## Poison.

Many travellers amongst the Indians give them the credit for the most marvellous cures of diseases, but I doubt very much if many of these can be sunstantiated by actual evidence. After living amongst them well over 20 years and spending months amongst tribes who previously had had neither contact with civilization, nor within living memory a visit from a white man, I can positively say that their knowledge of the treatment of most diseases is, at best, very poor, and in reality often detrimental. Periodically, some person will recover from an illness after any hope of recovery has been absolutely abandoned, but the same thing can happen in any modern hospital to-day with the finest skill and talent in attention. Such miraculous recoveries depend much more on the mental calibre of the sick person than on his physical capacity, or the treatment. Amongst primitive people they are of course the customary nine days wonder. Everybody hears of them but the credit can scarcely be assigned to anyone except the patient himself.

In the same way many travellers credit the Indians with a knowledge of all kinds of mysterious poisons, some of which may take effect almost at once, and others which will only produce fatal effects after a variable lapse of time, sufficient to make it impossible to declare who was the responsible party. Again I am certain these accounts are much exaggerated although definitely there is much more reason or scope for the assertions. All Indians

a considerable knowledge of the detrimental effects of many of the plants in their environment. Parents will see that their children do not touch various roots, fruit or barks. There are many plants they know can cause death, but these are rarely (if ever) used on people, although many are turned to use in securing supplies of game, and the many varieties of fish poisons are by far the most popular, the best known and most often used.

I once met a doctor, who somewhere around the seventies of the last century visited the Macussi and Wapichanna in the Rupununi District. While crossing Macussi territory, they entered a village where a drinking festival and dance was in progress, and spent the night there. About 9 p.m. the doctor was called to inspect one of his men, who had suddenly become very ill. He found the tongue of one of the carriers had begun to swell alarmingly and the man complained of agonising pain in his whole mouth and throat. No medicine on hand seemed to give any relief and the tongue continued to swell until the mouth and nasal passages were completely blocked. Towards morning, the carrier died, from as far as could be seen, sheer inability to draw breath. Enquiries into the probable cause, showed that this carrier had mortally offended a Macussi of that village some years previously. On his arrival no signs of enmity were shown the man: on the contrary he was made welcome, but, after darkness had fallen, he was singled out for special attention and drink was forced on him until he was fast becoming hopelessly drunk. When the appropriate moment arrived, a woman approached with a calabash of drink which he was baited to drink without a

stop. Under the long nail of the woman's thumb a deadly alkaloid salt was secured and as soon as the man accepted the calabash, she dipped the point of her thumb into the beer. The salt dissolved at once and the man drank the beer without noticing anything. Within the hour he was in great pain and was dead before morning.

I have been in and out of the Macussi tribe for many years and did not then, and do not now believe the story, although the doctor was very definite as to the results of his investigation. I don't believe that any Indian has either the apparatus or the brains to evolve and concentrate a rapidly soluble and deadly poison to go into such a small compass or to be of such horrible effect. Whilst I knew that the Indians certainly had a considerable knowledge of the lethal properties of various vegetable matters, I felt sure none knew how to administer it to anyone in some secret way, but this idea was rather rudely shattered when a man I knew quite well together with his attendant boy were poisoned.

This friend was making a long journey amongst the Indians, picking up fresh carriers to assist as he found convenient, but keeping his own personal attendant throughout the whole trip. On his return journey, he was met by a party of Indians who offered his party some food, of which they were very glad as they had been on pretty short commons for some days. My friend was handed a special dish which appeared to be some small vegetable bulbs that had been boiled, very similar to arrowroot and not unlike our own

potatoes. My friend took only one mouthful but as it had a very pronounced disagreeable flavour, he passed the balance over to his personal boy who, aware of local customs, had to eat as much as he possibly could. My friend's mouth and throat began at once to have a nasty burning sensation and his tongue began to swell considerably: his entire mouth and throat blistered and became so much/like red raw flesh. He suffered agony for weeks and it was many months before he became normal again. His attendant died in agony.

I was very loath to believe all this, although I had no reason to doubt the veracity of my friend. Some years later I had occasion to visit a rather remote village and I was considerably surprised when one of the men with whom I was on particularly friendly terms, asked me if I had come for a certain woman. Knowing their peculiar way and from curiosity I asked him why he should think I had any interest in that particular woman, whom incidentally I know quite well. He answered he felt sure I had come to arrest the woman for having poisoned my friend. I pooh poohed the whole idea for how could she poison anyone ? He then detailed how this woman had a deep grudge against the man: how she had gone to meet him and how she had given him the boiled bulbs of a certain indigenous calladium which it was certain death to eat. When I enquired for the woman, I found she had disappeared in the forest as she saw me approaching. I knew it would be easier to find a needle in a haystack than to search for her in that forest, so I passed on. I have never been back: have never since seen that

man or the woman and I can only give the bare facts of the story as they came under my observation.

One occasion I was coming up riverffrom the coast with a boat manned by a dozen Wapichanna men. One of my men broke down with bad dysentry and malaria fever. For days it was touch and go as to whether he would live, but the medicines I administered proved effective. I had got him back to that stage of convalescence where he could sit up in the boat and take an interest in what we were passing, although against his wish I forbade him to do even the lightest work. On our way through the Macussi country, we came upon a large party of probably a couple of hundred of this tribe camped on the side of the river. There was no love lost between the two tribes in these days. The Wapichanna regarded every Macussi as Komaima and evil spirit, and the cause of every death in their tribe. The Macussi regarded the Wapichanna with intense jealousy because, for no very tangible reason, no settler or trader had resided in Macussi country for many years, whereas there were several such traders amongst the Wapichanna. The Macussi knew that my boat contained such merchandise of which they stood in great need, and which they would have loved to see going into barter amongst themselves, and soon they started a running barrage of rather immoral ridicule at my men, as we were passing. My own men were shaking in their skins, and much too afraid to reply although they knew what was being said. We were almost past their camp when one hag, determined to get something from the men, waded out into a shallow we were passing and demanded

some article - a knife or something - I forget now. In her hand she carried a calabash of beer in exchange, and if they refused she threatened to send every Kenaima in the Macussi country to wipe out the entire tribe of Wapichanna. My men were now almost paralysed with fear and begged me to give her a knife. I consented, saying, "All right, mop up that beer and let us go ahead". While busy getting out a knife, the sick man who knew the Macussi language well, took the calabash, and had a good drink as he took it, and again as he handed it back. We passed on without further incident, but that night my boy's dysentry broke out afresh. Medicines proved of no use now, and when we were within a mile of his home, he died. Every man in the boat swore the man had been poisoned by the Macussi. The sole topic of conversation for weeks was his dreadful death; the whole tribe believed it and were living in terror of Kenaima in case the Macussi made good their threat. Had any stranger arrived about that time, he would have got another instance of their mysterious ability in poisoning.

As is natural in any society where there is no written language, all teachings are oral, with some practical demonstrations of the more important and intricate matters. Thus the method of preparing any peculiar compound would be handed along from father to son, but the chain of continuity might at any time be snapped by death, and the secret lost for ever. Most of the tribes have now come to some extent under the influence of civilization, and their customs and habits have

undergone large modifications. I have myself seen the Taruma using stone knives, but to-day no Taruma could make one; they depend on the steel by way of barter to do their cutting. The Waiwai, generations ago, depended on the use of stone implements and fire to cut away and do the subsequent charring in felling trees and making fields, but since the axe of civilization became known, this method has been forgotten and lost forever. Thus change of habit can greatly modify their knowledge of what were once important factors in every day life, hence it may betthat some tribes long ago knew more than those, whom - primitive enough, Heaven knows - I have met.

Few tribes are at active warfare with each other. There may be great fear or dread of a neighbouring tribe, largely due to ignorance, superstition and lack of information, but such fear can be or has been removed by a little association. Most of the dreaded tribes, such as the Waiwai, when I first entered their tribe, dwell in the far remote recesses of the forests, where they live very isolated lives, are very few in number, and the use of any poison for private revenge or gain would be limited very much in scope. When from any cause, strong enmity arose between members of the same tribe it is much more likely that one would shoot the other with an arrow, or do some other sufficiently serious bodily harm as to cause death, and there are not infrequently murders committed by such means in moments of extreme exasperation or passion. They have demonstrations almost daily in the pursuit of game, of the effectiveness of such methods

in killing the largest known animals, and they are much more likely to try this method, than to resort to some subtle poison of which they can have little or no experience, to rid themselves of someone they hate.

This argument only deals with death at close quarters, where different means to the same end are always available, but matters assume a very different aspect when it comes to causing death at some distance, such as in the inter-tribal fighting, which oral teachings and myths disclose, or the every day necessity of procuring game for each succeeding generation. Here any aid that tends in some way to the tribal security, or a fuller supply of food, becomes most important, and at once we have valid reasons why such side should not be forgotten and why they should be passed on to succeeding generations. Thus the deadly alkaloid salt that could satisfy personal petty spite would s tand a poor chance of surviving, by comparison with some poison which could be relied on to cause death at a distance, say up to the limit of the accurate range of the arrow.

All the more remote Indians of my acquaintance have a good knowledge of such a poison, a very little of which introduced into the blood stream of a victim by an arrow, either from the blowpipe or bow, means death in a short space of time. This peculiar poison is known to the outside world generally by the name of Urali or Kurali. Each tribe gives it its own local name, and although there may be slight differences in the manufacture, results are the same and equally good. In the days of warfare, it was

very necessary that the knowledge of its manufacture should be general, and uninterrupted and certainty in the chase equally important. One poisoned arrow means a quick death to the tapir - the largest game of the forests - but fifty non-poisonous arrows might be required; the tapir might even escape and every arrow would be completely lost. Under any but the best circumstances every arrow fired into a tapir is smashed beyond repair in the animal's struggle in the dense jungle around him, thus entailing several days of hard work in making a new set, just at a time when they may be most urgently required.

