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than any other disease. Malaria, tuberculosis and typhoid fever follow in the order named. During the 1907 fiscal year, 11,975 persons were treated at Commission hospitals.

In June, and again in August, 1905, single cases of bubonic plague occurred at La Boca. There was no spread. In 1907, a case of yellow fever was taken from one of the boats in the harbor. None of the other passengers exposed became infected.

In August, September and October, 1906, there was not a death among the 6,000 American men, women and children on the Isthmus, a truly remarkable occurrence.

A newcomer on the Isthmus nowadays wonders at the absence of mosquitoes in Panama and Colon and the settled portions of the canal strip. The reason is revealed when it is stated that during the fiscal year 2,736,509 gallons of mosquito oil were sprinkled on the streets and low places.

The quarantine end of the Department of Sanitation is the watchdog of the Isthmus. A rigid inspection is made of passengers and crews on incoming boats, and in case of those touching at infected ports, the passengers are held in detention for five days. The total vaccinations for the 1907 fiscal year reported by this service were 34,589. Total net immigration for the year was 30,545. Number of immigrants rejected, 44. The quarantine station on the Pacific side will be located shortly on the island of Culebra, in Panama Bay.

The longer one remains on the Isthmus, the better inured he becomes to the conditions. This is true in the majority of cases, and is demonstrated by the constantly diminishing average sick rate among the employes. For one while during December, 1907, the average daily hos-

pital admissions were lower than any similar period since sanitary operations have been conducted on the present scale.

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## THE KING PIN OF THE CANAL.

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The true source of the Chagres has never been accurately determined. It has, however, two principal branches, one (the larger) known as the Pequeni, rising in the Cordillera San Blas, which at that point forms the Continental Divide, very close to the Atlantic Coast. The other branch has its origin about twenty miles (by the river), above Alhajuela, at which point the French Canal Company established a gauging station.

Between Alhajuela and the Caribbean, the principal tributaries are the Gatun, Chilibre, Obispo, Gatuncillo and Trinidad, named in the order their of joining the Chagres. In the dry season these may be regarded as negligible, but during rainy months they become tropical torrents, with a volume not to be ignored. None of the tributaries have been followed to their source, with the exception of the Obispo, although the Isthmian Canal Commission has established gauging stations on the Trinidad and Gatuncillo, about eight miles above Gatun.

Few rivers show a greater variation in the amount of discharge at different periods of the year than the Chagres. In the dry season, it is a clear, quietly flowing stream, while during the rainy season it becomes a great river, subject to sudden and violent freshets and floods.

The following table shows the maximum, the minimum and the mean discharges at each of the three principal gauging stations operated by the Isthmian Canal Commission:



*A scene on the Chagres River--Panama.*  
*Author: American S. P. S. from Agency & Advertising Bureau, J. Mandeville*

# PURITY IS PROVEN

An analysis lately made by the Department of Sanitation of the Isthmian Canal Commission has proven the purity of

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*Paraiso Springs Carbonating Works,*

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**HERE'S TO YOU.**

Name of Station	Years of Observation	Maximum Discharge in cubic feet per second		Minimum Discharge in cubic feet per second		Mean Yearly Discharge in cubic ft. per sec.
			Date		Date	
Allajuela	1899 to date	92,000	12-3-06	240	Apr. 01	2380
Gamboa	1882 to date Except 1889 & some months 1897-1898.	70,000	12-3-06	240	Apr. 01	3046
Bohio	1899 to date	108,000	12-4-06	240	Apr. 01	4603

The gauging station at Gatun was established in May 1907, and while discharges have been measured there since that time, the observations have not been carried on for a sufficient time to permit their use as authoritative. Enough data has been secured however, from measurements made this year, to enable us to compute the discharge at 135 per cent. of that at Bohio.

The following table taken from the revised edition of General Abbot's book "Problems of the Panama Canal" will show the maximum discharge reached in the eight

greatest floods of the Chagres of which there is authentic record.

Date	GAMBOA				BOHIO			
	Max. height above low water in ft.	Discharge in cubic ft. per sec.		Per cent above low water in ft.	Max. height above low water in ft.	Discharge in cubic ft. per sec.		Per cent
		Maximum	In 48 hours			Maximum	In 48 hours	
Nov. 1906	22.10	40,075	25,003	62	26.08	46,292	38,738	81
Dec. 1906	35.65	76,008	42,377	56	38.65	108,006	74,371	69
1893	25.33	43,066	27,971	65	28.54	51,100	43,590	85
1890	31.82	65,371	34,752	54	32.15	71,660	51,068	71
1888	31.37	58,132	48,278	83	34.68	79,000	--	--
Nov. 1885	31.50	64,488	43,404	67	33.79	74,800	--	--
Dec. 1885	24.11	44,923	32,421	72	26.41	47,466	--	--
1879	36.65	78,614	--	--	39.37	112,730	--	--

\*Note: The height reached during this flood was recorded only for Bohio; that at Gamboa being calculated by means of the relation which has been found to exist between those two stations by subsequent observations.

The Chagres above Gamboa is a clear mountain stream, and in the dry season the amount of matter carried in suspension is so small that no observations were deemed necessary. However, experiments were made by the Isthmian Canal Commission of 1899-1901 in order to determine the amount of matter carried in suspension during the rainy season, with the following results: At Alhajuela it was found that the matter in suspension was .15 of one per cent. of the total volume of the water, and at Bohio .18 of one per cent.

As the result of a chemical analysis of the water of the Chagres by Dr. Arthur I. Kendall, Acting Chief of the Isthmian Canal Commission Laboratory, collaborating with Ricardo M. Arango, Division Engineer in charge of the hydrographic work of the Commission, it was found that at Gamboa there is an average of 228 parts of solid matter carried in suspension to every million parts of water.

In the course of the Chagres river from the Sierra San Blas, its bed presents varied geologic formations. At its source granite is found and pieces have been washed down, but little is known of the exact character of the country. Above Alhajuela, there is stratified limestone, sometimes white but usually gray, which passes under the sandstone of the lower river. Lower down, between Alha-

juela and Cruces, a compact calcareous sandstone presents itself, containing fossils of the upper Oligocene or Miocene period, while the bed of the river at Gamboa is composed of compact limestone. At Bohio, there is a fine-grained volcanic breccia, and at Gatun a moderately close conglomerate under a brownish, impure calcareous clay, the former containing fossils of the Oligocene age. Between Gatun and Limon Bay, the Chagres passes through a stretch of swampy lowlands reaching almost to the sea, where the river cuts through a range of low hills.

### **Meteorological Work on the Isthmus.**

This work could not be considered as fairly established by the Isthmian Canal Commission until January 1, 1906, when there were in operation two first class meteorological stations,—Ancon and Naos, and twelve rainfall stations,—Cristobal, Gatun, Bohio, Tabernilla, Bas Obispo, Gamboa, Alhajuela, Empire, Culebra, Rio Grande, La Boca and Panama. Of these, the stations at Ancon, Naos, Cristobal, Rio Grande and Bohio were using self-registering instruments. During the year Brazos Brook, Bas Obispo, Empire, Camacho, Culebra and La Boca were supplied with self-registering instruments and Bas Obispo was established as a first class meteorological station. This station is also equipped with an up-to-date evaporation plant, where experiments are being conducted to ascertain the daily, monthly and annual amount of evaporation. The Naos station was discontinued January 1, 1908, and consolidated with Ancon.

