

# ORGANIZATION OF MEDICAL SCIENCES IN COSTA RICA: PROBLEMS OF AN UNDERDEVELOPED AREA

By Frederick T. Wolf

COSTA RICA, immediately north of Panama and south of Nicaragua, is a nation of some 1,200,000 inhabitants. The country takes its name from the gold ornaments of the Indians, seized by the Spaniards during the conquest. Ethnically, the population of Costa Rica is an essentially homogeneous one of pure Spanish descent, as a result of the efficiency with which the Indians were decimated by the invaders. There are perhaps 3000 Indians remaining in Guanacaste Province in the northwest. In Limón Province on the Atlantic coast, there is a considerably larger number of Negroes, brought to the country from the British West Indies (Jamaica, Trinidad, Barbados) to build the railroad and work on the banana plantations. Until relatively recently, the Negroes were excluded from the *meseta central*. Thus the typical Costa Rican is a person of essentially pure Spanish ancestry and culture.

Since breaking the ties with Spain in the early 1800's, the government has been a democracy. As Latin American governments go, that of Costa Rica is a stable one, there having been no internal discord since the revolution of 1948 which brought José Figueres to power. Communists present much less of a problem in Costa Rica than elsewhere, an unofficial estimate placing their number at approximately 5,000. Costa Rica is unique in not having an army, though there is a small force of national police. Its people are peacefully inclined, and the funds spent in other Latin American countries for the upkeep of a sizeable military establishment are used in Costa Rica for other purposes. In the last election, in which the incumbent conservatives were defeated by the liberals, the transition was accomplished without bloodshed, to the surprise of no one.

The economy is primarily an agricultural one, based principally on coffee and bananas. Costa Rica has had its difficulties, economically speaking, during the last couple of years, because of the low prices brought by its principal exports on the world's markets, and is contemplating the introduction of an income tax. A mild inflation is taking place. Approximately two out of every three families engaged in agriculture own their land. The country is underdeveloped, and much more land could be devoted to agriculture. There is relatively little industrial development, and almost no heavy industry. While a small proportion of its citizens is quite wealthy, the income of the vast majority of the population is low.

It is the purpose of this paper to survey briefly the present state of medicine in Costa Rica, indicating both its points of excellence and its deficiencies. Socialized medicine is an accomplished fact in the country, the socio-economic conditions which prevail requiring that the government assume the task of the medical care of its citizens. It has happened that several past presidents of Costa Rica have been physicians. This fact has doubtless played an important part in the development of medicine in the country to a degree where the general level of medical care surpasses that prevailing in the closer neighboring countries of Central America. This point should be borne in mind with reference to some of the shortcomings which will be brought to light in the course of this presentation.

THE *Ministerio de Salubridad Pública*, which is charged with overall responsibility for medical services in Costa Rica, is headed by a minister of cabinet rank, appointed by the President. Currently, under the Orlich regime, the minister is Señor Max Terán Vals. The minister, who is concerned primarily with problems of administration and policy, need not be a physician. The minister is concerned also with maintaining proper relations with and coordinating the activities of the several extraterritorial organizations involved in medical problems in Costa Rica, such as W. H. O. (*Oficina Mundial de Salubridad*), the Pan American Sanitary Bureau (*Oficina Sanitaria Panamericana*), U.N.I.C.E.F., F.A.O., Care, and others. While the organizational complexity is extreme, there is very close cooperation and remarkably little duplication of effort. The ministry is operated from a plexus of three buildings in downtown San José. Total expenditures for health services in 1960 approximated 60 million *colones*, or \$9.8 million, equivalent to \$8.38 per capita, as against \$29.81 in the United States.

The hospitals of Costa Rica are supported primarily by the national lottery. The lottery is a phenomenon which enjoys great popularity throughout Latin America, and can scarcely escape the notice of any visitor to Costa Rica. Nine percent of the income from the lottery is allocated to hospitals, this source comprising approximately 80 per cent of all hospital revenue. The remaining 20 per cent is provided by inheritance taxes on stocks and real estate.

