

sands of the most primitive human beings. Steam-navigation exists on the Tapajos and Tocantins, and a railway is constructing along the banks of the Madeira. The Xingu is, however, almost unknown. Previous explorers have not reached beyond 4° south latitude, beyond which were supposed to be fierce tribes of cannibals. The primitive inhabitants of Brazil, retiring before the whites, were supposed to have concentrated themselves here as in a last stronghold. Between Piranhaquara and Paranaatinga the river was absolutely unknown; and the existence of a water-way for trade to Para is a matter of the utmost importance to the inhabitants of the Matto Grosso, now confined for commercial purposes to the Paraguay.

The first part of the journey was made by land, and the latter part on the river. The military force commanded by Paula Castro worked with the civilians in perfect accord. They left Cayaba May 26, passing through the region of the Baicairis (partially civilized and friendly Indians), and after some delays, caused by the fact that the real distance was one-half greater than shown on the maps, they crossed the Paranaatinga July 5, 1884, entering the unknown region, and travelling westward. The plain is a vast desert with an altitude of some twelve hundred feet, above which rise dunes of red sand and decomposed gravel to a further height of from two hundred to three hundred feet. The water was good, the grass very tall, but trees scarce and low, the vegetation being chiefly near the streams. Tapir and deer were seen, and a few birds, but the fauna is scanty. At mid-day the temperature was 80° F., but during the night it fell to 45°, and the party found great difficulty in obtaining game enough for food. Twenty leagues east from Paranaatinga they found a river which they decided must be the Xingu. Making bark canoes, they began to descend it, meeting great difficulties: the river seemed to contain more rolling stones than water. In nineteen days, when they met the first Indians, they had passed more than a hundred rapids and four cataracts, of which one was fifteen feet high. Seven canoes were destroyed or wrecked: only six remained. Their provisions were almost exhausted, their clothing in rags, shoes worn out, and the men depressed by Malaria and the labor of frequent portages, when everything had to be carried on their shoulders around rapids. Aug. 30 they arrived at the mouth

the Batovi, and had reached more level country. Here three large rivers unite to form the Xingu, which is about a quarter of a mile wide. Numerous distinct tribes are located in this vicinity, all in about the same stage of culture. Surprised by the advent of the whites, they offered no hostilities, though fierce and untamed. They knew nothing of fire-arms. The reflection of the sun by a mirror alarmed them. One band of Suyas proposed a joint expedition against the Trumais, with whom they were at war. The Trumais live in villages of high round huts, several families in each. They cultivate manioc, maize, potatoes, and cotton, smoke wild tobacco, but do not know the banana. They do not hunt much, but shoot fish with arrows, and net them in pools.

They have no spears, but kill wild animals with bow and arrow. They regard the flesh of the capybara as a delicacy, but do not eat that of the tapir or deer. Monkeys are eaten, their flesh dried and smoked for future use. They were much afraid of the dogs with the expedition: only one tribe had a name for this animal. The men go naked; they wear, however, strings of ornaments, teeth, shells, or nuts around the neck and waist, and a sort of cotton ribbon on the arms and legs. The women of most tribes wear a clout made of palm bark which could be put in a match-box. The Suyas women wear absolutely nothing, although they know how to weave cotton hammocks, and make a sort of cordage of vegetable fibre. They do not know metals: all their tools are of bone and stone. Buttons were extremely desired. Steinen thought that with a gross of buttons he could have bought a house, field, food, and several wives. They are well proportioned. They practise the tonsure, shaving the crown with a very hard, sharp leaf resembling grass. They wear two feathers in their ears, and a diadem of feathers or straw. They play the native flute agreeably, and are fond of music. They ornament themselves at their feasts with bijoux made of cotton or straw, or carvings of wood representing birds. In the houses are hung figures of animals coarsely plaited of straw, with some artistic merit. The Suyas, of whom only about a hundred and twenty were seen, are the terror of the other tribes. They are of greater stature, though absolutely nude, and wear a labret in the lower lip, and straw ornaments in the ears which reach to the shoulder. They cut the hair in front, and leave it long behind. They make baskets, hampers, and boxes of straw, and very perfect carvings of birds in wood. Their flute has three pipes of graduated size. They fight with heavy clubs ornamented with inlaid shell.

After leaving these people, another series of difficult rapids was encountered. The party were reduced to severe straits, were obliged to live on fish, two pumas which were killed served as a delicacy, fever prevailed among them, and their clothing was almost gone. Below the rapids they encountered a friendly tribe, the Yurumas, who were entirely ignorant of the people farther up the stream. These Indians sold them new canoes, and furnished guides. At last, on the 13th of October, the weary explorers reached Piranhaquara, the first outpost of civilization, almost naked and exhausted, but without the loss of a single man.

They had demonstrated the inutility of the Xingu as a trade route, but they obtained most valuable geographical and other scientific data in their traverse of the unknown region.