Urali Poison is fairly well known in the outside world and is in considerable use amongst various experimental bodies because of the different effects it creates when administered to all warm blooded animals. Much of the compound, masquerading commercially as Urali, is however very indifferent either through faulty manufacture or deliberate adulteration in face of a good overseas demand. When I first went amongst the Wapichanna, I found urali in general use, not only amongst them but in all the surrounding tribes. Guns of various kinds began to be introduced and as their range was more than the arrow, their results more certain and rapid, the blowpipe and bow and arrow were superseded just as soon as each individual could afford to buy a gun. The manufacture of urali amongst the Wapichanna fell away, until only one man knew how to make it. The forest fires of 1911-12 swept over the mountain where this man lived, wiping out his field and village and also the forest trees from which he drew

his ingredients. He migrated to Brazil and the secret was lost to his tribe. It was still considered the correct thing to shoot the Red Howler Monkey with poisoned arrows, for the few weeks they were in season, and supplies had to be purchased from long distances away. The neighbouring Macussi tribe was held in great dread, and though this fear was slowly decreasing, the Macussi no longer knew the secret either, and it became necessary to purchase urali from the Arecuna and Patamona tribes who lived beyond the Macussi. The supply was so erratic that for some years before I left the district, there was no urali of any kind to be found amongst the Wapichanna. My experience has been that once guns are introduced to any tribe, Urali poison is relegated to a minor place and the secret soon lost.

The Taruma tribe made large quantities of a poison very similar to Urali and called it Makabur. At each of my visits to the Taruma, I found every adult male in possession of a fair amount. In effect, as I have repeatedly seen, it was every bit as effective as urali, yet it never became popular amongst the Wapichanna. Probably it was due to a different method of putting it up in marketable form. The Wapichanna preferred his supply put up in bulk in a tiny calabash, whereas the Taruma spread theirs directly on to prepared arrow points, which were ready for use, as soon as they were dry. Urali is difficult to keep for mould or mildew during the wet season is fatal to its potency. In calabash form, it was easier kept and even if it did go mouldy could beeasily brought back to full potency by boiling it with the bark of a certain vine the Wapichanna knew of in the forest.

The Taruma variety thinly spread over dozens of arrow points was more difficult to keep, and could not possibly be scraped off for reboiling. The Waiwai used a poison similar to Makabur and I have seen it in fair quantity amongst them at all my visits.

The manufacture of urali generally is the secret of certain families. It is not so much a secret as the natural outcome of their mode of life and teachings. With no written language, a man can only teach a limited number on any subject and when, as in the case of making a potent drug of considerable complexity in composition, he must have apprentices to whom demonstrations may be given, so it is natural that a son or some near relative living in the demonstrator's own house and constantly available, should be chosen. Amongst themselves, it is not regarded as any secret. It is however a speciality peculiar to certain families, simply due to the fact that the general public have not the opportunity to learn the details of manufacture. This is the reason of the many weird tales that are generally current of the great mysteries attached to the work, and the carefully hoarded secret of the ingredients.

I have never seen urali manufactured, but several Indians have told me how it is done and have offered to teach me if I would promise faithfully to follow the very rigorous ritual demanded by custom during the process. The successful maker of the poison must abstain from all food from the time his fires are lit until the boiling process is completed. He generally retires to some distant hut, where no one under any circum-

stances is allowed to come near. Any unauthorised person appearing on the scene would probably reduce its potency to nil. This rule is absolute in the case of women, and the manufacturer must have abstained from any intimate association with woman for some time previous to his beginning operations. He must drink considerable quantities of water in which strong tobacco has been macerated. Then there are many minor details for the student to learn; the different passes to be made, and most important of all, the quantities of the various barks to be used. I was quite curiou in these early days, when I went amongst the Indians, but not sufficiently so to voluntarily undergo some of these trying practices, which I knew could have no real effect, so - and quite rightly - they refused to allow me to see the process. It is often said that snake fangs play an important part in making urali, but every maker I have asked has always scorned the idea. I have had a poison maker amongst my carriers for weeks, on trips when numerous snakes were killed; he took no interest, beyond helping them to death. The fangs of the fierce bushmaster, often quite two inches long, may often be found in the shoulder baskets of Indians, but that means nothing. They have simply been kept as a trophy and to show the prowess of the hunter, as the bushmaster is by far the most deadly snake of the forest, as also the most pugnacious, attacking man for no apparent reason; he is the largest of all poisonous biting snakes, so therefore the most dreaded. The hunters generally keep some part of the bigger game that falls to their skill and weapons, such as the teeth of

deer, wild hog, acori, and all the various cat tribe. These all form necklaces or other ornament for the hunter, his wife or his children. Many feathers of birds shot are also kept and used in a like manner. The youth recently admitted to manhood adorns his hammock with the tufted crest of the powis or other birds to show the world his ability and skill. The teeth of a snake are kept solely, in my experience, as a momento of the occasion, when he was probably within an ace of losing his life, or for their extreme size or as a tribute to his physical powers.

The actual ingredients for making urali are the barks of various trees and vines - about three in number - although different plants are used in different environments and by different tribes. The plants which grow at several thousand feet elevation in rocky mountainous land would scarcely be found on the undulating deeper soiled plains of a thousand feet above sea level. The principal bark is that of a vine which in its younger stages has fairly long spines on its stem.

I once made a garden in which I grew every rare medicinal plant in use amongst the Indians. Most of these were Calladiums and different herbs that were used as beanas to give success in hunting, fishing and living. Nearly every form of game and a large number of the bigger and best flavoured fishes have their special vegetable beana. Thus a bulb of one plant carried in the hunting bag ensures success in locating wild pigs; the cloudy leaf of a certain calladium run along the rod or the line by hand is supposed to mean success in fishing for a particular variety

of tiger fish. I got a plant from the most successful urali maker in the district, which he told me was the most essential bark according to his recipe. The plant throve quite well, although it grew only slowly and I had it trained up a support to fully six feet after some years. Many of the elder men knew the plant and vouched for its being the real thing. Numbers of them used to bring their growing sons and male relatives along, with a request to inspect the plant. Their object was to memorise its bark, leaves, and any other peculiarity, as the plant was extremely rare in the low-lying forests. Its habitat was the tops of certain high rocky mountains whence indeed I had got it. Unfortunately I went home to England on leave, and when I returned my urali plant had died from the lack of water during the dry season. I was never able to obtain another plant, as the forest fires of 1911 destroyed the last known sources of the supply amongst the Wapichanna. I have been shown a tree the bark of which is said to be the second ingredient in urali. I have seen specimens of a good size - 18 inches diameter and over - with a grey outside bark and a greeny yellow cambium. In these early days there was little or no interest taken in urali, and unfortunately I never had the bark, leaves or flowers sent out for identification. After 1911 all chances of making a study in my district vanished with the forest fires, and the migration to Brazil of the last man who knew the plants and the secret of manufacture.

Shorn of all its formalities and secret humbug, I imagine

the making or urali is quite simple once you know the different barks required. The Indian takes a certain amount of bark off two different plants - three at the most so far as I could tell although methods vary with different chemists -. These barks are pounded up and each variety put in a separate, large, earthenware pot and covered with water. Fire is put under the pots and they are kept boiling continuously. When sufficiently cooked, the bark is lifted out with a stick, but boiling is continued until the liquid is evaporated and the quantities are judged to be about right. The different liquids are strained through a fine mesh sieve and thrown together into a single pot, and boiling recommences and is continued until the required density is obtained. During the last boiling a number of small squares of bamboo is thrown into the pot. These pieces are roughly half an inch square and generally left in, even when packed and dried for sale. The first boiling may take as much as 48 hours continuous fire, varying in the amount of water and subsequent evaporation and the second boiling should not take more than 18-24 hours. Men who have made urali have told me the operation never took longer than 3 days in their case. The result of this work is a dark brown treacle looking liquid. The man of experience boils until density is considered right and applies no test until later, but the novice generally tries it out on some captive animal - generally a chicken - and the effect is carefully noted, when if satisfactory, the pot is taken off the fire and set aside to cool. A number of small gourds or calabashes, roughly about

three inches across the mouth and two inches deep, have been previously prepared. Into these a few spoonfuls of the dark sticky liquid is now poured, care being taken to see that a few of the bamboo squares are included. The calabashes are put out in the sun for some days until the urali becomes quite hard and dry, when it is ready for sale or to be packed away indefinitely either for future use, or the appearance of a customer.

In calabash form, urali can be kept for years without deterioration if proper care is taken of it. The few calabashes that filtered through latterly to the Wapichanna could not have taken less than a year to reach them since the time the poison was made, and a lapse of even three to five years is probable. The lucky possessor had a supply that would last him for some years as it was very sparingly used and I have seen urali that was at least ten years old. It is however very subject to mildew or mould during the rains and seasons of excessive moisture, when it completely loses its potency. The Indians carefully stew their urali in such a position that the heat from the continued household fire drives off all moisture. In bringing it down from the far interior, I have repeatedly had urali completely ruined from mould, even when I was taking the greatest care of it. When urali lost its potency, the Wapichanna knew another liano that when boiled up with the deteriorated stuff renewed its efficacy. I have seen my headman once or twice collect this, - rather rare - liano for the purpose. When the urali of barter is required for use, a little water is dropped

on one spot. The poison soon absorbs the water and becomes soft. The Indian then coats such arrow points as he wishes with the urali, after which both calabash and arrows are put in the sun to dry thoroughly.

The knowledge of the various barks and some idea of quantity are the two essential factors in making urali. The Indian has no scales to weigh his bark nor measures to regulate the quantity of water. He has no apparatus to test either density or strength of his liquids in any way during manufacture. The whole art is done by rule of thumb backed by some previous experience, but even with the most observant, the amount of bark and water used will never be the same twice in succession, nor will the chemical composition of the bark always be the same, yet it is seldom that a boiling is useless. There are degrees of potency between every boiling but it is not often they have a complete failure. On such occasions the blame is laid on occult influences as an excuse. A woman in certain conditions may have touched the barks or seen the boiling or something equally trivial that appeals to his simple imagination and mind, although actually his own faulty mixture would be the real reason.

I have had Indians who said urali is a specific for toothache, but I have never seen it used. I have known, however, when a man has tasted it with no ill effect. I had some in a box of medicine which got thoroughly wetted on a journey. The case was opened to dry things out by a friend, who found the calabash of urali and did not know what it was. A medicine man tasted it

and at once pronounced it to be urali. How he came to know the taste, I never knew unless he had the habit of taking small amounts to give him greater success with the spirits he had to exercise. All my men said the poison was harmless, unless it came into contact with the blood in circulation. Here a very small amount is fatal, and I have seen a large monkey drop dead out of the forest roof in less than two minutes after being struck by a tiny arrow. Animals so shot suffer a minimum of pain and never struggle in death. The pain from a blowpipe arrow would be no worse than the half inch prick of a pin, or a hypodermic syringe. A monkey shows but little sign on being shot. True, he jumps at the impact and turns to brush away the arrow, but rarely scampers off. The pain is too slight to make him realise there is any danger. Naturally active and restless, he will wander into the next tree top or so, his movements gradually growing slower and slower, until, just as if he had gone to sleep, he slumps down on a branch and falls over dead.

