Half a Century of Medical and Public Health Progress

Reprint from
Bulletin of the Pan American Union

WASHINGTON, D. C.
DIRECTING COUNCIL
OF THE
PAN AMERICAN SANITARY BUREAU

DIRECTOR
DR. HUGH S. CUMMING
Surgeon General (Retired), U. S. Public Health Service

VICE-DIRECTOR
DR. JOÃO DE BARROS BARRETO
Brasil

COUNSELORS
DR. MIGUEL SUSSINI
Argentina
DR. ANTONIO PEÑA CHAVARRÍA
Costa Rica

ASSISTANT DIRECTOR
DR. EDWARD C. ERNST
United States Public Health Service

SECRETARY
DR. ARISTIDES A. MOLL
Editor, Pan American Sanitary Bureau

MEMBERS
DR. ATILIO MACCHIAVELLO
Chile
DR. LUIS MANUEL DEBAYLE
Nicaragua
DR. A. L. BRICEÑO ROSSI
Venezuela
DR. DAGOBERTO E. GONZÁLEZ
Perú
DR. MANUEL MARTÍNEZ BÁEZ
Mexico
DR. PEDRO MACHADO
Cuba
DR. JUAN ANTONIO MONTALVÁN
Ecuador

HONORARY MEMBERS
DR. JORGE BEJARANO, Honorary President
Colombia

DR. CARLOS ENRIQUE PAZ SOLDÁN
Perú

DR. JUSTO F. GONZÁLEZ
Uruguay

DR. LUIS GAITÁN
Guatemala

TRAVELING REPRESENTATIVES
DR. JOHN D. LONG
DR. JOHN R. MURDOCK
DR. ANTHONY DONOVAN
DR. HENRY HANSON
DR. FÉLIX R. BRUNOT
United States Public Health Service

SANITARY ENGINEERS
SR. WILLIAM BOAZ
SR. EDWARD D. HOPKINS
SR. WALTER N. DASHIELL
SHOULD we try our hand at the unwelcome task of evaluating the advances achieved during the last five decades in the various fields of human activity, medicine, both preventive and curative, would certainly claim a place at the top of the list.

In so far as the Americas are concerned, the evolution still in progress that has brought into existence splendidly equipped hospitals, effective research institutions and workers, a properly trained medical profession, constantly improving health services, control of plagues once devastating entire countries, and social legislation aiming to protect the life and health of all the people at all times on a scale undreamed of before, makes an inspiring tale.

When the Pan American Union was created in 1890, the means of combating diseases were everywhere, and especially in the New World, far inferior to what they are today. Against many of the most prevalent conditions mankind was practically unarmed, and the principles embodied in the old proverb that "an ounce of prevention is worth a pound of cure" were far from being generally accepted in so far as medicine was concerned. Medical thought, however, had just been revolutionized by a series of marvelous advances for which the ground had long been prepared, but actually beginning with Pasteur’s researches on fermentation (1857), and more especially with his work on virulent diseases twenty years afterwards.

GERM THEORY.—"Come!" wrote Pasteur in 1871, "we will transform the world by our discoveries." The germ theory of disease was definitely placed on a solid basis with Pasteur’s and Koch’s studies of anthrax (1876–77), the discovery of means for growing, obtaining and identifying bacteria (1877–87), improved microscopes, filters, incubators, and the identification in rapid succession of the organisms causing relapsing fever (1873), malignant edema (1877), leprosy, glanders and gonorrhea (1879), pneumonia, malaria and typhoid (1880), tuberculosis and rhinoscleroma (1882), cholera, erysipelas and diphtheria (1883), tetanus (1884), undulant fever (1886), meningitis and chancre (1889), as well as the lacto-bacillus, the staphylococcus (1881), the streptococcus (1884), and the colon bacillus (1886). The by-products which Perkin extracted from coal tar in 1857 proved useful indeed first to make these germs visible and then to destroy them.

By 1890 cholera had just inflicted the last (1886) of its castigations on the Western Hemisphere; typhus fever continued its ravages; smallpox epidemics were far from uncommon; and yellow fever remained as a black cloud on the horizon of practically every American Republic from the Mississippi to the Plate; while plague had yet to make its first appearance on American soil (1899). The germs and mode of transmission of plague and typhus fever were still unknown, as also the organisms of syphilis, bacillary dysentery, kala-azar, sleeping sickness and whooping
cough, and the mode of transmission of such insect-borne diseases as malaria and dengue; while, in the case of yellow fever, few had paid attention to the startling ideas repeatedly advanced by a modest Cuban physician since 1881.