While any individual with the necessary means may engage the services of a private physician of his choice, socialized medicine is the rule in Costa Rica. The workings of the system (*Caja de Seguro Social*) are similar to social security

in this country. Every employer is required to provide health insurance for his employees and their dependents. In Costa Rica, the benefits of the system are applied to the living in need of medical attention, rather than as death benefits paid to survivors.

The leading hospital of Costa Rica is Hospital San Juan de Dios, in San José, which was established about 1850. This is a large and excellently equipped general hospital of 1500 beds. It has 38,000 admissions, and performs 14,000 operations per year. Cases are referred here from all over the country in instances in which its superior facilities and services are needed. Its clinical records, going back to about 1900, include the files of some 800,000 persons. Hospital San Juan de Dios is located adjoining the Ministry of Health, a large Tuberculosis Hospital, and the new Hospital de Niños. Altogether these units comprise an excellent center for the medical services of the country.

There are 37 hospitals in Costa Rica, of which five are specialized, two being devoted to tuberculosis, two to mental disease, and one to leprosy. In Costa Rica as a whole, there are 5.1 hospital beds per 1000 inhabitants. In San José province, the figure is 8.5 per thousand, while in Guanacaste province it is only 1.5 per thousand. While these figures do not approach the U.S. level of 9.1 per thousand, Costa Rica is in a most favored situation in this regard on comparison with its neighbors in Central America.

Sanitario Carlos Durán, established in 1918, is a 300-bed tuberculosis hospital located on the slope of Volcán Irazú, at an altitude of approximately 8000 feet. Its director is Dr. Raúl Blanco Cervantes. Nursing care is provided by an order of Catholic sisters.

The United Fruit Company, which operates in Costa Rica as the *Compania Bananera de Costa Rica*, maintains its own hospitals. While many banana plantations were formerly located in Limón province of eastern Costa Rica, the heavy inroads of Panama disease forced the abandonment of these, and the establishment of new ones in Puntarenas province, in the extreme southwestern portion of the country, around Golfito. Many of the plantation workers in this area are Nicaraguans, attracted by the wages which are higher than in their own country. The cases seen in the hospitals differ somewhat from the common run. Many are traumatic, resulting from machete wounds inflicted in a moment of violence following the excessive intake of *guaro* on a Saturday night. There are no few cases of dermatitis due to dithane, the fungicide spread by helicopter for the control of *sigatoka* disease of bananas. And the illegitimacy rate is the highest in the country, approximately fifty per cent.

Costa Rica is a country of young people, and its birth rate is one of the highest in the world. Over 60 percent of the population is under 14 years of age. Pediatrics thus plays a very large part in the overall medical situation. A case in point is provided by the new Hospital de Niños, in San José, built at a cost of 20 million *colones*. At the time of the writer's visit in August 1963, it had not yet been placed in operation owing to difficulties in raising the funds required. The late President Kennedy, when he visited Costa Rica in March 1963, donated 1 million *colones* (\$150,000) of his own personal fortune toward the funds necessary for opening the hospital, in a gesture which enhanced not only his own great personal popularity in Costa Rica, but also the pre-existing pro-American attitude of the people.

Costa Rica is divided into the seven provinces of San José, Guanacaste, Alajuela, Heredia, Puntarenas, Cartago, and

Limón. Outside of San José, there is a regional general hospital in each province. Most of the medical services of a relatively minor nature are handled at the grass roots level by the clinics or sanitary units. There are 67 of these throughout the country, one in each canton (the political unit into which each province is divided). The various medical services in outlying districts were organized into sanitary units (*Unidades Sanitarias*) in 1931.