Urali is the only compound of any degree of complexity that seems known to the Indians, but they all have a considerable knowledge of a number of simple vegetable poisons used almost exclusively in the killing of fish. During my residence, I made quite a lot of observations of such poisons as on occasions they could be extremely useful. These observations were confined principally to the Wapichanna tribe and they have at least sixteen different varieties of vegetable poisons which are in general use in killing fish. These range from small shrubs which they plant

in their fields, to lofty trees, and include several lianes. The parts used are the roots, bark, leaves, fruit or the entire plant according to which part carries most poison. There is a considerable range in potency amongst the different varieties. Some are very deadly and will kill every fish in the water. These are used to poison on a grand scale, say a pool with a surface area of approximately an acre, and with a depth of less than an inch at the edges, to eight or ten feet deep at the centre. Others however are much less deadly, and are used on much more restricted areas, while certain poisons only affect certain varieties of fish. When the roots, bark or wooden parts of a plant are used, they are well beaten by a wooden club on a rock. The mass is then put into woven palm leaf baskets and leached in the water to be poisoned. In the case of leaves or seeds, a hole is generally made in the ground in the form of a mortar and they are pounded and squeezed with a rough wooden pestle until they are pulped, when they are leached in the water as usual.

By far the most popular and most efficient of all the poisons is a stout liano, known to the outside world as Haiari, of which the Wapichanna recognise about five varieties through slight differences in colour of the wood, bark or leaves, and all showing a difference in potency. These lianes are found only in high forests, but the Wapichanna have combed their district so well that it is of rare occurrence, unless beyond the range of their customary hunting activities. In more recent years Haiari has become well known to science and its use as a valuable insecticide has

been conclusively proved. It is said to be stronger and more effective than Derris Root, but so far it has been impossible to secure it in sufficient quantities to be much beyond the experimental stage. In my earliest days, most of the Wapichanna cultivated one variety in their fields. This was the strongest of all the known Haiaris and was easily grown and made rapid growth. The poison in these lianes is distributed throughout the entire vine, and in the cultivated variety, roots, stem and twigs were all used. So far as I know, no one has started plantations with this variety on anything like an economic scale and there is a considerable field for the pioneer. The extract from Haiara has enormous possibilities as a spray in horticulture and many sides of agriculture. The juice of Haiara is used in the districts where it grows as a remedy for mange or scab in domestic animals.

When a Wapichanna makes a find of Haiari in his forests, the exact location is kept very secret until such time as the dry season has set in and the rivers almost stopped running. Then he discloses his secret, and a poisoning match is arranged at some selected spot where fish are known to be in quantity. A Master of Ceremonies is appointed, generally some elderly headman of considerable character and personality. He assumes complete control of operations and decides who shall, or shall not be invited. An expedition of some six to ten carriers is sent to cut down the vine. The whole plant is used up to small twigs, cut into lengths of rather over two feet in length and

carried to the rendezvous, where everyone must assemble at least one day previous to the operation if possible. Sexual continence is strictly demanded for some days previous to and during the ceremony as indulgence would seriously mitigate success.

If the selected pool has no exits or ramifications, operations can be begun without many preliminaries, but where a pool has openings connecting with other pools or a small stream of water flowing in and out; all such channels must be closed, otherwise the fish would rush out and escape. Walls have to be built across all possible exits. Where shallow, a rough cobble stone wall is built to just above water level but in the deeper parts, palm leaf retainers have to be used. In such parts as are deep, rough poles are erected and stones rolled up to keep them in position, the men even diving if necessary. Across these poles a few lianes are tied to act as laths and palm leaves are laid thickly over the framework on the side where the stream enters or leaves so as to utilize the current to hold them in position. The erection of these barricades may take a whole day or more, but is generally completed the night before the actual poisoning.

On the morning of actual operations, the usual light breakfast is eaten in the growing dawn and soon after the sun has risen, even earlier on occasion, the M.C. sends out a number of young lads to act as sentries at strategic points. Their duty is to see that no passing stranger or late arrival is permitted to approach, once operations have begun. They are allocated camping sites in the near vicinity, but on no account must they

view the proceedings, otherwise it would mean bad luck to the poisoning. When the M.C. later gives the "All clear" signal, these strangers can approach and receive their share of the spoil, but even then, it is not considered "good form" to appear in a hurry - no matter how hungry they may be. One of the first poisoning matches I attended was by pure accident, as I came across it unexpectedly, when crossing from one side of their country to another. Operations were in full swing and my carriers made for the camp assigned to them, but I thought I would go and see the operations. The sentry protested and finally rushed off to call the M.C. who came hastily up in a perfect stew about my unwelcome appearance. I argued that their regulations did not include white men and that my presence would probably help rather than hinder success. Consent was reluctantly given and I joined the party. A little intelligence showed me that by placing the poison in the deeper parts of the water, it would affect the greater number of fishes which would naturally congregate there and then allow it to spread to the shallows. The result was that the fish turned up (died) a couple of hours or more earlier than was usual; the pool proved to be better stocked than ih previous years and the catch was larger. In any case my reputation as a fish poisoner was made.

After placing the sentry guards, the M.C. next posts a line of guards armed with bow and arrows, clubs, spears, machettes or just the bare hands along or just behind the different retaining walls in order to secure any fish that either finds a way through

or jumps over as frequently happens. Outside the pool they can murder or kill all fish to their hearts' content in any and every way they choose, but on no account may anyone as much as touch a fish inside the pool until the M.C. gives the signal. They are very strict about this rule unless in the case of certain fish that are dangerous. The various species of perai can cut off a finger or toe, or can take a chunk out of a limb at a single bite, and are mercilessly clubbed and thrown aside. The Stingray is also awarded the same fate and a few others, but it is only such fish as are rarely or never eaten and are a potential danger, that may be killed. I once killed a few choice fish while operations were in full swing just to see what they would do. It drew down a nice lecture from the M.C. and the discouraging scowls of everyone. Later on I asked to have these fish cooked and not a soul would touch them although they were all choice quality, nor could I give them away. When everything was over they were left lying, to be eaten by the carrion crows and various hawks that assemble as soon as they get the chance and devour all discarded fish and such tiny minnows as are beneath the notice of even the children.

While these various guards are being posted, the carriers bring the baskets of Haiari out on to some convenient rocks in or as near the pool as possible, where it is at once attacked by some half dozen hefty men who, armed with long wooden clubs, beat it into a massof strings. The poison element is held in the cells of the woody fibre of the stem, and the more it is pounded the more poison is liberated. The wood is tough, but

fairly soft, and at first breaks up into a stringy fibrous mat. The spare men, women and children now put the beaten lianos in roughly woven palm leaf baskets and go out into the pool. The children keep to the knee deep shallows, the women go farther out to neck deep water, while the men swim the deeper parts dragging the baskets behind them. Everyone dips his or her basket under the water to ensure complete saturation, then lifts it in the air to allow the water to drain out carrying with it a considerable portion of free poison. For the first few dips, the water falls back a decidedly milky colour, but soon it becomes crystal clear, when the baskets are taken back to the rock and the fibre given more beating. Repeated beatings and washings go on until the poison is exhausted, or the M.C. decides the operation has gone far enough.

As soon as the fish begin to feel the effect of the poison, they make for clean clear water if possible, hunting every possible avenue for an exit. Numbers approach the barricades and quite a few jump clean over and there excitement begins amongst those on guard. The great majority of the fish, by expanding the air sac, rise as near to the surface as possible, but keep darting away at anyone's approach, but they soon turn over, side or belly up, and float helplessly around until they die. The M.C. keeps going round, directing poison to be dropped here or there as he thinks necessary, and supervising generally. At length he makes a ceremonious round of inspection where upon all operations are suspended as this may mean the signal to commence collecting the fish. If satisfied that the fish are completely

were well wooded all round, so as to prevent the entrance of cattle. It was, however, only possible to do this when operations were on a grand scale. Small individual poisonings near their homes could not be restrained or regulated and considerable numbers of cattle were lost every year, and there was often considerable friction on this account at times. One rancher doubted that the poison would affect cattle in any way and he gave his own staff permission to poison a pool close to his yards and at which his cattle drank every day. Next day, when he found nineteen out of his twenty milch cows lying dead by noon he realised his mistake. The afternoon was spent erecting fences round the pool to prevent further accidents and subsequently a claim was laid before the local Government officer for damages, as the poisoning had been done by Indians who should have known better. He, however, received a very stern lecture on his own account. When trekking across country with few water holes, the traveller has to be very wary of such as he meets. The Indian carefully scrutinises the weed or grass grown edges where the tiny minnows love to hide. If none are seen, it means the pool has been poisoned and even if it has been weeks or even months ago, it is unwise to drink. I have known some severe attacks of diarrhoea result from unwittingly drinking poisoned water, weeks and weeks after the poisoning had been done.

When the fish have all been collected, each family assembles at some favourable spot where they commence gutting and taking off the scales. The first fish treated, naturally

go into a pot to provide a good meal all round as everybody is now hungry, since no food is allowed during operations and it is probably some time past noon. The surplus fish are promptly placed on a barbecue for curing and drying. A barbecue is made by planting 4 to 6 forked upright poles in the ground to reach a level of about waist high. On top of these forks a grid of slender saplings is built, and a large fire started underneath with wood that gives off a minimum of smoke. The fire is kept going continuously, probably all afternoon and all night, until the fish are completely cured, when they can be packed into baskets, and the crowd disperse.

The numbers of fish killed in these poisoning affairs is truly astounding. A biggish poisoning would have about 20 adults, which with 5 to a family means 100 persons all told. The average catch will run well over 100 pounds of fish per family making roughly one ton of fish, but this may be doubled or more in some of the really large affairs. On the average, I doubt if these fish would scale more than half a pound each. Thus probably 4000 fish or more may be killed at a single poisoning. Much depends on the numbers of fish trapped in these pools when the dry season sets in. I have cast-netted a small circular pool not more than 15 yards diameter and have caught roughly 50 lbs of fish every week for some six weeks in succession. Fortunately the rivers simply teem with fish from the sea to their sources, and each year during the floods of the rainy season, every pool is replenished.

