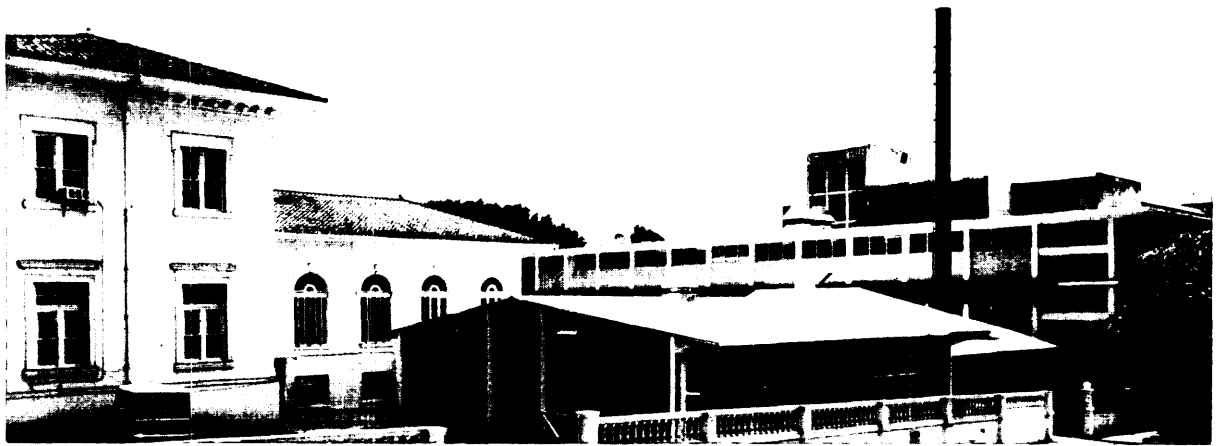


Chapter 2

# **Gorgas Memorial Institute and Laboratory**



*Photo credits: Gorgas Memorial Laboratory*

Front entrance to the Gorgas Memorial Laboratory, in Panama City, Republic of Panama (bottom photo). Photo at top shows the Laboratory complex in Panama City. At the extreme left is the side of the administrative offices; the lower connecting structure houses the Library; to the right rear are the research laboratories. The complex also contains animal buildings and an insect facility (insectory)

# Gorgas Memorial Institute and Laboratory

The Gorgas Memorial Institute of Tropical and Preventive Medicine, Incorporated (GMI), a private, nonprofit organization, was incorporated in Delaware and registered in the Republic of Panama in 1921 as a memorial to Major General William Crawford Gorgas (47).

The Gorgas Memorial Laboratory (GML), GMI's research arm and primary function, was established in 1928 in the Republic of Panama, with resources made available by the Governments of the United States and Panama and by several national and international agencies. The establishment of GML was made possible by an act of Congress (Public Law 70-350), which authorized a permanent annual contribution for the facility, provided that a site and building were made available from other sources, and by action of the National Assembly of the Republic of Panama, which granted land and a building on the condition that the property be used for a research laboratory (47).

The contribution made annually by the U.S. Government to GMI, which constitutes the core support for the maintenance and operation of GML, is administered by the Fogarty International Center (FIC) of the National Institutes of Health

(NIH). Public Law 70-350, as amended, authorizes Congress to provide up to \$2 million for GMI. In fiscal year 1983 GMI received \$1.8 million through FIC, an increase from the fiscal year 1982 allotment of \$1.692 million. Although GMI asked for \$1.9 million in core support for GML in fiscal year 1984, the latest fiscal year 1984 NIH budget request targets no funds for GMI (47,115).

GML also receives grants and contracts supporting specific research projects from a variety of United States, Panamanian, and international organizations. In fiscal year 1982, total U.S. contributions including research grants from the U.S. Army, Navy, NIH, and the Agency for International Development totaled approximately \$2,225,200, or 96.9 percent of all direct financial support for GMI/GML (see tables 3A and 3B).