Vectors.—The role of vectors, one of the most promising leads in preventive medicine, was then just assuming prominence through the researches of Manson (1876), Finlay (1881), Th. Smith (1893), Bruce (1894), and Ross (1897). The part played by inanimate objects, especially water, milk, night soil, droplets, towels, eating and drinking utensils, was but imperfectly realized. Preventive inoculation was mostly limited to smallpox and Pasteur’s antirabic vaccine was still only cautiously used in a few institutions, among them the ones recently organized in Buenos Aires, Montevideo, Habana, Mexico and Rio. Among the protozoa, the trichomonas (Donné, 1837), trypanosoma (Gruby, 1843), balantidium (Malmsten, 1857), giardia (Lamb, 1859), amoeba (Lamb, 1860; Lewis, 1870; Cunningham, 1871; and especially Loesch, 1875); and the plasmodium (Laveran, 1880), were known, but the pathogenic potentialities of the group were far from being realized. Fungi had been related to some conditions, as favus (Schoenlein, 1839), alopecia (Gruby, 1841), and actinomycosis (Langenbeck, 1848), but mycology remained practically a closed book. The importance of filterable viruses, now known to be the cause of over 70 major diseases, had not been even suggested by Iwanowsky’s work on the mosaic disease of tobacco (1892) and Loeffler’s and Frosch’s on foot and mouth disease (1898).

Laboratories.—Laboratories, the sentinels of the physician and the sanitarian, were still to a great extent a curiosity, only Brazil (1883), the United States, Argentina, Uruguay, and Cuba having institutions of this type. The United States Public Health Service had opened its hygienic laboratory in 1887 in New York City, but it was not transferred to Washington until 1891, and had no building of its own until 1904, while the first municipal laboratory was not organized until 1888 in Providence, a few years earlier than the University of Pennsylvania laboratory (1892). The world-renowned Oswaldo Cruz Institute was founded at Rio de Janeiro in 1899. At present all national and many local departments of health have laboratories, a number of them perfectly equipped and performing research work of the highest type. Courses in bacteriology began in those decades, starting with 1885, and now are an essential part of every medical curriculum. The institutes at Buenos Aires, La Paz, Rio, Sao Paulo, Santiago, Bogotá, Habana, Mexico, Lima, Panama, Montevideo and that planned for Caracas, are a source of perpetual joy to the investigator and to the health worker.

Health Organization.—Not all the American Republics had national departments of health in 1890, a number of them being first organized as follows: 1891, Mexico; 1892, Chile; 1895, Uruguay; 1897, Brazil; 1899, Paraguay; 1900, El Salvador; 1903, Peru; 1906, Guatemala; 1907, Bolivia; 1909, Venezuela; 1910.

It has been estimated that out of about 1,700 known diseases, 742 (about 43.6 percent) are due to animate agents.

It has been estimated that of the three of the four major diseases was pointed out by Spanish-speaking physicians: Finlay (yellow fever), Simond (plague), Cortezo (typhus). In the case of cholera, the Portuguese Orta and Correia were the first westerners to describe the disease, and the Spaniard Ferrán the first to prepare a vaccine against it.

Including smallpox, chickenpox, yellow fever, dengue, measles, rubies, mumps, poliomyelitis, encephalitis lethargica, herpes zoster, psittacosis, and venereal lymphogranulomatosis.
Costa Rica; 1912, the Dominican Republic; 1914, Honduras; 1916, Haiti; and 1925, Nicaragua. Both Cuba and Panama enjoy the distinction of having come into national existence with country-wide health service, and Cuba in addition led the world in organizing in 1909 a national Ministry of Health. Such ministries are now in existence in more or less complete form in all the American Republics with the exception of Argentina, Guatemala, Haiti, Mexico, Nicaragua, and the United States, but both Mexico and Nicaragua have autonomous and the others quasi-autonomous health departments. Their appropriations, once practically nil, are showing a steady and healthy increase, as the people realize the benefits of health and how it must be obtained: they were multiplied by 10 in Bolivia from 1930 to 1937; by 4 in Argentina, Brazil and Paraguay; by 3 in Venezuela; by more than 10 in Chile from 1911 to 1938, and by more than 100 in Mexico from 1900 to 1939.

The attention given by governments and peoples to public health is very well demonstrated by a number of outstanding developments, embracing: new legislation, incorporating the latest scientific developments; reorganization of public health services, including the recent creation of new Ministries of Public Health in Bolivia, Brazil, Colombia, Panama, Paraguay, Peru, Uruguay and Venezuela, while in Nicaragua the opposite has happened—the old Ministry being transformed, for reasons of economy, into a Bureau of Health; widespread development of health centers; extension of laboratory service; great attention to the problem of proper diet for the people, and studies of nutrition;
attention to the training of public health personnel; gradual introduction of full time service; creation of services of public health education or propaganda; improvement of vital statistics compilation; including disease reporting; initiation of well-guided campaigns against certain diseases, such as yellow fever, plague, malaria, leprosy, intestinal parasitoses, onchocerciasis, and bartonellosis; introduction of compulsory social security in Chile, Ecuador, Peru, and the United States, and the study of it in other countries.