The Macussi used to stage the largest poisonings of fish

I have ever seen. Their territory abounds with large lakes along their river, in which enormous quantities are trapped. Some of these run into acres in extent, and resource has to be had to dug-outs and woodskins to distribute the poison as also to eliminate danger from the more voracious fish, the stingrays and huge alligators that abound in these pools. In certain parts of the forests controlled by the Macussi, there are almost inexhaustible reefs of Haiari poison, and I have repeatedly seen long line of carriers, well laden with the liano, converging on a certain lake where several hundred people would assemble to take part. In Macussi country there are large numbers of a huge fish - the Arapaimagigas - which may often scale 400 lbs or over. These fish rarely succumb to the poison, although generally it affects them to the point of becoming "drunk" as it is termed, when they rise to the surface for purer water. No self respecting Macussi will eat this fish, so he is rarely if ever molested or shot. If an Arapaima appears on the surface it is considered great sport for the children to ride on its back. A woodskin cautiously draws alongside the bemuddled fish and a naked boy, anything from 9 to 13 years of age - jumps astride its back. The idea is to grasp the fish with the arms and to see who gets the longest ride. Most of them are thrown as soon as they touch the fish. When the fish is exceptionally sluggish and a good grip is secured, the urchin may be carried below the surface of the water and finally reappears quite a distance away. In strict Macussi etiquette the collected fish

belong to no particular person. Each person carries his catch to a special place, where the fish are sorted out according to species and placed in separate heaps. When the poisoning is finished, the fish are distributed so that the representatives of every family receive their proper quota of the special, good or inferior grades, after which the pots and barbecues get going.

Alligators of various species are found in all the rivers. Several of the smaller varieties are eaten and the eggs of all are esteemed a delicacy. The larger variety - known generally as the Kaiman - grow to a huge size, ranging anywhere between 12 to 20 ft in length. I know of no tribe which eats these brutes, for not only must they be pretty high smelling, but it is almost an impossibility to kill them with the weapons at the command of the aboriginals. They are very powerful and I have been dragged around helplessly in a fair sized boat, when I had got one on the line when fishing. I have known of several deaths amongst the Indians who were caught unawares, and have witnessed some very narrow escapes. I knew one Wapichanna boy quite well who went shooting fish along the margin of a lake where lived a few of these monsters. An arrow he had fired missed its mark and stuck in the mud of the shallow water. The boy waded out to retrieve his arrow in water little more than knee deep. A huge Kaiman must have been lying hidden for the man was suddenly seized by the legs and carried off into deep water. The man's companions fled to warn the camp but nothing could be done. Next day a spot at the edge of the lake was found littered with loose beads

and a few broken bones. The beads were recognised as those from necklaces round the lad's neck. Travelling up country, my boys once made the mid-day camp in an inlet that held dozens of these huge brutes. We had scarcely begun our fires when a contract boat manned by some 20 negroes arrived for breakfast also, but they decided to make fire on the other bank of a small stream so as not to mix with my Indians. Amongst other things, the negroes had to throw ashore a large bundle of folded tarpaulin in order to get down to their supplies. Both camps served breakfast simultaneously and we were all quietly sitting eating, when a Kaiman broke water by the side of the negro boat. There was not a single gun which had been landed, so we all sat quietly to see what the brute would do. His attention was drawn to the tarpaulin and presently he began to gather it into his mouth. When he had got a good hold he suddenly whipped round and dived in the lake carrying the 50-80 lbs bundle with him. The rest of the day was spent dragging the place with hooks but the tarpaulin was never recovered. These Kaimen generally have a cave in which they place anything large that they may capture until they feel inclined to eat. My Indian captain offered his quota of consolation tomthe negroes by telling them that he was sure the Kaiman had taken the tarpaulin to make a suit of clothes for himself. In those days clothes were just becoming popular amongst the Indians. Owing to enormous strength and size, a Kaiman is pretty well monarch of all he surveys, either on land or water, yet there is one animal - the otter - that can overcome him. The Indians say that when the Kaiman comes out

to bask on the sandbank - a favourite stunt - a pack of otters has been known to attack and kill him. The otters carefully keep away from his mouth and concentrate on his legs and toes. The brute does not seem to have the sense to make for the water and submerge. He whips round to catch such otters as have attached themselves to his toes and legs. He soon gets exhausted on the hot sands and finally they chew off his limbs and he dies. Once when travelling in a lonely river, we found every evidence of some great struggle on a sandbank and one foot of a Kaiman. The Indians reconstructed the scene as that of a fight between him and the otters. I have, however, never witnessed one.

Apart from the Haiara, they have quite a number of other lianos and shrubs that are poisonous to fish, but these are weak in their effect, bulk for bulk, when compared with Haiara. They are used more locally in the pools of the small creeks near their homes, the net catch from which will only be a couple of potfuls or so of fingerling fish. It is these varieties that much more often kill the unsuspecting cow, as the small creeks are seldom wooded along their course. Most Indians grow or cultivate a number of fish poisons, - the Wapichanna have at least six. The quantity, however, seldom goes beyond an amount sufficient only for occasional use, and again on a rather small scale near their homes. These poisons are all pounded or pulped, and used the same way as Haiari, but there is one that deserves mention - the Kunan or Konani. The leaves, fruit, flower and the very tender twigs are grated down to a pulp,

which is mixed with a certain amount of bitter cassava pulp. This is wrapped in green banana leaves and gently roasted amongst the embers of a good fire. When being used, it is made into pellets about a quarter of an inch in diameter and thrown into the river around some tangled boulder strewn place, knee to waist deep, with rapid running water, which is known to be the resort of certain vegetable feeding mullets. As soon as the fish takes the poison in his mouth, he rises to the surface where he dashes around in the most crazy manner to eject the mouthful. More and more fish rise until every pellet has claimed a victim. The instant a fish appears, everybody dashes in to secure it; another and another appears and they separate until every person, bare hands the only weapon, is hunting on her or his own. The madly rushing fish offer no target for the arrow and soon you have a crowd of shrieking, laughing people, racing, stumbling and diving all over the place, all eagerly trying to secure fish. Should the fish succeed in throwing out the poison, he recovers almost at once and disappears, hence the need for haste. On the other hand, if the fish is not successful in ejecting the poison, he dies very quickly and as such fish deflate the air sac as they die, they soon sink and are lost. Time and time again, I have barked my shins badly in a mad endeavour to get my fish. There is great rivalry amongst everybody, and I know of few more exciting aquatic sports than poisoning fresh water mullet if they are plentiful.

All Indians love to eat fish and each tribe has developed its own technique in their capture according to the circumstances in each district. This love of eating fish may to some considerable extent sway their mode of living in the face of approaching civilization. When I first met the Wapichanna the blowpipe, although not made by themselves, was common, the bow and arrow universal, and a gun the rare exception. In little more than 20 years, the proportion was just reversed. The gun was universal, the blowpipe extinct and the bow and arrow of only secondary importance. Since the arrow, however, is the only common possible method of procuring fish for daily consumption, the use of the bow and arrow will always be general. Their arrows have undergone considerable modification in form and variety. The old bone arrow points are no longer made, as also many of the varieties for different types of game, many of which had their own particular arrow. The arrow is now useful only for shooting fish and common iron points in various forms, being less liable to breakage, are now in general use.

The same may be said of the Macussi tribe who live in similar environment, but a difference is found among the Arecuna and Patamona tribes, who inhabit a rugged mountain range whose peaks run up to some 8000 feet in altitude, yet little more 50 miles distant. The rapid descent of several thousand feet in such a short distance, largely over high perpendicular falls, prohibits fish of all kinds ascending to their country. There are, however, a few small fish in the district probably the

survivors of the days when these sandstone and conglomerate mountains were under water. When a party of these Indians finds one of these three inch fishes in one of their crystal clear streams, the excitement is as great as if a meteorite fell in Trafalgar Square. The principal weapon of these tribes is the blowpipe in conjunction with urali poison - both of which they manufacture extensively - while the bow and arrow are of very minor importance. Should commerce or industry ever place within the reach of these people the elementary amenities of the outside world, the gun would completely oust the blowpipe and bow from use.

The Taruma live on fish to a greater extent than any other tribe, due to their scanty numbers, who all live along the banks of a fine broad river which is heavily stocked with fish. They use the bow rather rarely and depend more on the hook and line for supplies, and are by far the most expert fishermen I have met. They use a wonderful range of bait, running through the flesh of beast or bird, fruit, flowers, and coloured feathers. They imitate accurately the fall of various fruits in the water, in order to attract and deceive fish which have a fondness for these different varieties. How often have I envied the sensitiveness of eye and touch of the Taruma, when I have seen them jerk fish after fish into their corial, whereas I could feel and see nothing and would raise my hook to find the soft ripe banana used as bait had been gently eaten. At one time the Taruma made their hooks of bone - Old Bushdeer told me - but the steel ready made ones obtained through barter now supersede these

and I never saw any. Unfortunately, the Taruma are almost extinct, but had civilization come their way, the bow and arrow would have disappeared and the gun and rod been the accepted methods of supplying game.

The Waiwai live largely on the extreme sources of small creeks, but with a landing place and corials on a navigable river some hours from their villages. They eat few fish by comparison, and their technique is confined to steel hooks, a few traps and occasionally the bow and arrow, generally for the killing of only certain fish of which the Haimara is the most desirable. Their huge bows, often as much as 7 to 8 feet in length, and their various arrows, have been developed principally for shooting game on the land or the leafy roof of the 200 feet high forest in which they live. Harari is common in Waiwai territory, and I once staged a poisoning match as I had some twenty Wapichanna and Taruma carriers with me. My men did all the work and the Waiwai did not seem much interested at all. Let a shout of "wild hog" go up, however, and any Waiwai village will be completely depopulated in three seconds. When guns become available, the Waiwai will in a single generation, come to rely solely on them for shooting, and their other weapons will completely disappear, or become so modified as to be mere toys in comparison with the beautiful and popular weapon in use during my various visits.

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## Piaimen.

Every tribe of Indians possesses medicine men of some degree of qualification which may range from the making of passes over some sick person to the ability of ranging in the spirit and the killing of such demons as are detrimental to human life and welfare. The former are common and may be found in practically every village, but the latter, generally known as Piaimen, only come into being after considerable practice or as the result of a chain of circumstances. Piaimen have to be made and seldom reach the Harley Street status until fairly late in life. It is very rare to find a son following a father in the profession, a contradiction to ordinary tribal procedure where it is general that an expert father passes on his knowledge most easily and readily to those of his own family immediately under his own roof and control.

