



Percent distribution of the population of the survey area by age groups and by color.

TABLE 4

COLOR AND SEX DISTRIBUTION OF THE POPULATION IN THE SURVEY AREA, IN THE MUNICIPALITIES OF ARROYO, PATILLAS AND MAUNABO AND IN PUERTO RICO

Population	Survey Area		Arroyo, Patillas & Maunabo (1930)		Puerto Rico (1930)	
	No.	Per Cent	No.	Per Cent	No.	Per Cent
TOTAL.....	4,400	100.0	31,461	100.0	1,543,913	100.0
WHITE.....	1,926	43.8	15,319	48.7	1,146,719	74.3
Male.....	998	22.7	7,998	25.4	574,369	37.2
Female.....	928	21.1	7,321	23.3	572,350	37.1
COLORED.....	2,474	56.2	16,142	51.3	397,194	25.7
Male.....	1,249	28.4	8,188	26.0	197,392	12.8
Female.....	1,225	27.8	7,954	25.3	199,802	12.9
TOTAL MALES.....	2,247	51.1	16,186	51.4	771,761	50.0
TOTAL FEMALES.....	2,153	48.9	15,275	48.6	772,152	50.0

The sex distribution of the population in the surveyed area is as follows: 2,247, or 51.1 per cent, are males, and 2,153, or 48.9 per cent, are females. In the three municipalities the sex distribution of the population in 1930 was 51.4 per cent males and 48.6 per cent females; in Puerto Rico the proportion was about 50 per cent for each sex in 1930, as there were only 391 more females than males in a total population of 1,543,913.



### *The Housing Problem:*

The most common type of house in the surveyed area is the wooden galvanized-iron-roof type. Only one of the houses is built of concrete, and about 10 per cent are simply huts built and roofed with sugar-cane leaves or with *yaguas*.

A few houses occupied by important employees have from five to eight rooms; those occupied by minor employees, as a rule, from three to four rooms, including living, dining and sleeping rooms; most of the workers' houses, however, consist of one or two rooms and kitchen. The kitchen is usually a very small compartment, or merely a "lean to".

In planning the survey it was thought that the kind of stove used would throw some light on the standard of living of the families. The information gathered in this respect shows that 75.9 per cent of the families use *fogones*,\* 17.3 per cent have *hornillas*\* while 6.7 per cent have other kinds of cooking conveniences.

Nearly three-fifths (58.6 per cent) of the houses have from 100 to 299 sq. ft. of floor area and only 31 of them or 4.9 per cent have 1,000 sq. ft. or more of floor area. Forty-six per cent of the houses sheltering 48.0 per cent of the families have from 1 to 4 exterior doors and windows while only 13.8 per cent of the dwellings sheltering 13.2 per cent of the families have 8 or more exterior doors and windows.

The majority of the houses for employees and factory workers have been constructed close to the factory. A large number of those for the field laborers were erected in formation of small villages, usually on the sites where the *haciendas* and small centrals of the past existed. Besides that of Lafayette, there exist villages of this kind at Colonia Providencia, on the site of the old central of that name; at Colonia Garonne, close to the site of the vanished Central Columbia, and at Colonias Felícita, Enriqueta-Concordia, etc., more or less on the same sites where the former owners and their *agregados* lived before these haciendas were absorbed by Central Lafayette. The rest of the houses are scattered throughout the colonias, although groups of two or more are often found along the roads and paths.

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\* Types of fireplaces designed for cooking, peculiar to the country, may be roughly translated as "fire boxes" and "brick ovens", respectively.



Only too frequently houses have been built in places where the soil is very poor, or swampy, so they should not encroach on the sugar cane plantations. The information gathered indicates that more than one-fifth (22.4 per cent) of the houses have swampy surroundings.

Table 5 shows in detail the composition of the houses, giving the material of which the walls and roofs are constructed. Eighty-seven per cent of the total number of houses are wooden, including 7.8 per cent in which the walls are partly of wood and partly of galvanized iron. Nearly 89 per cent of them are covered with galvanized iron and about ten per cent with straw or *yaguas*.