Panamanian support for GML, which largely comes in the indirect form of property grants and a tax-favored status, is more difficult to tabulate. In 1930, the appraised value of the land donated by the Republic of Panama was \$126,750. Estimates of the current value of the land and facilities have gone as high as \$20 million by one senior Panamanian official, but no exact figure is available. In 1979, FIC estimated the value of the "in-

**Table 3A.—Sources of Financial Support for the Gorgas Institute and Laboratory Fiscal Years 1975-82**  
(dollars in thousands)

	1975	1976	1977	1978	1979	1980	1981	1982	1975-82 total
U.S. Appropriation . . . . .	\$ 707.5	\$1,360	\$1,400.0	\$1,400.0	\$1,700.0	\$1,700.0	\$1,800.0	\$1,692.0	\$11,759.0
National Institutes of Health ... , . . . .	929.1	174.8	228.1	248.4	333.3	255.9	305.1	219.2	2,693.1
Health and Human Service (HEW) . . . . .	.	.	—	—	4.4	4.7	0.9	—	10.0
U.S. Army . . . . .	223.4	203.5	111.7	130.2	145.2	187.5	257.8	228.6	1,488.0
U.S. Navy . . . . .	35.0	33.8	25.0	25.0	30.0	35.0	35.0	35.0	235.8
AID . . . . .	120.0	5.5	—	—	8.1	23.3	45.2	—	202.1
Subtotal Federal support . . . . .	\$2,015.0	\$1,777.6	\$1,764.8	\$1,803.6	\$2,221.0	\$2,205.5	\$2,444.0	\$2,174.9	\$16,406.3
Other U.S. support ... , . . . .	\$ 7.3	\$ 4.3	\$ 2.7	—	\$ 58.3	\$ 89.5	\$ 58.6	\$ 50.3	\$ 271.1
Total U.S. support. . . . .	\$2,022.3	\$1,781.9	\$1,767.6	\$1,803.6	\$2,279.2	\$2,295.0	\$2,502.6	\$2,225.2	\$16,677.5
Government of Panama . . . . .	—	\$ 59.3	\$ 17.2	\$ 37.1	\$ 1.0	\$ 308.4	\$251.0	\$22.5	\$696.5
WHO/PAHO . . . . .	\$ 7.7	4.4	16.0	36.9	118.2	57.0	47.8	49.0	336.9
World Bank . . . . .	—	—	—	—	—	—	—	—	6.8
Wellcome Laboratories . . . . .	—	—	—	(a)	<sup>69</sup>	1.0	—	—	1.0
Total non-U.S. Support. . . . .	\$ 7.7	\$ 63.7	\$ 33.2	\$ 80.8	\$ 120.2	\$ 365.4	\$ 298.8	\$ 71.5	\$ 1,041.3
Total support . . . . .	\$2,030.0	\$1,845.6	\$1,800.8	\$1,884.5	\$2,399.5	\$2,660.4	\$2,801.4	\$2,296.7	\$17,718.7

<sup>69</sup>Less than \$50

**Table 3B.—Sources of Financial Support for the Gorgas Institute and Laboratory Fiscal Years 1975-82  
(as of percent)**

	1975	1976	1977	1978	1979	1980	1981	1982	1975-82 average
U.S. Appropriation . . . . .	34.9	73.7	77.7	74.3	70.8	63.9	64.3	73.7	66.4
National Institutes of Health . . . . .	45.8	9.5	12.7	13.2	13.9	9.6	10.9	10.0	16.7
Health and Human Service (HEW) . . . . .	—	—	—	—	0.2	0.2	(a)	—	0.1
U.S. Army . . . . .	11.0	11.0	6.2	6.9	6.1	7.0	9.2	10.0	8.4
U.S. Navy . . . . .	1.7	1.8	1.4	1.3	1.3	1.3	1.2	2.0	1.4
AID . . . . .	5.9	0.3	—	—	0.3	0.9	1.6	—	1.1
Subtotal Federal support . . . . .	<b>99.3</b>	<b>96.3</b>	<b>98.0</b>	<b>95.7</b>	<b>92.6</b>	<b>82.9</b>	<b>87.2</b>	<b>94.7</b>	<b>92.6</b>
Other U.S. support . . . . .	0.4	0.2	0.2	—	2.4	3.4	2.1	2.2	1.5
Total U.S. support . . . . .	99.6	96.5	98.2	95.7	95.0	86.3	89.3	96.9	94.1
Government of Panama . . . . .	—	3.2	1.0	2.0	(a)	11.6	9.0	1.0	3.9
WHO/PAHO . . . . .	0.4	0.2	0.9	2.0	4.9	2.1	1.7	2.1	—
World Bank . . . . .	—	—	—	—	—	—	—	—	1.9
Wellcome Laboratories . . . . .	—	—	—	(a)	(a)	—	—	—	(a)
Total non-U.S. Support . . . . .	0.4	3.5	1.8	4.3	5.0	13.7	10.7	3.1	5.9
Total support. . . . .	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

<sup>a</sup>Less than 0.05 support.