Each sanitary unit is staffed by a doctor, on either a full-time or a part-time basis, a full-time nurse, and an aide. A jeep, truck, or other vehicle is part of the usual equipment. Fifty-two of these units have a sanitary inspector whose duties include maintaining the safety of the water supply and supervising the construction of latrines. In Costa Rica, 95 per cent of the urban population have homes provided with running water, which is somewhat higher than in the United States or Canada. Somewhat over half of the inhabitants of Costa Rica have access to a community water supply. But only some 121,000 have sewerage; in this respect Central America in general is much worse off than North America or even South America.

Twenty-six of the sanitary units are equipped with laboratories. A training program for laboratory technicians has been in effect since 1938. In 1960, the laboratories performed some 435,000 examinations, of which 202,000 were hematological, 100,000 were parasitological, 75,000 were bacteriological and 57,000 were serological.

Prenatal care of expectant mothers, childbirth, and pediatrics accounts for a considerable proportion of the work of the clinics. Drugs and medicines are frequently in short supply, and the writer has seen professional samples collected from doctors in the United States given to outpatients. Even though medical attention is free, often the best medication is unavailable, or must be given in repeated doses under supervision, which is impractical for the patient who has come some distance to the clinic on foot, and must return to his job in order to support his family. Although the people are poor, they are inherently proud, and careful consideration must be given to the cost of a prescription which is to be paid for by the patient. And no little of the practice of medicine, here as elsewhere, involves tender loving care, and an element of faith healing.

Notwithstanding the domestic airline, the railroads, and a few good highways, the transportation system of Costa Rica is primitive, and jeeps or other 4-wheel drive vehicles, oxcarts, and foot remain the usual forms of transportation for many people. Because a considerable proportion of the population lives at some distance from a doctor, mobile health units, financed by the *Alianza para el Progreso*, have been put into operation. These mobile health units receive the active cooperation of Ministry of Education. When a unit arrives in a small community, its operation takes precedence over the school work of the children, and the services of the school teachers are utilized in health education and preventive medicine. There are at present 4 mobile health units, which visit the various communities at intervals of 2 weeks. Plans for airborne health units are under discussion.

THE physician in Latin America generally occupies a most favored socio-economic position, and the respect in which he is held in the community is second to none. This results not only from the relative scarcity of doctors, but also from the fact that a medical education is relatively expensive in

comparison with preparation for other occupations, such as the priesthood or law. Consequently a medical career is usually possible only for the economically privileged. However, salaries are so low that it is not uncommon for a doctor in Costa Rica to have several jobs. For example, he may simultaneously teach in the School of Medicine, work for the Ministry of Public Health, and engage in private practice.

There are approximately 500 physicians in Costa Rica, roughly one for every 2400 inhabitants. While the ratio is somewhat lower than in the United States, the actual situation is worse than the impression conveyed by the figures alone, because of distribution. A great percentage of the doctors of Costa Rica is located in San José and other larger cities, with the result that many rural areas, particularly the thinly populated ones of the north and southeast, are without a satisfactory level of medical service.

Many of the physicians of Costa Rica have received their training in Mexico, in Europe, or in the United States. Perhaps the largest number have been educated in Mexico. In general, these are excellent clinicians, but are somewhat weak in the basic medical sciences. Of those trained in Europe, probably Barcelona is represented by the greatest number. The general reputation of the few trained in Chile is particularly good.

The *Colegio de Médicos y Cirujanos* is the organization in Costa Rica equivalent to the American Medical Association in the United States. Acceptance by this group is required of any physician who wishes to practice medicine in Costa Rica. The *Colegio* also maintains the *Registro de Especialidades Médicas*, which is the certifying body designed to guarantee a satisfactory level of competence in the various medical specialties.

There are some 525 nurses and midwives, 422 pharmacists, and 146 dentists in the country.