TABLE 5  
MATERIALS OF WHICH HOUSES ARE CONSTRUCTED

Material of walls	No. of houses	Per Cent	Material of Roof			
			Galvaniz- ed iron	Straw	Yaguas	Other
ALL HOUSES.....	770	100.0	684	52	27	7
PER CENT.....	100.0	.....	88.8	6.8	3.5	0.9
Concrete.....	1	0.1	1	.....	.....	.....
Wood.....	614	79.7	589	10	9	6
Straw.....	32	4.2	3	28	1	.....
Galvanized iron.....	19	2.5	19	.....	.....	.....
Yaguas.....	42	5.4	17	9	16	.....
Galv. iron & wood.....	60	7.8	54	4	1	1
Other.....	2	0.2	1	1	.....	.....

*Ownership of homes:* The 860 families investigated live in 770 houses, of which 338, or 43.9 per cent are property of the Central; 404, or 52.5 per cent, are property of the families living in them; and only 28, or 3.6 per cent are rented houses or houses ceded free by their owners. Of the 404 houses, property of the householders, 124, or 30.7 per cent were located at Colonia Bordelaise; 74, or 18.3 per cent, were located at Colonia Garonne; 64, or 15.8 per cent were located at Colonia Felicita; 47, or 11.6 per cent, at Colonia Providencia; 30, or 7.4 per cent, at Colonia Enriqueta-Concordia; 38 or 9.4 per cent at Colonia Palmas 4 Calles; 26, or 6.4 per cent at Colonia Catalina, and only one house at Colonia Lafayette.



TABLE 6  
OWNERSHIP OF HOUSES

Colonias	Total No. of houses	Free				Rented or ceded by owner	
		Houses ceded by employer	Per Cent	Houses owned by house- holder	Per Cent	No. of houses	Per Cent
ALL COLONIAS.....	770	338	43.9	404	52.5	28	3.6
Bordelaise.....	177	43	12.7	124	30.7	10	35.7
Catalina.....	50	23	6.8	26	6.4	1	3.6
Enriqueta-Concordia..	74	43	12.7	30	7.4	1	3.6
Felicitas.....	82	15	4.4	64	15.8	3	10.7
Garonne.....	133	58	17.2	74	18.3	1	3.6
Lafayette.....	64	63	18.6	1	0.2	.....	.....
Palmas 4 Calles.....	98	51	15.1	38	9.4	9	32.1
Providencia-Perú.....	92	42	12.4	47	11.6	3	10.7

Of the 28 families living in houses rented or ceded free by their owners, 4 pay a rent of 30 to 50 cents per week, 3 pay rents of \$2, \$3 and \$7 per month, respectively, 16 do not pay rent and in five cases there is no definite information on this point.

*Rooms per dwelling:* There are 1,255 sleeping rooms in the 770 houses surveyed, or an average of 1.4 rooms per dwelling place. The 860 families living in these 770 houses have a total number of 4,400 members, representing an average of 3.5 persons per sleeping room. There are 623 families with an aggregate number of 2,844 members, or 64.6 per cent of the total population in the surveyed area, who have only one sleeping room, or 4.6 persons per room. One-hundred and forty families with 912 members, or 20.7 per cent of the total, have homes of two sleeping rooms, or 3.2 persons per sleeping room. As might be expected, the average number of persons per room decreases as the number of rooms in the houses increases (table 7).

Considering now the total number of rooms in the house with the exception of bathroom and kitchen, there are 2,140 rooms for the 4,400 members of the 860 families, which gives an average of 2.5 rooms per dwelling and 2.0 persons per room. The number of persons per room in dwellings of only one room is 3.5, and 2.4 for dwelling places of 2 rooms.



Four-hundred and sixty-eight families with 2,283 members, or 51.9 per cent of the total number of members, live in houses of two rooms—living room and bedroom.

TABLE 7  
NO. OF OCCUPANTS PER SLEEPING ROOM

No. of sleeping rooms per dwelling place	No. of families	Total No. of rooms	Members in families		Ave. No. of occupants per room
			No.	Per Cent	
TOTAL.....	860	1,255	4,400	100.0	3.5
1.....	623	623	2,844	64.6	4.6
2.....	140	280	912	20.7	3.2
3.....	51	153	303	6.9	2.0
4.....	35	140	247	5.6	1.8
5.....	8	40	68	1.5	1.7
6.....	2	12	21	0.5	1.8
7.....	1	7	5	0.1	0.7

There were some inquiries in the investigation sheet regarding ventilation, light, and cleanliness, the answers to which are necessarily very subjective, as there was no standard to measure or compare the degree in which those conditions appeared but the criterion of the field worker to classify them as "good", "fair" or "poor". Therefore, not much reliance can be placed upon these answers, and they have been tabulated merely as an indication of conditions as appreciated by the field workers.

