

SPANISH COLONIAL TRAILS IN PANAMA¹

I

Panama has for centuries been important in world history solely as a passageway between two great oceans, which are otherwise inaccessible to each other for thousands of miles. Despite some agrarian and mineral resources, its life has been based upon its character as an isthmus several hundred miles long, and so narrow that both oceans may be seen from any one of several low peaks. Relatively broken and low ranges form the Continental Divide. The isthmus, generally speaking, runs east and west, so that one moves south in travelling from the Atlantic to the Pacific. Several fairly short and easy crossings competed for attention from the sixteenth to the late nineteenth century. Only those of the central region, between the seventy-ninth and the eightieth meridians, proved to deserve attention after careful examination.

In this central region the coasts are some forty miles apart, or even some miles less if measured between certain

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So many persons have helped me that it seems invidious to single out a few. But neither can I name them all, nor can I fail publicly to thank a few upon whom I imposed most heavily. Such were Chief of Surveys R. Z. Kirkpatrick, Chief Health Officer D. P. Curry, and Mr. and Mrs. Tom Booz, "old-timers" in the Zone, and Colonel C. F. Severson, Lieutenant Colonel A. P. Underwood, and Major W. S. Woods, now or formerly of the 33d Infantry, U. S. Army. To them and to the many unnamed, I am deeply grateful.—R. D. H.

indentations. Only one peak, the Cerro Brujo near Puerto-velo, exceeds three thousand feet. Heights of fifteen hundred feet are rare, and most of the area is under six hundred and fifty. The Continental Divide runs closer to the Pacific than to the Atlantic, but at about the seventy-ninth meridian it throws off a short range that runs up to and along the north coast. Within the > thus formed lies the drainage basin of the Chagres river. The Atlantic slopes of the mountains are abrupt and short, whereas the Pacific side has a rolling plain some ten miles wide between the divide and the ocean.

The Chagres river, now largely submerged by lakes of the Canal Zone, covered about one hundred and twenty miles from start to end of its tortuous course. Its use was restricted to small craft drawing less than twelve feet of water by a winding channel and a limestone ledge at the mouth. Once over the ledge, boats found a river several hundred feet wide flowing gently between curving, jungle bordered banks. The water was twenty to thirty feet deep as far as the junction of the Trinidad or Dos Brazos. From there, the depth averaged five or six feet for some fifty miles up river to Cruces, but frequent shoals and rapids hampered transit. A Spanish map of 1759 names no less than twenty-three *raudales* in that distance. Dry season mean water level at Gorgona was about thirty-five feet, and at Cruces about fifty-two feet, above the mean level of the Atlantic. Long before it reached Cruces the river had become "a deep ditch with a few feet of muddy water at the bottom." Up stream from Cruces the terrain rose more steeply, rapids became even more frequent, and the river turned into a clear stream flowing over sand, gravel, and rock, bordered a short way off by sharply defined hills covered by forests and separated by jungles. Finally the Chagres proper branched into such sizable water courses as the Pequeni and the Boqueron. Here, as the mountains closed in sharply, the rivers raced through

a net work of gorges and box canyons in a maze of rugged peaks.

Climactic conditions were tropical. Modern figures show an equable temperature through the year, with May to September only a little hotter than the rest. The coolest hours are five to six A. M., averaging about seventy-two to seventy-four degrees fahrenheit at the central point of Alhajuela. The hottest hours, about midday, average eighty-four to ninety. Rainfall and humidity vary between the wet or "winter" season, June to November, and the dry or "summer" season", January to April, with December and May as intermediary months. Relative humidity varies from 0.80 to 0.87, according to season. Annual rainfall varies from seventy inches on the Pacific coast to one hundred and thirty on the Atlantic, with ninety inches in the interior. No month is entirely without rain, but the amount is negligible during the dry season, except temporarily as to river freshets. In the winter season, the monthly downpour will be at least five to twelve inches, depending on the region, and may reach twenty on the north coast.

The effect of such climactic conditions upon human energies and upon the fertile lands may be imagined. The effect of the rains upon the Chagres river need description. "When the saturated clouds burst over its drainage area of a thousand square miles," said an observer before the Canal was built, "and pour into it at times a uniform depth of seven inches of water in a day, the river rises forty inches in twelve hours, and carries with it . . . to the sea, a vast mass of tropical, arboreal rubbish, clay, mud and detritus, . . . from its swollen tributaries." The greatest floods always occurred in November or December. Even small freshets, with a minimum ten foot rise over dead low water level, were rare from January to April, but they averaged three in every other month, and might occur ten times in any one month. Though the duration

of freshets was short, they presented a constant menace to boats, and even more to horse or foot travellers in the canyons of the upper river.²



To understand this brief sketch of the history of Isthmian crossings, recollection of a few outstanding facts of Spanish American history is necessary. The first Spanish colonizations and transits took place toward the eastern end of the isthmus. Attention soon shifted to the center. In 1519 Nombre de Dios and Panama City were founded, respectively on the north and south coasts, chiefly as bases for exploration of the Pacific. The conquest of Peru from 1531 sent a wave of treasure and travellers across the isthmus to Spain. The bullion and the merchandise of the colonies founded on the Pacific side of South America, compelled by law to use the Panama route, raised the wave to a flood. This lasted unabated into the seventeenth century, and continued on a lesser scale for another hundred years. In the eighteenth century, for reasons not directly connected with Panama, the Spanish policy changed, breaking the Isthmian monopoly of transportation. The great annual fleets ceased to visit Panama after 1737, and more and more trade passed from Spain to the Pacific

² Geographical description throughout this paper is based on numerous maps and geographies, on personal observation, and on conversation with men long acquainted with the Isthmus. For most of the specific figures see: G. E. CHURCH, "The republic of Panama," *Geographical Journal*, XXII (December, 1903), 676-685; H. L. ABBOT, *Problems of the Panama Canal, including climatology* (New York, 1907); H. L. ABBOT, "Hydrology of the Isthmus of Panama," U. S. Corps of Engineers, *Professional memoirs*, VII (1915) 657-663; A. P. DAVIS, "Report on the hydrography of the Panama Canal route," *Report of the Isthmian Canal Commission, 1899-1901* (1904), text volume, 219-246; J. A. LLOYD, "Account of levellings," *Philosophical Transactions of the Royal Society*, CXX, pt. 1 (1830), 59-68, and "Notes respecting the Isthmus of Panama," *Journal of the Royal Geographical Society*, I (1831), 69-101.

coasts of South America via the Horn, under laws of 1748, 1765, and later.³

The crossing routes in the central region developed rapidly in the sixteenth century, when one trail entirely overland, and another in conjunction with the Chagres river, quickly appeared. With some changes in detail, these remained standard for three centuries.