SOURCE: Gorgas Memorial Institute, 1983.

direct services” provided each year by the Panamanian Government to be \$175,000.

GMI is required by law to make an annual report to Congress on the activities and expenditures of the laboratory. The U.S. General Accounting Office (GAO) audited all GMI/GML financial statements until 1980 (47).

GML is currently engaged in an effort to cut costs and broaden its financial base of support. This issue is being addressed in the related GAO study, and will not be covered in this technical memorandum. Plans call for the the closure of Building 265, which cost an estimated \$279,102 to maintain in fiscal year 1982 (see table 4); however, modifications to accommodate the relocation of the virology program formerly housed in the building are estimated at a one-time cost of \$250,000 (table 5 shows this figure, as well as other projected costs for fiscal year 1984).

The Laboratory has just finished terminating the employment of some 29 of GML’s employees and staff. The closing of the entire bacteriology department eliminated three Panamanian scientists with 10 to 22 years tenure at GML (121). GMI sought relief from the Panamanian Minister of Health and Minister of Labor from penalty charges attributable to early termination of Panamanian employees (47), but waivers were not

granted. GMI has established a Development Committee to explore fund-raising possibilities in the private sector. Because of the completion of a number of commissioned projects, revenues from research grants and contracts dropped from \$995,641 in fiscal year 1981 to \$594,224 in fiscal year 1982. As a result of this decline, the proportion of total funding represented by U.S. core support rose from 64.3 percent of all revenues in fiscal year 1981 to 73.7 percent in fiscal year 1982.

Of the \$1,884,824 spent by GMI/GML over the 12-month period ending July 1983 after the reduction-in-force, over half (\$928,101) went towards salary costs. Utility charges, including those for Building 265, came to \$413,257. Administrative costs accounted for \$130,732, and another \$163,258 was spent to maintain the GMI office in Washington, D.C. The “direct” nonsalary research dollars amount for the laboratory was \$209,476 (121).

At its headquarters in Washington. D. C., GMI is governed by a 47-member Board of Directors, which includes officials of the Governments of the United States and Panama, representatives of national and international agencies active in areas of common interest, and U.S. and Latin American scientists and professionals. The board meets annually to determine the policies of the organiza-

**Table 4.—Gorgas Memorial Institute of Tropical and Preventive Medicine, Incorporated:  
Operating Budgets Fiscal Years 1982 and 1983**

	Fiscal year 1982		Fiscal year 1983	
	Budgeted (1/20/82)	Actual unaudited	Program Old	Budget New
<b>Revenue:</b>				
Contribution by the United States . . . . .	\$1,692,000	\$1,692,000	\$1,800,000	\$1,800,000
Research grants and contracts . . . . .	609,407	594,224	346,209	346,209
Other . . . . .	2,500	10,442	10,000	10,000
Subtotal . . . . .	2,303,907	2,296,666	2,156,209	2,156,209
Additional revenue required . . . . .	386,888		390,930	524,011
Total revenue required . . . . .	2,690,795	2,296,666	2,547,139	2,680,220
<b>Expenditures:</b>				
<b>Core—</b>				
<b>Infectious Disease Program</b>				
Virology . . . . .	275,390	340,752	383,547	374,146
Bacteriology . . . . .	105,765	110,826	114,741	183,052
Parasitology . . . . .	78,515	85,053	79,565	73,920
Immunology . . . . .	21,430	21,585	35,364	48,166
Clinical . . . . .	71,297	81,809	60,366	67,688
Total . . . . .	552,397	640,025	673,583	746,972
<b>Ecology &amp; Epidemiology Program</b>				
Ecology . . . . .	110,216	95,840	105,155	106,586
Vertebrate Zoology . . . . .	42,474	39,831	41,039	41,039
Entomology . . . . .	17,000	15,801	18,029	18,029
Epidemiology . . . . .	494	6,664	9,331	9,331
Vector Biology . . . . .	143,839	158,478	139,477	139,477
Total . . . . .	314,023	316,614	313,031	314,462
<b>Primate &amp; Laboratory Animals Program</b>				
Animal Models . . . . .	46,254	47,350	57,754	53,954
Animal Colony . . . . .	73,546	81,969	85,977	88,427
Total . . . . .	119,800	129,319	143,731	142,381
<b>Education &amp; Technical Support Program</b>				
Educational Programs . . . . .	5,425	4,346	6,139	5,639
Library . . . . .	57,991	56,829	62,451	71,056
Total . . . . .	63,416	61,175	68,590	76,695
Data Processing . . . . .	43,712	36,777	39,551	45,738
<b>Administration</b>				
Washington, D.C. . . . .	161,256	146,242	163,258	163,258
Panama . . . . .	326,647	256,095	313,609	330,765
Total . . . . .	487,903	402,337	476,867	494,023
<b>Maintenance</b>				
Panama . . . . .	232,992	269,449	277,804	290,539
Building 265 . . . . .	309,693	279,102	290,583	321,011
Total . . . . .	542,685	548,551	568,387	611,550
Seniority Premium . . . . .	25,000	21,028	15,000	
Total core expenditures . . . . .	2,148,936	2,155,826	2,298,740	2,431,821
Direct grant and contract expenditures . . . . .	541,859	445,089	248,399	248,399
Total expenditures . . . . .	2,690,795	2,600,915	2,547,139	2,680,220
Excess revenue over/(under) expenditures . . . . .	\$ -0-	\$ (304,249)	\$ -0-	\$ -0-