It is impossible to present a satisfactory and accurate picture of medical research in Costa Rica within a few sentences, but perhaps a few generalizations may be in order. The writer received the impression that much current medical research is of a very practical nature, devoted to immediate problems of public health. Much field work is in progress, and more remains to be done to gather complete and reliable information as to the extent and prevalence of various diseases. As in most Latin American countries, statistical information is scanty and somewhat less than 100 percent reliable. In addition to preventive medicine and public health, the areas which appeared to me to be most active included pediatrics, parasitology, nutrition, clinical research, and pathology. The medical situation in Costa Rica has not yet progressed to the extent that their doctors can afford the luxury of certain kinds of more sophisticated research, devoted to areas of theoretical or academic rather than practical interest.

Impetus for research is afforded by an abundance of technicians and by excellent microscopic equipment. A serious handicap, however, is the fact that almost all items of scientific equipment must be imported. For large or heavy items, air transportation is prohibitively expensive, and the alternative of transportation by ship to Puntarenas or Puerto Limón, followed by rail transportation, is slow.

A number of the leading physicians of Costa Rica enjoy an international reputation, and the results of their research are published in the leading medical journals of the world. In addition, the journal *Acta Médica Costarricense*, published by the *Colegio de Médicos y Cirujanos* and edited by Dr. Rodolfo Céspedes, provides a publication outlet.

THERE is a single school of medicine for training of doctors in Costa Rica, affiliated with the National University in San José. The University itself has undergone periods of ascendancy and decline. After rather early beginnings in downtown San José, the University was discontinued completely for a time, but was re-established in 1940 in the suburb of San Pedro with modern buildings, and now enrolls some 4,000 students. Many of the students are on a part-time basis, either holding a job during the day and attending classes in the evening, or dropping out altogether for a time, and then going to school again. Tuition fees are nominal. The University operates on the Latin American calendar, with a long vacation during the winter months.

Louisiana State University School of Medicine has cooperated closely in the development of the School of Medicine of the University of Costa Rica, in a program administratively distinct from that of the I.C.M.R.T. (*vide infra*). A new building for the School of Medicine, constructed with Costa Rican funds, was completed in March, 1961. It is located near the Institute of Microbiology, in an effort to make use of the considerable strength of the latter. It is planned that the faculty shall eventually consist entirely of Costa Ricans, to be trained in the United States. At present, some members of the I.C.M.R.T. staff hold appointments in the School of Medicine as well. Some thirty staff members of the School of Medicine have received some stateside training at L.S.U., while 30-35 faculty personnel of L.S.U. School of Medicine have spent at least brief periods in Costa Rica at some time, on a consulting basis.

One feature of the organization of the School of Medicine in Costa Rica which might appear unusual is the fact that the dean is not appointed, but is elected for a term of 2-4 years. While democratic, the procedure results in a certain degree of instability. Financial support of the School of Medicine by the government is separate and distinct from that provided to the University proper, so that the School of Medicine is an autonomous organization.

Contrary to the situation in the United States, an undergraduate degree is not required for admission to medical schools in most Latin American countries, including Costa Rica, where two years of pre-medical work are prerequisite to admission. The teaching is in Spanish, but because there are few good Spanish texts in many medical subjects, English texts are used. Instruction in microbiology and parasitology takes place in the *Instituto de Microbiología*, while pathology and clinical work are taken at Hospital San Juan de Dios. The staff is at present strong in anatomy, but weak in biochemistry.

The School of Medicine of the University of Costa Rica has yet to award its first M.D. degree. At the present time, there are 10 students in the third year class, 18 in the second year, and 19 in the first year. The reasons for failure to attract a greater number of qualified students are not clearly understood. While improvement is to be anticipated in the near future, with plans for classes of 40 students per year, it is apparent that the medical needs of the population of the country cannot be met with locally trained physicians for some time to come.