The overland trail from Nombre de Dios to Panama must have been used as soon as the cities were founded. "Aided by the Governor, Pedro Arias," said Peter Martyr about 1524, "the colonists resolved to unite the two settlements by a road. . . [This] was therefore laid out at the cost of the king and the colonists, nor was the expense small. Rocks had to be broken up, and wild beasts had to be driven from their lairs. . . The work is not yet completed." The historian Oviedo crossed twice in 1521. He described the route in print five years later, as "muy áspero y de muchas sierras y cumbres muy dobladas, y de muchos valles y rios, y bravas montañas y espesísimas arboledas, y tan dificultoso de andar, que sin mucho trabajo no se puede hacer; y algunos ponen por esta parte de mar á mar, diez y ocho leguas, y yo las pongo por veinte buenas, no porque el camino puede ser mas de lo que es dicho, pero porque es muy malo".⁴ Later Spanish writers, though less lengthy, all echo his "muy malo," often in stronger phrases.

The water route involved a coastal trip from Nombre de Dios to the mouth of the Chagres, navigation of that river to Cruces, and travel overland from there to

³ Cf: C. H. HARING, *Trade and navigation* (Cambridge, 1918); R. D. Hussey, *The Caracas Company* (Cambridge, 1934), 3-34, 194-231, and "Colonial Economic Life," in A. C. WILGUS, ed., *Colonial Hispanic America* (Washington, D. C., 1936), 324-326, 327-332.

⁴ FERNÁNDEZ DE OVIEDO Y VALDÉS, *De la natural hystoria de las Indias* (Toledo, 1526), cap. lxxxv; PIETRO MARTIRE D'ANGHIERA, *De Orbe Novo*, dec. 6, cap. 2 (MacNutt translation, New York and London, 1912, II, 214).

Panama. It attracted attention at least by 1527, probably because transportation for heavy merchandise as well as for persons was becoming important. In 1527 the city of Panama sent Captain Hernando de la Serna to explore the "Rio de los Lagartos," from the point nearest to the city. After a six day canoe trip early in April, Serna reported the river good for navigation, with enough water for ships half way to the landing point. From there canoes and scows (*barcas chatas*) would be used. The banks, he claimed, would permit the use of trackage lines. Exploration showed the country between the embarkation and Panama to be mostly plains, without serious obstacle to the use of *carretas*, so that one could prepare a road with little cost. The Crown promised only consideration of the project at this time. By 1533, very likely under the influence of the Peruvian conquest, the river route was in regular use. Cruces was the embarkation point, though there probably was no permanent establishment there.⁵

Until 1594, no important development took place, but dissatisfaction with existing conditions steadily increased. The river route was very slow, fairly arduous, and not without peril. But it was so much better than the overland trail in the last two respects that from the very start of the agitation for use of the river, one finds the residents of Panama advocating that the Chagres be the chief route. Travellers like Fray Tomás de Berlanga, who went overland in 1535, supported them.⁶ Fray Tomás voiced the usual complaints about the road and, fresh from the hiring of his mules, reported Nombre de Dios to be a *cueva de ladrones*. What might have happened, in spite of seasonal variations in the river, is hard to say, but

⁵ HERRERA, *Historia general de los hechos de los Castellanos*, Dec. 4, Lib. 1, Cap. 9; Muñoz MSS, Acad. de la Hist., Madrid, v. 78, 79, 80, *passim*; MANUEL SERRANO Y SANZ, *Archivo de Indias y exploraciones del istmo... de 1521 á 1534* (Madrid, 1911).

⁶ Berlanga á S. M., Panamá, 22 de febrero de 1535.—*Doc. Ined. Ind.*, XLI, 532-538.

for a new factor. About 1560 foreign corsairs appeared off the coasts of Panama, began attacking the small craft on their way from Nombre de Dios to the Chagres, and finally even penetrated the interior.⁷ From that time, along with discussion of fortification of the Chagres, one finds projects for improvements in the much more defensible overland trail. Thus in 1569, viceroy-elect Toledo, having stopped long enough on his way to Peru to listen to the clamours about both roads, ordered that experienced men explore "another road about which there was news, without rivers and without mud, the amounts of this in the other road being incredible."⁸ Another debate concerned the suitability of Nombre de Dios as a terminal port.

Nombre de Dios was clearly unsatisfactory by the later sixteenth century. The harbor was small, exposed, dangerous with rocks, and so shallow that ships usually moored far out when full and moved nearer when half unladen, and even then the stevedores had to wade out up to their armpits and carry the goods ashore. Food had to be imported from Panama City. In 1575 the town had some two hundred houses, mostly uninhabited except when the fleet was in, and some fifty *vecinos*. Twelve years later it had some sixty houses, all of wood, and thirty *vecinos*, and engineers reported that "every day the port is becoming worse, and filling up." They gave no reason, but erosion of the surrounding hills by wood cutting and perhaps by trail making is a likely cause. The town was so unhealthy, especially when crowded by the arrival of the fleet, that a report of 1588, apparently

⁷ Cf: I. A. WRIGHT, *Documents concerning English voyages to the Spanish Main, 1569-1580* (London, 1932). Manuscript records show that the French were in the vicinity of Panama before the better known English.

⁸ "Lo que el virrey mi señor ha proveido . . . después de que . . . entró en Tierra Firme . . ."—*Doc. Ined. Esp.*, XCIV, 231-232.

based on church records, stated that over forty-six thousand persons had died there since 1519. No white man lived in it who could avoid doing so. The harbor was virtually undefended, and indefensible. Some sort of breastworks were probably built early, and in 1562, after years of appeal, the Crown ordered a *fortaleza* constructed. Nothing resulted worthy of the name, and the town was several times taken by corsairs.⁹

The fate of Nombre de Dios was settled as part of the effort to safeguard the Caribbean, after Drake's raid in 1585-1586. When news of the raid reached Spain, the Crown despatched *maestre de campo* Juan de Texeda and the *ingeniero militar* Juan Bautista Antoneli to inspect the ports of the Indies and prepare a plan for defense. Antonio sailed for Spain in 1587 to draw up the plan, and returned to America next year to supervise the work. His plan included a fort at the mouth of the Chagres—Fort San Lorenzo—and provision for the trail overland. Antoneli's remarks on the existing trail showed him aware of its defects. But his job was to safeguard the royal treasure, and he judged that could best be done by retaining a trail but moving its terminus to the strong site of Puertovelo.¹⁰

⁹ DR. ALONSO CRIADO DE CASTILLA, *Sumaria descripción del Reino... llamado Castilla del Oro...*, Nombre de Dios, 7 de mayo de 1575.—M. M. DE PERALTA, *Costa Rica, Nicaragua y Panamá en el siglo XVI* (Madrid, 1883), 526-540; [Junta de Puerto] á S. M., 29 de julio de 1588. "Sobre los caminos de Nombre de Dios".—Archivo General de Indias (hereafter cited as "A. I.") 147-6-5 (Ind. Gen. 1887); Baptista Antonio [e. g., Juan Bautista Antoneli], *A relation of the ports... Anno 1587*.—RICHARD HAKLUYT, *Principal navigations* (3 v., London, 1598-1600), III, 548-557; Gov. Luis de Guzmán á S. M., Nombre de Dios, 24 de nov. de 1562, and other letters since 1550.—A. I., 69-2-39 (Panamá 29); Ciudad de Nombre de Dios á S. M., 29 de agosto de 1568.—A. I., Patr. 2-5-1/22 (Patr. 267).