During the year 1907, Cristobal was established as a first class meteorological station, and the stations at Alhajuela, Gatun and Bohio equipped with triple registering instruments for recording the wind direction and velocity, sunshine, and rainfall.

There are now in operation on the Canal Zone three first class meteorological stations, at which the following observations are taken: Barometric pressure, temperature,

relative humidity, dew point, vapor pressure, wind direction and velocity, sunshine, cloudiness and rainfall, while at Bas Obispo the evaporation experiments above referred to are conducted; at Ancon on the Pacific, and Cristobal on the Atlantic side of the Isthmus, records of the tides and ocean temperature are taken.

Alhajuela, Bohio and Gatun are recording wind direction and velocity, and rainfall. Brazos Brook, Tabernilla, San Pablo, Gamboa, Empire, Camacho, Culebra, Rio Grande and La Boca are recording only rainfall.

The pressure, temperature, relative humidity, wind direction and velocity, sunshine and rain are recorded hourly, thus showing the hour of the day most affected by these elements.

The mean and annual temperature on the Pacific side is slightly higher than that on the Atlantic side of the Isthmus. The mean temperature for the Canal Zone is about 80 degrees Fah.

The year is divided sharply into two seasons, dry and rainy, the latter lasting from April to December. The heaviest rains usually occur in November.

The precipitation is greatest on the Atlantic Coast, where the mean annual rainfall is 128.19 inches at Cristobal, and least on the Pacific side, where it is 48.43 inches at Naos.

A table giving a synopsis of the climatological data of the Isthmus follows, as also a statement showing the maximum, minimum and mean rainfall at the stations of Cristobal, Gorgona, Culebra and Panama.

The Bureau of Meteorology and River Hydraulics (afterwards raised to a Division), under which all hydrographic and meteorological studies are made, was established June 14, 1905, by former Chief Engineer Wallace. Mr. Ricardo M. Arango, who had served as Consulting Engineer during the installation of the water and sewerage system of Panama has been in charge of the Division since its inception.

**SUNSET AND SUNRISE TABLE**

1908.	SUNRISE		SUNSET.	
	H.	M.	H.	M.
Jan. 1	6	16 A. M.	5	52 P. M.
11	6	19	5	57
21	6	21	6	02
31	6	21	6	06
Feb. 10	6	20	6	09
20	6	17	6	10
Mar. 2	6	14	6	11
12	6	08	6	11
22	6	03	6	11
Apr. 1	5	57	6	10
11	5	52	6	10
21	5	48	6	10
May 1	5	44	6	10
11	5	41	6	11
21	5	40	6	13
31	5	39	6	16
June 10	5	40	6	18
20	5	42	6	21
30	5	44	6	23
July 10	5	46	6	24
20	5	49	6	24
30	5	51	6	22
Aug. 9	5	51	6	19
19	5	52	6	15
29	5	52	6	10
Sept. 8	5	50	6	05
18	5	49	5	59
28	5	49	5	53
Oct. 8	5	48	5	47
18	5	48	5	42
28	5	49	5	39
Nov. 7	5	51	5	36
17	5	54	5	36
27	5	58	5	37
Dec. 7	6	04	5	40
17	6	09	5	44
27	6	14	5	49
1909				
Jan. 6	6	17	5	55

The above table is in local Panama time and is computed for Lati-



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tude 8 deg., 57 min., and 16 sec. north; longitude 79 deg., 31 min., and 4 sec. west.

Colon is in Latitude 9 deg., 22 min., 16 sec. north; longitude 79 deg., 52 min., and 27 sec. west, the difference between local Colon time and local Panama time being about two minutes. By deducting therefore two minutes from the figures on the above table will give the correct sunrise and sunset time at Colon.

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### **PANAMA'S MORALS IN THE '70S**

Things are looking up in morals. We have good authority for stating that a mule was baptized the other day, and now the pleasing intelligence comes from Aspinwall that a five-foot alligator went to church in that quiet and respectable town last Sunday. The donkey had the precedence in the entry into Jerusalem, but his morals were not stated, and for the above ceremony they concluded they would have a good mule, no common donkey, but an orthodox mule or none, so they baptized the candidate and branded him with the sign of the holy cross.—Panama Star & Herald in 1872.

MEXICAN, YUCATEC, GUATEMALAN AND GUINEAN RAINFALL

AT COLON, GORGONA, CULEBRA, & PANAMA.

STATIONS:	JANV.	FEBRY.	MARCH.	APRIL.	MAY.	JUNE.	JULY.	AUG.	SEP.	OCT.	NOV.	DEC.
<b>COLON:</b>	(37)	(37)	(35)	(37)	(37)	(37)	(36)	(36)	(36)	(37)	(36)	(36)
Mean.	3.99	1.39	1.32	4.31	12.17	13.18	16.49	15.08	12.45	13.84	21.13	12.08
Max.	19.20	6.49	9.17	21.73	25.00	22.00	27.68	25.43	22.99	20.32	43.01	30.94
(Year)	1899	1899	1895	1899	1891	1872	1899	1882	1890	1862	1862	1893
Min.	0.63	0.04	0.02	0.43	1.63	6.41	9.07	5.78	5.35	5.83	7.05	0.94
(Year)	1849	1897	1865	1899	1871	1899	1905	1902	1867	1897	1884	1873
<b>GORGONA:</b>	(3)	(5)	(4)	(5)	(3)	(3)	(3)	(3)	(6)	(3)	(3)	(4)
Mean.	2.52	0.55	0.88	2.66	13.03	8.24	11.56	3.45	15.87	11.90	11.76	5.48
Max.	3.78	2.01	3.31	3.13	28.12	13.54	19.72	12.88	15.98	18.42	17.27	7.91
(Year)	1899	1899	1899	55-1300	1897	1897	1900	1.98	1897	1894	1894	1897
Min.	1.21	0.08	0.00	1.38	5.04	4.00	5.16	8.98	11.25	7.72	7.16	5.94
(Year)	1897	1897	1897-8	1898	1898	1895	1896	1856	1900	1898	1875	1898
<b>CULEBRA:</b>	(19)	(18)	(18)	(18)	(18)	(18)	(17)	(17)	(17)	(18)	(18)	(15)
Mean.	1.84	0.43	0.81	3.83	11.40	9.00	9.04	10.84	10.80	11.05	12.67	7.86
Max.	8.60	2.28	3.03	16.70	32.20	14.90	20.23	17.70	18.18	20.65	24.10	24.60
(Year)	1902	1899	1896	1896	1897	1907	1903	1856	1895	1886	1896	1885
Min.	0.00	6.00	0.00	0.04	6.29	3.95	2.02	3.33	6.22	5.75	6.69	0.35
(Year)	1895	*	**	1907	1884	1903	1858	1855	1906	1888	1899	1900
<b>PANAMA:</b>	(11)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
Mean.	1.51	0.63	0.99	2.36	8.62	9.00	8.52	6.91	7.91	11.03	11.42	3.09
Max.	5.61	2.52	5.71	5.35	11.22	13.78	15.22	11.46	15.06	20.27	19.21	5.52
(Year)	1899	1879	1879	1900	1900	1881	1900	1880	1901	1900	1879	1906
Min.	0.00	0.00	0.00	0.00	4.44	5.03	4.31	4.05	4.05	4.35	6.46	0.98
(Year)	1882	1903	1882	1899	1897	1880	1905	1882	1882	1906	1880	1879
	1901		1900-1									

NOTE. Nos. in parentheses denote years of observation. 1857, 1858, 1860, 1862, 1863, 1864, 1865, 1867, 1868, 1869, 1891.

