beta*).

The last ordeal poison of this area is *Erythrophleum africana* G. Don. of the *Leguminosae* (also known as *Gleditschia africana* Welw.). Its active principle, the cardiac glycoside erythrophlein, was extracted from the bark of the roots or stems. The observed physiological effects were similar to those of *E. Couminga*, there being but slight modifications due to differences in concentration.

The methods of employing these minor plants and their poisons in the ordeal probably varied little from the normal procedures of East Africa. However, since descriptions of its use occasionally trace the symptoms of poisoning through to death, it is fairly certain that they experienced some use among the more serious tribes of the western Lake Nyassa district where death was often included in the ordeal.

Central and West Africa

It is in these areas that the ordeal poisons achieved a noteworthy diversification both of plant sources and methods of employment. It is also here that the ordeal reached a frequency and a depth of solemnity far greater than in the eastern and southern regions. Why this situation should have existed is a mystery, for all Africa abounds in poisonous plants of every description. Postulations concerning the natives' temperament are haphazard and almost impossible to substantiate. It may only be suggested that an unusual degree of superstition probably combined with the deep-seated belief that death was a violence against nature. The ordeal then may have risen to great prominence as the detector of the cause of these violences.

Strychnos Icaja Baill.

Strychnos Icaja Baill. of the *Loganiaceae* is the principal source of ordeal poisons in central Africa. Many different names have been applied to this species, but they are all synonyms or represent varieties, as in the case of *S. Dewevrei* Gilg. and *S. densiflora* Baill. There also are numerous vernacular names. This plant has been known in various areas as *bengue*, *benge*, *m'boundou*, *boundou*, *casa*, *caja*, *icaja*, *acaja*, *encaja*, *kassa*, *n'casa*, and *n'kassa*. Unfortunately, these names also implied the ordeal in general.

This tree grows in Gabon, the Moyenne Congo, the Cameroons, and the Belgian Congo. Its active principle, the alkaloid strychnine, is located exclusively in the suberous cellules in the bark of both the roots and the trunk. This principle is a poison of the central nervous system, inactivating first the respiratory centers and then the heart. It was thought, at one time, to possess several different alkaloids because of an observed duality of effects, the one convulsant, the other paralytic. However, experimentation has revealed that this duality results from different doses, and analysis of the bodies of animals experimentally poisoned has disclosed but one alkaloid. An extremely weak dose acts merely as an intoxicant and diuretic.

The progressive fatal effects of poisoning are as follows: Initially there is restlessness, nervousness, abrupt movements, and stiffness of the facial muscles. Then more pronounced twitchings become evident and soon develop into muscular spasms followed by spinal convulsions. In these muscular spasms, which involve all voluntary muscles, the stronger (usually the extensor) of a pair predominates. During this stage the mind is clear.

Each convulsion usually lasts about one minute, and is punctuated by a relaxed condition of depression nearing paralysis. After this 10–15 minute interperiod of relaxation, almost any stimulus will induce the next spasm. If the person does not die during the convulsions, he gradually becomes weaker and the paralysis more prominent. Death ultimately comes from tetanic exhaustion or asphyxiation.

In contrast to several other ordeal poisons, a repetition of administration led not to immunity but to increased susceptibility. (Underhill, 1924)

Methods of employment varied from area to area, but there seems to have been a definite division between Gabon and its environs and the Belgian Congo.

In Gabon, the tree was considered sacred, for the natives, knowing little of cultivation, had not seen fruits drop to the ground, but had noticed young shoots sprouting. They believed that this occurred spontaneously. This sacredness was patronized by the natives, who gathered the bark only in the daytime. For it was believed that, at night, the spirit of the plant was out watching for sorcerers and criminals. A further derivative of this belief is found in the natives' practice of using the poison only on free men. The unworthy slaves were either skinned alive or sold to cannibals.

In this area, the mahogany-red root-bark of young plants was usually used in the ordeals.

These roots were customarily gathered by medicine men who went alone to the woods. The plant was pulled up, the roots cut off, and the bark detached. This was grated into water and allowed to steep. Fermentation quickly took place, and after the effervescence had subsided, the water turned red and the poison was ready. In another method, the macerated bark was placed in water to soak for a day before use.

Although mass ordeals similar to those decreed by the kings in Madagascar did occur, this procedure was distinctly the exception. The poison was given specifically to those who were suspected of having committed a crime or of being in league with sorcerers.

The inhabitants of this area had great faith in the ordeal and willingly submitted to it to clear themselves of any guilt. In connection with this, witch doctors often strengthened or secured their positions by taking the poison publicly. However, they were extremely careful to mix weak doses.