¹⁰ Royal appointment, February 15, 1586.—A. I., 32-3-1/34; Antoneli's *relation* [*supra*, note 9]; Junta de Puerto Rico á S. M., 19 de abril de 1588.—A. I., 147-6-5 (Ind. Gen. 1887); I. A. WRIGHT,

Puertovelo was not merely the best harbor on the Atlantic side of the Isthmus; it was the only good one. Its main part is more than two miles long and a half wide. With deep water far in, a sandy bottom, and shelter from all storms, it could be entered or left by ships almost regardless of the wind directions. Fresh water was abundant, and there was plenty of timber and stone. A good town site existed, with room nearby to graze cattle and grow corn. Defense would be simple, by constructing two or three forts. Antoneli did not, apparently, realize the chief defects: the lie of the port barred ventilation even by the "northers" that helped other Caribbean ports, and the marshy land where he proposed to graze a herd was at least as likely to breed fevers as cattle. The site was occupied only by cimaron negroes, who had remained there in uneasy quiet when others were subdued a few years earlier.¹¹

The Spanish authorities agreed that some move should be made, but hesitated over the injury to the inhabitants of Nombre de Dios, as well as over a chimerical project, then some thirty years old, to cross Honduras instead of Panama. Finally, on December 21, 1593,¹² the Crown ordered the change to Puertovelo and the opening of a road as proposed by Antoneli, provided one hundred thousand ducats from Peruvian treasure, and established a special tax for further expenses. Antoneli and his associate, Francisco Valverde, reached Panama on Easter-day, 1594. Work was delayed by the two men successive-

"Maestre de campo . . . Texeda, 1588-1593",—*Reforma Social*, XIII (1919) 138-139; R. D. HUSSEY, "Spanish reaction to foreign aggressions in the Caribbean to about 1680",—*Hisp. Amer. Hist. Review*, IX (1929), 286-302; many letters by, or about, Antoneli's work, in the Archivo General de Indias, especially A. I., 69-2-24 (Panamá 14) and 60-1-40 (Mexico 257).

¹¹ Criado de Castilla á S. M., Panamá, 14 de abril de 1579.—A. I., 69-2-39 (Panama 29).

¹² Copy of the real cédula, at start of *Testimonio* of 11 de mayo de 1594.—A. I., 69-2-24 (Panama 14).

ly coming down with a nearly fatal illness, and later by labor troubles. The hired negroes left for their farms when meat gave out and fish was substituted, and both they and the Spanish workers, reported the disgusted officials, murmured constantly over their food and other working conditions. The fleet used Puertovelo as a terminus in the fall of 1594, but it is significant of the state of the road that the Italian passenger, Carletti, went to Panama by river, instead of by the land route, normally preferred by individual travellers. When Drake visited Puertovelo in February, 1596, he found only eight or ten houses completed, and the Governor's house and a fort under construction. Drake's preceding destruction of Nombre de Dios, however, caused a complete transfer of the population to Puertovelo, with resultant acceleration of its building. By October, 1597, the new city and its forts were in an advanced stage of building, and the road was "finished", though questions of its *adobo y conservación* had still to be settled.¹³

The outstanding development thereafter was the change in the site of Panama City. Morgan's sack of that settlement, and the accompanying destruction by fire, in 1671, proved the indefensible character of the old location, and eliminated most of the economic argument against the cost of a transfer. In addition, the old site had never possessed a good harbor, most of its heavy merchandise being transhipped to lighters at Perico Island, two leagues to the west, for transfer to the mainland opposite, or direct to the small port at Panama. The latter was left

¹³ Papers in A. I., 69-2-24 (Panama 14), especially: Villanueva Çapata á S. M., Nombre de Dios, 12 de marzo de 1595, and Puertovelo, 12 de mayo de 1595; Salazar á S. M., Panamá, 6 de marzo de 1596; Audiencia de Panamá á S. M., 4 de junio de 1596; Villanueva Çapata and Francisco Valverde Mercado á S. M., Panamá, 30 de octubre de 1597; Sotomayor á S. M., Puertovelo, 10 de noviembre de 1597. Also, "The voyage truly discovered . . ."—HAKLUYT, *op. cit.*, III, 588; FRANCESCO CARLETTI, *Ragionamenti sopra . . . suoi viaggi* (Firenze, 1701), I, 41-48.

dry when the tide went out. The new site was on a small rocky peninsula near Perico Island, and was protected against attacks by large ships by coral reefs on the seaward side. Though it had rather less of a harbor than Old Panama, it was closer to Perico, and the protests of merchants went unheeded along with those of other citizens reluctant to leave their homes. The walls began to rise in 1671. By the middle of 1675, though the cathedral, the churches, the city hall and the jail were very incomplete, and the governor's house and Audiencia were not started, work was in general so far advanced that the President reported the city ready to care for the next fleet from Peru. "The old site," he said, "is stripped of materials and people, its streets are become woods, and it is usable only by birds and beasts. There remains only a memory of its having been a city."¹⁴

In the eighteenth century use seems to have begun of Gorgona as an alternative dry weather landing place on the river route. Opening of a road to Gorgona was proposed in 1735.¹⁵ Nothing more about the matter is known to this writer, except that the route did come into existence, and that if it had not done so before the ruinous days of the late eighteenth century, it probably would not have done so at all. Discontinuance of the annual fleets wrecked the prosperity and revenues of an area that lived solely upon trade. For a time after 1749 hardly a dozen ships a year entered at either side of the isthmus, and the annual revenues of the province fell below one hundred thousand pesos, less than was required for the minimum expenses of government. The audiencia was replaced by a

¹⁴ BANCROFT, *History of Central America* (3 v., San Francisco, 1882-1887), II, 482-579; various papers in the Archivo General de Indias, especially: Presidente Alonso de Mercado á S. M., Panamá, 12 de julio de 1675.—A. I., 69-2-35 (Panama 25).

¹⁵ CAPITÁN E INGENIERO NICOLÁS RODRÍGUEZ, *Informe sobre los caminos que se trafican á los sitios de Cruces y la Gorgona*.—A. I., 109-1-22.

military commandant in 1751, chiefly for this reason.¹⁶ Removal of trade restrictions in the later years only slightly improved matters for Panama. The crossings can have received little attention under such conditions. There was less need for their maintenance and less money for the costs.