CLIMATOLOGICAL DATA, CANAL ZONE, 1908.

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN
Pressure	30.86	30.90	30.80	30.80	30.84	30.85	30.83	30.84	30.84	30.85	30.83	30.88	30.86
Maximum Temperature	95	97	96	94	93	80	92	91	93	92	90	90	91.5
Minimum Temperature	71	69	60	71	72	70	71	71	73	71	70	70	70.6
Mean Temperature	81.4	81.4	81.6	82.2	81.8	79.9	79.8	80.2	81.4	80.0	79.8	79.1	80.7
Relative Humidity	90	90	88	86	89	90	92	91	90	87	91	87	89.3
Dew Point	73	72	73	74	76	74	75	74	75	73	74	71	73.7
Wind--Direction	N.	N. W.	N. W.	N. W.	N. W.	N. W.	N. W.	N. W.	N. W.	N. W.	N. W.	N. W.	N. W.
Wind--Velocity	12	12	12	10	8	6	7	6	6	8	6	10	9
Sunshine--Per Cent	61	67	61	47	49	42	38	41	38	51	32	54	43
Cloudiness--Per Cent	50	56	59	72	74	64	62	76	60	43	66	73	73

While the temperature of Panama is necessarily high and enervating during the day, the nights are comparatively cool and refreshing. The uniformity of temperature prevailing throughout the Isthmus is strikingly illustrated in the record of fifty-six cities and towns situated in widely-scattered parts of the country, some on the Caribbean coast, some on the Pacific coast, and others in the hills in the interior. The coolest town shows a mean temperature of 77

deg. Fahr.; the warmest 81.6 deg. Fahr., the average for the entire number being 79.5 deg. Fahr. The extreme range of temperature nowhere exceeds 35 degrees; the thermometer rarely falls below 68 deg. Fahr., or rises above 95 deg. Fahr., though in Colon 104 deg. Fahr. was registered on one occasion. The humidity is excessive reaching as high as 90 per cent. in the mornings during the rainy season, and 75 per cent. in the afternoons.

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## Beyond the Chagres.

The following selection from "Panama Patchwork" is reprinted with the kind permission accorded the publisher, by the author prior to his death. At the time the piece was written, the name "Chagres" was hardly one to conjure with. It was associated with deadly fevers, and all manner of things evil. Nowadays the name has lost some of its potency and mysticism, although at the present time, the territory of the upper Chagres is a region practically unknown, and strange as it may seem even the true source of the river, destined to be the great feeder of the canal, is as yet undetermined. The so called "Chagres fever" is nothing more than an aggravated type of malaria.

1. Beyond the Chagres River  
Are paths that lead to death...  
To the fever's deadly breezes,  
To malaria's poisonous breath!  
Beyond the tropic foliage,  
Where the alligator waits,  
Are the mansions of the Devil...  
His original estates!

3. Beyond the Chagres River  
Lurks the cougar in his lair,  
And ten hundred thousand dangers  
Hide in the noxious air,  
Behind the trembling leaflets,  
Beneath the fallen reeds,  
Are ever-present perils  
Of a million different breeds!

2. Beyond the Chagres River  
 Are paths fore'er unknown,  
 With a spider 'neath each pebble,  
 A scorpion 'neath each stone,  
 'Tis here the boa-constrictor  
 His fatal banquet holds,  
 And to his slimy bosom  
 His hapless guest enfolds!

4. Beyond the Chagres River  
 'Tis said--the story's old--  
 Are paths that lead to mountains  
 Of purest virgin gold;  
 But 'tis my firm conviction,  
 Whatever tales they tell,  
 That beyond the Chagres River  
 All paths lead straight to hell!

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## UNCLE SAM'S ISTHMIAN DOMAIN

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The treaty provides that the Canal Zone shall extend from the 3-mile limit in the Atlantic Ocean to the 3-mile limit in the Pacific Ocean and to the distance of five miles on either side of the center line of the canal. By the agreement entered into by Gen. Davis, then Governor of the Canal Zone, and representatives of the Panama Government, on June 15, 1904, the limits of the Zone were provisionally determined with reference to the center line of the sea-level canal projected by the French canal company. In a few localities, where it became necessary in order to settle questions pending, the provisional limits were located and marked, by joint action of the Zone authorities and Panama. When the center line of the lock canal to be built by the United States was located, it became possible to determine and locate the permanent boundary lines of the Zone. Maps were therefore prepared by the Canal Commission showing the proposed permanent boundary lines, and were submitted to the Panama Government, which accepted them. Joint parties under the direction of engineers representing Panama and the United States, were put in the field for the purpose of locating the lines as shown on these maps. The lines which have now been located consist of a succession of tangents, instead of curves as did the provisional boundary lines. It is proposed to mark the intersection of the tangents by concrete monuments, and

where the boundaries intersect streams and roads, by iron pipes. The provisional boundaries of the cities and harbors of Panama and Colon, which are excepted from the Canal Zone by the treaty are still observed, although it is expected that before long the permanent boundary lines of these cities and harbors will be determined, thus definitely settling the question.

The line of demarcation between the Canal Zone and the city of Panama is at present fixed as follows:—

"Beginning at a stake set above high-water mark on the extremity of the Punta Paitilla, on the southerly shore of the Bay of Panama, which point is on the southeastern margin of the harbor of the city of Panama, thence northerly to a stake set near the summit of Cerro Pelado, said cerro (hill) being about one hundred metres to the south of the Savannah road and about eighteen hundred metres to the westward of Caledonia Bridge; thence westerly in a straight line to a stake set on the summit of Cerro Corundú, which is situated on the right bank of the river of the same name, near where said stream is crossed by the road leading from the city ice plant to Corozal; thence in a straight line in a southwesterly direction, crossing the railroad tracks to the La Boca junction, to a stake set at the south-east corner of the tract of land belonging to the United States called La Section, which stake is on the north side of the road leading from Panama to the United States hospital on the slope of Ancon Hill; thence in a straight line across the fields and meadows and passing about one metre to the north of the springhouse known as Chorrillo to a stake about 75 metres to the west of said springhouse, set on the north side of the road leading from Panama to La Boca; thence in a straight line across the La Boca road to a stake set just above high-water mark at the extremity of the point known as the Punta Mala on the southerly shore of Panama Bay and opposite the Island of Gabilan."