A standard procedure of administration among the Gallois and the Inenga tribes was as follows:

The medicine man drew a line in the ground or designated a tree about ten feet in front of the accused, to whom he gave the drink. As the poison took effect, the medicine man signaled to the accused, who started to walk towards the line or the tree. If he made his goal before collapsing, he was declared innocent, and the people fell upon his accuser, either killing him or forcing him to undergo the same ordeal. If the accused failed to reach the line, however, the people fell upon him and cut him to pieces. (Perrot and Vogt, 1913)

Among the Pahouins, a slightly different procedure is recorded (Lasnet and Boyé, 1911). In the public square of the village, the drink was given to the accused who had to down it in one gulp. When the poison began to act, the medicine man held a stick about 50 centimeters above the ground and indicated that the accused should jump over it. If this were accomplished, he was pronounced innocent and was given his liberty. If he were not able to do it, he was immediately killed or sold to cannibals.

In rare cases, a person who had not been immediately murdered might slowly have started to recover. When this exceptional event occurred, that person was declared

divine, and was looked upon as such for the rest of his life.

In the above tribes, when the person showed his innocence or began to regain vitality, he was given an antidote to rid his stomach of the poison. This antidote was usually palm oil or a repugnant organic mixture. This naturally suggests that some might have tried to fortify themselves against the poison ahead of time. But this rarely happened, for the medicine men had succceded well in maintaining the people's faith in the judgement of the ordeal spirit.

Turning now to the Congo, it is found that there was a basic difference in the preparation of the drink, and several differences in custom and in the interpretation of effects.

In a civil case, in one tribe, each party sent out a proxy to gather the poison bark from a mature tree trunk (called *n'kassa*), rather than from the roots of a shoot (called *m'boundou*). The bark of the trunk was non-fatal, while that of the roots usually caused death. These men would cut a block about 20 by 30 centimeters from the bark, grate it to powder on a stone, and return to the village with this powder and with some intact bark to demonstrate their knowledge of the correct tree. The medicine men openly mixed the powder with water to show that no foul play was involved, and the two participants drank the resulting concoction. This had to take place before ten o'clock in the morning if it were to be successful. If a participant vomited, he was declared innocent. But, if the poison acted as a purge, he was judged guilty and was forced to submit to a prescribed punishment. (Perrot and Vogt, 1913)

The Boloki tribe based their judgement of guilt or innocence on the degree of inhibition of physical ability. Two medicine men simultaneously fed about one tablespoon of the bark to each defendant in a civil case. After

chewing vigorously, the two would then wash the mixture down with sugar-cane wine. After the symptoms of intoxication appeared, the first to fall down lost his case. In the event that both remained standing for an inordinate period, the medicine man would take further charge of the ordeal. He would usually flourish a plantain leaf or stalk in front of the disputants, and order them alternately to jump over it a number of times. During this stage, either one or both of the parties would falter. Finally, one would fall, and the case would be settled. The loser was escorted or carried to his hut, while the winner received the congratulations of the crowd, and was smeared with red camwood powder as a testimony to all that his case had been successful. (Weeks 1913)

Among the Bakongo tribes of the Lower Congo, there existed an interesting antithesis to this interpretation of effects. The accused persons drank the poison at sunrise and prepared to spend the day in the open under the taunts of their tribe. If the poison acted as a purge before sunset, that person was declared innocent. If it did not, he was guilty, and had to pay the usual forfeit decreed by the medicine men. Since the bark of the tree was less toxic than the root bark of the young shoot, death did not usually result. In serious situations, however, *m'boundou* was added, and the relatives of the deceased had to assume the forfeit. Suspicion of witch-craft or murder were the usual crimes for which this custom was observed.

In the M'Boschi tribe, a different procedure was followed. A ring was cleared in the jungle away from the village. Three large trees were then felled across it. The accused was given a strong dose of the poison (about one-third of a liter), which was usually tinted a brighter red by the addition of sandalwood, and had a larger amount

of *m'boundou* in it. When the poison took effect, he had to jump successfully the three trees. If he were able to clear all three, he was innocent. But if he stumbled or fell over any one of them, he was allowed to lie there and die.

Among the Boubanguis, the accused was isolated for three days before the trial. He was then bound and covered with wood to prevent his slightest movement. On the day of the ordeal, a refusal to drink the poison established his guilt, and he was decapitated. If he accepted the drink, he was left bound all day. The medicine men returned that night. If he were still alive, he was judged innocent. In this tribe, the medicine men always prepared the poison secretly. (Lasnet and Boyé, 1911)

In both of the above cases, a heavy emission of urine during the ordeal was usually a sign of recovery and, hence, innocence. Also, in the trials of sorcerers, the people believed that an examination of the dead person's entrails would yield a number of small white pellets which represented the heads of the people killed by the spells he had cast.