II

Industrious search of the *Archivo General de Indias* would add greatly to the above notes on the history of the crossings. All the search imaginable could not assure precise determination of the routes and intermediate locations. Even modern maps are uncertain about the topography and nomenclature of the interior of Panama; the older ones were ludicrously inaccurate. When one adds that, aside from Oviedo in 1526, the Spanish writers maintain such silence about the routes as to suggest censorship, the difficulties become appalling. Fortunately several foreigners left accounts of their observations, though none of them had sufficient previous knowledge of Panama to get their descriptions clear. With these accounts, with occasional references by Spaniards, and with maps old and new, a careful check of present-day conditions and trails permits reconstruction of colonial aspects with fair certainty.¹⁷

The two routes from Panama City to the north coast

¹⁶ JUAN DE SOSA, and E. J. ARCE, *Compendio de la historia de Panamá* (Panamá, 1911), 165-166; BANCROFT, *op. cit.*, II, 593-594; ANTONIO DE ALCEDO, *Geographical and historical dictionary of America* (Translation by G. A. Thompson; 5 v., London, 1812-1815), IV, 16-22, 200-202.

¹⁷ To avoid an unwieldy mass of citations, authorities for specific points will be given only when contemporary evidence is uncertain or contradictory. The more important descriptions for the two trails, and the maps used, are listed below in appropriate places.

diverged at the start. Old Panama¹⁸ was built in the shape of an $_$, with the cathedral, *plaza mayor*, and government houses at the southeast corner. East of these buildings lay the old port, docks, and shipyards, now a nearly dry mangrove swamp. Most of the city stretched to the west, with a *Calle de la Carrera* running from the plaza mayor along the shore, and two or three parallel streets behind. Three quarters of a mile from the cathedral, *La Carrera* crossed the stone bridge of Paita that was used by wagons coming from the shore opposite to Perico Island, and by travellers to Cruces on the river. North from the plaza mayor and through swampy country went the *Calle de Santo Domingo*. Half a mile out it crossed a bridge over the Algorroba River, and continued straight north over a causeway. All these features were present when Antoneli described the city in 1587. The northern bridge, originally wooden, was replaced sometime between 1607 and 1640 by the stone bridge that stands to one side of the present auto road, and is known as the "Royal" or "Morgan's" bridge.

The road to Cruces, for the first few miles past the Paita bridge, cannot now be located, and the terrain would permit travel almost anywhere. Considering the need of a road to Perico, it seems probable that the Cruces trail would follow that road along the coast till past Paita Point, and then swing north across the Curandú river into the

¹⁸ Antoneli [as cited in note 9]; "Descripción corográfica de . . . Panamá, (1610),"—*Doc. Ined. Ind.*, IX, 79-108; "Descripción de Panamá y su provincia sacada de la relación que por mandado del consejo hizo y embió aquella audiencia (año 1607),"—*Relaciones históricas é geográficas de América Central* (Madrid, 1908); CRISTÓBAL DE RODA, *Discreción de la ciudad de Panamá* (MS. map, 1609).—A. I. 69-4-18; J. D. THOMPSON, "Panama la vieja," U. S. Naval Institute, *Proceedings*, LIX, pt. 1 (Febr., 1933), 208-220, 231-238. The last item is based chiefly upon Roda's map and the 1610 description, but is controlled by knowledge of present conditions, and is clearer than either of the sources. The historical parts can all be traced to C. L. G. ANDERSON, *Old Panama and Castilla del Oro* (Washington, 1911).

present military reservation. The stone bridge there, on the old Corozal Road, might well be of sixteenth century construction. From there most of the trail is still in use. It crosses rolling, lightly forested country, nowhere difficult until it approaches the Chagres river. The trail reached six hundred feet in altitude at the divide and again near the Cerro de Tavernilla, dropping to about four hundred and fifty feet between. Rugged country began as the trail dropped some four hundred feet down the Casaño valley to Cruces, from the headwaters of the Tavernilla river, crossing diagonally a number of very precipitous spurs of the divide. It zigzagged through the ravines. Where it crossed a spur it appeared, said one Major Fitzgerald about 1849, like "a succession of stairs, up and down, with a hole in each step about three inches deep, worn by the feet of the animals . . . into which your horse or mule inserts his foot, and you cannot make him place in anywhere else." Cruces was six leagues from Panama.¹⁹

At Cruces—now under Gatun Lake, a little above present day Gamboa—one found a settlement of a church, a half hundred houses, and "many store houses large and strong." All were of wood in the early seventeenth century, and probably earlier. About 1570 the warehouses had forty-seven *cámaras*, in charge of an *alcaide* who rented them to merchants and kept track of merchandise in his books. In 1575 a *cámara* cost a half peso for a night. The *alcaide* was appointed by the city of Panama, but the job had become an hereditary *alcaldía mayor* by the later eighteenth century. The English narrator of Drake's raid of 1573 speaks as though the settlement was approached from the land side only by a bridge,

¹⁹ See items listed in note 20, and: LÓPEZ DE VELASCO, *Geografía y descripción universal de las Indias . . . 1571 á 1574* (Madrid, 1894), 344-345; Real cédula de 27 de febrero de 1591.—*Doc. Ined. Ind.*, XVII, 432-433; PHILIP NICHOLS, *Sir Francis Drake revived* (London, 1628), 63-65; ALCEDO, *op. cit.*, I, 355-356, 534; CRIADO DE CASTILLA, *Sumaria descripción* [as cited in note 9].

and had another in use as a wharf. The wharf (*embarcadero*) is plainly spoken of by 1591, and it appears on the up-river side of the town on an eighteenth century map, but the present writer knows no explanation for the landward bridge. Perhaps it was a sort of causeway for use when the river overflowed its banks. The trip by water between Cruces and Puertovelo was by no means easy, in view of the shallows, rapids, sudden floods, and danger from sunken logs. It lasted one or two weeks, depending on direction, and condition of the river.²⁰

The Gorgona trail, as described in nineteenth century maps and writings,²¹ closely followed the route on the manuscript map of 1735 that proposed opening the trail. It crossed the divide by a less arduous route than did the Cruces trail, but ran through marshy country near the river, so that only dry weather made its use possible. Gorgona was never more than a miserable little hamlet, set on a hill that rose far enough above its surroundings to be safe in floods.

