

have been recorded from Tropical Africa previous to those described by Mr. Seton-Karr, if the identification of some of the specimens as paleolithic is verified, the discovery is a very important one.

IN nearly every county of Central and Northern Indiana there occurs a kind of black soil, often spoken of as "bogus land." It is also sometimes called "alkali," but not correctly, for the land has none of the essential characteristics of alkali soil. The improvement of these hitherto unproductive black soils is the subject of a *Bulletin*, by Mr. H. A. Huston, published by the Agricultural Experiment Station of Purdue University, Lafayette, Indiana. It is asserted that thousands of acres of such soil are susceptible of amelioration to such an extent as to be made the most productive maize lands in the State. The use of straw or kaint has proved very profitable as a means of temporary improvement, but for permanent improvement a resort to efficient drainage—and that of a special kind—is essential. It is strongly recommended that, before incurring any other outlay, a preliminary survey of each area should be made, and the system of improvement determined according to the results of such survey.

PROF. H. G. SEELEY, F.R.S., will begin the summer course of lecture-excursions with the London Geological Field Class at the end of April. The subject of the series will be the Physical Geography and Geology of the Thames and its Tributaries. This is the eleventh annual course. Mr. R. Herbert Bentley, 31 Adolphus Road, South Hornsey, N., is the hon. secretary to this society, which gives a systematic course of teaching in the open country.

THE *Proceedings* for 1895 of the Agricultural Research Association, the organ of the Research Station, Glasterberry, Milltimber, Aberdeen, contain reports by the Director, Mr. Thomas Jamieson, on the securing of crops, on the permanence of manure, on the "furrow-system" of sowing grain, on the mechanical conditions of soils as affecting the growth of plants, on the mechanical analysis of soils, and on new manures.

THE Danish Meteorological Institute has recently published a valuable series of observations made in the Isle of Denmark, Scoresby Sound, lat.  $70^{\circ} 27' N.$ , long.  $26^{\circ} 12' W.$  From September 18, 1891, to July 31, 1892, meteorological observations were made every hour, under the direction of Mr. C. Ryder, the chief of the expedition. The mean temperature of the six months from November to April ranged between  $1^{\circ} 4$  and  $-13^{\circ} 9$  F. From the beginning of May the cold began to diminish, and in July there was only a frost on one day. The absolute minimum occurred on March 7, when the thermometer fell to  $-52^{\circ}$ , and the absolute maximum amounted to  $58^{\circ}$  on July 13. The wind was usually very light, while calms were very prevalent, amounting to about 80 per cent. Snow, and occasionally rain, fell on 131 days out of 318; neither hail nor thunderstorms occurred during the period of observation, but fog and mist were very frequent, especially between December and June. Aurora borealis occurred on 142 nights out of 183 between October and March; this phenomenon is made the subject of a special discussion.

THE additions to the Zoological Society's Gardens during the past week include a Moustache Monkey (*Cercopithecus cephus*, ♂) from West Africa, presented by Mrs. Polini; two Rhesus Monkeys (*Macacus rhesus*, ♀♀) from India, presented respectively by Mr. C. Harmer and Mr. C. T. Trevalyan; a — Boa (*Boa* —) from Dominica, presented by Mr. W. Weldon Symington; a Barnard's Parrakeet (*Platyercus barnardii*) from Australia, deposited; a Raccoon-like Dog (*Canis procyonides*) from Japan, two Elliot's Pheasants (*Phasianus ellioti*, ♂♀), two Bar-tailed Pheasants (*Phasianus reevesi*, ♂♀) from China, two Rosy-billed Ducks (*Metopiana peposaca*, ♂♂) from South America, purchased.

NO. 1380, VOL. 53]

#### OUR ASTRONOMICAL COLUMN.

THE ROYAL OBSERVATORY AT EDINBURGH.—The new Royal Observatory, which has been in course of erection on Blackford Hill, to the south of Edinburgh, during the last four years, was formally opened by the Secretary for Scotland, Lord Balfour, on Tuesday. A short article in the *Times* reminds us that the observatory owes its origin to the presentation to the Scottish nation by the Earl of Crawford of the splendid collection of instruments in his private observatory at Dun Echt, in Aberdeenshire, which was followed by the appointment of Dr. Ralph Copeland, the superintendent at Dun Echt, as Astronomer Royal for Scotland and Professor of Astronomy in the University of Edinburgh in 1889. As there was not sufficient accommodation for the new instruments in the old buildings on the Calton Hill, it was resolved to erect a new observatory worthy of the nation and of Lord Crawford's munificent gift. A Government grant of £33,000, afterwards increased to £36,000, was obtained, and the Town Council of Edinburgh granted on easy terms a site deemed in all respects suitable, on the eastern crest of Blackford Hill, which possesses exceptional stability, a convenient elevation, and unusual purity of atmosphere, the smoke nuisance intruding itself only in one day out of eighteen.