Infrequently, in the Congo, the medicine men resorted to the eastern African practice of making a mixture of repugnant materials to test the good faith of the accused in minor cases. However, their interpretation differed from that of the East in that distaste or retching by the accused denoted guilt. This trial was resorted to only when *m'boundou* or *n'kassa* were not available.

In contrast to the rest of Central Africa, there was found among the Azande people of the Northern Congo-French Equatorial Africa region a lessening in severity of human ordeals reminiscent of East Africa. They referred to the ordeal as "consulting the poison oracle," who supposedly lived in *benge*. In these consultations, the question was decided by the action of the poison on

a proxy, usually a fowl. A question was posed in specialized phrasing to the oracle, after which the poison was forced down the throat of the proxy, The answer was interpreted from the extent of the poison's action, i.e., whether the chicken died or lived, and if it lived, what its actions were.

This oracle was of supreme importance in the everyday lives of the people. Its wisdom was sought before every decision of moderate importance. Hence, every man kept his store of poison and chickens, for without them he was lost. It was his only means of protecting himself from all evil, including witches and future bad luck. Other tribes had numerous non-poisonous oracles to help them in their lives, but the Azande placed complete faith in his poison oracle.

The frequency of consultation varied individually, but the following is a basic list of situations about which the oracle was most often consulted: (Evans-Pritchard, 1937)

To discover why a wife has not conceived.
During pregnancy of wife, about place of delivery, about her safety in childbirth, and about the safety of her child.
Before circumcision of a son.
Before marriage of daughter.
Before sending son to act as page at court.
In sickness of any member of family. Will he die? Who is the witch responsible? etc.
To discover the agent responsible for any misfortune.
At death of kinsman in the old days. Who killed him? Who will execute the witch? etc.
Before exacting vengeance by magic. Who will keep the taboos? Who will make the magic? etc.
In cases of sorcery.
In cases of adultery.
Before gathering oracle poison.
Before making blood-brotherhood.
Before long journeys.
A man before marrying a wife.
Before presenting a prince with beer.
Before large-scale hunting.
A commoner in choosing a homestead site.

Before accepting, or allowing a dependant to accept, European employment.
Before becoming a witch-doctor.
Before joining a closed association.
A man before he and his adult sons go to war.
In cases of disloyalty to a prince.
A prince before making war.
To determine disposition of warriors, place and time of attack, and all other matters pertaining to warfare.
A prince before appointing governors, deputies, or any other officials.
A prince before moving his court.
A prince to discover whether a communal ceremony will terminate drought.
A prince to determine the actions of the British District Commissioner.
A prince before accepting presents and tribute.

Among the Azande, humans drank the poison only as a result of three situations. A man who was accused of a serious offense might offer to drink the poison if a test with the chicken had gone against him. Secondly, a man accused by a woman of having committed adultery with her could demand that both should drink the poison. And thirdly, the poison was occasionally given to small boy captives in cases involving princes.

Other Ordeal Poisons

As evidence of the importance of the genus *Strychnos* in the ordeals of the Congo and Gabon, there are two other species, *S. Kipapa* Gilg of the Mukenge region, and *S. dekindtiana* Gilg of the Congo and Angola, which were used in a fashion similar to *S. Icaja.*

The drink was prepared by placing the powdered bark of the roots in a gourd or cup with some straw. Water was then added, and the mixture was stirred. The liquid, which had become red, was strained and stored until needed.

Its effects were essentially the same as those of *S.*

Icaja. Either vomiting or death preceded by convulsions was the result.

Although *Strophanthus hispidus* A.P.DC. of the *Apocynaceae* grew in many of the western countries, as well as in the Congo and Gabon, it was used primarily as an ordeal only in the latter regions. It was the *inée* or *onage* of the Gabon natives.

The poison in this plant was contained in the seeds, which were ground up and added to water, the resulting decoction being fed to the accused person.

Its active principles, the cardiac glycosides strophanthin and ouabain produced effects somewhat similar to a combination of digitalis and curare. There was an introductory irregularity of the heart and respiration followed by a gradual slowing of both until the heart finally failed. Convulsions immediately before death were frequent.

Although *Securidaca longipedunculata* Fres. of the *Polygalaceae* grew in most of the western and coastal countries, it was used as an ordeal poison primarily in the Congo.

The active principles are methyl salicylate ($C_8H_8O_3$) and a saponin. They cause damage to the bone marrow and engender haemolysis in the blood.