SOURCE Gorgas Memorial Institute, 1983.

tion, review the managerial and fiscal operation, approve budgets, and elect officers, Board members, and advisors. Between meetings, the Board's functions are delegated to the 9-member Executive Committee, which meets monthly under the chair-

manship of the President of GMI, Dr. Leon Jacobs, a Scientist Emeritus of NIH. The 24-member Advisory Scientific Board, consisting of scientists in various disciplines, is to advise on the development and review of scientific programs

**Table 5.—Gorgas Memorial Institute of Tropical and Preventive Medicine, Incorporated: Projection Fiscal Year 1984**

Revenue:	
Contribution by the United States . . . . .	\$1,899,000
Research grants and contracts . . . . .	300,000
Other . . . . .	10,000
Subtotal . . . . .	2,209,000
Additional revenue required . . . . .	18,000
Total revenue required . . . . .	2,227,000
Expenditures:	
Core—	
Epidemiology . . . . .	180,509
Microbiology . . . . .	276,237
Tropical Ecology . . . . .	326,553
Applied Pharmacology . . . . .	165,699
Administrative Services & Training—	
Panama . . . . .	913,553 <sup>a</sup>
Administration—Washington, D.C. . . . .	177,000
Total core expenditures . . . . .	2,039,551
Direct grant and contract expenditures . . . . .	187,449
Total expenditures . . . . .	2,227,000
Excess revenue over/(under) expenditures . . . . .	\$ -0-

<sup>a</sup>Includes \$250,000 for anticipated facilities renovation

SOURCE: Gorgas Memorial Institute, 1983

## ORGANIZATION

The organization of research activities of GML is currently undergoing change. Previously (and still officially) GML was divided among four scientific programs (see fig. 1). The Infectious Diseases Program was divided into Virology, Bacteriology, Parasitology, Immunology, and Clinical sections. The Ecology and Epidemiology Program was responsible for Vertebrate Zoology, Entomology, Epidemiology, and Vector Biology. Animal Models, Primate Biology, and Animal Colony research were under the Primatology and Laboratory Program. Education and Technical Support programs handled the Library, Photo-Laboratory, and Educational sections. In addition, GML maintained administrative and data processing sections.

Tentative plans for departmental reorganization have been drawn up, but will not be implemented until GML's financial situation is more secure (121). The new organization will include divisions for epidemiology, laboratory sciences (e.g., immunology, parasitology, serum bank), environmental biosciences (e.g., vector bionomics, ecology), clinical therapeutics (e.g., animal

and, if plans are fulfilled, to serve as an editorial review board for GML staff's scientific manuscripts. \* The officers, members, and advisors serve without compensation (47).

In 1972, the Middle American Research Unit, which had been in existence since about 1960 in the Canal Zone as an offsite laboratory of the National Institute of Allergy and Infectious Diseases (NIAID), was merged with GML. At the end of fiscal year 1975, NIAID concluded its support for the work formerly done by this unit with a resulting loss of senior personnel and financial support for GML (11 O).\*\*

● See the GAO report for a review of the activities of the Advisory Scientific Board.

