

ANNUAL REPORT
OF THE
BOARD OF REGENTS
OF THE
SMITHSONIAN INSTITUTION
SHOWING
THE OPERATIONS, EXPENDITURES, AND CONDITION
OF THE INSTITUTION
TO
JULY, 1896.



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1898.

BOWS AND ARROWS IN CENTRAL BRAZIL.¹

By HERMANN MEYER.

The present treatise is an introduction to a larger one now in course of preparation. While this larger work is to discuss the distribution of the bow and arrow throughout South America, and to widen the knowledge of her mixed populations by means of a thorough investigation of material in museums and the study of literature, it is the aim of this brochure to point out the system only in general outline, with the comparison of the materials furnished for the classification of bow and arrow, and to set forth for a circumscribed region—the Mato Grosso—how, through the harmonizing of different tribal groups, ethnographic types arise; what share the several associated tribes have had in this creation of groups; and, on the other hand, what ethnographic development within the group each tribe has undergone.

It will not be possible to make an extended review of individual tribes in a preliminary description of the bow and the arrow. This is in view for the later work, and at this time it will be presented only so far as an ethnographic characterization is necessary. In the same way here the review will be only so extended concerning the meaning of these weapons for a tribe as to reveal some variation of the arts by which an advancing or retarding momentum in the ethnographic development has been given.

For investigating the ethnographic materials which furnished the groundwork of my investigation, it was made possible through the recommendation of Professor Bastian, in Berlin, and Professor Ratzel, in Leipzig, to study the collections belonging to the museums in Berlin, Munich, Vienna, Braunschweig, Copenhagen, Stockholm, Christiania, Brussels, Amsterdam, Rotterdam, Leiden, London, Kew, Salisbury, Oxford, Cambridge, Newcastle, Edinburgh, Glasgow, Belfast, Dublin, and Liverpool; and I here express to the directors and conservators of the establishments mentioned, above all to Professor Bastian and Professor Ratzel, and especially to the head of the American section of the ethnographic museum in Berlin, Dr. Seler, my heartfelt thanks for the

¹Inaugural dissertation by Hermann Meyer, of the University of Jena. Translated from original German "Bogen und Pfeil in Central-Brasilien." Leipzig. Druck von Bibliographischen Institut. 1896.

encouragement rendered. Moreover, I am obliged to Professor von den Steinen, to Dr. Ehrenreich, and to Dr. Richard Andree for friendly assistance.

A large number of museums on the Rhine, in Switzerland, France, and Italy, which I had not time to visit, I thank for their promises to render complete my investigations in the future. The rich material of the Leipzig museum was unfortunately at the time, through want of space, packed up and not accessible, yet it is hoped that shortly after the completion of the new museum building it will be possible to make studies there also.

In the study of material stored up in museums one must proceed with the greatest prudence in deciding the matter of locality, for the beginner in this field, who has no knowledge concerning the associations of a specimen, makes false and confused reports. There exist only small collections whose data have any claim to confidence; the great majority of objects are either unknown or insufficiently or falsely labeled. Very many pieces which have been brought together from some estate, or through collectors on the coast, far from their origin, bear absolutely untrue information regarding their provenience. There are many pieces that migrate down a river, even to a trade station near the mouth, and then come into the possession of a traveler who knows only the name of the last place or of the river. Other specimens that the traveler really got from the natives represent not indeed the true ethnographic type of that tribe, since these also could have come into the possession of a tribe through traffic or as booty, as Lucioli narrates of the Ucayale tribes—that slaves among them worked in their own manner. However, by means of a careful comparison of specimens in question with well-identified material it is possible to find out with some certainty their coordination.

In the accessible literature are only a few modern works of any value for furthering this investigation, since the majority of travelers, particularly older ones, have often some other object than the promotion of ethnography, and consequently give only brief notices on ethnographic subjects. Only in the rarest cases do they devote themselves to a detailed description of weapons and tools of a tribe with whom they came in contact. For that reason are to be found abundantly in different accounts of the same tribe contradictory statements, so that even in the utilization of such notices one must use the utmost caution and critical discrimination.

Unfortunately it was not possible for me to identify the substances used in the manufacture of bows and arrows, by which I might have had better data for the fixing of the locality and for proving also the craft marks. A botanist skilled in South American flora, to whom I referred a single little sample of wood for microscopic investigation, declared that among the endless number of South American species of trees he could render assistance only through the leaves or the flowers.

This was unfortunately impossible in the case of the weapons. I must, therefore, confine myself to the repetition of the reports of collectors or quotations from literature.

Since I have expressed these many difficulties which are in the way of a thorough investigation, the reader will perhaps lightly criticise any errors or shortcomings that may appear in my work, especially when I here suggest this is to be merely an effort to throw a little light upon the tangled ethnographic conditions in South America—only a first effort in a larger inquiry, and laying no claim to enduring validity.

The motive in ethnographic investigation is twofold. First, to furnish a contribution to the ethnography of a single group, by which the group as such may be set forth in its individuality. Second, it should be sought to establish upon the foundation of the descriptive part a scheme for fixing the relationship of this group to its neighbors, and, above all, to mankind in general. I say advisedly a scheme, for everyone must be conscious that such investigation can be only one-sided; and as yet one is not entitled to draw larger conclusions and family connections of the people in question. Only when the purely objective ethnographic results compared with linguistic, anthropologic, and ethnologic investigations agree, can the perfect accuracy of the outcome be accepted. Into what dreadful blunders one is led by precipitate conclusions of all sorts drawn from one-sided data is sufficiently known.

That ethnographic and linguistic studies in nowise always lead to the same result may be realized in the examination of every ethnographic collection. On the one side it may be seen that two hordes related in speech have entirely different ethnographic characters, while, on the contrary, the industries of two may agree while genetically they belong to different stocks. This remark is very pregnant as regards South American peoples, and I shall seek on the basis of my studies of materials and literature to establish a correct theory concerning the ethnographic relationships of South America.

We must here examine the imitative instinct of men as a motive. Assume that different impulses and migrations of divers tribes having unlike ethnographic characters have brought them to settle near one another, one can recognize among most of these tribes a variation, through a series of years, of their ethnographic characteristics. They have become more or less assimilated in their mode of living and their ethnographic peculiarities. This assimilation, that is external likeness in type forms, may arise in different ways. If the tribes are inimical, then captured objects have influenced the technique, but if the tribes have entered into friendly commerce, then the possibility of acquiring by trade, tools, weapons, etc., is easily afforded. If they are brought into still nearer contact through the force of culture, through common acculturation, then the preservation of old ethnographic peculiarities in the tribe is rendered more difficult. Finally, among tribes that practice slavery there is still greater likelihood that these, owing to the

customary freedom of intercourse, would immediately impart their own characteristic forms to the peculiarities of their masters. But chief among these, that form which suggested itself as the fittest to adopt, and for which the locality and conditions supplied the necessary material would be most persistent. It seldom happens that proper material is procured from a distance through trade, or that any other material would be chosen than the one there in use for certain forms.

As the chart at the end of this article points out with respect to the distribution into ethnographic areas, there occur in the same tribe several separate types in close contact. This phenomenon is to be referred back chiefly to a certain persistency with which favorite old-time forms hold on. This attachment to the ancient is very frequent on types that are completely changed through assimilation, still showing small idiosyncrasies or added decorations and so on, so that it is possible through these marks to obtain a glimpse backward on the original form. Frequently, through trade or capture, certain objects or weapons pass immediately into the employ of the new owner and are more widely diffused in association with the old forms. Especially in these inquiries in which several tribes are brought together in comparison is an association of this kind noticeable, but apparently comparison of different forms is possible only when a tribe has been split into several parts and each one has borrowed on other soil different customs and forms from neighboring tribes. These tribal divisions have then had an entirely different ethnographic development. Do we find among a group of originally diverse tribes, which have acquired through assimilation special ethnographic characters, a people with entirely different characteristics, then we are able to conclude that either this people remains out of contact with surrounding tribes or has just come there.

This ethnographic association would differ perhaps according to the choice of the object taken for the classification; at least my investigations lead to this result, whether we select the bow or the arrow as object of comparison. But a certain analogy is to be recognized in all grouping of this sort. For an ethnographic classification all the tribes studied should be regarded from the same point of view, namely, that the object selected shall be common to all.

As is known, the entire population of South America, originally depending on natural conditions, have been hunting peoples, and the greater part of them have held on to this manner of life. The hunting implement is then common to all. Now we find among the different tribes generally various methods of capturing animals. One employs the blowtube, the second a sling, the third a bola and a lance, but all have as the chief weapon the bow and arrow, which even the gun can not supplant, because the noiseless shooting of the bow does not frighten the game. Only the tribes of the Pampas, who since the influx of the Spaniards have taken up with the horse, have more and

more given up the bow, since as riders they can not conveniently use it. In fighting on foot at the time of Dobrizhoffer the bow was always the favorite weapon. Also the tribes that are now completely sedentary, which practice hunting along with agriculture only for amusement, exercise still the greatest care upon the preparation of this weapon and know how to use it with skill. In their sagas the bow and the arrow still play an important role. They are regarded almost as sacred and are frequently used as cult objects. If a people through constant association with culture exchanged their bows and arrows for other weapons, then the children kept up the old reminiscences and held on to the bow and arrow as playthings. We can thus appreciate the interest which a South American Indian feels when foreign bows and arrows are brought to his notice. He is accustomed to recognize the tribe by its arrow. I therefore indorse the position of Von den Steinen¹ when he says, "just as in comparative philology, a comparative arrow study may be conducted," as a rule for the resulting ethnographic grouping. This position has full force only when the difference of time between the arrival of different collections is taken into consideration, since, as has been already said, the ethnographic characteristics have been subject to great variations.

It can not then be wondered at that in the general distribution of bows and arrows so great a diversity of form exists, which makes possible a grouping for a fundamental study. This grouping demands again the separation of forms according to specific marks of structure. Of great importance in the distribution of the arrow appears to be the feathering, which seems to be capable of unlimited variation. There may be also bestowed a great deal of care on the fastening of the feather, on the wrappings of the shaft with thread, or upon the manner of fitting the feather. Moreover, the wrapping of the feathered end or shaftment offers excellent opportunity to preserve certain textile patterns, perhaps the one remaining survival of the old tribal peculiarity. Besides the feathering, the fastening of the point to the shaft, or of the point to the foreshaft, affords a safe datum for discriminating. The shape of the point also furnishes a guide for differentiations, however generally the varietal marks of the point and shaft adjust themselves with those of the feathering, so that the last may be taken as a basis for classification. The dimensions of the arrow are not directly useful as a means of separation, although individual tribes are characterized by the measurements of their weapons. Yet there are not seldom within a single tribe differences of half a meter in the lengths of the same sort of arrow. The choice of material depends chiefly on natural surroundings which a tribe encounters from place to place. It could, therefore, through identification of material and the botanical proof of the source of a plant, be shown that an arrow belonged to a certain group; unfortunately this is not possible where accurate data

¹ Unter den Naturvölkern, Central-Brasiliens, page 229.

concerning the material are not given by the collector. Only single types like the Chaco arrow may be recognized through the material. In the classification of bows through the cross section the material would be of weight.

Before offering some remarks on the characteristics of bow and arrow types by regions, I shall seek briefly to describe South American bows and arrows as a whole.

Unlike the North American bows, which are generally small and often made up of parts differing in material joined together, the South American bows are all self-bows, that is, they are made of a single piece. For the most part they are very large; only in the Guiana region and the northwestern lands, as well as in the South, the Gran Chaco, the Pampas, and in Terra del Fuego are smaller forms in use. A certain similarity of the Chaco bow with that of the northern Llano tribes, the Goajiro, is inexplicable. Further, in forest regions almost throughout, excepting Guiana, large, powerful bows are in use, while the smaller belong to open steppes. In this fact there is a contradiction to the affirmation of Ratzel concerning Africa, that the forest bows are smaller than the steppe bows, since the contracted forest prevents the use of the larger forms. On the contrary, among the Jauapery, who live in the forest region on the lower Negro, bows are found, according to Pfaff, 3 meters long. The South American bows are made with the greatest care, so that in the manufacture the peculiarities of the materials are utilized to their utmost extent. The form is, with rare exceptions, symmetrical. The curvature is not pronounced and symmetrical, but sometimes through a little bulge of the middle a slight double curve is effected. Bows are neatly wrapped with liana bast or with yarn and cotton string, partially, as a general thing, and frequently thus to old bows an artistic touch is given and beautiful patterns developed. Feather ornaments are also often added to the bow. The plain bows exhibit, as Ratzel has pointed out, a decided similarity with those of the Melanesians.

