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HYDROGRAPHIC AREA OF THE RIO WANQUE OR COCO IN NICARAGUA.

BY J. CRAWFORD, CAPE GRACIAS AL DIOS, NICARAGUA.

ABOUT four miles west from the town Ocotal, capital of the Department of Nueve Segovia, in Nicaragua, at about Long. $86^{\circ} 40'$ west (from Greenwich) and Lat. $13^{\circ} 30'$ north, the waters in the large creeks Somote-grande and Maculiso, unite and form the commencement of a river, known to all persons living on its banks, for fully three-fourths of its length, from its mouth up as Rio Wanque,¹ for the remaining fourth as Rio Coco or Rio Segovia.

The general course of this river, for the first ninety miles from its commencement down to the mouth of a affluent, the Rio Phantasma, is eastwardly and from thence to its disembogue into the Caribbean Sea at Cape Gracias a Dios, is about 22° east from north, but it is very sinuous, changing its course every three-fourths of a mile to every two miles of its length as it flows rapidly near to or along the southern side of "The mountain system of New Segovia."²

The important creeks and rivers are herein named in the order they enter the Wanque River, commencing at the most westerly.³

Rio Somote-grande, rising on the south side of Dullsupo Mountain ridge,⁴ and flowing southeasterly to where it unites with the Rio Maculiso, and forms the Wanque River.

Rio Maculiso, draining the southern side of the mountain range, Ococan (to the N. E. of the Dullsupo Mountains), composed in part of the mountain ridges, Maculiso, Santa Maria, and Ococan (about Long. $86^{\circ} 50'$ W., and Lat. $13^{\circ} 20'$ N.) and flowing southeastwardly until uniting with the Rio Somote-grande, and forming the Segovia or Wanque River.

Rio Depilto, receiving its waters principally from the southerly sides of the mountain ridges Ococan, Depilto, and Jalapa, and flowing southwardly, between moraine ridges for a part of its route until confluent with the Segovia or Wanque on the southeast side of Ocotal.

¹ Rio "Coco," "Segovia," "Wanx," or "Wanque." Coco, abbreviated from Cookra, the name of the aborigines once living on its banks, has precedence because of antiquity. Segovia, the next oldest name, was given to it by the Spaniards, and it is now known as Rio Segovia by the Latin and North Americans and Europeans living near it and near its headwaters in the department of Nueve Segovia, and is the official name used by the Government of Nicaragua for that part of this river. At its mouth, however, it is officially referred to as Rio Coco or Wanx. Wanque is the name invariably used by the Sambos (a mixed semi-civilized people) living along two-thirds of its length from Cape Gracias up the river. Also, the Sumo Indians, living along one of its largest tributaries, the Rio Bokay, always name it Rio Wanque.

² So named by Élie de Beaumont. For its direction, locality, etc., see Professor Joseph Prestwich's *Geology*, London, 1886.

³ Recorded in this paper because convenient, at present, for reference to locate lodes and deposits of valuable minerals and metals, and groves of valuable trees discovered near to these rivers and creeks.

⁴ The locality is known as "rin on del burro" (i.e., resembling dimly a mule) and is a landmark guide in that part of Nicaragua, where no roads have been made and the paths are often dim.

Rio Palacaquina, percolating from old volcanic ridges on the southwest, it flows northeastwardly until its waters enter the Wanque or Segovia at the Indian village of Telpanaca.

Rio Jicore has as its principal hydrographic area the southern sides of the mountain ridges of Jalapa, Jicore, Encino, and Murar, in the Encino Range of mountains, and also the Quilali and San Juan del Panaca Mountains in the Quilali Range, and flows southeastwardly until entering the Wanque River at Pueblo Quilali.

Rio Phantasma flows from the south, draining ridges that form the Phantasma Range in the mountain system of Matagalpa.⁵

Rio Quã, from the southwest, rising in the Quã Range in the Matagalpa System of mountains.⁶

Wa-wa-lee Creek, from the northeast; it drains a part of the short ridge Ventura, in the mountain system of Nueve Segovia.

Kilambe Creek, from the south, rising from a long mountain ridge of that name.

Rio Opoteka enters the Wanque River from the northward and drains the southern side of the Opoteka Range in the mountain system of Nueve Segovia.

Rio Wanblau, from the southeast, joins the Wanque River near the head of the long series of cascades in the Wanque known as Ke-y-on; it drains the northeastern termination of the ridges Wan-blau, Keyon, and Pene Blanca (about 7,000 feet altitude above the Caribbean Sea, the highest mountain in Nicaragua) in the mountain system of Matagalpa.

Ya-male Creek flows from the west into the Wanque near the foot of the cascades Keyon.

Peas Creek, from the southeast, gathers its waters from a low ridge that is within four leagues of the Rio Bokay, to the south.

Bolemaca Creek, flowing from cerros of that name (that are composed of cryptocrystalline limestone intersected by numerous interusculating veins now filled with crystallized calcite), eastwardly into the Wanque River; the mountain Bolemaca is in the system of Matagalpa.

Oulawas Creek, flowing from the east from a cerro named Kay-ân that is composed of marble and compact limestones.

Rio Bokay, from the southeast and east, about one-half of the size of the Wanque River, drains the hydrographic area on the east side of the mountain ridges Pene Blanca and Barbar, and the north side of the Wanblau Mountains; its general course is northeastwardly, near to and parallel with the Wanque River in that part of the country.

Wylawas, Attawas, and Saccos Creeks come from the eastward, draining, through placer gold mines at their heads, a part of the western side of a long lateral moraine of glacial epoch, unstratified deposits of clays, gravels, boulders, and sands.

Six creeks, flowing eastwardly from the mountain system of Nueve Segovia, examined and names not recorded, but reported by the Sambos to have along near their banks numerous groves of large-sized mahogany, cedar, walnut, and rosewood trees.

Naga-was Creek, from the northwestern end of the long lateral moraine above mentioned, flowing northwardly through placer gold mines to the Wanque River.

Rio Wash-pook, draining the northeastern end of the lateral moraine above mentioned, and entering the Wanque from the southeast; several of its tributaries drain placer gold mines, also lodes containing gold.

From the mouth of the Rio Wash-pook, east of north and north to the Caribbean Sea, is the delta of the Wanque River, embracing several lagoons and lakes and intersected by several inter-connecting natural canals. There are three long series of cascades and low falls in the Wanque River. The most westwardly commences a few miles below (N. E. of) the mouth of the Rio Opoteka, at the locality named Ke-y-on, where the river has eroded about 3,000 feet in depth from the present altitude at the south end of the mountain ridge Opoteka, and about 2,700 feet depth from the altitude at the northern terminatoin of the Keyân Mountains. The other two long series of cascades are below the

⁵ This mountain system was so named in 1889 by the author of this paper and examined by him on its southern ridges up to the water-dividing ridge in 1890.