The general effects on the person were similar to the action of other ordeal poisons, except for the fact that certain people were more highly susceptible to it than others. This factor was undoubtedly highly influential in its retention as an ordeal poison.

Present-day natives of the same area have established an interesting link with the days when this poison was in constant use. They now give it to persons possessed of evil spirits to cause the vomiting and purging which supposedly drives those spirits from the body.

Several other plants which found use in the Congo as ordeal poisons are *Combretum confertum* Laws. of the

Combretaceae, *Piptadenia africana* Hook.f. of the *Leguminosae*, mushrooms from the genus *Dictyophallus* of the family *Phallaceae*, and *Manihot esculenta* Crantz of the *Euphorbiaceae*. This last plant, as previously mentioned, was used to a certain extent all over Africa, but its greatest popularity was in the Congo.

Its seeds contain the alkaloid manihotoxine (structure and composition unknown), which causes violent vomiting, burning of the throat, and acute diarrhea. In large doses it is fatal. The juice of its roots was also employed as an ordeal poison. The active principle therein is hydrocyanic acid, which acts by forming a stable complex with hemoglobin and by inhibiting the action of cytochrome oxidase.

Two additional poisons of the Congo were not taken internally. These ordeals were called *epomi* and *mokungu*. The plants employed were numerous members of the genus *Acacia* of the family *Leguminosae*.

In these ordeals, the sap pressed from the bark was put under an eyelid of the accused person, or under the eyelids of both disputants in a civil case. If the eye were destroyed, the charge against that person had been valid. This type of ordeal was usually reserved for women, especially among the Ngombe of the Northern Congo.

West Africa

The ordeal poisons of West Africa were generally employed in the same fashion as those of the central region. They differed only in that there was a greater geographical distribution both of the plants involved and of the employment of their poisons.

Since most of the poisons that were used in the extreme west were also known and employed in the northern areas of French Equatorial Africa and the Cameroons, these countries will be considered with the West.

Erythrophleum guineense G. Don

Erythrophleum guineense G. Don. of the *Leguminosae* was one of the most widely used ordeal poisons in Africa. This species has also been designated by the following synonymy: *E. judiciale* Proctor, *E. ordale* Bolle, *E. leonense* G. Don, *Mavia judicialis* Bertol., and *Afzelia grandis* Hort. ex Loud. In addition to having its greatest concentration on the western coast from Senegal to the Cameroons, it was often resorted to in the Congo and Gabon, and found occasional use in the eastern and southern regions. Its vernacular names, each of which was used in several different regions, were sassy bark, *moavi*, *n'kasa*, *n'ka*, *mancona*, *arui*, *m'bondo*, *casca*, *cassa*, *teli*, *tali*, *meli*, and *bouronne*.

The bark of this large tree, which varies in height from 40 to 100 feet, contains the extremely toxic alkaloid, erythrophlein. This alkaloid effects the heart and body in a manner similar to digitalis and picrotoxine combined, i.e., it causes an abolition of voluntary motion, exaggeration of reflex action, and convulsions followed by paralysis of the heart. Its external effects are a paling of the face, labored and irregular respiration, convulsions, vomiting of watery material without effort, urination and fecal discharges, several great convulsions, and then death.

In addition to the effects of the poisonous principles, it has been suggested that tannins contained in the bark were largely responsible for the tree's employment as an ordeal poison. Since these substances are highly irritative to the lining of the stomach, more often than not the poison was probably rejected before its poisonous action had commenced. A poison which invariably killed would undoubtedly have had a short life as a vehicle for the ordeal.

Preparation of the poison was often simple. The bark

(or sometimes leaves and seeds) was merely scraped and powdered, added to water, and allowed to steep. Sometimes the person was only given the bark to chew, followed by a large draught of water. However, in many cases, there were certain additions to the brew which made the procedure extremely complicated. A simple addition consisted of salt to enhance the poisonous effects. But more often, the extra material was made up of powdered glass, lizards, toads, crushed snakes, and human flesh. The hearts of the previous year's victims were dried in the sun, powdered, and mixed with the succeeding year's brew. This mixture, which might additionally have contained human brains, liver, blood, and bile, was put into a vat or tub and allowed to infuse and ferment for a year. When it was needed, two spoonfuls were added to a cup of water and mixed.

This practice seems to have been especially common among the Balantes, for it was their tribe which held human skin to be particularly significant. As in Madagascar, the natives believed that spirits of evil subsisted on human flesh. Similarly, it was thought possible for a person's body to become host to one of these spirits, who had come to torment the community, whether or not the individual was cognizant of the spirit's presence. Thus, when undergoing the ordeal, if the pieces of skin were not found among the egested material, the person was declared guilty, for the evidence that he was harboring an evil spirit seemed incontrovertible.