The size of arrows is naturally in relation with that of the bows. The steppe peoples and the Fuegians have the smallest arrows. They also exhibit much care in their finish, and adorn them greatly by means of wrappings upon the joints where the several parts are united. The arrows of the steppes are made especially with reed shafts having wooden points, those of upper South America have mostly in the reed shaft a fore shaft inserted, which carries the point.

The material of the shaft over the entire middle region is mostly the widely distributed knotless Uba reed (*Gyncrium saccharoides*), and especially in the East the more slender Cambayuva reed. The reed shaft of the Chaco tribes is similar to the Cambayuva. Only among the Fuegians and a few other tribes in special kinds of arrows is wood used for shafts. The points are of wood, at times smooth and again with rows of opposite barbs, or from long, sharp splints of bamboo, from

bone, from spines of the ray fish and in later times of iron. Stone points were, indeed, originally in vogue over the whole area, and have held their own only among the most southern and the most northern tribes, Central Americans and Fuegians. Poisoned arrows are spread over nearly the whole forest region.

The different groups may now be characterized:

Bows in Central South America are of five different classes or groups:

Group 1.—Peruvian bow.—Rectangular or long elliptical cross section and almost always made of the heavy, black chonta palm wood. (Pl. LVII, fig. 1; Pl. LX, fig. 1.)

Group 2.—North Brazilian bow.—Semicircular cross section, characterized by the material, a reddish brown, smooth, leguminous wood. (Pl. LVIII, fig. 10.)

Group 3.—Guiana bow.—Small with parabolic cross section for the most part and a channel along the outer side. Made from a dark-brown wood. Between the north Brazilian type and the Guiana type there is an intermediate form.

Group 4.—Chaco bow.—Round and beautifully smooth exterior, made from the red Curepay acacia.

Group 5.—East Brazilian bow.—Distinguished by the choice of different woods. The type is separated into two subgroups, which at the north have their connecting link in the Shingu bow and at the south in the Kameh bow. The western class has been developed out of the smooth, strong wooden bow of the Bororó, having cross section, and wrapped with "cipo," a liana bast. The eastern subgroup is marked by the black Airi palm wood, in the southeast less carefully made by the Puri and Botocudos. On the contrary, in the Caraja bow (Pl. LIX, fig. 1) of dark-brown palm wood it has reached a high development, which still survives in the Shingu bow (Pl. LVII, figs. 1, 4, 7), the intermediate form between the eastern and the western subgroup. To the eastern subgroup belong the majority of the Ges tribes, while the western subgroup finds its greatest extension among the Tupi tribes of Paraguay.

Outside of this group stand the Mataco bow, the Fuegian bow, and the Central American bow, which are not considered here.

The types of feathering are as numerous as the bow types, and may be briefly characterized as follows:

Feathering of South American bows.

1. *East Brazilian or Gez-Tupi feathering.*—A widely separated group, which, like the east Brazilian bow group, extends over the entire eastern Brazil as far west as the Paraguay and the Shingu. Two feathers unchanged, seldom halved, are fastened at their upper and lower ends to the shaftment opposite each other with thread, fiber or cipo bast. Frequently these wrappings are laid on in patterns or have an ornamentation of little feathers added. (Pl. LIX, figs. 8 and 9.)

2. *Guiana feathering*.—Small, and carefully laid on. Two short half feathers are bound to the shaft in different places with seizings of fine thread. The shaft has always a nock piece to fit against the stretched bow string in shooting. An account of its distribution and of the footing or nock piece will be given further on.

3. *The Shingu sewed feathering*.—Two half feathers stitched to the shaft opposite each other through perforations. The ends are seized fast with plain or patterned lashing. (Pl. LVII, fig. 9.)

4. *The Arará feathering*.—Two long half feathers, which, in addition to the end seizings, are held down by narrow wrappings of thread at short distances apart. At the nock the wrapping is done in beautiful patterns. (Pl. LVIII, fig. 14.)

5. *The Mauhé feathering*.—Like the east Brazilian feathering, has two entire feathers bound on above and below. At the base of the shaft, however, a nock piece or footing is set in. (Pl. LVIII, fig. 13.)

6. *The Peruvian feathering*.—Constitutes a little group on the Ucayale and is quite like the east Brazilian on the whole.

Perhaps the Mauhé feathering, as well as the Peru wrapped feathering, belong genetically together with the Tupi feathering in the east Brazilian group. By this is strengthened the hypothesis of Von den Steinen and Ehrenreich that the west and the central Tupi wandered to the westward and to the Amazon again as far as the Tapajos and Shingu. Also on the Tocantins, on whose lower waters Tupi tribes have settled, are found arrow forms like to those of the Mauhé.

7. The great group of Peru cemented feathering includes two divisions:

a. The northern, belonging to the Amazon region, which falls into subdivisions according to the presence or form of the nock.

b. The southern, which embraces the anomalous Chaco feathering. (Pl. LVIII, fig. 15.)

The two feathers of the cemented feathering are separated from the midrib with only a thin portion of the quill remaining, bound fast to the shaftment in close spiral with thread or yarn, and to increase the hold on the shaft along the feather, the shaftment is covered with black or brown pitch.

Examining the chart of the geographic distribution of bow and arrow types, it appears that—

The division into ethnographic provinces by reason of the domination of certain forms, on the whole, has nothing to do with the tribal characteristics. As among the Bororo, starting out from an originally identical type, two entirely separate types succeed through different associations with other stocks;

The classification, furthermore, has not led to the same result for bows and for arrows;

Frequently from a bow an arrow is shot which has quite a different distribution from that of the bow;

But, yet, a certain analogy is discoverable in the two methods of grouping.

So the boundary lines of the enclave of east Brazilian feathering correspond in gross features to the boundary lines of the distribution region of the east Brazilian bow. Furthermore, omitting the region of the Chaco feathering, the region of the Peruvian bow is overlaid by that of the Peru cemented feathering.

The Guiana bow has about the same extent as the Guiana arrow; however, the southern boundary of the bow region lies more to the north than that of the feathering, which in several places overpasses the Amazon.

To these almost analogous groups belong a bow type which altogether detached from a feathering region on the north engrafts itself on the region of the Peru bow and the east Brazilian bow. Also, where the three chief feathering groups—the Peru cemented feather, the east Brazilian, and the Guiana—come together, three entirely separate feather types (Mauhe, Arara, and Shingu) have spread over regions whose borders intrude into one another.

This mixed area into which the characteristics of individual ethnographic developments have obtruded themselves is the Mato Grosso. We can from this realize what great importance the thorough exploration of this region possesses for the entire ethnology of South America, and I hold it, therefore, not fruitless if I seek before I describe clearly in a greater work the result of my investigations upon the collective material concerning the South American bows and arrows, to give, so far as it is possible, in this publication an ethnographic picture of the Mato Grosso.

The Mato Grosso is the highland in which several principal rivers of South America have their origin. While the Paraguay flows southward and furnishes, through its extremely fortunate advantages for navigation, the veins of commerce, the fountains of the most important affluents of the Amazon on the south spring from the neighborhood of the Paraguay sources, so that a lively commerce from the Amazon to the La Plata would go on across interior Brazil by water, if an impassable barrier to navigation between the northern incline of the Mato Grosso and deep water of the Amazon were not established by the waterfalls and rapids. Since, through the earlier expeditions on these rivers—Tapajoz, Shingu, Araguay, Tocantins—for the purpose of information concerning the feasibility of a good connection with the Amazons, no practical result was obtained, it is natural that general geographical knowledge about this region should have remained very meager up to this century. It was through the expeditions of Natterer, Castelman, Wedell, Martius, Pohls, Von den Steinen, and Ehrenreich that a glance was obtained at the natural relations of this area, and especially was it Natterer, Martius, Von den Steinen, and Ehrenreich who made themselves serviceable for the ethnography of the

northern Mato Grosso, and who have shown that the hindrances which the rapids in the streams mentioned opposed to general commerce are not so insurmountable that even great tribal migrations upstream and downstream can not be proved on ethnographic and linguistic grounds. The immense importance which the Mato Grosso possesses for the ethnology of South America here fully appears, and it follows hence that the knowledge of the populations of the Mato Grosso must furnish the key for the entire ethnology of South America.

While the northern border is quite clearly fixed, on the east a limit is less sharply drawn, and the transition to the highlands of Goyaz passes only gradually through separate detached elevations. The sources of the Araguay are to be attributed to the Mato Grosso, while the Tocantins belong to the highlands of Goyaz. In the south the Mato Grosso slopes slowly toward the Paraguay basin. Let the boundary be the Serra de Cayapo, which extends from the western edge of the Goyaz plateau in a southwesterly direction to the Paraguay, and on the west side finds its continuation in a range of hills running in a northwesterly direction to the Rio Guapore. The alluvial lowland of the Paraguay is especially not to be reckoned with the Mato Grosso, though in ethnographic features it is not easily separated from it. In the southeast, the Mato Grosso is cut off from the Gran Chaco by the watershed mentioned, and on the west the Madeira furnishes the natural boundary with its forests, though these begin to appear already east of the Madeira. With exception of the woody river bottoms the Mato Grosso is a pure prairie region, which stretches away between the north flowing river perhaps still farther than the north border of the Mato Grosso.

It is clear that the Mato Grosso in its central location before mentioned, endowed with extremely favorable natural conditions, must have played an important rôle in the history of the South American peoples. Of all the events, however, of which the Mato Grosso was the theater of action nothing more is known. Only from traditional relations of a few tribes or from the narratives of colonists may the latest migrations and invasions be followed. It is therefore not possible from the present condition of knowledge to draw a correct ethnographic picture of the original divisions and dispersions of the populations. We are able from the comparison of materials in museums to gain only a foothold for the knowledge of prior wanderings. The inquiry how far these assumptions can be of use for illuminating the theory of migrations of the Ges, Tupi, Carib and Nu-Arawak families by means of comparative philology, proposed by Von den Steinen and Ehrenreich, lies outside the borders of this treatise and will be examined later.

The ethnographic picture of the present Mato Grosso shows, as may be seen from the chart of distribution, a division into four, perhaps three, regions when the arrow or the bow is used as material for comparison. Each geographic region is characterized by the predominance of a fixed type, which is peculiar to one of the above-mentioned ethnographic regions. In both classifications the two great areas of east

Brazil and the Peruvian type hold good which have certain analogies in their own borders. Some of the chief divisions in the Mato Grosso seem accidental to the Shingu drainage. Therefore, in accordance with the bow types, the Mato Grosso is divided into a west and an east half. The north Brazilian bow region does not overlap the Mato Grosso. When arrow types dominate the divisions two other distribution areas are revealed, in one of which the wrapped or sewed feathering prevails, as the peculiar Mato Grosso feathering may be termed, while the borders do not extend beyond those of the Mato Grosso. The area of the Arara feathering lies within the eastern part of the region of the Peru feathering; furthermore, the Mauhe feathering extends its influence on the northwest of the Mato Grosso. In the west Mato Grosso occur also the cemented, the Mauhe, the Arara, and the sewed feathering. This may be best characterized as to the mixed region, set forth as follows:

1. *Eastern and southern region*.—East Brazilian feathering.
2. *Central region*.—Sewed feathering.
3. *Western region*.—Mixed: Cemented, Arara, Mauhe, and sewed feathering.

Considering the bow in the same connection gives the following group:

1. *East Brazilian bow with East Brazilian feathering*.—Araguay and southern Mato Grosso.
2. *East Brazilian bow with Shingu sewed feathering*.—Shingu and West Bororo.
3. *Peru bow with feathering of mixed areas*.—Tapajoz.

This grouping is naturally to be taken *cum grano salis*, since transgressions and intrusions occur in individual cases.

In the following consideration of single stocks or tribes it will not always be possible to hold strictly to the plan, while this arrangement, which throws upon the screen a complete ethnographic picture with natural coherence often, as will be seen of the Bororo, must point out the originally component parts of a stock, on account of the differing developments of its ethnographic characters. In order to set forth genetically the types resulting from the original type an assembling of the parts is necessary in the discussion.