Health development followed a similar path in the United States, since only 18 states had provided for statewide health organization before 1880; 13 did so in the following decade; and in the rest, beginning with Florida and North Dakota in 1889, and ending with Texas in 1909, the process proved to be slow and laborious. The national Public Health Service has shown a steady growth since laws issued in 1889, 1890, 1893, 1902, 1912, and 1918 endowed it with quasi-military organization, and extended its duties in connection with health matters, research, and general prevention of disease. The expenditures of the Service have increased from less than $1,400,000 in the fiscal year 1899-1900 to about $23,000,000 in the fiscal year 1938. Health appropriations in states and cities exhibit a parallel rise.

VITAL STATISTICS.—The organization of vital statistics services ran a rather similar course. At the beginning of the twentieth century very few indeed were the states or communities having good registration services in the United States. The death registration area had begun in 1880 with only five states, and did not embrace the whole country until 1934, and the birth registration area was not organized until 1915 and had to wait until 1939 to become truly national. While some countries in Latin America have had the opportunity of developing similar services, local conditions have prevented others from reaching this degree of excellence.

Since 1890 the population of the Americas has more than doubled. That of the United States has increased from 62 million to 132 million, and that of Latin America from 53 to about 120 million. The number of cities with over 100,000 inhabitants has risen from 12 to about 48 in Latin America, and from 28 to 93 in the United States.

General death rates during the last four decades have also shown most encouraging reductions, as indicated by the following: Argentina, from 20 per thousand to 11.5; Chile, from 31.8 to 24.5; Colombia, from more than 20 to 15; Costa Rica, from nearly 30 to 16.7; Cuba, from over 30 to 12.4; Ecuador, from 25 (1920) to about 20; El Salvador, 21.0 (1899–1911) to 17.0 (1938); Guatemala, from 35 to 18.4; Mexico, about 39 (1899) to 21.9 (1938); Panama Canal Zone, about 27 (1908) to 5.8 (1938); United States, from 18 to 10.6; Uruguay, from 17 to 9.7; Venezuela, from over 21 in 1907 to 17.2.

The same phenomenon of lower mortality is also reflected in cities: Buenos Aires, 15.9 (1903) to 11.5; La Paz, 38 to 22.4; Rio de Janeiro, about 38 to 16.9; Santiago, over 30 (1904) to 24.8; San José, over 30 to 12.5; Habana, 24.4. to 14; Quito, 30 to 21.2; San Salvador, 35 to 22.4; Mexico City, from 50 to 23.8; Panama City, 55.8 to 12.4; Asunción, from 21–22 in 1914 to 15–17; Lima, over 35 (1903) to 20.5; New York, 18.2 (1903) to 9.8; Montevideo, 16 to 14.1; and Caracas, 32.8 to 19.4.

Life expectation has naturally lived up to this promise, having increased in the United States from less than 40 to 61.5 years. Nowhere in Latin America has it reached such figures, but it is on the increase everywhere.

Incidentally, this branch of public
HALF A CENTURY OF MEDICAL AND PUBLIC HEALTH PROGRESS

health—vital statistics—is among those showing a most satisfactory progress, constant efforts being made in all parts of America to improve collection as well as presentation.

DISEASE PICTURE.—The disease picture has also completely changed, nowhere perhaps more than in the United States. In 1900 the ten leading causes of death were influenza-pneumonia, tuberculosis, diarrhea-enteritis, heart disease, nephritis, cerebral hemorrhage, cancer, bronchitis, diphtheria and typhoid. In 1937 heart disease, influenza-pneumonia, cancer, cerebral hemorrhage, nephritis, tuberculosis, motor vehicle accidents, diabetes, arteriosclerosis and diarrhea-enteritis headed the list. The outstanding fact was the decrease in communicable disease, as shown by the elimination of diphtheria and typhoid from this group and the fact that the diarrhea-enteritis death rate is a tenth, the tuberculosis death rate a fourth, and the influenza-pneumonia rate half of what it was. On the other hand, cancer has doubled and heart disease more than doubled its rate; and a new arrival, motor vehicle accidents, is exacting a constantly increasing toll. Chlorosis, St. Vitus' Dance, ergot poisoning, and miliary fever have practically disappeared from nosography, the onsets of cholera have been stopped, and the ravages of plague, yellow fever and typhus fever are being constantly restricted. On the other hand, their places are being taken by new diseases, or old acquaintances recently unmasked, such as appendicitis, peptic ulcer, undulant fever, deficiency conditions, gall-bladder disease, cancer, industrial poisonings, and mental disease.