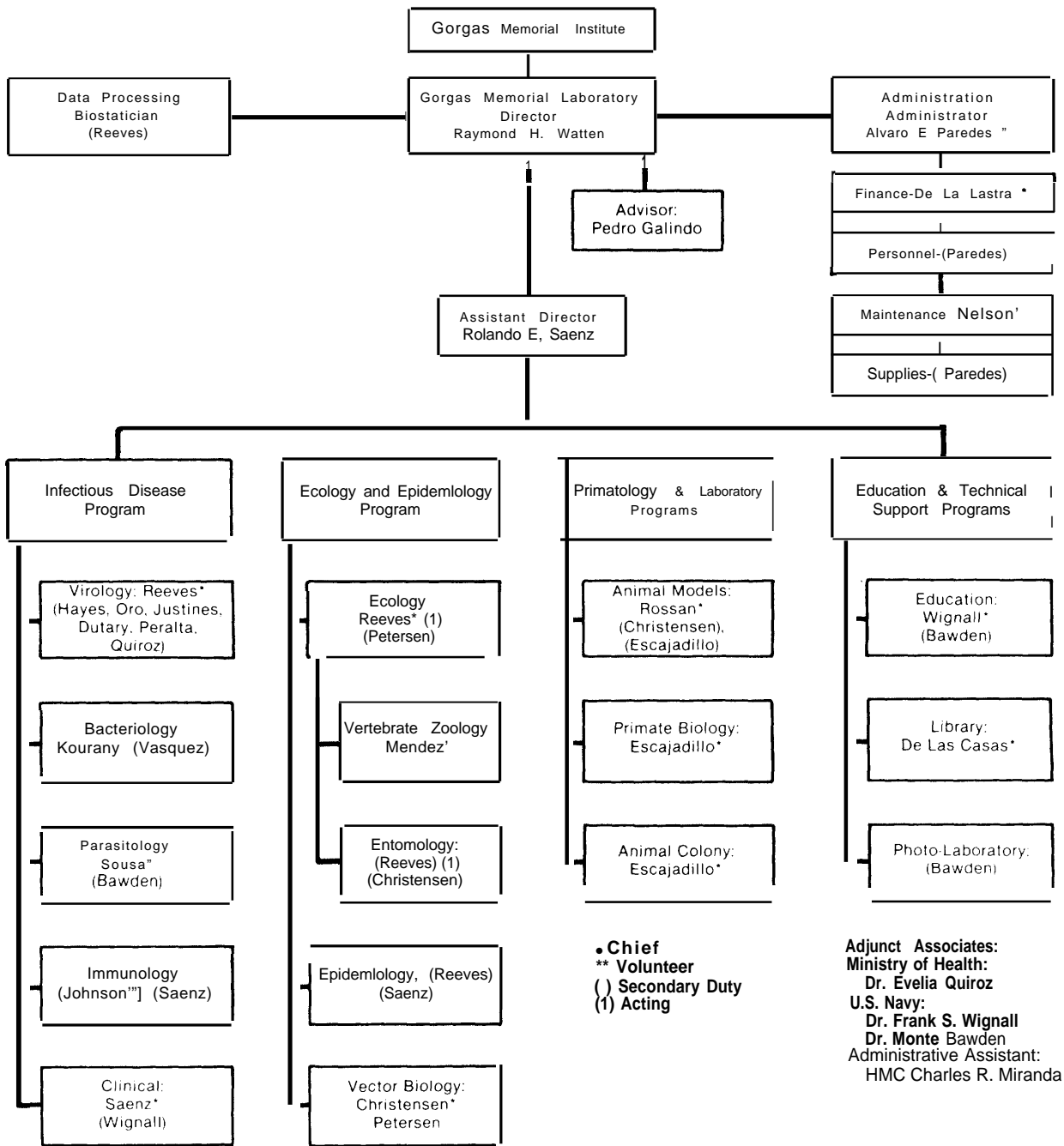
\* \*\*Because of a deteriorating political situation, the Centers for Disease Control was forced to close its own Central American Research Center located in El Salvador in 1981 and relocate to a smaller research and training unit in Guatemala (53).

models, clinical investigation), and support services (library, administration, etc. ). Figure 2 illustrates the proposed organization.

The interdisciplinary scientific staff of six Americans, nine Panamanians, and one Peruvian includes entomologists, arbovirologists, parasitologists, and other specialists (see table 6). One U.S. Navy medical officer and one Navy Ph. D. parasitologist are currently on GML's scientific staff. The director of GML, Raymond H. Watten, M. D., previously the commanding officer at the Navy's Medical Research Unit in Cairo, oversees a total of 94 staff members and employees (121).