The buildings consist of the observatory proper, the official residence of the Astronomer Royal, the residence of the assistant astronomers, and subsidiary buildings. The observatory is a T-shaped building, the head of the T facing the north with a frontage of 180 feet, and having at each end a telescope tower, of which the eastern is 75 feet high and 40 feet in diameter, and the western is 44 feet by 27 feet. The former contains the most important instrument in the observatory—a new refracting telescope of 15-inch aperture. The latter contains the reflecting telescope, removed from the Calton Observatory, which has an aperture of 2 feet, and which is to be used in astro-physical researches.

Among the other instruments in the observatory are a meridian circle,  $8\frac{1}{2}$  inches in diameter; a self-recording anemometer; an ingenious chronograph; the telescope with which the late Prof. Piazzi Smyth made most of his observations on the Calton Hill; several good spectroscopes; a reversing transit instrument; and the clock, connected by wire with Greenwich, which fires the daily time-gun at Edinburgh Castle and drops the time-ball on the Nelson Monument. Connected with the observatory, there is a well-equipped photographic laboratory, and a library with accommodation for some 30,000 volumes, which is already well furnished with the treasures of the Dun Echt collection.

COMET PERRINE-LAMP.—The Perrine-Lamp comet was observed at the Astro-Physical Observatory, South Kensington, on the 1st inst., and spectroscopic observations were made by Mr. Shackleton. On account of the faintness of the comet the spectrum was weak, but a fair amount of continuous spectrum was seen, with three maxima in the green blue, which in all probability correspond to the carbon bands, as they had the same relative positions; this, however, could not be verified by direct comparison.

#### BOGGIANI'S RECENT EXPLORATIONS AMONGST NATIVE TRIBES OF THE UPPER PARAGUAY RIVER.

THE country along the upper course of the Paraguay has recently been attracting the attention of men of science. A short time ago naturalists were aroused by the wonderful discovery made by Dr. Bohls of *Lepidosiren paradoxa*, that rarest and strangest of fish, living in abundance in lagoons in the Lengua territory of the Gran Chaco, not very far from the right bank of the Paraguay.

I now intend to give a short account of the ethnological results of the explorations of an Italian artist, Cavaliere Guido Boggiani, who, little more than three years ago, lived amongst two of the less-known native tribes, further north, on both sides of the Paraguay River. They are the *Chamacocos* and the *Caduveos*. Boggiani brought home extensive ethnographical collections from both, which he has described in lectures delivered at Rome and Florence, recently published in elegant

and richly illustrated monographs, in which much new information is given on those two previously ill-known tribes.<sup>1</sup>

The *Chamacocos*, of whose singular long-handled stone axes and stone chisel I published an account some years ago in the *Archives internationales d'Ethnographie* of Leyden, inhabit the neighbourhood of Puerto Pacheco, on the right bank of the Paraguay River, now ceded back to Bolivia, their territory lying between 20° and 21° S. lat. They are, however, true nomads, and wander north and south along the main river, but generally from that inland. Their affinities appear to be with the lost *Zamucos*, who formed part of the Chiquitos confederate missions, which flourished about 150 years ago; but up to a quite recent date (*circa* 1885), the *Chamacocos* were quite unknown. The origin of this name is obscure; it is not that by which the tribe calls itself, if such a collective name exists. Boggiani found that the names *Mirria*, *Ibitessa*, and *Ennima* were given to sections of the tribe.

The first Hispano-American settlers at Puerto Pacheco, who dubbed the natives as *Chamacocos*, became aware of the existence inland of a wilder people, whom they called *Chamacocos bravos*. These were not infrequently raided upon by the *Chamacocos manzos* (*i.e.* civilised), who carried off their children to sell as slaves, and pillaged their camps. Boggiani has found out that this is a kindred but distinct tribe from the *Chamacocos*, speaking a different language; their true name is *Tumanà*, and it appears that the singular long-handled stone axes, which have come into European hands through the *Chamacocos*, are mostly, if not all, taken from them. Further inland, beyond the *Tumanà*, Boggiani was informed that an agricultural settled tribe, the *Timàru*, lived, in whom he suspects the real descendants of the *Zamucos* may be found.