Let us begin with the tribes of the upper Shingu, which belong collectively to the area of the East Brazilian bow with sewed feathering. These tribes, which have been known to us only a short time through the two Shingu expeditions of Von den Steinen, belong, according to his investigations, to different linguistic families, to wit:

	Linguistic families.
Baccairi, Nahuqua.....	Carib.
Aueto, Kamayura, Menitsana.....	Tupi.
Mehinaku	Nu-Arawak.
Suya.....	Tapuya or-Gês.

This commingling of tribes, belonging to different stocks in the comparatively narrow space of the upper affluents of the Shingu, Kulisehu, Batovy, and Kuluene, furnishes the best example of how, through long contiguous dwelling, national peculiarities are obliterated and a new common type takes the place. The bows and arrows of these stocks differ only very little from one another, but together very much from those of the stocks of the lower Shingu; for example, from the Yuruna, of whom they have no knowledge, on account of the rapid streams difficult to pass. Among these, it will be seen later, the East Brazilian feathering unites with the Peru bow, a circumstance which witnesses in favor of the Von den Steinen theory of the migration of the western Tupi.

If the Upper Shingu tribes be kept solely in view, without regarding small differences, the following statements may be confirmed:

To all of them the bow and the arrow are common, while other weapons, such as the throwing stick and the club, appear only among isolated tribes.

The arrows, as well as the bows, are universally beautiful and carefully wrought, from which Von den Steinen draws the conclusion that they indeed, as hunting peoples, had also an irregular kind of sedentary life, and that they, notwithstanding that the hunter stage is always more and more being supplanted by agriculture, have not become negligent in the manufacture of hunting implements. This rests chiefly upon the exalted position which the bow and arrow holds in their tradition. He mentions of the tribal history of the Baccairi, among others, that the culture-hero Keri had created the tribe out of different arrow reeds. (Von den Steinen, op. cit., 228, 379.)

Von den Steinen says, "the length of the bow reaches 220 to 250 cm." (Pl. LVII, figs. 1-7). The yellow wood is furnished by the Arata tree *tecoma*, etc. Dark-brown palm wood is often found among the Aueto and Kamayura tribes and among the Tupi stock, whose bows are wound with cotton wrappings in a sort of staircase pattern, a decoration widely distributed in South America. The cross section of the bow is about circular and it tapers toward the end, becoming more elliptical. The ends are somewhat rounded for the reception of the bowstring, running to points. The bowstring, twisted from the bast of the tucum palm, is looped on at one end. It is knotted around the other end and is extended along the back, becoming smaller and smaller, and is made fast around the upper limb, about two-thirds the height of the bow. The curvature of the bow differs and often there is more than one curve. A single slight curve is rare and only to be found among the Baccairi and the Nahuqua. The Aueto and Kamayura have slightly double-curved bows, with ends bent back. The bows of the Baccairi, Trumai, and the palmwood bows of the Aueto and Kamayura show a bend of the limbs in an opposite direction.

On a bow of the Kamayura and two of the Baccairi are tight leather rings stretched over the limbs, a custom which is also to be seen upon

the bows of the Sokleng of southeastern Brazil. (Pl. LVII, fig. 7.) That different ways of bending the bow are customary close together in the same stock is not to be admitted; it is more likely that bows whose exact origin is not fixed might have been scattered by the lively barter on the Shingu.

The arrows appear to have less dispersion as trade objects, which again has its explanation in the fact that the arrow is esteemed as a characteristic of a tribe, and for that reason is less communicable to another tribe. Therefore we see among the most southern tribes—Baccairi, Nahuqua, and Auetó—no arrow with Cambayúva reed shaft; for, as is known from the tribal history of the Baccairi, these are made of Uba reed, a characteristic also of the Baccairi. This reed, in order that the natives may not be compelled to get it from far away, is planted in great patches in the river Batovy. (Von den Steinen, *op. cit.*, p. 210.) The northern tribes, on the contrary, have substituted for the Uba reed at times the Cambayúva reed, which, among the Yuruna, furnishes the only material on that side of the rapids. The use of the Cambayúva reed, which predominates on the Tapajoz and the Araguay, appears, from the latest information, to have arrived first upon the Shingu; at least other peculiarities permit the conjecture of an influence from the East.

Different kinds of points are to be found among nearly all the tribes of the Shingu. The simplest is a smooth-pointed piece of wood driven into the end of the reed shaft. This form is common to all stocks, as is one with a middle piece (foreshaft) fastened on with pitch and pointed with the beveled humerus bone of a monkey. (Pl. LVII, fig. 8.) Finally there is found, as will be seen also among the Bororo and Guató, the style that belongs to the East Brazilian group. A point with a barb or hook, effected by means of a double-pointed piece of bone laid in the hollow outer end of the fore shaft (compare Pl. LIX, fig. 6), wrapped with thread and pitched, is used among the Caraja on the Araguay, as well as in Western Brazil and Guiana. It is found among the Auetó, Kamayúra, and Trumai. On one side of the smooth wooden point of the Baccairi and the Nahuqua arrow 10 cm. long a barb is provided, by wrapping a little tooth or jaw spine of the ant bear. (Pl. LVII, fig. 14.) This practice is also a peculiarity of the Caraja. The use of the spine of the ray is also in vogue here. (Compare Pl. LIX, fig. 13.) Von den Steinen denies that the Shingu tribes, excepting the Yuruna, used the barbed wooden point; yet there is in his collection a specimen from the Kamayúra (Pl. LVII, fig. 12), which exhibits exactly this type of the Shingu arrow. This point, moreover, which is found abundantly on the Gez arrows, must have come from the east. The Suyá and the Trumai use in war and in chasing the jaguar arrows with long bamboo knives bound to the end of the wooden fore shaft, which are manufactured on the Shingu only by these tribes (Pl. LVII, fig. 2). Of this pattern, moreover, there is found an example among the Kamayúra. The Baccairi collection contains also

an arrow with bamboo knife-blade point. (Pl. LVII, fig. 13.) However, this point deviates from that of the Suyá in form, and resembles much more that of the Yuruna or of the Tapajoz region. It is strongly probable that the arrow came hither from the Yuruna, but perhaps it is a reminiscence of the earlier home of the Baccairi upon the Arinos.

Of the feathering I have briefly written in the general classification. (Pl. LVII, fig. 9.) Let it be here simply remarked that the variegated feathers of different birds are bound on in spiral wrappings of 90 degrees. At the nock end is generally found a wrapping of thread in staircase pattern as on the Auetó bow, which is laid over a ring cut from the bark of the wambi (*Philodendron*), to which is also fastened a little ring of red feathers. Sometimes the feathers are wanting, and only the wrapping with the bark ring and feather tuft remains. The nock is small and round.

On some arrows of the Suyá, who must have wandered, according to tradition, from the great stock of the Gez, on the Araguay and Tocantins to the west as far as the Tapajoz and back to the Shingu, occurs also east Brazilian feathering. Both wrapping material for feathers are made from white bast. Moreover, on the tip of the shaft is fastened a tucum nut (Pl. LVII, fig. 10) bored with holes, by means of which it sends forth in flight a clear sound. This toy is in vogue on the Tocantins as well as on the Tapajos, and also among the Arara on the Madeira; it is also spread among the Suyá from east to west. A circular band of color on the shaftment of some Baccairi arrows, as well as the custom all along the Shingu of binding the shaft and fore shaft with windings of bast, hints at Eastern influence.

In briefly recapitulating we must recognize decidedly an influence from the East. It appears, moreover, that the more southern tribes had been less overcome thereby. Upon the relationship of the eastern Baccairi to the western Baccairi on the Arinos the language must be the decider.

Furthermore, among the tribes of the Upper Shingu still in use among the Cayapo (Pl. LIX, fig. 17), is found the sewed feathering, which, according to the report of Von den Steinen (*op. cit.*, p. 155), has intruded itself from the majority of the tribes on the Araguay and Tocantins to those of the upper confluence of the Paranatinga, belonging to the drainage of the Tapajoz, in friendly relationship with the Baccairi and Nahuqua. However, since they have preserved in arrows and bows almost completely the characteristics of their principal tribes, it will be more seasonable to treat of them in the discussion of the eastern groups. Outside of tribes of the upper Tapajoz, treated of in that which follows, who in addition to other styles possess the sewed feathering, it is interesting to find in the Marine Museum at Rotterdam arrows with sewed feathering from the lower Tocantins, from the Tembe, and from an unknown tribe on the mainland opposite the Ilha de Arco. Perhaps it was from this unknown tribe that the Tembe on the other

side of the Tocantin received this technique, a tribe from the Shingu, which at the beginning of the century supplanted the Carib tribe of the Apiaka. This phenomenon is more interesting because through it the center of radiation of the sewed feathering is fixed on the head waters of the Shingu or the Paranatinga, and perhaps this feathering can be fixed as specially Carib. Therefore the circumstances bear witness that on the Madeira, among the Arara, who are to be assigned to the Caribs, the sewed feathering might first occur; still, even as easily it could have come to this tribe through the medium of the Apiaka of the Tapajoz, for the typical Arara feathering is also found again among the Apiaka.

Older collections from the Shingu perhaps will furnish information on this topic. Still, the possibility of finding such is far from certain, since the Shingu tribe, up to a short time ago, were wholly unknown.

A good transition from the central group to the westward or mixed group is furnished by the settled Baccairi belonging to the Shingu branch of the Baccairi, who lead a peaceable existence as agriculturists in the area between the Paranatinga, the Cuyaba, and the Arinos, in slight contact with their culture. As we know from the accounts of the Baccairi collected by Von den Steinen, both divisions were originally united near the falls of the Paranatinga, from which, accidentally, in the middle of the last century, one part drew away upon the Ronuro and Batovy to the Kulisehu, the other settled in the above-named region in a southwestern direction. We possess some arrows of these settled Baccairi in the Vienna museum, collected by Natterer in 1827 from the Arinos. (Pl. LVIII, fig. 15.) I was surprised to see among them Baccairi arrows, since this type deviated so much from them in the Von den Steinen collection, so well known to me, and at once, by nearer comparison, I could prove that they belonged there. With exception of the point, they pertain to the group of cemented feathering, and indeed to those in use on the Tapajoz and on the Madeira with pointed notches or barbs cut out and for the most part overlaid with reddish brown pitch: The well-known Uba reed of the Shingu is here replaced by the lighter and thinner Cambayuva reed. Von den Steinen says (op. cit., p. 229), "the settled Baccairi have, since they became acquainted with muskets, given up the Uba reed in general use on the Upper Shingu and possess now, if not purely boys' arrows, at least small arrows in comparison with those on the Shingu." I refer this change in the choice of material and the turning to another technique not to contact with culture but rather to association with the tribes of the Arinoz and Tapajoz. Any affiliation with the kindred tribe on the Shingu later has demonstrably not taken place. This tribe was known to the settled Baccairi only through the tribal history. Assimilation with the Tapajoz tribes could for that reason go on more easily. That the western Baccairi originally and indeed also down to the separation have used the Uba reed is proved by the Baccairi tribal history con-

cerning the plant. That the sewed feathering is peculiar to the whole nation and was not first adopted on the Shingu by the eastern Baccairi is shown by the fact, as will be seen later, that the western Bororo living at the head waters of the Paragnay, who perhaps at the same time have turned away from their eastern brethren on the Lorenzo (Pl. LVIII, fig. 17), in twenty years had adopted the sewed feathering and in some measure had modified it. But the then wild, contentious hordes could have been in contact only with the still united Baccairi, since the eastern Baccairi are now too widely separated from the western Baccairi to be in touch with these. The northwestern neighbors, the Pareci, who now practice the sewed feathering, can not be considered as middle men, since at that time the Pareci did not have the sewed feathering, while already the Bororo possessed it. While also the western Baccairi prove their ethnographic affiliation with the Tapajoz region by the Cambayuva reed and cemented feathering, they betray their relationship with the wild Baccairi of the Shingu only through the point on the arrow. Both points have been ascribed already to the Shingu as characteristic, the bone point from the humerus of the monkey stuck on the foreshaft (Pl. LVII, fig. 8), and that with the zygomatic process of the ant-bear (Pl. LVII, fig. 14) bound as the side of a palm-wood point about ten centimeters long, which, as was seen already, is on the Shingu peculiar to the two Carib tribes, the Baccairi and the Nahuqua.

Concerning the bows of these Baccairi, unfortunately, nothing is known. Von den Steinen reports only that they are smaller than those on the Shingu.