As to pestilential diseases, it may be noted that: for decades there has been no cholera in any part of South America; plague has decreased in Argentina from 63 cases in 1933 to 5 in 1938; in Chile there has been no human case of plague since 1931; in Guayaquil, Ecuador, cases decreased from 116 in 1935 to 36 in 1938, and in Peru from 400 in 1930 to 59 in 1938. All ports are now free of plague and yellow fever. Deaths from yellow fever in Brazil increased from 14 in 1930 to 76 in 1935 and 256 in 1938, while in Colombia they decreased from 48 in 1936 and 51 in 1937 to about 15 in 1938. Cases of typhus decreased in Bolivia from more than 1,300 in 1935 to 590 in 1936, 201 in 1937, and 167 in 1938; in Chile from a maximum of 15,379 cases and 3,596 deaths in 1933 to 829 cases, and 236 deaths in 1938; in Guatemala deaths have varied from 27 in 1930 to 158 in 1932, 117 in 1936, and 81 in 1937; and in Mexico, from 935 in 1930 and 1,684 in 1931 to 1,488 in 1935, and about 900 in 1938. The recent identification of the disease in Brazil, Cuba, El Salvador and Venezuela is to be noted. In Argentina, cases of smallpox decreased from 539 in 1936 to less than about 53 in 1938; in Costa Rica there have been no cases since 1934, nor in Cuba and Puerto Rico since the beginning of the century; El Salvador had about 400 in 1935 and 20 in 1938, while in Mexico the disease caused 15,003 deaths in 1931, 5,205 in 1935, and 3,428 in 1937. The outbreak which afflicted Guayaquil and certain small foci in Argentina, Chile and Uruguay were rapidly extinguished, thus keeping up a tradition dating back several decades. The infectious disease picture is being changed more and more by prevention and vaccination.

Medicine, to borrow Fletcher's picturesque simile, is like a large hotel with many rooms, where the guests are constantly changing. An interesting feature has been the finding or rather identification of new conditions, among which the most interesting probably are acrodynia (1903, Selter; 1914, Swift); agranulocytosis (1922, Schultz); American onchocerciasis (1915,
Robles*); American trypanosomiasis (1909, Chagas*); appendicitis (1886, Fitz*); aseptic meningitis (1893, Widal); Ayerza's disease (1901*); bacillary dysentery (1897, Shiga; 1899, Flexner*); blastomycosis (1892, Posadas*; 1896, Gilchrist*); encephalitis lethargica (1914, Cruchet; 1917, Economo); epidemic erythema (1926, Place et al.); equine encephalomyelitis (1931, Meyer, Haring and Howitt*); glandular fever (1887, Filatoff; 1889, Pfeiffer); infectious erythema (1889, Tschamer; 1899–1904, Stricker*); Madura foot (1894, Vincent); mottled teeth (1901, Chiaie); paratyphoid (1895, Tejera and Risquez*; 1896, Achard and Bensaude); pleurodynia (*1888, Dabney, 1923–4); rat bite fever (1887, Carter*; 1914, Schottmuller); sickle-cell anemia (1910, Herrick*); spirochetosis icterohaemorrhagica (1886, Weil); sporotrichosis (1896, Schenck; 1898, Beurmann); thrombo-angiitis obliterans (1908, Burger*); trench fever (1915, McNee); tularemia (1911, McCoy and Chapin*; 1921, Francis*); arboflavoniosis (1939, Sebrell).

New forms of old diseases have also been found, as for instance, alastrim*, jungle yellow fever*, sylvatic plague*, and endemic typhus. Conditions once believed to be absent in certain areas have now been found present and even constitute serious problems in various parts of America. This has been the case with undulant fever*, bacillary dysentery*, bartonellosis*, typhus fever*, Chagas' disease*, Rocky Mountain spotted fever*, and deficiency troubles, and the list will probably become longer.

Nutrition.—Perhaps even most important has been the recognition of avitaminoses*, i.e., diseases due to vitamin deficiencies, among which the most prominent are rickets, scurvy, sprue, beriberi and pellagra. This constitutes one of the most fruitful advances from a health standpoint, since it has permitted appreciation of the value of an adequate diet in order to maintain health and build up resistance to infection.

This movement has been reinforced first by the enterprise or pioneer research work of such men as Atwater, Chittenden, and Lusk in the United States, Escudero in Argentina, and González in Uruguay; and second, by the enactment of statutes aimed at safeguarding the purity of foodstuffs following the example given by the United States with its Pure Food Law of 1906, the principles of which have received hemispheric recognition.

Causes of Disease Discovered.—Since 1890, either the agents or the modes of transmission or both for a number of important diseases have been discovered: yellow fever (1881, Finlay; 1900, Reed, Carroll, Agaramonte and Lazear*); plague (1894, Yersin and Kitaasato; 1897, Simond); infectious abortion (1895, Bang); botulism (1896, Ermengem); malaria (1895–7, Ross); Vincent's angina (1896, Vincent); bacillary dysentery (1898, Shiga; 1900, Flexner*); tropical anemia (1899, Ashford*; 1902, Stiles*); kala-azar (1900, Leishman and Donovan); sleeping sickness (1901, Dutton and Ford); dengue (1903, Graham); syphilis (1905, Schaudinn and Hoffmann); yaws (1905, Castelani); typhus fever (1906, Cortezo; 1909, Nicolle; 1916, Rocha-Lima*; 1922, Hone; 1926, Maxcy*; 1931, Mooser*, Dyer*); Rocky Mountain spotted fever (1907, Ricketts*); verruga peruana (1909, Barton*); hemophilia (1911, Bullock and Fildes); septic sore throat (1912, Davis*); tularaemia (1912, McCoy and Chapin*); American onchocerciasis (1915, Robles*); Weil's disease (1915, Inada); rat bite fever (1916, Futaki); scarlet fever (1923, Dicks*); pinto (1927, Gonzalez-Herrejon; 1938, Alfonso and Grau; 1939, Leon*); psittacosis (1930, Bedson, Krumwiede*,