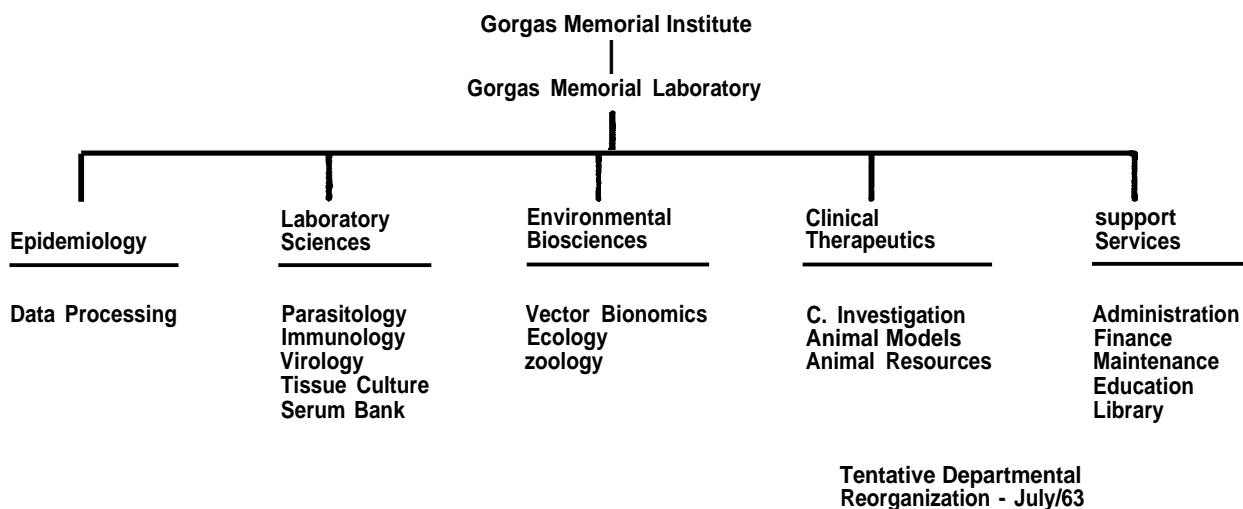
GML is strategically located for studies of disease transmission and movement in tropical America. Panama is a crossroad of transportation in the region and GML itself is in close proximity to the field. GML also benefits from an available supply of *Aotus* monkeys, a simian valuable for the study of human malaria (110). The U.S. Fish and Wildlife Service classifies the *Aotus* as an animal which could become endangered by international trade.

Figure 1. -Gorgas Memorial Institute Organization (currently official, but in process of being changed)



SOURCE: Gorgas Memorial Institute July 1982

**Figure 2.—Gorgas Memorial Institute-Proposed Organization Chart**



SOURCE Gorgas Memorial Laboratory, 1983

**Table 6.—Gorgas Memorial Laboratory Information on  
Scientific Staff as of July 1983**

Watten, Raymond H., M.D. (U. S.)  
Director  
Saenz, Rolando E., M.D. (Panamanian)  
Assistant Director  
Adames, Abdiel J., Ph. D. (Panamanian)  
Ecologist-Entomologist  
Christensen, Howard A., Ph. D. (U. S.)  
Entomologist  
Dutary, Betsy C., Ph. D. (Panamanian)  
Arbovirologist  
Escajadillo, Alfonso, D.V. M. (Peruvian)  
Medical Veterinarian  
Justines, Gustave, Ph. D. (Panamanian)  
Virologist  
Kourany, Miguel, M. P. H., Ph. D. (Panamanian)  
Bacteriologist  
Mendez, Eustorgio, Ph. D. (Panamanian)  
Vertebrate Ecologist  
Ore, Gladys, M.S. (Panamanian)  
Microbiologist  
Peralta, Pauline, Ph. D. (U. S.)  
Virologist  
Petersen, John L., Ph. D. (U. S.)  
Insect Geneticist  
Reeves, William C., M.D. (U. S.)  
Medical Virologist  
Rossan, Richard N., Ph. D. (U. S.)  
Parasitologist-Primatologist  
Sousa, Octavio E., Ph. D. (Panamanian)  
Parasitologist  
Vasquez, Manuel A., M.D. (Panamanian)  
Physician-Microbiologist

SOURCE" Office of the Director, Gorgas Memorial Laboratory, July 1983.