From the tribes of the Tapajoz region, which is only partially known to us, there are in many collections pieces whose exact location must first be fixed by comparison. The Natterer collection in Berlin has also thrown some light on this region. As was already brought forward and is apparent on the chart, the tribes of the Upper Tapajoz represented in the collections, in addition to other forms of arrow, have those with sewed feathering. We assumed already that the point of diffusion of the sewed feathering on the Shingu or of the united Baccairi might have been on the cataracts of the Paranatinga, and shall therefore seek to find out the path along which it arrived at the tribes settled on the Tapajoz and Madeira.

Eastern influence in the Tapajoz region appears first to be a secondary consideration. The principal migration has taken place from west to east. Which one has been the original type of bow and arrow in the Tapajoz region is no longer determinable on account of the diversity of types at present existing side by side. As may be seen upon the chart, there can be demonstrated by the material on three or perhaps four sides an acculturation of the ethnographic characteristics of the Tapajoz tribes. The Tapajoz region upon the chart is entirely surrounded by the region of the Peruvian cement feathering, and the

western Baccairi mark the farthest projection of this ethnographic development from the west. The cement feathering, which has wandered from the west to the east, whose starting point is to be sought in Peru, has undergone many variations in its long journey to the Tapajoz. In the Mato-Grosso, coming westward, is found the type of feathering with the notches cut out, on which generally a little bunch of red feathers is fastened. (Pl. LVIII, fig. 15.) The Madeira River is approximately the boundary between this and a western group, where the cement feathering comes in without notches, but with bands of network woven on the shafts. In the great Parentintim tribe these groups touch one another. A common peculiarity with the cement feathering, and also with the Arara feathering, is a decoration of the shaft by means of small encircling bands made of white quill, which explains the wrapping in stepped winding of cotton, previously mentioned as on the Shingu. (Pl. LVIII, fig. 14.) These quill rings are to be found among all groups of the cement feathering, and have perhaps served as suggestive methods for the bast rings on the Shingu sewed feathering. The Arara feathering appears to have derived the quill ring likewise from the pitch feathering, as will be seen. It is in this manner further perfected through an ornamental weaving in black and white strips of quill. (Pl. LVIII, fig. 17.) The notch has been here copied from the arrows with cement feathering influenced by the Arara type, and is cut out narrow and with a pointed angle.

Generally in this Madeira-Tapajoz region a large, broad, bamboo point, 30 to 40 cm. long, is distributed, which on one side is cut into an angle lying in the long axis, and is hollowed out on the under side so that the cross section shows a concavo-convex outline. (Pl. LVIII, fig. 16.) The foreshaft, upon which the point is fastened by means of a wrapping of thread, extends somewhat above this wrapping and is set at its other end, which is pointed, into the bamboo shaft. This point, which differs from the bamboo points of the western region as well as from those of the Shingu, is found outside of our region also among the Arawak tribe and the Juberi, on the Purus. It is well to mention that this point, like the cement feathering of the Madeira, has gotten as far as the Tapajoz.

Likewise a peculiar, barbed point, which is formed by a spindle-shaped bone, 10 to 15 cm. long, pointed at both ends and seized at its middle upon the upper end of the foreshaft, appears to have come among the Apiaka and Mauhe from the Madeira in abundance. (Pl. LVIII, fig. 19.) Thence it spread among the Parentintim, and from them is to be found among the Manaos on the lower reaches of the Madeira. In a remarkable way it makes its appearance also on the Tocantins, where exists also a kind of Mauhe feathering. If I had not found examples of this in different museums labeled Tocantins, I should have attributed them to the Tapajoz area.

Of the distribution of the Arara and the Mauhe feathering mention.

has already been made. (Pl. LVIII, figs. 13 and 14.) With the Arara feathering, as well as with the cement feathering, the pretty and well-known stepped wrapping is chiefly associated, which statement applies to the feathering as well as to the uniting of the shaft to the foreshaft.

The Mauhe feathering, which is perhaps a Tupi feathering modified through the Guiana type, comes into consideration here only so far as Mauhe arrows have been found among the Apiaka and the Mundrucu.

In contradistinction to the Shingu region we here find the Cambayuva reed distributed throughout the upper basin of the Tapajoz and the Uba reed throughout the lower.

In comparing collections at my command from the Madeira and the Tapajoz tribes, it became unexpectedly possible to recognize the present position of the unique metamorphosis of the type caused through foreign influence. In the Natterer collection of 1827 it may be observed that on the Tapajoz the cement feathering appears among the Apiaka, Mundrucu, Baccairi, and Pareci. It is now assumed that on account of the similarity of form among the Parentintim and the Apiaka the type of cement feathering, together with the well-known bamboo and bone points from the Parentintim, came last to the Apaika, and from these went downstream to the Mundrucu and upstream to the Pareci and Baccairi. Upon the relationship of these tribes to one another little is known; only, Martius has said concerning the warlike Mundrucu and Apiaka, that enmity and friendship alternate. (*Beiträge zur Ethnographie Sudamerikas*, pp. 211, 391.) It is easy to conceive that the Apiaka came upon their long canoes into contact with the Pareci and the neighboring Baccairi dwelling at that time still further northward. (*Ibid.*, 206.) In 1828 the gold prospector Lopez must have camped with some Baccairi under escort of Apiaka Indians on the Peixes River, an adjoining stream to the Arinos. At any rate the occurrence of the sewed feathering among the Apiaka hints at communication with the Baccairi. (*Von den Steinen*, op. cit., p. 388.)

In the arrows of the Apiaka at that time, eastern influences had been amalgamated with western, and sewed feathering and Baccairi points had been united with cement feathering and Madeira-Tapajoz points by commerce. The little barb bound diagonally on the side of the point, peculiar to the Baccairi, is here abundantly represented by a small palm-wood spine (cf. Pl. LVII, fig. 14), the long palm-wood point at times greatly thickens in the middle, as is customary on the Ucayale. Further, there is to be found among the Apiaka an arrow with Mauhe feathering and Tapajoz bone point, but with a Cambayuva shaft, impracticable for this kind of feathering.

Upon the Pareci arrows with cement feathering is seen, along with the bamboo point, also received from the Apiaka, a long wooden point with two sharp teeth or barbs set opposite, projecting at different distances outward, and striped throughout its entire length with clear brownish-gray poison. The occurrence of a poisoned arrow on the

Upper Tapajoz is very surprising, and it must be assumed that this arrow came either from the Mundrucu or from a tribe settled westward on the Madeira, since outside of the extinct Tapajoz, who, according to Acuña's account, possessed poisoned arrows. (Martius, *op. cit.*, p. 382, 388.) On the Tapajoz River only the Mundrucu knew of this practice. The Parentintim have a similar toothed projection on the foreshaft of an arrow with bone point.

Along with the cement feathering is found among the Pareci and the Cabischi related to them the Arara feathering. Still, it is here noticeably smaller, and there is wanting the stepped weaving customary among the Arara. Connected with it is associated also the bamboo point in use among the Arara. Since there is found in the Natterer collection among the northern Tapajoz tribes no Arara feathering, there must be assumed a direct contact of the Pareci or Cabischi with the Arara in the south who must inhabit the still unknown region between the Juruena and the Madeira. The variation which the Arara feathering has undergone at the hands of the Pareci is thus accounted for, if the differentiation had already sufficient time to take place before the exploration of Natterer.

The feathering of the Cabischi arrow is like that of the Arara in length, but shows at the butt end a very carefully cemented wrapping with fine bast (Von den Steinen, *op. cit.*, p. 426), which, as will be seen, exhibits a similar workmanship to that of the Bororo on the Cabaçal. As generally happens, the bamboo point has another form here. It runs to a sharp tip with flatconcave section and has at the inner end edges cut oblique. According to the account of Captain De Motta (*cf.* Pl. LX, fig. 17), in the year 1886. the Pareci have the same weapons as the Cabischi.

In the arrows of the Mundrucu, living to the north of the Apiaka, meet and cross the types of the cement feathering of the Apiaka and the Mauhe feathering. It is merely a poisoned arrow with a fish-spine point projecting forward, which calls to mind similar pieces on the Upper Negro, but shows the usual cement feathering. The Mundrucu must first have learned in modern times the use of arrow poison, and this they did not invent themselves, but borrowed it from the northern neighbors. (Martius, *op. cit.*, p. 389.)

To discuss the arrows of the Mauhe, living entirely outside of the Mato Grosso, is beyond the scope of this paper. They also have been strongly influenced by Madeira forms. So rest the accounts of 1827.

There are outside of the Natterer collection two smaller ones of whose date of acquisition nothing is known, but from a comparison with that of Natterer it appears to have been secured later. One of these collections in the British Museum has the mark "Apiaka, Rio Tapajoz below the mouth of the Juruena." The other, in the museum at Stockholm, acquired on the coast from the Brazilian General Silva da Castro, has no data of locality, but is to be ascribed also to the Apiaka.

Since the arrows in the British Museum represent exactly the type of Natterer's Arara, and particularly his Tora arrow, they may, provided the label Apiaka is to be retained, have come over directly from the Arara to the Apiaka. A characteristic of the Arara arrows is, besides the feathering, the frequent occurrence of beautifully toothed bamboo points (Pl. LVIII, fig. 17), which are also to be found among the Juberi on the Rio Purus, and in somewhat modified forms among the Cashivo on the river Ucayale. A more striking peculiarity is the decoration of the shaft by means of ornamental wrapping, carefully laid in strips of white and black quill. Among the Arara the setting of a Tucum nut (cf. Pl. LVII, fig. 10) on the shaft is practiced, and perhaps came to them from the Tapajoz, where the Suyá got the idea from the eastward. The Tora arrows, resembling in essential particulars those of the Arara, have, however, adjoining the quill work a painted ornament (Pl. LVIII, fig. 18) on the wrapped tang of the bamboo point, which also the arrows of the Parentintim show abundantly.

While these arrows exhibit, indeed, the pure Arara type and on that account do not leave the indication of locality free from objection, the unmarked arrows of the Stockholm Museum with greater certainty may be ascribed to the Apiaka. They show partly a union of cement feathering with the most general fashion of the Arara arrow; are, in fact Arara arrows passed over to the Apiaka type. One arrow displays the variety of sewed feathering discovered by Natterer.

If we now study the boys' arrows in the Von den Steinen collection of 1888 (op. cit., p. 433), belonging to the Pareci tribe who, according to that author, have exchanged bows and arrows for muskets and given the former to boys for playthings, we shall see also the variegated sewed feathering.

It appears also that this, which, indeed, long before the beginning of the century, had gone westward as far as the Arara tribe in a somewhat simplified form first, in much later times had found its way among the northern tribes of the Tapajoz.

We may now bring together briefly the results of studies upon the Madeira-Tapajoz region. The bow and the arrow types of the Tapajoz tribes show preponderating westerly influences, which these received from the Parentintim and the Arara by way of the Madeira. The first demonstrable intrusion, the migration of the cement feathering, came upon the Apiaka from the Parentintim. Thence it found wider distribution in the Tapajoz region. Perhaps at the same time the sewed feathering of the Baccairi, somewhat varied among the Apiaka, extended to the Arara, and a third stream moved along from the Arara to the Cabischi and the Pareci. Later came also the Apiaka into direct contact with the Arara and received their type unmodified. The sewed feathering meanwhile intruded southward and was received by the Pareci. The working in of the Manhe type is only of a secondary importance.

From other tribes of the Tapajoz region, which are known only by

name, we possess no collections. Of the Cayabi, near neighbors of the Baccairi on the Rio Verde, Von den Steinen says "that they use arrow shafts of Cambayuva reed." (Op. cit., p. 392.)

The distribution of the bow types is very simple in the Tapajoz region and shall be touched on only briefly.

The Museums possess bows of the Mauhe, Mundruku, Apiaka and Pareci, and some with the general label Tapajoz.

Martius describes (op. cit., p. 203, 401) two different bow types among the central Tupi, to which stock belong for the most part the tribes on the Tapajoz. "They shoot long arrows from immense bows, often longer than a man, made from the black wood of a palm tree or the red wood of a mimosa, whose strings are twisted out of Tucum fiber or cotton." The bows from black palm wood belong to the Peru group, and are represented on the Tapajoz by Apiaka and Pareci examples. (Cf. Pl. LVIII, fig. 1.) The bows made of red leguminous wood, pau d'Arco of the Portuguese, with semicircular cross section are of the northern Brazilian type and here occur among the Mundrucu and the Mauhe. They are, for the most part, manufactured by the Mauhe and brought to the friendly Mundrucu through trade. (Pl. LVIII, fig. 10.)