At the commencement of some ordinary complaint such as a bad cold or an ache somewhere, little attention is paid at first. When however the illness grows worse or continues for a length of time, it is customary to ask some virile adult, or one of the elderly men who already has a reputation, "to blow" on the patient. When a man is asked "to blow" on someone, he generally makes and lights a cigarette, and after a few puffs to ensure that it is going properly and also for a moment or two of serious concentration, he goes over and squats on his heels or sits down on one of

the low stools in general use - often the shell of a land turtle, - alongside the hammock of the patient. He then takes a long noisy inhalation through the cigarette, drawing in the smoke to the full capacity of his lungs. He now exhales the smoke in short puffs on the spot where the pain is located, muttering incantations in an undertone with each puff, and ordering the spirit of the pain to leave the body and go elsewhere. The invalid is never blown on with more than two or three exhalations in succession, and the blower retires to his hammock or such duties or work as he may have on hand. Should the blower be a non-smoker, or tobacco not available, the blowing is done with the ordinary breath in much the same manner. Men are generally selected, but women blow on invalids also, generally in the case of ailing babies and children, but they seldom if ever use smoke. Young lads may be asked to blow when capable adults are not available and in their cases the results are carefully noted as anyone may have the makings of a celebrated curer of disease. I have often been asked "to blow" on sick people, particularly little children, but realising that the method had no actual value beyond the psychological in the case of grown-ups I always refused. I preferred to prescribe such simple medicine as I had at command and which were of much greater assistance.

Some men, through a chain of lucky recoveries, acquire quite a reputation for "blowing", but they are by no means what

are called piaimen, however successful they may be. Success acts as a stimulant however, and soon a man may begin to pretend and probably actually believe that he has the ability to cure through supernatural means, and he takes his first step towards entering the ranks of the amateur piaimen. Gradually he assumes credit for marvellous cures. His successes become generally known; his failures are simply put down to the influence of some strong piaiman working against him, or directly to Kenaima or evil spirits. Gradually he receives requests from further afield, his influence and experience extends and he goes deeper into the mysteries of the cult. He may or may not consult with another piaiman, but as these are generally very jealous of their profession, I fancy it is rare. I have only known of one such instance where two brothers became well known piaimen, in which the elder taught his small brother what he should do. Anyone can, however, attend at a seance and in this way acquire a fair knowledge of the procedure. Every Indian knows these, or at least the more obvious and the budding piaiman can easily do something new so as to go one better than the other fellow, and thus impress his fellows with his ability. A few lucky recoveries again, and the piaiman's success is assured and he is a made man with a large clientele ready to pay for his every service.

Most men become piaimen voluntarily; others again may be forced into the profession against their own wish, probably

through some boasting admission in a moment of exhilaration that they can deal with spirits when they already have a certain notoriety and success in "blowing". One of the first men I employed amongst the Wapichanna was a young married man who was the best weaver of baskets in the tribe. I was interested in this work, and I got him to teach me everything he knew, and although he was a very shy reserved fellow, in this way we became great friends. He became much attached to me and was at great pains also to teach me much of his language. He was also a well known "blower" and as he accompanied me round the tribe on various tours of inspection, he had abundant opportunity of extending his practice. He was very successful, too successful, in that he drew forth the jealousy and rage of an already established piaiman who soon spread it around that some deaths in the tribe had been caused by wrong blowing by my friend. As it happened, some of these cases were far afield and the boy had never been within miles of the village. The boy was horrified as both his desire and performance had only been for good and in line with tribal practice. He retired to the depths of the forest and only came out once a year to see me, but the tale had gradually gone the rounds that he was dabbling secretly in the occult, and would soon become Kenaima or evil spirit. Eventually he did become a piaiman and had a fair reputation.

A piaiman of this description with a genuine desire to help those in sickness can add to his usefulness by assuming

some degree of control over the supernatural as it definitely has a considerable psychological effect on his patients, through which they accomplish some of the marvels so frequently brought to the notice of the outside world. I have never in all my experience known a piaiman do anything that could not be explained and most of the people cured would have recovered in any case. Periodically, a case can occur where the will to live has been started by the removal of the dread of Kenaima from the patient's mind or psychological effect through the piaiman's efforts.

There are men who take up the profession of,piaiman from a very different angle. I have in mind one or two who were simply lazy vagabonds with a boastful domineering disposition and who definitely began to experiment in the occult simply as the means to their own selfish ends - easy money, unbridled licence and occasionally, revenge. Fear of various aspects of the unknown and the spirit world is an enormous factor in all primitive minds, a fact that can be largely traded on by the unscrupulous and the "get rich quick and easy" type. An Indian can begin his reputation as a piaiman by hinting that a certain death has been caused by his sending out a Kenaima. His neighbours put two and two together - the budding piaiman and the deceased were bad friends - and make five ! He may hear of some person very ill and foretells a death which becomes true. Once it gets generally known that a man holds the power of death at command, his prosperity is assured. Any sick person

prefers his skill backed by a pious hope that a large fee will induce him to drive off or kill the Kenaima which this man has himself sent. His services are in request as a piaiman and from every house he enters he will also receive gifts, voluntarily given him in an endeavour to purchase his favour, and immunity from the dreaded Kenaima. No one dares to refuse his slightest or most exorbitant request, and he is feted and fed wherever he goes.

A bad piaiman soon passes into the Kenaima however, and as such his career is rarely long. The man openly boasts he can cause death over scores of miles to anyone that incurs his displeasure. This must be through the means of Kenaima, therefore he himself must be Kenaima. Kenaima are spirits emanating from some corporeal body somewhere. Here, right to hand, is such a person and the sooner he is killed the sooner will cease the epidemic of Kenaima. He may be dangerous, but it is merely a question of time before some Indian, deeply moved through the loss of some loved one, will vow to kill him. Special weapons must be prepared. The Indian knows he is fighting with a man armed with the supernatural, and the ordinary arrow or gun will be of little use, therefore he makes some arrows that will cause the greatest amount of damage possible, generally from the joints of large bamboo, which on striking a bone, mushroom and cause dreadful wounds. If a shotgun is used, double or even a heavier charge of gunpowder is poured into the muzzle loading type in general use. Chopped up nails, bits of wire, pieces of iron

or even chips of stone are used as shot. Not infrequently the gun is so overcharged that there is considerable danger of its bursting, and I have known a case of a piaiman so shot (and at close quarters) recover, simply because the gun was imperfectly overloaded. The piaiman is generally ambushed and shot without warning. In the case of such violent deaths one naturally abhors the means used, yet I must admit it removes an objectionable feature that has become a source of danger not only to the happiness and security of the tribe, but to the life of such members whose mental and physical qualities are closely allied.

I remember the case of one man, admittedly of a rapacious, domineering type, who for some years had been the scourge of the Wapichanna and who had long been classed as Kenaima of the first water. Finally he either claimed, or was given the credit of killing a little child. The parents felt their loss very acutely and the father made it frankly public that he was going to shoot this bad piaiman. The rumour spread until it reached the ears of the man in question, who to everybody's surprise, ordered his family to get ready to accompany him, as it was his intention to pay a call and settle matters with the outraged father some 40 miles away. When about 3 miles from his destination the piaiman was met by two women who warned him that the dead child's father was lying hidden in a swamp just ahead with the intention of shooting him. He made his wife and family stay where they were, while he, gun in hand, went ahead to investigate. Soon a shot was heard and the wife rushed up to find her husband lying

dead on the trail. I had to investigate the case, and the evidence showed that the man who fired the shot had risen clearly above the tall grass where he was hidden, cooly taken aim and fired. The piaiman was walking with his head down and paid no attention when his assailant rose a few yards off and must have been plainly visible. The man was shot at a distance of not more than 12 to 15 feet. I have never understood the mentality of that man, who walked straight to certain death without using average Indian intelligence or lifting a finger in self defence. It is certain that once the man had publicly threatened to kill him, his bluff was called, and he must do something to keep his reputation, yet he need not have left his home in the first instance and he could have turned back after having received the warning of what lay ahead. Most piaimen harbour the belief that they are invisible at such times as they care to be so, as when they travel over large distances and visit homes and villages during a seance, and the piaiman in question may have thought this might be his case in the present instance.

The life of a piaiman is at best hard and strenuous, and the better and more successful he is, the worse it is, as then his services are in almost constant demand. The long seances he must conduct - invariably at night - may mean anything from 3 to 6 hours of yelling, shouting, and singing with a considerable amount of acting and bodily and mental excitement. He is popularly supposed to drink a quantity of tobacco

water during the performance, although most if not all of them evade this by some trick or other. I have known piaimen almost too hoarse to speak the next morning. Most of them are very much the worse for wear and generally go home for some days to recuperate, before conducting a fresh seance.

My opinion of a piaiman's seance is that it is the last thing on earth that the traveller wishes to be within earshot of, apart probably from a first experience which naturally is interesting. The piaiman deals only with evil spirits - Kenaima - and everyone believes that only the spirit language must be spoken in the seances. This language must naturally be different from that of the tribe, as no individual tribe will admit that they possess or have at their command Kenaima of any degree. The evil spirits invariably come from outside: a neighbouring tribe probably, but more often from one many days' journey distant, and of whose language they are completely ignorant. Thus the Kenaima must possess a peculiar language of its own and that the piaiman is supposed to know! The language of any known tribe being ruled out, he is thrown back on his own ingenuity to create one, especially as speech is a recognised method of striking fear home to the heart and mind, and the louder and more forcible, the greater amount of intimidation. A piaiman is reduced to his own imagination and inventiveness in the matter, and as this is but poor in even the best, he has to fall back on all the strange and peculiar sounds

he has ever heard during his life and to reproduce or caricature these if he wishes to be original, failing which he has simply to follow, in large measure, the sounds and methods of his fellow piaimen.

One man who heard the chug chug of a train starting, made quite an impression by including the sound in his spirit language. Again when the first sheep were introduced amongst the Wapichanna and their baaing caught a local piaiman's fancy, his chief form of spirit language became a loud imitation of the sound interspersed by way of variety with every other weird sound he thought fitting.

The greater part of every seance is therefore enlivened by the most grotesque and unintelligible sounds the performer can command, uttered in an almost inaudible whisper at one moment and the next at the utmost pitch of his harsh raucous voice. The whole seance is a bedlam of meaningless yelling, interspersed now and again with sentences in the tribal language to inform his audience of his progress among the spirits. This may be kept up from dusk to midnight, or longer, and when the traveller comes off a long wearisome journey, late in the evening, to find a seance is being staged that night in the only house where he can find shelter for miles around, his thoughts, in view of a certain inability to get to sleep before midnight can be imagined.