*Ventilation:* In 42.6 per cent of the houses the ventilation was considered "good", in 30.6 per cent, "fair", and in 26.7 per cent, "poor".

Seven hundred and eighteen families, or 83.5 per cent of the total, informed us that they sleep with the windows closed; in 5.5 per cent of the dwellings the sleeping rooms had no windows at all, and only 93 families, or 10.8 per cent of the total, said that they sleep with the windows open (table 8).

*Light:* In 38.9 per cent of the families the houses were considered sufficiently well lighted to merit the classification of "good"; in 33.6 per cent the light was classified as "fair", and in 27.4 per cent, as "poor".



TABLE 8  
SLEEPING VENTILATION IN HOUSES

Sleeping Ventilation	No. of families	No. of members in families	Per Cent
TOTAL.....	860	4,400	100.0
Closed windows.....	718	3,650	83.5
Open windows.....	93	541	10.8
No windows.....	47	199	5.5
Not specified.....	2	10	0.2

*Cleanliness:* Nearly half of the homes, 45.6 per cent, were classified as "fair" in cleanliness; 29.8 per cent as "good", and 24.6 per cent as "poor".

*Furniture:*

The furniture used by the families is scanty and of the cheapest quality. In a large proportion of the houses a few benches, some empty boxes, a small table, one or two cots and a home-made wooden bed is about all that is seen, and in some of them, not even as much as that. However, in many of the houses there are at least one imported iron bed and some chairs.

It would be hard to describe in detail the various combinations in number and kind of furniture used by the different families. Nevertheless, most of them fall within the following groups:

1. What might be termed the well-to-do families—proprietors, important employees, etc.—have the kind and quality of furniture required by a relatively high standard of living. These are the families possessing refrigerators, radios, pianos, living- and dining-room sets, etc.

2. The families of minor employees and of skilled and semiskilled workers, who have a steady income during most of the year or during the whole year, generally have a modest but rather acceptable outfit. They possess chairs, tables, beds, sewing machines, etc.

3. The families of the common laborers are, as a rule, devoid of every convenience. Their furniture merely consists of benches, hammocks, wooden beds or cots, etc.



*Baths:*

In 86.7 per cent of the homes there were no bathing conveniences of any kind; 7.9 per cent of them had bathtub and shower; 3.2 per cent had bathtub only, and 2.1 per cent had shower only (table 9).

TABLE 9  
BATHING CONVENIENCES USED BY INHABITANTS

Bath	No. of families	Per Cent
TOTAL.....	860	100.0
None.....	746	86.7
Shower.....	18	2.1
Bathtub.....	28	3.2
Bathtub and shower.....	68	7.9

*Water Supply: \**

The three towns, Arroyo, Patillas and Maunabo, have waterworks. Arroyo and Patillas obtain their water from deep wells from which the water is pumped to tanks situated at the required elevation; in Maunabo the water is taken from a mountain brook, diverted, by means of a concrete dam, into a cast-iron pipe line and stored in a concrete reservoir near the town. In this latter town during the periods of drought, the water service is given only at certain hours of the day according to the volume of water available. The water used at Maunabo, like all surface water, is exposed to contamination. In the case of Arroyo and Patillas the contingency of contamination is rather remote.

The water supply for the different colonias comes from different sources: Colonias Enriqueta-Concordia and Palmas 4 Calles receive their water supply from a concrete reservoir which derives its water from an irrigation canal and from a deep well. When the water from the irrigation canal which comes from the Patillas River becomes turbid, the reservoir is connected with the deep well. From said reservoir which has been constructed at sufficient elevation, the water is piped to the houses in Colonias Lafayette, Enriqueta-Concordia and Palmas 4 Calles. A part of Colonia Enriqueta-Concordia obtains water from a deep well from which it is pumped by a wind-mill. Colonia Provi-



dencia obtains water from a mountain brook and also from a deep well; Colonia Felícita from an irrigation canal, and Colonia Catalina from a shallow well from which it is pumped by means of a wind-mill; Colonias Garonne and Bordelaise obtain their water from the Maunabo waterworks. Only the houses near the factory and the houses of foremen and employees are equipped with water pipes at Colonias Palmas 4 Calles, Enriqueta-Concordia, Providencia, Felícita and Bordelaise. Faucets have been installed at convenient places to which the laborers' families have to go for their water. At the other colonias the workers have to obtain their water from faucets installed in the well pipes only when the wind-mills are working, or from near-by rivers and shallow wells when the wind-mills are not working. Many of the families, however, store rain water for drinking purposes.