* American contributions.
WATER FILTRATION PLANT, BOGOTÁ

The Colombian capital is one of the many cities that have safeguarded the health of their inhabitants by insuring a pure water supply.

Armstrong*); influenza (1933, Smith-Wilson, Andrews and Laidlaw); silicosis (Haldane); miners’ nystagmus (Lewelyn). “Et causae quoque estimaatio saepe morbum solvit” (Celsus).

A number of problems have been clarified by new conceptions such as droplet infection (1889, Cornet; 1899, Flügge); human carriers (1893, Koch; 1898, Petruschky); bacteriolysis (1893, Pfeiffer); focal infection (1904–16, Billings*); hydrogen ions (1909, Sorenson); contact theory (1910, Chapin*); side chains, allergy, immunity, agglutinins, latent infection, cell pathology, conditional and postural reflexes, acidosis, alkalosis, reticulo-endothelial system, chemical selectivity, the role of glutathione and lactic acid in the tissues.

HORMONES AND VITAMINS.—A number of long closed doors (pushed back by Claude Bernard, 1848–57; Addison, 1849–55; and Marie, 1886) to our study of Man the Unknown were opened through the knowledge of hormones, the balance wheels of bodily function (1889–91, Brown-Séquard; 1891*, Gley, Murray; 1894, Oliver and Schaefer; 1895, Magnus-Lévy; 1897–1910, Abel*; 1901, Takamine*; 1902, Bayliss and Starling; 1903, Sajous*; 1905, Halban; 1912, Iscovesco; 1914, Kendall*; 1918, McCallum and Voeightlin*; 1922, Evans and Long*; 1923, Allen and Doisy*; 1925, Collip*; 1926, Smith and Engle, Zondek and Aschheim; 1927, Rogoff and Stewart*; Kamm; 1931, Swingle and Pfiffner); amino acids (1899–1906, Fisher); sex-chromosomes (1902, McClung); and vitamins, the sparks of life (1897, Eijkman; 1905, Pekelharing; 1906–20, Hopkins; 1911, Funk; 1912–20, McCollum*; 1913, Osborne and Mendel*; 1918, Mellenby; 1922, Evans and Bishop*; 1924, Steenbock and Black*; 1925, Hess*, Weinstock and Helman; 1926, Goldberger*; 1927, Williams and Waterman*; 1928, Tillmans and Hirsch; 1928–32, Szent-Gyorgyi; 1935, Dam).

CLINICAL AIDS.—Clinical medicine—its American contributions.
horizon already widened by the microscope—was radically transformed and enriched by a series of discoveries including: test meals (1890, Ewald and 1914, Reffuss*); sphygmomanometry (1891, Riva Rocci); poligraphy (1892, MacKenzie); X-rays (1895, Roentgen, if not even before 1890—by Jennings and Goodspeed* in the University of Pennsylvania); bronchoscopy (1894, Kirstein); agglutination (1895, Bordet); lumbar puncture and cyto-diagnosis (1895, Quincke); physiological experimentation (as for instance the pioneer research of Cajal, 1897-1904; Pavloff, 1885-1923; Sherrington, 1898-1915; Bayliss and Starling, 1902; and Cannon*, 1908); hemoglobinometer (1900, Tallquist); spinal anesthesia (1898, Conring; 1899, Mutas*); infiltration anesthesia (1902, Schlerch); complement fixation (1907, Bordet and Gengou); blood grouping (1899-1901, Landsteiner); anaphylaxis (1902, Richet); psychoanalysis (1902, Freud); slit lamp (1902, Gullstrand); tissue transplantation and culture (1902-10, Carrel*); electrocardiography (1903, Einthoven); ultramicroscope (1903, Siedentopf and Zsigmond); calorimeter (1904, Atwater*); blood picture (1904, Arneth); differential count (1906, Schilling); basal metabolism (1910, Benedict*); blood transfusion (1914, perfected by Agote*); blood cell sedimentation (1918, Fahraeus).