The Bolivian settlement at Puerto Pacheco was formed in 1885; it had hardly begun to prosper when the Paraguayans took possession, and re-named the place *Bahia Negra*. A few years later, Boggiani and an Argentine friend got a concession from the Paraguayan Government, and formed two wood-felling stations in the neighbourhood. It is thus that my friend came in contact with the *Chamacocos*, most of his workmen belonging to that tribe. Boggiani's descriptions of the country and the natives are vivid, the fruit of a refined artist's genuine admiration of a virgin country and wild men. These he depicts as splendid specimens of humanity; tall, perfect in shape, with skin of a bronzed reddish tinge; long black hair, worn tied in a knot behind, in a thick queue, ornamented with feathers, or flowing loose. The women, who, as usual amongst savages, are the beasts of burden, are less handsome, and wear their hair short. No clothing is worn by either sex, except rough sandals of Peccary skin when on the tramp, and a profusion of feather ornaments and necklets of seeds, &c., on festive occasions. As most of the natives of tropical America, the *Chamacocos* excel in the "Arte Plumaria," and it would be difficult to describe in words the beauty of their combinations of bright-coloured feathers of the parrots, toucans, and trogons, with the grey of the rhea, the glossy black of the musk duck, the lovely pink of the spoonbill, and the white plumes of the egret. Amongst other curious ornaments, one of the strangest is the rattle of the *Crotalus*, for which these people have quite a predilection; for I have seen it dangling amongst feathers in diadems, armllets and leglets, united in bunches as ear-pendants (Fig. 1), and even tied on axes or clubs. I have never heard of other American tribes putting the caudal appendage of the dread rattlesnake to such use. During their dances the *Chamacocos*, besides small gourds containing stones, use belts made with loosely-strung carapaces of small tortoises, or the hoofs of stags. They make rude pottery with the hand, the potter's-wheel being quite unknown to them.

Formerly the *Chamacocos* lived in constant dread of the *Mbaya* or *Caduveos*, then a powerful predatory tribe, located on the opposite side of the Paraguay River, but who frequently raided the Chamacoco territory, carrying off young men and women as slaves. Now the white man, with his diseases and evil propensities, is their worst foe. Boggiani, however, appears to have been a general favourite with them. From his descriptions, the *Chamacocos* appear to be, on the whole, an inoffensive and happy people, and show off their exuberant spirits in frequent dancing and singing bouts. They have various games, one of which may be described as a kind of lawn tennis.

<sup>1</sup> Guido Boggiani, "I Ciamacoco, Conferenza" (Roma, 1894); "Viaggi di un artista nell'America meridionale, I Caduvei" (Roma, 1895); "I Caduvei, studio" (Roma, 1895).

Besides the singular stone axes with long, flat hard-wood handles, which appear to belong properly to the *Tumanà*, are called *Nò scico*, and may be considered more like war-clubs than cutting implements, the weapons of the *Chamacocos* are plain clubs, wooden spears, large bows for shooting arrows pointed with hard wood, and small bows with a double string, used for shooting clay bullets; these for catching birds.

The women make neat bags and reticules of different kinds of netting, also hammocks, used generally for wrapping and carrying larger parcels. The *Chamacocos*, like most savages, make fine cord of various kinds, using mostly the fibres of the *Ybira*; the weaving loom is unknown to them. Their food is heterogeneous, but they have curious superstitions regarding some kinds; thus deer-flesh is only eaten by men, whilst women can feed on birds and small game; children cannot partake of the eggs of the ostrich (*Rhea*). Boggiani has also collected a small vocabulary of the hitherto unknown language of these people.

Boggiani spent two months and a half with the *Caduveos* of the Nabilecche River, mostly at their principal village *Naliche*, living as one of them, and enjoying most favourable opportunities for studying the manners, customs, and character of this once powerful and partially civilised tribe, now sorely reduced in numbers and on the wane. It is strange how little has hitherto been known of them and of their country, so much so that even on recent maps the Nabilecche, which runs into the main stream of the Paraguay River some 10 or 12 kilometres north of Fort Olimpo, in Brazilian territory, is not only misplaced but considered a mere branch of the Paraguay. *Naliche* is not on the



FIG. 1.—Chamacoco ear-pendants of rattlesnake tails.

banks of the Nabilecche, but some distance inland, half way to the Miranda mountains. It consists of a single row of huts slightly bent, united under a common roof of *Yatai* palm-leaves; at the back, separated by boards, are the true huts; the front forms a kind of covered corridor, continuous right through. In front is a square, kept quite clean, at the lower end of which is a spring, which gives the water supply to the village. The country around is a fine wooded and grassy undulated plain, on which the cattle and horses of the *Caduveos* graze. In cleared portions of the adjoining forest are the fields, in which each family cultivates the necessary crops of mandioca, maize, rice, gourds, and sugar-cane, besides papaws and bananas. Poultry and numerous mangy cur-like dogs complete the list of domesticated animals.