UNDER the provisions of the International Health Research Act (86-610), the Congress of the United States, in July 1960, approved the establishment of a number of International Centers for Medical Research and Training

throughout the world. The motivation, while partly altruistic, also resulted from the fact that many diseases of tropical origin had so declined in incidence in the United States that it was becoming increasingly difficult to impart proper training in tropical medicine in U.S. medical schools. These centers represent cooperative enterprises between a specific U.S. medical school and the various foreign countries. At present there are 5 such Centers: one in Calcutta, India sponsored by Johns Hopkins University; one in Lahore, Pakistan sponsored by the University of Maryland; one in Kuala Lumpur, Malaysia sponsored by the University of California; one in Cali, Colombia sponsored by Tulane University, and one in San José, Costa Rica sponsored by Louisiana State University. The I.C.M.R.T. has already begun to play an important role in medical affairs in Costa Rica.

Dr. William Frey, dean of L.S.U. School of Medicine, is director of the I.C.M.R.T. The associated director is Dr. Clyde Schwartzwelder, parasitologist at L.S.U. Program coordinator and local director in Costa Rica is Dr. Fred Payne. Dr. Antonio Peña Chavarría plays an important role as consultant to the program.

The I.C.M.R.T. is organized into six sections, dealing with administration, bacteriology, parasitology, pathology, virology, and epidemiology. The administration section has overall local charge of the program which represents an annual expenditure of approximately \$500,000. Currently, emphasis throughout the program is on field work, with a gradual shift to laboratory work contemplated as greater familiarity with disease incidence is obtained and additional facilities become available. A 400,000 *colones* bond issue has been authorized for construction of a building specifically for the I.C.M.R.T., which is currently housed partly in the Hospital San Juan de Dios, and partly in the Medical School of the University of Costa Rica.

Some generalities concerning the activities of the various sections of the I.C.M.R.T. may be in order. The work of the bacteriology section is centered on Enterobacteriaceae because of the great importance of diarrheal diseases and the high infant mortality resulting therefrom. The epidemiology section is also concerned in this area, as well as the closely related problem of the nutritional status of the population. Cancer problems constitute the principal focus of attention of the pathology section, since gastric cancer is far more prevalent in Costa Rica than elsewhere. Parasitological work is centered on helminthology. The work of the virology section has been somewhat slower in getting under way because of delays in procurement of the more elaborate equipment required. At present they are isolating arbor viruses (arthropod borne) and carrying these in tissue culture in monkey kidney tissue. Under discussion is a proposal that this group undertake the preparation of poliomyelitis vaccine for the entire country.

**T**HE Faculty of Microbiology of the University of Costa Rica has played in the past, and continues to play a role of importance in medical affairs not only in Costa Rica, but in other Latin-American countries as well. It is housed in a building adjacent to the School of Medicine, with which it works in close cooperation. Its dean, Fernando Montero-Gei, also occupies a position in the Ministerio de Salubridad Pública. In December, 1961, the Faculty of Microbiology was host to the Congreso Latinoamericano de Microbiología, on the occasion of the second triennial meeting of the latter group, and its first following its organization in Mexico. The

congress attracted an attendance of 300 persons from Argentina, Canada, Chile, Colombia, Guatemala, Honduras, British Honduras, Mexico, Nicaragua, Panama, Puerto Rico, El Salvador, Venezuela, and the United States.

Two years of pre-professional work in the *Facultad de Ciencias y Letras* are required for admission to the Faculty of Microbiology. The curriculum includes three years of course work. During the first year, the students take courses in descriptive anatomy, histology, physical chemistry, biochemistry, microbiology, and immunology and serology. During the second year there are courses on arthropods, pathology, medical microbiology, physiology, protozoology, and helminthology. In the third and final year, the students pursue courses in mycology, clinical biochemistry, virology, hematology, public health, industrial microbiology, food microbiology, and water microbiology. Graduates receive the title of *Licenciado*, which is roughly equivalent to a Master of Arts or Master of Science degree in this country.

The Faculty of Microbiology trains technicians not only for Costa Rica, but for several other nations of Central and South America. But its funds are limited, and there is hope that this group will be more successful in the future in attracting outside support, particularly from the United States.