As has been said, the eighteen league trail from Old

²⁰ Among numerous good descriptions of the trip via Cruces and the river, see: any edition of THOMAS GAGE, *The English American* (London, 1648) and JORGE JUAN and ANTONIO DE ULLOA, *Relación histórica del viage* (4 v., Madrid, 1748). Also: *Memoire* (MS., anonymous and undated, by experienced French trader, about 1743-1750). —Arch. Affaires Etrangères, Paris, "Memoires et Documents" Amérique 2, fol. 47-131 v° (at fol. 78-78 v°); accounts of voyages to California via Panama, about 1849-1854; letter of Major Fitzgerald, in the "Rockwell Report" [*infra*, note 34], p. 16; MS. account by the "Anonymous Jew," [*infra*, note 22]. The most vivid description, especially of the scenery on the trip from Puertovelo to the mouth of the Chagres, is in MICHAEL SCOTT, *Tom Cringle's Log* (Edinburgh and London, 1833), II, chap. 6, 7; reprinted from "Blackwood's Edinburgh Magazine," XXXIV (1833), 71-94, 141-171. This describes conditions about 1822.

²¹ Many of the California gold rush travellers used and described the Gorgona trail. See also: U. S. War Dept., Office of the Chief of Staff. Second Division. N° I. *Notes on Panama. Compiled... by Capt. H. C. Hale.* ["Confidential..."] (Washington, 1903), 154, 179.

Panama to Puertovelo²² went north from the *plaza mayor* over a bridge and causeway. It then ascended the valley of the Algorroba and headed for the Chagres near the junction of the Pequeni. The terrain for miles around there is rolling and fairly open. At the Continental Divide the trail reached six hundred feet in altitude, continued close to the crest for about a mile, and then dropped slowly till it reached the headwaters of the Chilibrillo at about three hundred and forty feet. From there to the crossing of the Chagres, a hundred and fifty feet lower the route evidently depended on the season. The country is swampy near the main rivers. The area back from the rivers is today crisscrossed with trails, the rivers flow underground in several places, and there is a fine natural bridge over the Rio de la Puente or Caimililla. Oviedo, describing the

²² In addition to OVIEDO, *op. cit.*, ANTONELI [*supra*, note 9], and mentions in descriptions of the terminal ports, there are accounts for the following years:

(ca. 1620) ["Anonymous Jew"], *Descripción general del Reyno del Pirú* (MS., no author, no date).—Bibl. Nationale, Paris, MS. Espagnole 280. This lengthy account, apparently by a Portuguese trader and Jew, was mostly printed in abstract by J. DE LA RIVA AGÜERO, in *Actas y Memorias, Congreso de historia y geografía... en Sevilla, 1914* (Madrid, 1914), 347-384. But this printed version omits the final portions, which treat of Panama, Cartagena and Havana.

(1675) ILYAS IBN-HANNA IBN-AMMUDAH, *Rihlah* (ed. by Père Antoine Rabbath) (Beirut, 1906; reprinted from "al-Machriq," VIII, IX (Beirut, 1905-1906). For information about this account of travels by a Syrian priest, I am indebted to several Orientalists of the United States, but especially to Drs. Philip Hitti and E. J. Jurji of Princeton University. Dr. Jurji translated the relevant sections. The account is fanciful in the extreme.

(1732) JOHN COCKBURN, *Journey overland from... Honduras to the Great South Sea* (London, 1735), 249-259; same book, reprinted as *The unfortunate Englishman* (Leith, 1817), 163-165.

(1819) W. D. WEATHERHEAD, *Account of the late expedition against the Isthmus* (London, 1821), 70-80.

Later accounts, covering part of the trail, include: J. A. LLOYD [*supra*, note 4]; R. Z. KIRKPATRICK, Chief Hydrographer of the Canal Zone, to Ass't Engineer of Maintenance, *Memorandum... trip Gamboa-San Juan-Boqueron-Nombre de Dios, Balboa Heights, C. Z.*, April 7, 1925 (MS.; copy in the present writer's possession).

puente admirable, states that the trail used it. No later traveller speaks of it, but modern maps show a trail, sometimes called the Puertovelo Trail, crossing it to Santa Barbara. There is better evidence in modern maps and exploration for habitual use of the route through the marshy country down the Chilibrillo and then down the Rio Azote Caballo, and from there to the Chagres by any one of several ways. The significant name of "River Flog-your-horse", one supposes, was bestowed by riders travelling uphill, in the opposite direction.

After crossing the Chagres, the trail proceeded up the Pequeni valley through the eighteenth century settlement of San Juan and a "pueblo de Indios", possibly present day Salamanca. The trip was easy until one reached the junction with the Boqueron, some two hundred feet above sea level. But up the Boqueron the trail became one hard to forget, abrupt slopes, deep ravines and knife-like ridges alternating with travel in and across the tumbling rivers. The water travel was the best part, remarked an anonymous traveller of the seventeenth century. In modern times a trail went well up the Pequeni before crossing it, and then kept wide of the Boqueron for some miles. This may not have been used in colonial days. Certainly the normal trail kept close to the Boqueron, though above it on the hills. Immediately on crossing the Pequeni, on this route, one ascended a precipitous mountain and went along a ridge so narrow that "sometimes one had his feet, one each, in the two river drainage areas." This hill, called the *lomas de Capirilla* or the *paso de Cuperilla*, was fortified in 1596 to check Drake's march. The fort, "San Pablo de la Victoria," was evidently maintained thereafter.²³ "It was impossible to keep

²³ Lic. [Antonio de] Salazar á S. M., Panamá, 22 de enero de 1596.—A. I., 69-2-24 (Panamá 14); *Relación de lo que sucedió á la armada inglesa en Nombre de Dios* . . . 1596.—A. I., Patr. 2-5-1/20 (Patr. 265); THOMAS MAYNARDE, *Sir Francis Drake his voyage, 1595* (London, 1849), 14-16; "Anonymous Jew," [*supra*, note 22].

on the mules without breaking their necks," said Cockburn of his experience at the hill. "Some part of this road is not above two feet broad, having precipices on each side four or five hundred feet deep, so that by the least slip of a mule's foot, both itself and the rider must be dashed in pieces." Today the waters of Madden Lake cover the southern slopes to the two hundred and sixty foot level, but the trail is visible over the top, double tracked between the cannon at the northern and southern ends of the crest. "The road resembles an ancient [military] trench," said Kirkpatrick in 1925, "of which the [fire] steps are gone. It is from two to ten feet deep, and many of the cobble-like pavement, or curb, stones are still in place."