The *Caduveos* are known also under the names of *Mbayas* and *Guaycurù*; this last is erroneous, it is the Guarany for "savage." Boggiani believes that they came across the Chaco, and were once in contact with the civilised tribes of Peru; I can hardly follow him as far as that. It is evident, however, that amongst the surrounding wild nomadic tribes the *Caduveos* emerged as a warlike but agricultural people, with fixed residences and certain industrial arts, such as weaving and pottery; in this they excel even to this day. The beauty and variety of their ornamental designs is truly wonderful; Boggiani, as an artist, was particularly struck with this remarkable development in a savage people, and he gives quite a series of fine drawings in illustration of the artistic taste and invention of the *Caduveos*, to be seen on their earthenware and in their very elaborate body and face



painting. As Boggiani justly observes, the decorative art of the *Caduveos* is not the casual result of a complication of rude and primitive designs, but that of a logical study of the harmony and æsthetic combination of lines and figures.

Boggiani, after a long and careful comparative study of the ornamental designs of the *Caduveos*, comes to the conclusion that they show distinct affinities with ancient Peruvian art. In a paper read in September last, at the Italian Geographical Congress,<sup>1</sup> he gives a very interesting account of ornamental designs found on the skin of Peruvian mummies, and comes to the opinion that they were painted, not tattooed, the designs and the process being similar to that practised by the modern *Caduveos*, who stain their skin with the juice of the *Genipa* in ornamental designs of a blue-black colour, which penetrates partially the epidermis, and is sufficiently durable, lasting six or seven days; as the staining process of *Genipa*-juice, darkening by the action of light, is rather slow, powdered charcoal is added to heighten the effect. The instruments used are small sticks, to the end of which a tuft of cotton-wool is in certain cases tied; the artists are women. A red dye is obtained from the well-known *Urucú* or *Bixa orellana*, but it is far less durable. The *Caduveos* paint thus the feet and lower part of the legs, besides the face; the designs vary *ad infinitum*.

Boggiani describes the *Caduveos* as tall and well-made, of a light bronze colour; the hair is worn short and well combed and greased; the upper incisors are filed to a point; depilation is scrupulously practised. They are cleanly, often bathing and washing their bodies. The men wear a piece of cotton cloth from the waist downwards, held by a belt, richly decorated; the women have,

arrows are, however, yet in use for the chase and for fishing. Boggiani was able to secure a few rough stone axes, but they were designated as "sky stones," and used for crushing nuts. The *Caduveos* have canoes or dug-outs of different sizes, which they manage with skill. The chiefs, and their descendants also in the female line, form a sort of nobility, now more numerous than the commoners; the lower caste is formed by slaves, often the descendants of captured *Chamacocos*. The head chief is called *Mbaya*, a name which is also applied to the whole tribe; his authority is not great, and much freedom exists amongst the heads of families; even the slaves are well treated, and often ultimately are considered free. One wife is married, and the bridegroom goes to live in the house of the bride, taking with him the family poles, which are driven in the ground in front of