As an example of such a seance I describe below, one at which I was present during the whole proceeding with the

piaiman only a few feet away from me. The patient was a woman not more than 30 years old who had been sick off and on for some time. It was considered practically certain that she was suffering from the attack of a Kenaima, and the piaiman was sent for. He arrived about mid afternoon and after the hospitality and welcome, he started a series of conversations with every adult, adroitly bringing in the case of the woman who was sick, with whom he also had a long conversation, when he took the opportunity of "blowing" smoke on her as a preliminary palliative prior to the seance proper. In the course of these conversations he had received the public's opinion as to just how and where the Kenaima had stricken the woman, which gave him a definite line to follow during his operations and his diagnosis of the case, which would fit in with popular opinion and draw forth the customary "I told you so".

A little before sundown, two youths were sent out to cut a couple of handfuls of selected twigs about two feet long, well adorned with tough rustling leaves that would give out a good sound when shaken. These twigs were firmly tied at their base into two separate bundles just large enough to be easily grasped by the hand. One of the elderly men of the village had meanwhile been chopping up a few ounces of strong tobacco, which was put in a calabash filled with water and set aside to soak.

In the gathering gloom of night, the whole village

assembled in the house where the invalid was lying in a hammock. It was a tiny hut and the place was soon packed with people except a space of some six feet in diameter immediately in front of the patient. In this place an empty box was turned up as a seat and between that and the patient was placed the calabash of tobacco flanked by the two bundles of twigs and leaves. Presently the piaiman entered and took his seat on the box. The doors and all places where light could enter were closed while the piaiman spoke to a few of the men and got his bearings, then he ordered, "Put out all lights", whereupon the fires were promptly blacked out with water. The piaiman then began singing in a rather low tone of voice some of the wordless tribal tunes that are common. Some half hour of this and we heard the gurgle of the tobacco water. It was absolutely pitch dark, but it sounded more as if he had put his lips on, or just under the surface and was blowing bubbles instead of drinking it. The piaiman had gradually been raising the pitch of his voice until he was singing at the top of his voice. Soon he slipped into spirit language and began caricaturing various animal sounds. He had also taken up the bunches of twigs which he shook violently in the air or forcibly beat the floor. He was now in full force, yelling at the top of his voice all the meaningless and wholly unintelligible sounds in his repertoire. Presently he altered his voice to a deep guttural, his face close to and

probably almost touching the ground. Then he resumed his ordinary voice, which began to rise in the air from a lower to a higher level. As the sound ascended, it decreased in volume and the rising leaf shaking gradually became fainter until the last whisper died away, and the final almost inaudible shiver of the leaves sounded high in the air.

This particular piaiman had a wonderful reputation for his ability in ventriloquism, even amongst various white men who knew him, and which accounted for my presence there that night. He had, however, not the faintest knowledge of the art. Certainly he altered the pitch of his voice, but his ability to "throw his voice" was due to his speaking with the lips at as near ground level as possible, gradually rising erect and finally standing on tiptoe on top of his seat with the bunch of leaves held high over his head, lowering the voice and the quivering leaves as he rose until both became inaudible. To the credulous it all sounded very strange and mysterious, sitting there in complete darkness on a mud floor packed to touching point with Indians on every side. The performance would never have stood the light of day as an exhibition of ventriloquism as I could distinctly follow the ascending sound without a break, with my eyes so to speak, until my head had to be bent backward in the endeavour to locate the last dying quiver of the leaves.

A tense silence now ensued, then a few whispers were

heard in the audience. "His spirit is now ranging the distant mountain tops". "He has now gone away amongst the spirits". "He has gone hunting Kenaima", and such like caught the ear. The silence seemed terribly long, long enough for everyone to move around and re-arrange his cramped limbs and distract the attention from the last focus of the disappearing voice and rustling leaves, but at length a faint rustle of leaves began slowly and gradually rising in intensity. A whisper was soon heard also growing louder in pitch and lower in altitude, until the piaiman was back on terra firma with a loud voice and some hearty thumps on the ground with the leafy twigs. Then he told the crowd where he had been, how he had crossed the mountains and how over the top of a far distant range of mountains he had met the evil spirits, - Kenaima of a tribe living hundreds of miles away. They had evaded him and managed to hide, and he had hurried back lest his audience be caught unawares and unprotected. Complimentary remarks were now showered on him by everyone, encouraging him to return to the spiritland where it was everyone's opinion his well known ability would surely be crowned with success and the patient would recover.

When plaiting their baskets all Indians have a habit of taking a mouthful of water and then blowing it back out of the mouth in a fine almost mistlike spray over the work in hand, when the moisture tends to keep the various strands securely in position. The piaiman began taking very audibly a mouthful or two of the prepared tobacco juice, blowing it all over the

open space around him and across the patient's body. Some of it came over the audience to their discomfort; my own included, but no one dared remonstrate. That which fell on the ground would soon disappear in dust under the hammering of the threshing leafy twigs.

The piaiman now repeated his previous manoeuvres, gradually fading away into space as symbolised by the diminishing sound of voice and quivering leaves. This time I had got into a more comfortable and favourable position and was able to sit out the long silence in comparative comfort, with my eyes focussed on the invisible point where the last rustle had been heard. The long tense silence was without the slightest warning suddenly broken by the resounding thump of bare feet striking the mud floor with force, followed almost immediately by the violent whack whack of leaves striking the earth, but not before I noticed the long downward swish of these leaves through the air as the piaiman jumped off his box to land on the floor.

In a loud voice, quivering with excitement, the piaiman shouted "I have caught the Kenaima", and immediately every person in the room began shouting at the top of their voices, "Kill him ! kill him !". There now began what sounded like a glorified dog fight. Men, women and children were shrieking and shouting encouragement in strained unnatural highly excited voices. The piaiman now had two parts to act: the most terrible

squeals of pain from the Kenaima as he received blow after blow from imaginary weapons in the hands of the witch doctor, intermingled with a running fire of yells in a completely different tone of voice from the piaiman himself, imitating and caricaturing every weird sound he knew - a cow, sheep, donkey, anything so long as it would intimidate the enemy, and keep or raise the excitement amongst the audience. Amongst all the noise there could also be heard the handfuls of twigs violently beating the earth and the heavy impact of bare feet on the floor as the piaiman sprang hither and thither to give reality to a desperate struggle with a powerful opponent.

The Kenaima was reported as weakening, his squeals and groans grew fainter until with one long quavering wail he sank quiet. Complete silence also fell on the crowd until the piaiman in a harsh but almost natural tone announced "The Kenaima is dead", and one heard on every side the long whistling indrawn breaths and sighs of the entire audience. Conversation became general and we were informed how the piaiman had met and caught the Kenaima, and a number of details of the actual fight, none of which of course could have been seen in the dark. After half an hour or so of this, a man - one of my own personal boys - said as he had been away from home for some time he would be glad if the piaiman would visit his distant village and see that all was well with his family. Nothing loath the piaiman agreed. We were treated to another

exhibition on similar lines, another dog fight and another dead Kenaima. Another stranger in the village asked a similar favour with the same result - another dead Kenaima, and the seance was over. It was now well past midnight. The piaiman must have been near the point of exhaustion and his audience sleepy, stiff and cramped so everybody sought his hammock.

The whole affair was really a well staged, dramatic and most realistic play. In absolute darkness and surrounded by mass excitement there is every excuse for an onlooker attributing the marvellous and incredible to the performance. Certainly the Indians believed the whole thing to be absolutely real and true, but I doubt if the piaiman believed in it himself. At his first few seances the man must know he is simply staging a hoax and he realises his success depends on the ability to carry his audience in the accepted field of excitement. The beginner rarely can do this, but the Indians are tolerant and he continues to practise, often amongst his own family. At each attempt he acquires experience and confidence until success does come. I remember one young piaiman who for years was an almost complete failure. Certainly he killed his Kenaima at every seance, but he could not hold his audience nor could he raise the excitement and realism to a proper pitch. Eventually he became a fair success however, but the seance given above was one conducted by a very famous piaiman at the height of his popularity.

Even if the piaiman knows at first that he is merely play-acting and that the whole thing is make-believe and fake, I do think eventually he comes to believe his performance is genuine. It is little short of marvellous how the mind can deceive itself in time. Every Indian believes just as firmly in spirits - some good but mostly bad (as our own "Deliver us from evil") - as those in civilization believe that there is a God in Heaven and a Devil in Hell. With this solid foundation it is easy to raise some system to counteract the evil. His first awkward uninitiated attempts were more a feeler in the dark, but gradually he develops personality, the methods of controlling the feelings of the crowd and with it success and a definite knowledge (surpassing belief) of the genuineness of his performance.

Early on the morning after the seance the sick woman was up before the sun and busy preparing food. She was quite lively and in answer to my enquiries said she was perfectly well. "I am completely cured but have not yet much spirit", were her actual words. The piaiman however seemed rather the worse for wear; something after the nature of the 'morning after the night before' and an exceedingly hoarse voice, but he soon got down to business. The husband of the woman who had been cured had to pay, and pay handsomely for the piaiman's services. Then on the plea that if the Kenaima had not attacked that particular woman, it would certainly have been another woman, probably So and So's wife, naming a good hard

working villager, and So and So had to pay. Then my boy had to pay for his Kenaima as also the other stranger, and it was not long before every responsible person in the village had contributed some article of barter or necessity of life to the piaiman's empty bag. They paid up quite cheerfully. Life at best was uncertain, but meanwhile they had got a short respite granted, and their little world had been cleared of all danger for the time being. It was cheap at the price, although it still meant unceasing vigilance on their part at all times to ward off new evil spirits that might creep up at any moment unseen and unheard to destroy them.

The foregoing is a description of the straight killing of a Kenaima, but there are many other forms in which these can injure the human body. A piaiman may decide the spirits have introduced some ordinary object in daily use into such parts of the body as the patient declares he feels pain. Amongst the commonest of these is the introduction of a rusty fish hook or an iron arrow point into the bowels via the anus or into the chest or head via the mouth or the ear, the former when the patient exhibits severe abdonimal pain; the latter in pulmonary troubles accompanied by pain and the spitting of blood, or some inflammatory and painful trouble in the head. The piaiman must remove these as well as kill the Kenaima, which generally means considerable pawing of the patient in the region of the pain or the organ of entry. Such arrow point or other

substance is of course completely invisible to all but the piaiman and he carefully hides it away in some safe place by a spirit journey to the top of some mountain many miles away.