Above the ravine of the Rio Mauro the trail was less bad, but continued to ascend through irregular hilly country until it crossed the divide. From these heights, variously called the Capira or Santa Clara mountains, it pitched steeply down the valley of the Cascajal into Puertovelo. The lower part of the Cascajal offers easy passage. But Weatherford—who went *up*, starting from Puertovelo—found the upper part so bad that it was called the *Camino de Herradura*. It was "so narrow and steep," he remarked, "in many places almost perpendicular, that we were obliged to ascend climbing with our hands and feet . . . we sunk up to the knees in mud . . . at other times the whole party seemed to be lost in the windings of the road, cut deep into the side of the mountain." Near Puertovelo, as one came down, one passed the "Three Crosses," marking the place where missionaries first preached to the Indians, and then entered through the squalid "Guinea" quarter of the slaves, passed by the *Iglesia mayor* and over a stone bridge, and so came into the *plaza mayor* before the government house. In the mid-eighteenth century the town proper had some one hundred

and thirty houses, mostly of wood, though some had the first course of stone.²⁴

The use of Nombre de Dios before 1594 and of New Panama after 1674 caused slight divergences from the above routes. There is no real written description of the route out of Nombre de Dios, but what few mentions there are, joined with a study of the topography, prove that it went up the Rio Nombre de Dios, crossed the divide at about seven hundred and fifty feet altitude, and came down the upper reaches of the Boqueron into the trail just described. A modern trail, and the railway of an abandoned war-time manganese mine, follow that route across the divide. Both the Cruces and the Puertovelo trails left New Panama by the Puerta de Tierra,²⁵ and went out the present National Highway, or Sabana road. In terms of present day landmarks, the Cruces trail probably turned just before the bullring, and passed up to join the older trail at the Curandú bridge. The Puertovelo trail continued on the highway past the race track and the Rio Matanillo, branched left toward Pueblo Nuevo and then left again—behind most of the present town—and so hitched on to the old trail in the rugged country about the headwaters of the Algorroba.

The whole central region of Panama is covered with other trails, and probably was in the colonial period. Whether any can reasonably be called "Spanish trails" is doubtful. The most probable case for inclusion is that of a trail west from Panama to an "embarcadero" on the

²⁴ JUAN DE ULLOA, *op. cit.*, Bk. 2, Chap. 2. See also items in notes 10 and 22, and "Descripción corográfica de... Puertovelo (1607)."—*Doc. Ined. Ind.* IX, 108-120.

²⁵ See the excellent maps of the city and vicinity before expansion and modernization in the later nineteenth century: H. TIEDEMANN, *Plan of the city of Panama... published by Dr. E. Autenrieth, engraved on stone by J. Schedler, New York, 1850*; H. TIEDEMANN, *The road from Chagres to Panama... published by E. L. Autenrieth, engr. on stone by J. Schedler, New York, 1851.*

Rio Trinidad. This would have passed through fairly good country under dry weather conditions, though the river might then have been hard to navigate. The trail is roughly sketched into the map which accompanies this article, following an old path to Chorrera. But data about this route occurs almost entirely on maps, and the earliest by certain date is foreign, in EXQUEMELIN's *De Americaensche zee-roovers*, published in Amsterdam in 1678.²⁶ Map making techniques in the eighteenth century were such that inclusion of the trail in many later maps, foreign and Spanish, is still weak evidence. An anonymous article of 1809, ascribed to the Ecuadorean J. M. Antepara, is the first known written mention of the *embarcadero*, and Antepara—or whoever the author was—admits acquaintance with an atlas of 1762 which shows the trail.²⁷



The trails were maintained, fortified, and furnished with stopping places, through governmental action. Conditions among the carriers on the Cruces trail showed *mucha rareza y desorden* in the early days, causing the governor to propose in 1536 that the carriers be bonded and taxed under control by the terminal towns. The proceeds would be spent on public works, including roads.²⁸ Whether or not as a result of this, on April 8, 1538, the

²⁶ The road appears in, *et. al.*, a Spanish manuscript map, "Delineación de la tierra y ciudad de Panamá" (no date; ascribed to 1671).—Bibl. Nat., Paris, Ge D 8074, and copy in Map Division, Library of Congress; in maps of most of the later editions of Exquemelin; in E. BOWEN, *Sequel to the seat of war in the West Indies* (London, 1740); and in the maps, listed at the end of this article, by Jefferys (1762), Bellin (1764) and López (1785).

I am indebted to Col. Lawrence Martin of the Library of Congress for examination of some of the above items which were not available to me.

²⁷ "Emancipation of South America,"—*Edinburgh Review*, XIII (Jan., 1809) 277-311 (at 282). See also C. L. G. ANDERSON, *op. cit.*, 307.

²⁸ Muñoz MSS., Acad. de la Historia, Madrid, v. 80, p. 256.

Crown ordered the Audiencia and Bishop to confer on the question of repairs to the overland trail, to use necessary funds from the royal treasury, to levy an impost on goods using the trail until the royal advance was repaid, and then to cease collecting the tax until further orders. Some such practice presumably continued as need arose. At any rate, about 1569 to 1571 both Nombre de Dios and Panama had slaves experienced in maintenance work, and at least the former city repaid itself by an impost upon merchandise. From 1580 to 1588 Panama successfully cited the *cédula* of 1538 as a basis for an impost; an *avería* of one half percent was being collected on silver in 1593, and a like tax on merchandise and bullion a generation later. When or how *ventas* or inns were established is not known, but Enríquez de Guzmán, in 1535, found *ventas* at Capira, La Junta, and Chagres on the overland path, and López de Velasco (1571-1574) stated that Panama owned the *ventas* of Cruces and Chagres, and that Nombre de Dios owned one on the "rio pequeño" which it rented and kept up at its cost.²⁹ The *venta* of Cruces was, of course, in the settlement by that name. The locations of the *ventas* on the overland trail are hard to determine. Travellers name them confusedly, whether because they never knew their own location or forgot the details before writing. Moreover, the local names changed with the centuries. One of them, "Capira", which usually indicated the northern divide, was applied by Oviedo to a *cacique* who lived some eight leagues down the trail from Nombre de Dios, and it appears on some eighteenth century maps as the name of a river or a mountain range

²⁹ "Lo que el virrey [Toledo] mi señor ha proveído... [1569]" —*Doc. Ined. Esp.*, XCIV, 231; LÓPEZ DE VELASCO, *op. cit.*, 342, 344-346; Audiencia de Panamá a S. M., 10 de junio de 1590, and Real *cédula*, 21 de diciembre de 1593.—A. I., 62-2-24; "Anonymous Jew," [*supra*, note 22]; Alonso Enríquez de Guzmán, "Libro de la vida y costumbres", *Doc. Ined. Esp.*, LXXXV, p. 243.

in that general region. But contemporary accounts suggest³⁰ that the venta de Chagres never changed its position, at the crossing of the Chagres river six leagues from Old Panama. The *ventas* of Capira and La Junta are not mentioned after 1535. The name "La Junta" suggests the junction of the Pequeni and Boqueron. If so, the *venta* was probably soon replaced by the Venta de la Quebrada, later known as the Venta de Boqueron. This was the one owned by Nombre de Dios in 1571. In 1596 it was a "great house" with room for five hundred mules, about a league north of the fortified *Lomas de Capirilla*. This seems to mean a location near the Rio Mauro, and that river, significantly, is notably a narrow ravine, or *quebrada*. The Venta de Capira may have been the same as the seventeenth century Venta de Caño. This seems to have been five leagues across the mountains from Nombre de Dios, where the branches of the trail diverge. Such an inn would have been desirable for travellers who came from Nombre de Dios, apparently a harder trip than that from Puertovelo. A Venta de Carasco, mentioned in the early seventeenth century, and a "House Atrass" of 1819, were probably identical. They were on the south side of some river, which might equally well be the Pequeni, or the Ancho.