Among the majority of the tribes which employed this poison, preparations and all aspects of the procedure were carried out in public to demonstrate that no trickery was involved. To substantiate this further, a sample from each batch of poison was given to dogs before the ordeal. When the dogs were dead, proceedings commenced.

In one tribe, the accused was seated on a high seat in

the center of a circle. The medicine man raised one hand in the air, and placed the other on the jaw of the participant. He then showed the bark to the crowd, washed it with his own hands, and grated it into water. Before the accused was allowed to drink, he was compelled to spit and to rinse his mouth to demonstrate his good faith by having nothing hidden. He was then fed rice or cola, and was carefully watched as he repeated a prayer of imprecation against himself as if he were guilty. Finally, he was allowed to drink. As soon as he had emptied the cup, it was refilled. There existed no set number of cups. Hence, it was filled over and over, even after he had started to vomit. This was continued until he had given up all the material he had been fed, for this was the sign of innocence. If he egested some, but not all, of the food, he was sometimes allowed to retire. If the poison had not acted as a purge by that hour the next day, he was pronounced innocent. During the trial, if the accused did not vomit, or was purged, he was deemed guilty. (Perrot and Vogt, 1913)

In one tribe of Cazamance, sixteen cups of poison was the maximum limit. If the victim consumed all of them without event, he was declared guilty. When this had been established, the medicine men would try to induce vomiting by feeding him raw eggs. In the event that these efforts failed and the person died, or if he were too old to be sold as a slave, one of his relatives was taken instead, unless his family was rich enough to buy his freedom. When the accused did vomit during administration, he was required to move his arms and legs to demonstrate their suppleness before he was pronounced innocent.

In addition to the normal use of the ordeal, aspiring witch doctors had to submit to it several times as one of their final tests. Kings, too, were occasionally subjected

to it. When a king died from an hereditary throne, at least one of his sons must have submitted twice, must have been willing to undergo the trial for a third time, and must have given proof of his power as a great witch doctor, or the throne was declared vacant. In the rare case in which an enthroned king was called to submit, he was usually allowed to take the poison by proxy, i.e., a slave was sent instead.

Before the occupation by the French, almost all of the villages of Cazamance and the Balantes held mass ordeals each year to purge their societies of any sorcerers or criminals. To participate in, and to triumph over, the ordeal was a matter of great social prestige. Even those who had left the country tried to return to join their families in the ceremonies. Their faith was so great that, if a person tried to escape the ordeal, he was caught, deprived of his belongings, forced to leave the country, and branded a public disgrace for the rest of his life.

In order to participate, it was necessary to pay a certain fee, which was usually beyond the means of the average native. Their faith in the ordeal, however, prompted the poor to go to work for the whites of the area, until they had the requisite amount. Other forms of payment might be rice, silk, loincloths, or some other commodity. A middle-class person would often give a nanny-goat, and a wealthy native would bring a bull as his gift. In modern days, before the ordeal was outlawed, the privilege to participate cost three francs.

This payment had to be made to the medicine man before the ceremonies. For this type of ordeal, that person was usually of the Diola race, and was brought to the village especially for the ceremony. The pay was split three ways: one-third went to the medicine man who officiated; one-third was given to the village chief; and one-third was sent to the chief of a village totally

unconnected with either the Balantes or the Diolas. There seems to be no explanation for this last action.

The day of the ordeal was a festive holiday. People sang and feasts were prepared by those who expected to triumph over the trial. The ceremony was conducted in a clearing away from the village, where the people formed a wide circle around the medicine man who distributed the poison in cups.

As soon as he drank the *tali*, each Balante ran to the bushes and seated himself at the foot of a tree. Those who were saved soon vomited, and returned to the village with the rest of those who had survived, each convinced that this was the end of trouble for their community. But those who died were hated and blamed for all evil. Their bodies were thrown into the underbrush to rot or to be eaten by wild animals.

The mortality rate of these ordeals was exceedingly high. Each year approximately one-fourth of the population succumbed. In 1895, the French made the practice a crime. But nevertheless, in 1910 and 1911, there were respectively 1,500 and 2,000 deaths. At the present time, however, it is doubtful that even the most isolated natives practice this custom. (Lasnet and Boyé, 1911)

In the Boriawah tribe, the medicine man held a lizard in his hand when there had been suspicion of witchcraft. As he walked among the people, the lizard occasionally jumped on a person, who was then considered to be under suspicion and was forced to submit to the ordeal.