All of the area enclosed on three sides by the boundaries above described, and on the fourth side the shore-line of Panama harbor from Punta Mala to Punta Paitilla, constituting the city of Panama, and the harbor adjacent situated between the said headlands or points, are under the jurisdiction of the Republic of Panama. All of that portion of the old municipal district of Panama which is within five statute miles of the centre line, or axis, of the Canal, and which is not included within the city limits above described, has been recognized by mutual agreement of the authorities of the United States and of those of Panama as

belonging to the jurisdiction of the United States. The islands of Naos, Perico, Flamenco, Culebra, Tortola and Changarni are in the Canal Zone, while the islands of Taboga and Taboguilla are under the sole jurisdiction of Panama.

The provisional boundary lines of the city and harbor of Colon is as follows:—

"Beginning at a stake situated at low water mark on the northern shore of Boca Chica, or Folks River, at a point 50 metres to the eastward of the centre line of the main track of the Panama Railroad, near where said railroad enters upon the causeway crossing said Boca Chica toward the south, thence in a curved line, always parallel to the centre line of the main track of the Panama Railroad, going toward the city of Colon and always at the uniform distance of 50 metres from said centre line, to a point where the said curved line parallel with the railroad track shall intersect the centre line of 'E' Street, sometimes called Bolivar Street, city of Colon; thence, following said centre line of Bolivar Street, northerly to the intersection thereof with the centre line of Eleventh Street in the said City of Colon; thence in the centre line of said Eleventh Street westerly to the shore of Limon Bay; thence, following the low water level of Limon Bay, along the shore line of La Terre Plein to a point on said shore line, at low water mark of the same directly west of the monument of Christopher Columbus now standing on the western extremity of said Terre Plein; thence in a straight line due west across Limon Bay to the westerly shore thereof; thence northerly, following the low-water shore line of Limon Bay, to Toro Lighthouse; thence in a straight line easterly to the lighthouse on the westerly corner or extremity of Manzanillo Island; thence easterly, southerly, and westerly, always following the low-water shore-line of Manzanillo Island, washed or bounded by Manzanillo Bay, Boca Grande, and Boca Chica, which is sometimes called Folks River, to the stake above described, at the point of beginning of this boundary on the shore of said Boca Chica."

"The lands and waters enclosed by the boundaries above described, excepting the present lighthouse, on the westerly point of Manzanillo Island together with its site one hundred metres in diameter bounded by a circle of which the lighthouse is the centre, and excepting also, an area through the harbor of Colon, extending from the southern margin thereof along the exit of the Channel entrance to the canal, measured three hundred and thirty metres wide on each side from the said central axis, to where said channel shall terminate beyond the harbor of Colon in the Caribbean Sea, constitute the city and harbor of Colon, under the jurisdiction of the Republic of Panama."

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In September, 1904, the Canal Zone was divided into five municipal districts, and a local municipal organization on the order of the usual city government plan was established in each district. While the officials were appointed by the Governor, it was purposed to have the municipalities self-governing as far as possible. As very few of the more intelligent citizens of that part of the Isthmus embodied in the canal strip live outside the cities of Panama and Colon, and as Americans and others, not citizens of Panama living in the Zone are almost all employed by the Canal Commission, the practice developed of appointing Americans to municipal positions. This was contrary to the idea of self-government, and on April 15, 1907, the municipal organizations were abolished by Executive order of the President, and four administrative districts were created in their stead. District tax collectors were appointed, municipal judges gave way to district judges, and the Commission was clothed with authority to enact ordinances on subjects previously legislated by the municipal councils. The four administrative districts at present are Ancon, Empire, Gorgona and Cristobal.

The granting of liquor licenses in the Zone is directly under the control of the Commission and saloons are only allowed at certain points. The annual license is \$1,200, U. S. currency. Thirty-four saloons are now operating within the limits of the Zone.



The number of agricultural leases in the Canal Zone during the fiscal year of 1907 has decreased, instead of increased, as was expected. The reason for this is not apparent, unless it is that the returns from agricultural ventures are slow, and require an amount of capital which the small investor who would engage in independent pursuits in the tropics is not prepared to furnish; doubtless, it is also partly due to the fact that remunerative employment can always be secured on the canal works. The reduction in the number of leases has also been due to some extent to the cancellation of leases on watersheds, draining into reservoirs which furnish the water supply for towns and villages on the Isthmus. Three watersheds have been entirely cleared of human habitation, and no leases are now made in the vicinity of reservoirs without reference to the Sanitary Department for approval as to location.

In view of the fact that many roads and trails have been opened in the administrative districts of Ancon, Emperador and Gorgona, there is every reason to believe that the number of agricultural leases will increase during the present fiscal year, as there is now available a large amount of valuable agricultural land which has hitherto been inaccessible. The total number of leases for building lots in force on June 30, 1907, was 479, and for agricultural lands, 83; the leases for agricultural lands covering 344 hectares of land. About 52 square miles of land in the Zone was purchased by the United States from the New Panama Canal Company, and about 189 square miles was acquired from Panama under the treaty. Much of this land will be required for canal construction purposes, and a large part of it will be submerged by the lakes formed by the canal.

The authority for leasing this land is found in the Act of Congress approved July 28, 1892, authorizing the Secretary of War to lease, for a period not exceeding five years and revocable at any time, property of the United States under his control, and not required for public use.

The land laws of the United States do not apply to the Canal Zone, and the land laws of Panama in force in the Zone at the time of its cession to the United States are not applicable to the conditions in the Zone. "It is believed," says Governor Blackburn in his official report, "that as soon as it is possible to determine with reasonable certainty the lands that will be required for canal purposes on the Isthmus, the remaining lands should be opened to cultivation and settlement under some arrangement that will assure permanent tenure to persons desiring to secure it. A great deal of public land in the Canal Zone is occupied by squatters, who have been on the land for many years, without legal right. These persons are not disturbed except where their occupation of the land interferes with the canal work. Considerable land in the Zone claimed by private persons, is, it is believed, actually public land. The titles to such land will be adjudicated in the courts. The new Code of Civil Procedure provides a simple method of testing titles in such cases."

The ownership of land in the Canal Zone is as follows:

Owned by the United States, by purchase from the New Panama Canal Company.....	52.11 sq. miles
Owned by the United States, by condemnation and purchase, since the provisional delimitation of the Zone .....	3.01 sq miles
Public land held by the United States by cession from Panama under the treaty.....	188.91 sq. miles
Owned by the Panama Railroad by cession from Colombia and purchase from private owners .....	68.12 sq. miles
Owned by private persons .....	136.22 sq miles
<hr/>	
Total.....	448.37 sq. miles

Canal Zone revenues have always exceeded the expenditures. These revenues are derived principally from real estate taxation, real estate rentals, fines and costs, and liquor licenses. The following table shows receipts from

these sources, and also total receipts and expenditures for the fiscal years, 1905, 1906, and 1907:—

	1905	1906	1907.
Real estate	\$ 6,576.37	\$ 15,220.51	\$ 5,372.51.
Fines and costs	.. 15,390. 2	30,767.30	35,561.16.
Liquor licenses	.. 48,632. 0	92,060.92	95,715.40.
Rentals	.. 2,287.79	15,306.97	13,802.90.
Total receipts	.. 114,740.17	224,729.39	230,954.27.
Total expenditures	.. 47,486.12	141,384.95	173,112.13.