From the answers obtained in the investigation sheets, it appears that in 33.9 per cent of the families the source of water is the aqueduct (table 10), by which is meant water piped to the house in the form described above. Water from wells is used by 25.5 per cent of the families; 24.2 per cent of them obtain their water supply from rivers and streams; 7.2 per cent use rain water and 9.0 per cent use rain and water from some other source.

TABLE 10  
SOURCE OF WATER SUPPLY

Source of Water	No. of families	Per Cent
TOTAL.....	860	100.0
Aqueduct.....	292	33.9
Well.....	218	25.5
River & stream.....	209	24.2
Rain.....	62	7.2
Rain & other.....	77	9.0
Not specified.....	2	0.2

Fifty-six samples of water from different sources, covering all colonies, were taken for bacteriological examination.

\* Mr. G. Ramírez de Arellano, Sanitary Engineer, studied in a general way the water supply systems and the systems for the disposal of excreta.



A summary of the results of such examinations follows: 7 samples were absolutely free from *B. coli*; 8 samples were positive in the 10 cc. volume test, of which 4 were positive in 2-10 cc. portions; 1 was positive in 4-10 cc. portions and 3 were positive in 5-10 cc. portions; 16 samples were positive in the 1 cc. volume test; 17 samples were positive in the 0.1 cc. volume test, and 8 samples were positive in the 0.01 cc. volume test.

The number of bacteria per cc. ran from 1 to 12,000. The sources of the samples taken have been grouped in three main classifications, namely, rain water, water from deep wells and surface water (table 11).

TABLE 11

BACTERIOLOGICAL EXAMINATION OF SAMPLES OF WATER FOR HUMAN CONSUMPTION AT CENTRAL LAFAYETTE

Source	No. of samples taken	Negative samples	<i>B. Coli</i> in			
			5-10 cc. portions	1 cc.	0.1 cc.	0.01 cc.
TOTAL.....	56	7	8	16	17	8
Rain water.....	6	0	3	3	.....	.....
Deep wells.....	6	3	.....	1	2	.....
Surface water.....	44	4	5	12	15	8

*Disposal of Human Excreta:*

None of the three towns is equipped with a system of sewers; the few houses possessing sanitary installations dispose of their sewage by mean of septic tanks and cesspools. In Arroyo, as the ground is at a low level, these cesspools do not operate properly and drain into gutters and surface ditches which surround the town. In Maunabo and Patillas the cesspools operate more efficiently, due to the more favorable topographic condition of these towns.

The vast majority of the houses in the three towns use latrines for the disposal of human excreta. There are at least three types of latrines in use. One of them, known as type No. 108, consists of a concrete tank, where the fecal matter undergoes anaerobic action, and a leeching cesspool, into which the effluent is discharged from the septic tank;



this latrine is equipped with a concrete seat and a wooden superstructure. The second type, or rural latrine, widely used in the towns and out in the rural sections, consists merely of a hole dug in the ground over which a concrete platform is placed supported by a marginal concrete wall four inches thick and twelve inches deep into the ground, with a wooden seat and a wooden superstructure about six feet high. A third type of latrine, widely used too, is really a rudimentary type of earth latrine, consisting of a hole dug in the ground over which a wooden floor is placed, all covered by a flimsy wooden superstructure.

The houses of important employees around the factory and in Colonias Felicita, Providencia, Garonne and Bordelaise possess water-closets. Those of minor employees are equipped with the rural type of latrine, constructed out in the yard. The water-closets discharge into individual septic tanks and leeching cesspools. The majority of the workers' houses which are equipped with latrines have the rudimentary earth latrine described above, although in some cases the better type is found. In many cases one latrine serves for more than one family, for many houses have no latrines at all. The surroundings of the workers' houses are, in most instances, very unclean, and the latrines are so dirty and poorly kept that it is not surprising that many people avoid their use and defecate in the sugar-cane fields and in the bushes, thus defeating the primary object of a privy, which is to prevent soil pollution and the consequent spread of diseases of the gastro-intestinal tract.