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## ACTIVITIES OF GML

The activities at GML can be characterized as basic and applied biomedical research, public health and medical services, and training. Projects use the laboratory, the clinic, and the field as bases. Neither the types of activities nor the areas where they are carried out are entirely categorical or mutually exclusive. The border between basic and applied research, for instance, is not a clean line. Basic biomedical research, as used in this paper, refers to work that seeks to advance the state of knowledge about the vital processes that underlie the normal functioning of organisms and their malfunctioning in disease. Applied biomedical research draws upon basic information to develop means of prevention, treatment, and cure of disease (4).

At the two ends of the *research* spectrum, the distinction is clear. Observing and characterizing the physical and metabolic behavior of a malarial parasite is basic research. Using the information gained in that way to design an intervention, e.g., a vaccine or drug therapy, is applied research. Further down the line, e.g., testing the drug or vaccine in nonhuman primates, a major line of research at Gorgas, the work falls farther toward the applied end of the spectrum. A clinical trial of the intervention in humans is a final step before research turns to practice. Even during a clinical trial, however, observations can be made that would fit the definition of basic research, in furthering the basic knowledge of normal and abnormal human functioning. Marking the checkpoint between basic and applied research in the process described is all but impossible, and to spend a great deal of time attempting to do so is unproductive.

Many projects at GML have both research and service components. About 1,000 patients per year are treated in the clinic, providing an important service to the community. Observations of

those patients are an important source for learning about the natural history and treatment of diseases, many of which cannot be adequately studied elsewhere.

GML began as a traditional tropical medicine research institute concentrating on studies of malaria, trypanosomiasis, and leishmaniasis. In recent years, attention has been increasingly directed to arboviruses and their vectors (110). Currently, GML also is involved in research projects concerning sexually transmitted diseases, specific cancers, and ecological studies (see table 7 for a more detailed listing of areas of activity). In the past, GML has been called on to serve as a reference center for the region (76). GML also offers "Medicine in the Tropics," a 6-week tropical medicine training program offered primarily to physicians from the U.S. Navy, intended to prepare the medical officers for operational assignments in tropical areas. GML also hosts predoctoral and postdoctoral students and scientists. In 1981, students came from Venezuela, Costa Rica, Panama, and the United States; in 1982, from Kenya, Hungary, Argentina, Brazil, Cuba, Panama, and the United States. In the past 12 months, GML lists these training figures (121):

- 30 Students, *Medicine in the Tropics* (6-week course)
- 25 Visiting scientists
- 1 Postdoctoral student
- 2 Predoctoral students
- 3 Bachelor-level students
- 6 Trainees and graduate students

GML has working relationships with the Medical Entomology Research and Training Unit in Guatemala, the Centers for Disease Control, NIH, Louisiana State University (LSU), Johns Hopkins University, and other academic and scientific institutions. Most of these arrangements are "informal," but GML has a Memorandum of Agreement with LSU, Yale University, Johns Hopkins, and the University of Panama (121).