If the crime were a serious one, and if all concerned were certain of the person's guilt, cup after cup of poison was pressed upon him until he died or confessed, thinking that a judgement had fallen upon him. (Strong, 1911)

In the western part of the Congo, the bark was gathered by a medicine man who mixed the poison to a paste

by maceration with water. If he wished to kill his victim outright, he would mix with the paste one of the *Strychnos* barks (probably *S. Icaja*). The accused man was made to stand on a stone or a marked spot, and was not allowed to move from it during the ordeal. All the inhabitants turned out for the occasion, the girls with their skin painted, and the young men with their showiest ornaments. Dancing and singing accompanied the trial. The proclamation of guilt was the act of purging or vomiting.

In the same area of the Congo, a different procedure existed. The poison bark was finely ground and mixed to a paste from which five small loaves were made. These were fed to the defendant over a period of fifteen minutes, while the onlookers called upon *Moloki*, the evil spirit, to come out. If death or vomiting resulted, the man was judged, respectively, guilty or innocent. If purging occurred, he was declared guilty, and was given a chicken to eat and enough palm wine to intoxicate him. He was then buried alive to prevent the evil spirit from escaping from his body with his last breath. A large fire was kept burning over the grave for three days, after which time the body was exhumed and eaten. An innocent man, however, was carried around the village and decorated with beads, while his accuser paid a pig as a fine. (Torday, 1913)

Among these people, there was one alternative to submitting to the ordeal. The person could swear innocence by *m'bondo*. If he were perjuring himself, it was believed that he would die of dysentery within several days. (Johnston, 1908)

It may be mentioned in passing that the majority of the natives of West Africa believed so implicitly in the justice of the ordeal that if an innocent man should succumb to the effects of the poison, he would usually not

maintain his statement of innocence. Instead, he would believe that his judgement had come because of some act that he had forgotten or because of a crime of which he was unwittingly guilty.

Abrus precatorius L.

Another poisonous species which was used in the west from Senegal to Nigeria was *Abrus precatorius* L. of the *Leguminosae*. This plant, which is also known as jequirity or Indian licorice, has hard, bright scarlet seeds which contain the tetanic glycoside, abric acid, and a toxalbumin, abrin.

Although the use of this plant as an ordeal poison was widespread, there were certain hindrances to its continued popularity as anything more than an accessory instrument. One drawback was that it possessed the characteristic toxalbumin latent period before the commencement of effects. This was due to its partial inactivation by gastric juices, resulting in slow absorption. (It is approximately 100 times less toxic when taken orally than when it is administered subcutaneously.) Secondly, gastric juices failed to act upon the seed coat, so care had to be taken that each participant chewed vigorously. But the greatest drawback was that immunity could be established by the repeated ingestion of small doses. This last factor is undoubtedly the reason for its somewhat restricted use even as an accessory poison.

During the ordeal, the accused underwent severe vomiting, purging, general weakness, an inability to stand up, cold perspiration, colic, a depressed and then accelerated heartbeat, trembling, and, finally, heart failure. The interpretation of these results was similar to the general rule.

Adenium Honghel DC.

Adenium Honghel DC. of the *Apocynaceae* is a shrub

whose growth and use as an ordeal poison were restricted to the French Sudan and the upper parts of Senegal, where it was used primarily by the Marabout tribe.

This plant, which was known in the vernacular as *bouron*, *hongkel*, *kaurane*, or *kidi-sarane*, contains an extremely powerful glycoside, adeniine ($C_{19}H_{28}O_8$). Its action is analagous to digitalis and ouabain in paralyzing the heart and affecting the medulla. The muscles and nerves remain excited even after death, and lose this property very slowly.

In preparation, the flowers and peduncles were pulverized and infused with water. The solid material was then removed. Shortly after drinking, the heartbeat and the blood pressure increased. Respiration became labored and spasmodic. Accompanying the rise of the respiratory irregularity was a similar irregularity of the heartbeats. When both reached a peak, they suddenly ceased simultaneously. *Post mortem* examinations revealed severe gastro-intestinal irritation.

Closely related to this poison was *Adenium somalense* DC., which grew only in those areas of the Sudan which were confined to the Sahara Desert. The Somali tribe used the expressed juice of this plant in their ordeals.

Detarium senegalense Gmel.

Detarium senegalense Gmel. of the *Leguminosae* occurs throughout West Africa, and was known by the natives generally as *niey datah* or *datah i ney* and specifically as *tali* (for the plant), and *meli* (for the bark). An interesting interrelationship exists in this terminology, for it is identical to that used for *Erythrophleum guineense*. It is possible, however, that the passage of time brought these words into general usage for the designation of many plants which were used for the ordeal.