Tests.—Aids made available to medicine during the last fifty years are: liver tests (1886-1901, Ehrlich; 1918, Van den Bergh); tuberculin (1890, Koch); buccal spots in measles (1895-6, Filatow-Koplik); renal and urine tests (1897, Achard and Castaigne; 1908, Benedict*; 1910, Ambard; 1910-12, Rowntree and Geraghty; 1912, Folin and Dennis; 1913, Kjeldahl; 1918, Van Slyke); mental tests (Binet and Simon, 1906-11); serum diagnosis of typhoid (1896, Widal); skin tests for hay fever (1903, Dunbar); serum diagnosis of syphilis (1906, Wassermann); precipitation tests (1907, Michaelis, Meinicke; 1918, Sachs-Georgi; 1922, Kahn*); skin tests for tuberculosis (1907, Piqquet); intradermal test (1908, Mendel and Mantoux); pneumococcus typing (1909, Neufeld and Haendel); skin test for diphtheria (1910-13, Schick); colloidal gold test (1912, Lange); Coolidge tube (1913*); precipitation tests in typhus fever (1917, Weil and Felix); blanching phenomenon in scarlet fever (1918, Schultz-Charlton); spinal roentgenography (1921, Sicard and Forester); cholecystography (1923, Graham*); skin test for scarlet fever (1924, Dick*); pregnancy test (1930, Aschheim and Zondek); mouse test for yellow fever (1930 Theller*); lepromin test (1934, Bargehr); PPD (1934, Seybert*); eye sign in trypanosomiasis (1934, Romania*); flea inoculation in plague (1936, Eskey*); patch test (1937, Vollmer).

Improved diagnostic methods are constantly coming into the medical domain and to them a great part of the success obtained against a number of diseases, including cancer, pneumonia, syphilis, diphtheria, tuberculosis, and undulant fever, is due.

Drugs.—A wealth of drugs has also offered new hopes to ailing humanity: benzocaine (1890, Ritser); methyl violet (1890, Schilling); pyramidon (1893, Filehne and Spiro); chaulmoogra oil (1899, Tortoulis-Bey); epinephrine (1901, Takamine*); barbital (1903, Fisher); betanaphthol (1904, Bentley); veronal (1904); atophan (1908, Nicolaier and Dohrm); pantopon (1909, Sahli); procaine (1905, Einhorn); salvarsan (1909, Ehrlich); ambrine (1913, Barthe de Sandfort); sanocrystin (1913, Mollgaard); tryparsamide (1919, Jacobs and Heidelberger*); merychrome (1919, Young, White, and Swartz*); butyn (1920); carbon tetra-

*American contributions.
chloride (1921, Hall*); insulin (1921, Banting and Best*); yatren (1921, Mühlens and Heilig); quinidine (1922, Cotton); gentian violet (1924, Churchman*); liver extract (1925, Whipple*; 1926, Minot and Murphy*); plasmochin (1924, Schulemann); cholesterol (1925, Hess and Steenbock*); tetrachlorehylene (1925, Hall*); hexylresorcinol (1932, Lamson*); atebrin (1930, Mietsch and Mauss); protamin insulin (1936, Hagedorn); and finally sulfanilamide and its derivatives (1935, Domagk), the closest perhaps so far mankind has come to finding a panacea.*

MAGIC BULLETS.—The discovery of epihephrine, salvarsan, insulin and sulfanilamide rank with the highest achievements of medicine throughout the centuries. The therapia sterilisans magna is now complemented by the therapia curans magna.*

Cure and prevention weapons have been strengthened by sera and vaccines such as those for rabies (1882, Pasteur); cholera (1885, Ferrán; 1892, Haffkine); snakebites (1887, Sewall; 1894, Calmette); typhoid (1888, Chantemesse); tetanus (1890, Behring and Kitasato); diphtheria (1890-94, Behring and Roux); anthrax (1895, Sclavp); plague (1895, 1897, Yersin); scarlet fever (1902, Moser; 1924, Dick*); meningitis (1907, Flexner*; 1931, Ferry*); whooping cough (1907, Freeman); scorpion bites (1909, Todid); toxin-antitoxin (1912, Behring; suggested in 1907 by Th. Smith*); gas gangrene (1918, Weinberg and Seguin); pneumonia (1909, Neufeld and Haendel; 1917, Avery et al.*); Rocky Mountain spotted fever (1923, Spencer and Parker*); BCG (1924, Calmette); erysipelas (1925, Birgmaug*); spider bites (1926, Brazil and Vellard*); dysentery (1927, Fletcher and Jepps*); typhus fever (1930, Weigl; 1931, Zinsser and Castafiida*); yellow fever (1930, Hindle); convalescent sera (1897, Weisbecker); pollen extract (1911, Noon); bacteriophage (1915, Twort; 1917, d’Hérelle); lipovaccines (1916, Le Moignic and Pinoy); sensitized vaccines (1919, Besredka); defatted vaccines (1921, Douglas and Fleming); and anatoxin (1925, Ramon) have all helped this branch along.