Table 7.—Recent Activities of Gorgas Memorial Laboratory

Area of activity	Active/recent	Funding
<b>Animal colonies</b> . . . . .	A	Core
<b>Care and maintenance</b> of experimental animals		
Applied pharmacology:		
Malaria drug testing ( <b>Aotus</b> studies) (also under Malaria) . . . . .	A	U.S. Army contract
Rabies, clinical trial to identify best minimal dose of human diploid vaccine . . . . .	R	Core, with MOH
Arboviruses (various):		
Arbovirus survey in Tabasara River Basin . . . . .	R	Contract
Various projects relating to characterization of arboviruses and investigating outbreaks		
Aseptic meningitis . . . . .	R	Core
Blackflies:		
Vector competence of <i>S. quadrivittatum</i> for <i>O. volvulus</i> . . . . .	R	Core, with Johns Hopkins University
<b>Blackfly control</b> in Fortuna Hydroelectric project		
Species bionics; intervention at breeding sites		
Blood meal analysis:		
Feeding habits of known and potential vectors . . . . .	A	Core and WHO TDR
Campylobacter:		
Survey of this important cause of diarrhea in Panama . . . . .	R	Core
Cancer:		
Human T-cell leukemia virus. . . . .	A	Core and NCI grant
Cervical and penile cancer in Herrera Province. . . . .	A	Core
Association with HTLV; and with herpes simplex		
Cervical cancer and Herpes simplex . . . . .	A	Core, with McMaster University
Cell culture lines:		
Culturing of Sloth kidney cells. . . . .	A	Core
Culturing of <i>haemogogus equinus cells</i>		
<b>Chagas' disease:</b>		
<b>Study of risk</b> of infection and human manifestations of Chagas' disease transmitted by <i>R. pallescens</i> (Central Panama) and <i>T. dimidiata</i> (Western Panama) . . . . .	A	WHO TDR grant (partial)
Biological and Isozyme characterization of <i>T. cruzi</i> and <i>T. rangei</i> strains . . . . .	A	Core
Clinical diagnosis and treatment (approximately 1,000 cases per year) . . . . .	A	Core, with MOH
Data Processing:		
National Cancer Registry (Panama) . . . . .	A	Core, plus miscellaneous
Cervical cancer project		
National serologic survey		
Bayano Lake clinical surveillance project		
Malaria chemotherapy project		
STD Project		
Environmental Impact Assessment:		
Tabasara Hydroelectric Project . . . . .	R	Contract
Fortuna River . . . . .	R	Contract
Influenza and clinical diagnostic virology services and surveillance . . . . .	A	Core, with MOH
Leishmaniasis:		
Identification of vector species; identification of reservoir (porcupine) . . . . .	A	Core and WHO TDR grant
Isozyme electrophoresis diagnosis of strain and species of <i>Leishmania</i> and identification of leishmaniasis vectors . . . . .	A	Core and WHO TDR grant
Library:		
Reference service and collection available to staff and outside researchers . . . . .	A	Core and grant from Panama
Malaria:		
In <i>Vitro</i> cultivation of infectious agent . . . . .	R	AID grant
Antimalarial Drug Testing in <b>Aotus</b> monkey. . . . .	A	U.S. Army contract
Phlebotomus fever:		
Serologic surveys of U.S. troops and Panamanians for Chagres and Punta Toro Fevers. . . . .	R	Core
Comparison of Punta Toro and Rift Valley Fevers . . . . .	R	Core
Identification of amplifying host vertebrates . . . . .	R	Core
Retinochoroiditis due to Toxoplasmosis . . . . .	R	Core
Serum Bank Reference Collection . . . . .	A	Core

Table 7.—Recent Activities of **Gorgas** Memorial Laboratory-Continued

Area of activity	Active/recent	Funding
Sexually transmitted diseases (STDS):		
Gonorrhea—survey of prostitutes on prevalence and penicillin resistance . . . . .	R	Core
Epidemiology of STDS in Panama (prevalence; maternal STD and effect on pregnancy outcomes) . . . . .	A	Core, with MOH
Shigellosis:		
Study of drug resistance in shigella isolates. . . . .	R	Core
St. Louis encephalitis (SLE):		
Study of how virus is maintained in the tropics . . . . .	R	NIH grant
Studies with olivaceous cormorant . . . . .	R	NIH grant
Susceptibility to infection of Panamanian vector with three geographic isolates of SLE virus . . . . .	R	NIH grant
Virulence testing and RNA fingerprinting of Panamanian SLE virus isolates . . . . .	R	NIH grant
Training:		
Medicine and health in the Tropics . . . . .	A	U.S. Navy
Triatoma Colony maintained for xenodiagnosis . . . . .	A	Core
Trypanosomiasis . . . . .	A	Core and WHO grant
Venezuelan equine encephalitis (VEE):		
Search for epizootic virions from enzootic strains . . . . .	A	Core
Vertebrate zoology		
Survey of Mammalian Fauna of Panama. . . . .	R	Core
Long-term survey of rodents (zoogeography) . . . . .	A	Core
Studies of Ectoparasites . . . . .	A	Core
Yellow fever:		
Monitoring of animal reservoirs . . . . .	A	Core
Monitoring of epizootics in Spider monkeys		
Monitoring of variations in vectors' ability to transmit virus. . . . .	A	Core
Genetic studies of jungle vectors . . . . .	R	NIH grant
Longevity and age structure of Sylvan Yellow fever vectors. . . . .	R	NIH grant

KEY AID—U S Agency for International Development, MOH—Panamanian Ministry of Health NC1—National Cancer Institute NIH—National Institutes of health, TDR—Special Programme for Research and Training in Tropical Diseases (WHO), WHO—World Health Organization

SOURCE Off Ice of Technology Assessment, 1983 Information provided by Gorgas Memorial Laboratory WHO and Gorgas Memorial Laboratory fiscal year 1981 and 1982 reports