**I**N the concluding section of this report, I would like to present some general observations concerning a few specific medical problems in Costa Rica, selecting for attention those which are most serious from the standpoint of the population, and others which either do not occur or occur only sparingly in the United States.

Malnutrition is a problem of considerable importance *per se*, and is a significant contributory factor in other diseases. In the *meseta central*, where the rains through the centuries have leached the iodine from the soil, goiter is common, affecting perhaps 10 per cent of the population. Vitamin A deficiency, riboflavin deficiency and pellagra (niacin deficiency) may be seen in classical form. By far the most important nutritional problem, however, is kwashiorkor (*síndrome polycarencial infantil*). Both the marasmic type, related to the intake of too few calories, and the non-marasmic type, resulting from insufficient high quality protein of animal origin, occur. In Costa Rica, as elsewhere in Central America, newborn infants are nursed at the mother's breast until 12-18 months of age. Several months after weaning to a diet consisting of gruels of maize, cassava, yams, plantains or taro, kwashiorkor develops. Permanent brain damage may result in severe cases. The distribution of powdered milk is one means used to combat this, in a program which was started on a nationwide basis in 1950. At the *Unidad Sanitaria* in Tres Ríos, there are new modern facilities for the care of acute cases, and a model prevention experiment, in which children come to the clinic for one meal of milk and meat soup per day. The nutritional status of the population as a whole is probably worse today than 25 years ago, as a result of the low prices brought by the principal product of the country, namely coffee, on the world's markets.

The birth rate in Costa Rica is one of the highest in the world. Statistics of the Pan American Health Organization for 1957-1960 give 42.9-47.5 live births per 1000 inhabitants. A considerable number of deliveries in the more remote areas are made by midwives. There is a school in Costa Rica for the training of midwives. Infant deaths per 1000 live births number 80, which is high, but the corresponding figures for

maternal deaths, 1.4-2.1 per 1000 live births, compare favorably with those of other parts of the world. Illegitimacy is a social problem, and the rate may reach 50 per cent in certain exceptional areas—Golfito, for example.

As one consequence of the high birth rate, obstetrics and pediatrics play a larger role in the practice of medicine in Costa Rica than in the United States. The population of Costa Rica is presently increasing at a rate greater than the increase in the gross national product. The people are predominantly Catholic, and the idea of birth control is thus anathema to the devout. But the problem posed by the discrepancy between the burgeoning population pressure and the standard of living is causing not only concern but even open discussion among the intelligentsia of the country. Just how the issue will be resolved is impossible to predict at this time.

When young children are weaned, and thus come into contact with an unsanitary environment, diarrheal diseases take a heavy toll. Deaths under 5 years range from 8.5 to 11.7 per thousand, with gastritis and enteritis as the leading cause of mortality. Of a total of 10,063 deaths in 1960, gastritis and enteritis, with 1408 deaths, and diseases of early infancy, with 966, were exceeded only by senility as a cause of death. It is not an uncommon sight in pediatric wards to see two children occupying the same bed. But if a child reaches five or six years, he has a life expectancy of about 60 years.

Intestinal parasites are an important problem in Costa Rica. Surveys among school children have disclosed that frequently 90 per cent or more harbor some parasite either protozoan or helminth (or frequently both). The problem of intestinal parasitism is of course closely related to that of malnutrition. Among the helminths, *Ascaris*, whipworms, pinworms, hookworms and tapeworms are to be found. The incidence of pinworm and tapeworm infections is relatively low, but still much higher than in the United States. With *Ascaris*, whipworms, and hookworms, mixed infections are common. Excellent progress in the development of anthelmintic drugs has been made in recent years, but the ultimate goal, of a single drug which in one dose will be effective against *Ascaris*, whipworms, and hookworms, has not yet been reached. Of the various intestinal parasites, hookworm infections are by far the most serious, because of the pronounced degree of anemia which may be produced in this disease.