Something of the early history of the fortifications has been suggested. Many improvements were made in later centuries, including forts at the junctions of the Chagres river with the Gatun and Trinidad, about 1740. Their detailed history cannot be given here.

Paving and bridges were most inadequate. Antoneli's plans for the overland trail contemplated bridges at the rivers "de Capira" and Chagres. Wherever the Rio de Ca-

³⁰ The locations given are based on tabulation and reconstruction of distances and relative positions, from all the accounts cited elsewhere in this text, plus a few briefer mentions. All conclusions are tentative.

pira was, only the bridges already mentioned, in or near the terminal cities, were erected.³¹ As for paving or other forms of road-making, Cockburn said (1732) that "some of these mountains [on the Puertovelo trail] have roads up to them about the breadth of three feet, paved with a broad stone." One finds a few later mentions of this. Present day examination shows that the Cruces trail was paved for nearly its length.³² This paving was about eight feet wide, and was raised a couple of feet above the country in marshy or uneven places. Paving was done with rounded field stones, four to eight inches in diameter. These were laid carefully, and on hillsides might be bound in with a border and crossbars of rough blocks.

Passengers or freight moved on mules, often in trains of five hundred animals if sixteenth century accounts can be believed. There is no evidence for the use of wheeled vehicles.³³ The trip to Cruces was commonly made at

³¹ The writer has somewhere seen maps that show a bridge far up the Cascajal river. This might well be Antoneli's "Rio de Capira." There is no other record of such a bridge, and Father Ilyas ibn-Hanna "forded" the river in 1675. In 1938 the present writer, lacking time to explore for himself, asked three inhabitants of Puertovelo if there was such a bridge. They replied with equal facility, according to the phrasing of the question, that there was, there was not, or that they did not know.

³² Army officers well acquainted with the Cruces trail state that it cannot now all be located, which suggests a break in the pavement.

³³ A legend about the use of carts persists in popular English language books on Panama, and among Canal Zone residents. It probably derives from ANDERSON's readable but uncritical compilation, *Old Panama and Castilla del Oro* (1911). ANDERSON probably got the story from BANCROFT, *op. cit.*, I, 472, which quotes an English translation of PETER MARTYR (place and date of publication not given) to the effect that the overland trail was to be wide enough to give passage to two carts side by side. Bancroft evidently used the rare *De Orbe novo, The eight decades*. . . (London: Thomas Adams, 1612), which does include the words he quoted. Peter Martyr's original Latin is not available to the present writer, but MacNutt's excellent translation (2 v., New York and London, 1912) says "passable for carriages," not "for two carriages." Even the 1612 version says only that the plans called for such a road, but that it was not then finished.

night in order to avoid the heat of the sun in the open country. Night travel by the other trail would have been suicidal. López de Velasco, who never saw Panama, thought that the trail was travelled in the day time because the woods kept one comfortable. The "Anonymous Jew" who used the trail early in the seventeenth century tells a different story. "Passengers that travel by here," he said, "wear their shirts and undershirts, and drawers and stockings of drill (*cañamazo*) and sandals, and they carry another similar outfit of clothes, because they always reach the posadas soaked to the skin, and they disrobe and put on what they carry, while travelling." This man said that individual travellers could make the trip in two stages, but agreed with other accounts that the mule trains took four days. On the river enormous dugouts (*bongos*) might be used, as well as the barges (*chatas*). Both are described by Juan and Ulloa (1748) and the *chata* is illustrated. They had a longitudinal partition, a thatched cabin at the stern, and an awning full length. The *bongos*, which might have a beam of eleven feet, carried up to five hundred *quintales* (twenty-five tons), and the *chatas* up to seven hundred *quintales*. They carried a pilot, and anything up to a score of negro boatmen propelled them, usually by poles.

III

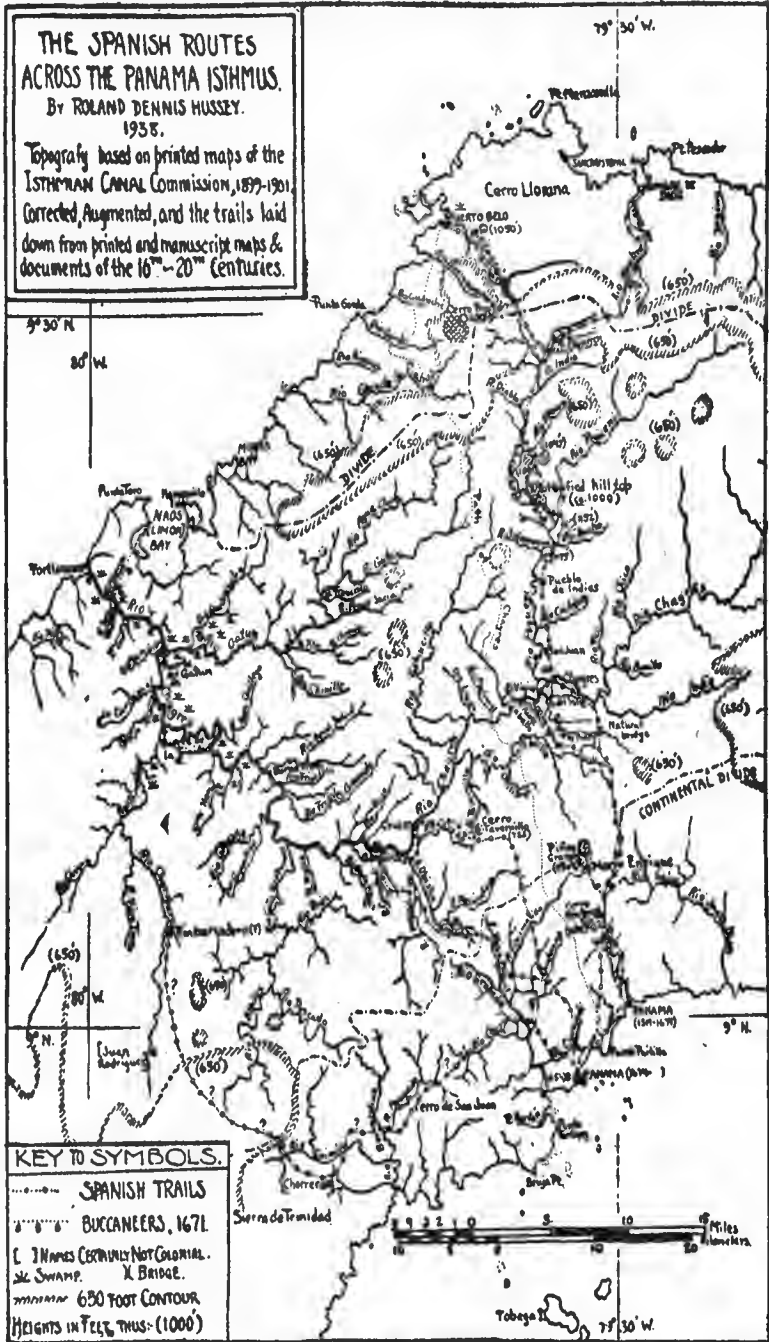
Spanish American independence completed the ruin of the overland trail, through war-time neglect, the breakup of South America into a dozen competing states, and the increase especially of direct foreign trade into the Pacific around the Horn. What little trade and travel came to the Isthmus could better use the river to Gorgona or Cruces than pay for the upkeep of a mountain trail. The faster crossing was still desirable, however, and one finds