This has likewise been the case with high frequency current (1887-92, Arsonval); organotherapy (beginning in 1889, with Brown-Séquard); ultra-violet rays (1893, Finsen); pneumotherax (1895, revived by Forlanini); radium (1899, Curie); ion therapy (1900, Leduc); deep roentgen therapy (1903, Perthes); protein therapy (1905, Winter); twilight narcosis (1906, Gauss and Krönig); pneumatic chamber (1917, Sauerbruch); sun cure (1914, Rollier); fever therapy (1917, Jauregg); duodenal drainage (1919, Lyon*); maggot therapy (1925, Baer*); hypertherm (1937, Kettering*).

Not only have new drugs come into use, but old ones, as well as certain methods and devices, are being employed with more efficiency or in fresh fields: digitalis in heart disease; salicylates in rheumatism; silver salts in eye trouble; iodine in goiter; calcium and potassium salts, caffeine and xanthine compounds as diuretics; hexylresorcinol and mandelic acid in renal troubles; bismuth as a spirocheticide; kaolin in cholera; petroleum and agar as cathartics; chenopodium, carbon tetrachloride, ficin, gentian violet, tartar emetic, pyrethrum, atebrin, emetine and ethyl chloride as anthelminthics; gold salts in tuberculosis and spirochetoses; ethyl

* American contributions.

* The first and for a long time only specific drug (quinine for malaria) was found in the New World. The other specific, mercury, was also largely developed in the Americas for an alleged American disease.—

* The principles of modern scientific medicine are quite well presented in a series of papers on “The Pharmacopoeia and the Physician,” published recently by the authorities of the U.S. Pharmacopoeia in cooperation with the American Medical Association.
chloride, ethylene and acetylene as anesthetics; antimonium in trypanosomiasis and leishmaniasis; nicotinic acid in pellagra; nitroglycerin in angor pectoris; thallium in ringworm; histidine in peptic ulcer; arsenicals in various conditions; picric acid, tannic acid and gentian violet for burns; pituitary extract in obstetrics; sodium thiosulphate in cyanide poisoning; ephedrine in respiratory conditions; chlorine, ammonia and ozone for the disinfection of water; insufflation in sterility; X-rays and radium in cancer; snake venom as an analgesic; pyretotherapy in venereal conditions; fluorine in prevention of dental caries; copper sulphate to destroy algae and snails; carbon dioxide in asphyxia and skin disease and to destroy rats; oxygen in pneumonia and anesthesia, insulin and metrazol in mental conditions; hydrocyanic acid, pyrethrum, coal oil and Paris green against insects.

Surgery.—Effective local anesthesia had just been discovered in 1890 (1884, Koller). Surgery, thanks first to anesthesia, and then to Lister's application of antisepsis, closely followed by asepsis, had just begun to venture into the internal cavities, but soon would extend its dominion to every part of the human body. This was the golden epoch that saw the rise of Pirovano in Argentina, Acosta-Ortiz in Venezuela, Barros-Borgoño in Chile, Carvallo in Peru, Valdés and Malda in Mexico, Ucrós and Montoya Flores in Colombia, Menocal in Cuba, DeBayle, Martínez and Ortega in Central America, Paes Leme and Almeida in Brazil, Halsted, Murphy and Matas in the United States, and their peers in other parts of America. Thanks to advances in physiology and anatomy, and especially standardization of technique and animal experimentation, their successors were to enjoy a vast domain indeed. Their art, from a small aristocracy, has become a democracy wide open to all talents, and steadily increasing its ranks. As late as 1876, on the centennial of American independence, the author of the first "Complete System of Surgery," Samuel Gross, of Philadelphia, stated that "there is not a medical man on this Continent who devotes himself exclusively to the practice of surgery." A single surgeon such as the younger Mayo could boast of having performed in his lifetime several thousand more operations on a single organ than all his predecessors throughout the centuries. Surgery in the Americas is on the rise. Through its thousands of practitioners it is contributing effectively in the field of technique, in the systematization of knowledge, in the improvement of training and in raising the standard of hospitals.

Hospitals.—In the housing of the sick Latin America has a long and proud tradition. By the time the first hospital was opened in the present United States the Spanish colonies were already studded with similar institutions. The progress made in the last half century is little short of astonishing. The Johns Hopkins Hospital, marking a new epoch, opened its doors in 1889, having been closely preceded by St. Mary's Hospital in Rochester, Minn., and followed in 1895 by the Mayo Clinic, which signaled the dawn of another distinct advance: group medicine. The number of hospitals in the United States has increased from a mere 149 in 1873 to 4,359 in 1909 and 6,166 in 1939, the tendency in the last decade being to decrease numbers and increase efficiency. A similar increase has occurred in Latin America. The countries having the most hospitals are Brazil (1,200), Argentina (750), Mexico (300), Colombia (250), Chile (184). In number of beds per 1,000 population Argentina and Uruguay lead. In con-
struction the bitter rivalry between the pavilion and the block systems seems to be eventuating everywhere in a happy compromise, combining the best features of both. The palatial institutions in Buenos Aires, the building programs under way in Argentina, Brazil, Cuba, the Dominican Republic, Peru, Uruguay and Venezuela, the plans for the care of leprosy, tuberculosis and mental cases, the new maternity and children’s hospitals, the stress on the organization of efficient nursing staffs, show how Latin American countries have become hospital-minded and taken long strides forward.⁹