The above amounts are all in Panama silver.

## TEACHING CANAL ZONE YOUTH.

The Isthmian Canal Commission authorized the establishment of a school system in 1904, but the pressure of other work prevented any action being taken under this authorization beyond the compilation of a census of children of school age, until December, 1905. At that time a Superintendent of Schools was appointed for the Canal Zone, and preliminary steps were taken toward opening of free schools, of primary grade and simple curriculum. The first free public school in the Canal Zone was opened at Corozal on Jan. 2, 1906. At the close of the term ending Sept. 30, 1906, there were 30 schools with an enrollment of 1796 pupils, and an average daily attendance of 1237. In March, 1907, there were 28 schools in operation. The total enrollment was 1724, and the average daily attendance 1227.

Under date of June 11, 1907, the I. C. C. adopted a resolution prescribing the length of the school year, and fixing the salaries of teachers. The public school term under this resolution now extends from September 30 to June 1, with the following intermissions, Sunday and Saturday of each week; Thanksgiving day and the Friday following; from

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December 21st to Jan. 5th inc., Washington's Birthday, the week preceding Easter Sunday, and Decoration Day, May 30.

The schools reopened October 1, 1907, with 24 in operation. The schools for white children are located at La Boca, Ancon, Pedro Miguel, Paraiso, Culebra, Empire, Las Cascadas, Gorgona, Gatun, and Cristobal. The schools for colored children have been established at La Boca, Las Sabanas, Paraiso, Culebra, Empire, Matachin, Cruces, Gorgona, Tabernilla, Bohio, Gatun, Mount Hope, Cristobal and Playa de Flor. It is intended to open schools at Pedro Miguel, Las Cascadas, San Pablo, Bas Obispo, Frijoles, and Majagual. Nineteen teachers are employed in the schools for white children, and three white and fifteen colored teachers in the schools for colored children. The white teachers come from the following localities: One from Alabama, one from Indiana, one from Iowa, one from Kansas, one from Massachusetts, three from Michigan, one from Mississippi, one from Missouri, one from Montana, two from Nebraska, one from New Mexico, two from New York, two from Pennsylvania, two from Virginia, and one from Panama. All are females, with one exception. The salaries of the teachers are \$60, \$90 and \$110 per month, U. S. currency for nine months in the year.

Teachers for the white schools have been carefully selected from the many applications for appointment, preference being given to those with normal school training and pre-

vious experience in the United States. All but four of the teachers employed for the white schools have had such experience.

The colored schools are in charge of the most efficient native and West Indian teachers that it is possible to attract to the service, and some delay has been experienced in opening these schools by the reason of the difficulty in securing properly qualified colored teachers. All of the colored teachers are from the West Indies or Panama.

The enrollment of pupils in the white schools for November, 1907, was 387; average daily attendance, 311. Enrollment in colored schools, 1079; average daily attendance 730.

The schools are divided into eight grades, in conformity with the similar organization of elementary schools in the United States. The curriculum includes reading, writing, spelling, grammar, geography, elementary physiology and free-hand drawing. In addition to the instruction in these subjects, English-speaking children are taught Spanish, and Spanish-speaking children are taught English. For white children who are too far advanced for the elementary grades, it is intended to organize high school classes at Culebra and Cristobal, in which instruction will be given in algebra, geometry, Latin, Spanish, botany, physical geography, general history, rhetoric and biology.

Children whose parents are employed by the Isthmian Canal Commission, or by the Panama Railroad Company, living at stations at which no school has been established are furnished free transportation on the Panama Railroad to the nearest station at which there is a school. Children of parents who are not employed by the Isthmian Canal Commission, or the Panama Railroad Company and are not residents of the Canal Zone, are admitted to the elementary grades wherever local conditions will permit upon payment of a tuition fee of \$2.00 gold per month, and to the high school grades upon payment of \$4.00 gold per month. All necessary material, including books, pencils, pens and paper,

are furnished to the children free of charge. No expense is to be incurred by children of the Canal Zone attending the schools, except a nominal charge for the mutilation or loss of books or other property resulting from the pupil's carelessness or negligence.

It is the aim of the Division of Schools to provide for the children of American parents, instruction similar to that which they would receive in the public schools of the United States, in order that they may not be handicapped by reason of their temporary residence on the Isthmus, and to provide for native children resident within the Zone and children of the Commission's West Indian laborers such schooling as they might obtain in the Republic of Panama, or in their native islands. Mr. David C. O'Connor is Superintendent of Canal Zone Schools.

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## THE ISTHMIAN WATER SUPPLY.

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When the United States took over the canal the crying need in the cities of Panama and Colon was an adequate water supply. The inhabitants were dependent on the rains during the *invierno*, or wet season, and on the street water peddlers during the *verano*, or dry season. Nearly all the houses were provided with tanks, and during the rainy season it was an easy matter to keep them filled, but a month or so after the appearance of dry weather these were of no further use, and the people had to resort to the *aguadores*. The luxury of a daily bath could only be compassed by the well-to-do, while the writer once noticed the same amount of water performing the following functions: First, used to wash the childrens' faces; second, used to wash out some articles of wear; third, used to

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scrub the stone floor of the habitation; fourth and lastly, used to wash off the side walk in front.

When the Commission first grappled the subject, it was proposed to construct a dam and reservoir on the Juan Diaz, a clear mountain stream about fifteen miles from Panama, but off the line of railroad. The Panama Government was largely in favor of this plan. On account of its accessibility, the plan of building a reservoir at Rio Grande Superior to supply the city of Panama, and intermediate points was ultimately adopted. A division was organized for this work and a corps of men sent down in July, 1904, in charge of Carleton E. Davis. The department was then known as the Division of Water Works and Sewers, afterwards Water Works, Sewers and Roads, and at the present time Division of Municipal Engineering.

Water was promised the people of Panama on the Fourth of July, 1905, and the promise was fulfilled. The occasion was appropriately celebrated, the local fire department turning out and making a test of the different hydrants. The work of paving and sewerage the cities of Panama and Colon was carried out by this department, operations having practically been brought to a close on November 1, 1907.

The Rio Grande reservoir which supplies Panama and points between lies directly on the railroad ten miles from the city. Its original capacity was 396,000,000 gallons, but during the prolonged dry season of 1907, the consumption was so great as to require an increased stor-

age supply. The reservoir has recently been enlarged to hold 521,000,000 gallons. The water is conveyed through a 16-inch main to another reservoir at Ancon, where it is filtered and distributed through the city mains. The water at times has a disagreeable odor and taste, but several analyses have been made by experts who state that the quality of the water compares favorably with that furnished Washington, Baltimore, Kansas City, and other places. The objectionable odor and taste is said to be due to the amount of harmless motile crustacea found in the waters of all tropical countries. There is a good deal of fine silt held in suspension, and it is advisable to boil the water before using for drinking purposes. The average daily consumption of water in Panama during November, 1907, was 775,367 gallons, as compared with 788,039 gallons in November, 1906. This shows a small falling off notwithstanding the fact that in November, 1906, there were only 625 connections compared with 1843 connections in November, 1907. The economy in consumption is wholly due to the installation of meters.