#### GEOGRAPHICAL NOTES.

THE great work of Gen. Tillo on terrestrial magnetism in European Russia, has just been published by the St. Petersburg academy of sciences. All previous investigations have been laid under contribu-

tion, and the work is accompanied by diagrams, and a magnetic chart of Russia. Investigations in this direction have been very active recently in Russia. Besides the work of Tillo, Miller, Scharnhorst, etc., Schwartz has recently published in the 'Russki invalid' important researches on the magnetics of Turkestan, especially of the observatory at Tashkent.

Charles Rabot has finished a reconnaissance of the Norwegian glacial region, known under the general name of Svartisen. This work is the result of several years' explorations, during which the author received the kindly co-operation of the Norwegian general staff. It is based on a series of triangulations, with the details filled in by means of sketches, and photographs taken at determined angles and azimuths. The result shows a region about 125 kilometres long by forty-five kilometres wide, and divided by mountains into four principal glacial bodies, but which, on the latest charts, is shown as covered by a single dome of ice.

The Military geographical institute of Italy has published a memoir on the mensuration of the area of the kingdom, and a new essay at the same. The figures are as follows in square kilometers:—

The peninsula of Italy . . . . .	236,402.1720
The islets legally connected with its shores . . . .	368.8649
Sicily . . . . .	25,461.2535
The Sicilian islets . . . . .	278.8147
Sardinia . . . . .	23,799.5607
The Sardinian islets . . . . .	277.6027
Total . . . . .	286,588.3—

This is about ten thousand square kilometres less than previous official figures, and two thousand less than Gen. Stebnitski's estimate.

The ethnography of the Austrian *litorale* has been deduced by Baron Carlo von Czoernig from the census of Dec. 31, 1880. The total is six hundred and eleven thousand in round numbers, of which 45.03 per cent are Italians, 32.27 Sloveni, 20.21 Croats, 0.35 Rumanians, and 2.14 German-Austrians, and others. Ethnographically, therefore, these coasts are Slavo-Italian.

Dr. Zélandt has just finished his great work on the Kirgiz, which will be soon published by the west Siberian section of the Imperial geographical society. It is divided into seven heads, treating of the history and archeology of Semirechinsk; of the resources of the central Tian-shan; of the life of the nomadic Kirgiz; of their social, commercial, and political institutions; of their ethnic relations; and of their temperament and culture. This work is supplemented by Katanaieff's recent memoir on the progressive movement of the Kirgiz of the Middle Horde, toward the Siberian frontier. A new chart of Russian-Turkestan, scale 1:42000, has just been issued at Tashkent.

It is announced that the work on the commercial geography of China, by Isidore Hedde, has been interrupted by the illness of the author, who has devoted twenty years to it, and was formerly a commercial agent of France in China. Two volumes still remain in manuscript, and will be printed if a sufficient number of subscriptions are received

by Paul Perny, care of the Société de géographie, Paris.

Dr. Ten Kate has just sailed for Surinam, with the intention of ascending the river of that name, crossing the Tumuc-kumac mountains, and descending to Brazil by the affluents of the Amazon River.

The recent expedition of Professor Chaffaujon on the Orinoco has been heard from. He had reached Caicara, and had prepared a map of the Orinoco and the region closely adjacent to its banks. In this work he was able to obtain much geological information, and discovered numerous pictorial and graphic aboriginal inscriptions, some of which seemed to be of the nature of writing. An immense mass of ethnological and natural-history collections had been made. Travelling was very expensive, and a large number of men were required to carry on the work.

Father T. Gaujon writes that Vidal Senèze, who had undertaken an exploration in the Chincha Islands, died at Guayaquil, and his collections were dispersed. The notes of his previous journey from Zumba to Bella Vista, reviewed by several residents of the region, had a certain importance; and the traveller, though without much training, had a spirit and an energy which make his death a loss to science.

A. Chaigneaux is about to take part in an expedition sent out by the Chilean government to the region where Crevaux lost his life, in Bolivia.

### A CRAB INVASION.

AN interesting occurrence, that should be placed on record, has been recently reported by Mr. L. S. Foster of New York, superintendent of the Spanish American district of the American ornithologists' union. It consisted in the sudden appearance of countless myriads of young crabs on the seashore at Cape San Antonio, the western extremity of the Island of Cuba, where it was observed by Francisco Baritista y Ovenes, keeper of the lighthouse at that place. Specimens of the crabs were sent to the U. S. national museum by Mr. Foster, accompanied by the following extract from a letter by the light-keeper, dated June 14, 1885:—

"After the light of the lighthouse had been extinguished in the morning of April 3, 1885, we went out on the gallery and saw at the edge of the shore, and at intervals farther out, large and small floating patches, of a reddish color, of what appeared to be wood, gulf-weed, or some other vegetable product of the sea. To our surprise, upon inspecting them more closely, we found these patches to consist of small living and moving bodies, belonging to the crab-family, being of that shape. I proceeded to measure the piles that were forming on the shore, and many of them exceeded one and one-half metres in size [probably diameter]. At eight o'clock in the morning, as more of the patches floated in shore, some of the piles increased to two metres. This multitude of marine animals came from the south-west, the wind and tide being from that direction; and the same phenomenon was repeated on April 9, and May 2 and