Martius met on the Tapajoz a chief of the Mauhe who brought out a bow of red wood to the Mundrucu and exchanged it for feather ornaments. (Martius, op. cit., p. 88.)

A bow 180 cm. long (Pl. LVIII, figs. 6-9) of dark-brown wood in the Copenhagen Museum with ornamented ends which exhibits an artistically carved human head having eyes inlaid with mother-of-pearl over which a line runs on both sides in a meandering pattern is most interesting. In cross section it belongs to the North Brazilian bow region. The peculiar ornament is found, moreover, on a war trumpet in the Copenhagen Museum which was found among the effects of the Prince of Nassau in the middle of the 17th century and of which Ehrenreich has given a short account in *Globus*. Furthermore, this same ornament is to be seen on two remarkable little boards in the Christiania Museum as well as on a club in the Martius collection in Munich, illustrated in Ratzel's "*Volkerkunde*" (11, p. 575). But in Vienna the label "Mundrucu" is upon a war trumpet which had been overlooked having the same ornament. The decorated end is bored through for the fastening of the cord, a fashion entirely out of vogue now in South America. The cord is a thick twisted gut string. In the middle or grip the bow is whittled on the inner side for better handling.

From the Pareci two bows are in hand, one from the Natterer collection, the customary Peru bow made from black palm wood, the other, a boy's bow, also made of black palm wood, brought by Von den Steinen having the North Brazilian form. Here occurs a rare instance in which a tribe adopts a foreign form without using for it the customary material. The form of the North Brazilian bow has either gone to the Tapajoz outwards through the Mauhe to the Pareci or been received from the Tora, from whom, as was seen, the painted ornament arrived on the

Tapajoz. Whether the road which the Peruvian bow took toward the Tapajoz is that of the cement feathering is not determined, since the only accessible Parentintim bow in the Berlin Museum shows angular edges, while the Apiaka and Pareci bows are rounded. Perhaps this has its origin among the tribes settled higher up on the Madeira who possess similar bows.

Having sketched in the foregoing pages the ethnographic characteristics of the Tapajoz region and recorded the ethnographic information concerning Shingu and Tapajoz peoples, I shall proceed no further among the Madeira tribes, since these indeed do not belong peculiarly to the Mato Grosso and are of interest only as they influenced the character of the Tapajoz region. Upon the characteristic forms which the migration to the Tapajoz made necessary, communication has been made in the course of the foregoing narrative.

The Araguay region presents only pure eastern forms, so that here is exhibited a much more simple ethnographic picture. Bows as well as arrows belong to the almost united group of Eastern Brazilian bows and feathering. By the evidence of the Shingu tribes it could be emphasized that some arrows of the Suyá, like those of the Yruna of the lower Shingu, deviate very much from the Shingu type and belong to the eastern feathering group.

The Suyá are as already seen, the member of the Ges or Tapuya stock most widely pushed to the west, and they have in spite of their long backward stretched road to the Tapajoz and to the Shingu, and in spite of the manifold contact with other tribes, held on partly to the old type, or after they had set their foot again on the Shingu adopted anew the eastern feathering.

The Yuruna, who, as is ascertained through Von den Steinen, are known through their travel downstream and possess not the slightest knowledge of the Shingu tribes, stand in more constant touch with the widely branched and extensive Caraja tribe, who control the region from the upper Araguay entirely to the lower Shingu and are the dreaded opponents of the Shingu tribes. Von den Steinen found among the Yuruna Caraja prisoners as well as a club captured from this tribe, and further among the Kamayura of the Shingu a club and an arrow of the Aruma, an ethnographic horde belonging to the Caraja tribe. Moreover correspondences to the Caraja type were previously observed on the Baccairi arrows. The Yuruna live on the borders of the eastern and the western feathering and bow regions, and they have received from the western region the dark palm-wood bow and from the east the arrows. (Pl. LVIII, figs. 1-3.) The bow exhibits not the customary form on the Tapajoz, but resembles more that in use farther to the west, with sharp rectangular cross section.

Also this cropping out substantiates the theory of migration concerning the central Tupi; the stepped weaving is also found here. The arrows of the Yuruna have the Cambayua reed shaft in vogue on the lower Shingu, upon which a wooden fore shaft is attached by means of

a wrapping of bast. The upper end is oftentimes channeled, and in the cavity a double piece of bone is fastened by means of a wrapping of fine thread cemented over, after the customary manner on the Shingu (Pl. LIX, fig. 6). In another kind of arrows there is on the point of the fore shaft a long, similar strong bamboo point, with half moon, concavo-convex cross section tied on by means of neat wrapping of thread around the tang, and the fore shaft is packed in a furrow cut out.

The bamboo point resembles precisely in form the one mentioned as belonging to the Baccairi on the Shingu. (Pl. LVII, fig. 13.) Still a direct connection is excluded. Where the common origin is to be sought can not be conjectured. Also are seen arrows with a simple stick of hard wood sharpened and stuck in the front end of the shaft. The feathering is very similar to the Caraja style (Pl. LIX, figs. 8, 9); two whole feathers almost 20 cm. long, opposite each other, are wrapped fast to the shaft with thread in slightly spiral arrangement, and the points of the feathers stick out at the butt end in form of a tuft. The decoration of the lower part of the shaft, and much of the fore shaft with wide spiral and longitudinal lines painted in black and yellow lac-like colors, is also abundantly practiced by the Caraja. The nock, which is cylindrical on the Caraja arrows, is here, as on the Tocantins and Tapajoz, continued to a point.

The Caraja, whose linguistic affiliation with the Ges group is not yet made out, are, as Ehrenreich's collection proves, surely to be accredited to it ethnographically. Bows and arrows show the characteristics of the eastern type and correspond almost entirely with those of Crahaos and Chavantes, their eastern neighbors, belonging to the Ges or Tapuya stock. The predilection of the tribes belonging to this group for the use of bast for fastening feathers, fore shafts, and bamboo points, which is to be seen on the Shingu River, is also in bold relief in the Caraja crafts. The wooden point, with unilateral barbs, characteristic of the Ges of the southeast (cf. Pl. LVII, fig. 12), which had penetrated already to the Kamayura and arrived among the Suya, is not found among the Caraja. Only the arrow originating from the hordes of the Aruma, which Von den Steinen got on the Shingu, shows this Ges point.

The bow is beautifully wrought out of dark-brown palm wood and decorated with feathers and ornamental wrappings of thread. (Pl. LIX, figs. 1-5.) In the manipulation of the material, the circular cross section flattened occasionally on the back, and the peg-shaped ends characterize excellently the South Brazilian bow of the Botocudo and Puri. However, near the Caraja and thence to the Shingu and south to the Cayapo, it shows fundamental dependences on the bow types there. It is slightly bent, about 2 m. long, and strung with a strong cord twisted from threads, which is knotted on one end and on the other encircles the peg, then returns on the back of the bow about half-way, as was seen on the Singu, where it is made secure under seizings. The lower end of this wrapping is decorated with a compact layer of

leaves, held on by means of black cotton thread bound closely down. At the end of this bowstring, wound backward and colored with white clay, is a large yellowish-red bunch of feathers, bound on as ornament. Moreover, about both ends is wrapped a stepped pattern about 5 cm. broad. The decorations are frequently wanting.

The arrows are quite as carefully made as the bows. The shaft is of Cambayuva reed, and the fore shaft, of different kinds of wood, is frequently, as among the Yuruna, adorned with yellowish-brown or red lines and points in lac-like paint. Among the very diversely shaped points occur only two already known, the smooth wooden point and the short bone point (Pl. LIX, fig. 6) set in slantingly in the wooden fore shaft, which is common among the Yuruna and upon the Shingu. Frequently this bone piece is replaced by a fish spine. (Pl. LIX, fig. 13.) A peculiar point, which is made of a delicate cylindrical bone cut off obliquely at the outer end, is cemented upon the point of the fore shaft, reminding one also of a similar form on the Shingu, only there the barbs are wanting. Moreover, there are two noteworthy points of palm wood to be mentioned as peculiar to the Caraja. One of them, lanceolate, two edged, with an angle on one broad side and the other rounded. The second point is knife-blade shaped, with a somewhat serrate edge at the inner extremity of the edge. (Pl. LIX, figs. 11, 12.) Both call to mind similar southern forms among the Cengua tribe in Paraguay. A lighter arrow for small game is made wholly from a piece of Cambayuva reed whittled to a point. (Pl. LIX, fig. 15.) The arrows with bamboo points (Pl. LIX, fig. 14) deviate greatly from the types up to this time described. The delicate long point, 30 to 40 cm., is hollowed out on the inner side only or very little and runs somewhat to a beak-formed point in front and is rounded abruptly at the inner end. The fore shaft, shoved into an excavated socket in the shaft, is tightly wrapped the whole length of its union with Cipo bast. A bird arrow exhibits a short wooden knob, thickened conically toward the front and terminating in a blunt point. (Pl. LIX, fig. 10.) The feathering is arranged upon the same principle as that of the Yuruna, but differs from it in more careful work and in the single points characteristic of the Caraja. The fastening of the feather, moreover, is wrought with black thread (Pl. LIX, fig. 8), or less frequently with winding of Cipo (Pl. LIX, fig. 9), in which often also little tufts of red feathers are caught; also the lower long binding, which here for the most part is effected by windings of thread, and stepped patterns includes often red feathers as decoration. Almost always here also the shaftment is painted with red and yellow varnish in lines, whereby an individual taste is to be recognized in decoration still remaining on several examples.

As already mentioned, the Chavantes and Crahaos, living eastward on the Araguay and Tocantins, are with little deviation to be reckoned in the company of Caraja; only less care is bestowed in the manufacture of their weapons, and so the decoration is frequently omitted.

Whether all the different varieties of points also exist among them is not known. There have been examined arrows with knife-blade points of bamboo (Pl. LIX, fig. 14), those with double-pointed bone tip (Pl. LIX, fig. 6), laid on diagonally at the fore end, arrows with smooth wooden points, and finally those cut from a single piece of Cambayura reed. Still the Chavantes may possess for war also an arrow with toothed points of wood. (Pohl, *Reise in Brasilien*, vol. ii, p. 30.)

The bows of the Crahaos are somewhat different, since the belly has a flat, guttered excavation, and only one end is cut to a point, while the other end is blunt.

The Aruma arrow, already mentioned, is likewise of Caraja type, but the characteristic toothed point of the Ges stock is here found. (Pl. LVII, fig. 12.)

It remains now only to mention the bows and arrows of the Cayapo, in the Natterer collection, from the region about the sources of the Araguay, in the eastern Matto Grosso. They occupy ethnographically a middle position between the Shingu and East group and the tribes settled on the south of the Mato Grosso. The peculiar bow of the Cayapo (Pl. LIX, fig. 16) is, in spite of its apparent isolated position, to be relegated to the East Brazilian type. Here also the cross section is fixed by the nature of the material. While the remaining part of the bow is nearly straight, its pointed ends, about 10 cm. long, are bent inward at an angle of 120 degrees. In order to give a sufficient excursion to the bowstring of twisted vegetable fiber, a ball of cotton is wound about the bow at the inner part of the nock. The bowstring is knotted on one end and ends with a sling at the other end of the bow. In a wide spiral winding the rest of the string is then carried back, as in the Caraja bow, and caught under compact bands of wrapping about 10 cm. in width.* The arrows give evidence in the sewed feathering, as already remarked by Von den Steinen (*op. cit.*, pp. 151, 153) of a long-enduring friendly relation with the tribes of the Shingu, especially the Nahuqua and the Cayapo, which has proceeded as far as the Parana-tinga—indeed, perhaps, as far as the Ronuro. Associated with the sewed feathering and the rounder nock, the predominant Ges character of the arrow is also striking. There are found here the Cambayura shaft made fast to the point by means of a wide wrapping of Cipo; also the long, unilaterally toothed wooden point (Pl. LVII, fig. 12) and the so-called Caraja bamboo point. The winding of the point to the shaft with wrapping of thread is here rude and meager, so that the fore shaft is seen through. (Pl. LIX, fig. 17). A strengthening of the shaft by partial wrapping of the Cipo is seen on the Cayapo arrows and those of the Bororo.