The district from Empire to Bas Obispo inclusive is supplied by the Camacho reservoir, with a capacity of 256,000,000 gallons. Gorgona, Matachin, Juan Grande and Mamei are supplied from a reservoir of 85,000,000 gallon capacity. The cities of Colon and Cristobal are furnished from the Brazos Brook reservoir, the capacity of which has recently been increased to 548,165,000 gallons. The normal average daily consumption in Colon is between 400,000 and 500,000 gallons.

On November 1, 1907, there had been laid in the city of Panama 11.30 miles of water pipe of various sizes, 5.12 miles in the city of Colon and 42.80 miles in the Canal Zone, making a total of 59.22 miles. During the same period there had been laid in the city of Panama 17.40 miles of sewer pipe, in Colon 5.80 miles, and in the Canal Zone 29.15 miles, a total of 52.35. In Panama 1,843 house connections had been made and in Colon 849.





*Fire Department celebrating the Inauguration  
of the American water system in Panama, July 4<sup>th</sup> 1905.  
Published American & P.R.R. Air Agency & Advertising Bureau, A. Dinakowski.*

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There had been 134 fire hydrants placed in Panama and 54 in Colon.

During the same period there had been laid in Panama 5.12 miles of brick pavements comprising 63,764 square yards, in streets ranging in width from 13 to 35 feet; 3.03 miles of concrete and macadam pavements, comprising 67,625 square yards, in streets ranging in width from 8 to 30 feet; and 10.4 miles of curbing had been placed. In Colon 2,721 lineal feet of brick pavement, comprising 6,410 square yards, had been laid; 3.24 miles of macadam pavements, comprising 39,603 square yards, in streets ranging in width from 14 to 44 feet, and 7.3 miles of curb and gutters had been installed.

The fire protection furnished to the cities of Panama and Colon is equal to that supplied to cities of similar size anywhere in the world

Several roads have been constructed by this Division throughout the Zone, the principal ones being as follows: Road from Panama to Las Sabanas, which is about four miles in length; from Panama to La Boca, about three miles; a complete system of roads around the Hotel Tivoli and Ancon section; all necessary highways at Culebra, Empire, Las Cascadas, Bas Obispo, Gorgona, Pedro Miguel, and a road from Mount Hope to Cristobal.

This division is under Commissioner Rousseau, and under the direct supervision of Division Engineer J. G. Holcombe.

## Public Works.

In November, 1906, the position of Water Commissioner was created which was changed to Superintendent of Public Works on March 1, 1907, when the water and sewer systems were turned over to that department. The work of this office includes the maintenance and operation of the water and sewer systems and paving of the cities of Panama and Colon; the collection of water rents from private parties supplied with water from the water systems constructed for Commission purposes in the Zone; the inspection of plumbing in Commission buildings in the Zone; the construction of roads and trails and other improvements in the Zone; the operation and maintenance of slaughter houses and markets in the Zone, street lighting and maintenance of public buildings.

During the dry season extending from December, 1906, to May, 1907, 37.31 miles of roads were constructed in the Zone. These included a 7-mile trail from Panama City into the Zone, following the old Cruces trail; a 5-mile trail from Pedro Miguel to Arraijan; a trail from Empire toward Chorrera; a trail from Bas Obispo toward Cruces; a macadamized road from Culebra to Empire; a trail from Empire to Gorgona, and a 3-mile trail from Mount Hope to the interior of the district of Cristobal.

The present Superintendent of Public Works is Mr. George L. Campen.

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## REVENUE END OF THE ZONE.

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Canal Zone Customs. The Canal Zone is divided into two customs districts known as Ancon and Cristobal, with the ports of Ancon on the Pacific side, and Cristobal on

the Atlantic side. The steamship lines entering the port of Ancon are the Pacific Steam Navigation Company, Compañia Sud-Americana de Vapores and the Pacific Mail Steamship Company. The first two companies run a regular passenger and freight service between Ancon and Valparaiso. The Panama Railroad Steamship Line runs a regular passenger and freight service between Cristobal and New York, and in addition there are many freight boats bringing coal and various other supplies to the Isthmus for the Canal Commission or for other consignees. No duties, tolls or charges of any kind whatever are imposed by the United States on vessels entering the ports of Ancon and Cristobal, and no collections are made by the Panamanian customs authorities on materials or supplies for the use of the Canal Commission, or the Panama Railroad, in accordance with what is known as the Taft agreement, under Executive order of December 3, 1904.

**Canal Zone Internal Revenue** The internal revenue of the Canal Zone is from the distillation of native rum. There are about 12 distilleries situated in the Canal Zone, and these work about fifteen days every two months. The charge for distillation is in accordance with the laws of the Republic of Panama, which charges \$12.00 per month per litre for a continuous apparatus, and \$6.00 per month per litre for a simple apparatus. During the year 1906, there was collected from this source \$7,026.75; for the first three quarters of 1907, ending September 30, there was collected \$2,987.88.

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**Canal Zone Lands and Buildings** This Division has to do with the lands and buildings belonging to the Isthmian Canal Commission within the Canal Zone, and the renting of agricultural and building lots to private concerns or individuals. The price for the rental of agricultural lands is \$3.00 per hectare per annum, a hectare being about two

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and two-fifths acres. The charge for the rental of building lots varies in accordance with the desirability of location, and the village in which the lot is situated. The amount collected during 1906 for land rent, was \$8,597.29; for building rent, \$318.95; for the first three quarters of 1907, ending September 30, land rent, \$6,653.20; building rent, \$427.25.

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**Canal Zone Posts** The Postal Division has seventeen post-offices, as follows: Aneon, Station A. Ancon, Corozal, Bohio, Bas Obispo, Culebra, Cristobal, Empire, Gatun, Gorgona, La Boca, Las Cascadas, Matachin, Paraiso, Pedro Miguel, San Pablo, and Tabernilla. There are in this service one director of posts, fifty gold, and twenty silver employes. Registry and money order systems have been installed in every post-office, and direct service is being given to all points, both foreign and domestic. The money order business was established in June, 1906, and has been on a steady increase from its inception. The money orders issued payable in the Canal Zone and other points will reach a monthly sum of \$350,000.00. Postage sales for the calendar year of 1906, amounted to \$42,197.04, for the calendar year ending December 31, 1907, to \$67,559.77. In accordance with Executive order of December 3, 1904, the stamps used in the Canal Zone postal service are stamps of the Republic of Panama surcharged with the words "Canal Zone," which stamps are



*U.S. Post Office and canal offices—Cristobal, Panama.*  
*Reproduction from a P. R. R. News Agency & Advertising Bureau of Standard*

purchased of the authorities of the Republic of Panama at 40 per cent. of their value. During the year 1906, there were registered in the Zone 75,218 domestic and foreign letters and parcels. During the period January 1, 1907, to June 30, 1907, there were registered 53,600 domestic and foreign letters and parcels.