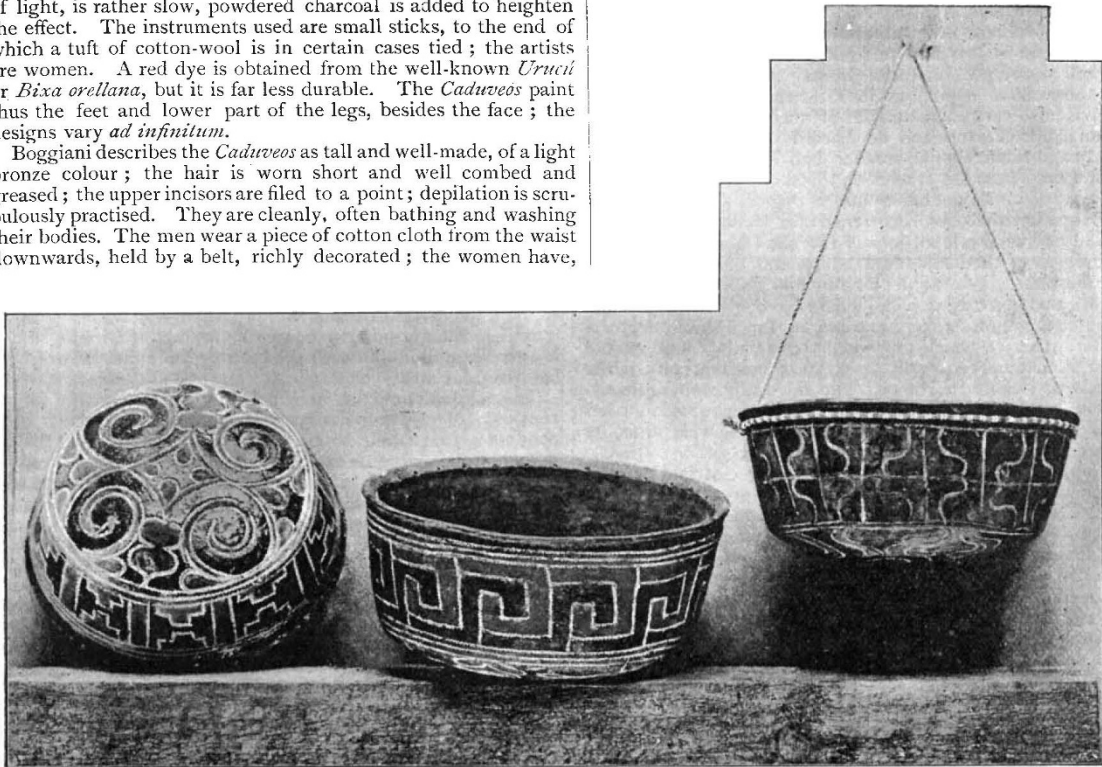


FIG. 2.—Caduveo decorated pottery.

besides, an upper garment covering the breast. Often both men and women have also a kind of *poucho*, which hangs from the shoulders, leaving the arms free. Necklaces, bracelets, and eardrums of beads or silver tubes are universally worn; they make their silver ornaments with skill and taste. The men smoke tobacco in cigarettes or in wooden pipes, tastefully carved in wood; the women only chew tobacco. The *Caduveos* were not many years ago skilful weavers of cotton cloth; at present the advent of cheap cotton textiles from Europe has virtually destroyed the native art. Boggiani was, however, able to secure some specimens, and the weaving and spinning apparatus.

As I have noted already, it is in the potter's art that the *Caduveos* excel; it is also the work of women; the ornamentation is rich, varied, and quite peculiar. The designs are traced on the unbaked clay with a cord; red is obtained with oxide of iron, black with the resin of *Palo santo*, white with a kind of chalk. The earthenware of the *Caduveos* presents a large variety in shapes and sizes. The only neighbouring tribe who do anything of the kind are the *Guanà*, but their ware is inferior in all respects.

The *Caduveos* now possess European weapons; bows and

the sleeping-place of the newly-married couple; these poles are carved with totemistic designs.

The *Caduveos* are at present much reduced in numbers, and Boggiani foresees their speedy extinction. Many are the causes which have led to this, derived from the contact with the whites; but it must not be forgotten that abortion and infanticide are, unfortunately, but too frequent amongst the *Caduveo* women, who only care to rear one child. They are, besides, cursed with the red man's love for strong drinks. Otherwise they are gay and sociable, delight in dances to the sound of drum and flute, and in a game very much like golf; pugilistic bouts, *coram populo*, are also in great favour, in which men, women and children join.

The *Caduveos* have medicine-men or sorcerers, who monopolise the spiritual and mystic rites, and effect cures. One, whom Boggiani saw practising with a piece of a glass mirror and a bunch of feathers on a dark night, was a *Chamacoco*.

Boggiani writes well, he is a careful observer, and has proved himself an excellent collector; he is to be sincerely congratulated on the good work he has hitherto done for ethnology, and we cannot but cordially join in the hope he expresses of being able to continue and complete his investigations of the native tribes of the Northern Chaco and adjoining regions.

HENRY H. GIGLIOLI.

<sup>1</sup> G. Boggiani, "Tatuaggio o Pittura? Studio intorno ad una curiosa usanza delle popolazioni dell' antico Perù." Atti del II° Congresso Geografico, Roma, 1895.