The tribes of the southern Mato Grosso are to be studied in common, although they exhibit great ethnographic differences and, as the chart teaches, are to be ranged partly with the West Peruvian group and partly with the East Brazilian group. They belong to the Paraguay

region and are, since they were compelled to follow an entirely different route of traffic to the southward-flowing rivers, in a directly opposite condition to the tribes of the Madeira, Tapajo, Shingu, and Araguay. Their ethnographic development must stand in direct association with that of southern tribes, shut off from the tribes of the northward-flowing rivers, which, for the most part, are confined within their own drainage regions, and only along subsidiary lines are they in contact with tribes of a neighboring drainage to bring about ethnographic adjustments. However, that the tribes extending farthest north on the Paraguay region came into frequent touch with the tribes neighboring to them is thereby not excluded, and, on the contrary, it is proved, as was shown in the case of the Cabischi arrow and Cayapo weapons. For that reason there can not be drawn up for the ethnographic development of the whole group a balance sheet respecting this region which would be derived through the coming together of many types from different directions into one or through the radiating expansion of a dominating type.

Further, a second motive constrains one to deviate from a hard and fast division, namely, that, as was already seen concerning the Baccairi, a people can develop along entirely diverse ethnographic lines through divisions and wandering away into remote parts. It is the case here with the Bororo, whose western branch approaches the Shingu tribes in their feathering and has received its bow in commerce with the Paraguay tribes, while the eastern branch has held on to the original common mixed type of eastern feathering and bow throughout. These two tribes, whose development is easily demonstrable, can be considered apart when it comes to the study of the fundamental type. On this ground it is well to discuss the Paraguay tribes of the Mato Grosso in common.

The Bororo tribe, the special representative of the native southern Mato Grosso populations, who, if not the autochthones, occupied the region of the southern Mato Grosso as far back as any information of the tribe is had, specially the upper Paraguay portion, existed, indeed, since the previous century in two groups, which have gone forth out of the region previously discussed between the Lorenzo and the Paraguay, and from which outward the eastern section pressed forward into the vicinity of the Cayapo, on the upper Araguay, the western half passing over the Cuyaba and the Paraguay and halting at the western confluence of the Paraguay. The Bororo are a hunter tribe purely, who, being given to fishing and the chase, held on tenaciously to their manner of living and developed an unrestrained free character and a wild temperament, which can not be said concerning close application to the field and the restful activity of the tiller of the soil. While the Government and the missions have succeeded with great difficulty with others, as for the Bororo, with their hostile indisposition to link their interests with those of the colonists and to settle in permanent aldeas-

ments, the plan to interest them in the cultivation of the soil did not succeed. They remained hunters as before, and only acknowledged with sufferance a guardianship on the part of the Government while advantages accrued to them in this way. Their support was abundantly cared for, so that they themselves were not brought to want for food or any other necessities of life. But the hunting and fishing went on in spite of their common occupation. When these no longer served them as a means of livelihood they were pursued as sport. The reduction of the two groups happened at quite different times. While the Bororo of the west were already settled in the first half of the century, the other half extended for a long time hunting and pillaging through the camps before it was possible to bring them to remain for some years on the Lorenzo.

The three collections from the Bororo—that of Natterer in Vienna, that of Rhodes and of Von den Steinen in Berlin—are from the two sections of the Bororo after their separation and, excepting the Bororo of Cabagá, after their subjugation. There is wanting the type of weapon of the Bororo from the olden time when they were united. Still it is possible to reconstruct the common type, partly, since from both groups pieces of the same type are in hand. Through this it must be accepted that in the Von den Steinen collection of the year 1888, shortly after the settlement of the eastern branch, this type partly returned, and in the Natterer collection of the western Bororo (collected in 1827) it is to be seen that only the eastern Bororo continued the original common type after the separation, and have only through commerce with their neighbors on the Araguay adopted varietal forms. The much longer absence of association of the eastern Bororo in comparison with the western substantiates this view, while much feebler associations with culture and with other tribes would render possible and easy a constancy in the making of weapons which are perfectly sacred to them as their crowning peculiarity. Let us examine, therefore, first, most carefully, the bows and arrows that Von den Steinen collected in the year 1888 in the colony of Thereza Christiana (Pl. LX, figs. 1 to 9), newly established in 1887, from the point of view that we have here to do with a purely hunter folk whose peculiarities culture could not have wiped out.

The bow was their most precious possession as the only means of livelihood. This belief finds its expression in the estimation in which it was held. Von den Steinen says (*op. cit.*, p. 502) that after the bow and arrow of a head of a family are burnt up in the funeral fire along with the household stuff, the survivors receive from friends bows and arrows as pledges for the foundation of a new household. Arrows, moreover, furnish the present of the lover to the girls and women of the ranchao, by whom they are given over to their brothers. With arrows and especially shaped bows the fortunate slayer of a jaguar would be distinguished, and arrows furnish the medium of exchange for cotton

and tobacco. In their ceremonies these weapons play a leading role. In the consecration of the skull of a dead man, a long and complicated mortuary ceremony, five bows set up in a semicircle form the foundation of a kind of sanctuary. Whether in the traditions here as on the Shingu the arrow plays a special role is not known. The great value of the bow and arrow naturally finds expression in the carefulness of their manufacture. Since they set forth the characteristic attribute of the hunter they are prepared only by the men, who expend a painstaking accuracy and care upon their production. Perhaps centuries of using the bow and arrow have developed different kinds for different functions, which show, indeed, the same characteristic marks of the tribe, differing in the choice of material and the form of the point. The arrows for war and for hunting larger mammals, as the jaguar, being much heavier in consequence of the use of the dense Seriba palm wood for the shaft, have their penetrating power greatly increased. Arrows with shaft from light Cambayuva reed are lighter and have longer flight.

These original, characteristic types of weapons, since they seem to remain relatively pure, enable the student to recognize through them tribes far away and correspondences with neighboring forms. From their next neighbors, the Cayapo, their hereditary enemies, they appear never to have learned the great strengthening of the shaft by wrapping it with Cipo bast, and this makes obtrusive the similarity of their arrow with that of the Caraja and with certain forms on the Shingu. Firstly, in the feathering, beautifully executed and decorated with little tufts of feathers, a relationship with the Caraja arrow can not be recognized, likewise the form of the bamboo point of the peccary arrow is the same as that of the Caraja bamboo point previously described. To both tribes, furthermore, the plain arrow cut out of a single piece of Cambayuva reed is common. (Pl. LIX, fig. 15). The barbed wooden point of the fishing arrow is suggestive of the Ges form.

All these correspondences point to the east or the northeast; for all that, relationships with the western tribes are not to be denied. The points made from the tubular part of the humerus bone of a monkey (Pl. LVII, fig. 8) are common to them and the tribes on the Shingu, the west Bororo, and the Guato. An artificial winding of the dark Cipo, associated with the loosened wind of the reed at the butt end of the feathering, points to similar work on the northern Paraguay, the black and white wrapping of thread for the fastening of the feather (Pl. LX, fig. 9; cf. fig. 14) is likewise in use among the southeastern tribes—the Guato, for example. The attachment of the bow to the Peruvian type is recognized by the natural peculiarities of the materials and the cross section (Pl. LX, figs. 1 to 7), as must strikingly appear, since these examples stand out isolated in the eastern Brazilian bow region. The black palm-wood bows with greatly thickened ends are somewhat aberrant by reason of their long elliptical, somewhat hollowed cross section.

The fastening of leaf filaments on a bow as a premium for having slain a jaguar as well also as the beautiful decorations on the chief's bow with wrappings and tufts of feathers are entirely like the Caraja custom.

While the Bororo, just described, appear to have preserved the type of their hunting weapons relatively pure up to the time named, the weapons of the Bororo of Cabaçal and those of Campanha, the western groups on the Cabaçal and the Jaura seem to have yielded more to foreign influence through contact with other tribes. These Bororo also, already having become sedentary, in the first half of the century held fast to the old custom, were prejudiced against agriculture and continued hunters. However, through continuous touch with culture and with their influence destroyed they are to-day entirely subdued. The dispersion of weapons went hand in hand with the wanderings of this tribe. The two collections from these Bororo were brought together at different dates. That of Natterer, assembled in 1827, containing arrows of the Bororo of Cabaçal and Campanha, comes from a time in which the Bororo of Cabaçal were still ranging free in the wilderness, but the Bororo of Campanha had then been brought under control for some years. It is now seen that the arrows of the Bororo of Cabaçal have from the first held to the original type to which the Bororo on the Lorenzo return. The broad bamboo point of the characteristic jaguar arrow (Pl. LX, fig. 8), which is so cut that the knot on the reed shaft runs across the point, the loose shafting of the point as well as the working of the intractable Seriba palm wood to a very long foreshaft, associated with a very short Cambayuva reed shaft is a reminiscence of the old union with the eastern Bororo. The feathering, however, with the feathers toothed on the margin has decidedly the characteristic of the Guato arrow (Pl. LX, fig. 14), though in this tribe there is wanting the peculiar arrangement of the nock. Whether this influence can have been exerted upon their westward wandering when they may have come in contact slightly with the Guato, or happened for the first time later after they already had settled on the Rio Cabaçal, is in doubt. An association with the Guato, the water nomads of the upper Paraguay, is very probable. The bow manifests no variations whatever. It is about the same simple unadorned weapon of the original Bororo on the Lorenzo. That these Bororo did not know the decoration of the weapon with little feather tufts, shows that the Bororo of the East had not been brought in contact with this technique originally but, as already mentioned, have taken it from their later neighbors.

The Bororo arrows of the Campanha in the Natterer collection, which were received from them after they had already become settled by conquest, show an advance in the migrations hinted at. Before all else, the Cambayuva reed used for shafts of arrows was entirely replaced by the Uba reed. The abundance of the Uba reed (*Syncrium saccharoides*), on the one hand, and the influence of the Guato using it and perhaps of the Baccairi, on the other hand, have occasioned this

change. As a single survival of the time before the separation of the Bororo, there is to be seen among the Bororo of the Campanha the jaguar (Pl. LX, fig. 8) arrow point, with foreshaft of Seriba palm wood. The feathering of this arrow is here entirely different. (Pl. LX, fig. 17.) The feathers are, in spite of the constant disasters of this tribe, set on the shaft with very much more elegance and care. When the Baccairi of the Tapajoz region are contrasted with one another, this technique would seem to have come only from the Baccairi on the Paranatinga, earlier united with the Bororo, while the wide separation of the Bororo from the Baccairi of the Shingu does not allow contact with them to be thought of. Moreover, the highly developed technique hints that the reception of the sewed feathering must have occurred already in much earlier time—indeed, shortly after their wandering into this region. Eventually this form, indeed, had already become known to the Bororo before the split and was lost by the eastern Bororo. The Pareci, the northwestern neighbors of the western Bororo, can not be regarded as intermediaries, because they, in more recent times, as was seen, first received the sewed feathering from the north. As for the origin of the Bororo, sewed feathering on the Shingu calls to mind that also on that river the bone point from the humerus of the monkey (Pl. LVII, fig. 8), as well as the wooden point of the Baccairi and the Nahuqua with side barbs of palm splint wrapped on, were known to the Bororo (Pl. LVII, fig. 14). In opposition to this approach to the Shingu type is the setting aside of the old Bororo bow and the adoption of the Guato bow (Pl. LX, fig. 10), only a little modified. An unpracticed eye would with difficulty discriminate the bows of these two tribes. These bows belong to the eastern Brazilian type, and, indeed, also here is to be found the bow with bast wrapping diffused in the western part of this region. The more or less round, slightly bent bow stave, made from the brown wood of the Caranda palm, is throughout its entire length closely wrapped in imbrications, with about 2 cm. broad strips of Cipo negro or Liana bast, only the ends are free and bluntly pointed. A strong palm fiber bowstring is carried back on this wrapping for a quarter of the length of the bow, as in those on the Shingu and the Cajara.