The entire revenues collected by the Revenue department during the calendar year 1907, amounted to \$186,644.64 divided as follows :

Distillation tax .....	\$ 3,770 68
Land rents .....	9,653.05
Building rents .....	1,706 75
Liquor licenses .....	40,800.00
Administrative districts .....	75,051.35
Money order fees .....	15,126.95
Postal sales \$67,559.77 net Zone Revenues 60 per cent. ....	40,535.86

Total Zone revenues .... \$186,644.64

Administration of Estates The Collector of Revenues, is *ex-officio* Administrator of Estates and administers on estates of deceased American employes of the Isthmian Canal Commission and of the Panama Railroad Company whose estate do not exceed \$500 gold.

The Division of Revenues, Customs Posts and Lands is under the supervision of Col. Tom. M. Cooke, with headquarters at Ancon. The deputy collectors are Mr. H. A. Gudger, Ancon, and Mr. E. L. Baker, Cristobal.

## THE GUARDIANS OF THE ZONE.

The Police Department was organized in May, 1904, after the taking over of the Canal Zone by the Americans. It has jurisdiction over and covers the entire

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The headquarters of Zone police is located at Ancon, C. Z., as is also the residence of the Chief of Police. The present Chief of Police, who is also Marshal of the Canal Zone, Warden of the Zone Penitentiary, and Coroner of the Canal Zone, is Capt. Geo. R. Shanton. The Chief Clerk of the Department is D. E. McDonald, who is in charge of Police Headquarters during the absence of the Chief of Police.

The strength of the force is 200 officers and men, who are about equally distributed throughout the different districts of the Canal Zone, the principal stations being located at Ancon, Las Sabanas, La Boca, Pedro Miguel, Paraiso, Culebra, Empire, Las Cascadas, Bas Obispo, Gorgona, Tabernilla, Bohio, Gatun and Cristobal.

Each of the above stations is supplied with a jail, and a majority of them have a number of outposts gov-





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erned by the main stations, all stations being in immediate charge of a lieutenant or sergeant, who is required to report daily to Police Headquarters. All stations and outposts are also immediately connected with Police Headquarters by telegraph and telephone.

The present strength of the force is one chief of police, one chief clerk, six clerks, one first lieutenant, one second lieutenant, twelve sergeants, twenty corporals, 80 first class policemen, all of whom are white, and eighty colored policemen.

The uniform worn by the white officers is khaki, with regulation campaign hat; that worn by the colored officers is khaki, with khaki helmet. The side-arms used are the regulation policeman's club, and regulation 38 Colt pistol.

Nearly all of the first class police officers—corporals, sergeants and lieutenants—are ex-police officers with good records in the States, or are military men with excellent records and credentials from the United States Army.

The Zone penitentiary is located at Culebra, C. Z., where all criminals who are sentenced to the penitentiary are incarcerated.

The headquarters of the penitentiary is at Ancon, as the Warden, as stated above, occupies the dual position of Warden and Chief of Police.

The average number of prisoners in the Zone Penitentiary is about 65.

The offices of Coroner and Marshal of the Canal Zone also come under the head of the Police Department, and the headquarters of these offices is also located at Police Headquarters, Ancon.

All police officers in command of stations are, by virtue of their position, deputy marshals and deputy coroners, and report direct to Police Headquarters, Ancon.

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## THE PEARL INDUSTRY OF PANAMA.

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For many, many years prior to the advent of the Conquistadores, the Pearl Islands (Islas de las Perlas) were known and exploited for the rich pearls that abounded in the shoal waters off the shore. These islands constitute an archipelago and lie well out in the Bay of Panama, about ninety miles from Panama City. There are in the neighborhood of 16 islands and 100 islets in the group, the largest of which is the Isla del Rey. San Miguel, the only town of consequence in the archipelago is located on this island.

The pearl fisheries have been worked more or less vigorously ever since the Spanish occupation, and thousands upon thousands of beautiful gems have been brought to light. At the present time the grounds are not so prolific, and it is only now and then that a pearl of exceptional value is discovered. The pearls found in these islands are credited with having a superior brilliancy of lustre, and range in value all the way from \$2 to \$2,000.

The fishing is done almost entirely by negroes who live on the islands and dive for the pearls in the most primitive fashion. The usual method of fishing is as follows:—Upon reaching the banks which lie from fifteen to eighteen fathoms under water, the diver ties a rope about his body, and with a small weight attached to his person to facilitate sinking, plunges out of the boat straight to the bottom. Landing in the oyster bed, he seizes and

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tucks one oyster under his arm, and holding one in each hand with occasionally one in his mouth, he ascends rapidly to the surface to regain breath. Half a minute is usually consumed in the operation.

The results are often very discouraging. Sometimes upwards of 1,000 oysters are opened before a pearl of value is found. In early Spanish times, slaves were impressed into the service, and many lost their lives from sharks and mantas that infest these waters. The manta is a flat fish of great size which wraps its fins about the object it seizes upon, and crushes it to death. Octopuses are also found in the vicinity of these waters. This element of risk makes the avocation of a pearl-diver anything but a pleasant one. The divers usually carry knives for protection, but notwithstanding this precaution, they often lose their lives. Most of the diving is done in the rainy season, that is from May to December, as during the other months of the year the temperature of the water changes, and on account of its coolness, the diver dislikes to go down. Pearl shells are also quite valuable and tons are shipped to the United States and Europe to be made up in buttons and buckles. The Panama Government exacts a license from those engaged in the pearl industry. The life of the mollusc is only nine or ten years, and it is not until the fourth year that the pearl, formed of accretions, begins to develop.

At the time of the Conquest, pearls were held in great estimation by natives in various parts of the New World. Hernando de Soto found them in Florida where they were used to ornament the tombs of the Indian princes. Gomara mentions that before Cortez made his triumphal entry into Mexico, he was presented by Montezuma with a magnificent necklace of pearls and precious stones. This necklace was afterwards given by Cortez to Emperor Charles V. Garcillaso records that the Incas of Peru set a great value on pearls, but the laws of Manco-Capac prohibited the natives from exercising the trade of diver on account of the great risk involved.

Humboldt describes the statue of a Mexican priestess in basalt, whose head-dress, resembling the calantica of Isis, was lavishly ornamented with pearls. Las Casas and Benzoni have related, not without some exaggeration, the cruelties practiced on the Indian and negro slaves employed in the pearl industry. Pearls early came into demand by the inhabitants of Southern Europe, and were introduced in diametrically opposite directions. The Paleologi of Constantinople wore garments covered with strings of pearls, while the Moorish kings of Granada in Spain displayed them in profusion. The pearls of the West Indies were preferred to those of the East Indies.