According to custom, the bark was made into an in-

fusion with water. This brew was drunk by the accused, who would not die from a small dose. In larger concentrations, however, its active principle, which is unrecorded, brought swift death preceded by convulsions. The ceremonies connected with the use of this plant did not diverge from the pattern of the normal West African ordeals.

Elaeophorbia drupifera Stapf

Another little-used plant was *Elaeophorbia drupifera* Stapf of the *Euphorbiaceae*, which grew abundantly throughout the west, but seems to have been used as an ordeal poison only in the Ivory Coast region. It was colloquially known as *do, douo, tene, dohe, klatou, baga, faman, and gbo.* Its active principle, whose name and chemical classification are unrecorded, was contained in the caustic white latex of the plant. This material was expressed and mixed with water. The usual methods of its use paralled those of *Erythrophleum guineense.* However, among certain tribes of the Ivory Coast, the latex was spread on the eyes of the accused, and was rubbed in with the fingers and several wisps of cotton, which were left there. The judgement of effects was similar to the judgement of its counterpart in the Congo. Damage to the cornea was evidence of guilt.

Mimusops Djave Engl.

Mimusops Djave Engl. (*Bassia toxisperma* Raoul) of the *Sapotaceae* is a giant tree of the evergreen forests of Nigeria and the Cameroons. Its use as an ordeal poison, however, was restricted to the latter region, where it was known by the natives as *noumgou.* The mahogany-colored nuts of the tree were used in the trials, for they contained a powerful cyanogenetic glucoside. Its employment in the ceremonies of the ordeal paralleled that of *Erythrophleum guineense.*

Physostigma venenosum Balf.

The best known ordeal poison of the western part of Africa, was the famous Ordeal Bean of Calabar, *Physostigma venenosum* Balf. of the *Leguminosae*. This tall, woody vine grew to an approximate length of 15 meters and a width of 5 centimeters at the base. Its habitat was the swampy areas from Sierra Leone to the Cameroons, and especially the Calabar Coast near the Gulf of Guinea at the mouth of the Niger River. The vernacular names of this plant were *isho*, *esere*, and *djirou*. In Gabon it was known as *n'chogo* or *m'boundou*, and in the Pahouin tribe as *itounda*, although it was rare in these areas.

Its active principles, the properties of which are antidotal to strychnine and atropine (and are used by the present-day natives in this capacity), are the alkaloids physostigmine (or eserine), calabarine, and eseridine (or geneserine). The most important principle, physostigmine ($C_{15}H_{21}N_3O_2$), acted as a powerful sedative of the spinal cord, resulting in a progressive and ascending paralysis of the lower limbs, a loss of voluntary muscular control, the paralysis of the smooth muscles of respiration, and death by asphyxiation. It acted on the involuntary muscles in a way resembling pilocarpine, i.e., there was an ascending and progressive tetanic contraction of the smooth muscles of the alimentary tract.

Its action was contradictory in that it paralyzed the motor nerve centers but stimulated the nerve endings. However, in highly poisonous doses, the central effect overcame the peripheral. Further action was illustrated by an acute increase in the volume of the blood and in the number of red corpuscles. This was probably due to the stimulation of the smooth muscles which expressed blood from stagnant areas.

The two less important principles, calabarine (compo-

sition unknown) and eseridine ($C_{15}H_{21}N_3O_3$), are thought to be decomposition products of physostigmine, which is relatively unstable. Calabarine, however, is antagonistic to physostigmine, but is usually present in such small quantity that its effects are negligible. In older beans, on the other hand, this principle might well, as a result of decomposition, have been present in large quantities. It stimulates the spinal cord in a manner similar to strychnine. Eseridine is essentially a purgative agent.

The following is an account of the observed effects of a fatal dose: (Balfour, 1860) Until about ten minutes after ingestion, the individual felt no ill effects. At that moment, however, he began to get thirsty, and experienced severe stomach cramps which the ceremony of the ordeal decreed he should bear without showing his pain. This progressive thirst was accompanied by an increasing flushing and swelling of the face which caused the victim to assume a stupid, drunken look. Then followed a protrusion of the eyes, trembling, and heavy salivation, which eventually became frothy. An intense contraction of the pupils of the eyes, heavy bowel movements, and increased difficulty in breathing accompanied this stage. As the limbs began to lose their usefulness, the person walked as if drunk. Soon, however, he lost the power to stand. This paralysis spread from the lower extremities upwards until the victim was in a general state of paralysis. Shortly after this, the poison reached the medulla, and with the incapacitation of the respiratory organs and the cardiac musculature, the person died. This resulted usually about thirty minutes after the ingestion of the beans. It is interesting to note that, up until the last stages of paralysis, reflex actions were still intact and the victim was able to converse coherently and sensibly.