The second collection of the western Bororo, by Rhode, in 1884, brings to us another stadium of development. In the sixty years that passed after Natterér's journey, the disadvantageous influences of culture likewise worked to the detriment of the Bororo of Campanha and of Cabagal, and from Von den Steinen's account (op. cit., p. 442) they to-day form only a poor, starving society. This is more wonderful, because after the year 1827 a certain constancy in the making of their weapons is shown. The sewed feathering, no less than the bone points, has become entirely domesticated. A similar bamboo point (Pl. LX, fig. 16) to that found among the Baccairi and Yuruna occurs also here and is associated with the sewed feathering. It appears also

to have come among the Bororo from the Baccairi. However, as already made clear, it is not easy to say whence the Baccairi received the point. But therewith also has the contact with the Baccairi belonged, since after the settlement of the Bororo the conflict northward must have ceased. It has at the present time a stronger assimilation with the Guato, the water nomads, which went on until the Bororo came hereabout. So, as at this place the Bororo received the bow from the Guato in this region, these last, in reciprocity, took the bone point. The Uba reed has entirely superseded the Cambayuva reed. To the stout, long shaft, which often, as among the Guato, is made up of several pieces bound together with wrapping of Cipo, is made fast a harder knotty wooden foreshaft by means of Cipo wrapping. These are all the arrows with which the Guato are familiar. Out of the originally much-diversified arrow forms remain now only two, the one with the bamboo point and the one with the bone point. With the bamboo point (Pl. LX, fig. 16) is associated the sewed feathering; with the bone point (cf. Pl. LVII, fig. 8) belong a feathering similar to that of the Guato type. However, the peculiar form of the barb is always wanting.

Of the tribes that live south of the Bororo no one is appropriately to be assigned to the Mato Grosso. They dwell together in the deep swampy lowlands of the Paraguay, which furnish the transition to the great Plains of the Gran Chaco. However, there are some tribes yet to be brought into this discussion, since the ethnographic connection with the Bororo are so striking that omitting them would leave the ethnographic picture of the Mato Grosso incomplete.

The Guato, already frequently mentioned, a people in their tribal affiliations quite as unknown as the Bororo, lived, so far back as information of them goes, upon the upper Paraguay and its tributaries, which, at the time of the inundations during half of the year, when their homes are partly submerged, they navigate as genuine water nomads in their canoes. Driven to the water, they live chiefly upon fish, which, in the absence of hooks, they hunt skillfully with bow and arrow (Castelnau, *Voyage*, etc., III, p. 9), an art which is commonly spread over South America.

The bow (Pl. LX, fig. 10-13), as mentioned, almost the same as that of the western Bororo, has as a variation a thick tuft 5 cm. long, which is shredded from the end of the Cipo filaments and wound fast about the bow, serving for a better security of the bowstring. The Cipo winding is cleaner and less carefully laid on than among the Bororo. The bowstring is made from the shredded fiber of the Tucum palm, or, according to Castlenau, also out of the gut of the monkey (Castlenau, *Voyage*, III, p. 14), and is, as among the Bororo, in its prolongation wrapped less close and fast about the bow. The arrows of the Guato are distinguished by the feathering, the same as those of the Bororo. Along with the bone point, which was, indeed, transferred from the

Bororo, and also with a harpoon arrow with unilaterally barbed point, there is in the Rhode collection a bamboo point (Pl. LX, fig. 15) having nothing in common with those of the Bororo. It is narrow, is a flattened circle in cross section, and is made fast upon the short foreshaft by means of a narrow band of Cipo wrapping merely, and the foreshaft is not, as generally, inserted into the point, but is spliced on. The Natterer collection furnishes the same style of arrow, but only with bone point. Arrow shafts made from pieces joined, already mentioned among the eastern Bororo, are held together among the Guato with fish glue. (Castelnau, *op. cit.*, III, p. 14.)

The feathering (Plate LX, fig. 14) of the Guato arrow is worthy of remark in its deviations from that of the Bororo. Generally one-half of the plume of the feather is cut toothed, as also partly among the Bororo of Cabaçal. The fastening of the smooth feather lying flat on the shaft is effected in the customary technique of the eastern Brazilian type by means of a cotton thread at the inner and outer end, which is blackened at the upper extremity. Sometimes Cipo is also utilized, which mostly continues from the upper wrapping to the lower in a longer spiral, simply encircling the shaft. This also calls to mind similar ones occurring among the eastern Bororo. The notch is worthy of notice. Two pegs of hard palm wood driven into the border of the nock prevent the reed from being split and rendered useless by the discharging of the arrow. This practice was found already in the Mauhe feathering (Pl. LIX, fig. 13), wherein a notched wooden nock is driven into the end of the arrow, a technique distributed throughout the entire northeastern region of South America and having its origin in Guiana. A more extended account will be given in the projected work. The technique employed by the Guato in the manufacturing of the notch differing from the customary method allows the belief that they discovered it independently of the northern nock technique. Outside of a few tribes neighboring to the Guato the nock pegs are nowhere found.

From the Guana, the last people here to be considered, there is in the Natterer collection only one long harpoon arrow with the label "Guana, Presidio Albuquerque and Miranda on both banks of the Paraguay, Mato-Grosso and Bolivia." It is absolutely of the Guato type. The shaft is of Uba reed; the foreshaft is fastened on by means of Cipo, and the long feather or shaftment terminates in nock pegs, only there is upon the smooth foreshaft of redwood, most commonly used in the Gran Chaco, an iron point set with bark pointing backward. Through this similarity with the Guato and indirectly with the Bororo arrow the story (von den Steinen, *op. cit.*, p. 379) of the coming of the Guana from the north out of the Arinos region gains probability. Dobrizhoffer, who traveled from the Chaco westward from Albuquerque, alleged that they differed from the Chaco people and that they did not use the horse. Natterer and Castelnau found them in the Presidio Albuquerque and Miranda, in three hordes, the Guana proper, the Terenos, and the Lai-anos. While also the use of the horse is not mentioned among the

Guana proper, the Laianos and Terenos are described as riding people (Castelnau, *op. cit.*, II, p. 469), who carry the customary weapon of the Chaco Indians, lances with iron points, clubs, bows with small arrows, and wearing the bodoque or labret received from the Guarani of Paraguay. To this assertion correspond some bows and arrows of the Terenos in the Berlin Museum, which completely correspond to the Chaco type. Although the three mentioned tribes are not to be regarded linguistically as Nu-Aruak the different modes of living and different character of weapons show an already very early separation.

The Terenos and the Laianos quite early, perhaps shortly after the Chaco people had begun to ride the horses introduced by the Spaniards, were driven from the common possession on the upper Arinos toward the northern Chaco, which had been seized, where they, as well as the Guana, were called a horseless nation by Dobrizhoffer. The Guaycuru, Mbaya, their neighbors, gained through the ownership of horses a great advantage over them and brought them under their sway. (Dobrizhoffer, *Geschichte der Abipones*, I, p. 161.) As will be frequently seen in a subdued people, the Guana accepted entirely the mode of life of their conquerors, and also their weapons, which they later continued using after they had again gained their freedom. Perhaps, at first, long after the wandering about had been taking place with these Guana, the remaining Guana also drew off to the southward. A village of the Guana near Cuyaba, 1848, was still called in that language Akten. (Von den Steinen, *op. cit.*, p. 550.) They settled in the vicinity of the Guato on the Paraguay, whereby an ethnographic commerce was effected.

Southward of the Guana the tribes living on the banks of the Paraguay are genuine Gran Chaco stock, whose history so far as known has been closely knit with that of this region. It might be here remarked that the form of arrow known from the descriptions of the Bororo, Guato, and Guana, finds many transitions to the type common in Paraguay, while the transition to the Chaco form takes place first indirectly through the Paraguay type. Furthermore, in the same way, these tribes are related to one another through their bow types.

The bow wrapped throughout with Cipo (Pl. LX, fig. 10) is to be seen in several differentiated forms as far as southeastern Brazil. The distribution of the nock pegs (Pl. LX, fig. 14) is evidenced by single unlabeled old arrows of pure Chaco type which are in the museum at Edinburgh. Whether these received the pegs in contact with the Guato type, or whether the origin of this technique is to be sought in some portions of the Chaco region, from which it was communicated to the Guato, is not disclosed. The practical value of this applied nock is easily seen. A technique of this kind can, therefore, since it does not differ outwardly from the character of the type, easily have been borrowed from a tribe extremely conservative in the giving out of their weapons, as we are able to demonstrate among the Chaco people, whose

smaller bow of Curepay wood has been found in prehistoric graves in Jujuy, in the western Chaco region.

We may now bring together the results reached for the southern Mato Grosso. It is known that, with exception of small movements in opposite direction between neighboring peoples, an ethnographic stream, rich in its influences, has flowed from the south, passing out from Paraguay and reaching to the Bororo. As well the Paraguay feathering, as the winding of the bow with Cipo may be traced as far as the Bororo. Afterwards this stream is met by one opposing it from the north. It is indeed astonishing, but its influence does not pass the Guato. The sewed feathering is confined to the Bororo; only the bone point is now to be found among the Guato. The spread of the Uba reed, as mentioned, founded on its abundant supply, can not testify directly of an ethnographic relationship.

The ethnographic picture of the whole Mato-Grosso appears, in spite of its original complexity, to be strikingly unified on closer inspection.

We see in the northern region two great ethnographic streams, one from the west and one from the east, running toward and in the Shingu encountering each other, so as to result in a mixed type. Between them is thrust in a third type, which perhaps, on the upper Shingu, at least so far as the feathering goes, has its center of dispersion toward the Tapajoz and Tocantins. A small by-stream is to be traced from the northwest to the Arara, the Juberi tribes, for example, and to the southeast on the Tapajoz from the Mauhe. In the southern Mato-Grosso runs a main stream along the Paraguay. A second one is directed southward from the Shingu region. Further influence of groups lying farther off is not to be recognized in the Mato Grosso.

The ethnographic character of a people is generally not coterminous with its linguistic affiliations, but depends also on a place which a people occupies with reference to its neighbors, and on possibilities of an ethnographic adjustment conditioned thereby. Original peculiarities of groups of tribes, like the Tupi, are to be occasionally found, but these have through many adjustments with others, not belonging to the stock, lost characteristics or have been changed therein. Whether the widely diffused stepped decoration (Pl. LVII, fig. 5), found all over northern South America, as well as the quill ring (Pl. LVIII, fig. 17), are to be regarded as tribal characteristics is to be decided by further and more careful observations.

The question how far the conclusions reached concerning the development of the Mato Grosso furnish generalized results for other regions, and how far other momenta for the completion of the ethnographic picture are to be considered, will be attempted in a later work.



EXPLANATION OF PLATE LVII.

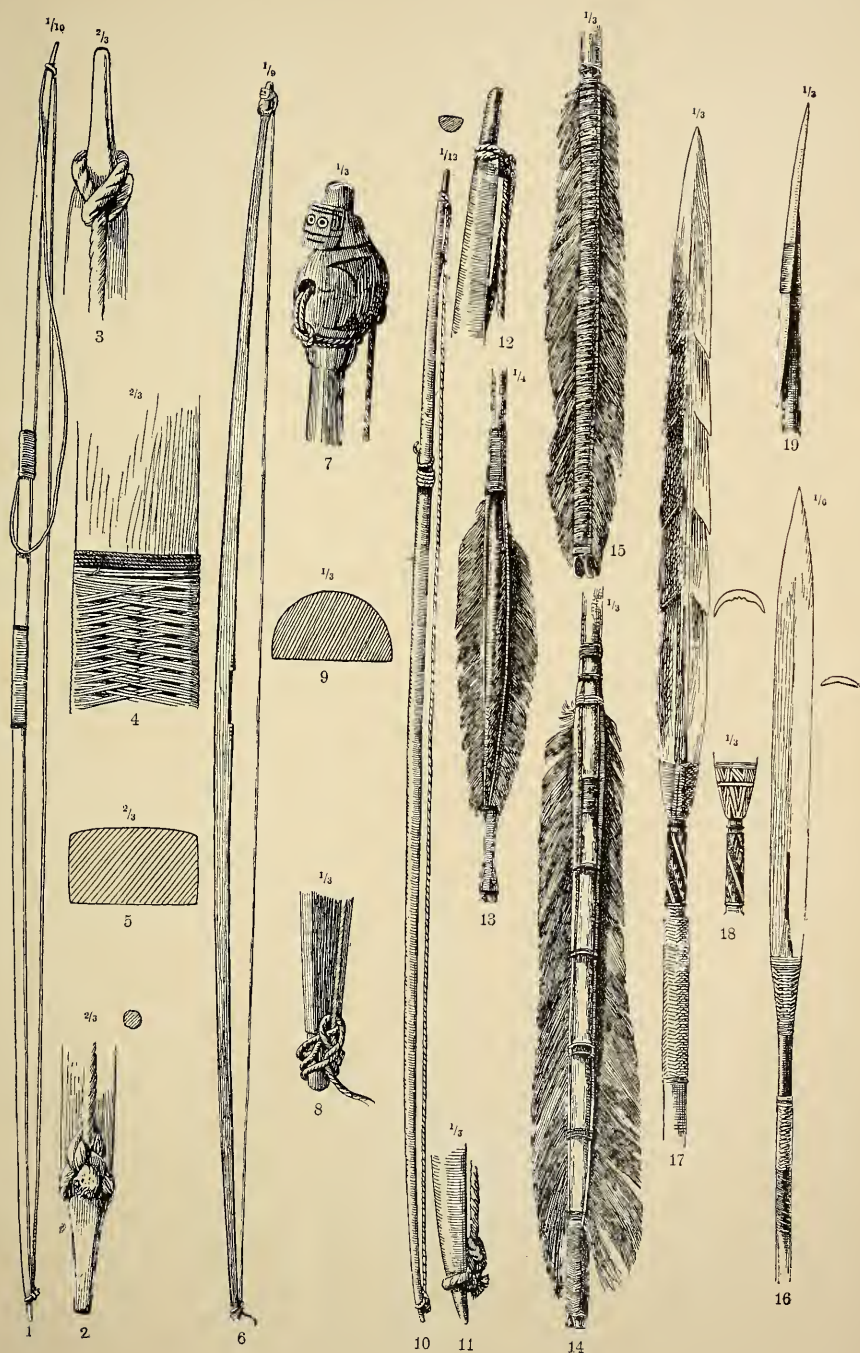
[Figs. 1 to 14, Berlin Museum.]