The islands of Margarita, Cubagua, Coche and Punta Araya off the Spanish Main, the mouth of the Rio Hacha in Colombia, and the islands in the Bay of Panama were as celebrated in the sixteenth century as was the Persian Gulf, and the Island of Tarprohane with the ancients. The first Spaniard who landed on Tierra Firme, one of the early names given to the Isthmus, found the Indians decked out with pearl necklaces and bracelets. Shortly after the adventurers from the Old World began flocking to the Americas, the traffic in pearls grew amazingly. Acosta tells us that in 1587, six hundred and ninety-seven pounds of pearls were imported into Spain from its Western possessions. Those of the greatest size and beauty



The use of the diving bell in connection with the pearl industry has been tried on several occasions, but without signal success.

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## THE NEW PALACE AND THEATRE.

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The most imposing edifice in the Republic of Panama is the new Government Palace and National Theatre, which occupies a beautiful site on the bay front, covering the area of one block between Central Avenue and Avenue B. The palace fronts on Central Avenue, and the theatre on Avenue B.

The structure was commenced in November, 1905, and will be finished in the early part of 1908. The estimated cost at completion is \$600,000 gold. The dimensions of the building are approximately 280 by 164 feet. The architectural style is patterned after the Italian Renaissance.

The principal rooms in the palace are the President's office, reception hall and parlor, private living rooms, offices of the Secretaries and their staff of employes, hall of Congress, and rooms of the National Treasury. All the rooms will be handsomely finished and furnished.

The theatre will have a seating capacity of 1,100, and a total seating and standing capacity of about 1,600. The interior construction is of stone and iron, and the building is absolutely fireproof. The stage is of magnificent size, and will accommodate the largest companies now traveling. The stage settings and equipment, including the metal curtain are of the latest and most approved design. The curtain, as well as the decorative effects on the ceiling and foyer were painted by the well known artist, Mr. Robert Lewis, a citizen of Panama, but who has





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Plaza de la Catedral, al costado del Hotel Central, Panama, R. P.

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spent many years at Paris in the interest of his work. The seats are of special design, the work of the celebrated Bordalli of Italy. Italian talent was also brought into play in connection with the painting of the stage scenery, the services of Prof. Agostini, a master of this art, having been secured for the purpose.

The matter has been broached of working up a regular theatre circuit for the west coast cities of South America. Should this come to pass, Panama will be represented in it, and the theatre-going public treated to the best operas and plays touring the Americas. In view of the long jumps that have to be made some governments of South America grant a small subsidy to prominent theatrical companies, and in this way secure some exceptionally fine talent. The fact however, that Panama has an up-to-date playhouse will furnish inducement to many of these companies who have not heretofore included the Isthmian capital in their itineraries.

The building was designed by Mr. G. N. Ruggieri of Panama, and constructed under the supervision of Mr. F. H. Arosemena. The contractors were Messrs. J. Gabriel Duque and Ramon Arias jr. The decorative painter was Mr. Enrico Conrado. The builders are to be complimented on the excellence of their work, which will stand as a lasting monument to their efforts.

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## THE PAN-AMERICAN RAILROAD.

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But for the untimely death of that far-seeing statesman, James G. Blaine, the Pan-American Railway would doubtless now be an accomplished fact. The scheme, if not born in his brain, was certainly fathered by Mr. Blaine from the moment he became Secretary of State. Mr. A. J. Cassatt, former president of the Pennsylvania Railroad, was made chairman of the first committee from the various American republics, and all went well until death called the prime mover. After Mr. Blaine's death and during the Cleveland administrations, the Pan-American Railway fell into innocuous desuetude, and not until a little over two years ago, when Andrew Carnegie offered to finance the undertaking, did it come to life again.

Mr. Carnegie provided the money to send commissioners to consult with the various South American republics interested, and the amount necessary to correct the surveys made by the United States Government during Mr. Blaine's hour of influence. Since Mr. Carnegie made his generous offer, there has been considerable shaking up of dry bone railway projects in South America. Both the railways of Argentina, ending at Bahia Blanca, and those of Chile terminating at Valdivia, have mooted new pro-

jects for extending the South American railway system southward toward the Straits of Magellan and Cape Horn. About the Straits gold and coal abound, and with the ever-increasing tide of immigration, the temperate countries of South America find that it pays to open up new lands by the building of railroads. Argentina is now covered with a network of steel, while new projects are ever forming. A trunk line extends from Buenos Ayres to Huanuco on the border of Bolivia, where contractors are at work connecting the Trans-Bolivian railway with the Argentina railways to the south, and at the same time building northward to the Peruvian railway that is slowly making its way through that country. But there is a gap of one thousand miles between Cuzco in Peru and Guayaquil in Ecuador which for the entire distance is practically untraversed by iron rails. From Guayaquil to Quito, an American syndicate is just completing a modern railway above the clouds that may ultimately be extended to the Colombian border. There is another thousand mile gap between Quito and San José in Costa Rica, extending through the Isthmus of Panama. Within the past year, one or two applications for railroad concessions in Panama have been made, but terms could not be agreed upon. From Lake Nicaragua to southern Mexico there is still another stretch of one thousand miles as yet devoid of railway facilities. From the vicinity of Tehuantepec however, there is not a break, and the run to New York City may be made in four days by express train. The Tehuantepec Railway is completed, the U. S. Government is digging the Panama Canal, and Central American railway schemes are hatched almost daily; in fact, a powerful corporation has already practically obtained a monopoly for railroad construction in Costa Rica, the intention being to build a line that in time will form a connecting link in the Pan-American system.

When the United States extended its network of railways into Mexico, the commerce of that country was

diverted from Europe until to-day two-thirds of the trade with Mexico is with the great republic of the north. Every year the United States sends goods of greater value to Mexico; Central America and Panama than the total of the entire exports to South America, which amounts to but a scant \$50,000,000. Mr. Carnegie believes that commerce follows the locomotive, and therefore he has promised that commercial drummers will be able to scour the South American continent inside of ten years via. the Pan-American Railway and its ramifications.

It is a great contract for one man to undertake the building of a railway, much of which must be above the clouds. Never before has man encountered such engineering difficulties as those that confront the builders of the Andean lines; not even in constructing railways in the Himalayas of India have such stupendous obstacles presented themselves. The lowest trans-continental passes in the Andes are higher than the summit of Mont Blanc. Only slow-working natives will be able to labor in this rarefied atmosphere, and many passengers from seacoast lands will probably be compelled to take the journey in stages. Water for man, beast and locomotive will have to be carried for hundreds of miles in these high altitudes where rain seldom falls. Great bridges must span apparently bottomless gulches, and tracks laid along the edge of precipices, and in grooves cut in the mountainsides. The scenery will be the most sublime ever spread before the eye of man, but the panorama will cost the projectors of the Pan-American railway more than \$200,000,000 to produce.

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its foreign diplomatic and consular service than Panama. The diversity of nationalities enlisted, and international interests involved in the construction of the great canal has led to the appointment by the various governments of wide-awake progressive men. Naturally the country most interested by reason of canal operations, is the United States, which maintains both a Legation and a Consulate General.