After a seance, the piaiman interviews the patient the following morning. If there has been a definite improvement, all well and good, but if the patient is still as bad or perhaps worse than previously something must be done. With practically no medicines at his command, the piaiman is limited to what the sick person takes either by way of drink or food. Beer in any form is generally prohibited and clear water in which a few leaves of some aromatic or acid shrub has been broken, only allowed. In the case of food, the patient is generally put on a very strict diet both in range and quantity, probably some tiny fish or a small bird being the only solid allowed. The scissor-tail bird is a favourite object of diet amongst piaimen and I have often seen a whole village scouring their district in search of the bird. Its little body is not larger than that of a small swallow and a good number are required to satisfy a hungry patient, once convalescence has set in.

It is very hard to define or forecast the effect of illness on any Indian I have known, and I have seen some very nasty accidents which would in ordinary life have necessitated a long visit to a hospital, yet in a week or two with little or no attention or remedies, they would be all right again. A young man in my employ was making fire by striking a por-

cussion cap on the sharp point of his ramrod with a new quarter pound flask of gunpowder. The iron point struck with too much force, pierced the flask, and the gunpowder exploded in his hands and burned the crouching naked body of the Indian. It was twelve hours later when I arrived to find the lad in very bad shape. His naked thighs, abdomen, chest, neck and face had received the full blast of the explosion and were simply one massof huge blisters. Fortunately he had closed his eyes at the moment of contact, and his sight was uninjured. I made a lotion of some oil and antiseptic which I had, and treated him for four days to the best of my ability. He must have suffered agony, yet he never once showed the slightest sign. On the fifth day to my consternation he calmly walked off to his village to be with his parents about forty miles away and within a month he was at work again.

In other cases a person may develop some very slight trouble to all appearance and die in spite of all that may be done for him, especially if he thinks he is the victim of Kenaima. Once a man is certain in his own mind of his being under the influence of Kenaima, the best thing to do is to clear his mind of the dread and the piaiman is the best remedy. The physical side of the Indians seems very closely allied to the mental, and it is here where the piaiman makes his marvellous cures. The patient knows the Kenaima has been killed, before his very eyes so to speak; the ambition to live

revives and quite frequently he recovers. Of course all men must die, and there are almost as many occasions when the piaiman is called to cases which are completely beyond all aid or help. Here the piaiman has dozens of loopholes. They were too long in calling him and the wounds caused by the Kenaima were so severe as to be fatal, or another Kenaima sent by some new enemy had entered the patient after the seance, or the blame may be laid directly at the door of some fellow piaiman of whom he is jealous or on unfriendly terms. The same piaiman is rarely, if ever, called in to perform a second seance. Should the patient linger, an invitation is sent to call a different one and there is generally quite a few to choose from. I have never met a female piaiman, although I have heard of one or two, generally women of considerable character and personality, according to tales, in a part where there were few outstanding men.

I always found it a good plan to stimulate the mind as well as to apply the obvious remedies in treating the more primitive Indians. When I entered the Wapichanna country the Chief of the Tribe tolerated me, but neither he nor his immediate villages accepted me as a Master or Pownar (Patron), due to his rather remote residence on the Brazilian Frontier where he and his men found work, and an avenue for sales of all surplus stuff. The old chief became ill at a time when I had to leave home for a prolonged survey of the work being

done in the high forests. Some months later I was at my main station having a day off, and in the early afternoon one of the sons of the Chief walked up to say his father had sent him for medicine. Enquiries showed that every piaiman within the radius of 50 or more miles had been called in and they had all performed without the slightest symptom of success. The Chief had steadily grown worse until now he was lying helpless in his hammock, unable to eat or attend to the usual functions of nature. He had been put on a very restricted diet and was now emaciated to skin and bone except his abdomen which had swollen to a huge size, "hard and shiny like the head of a drum". I told the man to go round to the kitchen and to wait till I called for him. It was impossible to diagnose the trouble, and there seemed very little I could do, however, I went over to my medicine chest, which every employer of ten or more men was at that time compelled to possess by law, and I took outsome aromatic spirits - Sweet Spirits of Nitre; Hoffman's Anodyne and Essence of Peppermint - a little of each, which I diluted with water and filled into a small bottle. I then retired to a comfortable chair and continued the reading of a recent twelve months old newspaper. A couple of hours later I called the man, and apologised for the delay, saying "This is very particular medicine, such as can only be taken by Chiefs and it is very difficult to prepare". I gave the man three or four of the very strongest purgative pills I possessed with instructions that the Chief had to swallow all

of them the minute his son reached home. I then handed him the bottle saying "Every morning and evening, exactly as the sun rises and sets, see that the Chief swallows a spoonful of the medicine in a small calabash of water, but on no account allow any other person to handle or taste the medicine, as it is so powerful and potent that in all probability they would die - only a Chief or his oldest son can taste this medicine and be sure of living, and you will probably feel very queer yourself, merely from the smell of it as you pour it out, but you need not be frightened. The feeling will pass off and your father will recover if he does as I say. In particular, tell the Chief he can eat whatever he likes, as much and as often as he cares to".

A few months later, the Chief arrived to thank me for his marvellous recovery, bringing two large baskets of farina as payment for the medicine. These I accepted, but in return made him a present to their full value. Each year afterwards, at the corresponding moon to his recovery, he would arrive with more thanks and presents. His villagers worked under me and their trade came my way, until one year I went overseas for a long holiday. On my return, I learned the Chief had died, and soon his son arrived to tell me all the details of his illness and death, and to lament my absence from the district, "otherwise my father would not have died". I discreetly closed one eye at my reflection in a mirror on the opposite wall and ..... I wondered !

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## Music.

All the Indian tribes love music but it is only amongst the more primitive and forest hidden that you hear their real national music to-day. Any tribes with only a more nodding acquaintance with civilization become shy and ashamed of their own rather crude instruments and performances, and try their utmost to possess one or two of our manufacture. Certain tribes have taken exclusively to the violin and have developed their own technique in the manufacture of these, largely due to their inability to purchase a proper supply, as also the difficulty in keeping them in proper order in the humid forest, where glue soon comes adrift and strings go west faster than they can be replaced. The violin they make themselves is a very crude affair, but it is a violin capable of standing up to the local conditions, and its crude imitation of the sound, is heavenly to their untutored ears. The body consists of half a calabash, over which a thin, worked down piece of wood, - in which a couple of holes have been bored, - is carefully fitted and cemented with some forest gum. A straight piece of timber fitted to take some 2 to 4 rough tuning keys is attached. A few horse tail hairs, or selected silk grass strands form the strings, under which a piece of wood is inserted as a bridge. Horse hair or silk grass again form the bow, when stretched between two points of a long thin sliver of wood, hewn out of a split tree. Many of these fiddles carry only two

or three strings, but some of these people have a quick ear for sound, and it is surprising how many popular airs they can play, so as to be plainly recognisable on these crude instruments.

The accordion is the most popular instrument amongst a majority of the tribes, as also the ubiquitous mouth organ. A good range of these latter among the visitor's baggage will nearly always ensure the open sesame, and a hearty welcome from the most taciturn and diehard villages. The mouth organ requires neither effort nor skill, and is in great request by youths. The accordion requires more art and practice and is much more expensive, but it possesses greater volume of sound and range of expression in capable hands, and most Indians will sacrifice much to possess one. They evolve simple tunes of their own in many cases, while others with opportunity and aptitude adopt a few popular airs from the outside world. Anything more productive of a splitting headache and a flood of classic profanity, I have yet to meet, than when one must spend a night - pouring cats and dogs - in a lonely Indian hut, during a drink and dance with some 4 to 6 accordions, all going at the same time and each person vigorously playing his own so-called tune on a non-stop programme, until sheer weariness or too much beer makes them seek their hammocks.

In their own primitive life, the Indians accept anything that will make a noise, as a musical instrument, but the crudest of these are only popular at their various dances,

where noise is at a premium as the sign of fuller enjoyment. Of these the drum is easily outstanding, and to our standard the most annoying, through monotony and loudness of tone. These drums were in use generally during that period when a youth undergoing initiation into manhood would parade the village square for a couple of hours before daylight each morning, thumping his drum. Sometimes one, sometimes two drumsticks are used and the notes are varied in time or rhythm. He drums one succession of notes for some 10 to 15 moments, then he changes. It may only be a single thump, followed by a quick double beat in the elementary stages, and turned the other way round by way of variation, but with practice he adds to his repertoire until he becomes a fairly expert drummer. Occasionally one of the elder men will demonstrate some particularly intricate tune, but generally the youth is left to evolve his own tunes. Practically every tribe I know possesses exactly the same type of drum, but in no case have I ever known them to be used as a method of signalling in any way.

Drums are made of hollowed out blocks of wood, covered at each end with skins. In other cases, a hard strong bark is used, one in particular being from a tree whose wood is no harder than the stalk of an ordinary cabbage which is in general use amongst such tribes as have few iron cutting instruments, for they can dig out the hole with sharpened pieces of wood. A tree of the correct diameter is selected - seldom more than a foot in diameter, and an 8" to 10" portion is junked carefully

out and the inside removed so as to leave a tube or shell, (whether bark or wood), about 1" thick. Two carefully stretched sun dried deer or baboon skins are used to cover the ends. Two circles of strong, tough lianos are prepared, just large enough to slip over the bark or wooden shells of the drum. The skins are wetted, the edges wound round these circles and carefully adjusted to fit the top of the drum. A strong leg-spun silk-grass cord is passed from liano to liano along the outside of the shell, and pulled until tight, when it is allowed to dry. When the skins are dried, the tension of this cord is altered until the desired pitch or tone has been obtained. Across the lower skin - which is never beaten - a very thin, double strand of silkgrass thread is stretched fairly tightly, into which is inserted a very thin sliver of bamboo, or the dried midrib of certain palms. This sliver of wood, about 3" long, and no thicker than a fine needle is placed in the centre of the drum end, and adjusted until perfect balance is obtained when a note is struck, with one point just touching the skin. When in proper position, this sliver of wood gives a prolonged note by rapid vibration against the tight skin in sympathy with the note struck, and the repeated oscillation of air inside the drum. If the sliver is not in correct position the note is flat, and the performer alters the balance until the desired effect is obtained.

Most primitive tribes make a musical instrument out

of the shell of the tiny fresh water turtle, which seldom grows beyond 6" in length. The Indian removes all flesh and body bones from inside the shell, generally by continued boiling in water, so as to leave the carapace - both back and front - intact and perfect. A thin layer of beeswax is attached to the protruding lip of bone at the head or rear - if a female turtle - of the shell. The side of the hand, between the wrist and the little finger is struck in a series of sharp fairly forcible strokes across the beeswax. This creates air waves, which the cavity inside the shell increases till a distinct and quite pleasant sound is heard. This sound can be an almost perfect imitation of the call of a certain tiny owl which dogs a burrow in the ground, and it is just possible the instrument may have been invented on that account. This owl is a favourite pet, but is never eaten.