The disposal of human excreta was studied directly in every house of the surveyed area and the results are presented in table 12. The outstanding fact disclosed by this table is that 371 families with 1,705 members, or 43.1 per cent of the total, have no sanitary conveniences of any kind in their homes. Water-closet installations were found in 4.6 per cent of the families and 52.0 per cent had latrines. The latrines were subdivided into "common", i.e., a latrine used by more than one family, and "single"—a latrine used by only one family. The percentage of families with common latrines is 40.3, and the percentage of families having single latrines is 59.7. The number of single latrines was still subdivided in two classes: latrines "in house" and latrines "in



yard"; 98.9 per cent of the families with single latrines have the latrine in the yard and only 1.1 per cent of them have the latrine in the house.

TABLE 12  
DISPOSAL OF HUMAN EXCRETA

Disposal of excreta	No. of families	Per Cent
TOTAL.....	860	100.0
None.....	371	43.1
Water-closet.....	40	4.6
Latrine.....	447	52.0
Common.....	180	40.3
Single.....	267	59.7
In house.....	3	1.1
In yard.....	264	98.9
Not specified.....	2	0.2

#### *Nuisances:*

The investigation sheet contained a large number of items on this subject. The answers were tabulated taking separately the three most important nuisances, i.e., flies, rats and mosquito-breeding places, and then combining these three or any two of them with any other nuisance. The results show that in 95 per cent of the families flies were reported; in 86.7 per cent of them rats were reported, and in 68.4 per cent, mosquitoes were reported. In 52.3 per cent of the families these three nuisances were present and in 25.2 per cent of them flies and rats were found, besides some other nuisance.

#### *The Nutritional Problem:*

It is a well-known fact that the staple food of the Puerto Rican peasants consists of vegetables, mainly tubers, and cod-fish for lunch, and rice and beans for dinner. As a matter of fact, rice and beans are used almost universally by the rich and poor, but the people of a higher standard of living usually supplement rice and beans with other foods to balance their diet.

On examining the daily diet of the families in the surveyed area the slight variation in foods or combinations of foods is noteworthy. Most of the people may be grouped as using a few combinations only. For instance, 1,536 persons,



or 34.9 per cent of the total, had only black coffee for breakfast. Of these persons, 827 had vegetables and codfish for lunch; 612 had either of the following: (1) vegetables and codfish, (2) rice and beans, (3) cornmeal; 64 had rice or rice and beans, and only 6 had rice and beans supplemented by meat or fish for lunch. Now, of the same number of people (1,536), 1,301 had only rice and beans for dinner; 57 persons had rice and beans, meat or fish; 41 had either of the combinations (1) vegetables and codfish, or (2) rice and beans; and 137 had for dinner other foods than those already specified (see appendix 2).

Moreover, it is seen that the food taken for breakfast by 85 per cent of the population is (1) black coffee, (2) coffee with milk or (3) coffee with milk and bread; that the food taken for lunch by 88 per cent of the population is (1) vegetables and codfish, (2) vegetables and codfish, rice and beans or cornmeal, or (3) rice or rice and beans; and that (1) rice and beans, (2) rice and beans, meat or fish and (3) vegetables and codfish, rice and beans, is the food taken for dinner by 93 per cent of the population. The term "vegetables" includes one or more of the following: plantains, bananas (green), sweet potatoes, dasheens, yams, etc. In many instances the families taking "rice and beans, meat or fish" use also fresh vegetables, eggs, chickens, etc., but, as it may be observed, the combinations (1) vegetables and codfish and (2) rice and beans, predominate over all others.

#### *Milk Supply:*

A significant point in the investigation of the milk supply is that 40 per cent of the families living in the surveyed area do not use milk at all in their daily dietary. Of the rest of the families, 17.4 per cent use milk from cows, property of the householders; 37.0 per cent use milk obtained from dealers; 3.8 per cent use goats' milk and only seven families, or 0.8 per cent of the total, use canned milk (appendix 3). It is interesting to note that the highest per capita consumption of milk is shown by the groups of families having their own cows, who consume a little over  $\frac{3}{4}$  of a pint per capita per day; those using cows' milk bought from dealers have a per capita consumption per day of exactly  $\frac{1}{4}$  pint; and those using goats' milk and canned milk show an average consumption of approximately  $\frac{1}{6}$  pint per capita per day.