Amebiasis or amebic dysentery has a rather high incidence in Costa Rica, which in the immediate past was estimated as 22 per cent. More recent information suggests that the true infection rate is closer to 40 per cent. Very few of the cases show clinical symptoms as there is a considerable degree of resistance on the part of some segments of the population who have lived with the disease for generations. The number of cases with severe complications, such as lung or liver abscesses, is small.

Leishmaniasis is a disease of the New World tropics, characterized by severe ulcers of the skin. It is caused by a protozoan, which is transmitted to man by the bite of sandflies. It is endemic in the highlands of Costa Rica, and is a serious problem in certain areas. The local name of the disease is *papalomoyo*, which is derived from the Aztec words *papalotl* (butterfly) and *moyotl* (mosquito), the first referring to the butterfly shaped rash which appears on the cheeks of infected persons, and the second to the insect vector of the disease. Visceral leishmaniasis or kala azar fortunately does not occur in Costa Rica.

Chagas' disease is caused by a protozoan rather closely

related to that responsible for African sleeping sickness, and is transmitted by the bite of certain bugs. The parasites are difficult to demonstrate in the blood stream, and consequently the usual method of diagnosis is to allow bugs, reared in captivity, to take a blood meal from the suspect, and then to look for the parasites in the gut of the bug. While Chagas' disease is a minor problem in Costa Rica in comparison with leishmaniasis, it is far more serious for the individual concerned, since it may lead to myocarditis, and subsequent death from heart failure.

The *meseta central* of Costa Rica is free of malaria. This disease is a real problem only in certain localized areas in Puntarenas province on the Pacific coast. Tertian, quartan, and the malignant *P. falciparum* types all are to be found. The usual vector is the mosquito *Anopheles albimanus*. Approximately 2,000 cases were reported in 1960.

Tuberculosis is a much more serious problem in Costa Rica than in the United States, and the situation calls for somewhat different management.

A country wide campaign involving mass examination of the population by fluoroscope, financed by the *Fundación Rockefeller*, was initiated in 1936. Tuberculin testing is employed on a wide scale, and some 440,000 chest roentgenograms have been taken. Vaccination with BCG is done in Costa Rica as is the case in Europe, though not in the United States, and some 320,000 persons in Costa Rica have received BCG in the last ten years. Remarkably few of those vaccinated have subsequently contracted the disease. In 1960, 624 active cases and 151 deaths were reported.

There is one hospital in Costa Rica for the treatment of leprosy. 57 cases were reported in 1960. The cases which occur are mild, without bone destruction in the extremities. Sulfones are used in treatment, as in this country.

Fungus infections are common in Costa Rica. Potentially, the most serious situation is presented by histoplasmosis. Skin tests disclose a high percentage of positive reactors, indicating a history of sensitization to the organism, yet systemic cases are very few. Chromoblastomycosis, a disfiguring disease characterized by cauliflower-like growths on the skin of the arms and legs, which is very rare in the United States, is as abundant in Costa Rica as anywhere in the world, and in hospitals one may occasionally see several cases in a single day. Nocardiosis or Madura foot, a fungus-induced tumor of the foot, is not uncommon, and infections of the skin of the ringworm type are abundant.

Costa Rica suffered a severe epidemic of yellow fever of the sylvatic type in 1951-1953 with some 400 cases and 70 deaths. The epidemic spread northward from Panama and extended to Guatemala. The vector was not the classical one, *Aedes aegypti*, but another mosquito, *Haemagogus*. No cases have been seen since that time.

There was a very severe epidemic of poliomyelitis in 1954, with approximately 1,000 cases. In 1960, 66 cases occurred in the country.

While the health situation in Costa Rica is good, and is constantly improving with time, more doctors and additional funds will be required to approach the level of medical services that obtains in the United States.

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lication No. 64 of the Pan American Health Organization, July, 1962. These observations are based on two trips by the writer to Costa Rica, one in December, 1961, and another in July and August, 1963, the latter as a Fellow in the Louisiana State University School of Medicine Program in Tropical Medicine. The information presented was gathered from

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