The shak-shak in various forms is a favourite mechanical means of making music, or noise, at their dances. Various hollow seeds are obtainable in the forests which, when strung on a string and wound round a bamboo pole, make a considerable jangling sound when the bamboo is struck on the ground. These trees havea limited radius of habitat, and what one tribe considers very ordinary and common seeds, are frequently held in great request by another tribe. Another variety is made by a whole perfectly circular calabash or gourd of about 6" diameter, carefully cleaned out, in which several small pebbles have been placed. The calabash is

perfect, except for two 3/8" holes at the top and bottom, through which a stick is fitted. The lower end of the stick, frequently ornamented with carving or feathers forms a handle. The whole thing is given short sharp jerks with the hand and the stones inside rattle around and produce a noise.

A number of hollow reeds or joints of bamboo, with one end closed and one open can be blown across the top with the breath and produce a note. These tubes are generally about 6" long and can be used singly or in numbers. Very small bamboo tubes lashed together in threes in a straight line are favourites, as the performer can obtain a note from each tube, without moving the head, and thus treble the volume of sound. These tubes can be made to vary in pitch and note if they are cut into varying lengths. About half a dozen tubes from reeds ranging from 3½" to 7" in length and of slightly different diameters are bound with string into a straight line, each successive length next to the nearest one in length, but with the open tops in a level line. These are held in front of the mouth and blown across by the breath, and the sound is varied by moving the different tubes into position, or by twisting the head from side to side while blowing. I have never heard any Indian produce a tune on these reeds, although the instrument is adapted to the purpose.

At special dances, long tubes procured from Balsa Wood

saplings about 2" diameter and three feet long are used. These saplings have joints similar to bamboo, but they are thin and weak, and easily broken with a straight wooden rod which is pushed through. The tube is placed in the mouth, and the breath blown forcibly through. Much breath is used in blowing and only a single note, or rather roar can be produced, of the same pitch which is generally a deep bass. The performer cannot keep blowing for very long at any one time, but he generally begins to speak or shout through the tube in imitation of some animal or bird, which he is supposed to represent. At one end of this flute he fixes a rude carved form of some such animal or bird which he trys to imitate.

The Taruma make a musical whistle from clay and it is the only example of such work that I have seen. Its invention shows considerable ingenuity, especially in a tribe which never had more than the most casual association with the outside tribes, as also that its manufacture is fairly complex and shows some knowledge of scientific principles. The clay is puddled by hand, the instrument is made and then burned in a fire to acquire the customary pottery hardness. If perfect, it is then ready for use, but it is generally painted with various coloured pigments according to the fancy of the manufacturer and glazed with forest gums before it finds a purchaser. It is pear-shaped in form, but only about half the width from back to front, of that from side to side. On the top, a short

nipple projects, which is placed between the lips and the performer then blows. The breath escapes through the lips down both sides of the nipple. (Place the end of a pencil between the lips and blow as a perfect example). The breath impinges on a hole on either shoulder of the instrument and the sound is produced. These two holes communicate with two separate air chambers inside the instrument - see illustrations. As a rule the two holes are of slightly different sizes as also the air chambers beneath, and in this way two distinctly different notes are simultaneously produced. It requires neither skill nor art to play, even a toddling child can automatically make a noise. I have bought dozens from the Taruma, price a medium fish hook each, for they were plentiful and seemed to be the national musical instrument of the tribe.

The favourite musical instruments of the various Indian tribes are flutes made from bamboo of various small diameters. They use all select bamboos with the longest possible space between joints, at least a clear 18" or more if possible. The diameter vary with the different tribes, the Wapichanna favouring those not more than 3/4 " diameter, while the Waiwai prefer those slightly larger with a maximum of 1½" diameter. The various diameters give a different tone, the smaller size a higher pitch, the larger a much deeper one. A man selects a good bamboo joint and lops it off complete with several inches to spare both above and

below the joint nodes. It is stuck away in the thatch of the hut and allowed to dry and season for some time. When taken down, the surplus ends are trimmed off, care being taken to have both nodes equal in shape and size, intact and smooth. The manufacturer then squints along the tube from end to end revolving it slowly before the eye until he locates the side with the least distortion and bend. Holding the tube firmly with the selected side up, he places the sharp edge of a knife at right angles to the surface at the extreme lower end and draws it slowly up to the other end with enough pressure to show a distinct mark from the scraping edge of the knife. This mark is perfectly straight and is a line along which to bore the various holes required. Five holes in all have to be bored, which is done by blowing the glowing ember of a pencil sized twig which is held touching the bamboo at the selected spot. Two holes, about an inch apart are burned in the tube at both the extreme upper and lower ends, but clear of the joint. These holes are used in fingering to produce the various notes. The fifth hole is bored about 6" from the selected end. This hole is placed in front of the lips and the player blows the breath gently across it, when the sound is produced. The flute is held in both hands, the left hand passing under and the fingers up in front of the two holes nearest the blowing hole. The first and second fingers are used only in fingering. The lower end is held between the thumb and fingers of the right hand and the first

and second fingers from behind manipulate the two holes immediately in front.

These flutes are rather difficult to blow. The lips have to be brought together until almost, but not quite, touching, in a perfectly straight line. An absolutely straight open space of about one inch in length and not greater than the thickness of an ordinary visiting card is essential. I have known quite a few Indians who were unable to play these flutes, as the centre, or some other part of the lips met and they could not form the necessary straight split. This method of blowing is required in all their flutes, whether of bamboo or bone and also in blowing on the cupped hands as a method of signalling.

In hand signalling, the hands are cupped together and touching the full length of the thumbs, along the heel and the sides of the hands to the base of the small finger. The four fingers of the right hand are passed round the back of those of the left hand but in such a way as not to pass further than the middle digit, and the palms kept in cup form as much as possible. (see illustration). Then the first finger of the left hand is stretched away from the second finger until it contacts closely with the left thumb, care being taken that the web between these two fingers forms one straight unbroken line. The hands are then brought until the chin just rests in the hollow between the thumb and first finger of the right hand, when the web between the 1st and 2nd outstretched fingers of

the left hand should be immediately in front of the lips. The hands must fit tightly together and round the chin leaving a good open space between the palms. The lips are pursed into a slit and the breath blown on the tight straight finger web in front when a fairly loud sound is emitted. This method of cupping the hands in blowing is nearly general, but an alternative method is to cup the hand together anyhow so as to leave a fair space between the palms. The two thumbs are brought together in front with a small open space between the first and second joints. The hands are brought up to the lips, the breath blown across this open space and the sound produced.

This method of hand signalling is extensively used by all Indians over short distances. It is much less distressing than a yell of equal volume and has the advantage of being less disturbing to game within reach of the sound; it is much less harsh on the voice and harmonises perfectly with the natural sounds of the forest. Variations of the note are given by lifting one or more of the free fingers clasped round the others and in this way intelligible messages can be transmitted some considerable distance. Such signals are very limited in quantity, generally such as "Come to me", and similar simple commands. An exact imitation of the call of several animals can be given and many a roving spider monkey in search of a mate has answered the call and swinging through the tree tops for almost half a mile has met death from the arrow or gun of

a motionless hunter as it passed overhead.

A number of the tribes use the femoral bone of the various deer and jaguars as flutes also. The bone is cleared of all flesh, generally being well boiled, the knuckle joint at the lower end cut off and the marrow extracted. The upper knuckle joint is cut away until a clear passage is assured down the full length of the bone, but so as to leave as much of the open textured bone as possible to rest more comfortably against the chin. A thin plate of beeswax is rammed into the tube for a short distance - $\frac{1}{2}$" to $\frac{3}{4}$" - below the upper end through which 3 or 4 small round holes are bored with a piece of wood. The rough open texture bone of the end is also coated with wax to make it less irritating to the lips. A small U shaped hole is made on the front of the bone where the breath is blown in playing the flute. Four equidistant holes are now made in a straight line down the bone, the uppermost just a little below the wax partition inside. The first and second fingers of both hands on their respective sides of the flute finger these holes and produce the notes of the different tunes they play. These bone flutes, especially the smaller deer ones, are found in the shoulder bag of most Indians, and their principal use is to give warning when they approach a village on a visit, so that dogs may be tied up and other preparations made to welcome the visitors. The jaguar femoral bone is used much more rarely owing to the general belief in the supernatural powers of the animal, but which powers do not affect a second owner. Thus A can shoot

a jaguar and may at any time be faced with the jaguar's supernatural revenge, but if he gives the bone to B, no harm follows the transfer. In nearly every village may be found one or two daredevils who possess such a flute, tastefully adorned with beads, coloured strings or gaudy feathers. When visitors arrive or at a dance, they can be seen strutting around with the flute dangling by a twisted cord from the wrist.

Many of the houses in savannah country used to have a form of Aeolian Harp sticking in the air above the roof pole, very much like the modern aerial. The long stem of some palm leaf was selected and a single fine strand of fibre worked free for about three feet along the centre. A small round piece of wood was slipped under the fibre as a bridge and the whole thing would be lashed to the roof pole so as to leave the upraised strand free for the wind to sweep across. The wind passing over the fibre produced an agreeable musical note which rose or fell in accordance with the wind's velocity. Should the fibre slacken and the note disappear, someone would climb up and renew the tension by pulling the bridge nearer to one end or inserting a larger bridge. The Wapichanna were particularly fond of this form of sound and I have often had them fit one on my permanent camps, especially during the dry weather, when it would last for months.

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When visitors arrive or at a dance, they can be seen strutting
around with the flute dangling by a twisted cord from the wrist.

Many of the houses in savannah country used to have a
form of Aeolian Harp sticking in the air above the roof pole,
very much like the modern aerial. The long stem of some palm
leaf was selected and a single fine strand of fibre worked
free for about three foot along the centre. A small round
piece of wood was slipped under the fibre as a bridge and the
whole thing would be lashed to the roof pole so as to leave
the uprised strand free for the wind to sweep across. The
wind passing over the fibre produced an agreeable musical
note which rose or fell in accordance with the wind's velocity.
Should the fibre slacken and the note disappear, someone would
climb up and renew the tension by pulling the bridge nearer to one
end or inserting a larger bridge. The Waiwhanna were partic-
ularly fond of this form of sound and I have often had them
when it would last for months.

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