statesmen like Bolívar, Herrán and Mosquera doing what they could to reopen a road. Their chances were improved by their willingness to use foreign capital and by new inventions and improved engineering in the outside world. The eventual victory of projects for a railroad and then for a canal has obscured the history of efforts to open a better trail or, especially, a macadam carriage road.³⁴

The story of those efforts concerns this paper only in one small part. It is doubtful if the Puertovelo trail was used at all, for general purposes, after 1826. In that year a Colombian, Domingo López, was charged to open a path across the isthmus at the expense of Panama City. As shown in 1830, on a map published by Lloyd, who apparently got a manuscript map of the route from López, this trail followed a remarkably straight line north to Puertovelo. As a result, it crossed the tops of hills instead of going around. López having died, the city tried again in 1834, paying one hundred pesos to one Marquines, a laborer of Cruces. He was to relocate the trail to avoid the heights. Thus was created the "Path of the Chagres" as the successor of the Puertovelo trail. It appears on maps even in the twentieth century, and for easy reference has been added to the map that accompanies this article. It

³⁴ Cf: two works by J. A. LLOYD [*supra*, note 2]; WILLIAM WHEELWRIGHT, *Observations on the isthmus of Panama* (London, 1844); NAPOLEON GARELLA *Projet d'un canal... à travers l'isthme de Panama* (Paris, 1845); JUSTO AROSEMENA, *Examen sobre la franca comunicación... por el istmo de Panama* (Bogotá, 1846); W. B. LIOT, *Panama, Nicaragua and Tebuantepec* (London, 1849); ["Rockwell Report"] U. S. Congress. House Select Committee on a canal or a railway between the Atlantic and Pacific oceans, ... *canal or railroad... [report] February 20, 1849* ([Washington, D. C., 1849]). This "Rockwell Report" reprints the articles by Lloyd, and gives a translation of Garella.

For data on the "Path of the Chagres," see especially: LLOYD (1830), p. 65, and the accompanying "Plan of that part of the isthmus of Panama eligible for affecting a communication..."; [Panamá] Sociedad de Amigos del País to Charles Biddle, Dec. 4, 1835, and to the Governor of the province, Aug. 21, 1883.—"Rockwell Report," 279, 290-293.



was never used extensively, if at all, by foreigners. The Cruces and Gorgona routes lost their importance only through the opening of the Panama Rail Road.

IV

A NOTE ON THE MAP

The map that accompanies this article is based upon a tracing of the appropriate part of "plate 2," in the portfolio of maps of the *Report of the Isthmian Canal Commission*, 1899-1901. (1 volume; portfolio of 86 maps, sections and views; Washington, D. C.: The Government Printing Office, 1904). Plate 21 of this portfolio has also been used. Earlier maps are very inaccurate on areas distant from the railroad or canal route. Later maps, unfortunately, show the Gatun Lake instead of the lower half of the Chagres river system.

The more important maps used in revision of the above, and in preparation of this article, are:

[Antoneli] *Plano del puerto de Puertobelo y de las fortificaciones que se habían de hacer* [1597].—A. I., 69-3-13.

[Cristóbal de Roda]. *Discreción de la ciudad de Panama*... [1609].—A. I., 69-4-18.

Plano Geográfico desde la ciudad de Panamá hasta el Rio de Chagre... por el Capitán D. Nicolás Rodríguez... Año 1735.—A. I., 109-1-22.

Mapa del Rio de Chagre... desde su boca... hasta el sitio de Cruces... [por] *Joseph Antonio Pineda*, [1759].—A. I., 109-5-20.

JEFFERYS, THOMAS. *A description of the Spanish islands and settlements* (London: T. Jefferys, 1762).

Maps 8, 9, 10 are respectively of Puertovelo, Chagres (town) and the Isthmus of Panama.

BELLIN, JACQUES N. *Le petit atlas maritime*. (5 vol., Paris, 1764). Maps 12-15 in volume II cover the Panama areas.

- A map of the isthmus of Panama, drawn from Spanish surveys.* (London: J. Bew, 1783).—Published in "The political magazine and parliamentary . . . journal," London, March, 183.
- Carta marítima del Reyno de Tierra Firme ú Castilla del Oro . . . por D. Juan López . . . Año 1785.*
- Plan of that part of the Isthmus of Panama eligible for affecting a communication . . . From observations and surveys performed in the years 1828 and 1829.* By J. A. Lloyd, Esq.—Published in "Philosophical Transactions of the Royal Society," vol. 120, pt. 1 (1830), pl. II.
- The road from Chagres to Panama . . . by H. Tiedemann . . . Published by E. L. Autenrieth, engr. on stone by J. Schedler. New York, 1851.*
- The isthmus of Panama, by Dr. E. L. Autenrieth. New Orleans. Engraved on stone by J. Schedler. New York, 1851. Published by J. H. Colton . . .*
- Plano de Panamá y cerro del Ancon.* [MS. map, before 1889; original apparently in Biblioteca Nacional, Bogotá] (Photograph in possession of the author).
- The Panama Canal. Map of the Canal Zone and vicinity. January 1927. Scale 1 : 100000.*
- American Geographical Society of New York. *Central America.* 1:1,000,000. *Panama. Provisional edition.* (1928).
- [Canal Zone]. *Section of surveys. Reconnaissance map of areas east of Panama Canal. Compiled by O. E. Malsbury. Retraced by Orsini. 3-23-28.* (Blueprint map; illustrates trip of R. Z. Kirkpatrick, *et. al.*, in March, 1925).

A few other maps are cited in notes to the article. In addition, I have seen, and used so far as necessary, many of the manuscript maps and plans of Nombre de Dios, Puer-tovelo and the mouth of the Chagres, listed in TORRES LANZAS, *Relación descriptiva de los mapas, planos, etc . . . de Panamá, Santa Fé, y Quito* (Madrid, 1906), and certain United States Army maps of a semi-confidential nature.

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