Conversely, a judgement of innocence came from the following reactions. The accused experienced nausea and

vomiting, but no lasting effects other than a headache which normally lasted for several hours after the test.

There were a number of variable factors which influenced the outcome of each ordeal. Primary among these was the inherent physical condition of each participant. If his digestive system were sensitive, the poison immediately irritated it to the point of causing him to vomit, thus saving him. However, if he were strong, robust, and had a good digestion, the poison probably was retained, bringing death. Even if this unfortunate did recover, the negative verdict of the ordeal was sufficient to warrant a sentence of death in some other fashion. An equally important factor in determining the outcome of the test was the degree of corruption of the medicine man in charge. It was possible for him to influence the results in a number of ways, such as regulating the number of beans, using the more poisonous mature beans, or altering the method of preparation to increase the concentration and hence the toxicity of the poison. However, as might not be expected, a large number of beans was not necessarily more toxic than a smaller number, for the greater amount of poison would usually irritate the lining of the stomach and cause rejection of the poison before it had reached a fatal concentration in the blood. The maximum number of beans which have been eaten without fatality in a single ordeal is listed as 35. Often, if the witch doctor were the accuser, both he and the accused had to take the test.

The ordeal by Calabar Bean, in addition to being used on criminals and sorcerers, was often given to warriors to test their fitness, and to children to see if they were going to grow up into virtuous, brave, and capable people.

The bean was administered either in the natural state or as an infusion in water. Boiling this water decreased the toxicity.

The methods of trial varied from area to area. In one tribe, it was customary to hold mass ordeals when the king died. In another, the number of beans which were egested was augmented by a similar number which the subject was required to eat. This augmentation continued until death occurred, or until all the beans in his stomach were rejected at one time.

In a third area, the judges, who were the chiefs of the village, would put the beans on the ground in front of the accused, who had to pick them up one by one and eat them. It was in this tribe that the medicine man was thought to influence a result of death by rubbing the beans with the tail of a leopard.

Contrary to the strong faith existing in other tribes, the natives of the Calabar region had no consistent beliefs about this practice. In one region, the ordeal was approached with confidence, while in another, it was looked upon as a sentence of death. Rarely would an individual publicly demand to submit, a common occurrence among other tribes. When this did happen, however, it was usually assumed that the person had made previous arrangements with the poison preparer.

For some years, it was highly difficult for investigators to obtain specimens of the plant for botanical classification, for although the natives were well acquainted with the bean itself, they knew nothing of its origin. This situation was in existence because, as written by the Rev. H. M. Waddell of Calabar (Hanbury, 1876),

> The plant is everywhere destroyed by order of the king, except when it is preserved for supplying the wants of justice — and that the only store of seeds is in the king's custody.

This practice resulted in a near deification of the plant, and was continued until the middle of the 19th century, when the practice of the ordeal was outlawed. This edict

was not immediately obeyed, but observance in any but the deepest areas of the jungle was made virtually impossible. It is now believed, however, that the practice has been completely effaced.

Conclusion

In order to appreciate the full significance of the ordeal in the minds and lives of these primitive people, it would be necessary to live in intimate contact with them. Although this is rarely feasible, a certain understanding may be gained by viewing the situation psychologically.

Consider the native in relation to his spiritual beliefs. Most of his life was spent under the pall of uncertainty and fear concerning the evil spirit who inhabited his whole universe. His mind was ruled by the thought of what their malign influence could do to him or to his family. When viewed in this light, the ordeal was a godsend for him in the simplicity and efficacy of its action. No longer did he feel that he had no defense against these mysterious powers.

When considered from a purely material viewpoint, his secular life was also immeasurably strengthened in security. Here was his defense against any wrong done to him. Here was a swift and simple method for determining the truth of a situation. It mattered little to him that, occasionally, a person he knew was innocent would be declared guilty, for his faith told him that both he and that person had been ignorant of the other's unconscious sin.

Naturally, the basic fallacy of his beliefs are evident when considered today. But even here the situation is not completely implausible. For, although psychosomatic interrelationships as yet constitute a little-explored field, it is common knowledge that this relationship exists, and that in certain cases it may exercise a definitely

positive influence over a person's reactions to various stimuli. We cannot state incontrovertibly that the power of an innocent native's faith did not occasionally cause his stomach to reject the poison. Nor could we be sure a guilty party did not realize that, according to his deepest beliefs, he would not be able to rid his stomach of the poison.

However, our purpose has not been to determine the inherent good or evil in this practice, but merely to illustrate the numerous variations in method, observation, and interpretation which were found throughout the area, and to demonstrate the illimitable value of this ordeal by poison in the complicated spiritual and secular life of the African native.

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