1. Double-curved bow of the Aucto, Upper Shingu.
2. Cross section of the same at the grip.
3. Cross section of the same at the ends.
4. Double-curved bow.
5. End of the same showing stepped pattern of wrapping.
6. Cross section of the same at the middle.
7. Single-curved bow, with rawhide rings stretched on, Baccairi tribe.
8. Arrow with Shingu sewed feathering and point from monkey humerus set on, Aucto.
9. Shingu sewed feathering, Aucto.
10. Tucum nut whistle on shaft, Suyu.
11. Bamboo point, Kamayura.
12. Bamboo wooden point, Ges from Kamayura.
13. Bamboo point, Baccairi.
14. Wooden point, with barb of ant bear zygomatic process.

EXPLANATION OF PLATE LVIII.

[Figs. 1 to 5, 10 to 15, Berlin Museum; 6 to 9, Copenhagen Museum; 16 to 19, Stockholm.]

1. Bow, Peruvian type, Yuruna tribe.
- 2, 3. Ends of the same.
4. Middle part wrapped with thread.
5. Cross section in the middle.
6. Bow with carved end, Mundruen.
- 7, 8. Ends of the same.
9. Cross section of the same.
10. Bow, North Brazilian type, Mauhe.
- 11, 12. Ends of the same.
13. Mauhe feathering, Mauhe.
14. Arara feathering, with stepped pattern and quill ring on the nock.
15. Peruvian cemented feathering, Baccairi.
16. Tapajos bamboo point, with stepped pattern in wrapping, Apiaka.
17. Toothed bamboo point, with ornamentation in quill work and stepped weaving, Arara.
18. Quill work and colored patterns effected in the wrapping of threads.
19. Bone point set on diagonally.

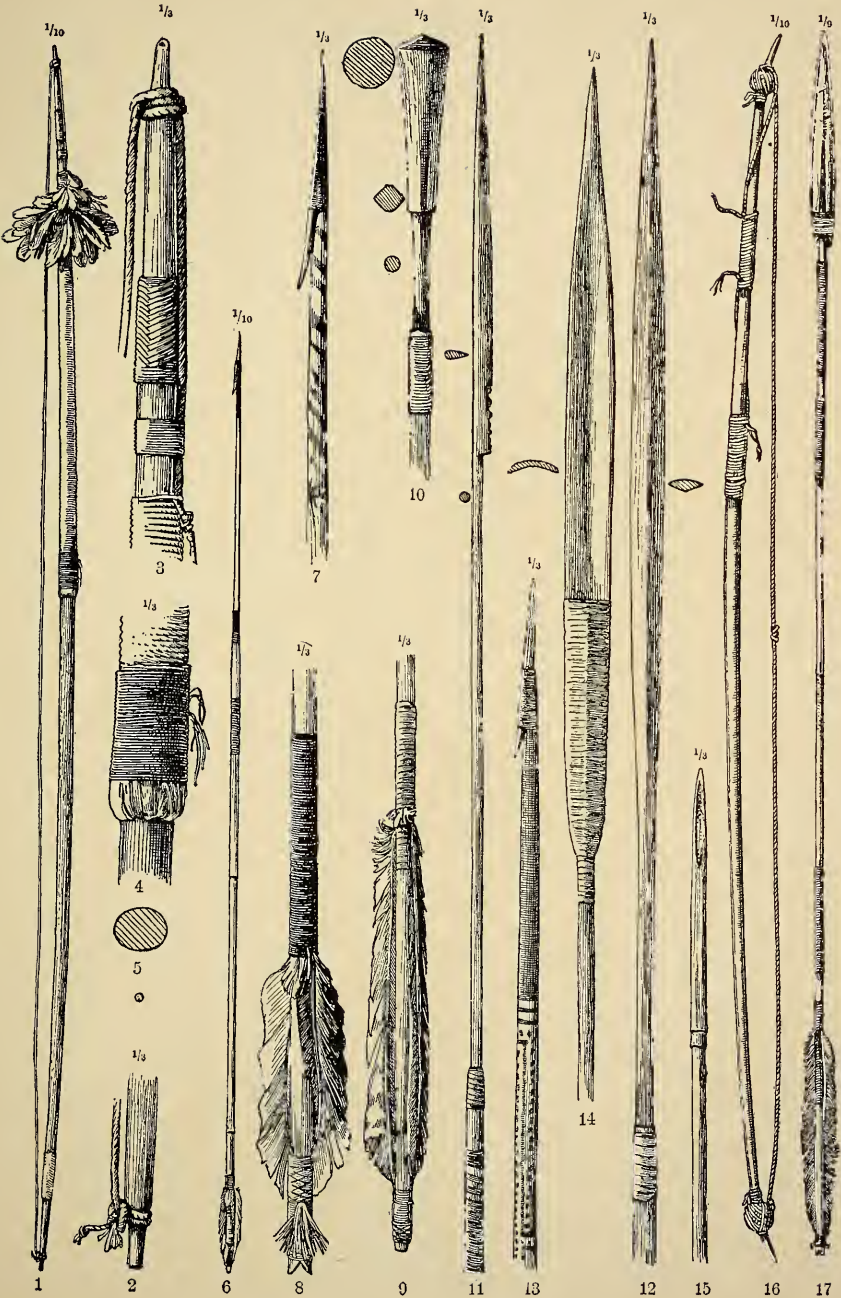


BOWS AND ARROWS OF CENTRAL BRAZIL.

EXPLANATION OF PLATE LIX.

[Figs. 1 to 5, Berlin Museum; 16, 17, Vienna Museum.]

1. Bow, East Brazilian type, Caraja.
- 2, 3. Ends of the same.
4. Middle or grip, with packing or wrapping of leaf.
5. Cross section.
6. Arrow with bone point cemented on diagonally.
7. Point of the same.
8. Feathering, wrapping of black thread, east Brazilian type.
9. Feathering, with wrapping of Cipo, east Brazilian type.
10. Wooden point of a bird arrow.
11. Wooden point of arrow, single edge, Caraja.
12. Wooden point of arrow, two-edged, Caraja.
13. Point of fish spine set diagonally on a painted foreshaft, Caraja.
14. Bamboo point, Caraja.
15. Point of an arrow out of a single piece of Cambayura reed, Caraja.
16. Bow, with cotton wrapping, Cayapo.
17. Arrow, with bamboo point, Cayapo.

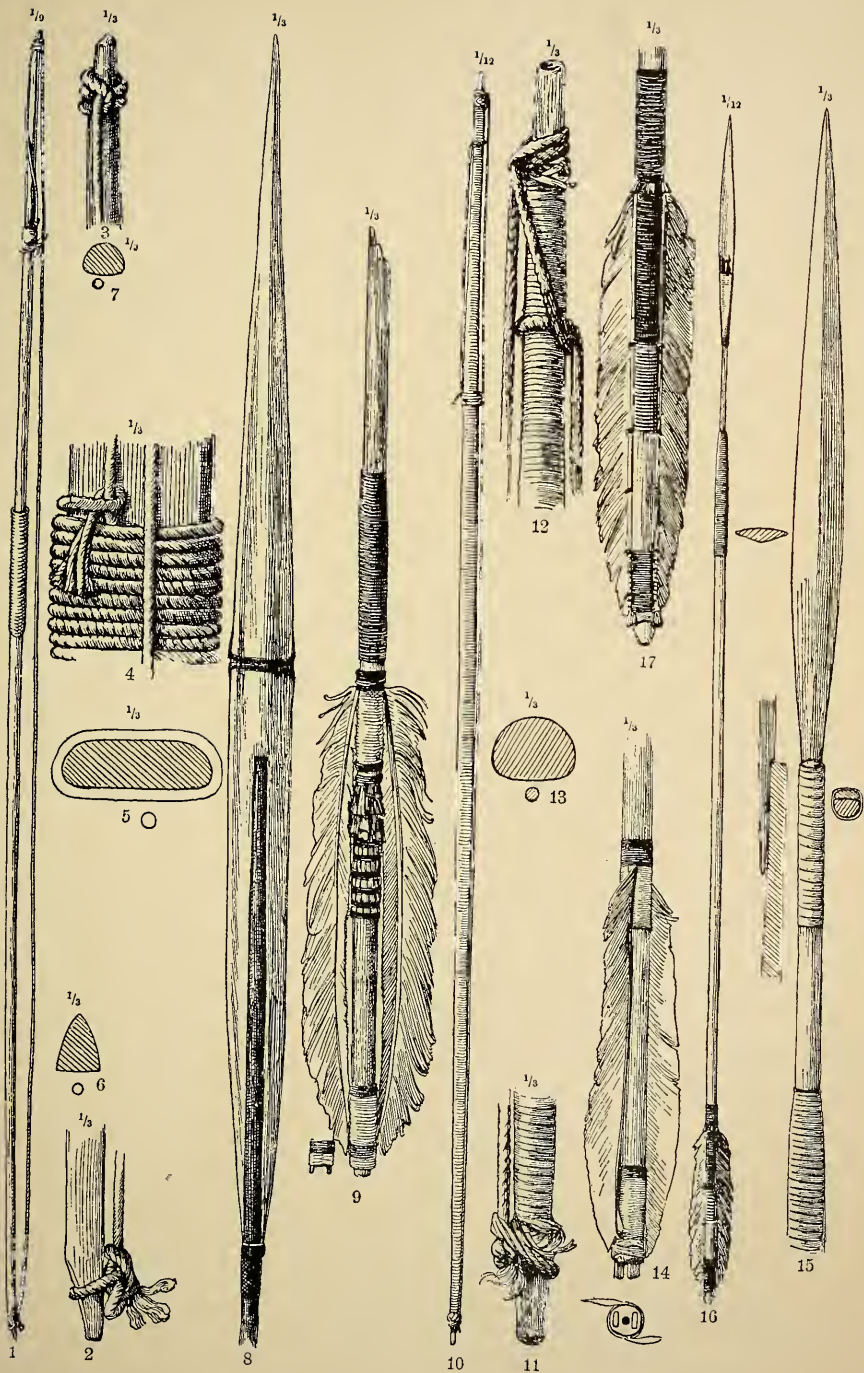


BOWS AND ARROWS OF CENTRAL BRAZIL.

EXPLANATION OF PLATE LX.

[Figs. 1 to 17, Berlin Museum.]

1. Hunting bow, Peruvian type, eastern Bororo tribe, Rio Lorenzo.
- 2, 3. Ends of the same.
4. Middle part or grip.
- 5, 6, 7. Cross sections.
8. Bamboo point of jaguar arrow, eastern Bororo, Rio Lorenzo.
9. Feathering of the same, eastern Brazilian type.
10. Bow, with Cipo wrapping and grommets, Guato.
- 11, 12. Ends of the same.
13. Cross section of the same.
14. Feathering, withnock pegs set in.
15. Bamboo point.
16. Arrow, with bamboo point, west Bororo.
17. Sewed feathering of the Bororo, western Bororo.



BOWS AND ARROWS OF CENTRAL BRAZIL.