MEDICAL EDUCATION.—After a series of surveys under the auspices of the Carnegie Foundation for the Advancement of Science, the American Medical Association ¹⁰ initiated in the first decade of the century a movement which reduced the number of medical schools in the United States from 160 in 1904 to 88 in 1920 and 77 in 1939, this reduction being accompanied by a marked improvement in the quality and extent of the training furnished. A new epoch dawned with emphasis on clinical and laboratory practice, the reform being initiated in the University of Pennsylvania (1893–95), and in the opening (1893) of the Johns Hopkins Medical School devoted to teaching medicine in accordance with modern scientific methods.¹¹

In Latin America this movement—still under way—has taken the form of attempts at making medical training more practical and effective, especially through the development of clinical observation and the introduction of laboratory methods. In Europe, on the other hand, we are witnessing the sad spectacle of the deterioration of professional education.

For a fuller treatment of this subject, see the paper by Moll in “Hospitals,” November 1939.

¹⁰ Founded in 1849, and publishing its Journal since 1853.

¹¹ Osler’s book, “Principles and Practice of Medicine,” a masterpiece of its kind, appeared in 1892.
The construction of new buildings for schools began in Chile in 1889 and in Buenos Aires in 1895. The well-equipped teaching institutes and hospitals created since in Buenos Aires, Rio, Sao Paulo, Habana, Montevideo, Lima, and Mexico City, and planned for other places, truly represent the best appreciation that could be given the art of healing.

The old problem of attracting promising young men to this field has now changed to the need of limiting students to the number actually required to serve the country. An interesting development is the policy initiated in some countries, such as Mexico and Nicaragua, of compelling new graduates to spend some time in a rural district or village before being allowed to practice in large cities.

WOMEN.—In the United States medical education for women goes back to Elizabeth Blackwell's graduation (1849), the Woman's Medical Colleges of Philadelphia and Baltimore being organized in 1850 and 1882, respectively. In Latin America it may be dated from Hostos' campaign in Chile in the late '70's. The first graduates in Chile and Mexico were in 1887, in Brazil in 1888, in Argentina and Cuba in 1889, in Peru in 1900 and in Haiti in 1940.

One field which women have made their own, fully justifying their choice, has been nursing. The first nursing schools in the United States opened in 1873 in Bellevue Hospital, New York, and in New Haven and Boston hospitals. By 1938 there were in the United States 1,328 schools of nursing with more than 82,000 students. On a smaller scale similar schools have been organized in practically all capital cities in Latin America, with a view to having at hand trained corps of aides for the care of the sick. The role played by United States nurses in developing nursing services in Latin America makes a glowing picture of achievement.

POST-GRADUATE TRAINING.—The first post-graduate institution in the New World was the New York Polyclinic (1882). Since that date this subject has received increasing attention, as shown by the creation of the Johns Hopkins School and the Mayo Foundation, the offering of special courses under many auspices, and the efforts at improving and checking the quality of these courses by the American Medical Association and the American College of Surgeons. An effort is being made in Latin America to establish a similar system, and post-graduate courses on a number of subjects are being offered periodically in such cities as Buenos Aires, Habana, Mexico, and elsewhere. The new health institutes and public health schools in a number of capital cities furnish post-graduate training for sanitarians.12

As public health has entered the people's consciousness and funds to apply its principles have been made available on an increasing scale, the need of a trained person has been realized everywhere. The Massachusetts Institute of Technology has offered biological courses since the '60's, and emphasized the subject under Sedgwick in 1883. Courses in public health were afterwards given in various schools, not less than fourteen, by 1930. The Johns Hopkins School of Hygiene and Public Health, first and largest of its kind, was inaugurated in 1918. In Latin America the only real school of this type is the Sao Paulo Institute of Hygiene. However, similar purposes are pursued by the Oswaldo Cruz Institute at Rio and the Institutes in Habana, Mexico, Lima, and the new School of Public Health in Chile.

TROPICAL MEDICINE.—The progress made in the study of diseases of warm cli-
mates, in which Americans took a very prominent part, led to the creation of the modern schools of tropical medicine.\(^3\) The first was founded (1886) at Hong Kong by Manson, being followed in the Old World by those at Hamburg (1892), London and Liverpool (1899), actually the first representative ones, Lisbon (1902), Brussels (1906), Amsterdam, Sydney (1924), Marseilles (1930), Madrid and Antwerp (1933). In the New World the dean of these colleges is the old (1917) Institute of Tropical Medicine and Hygiene in Puerto Rico, which became a full-fledged school in 1924. Next came the College of Tropical Agriculture (and Health) at Trinidad. Since then departments or schools of tropical medicine have been organized in the universities of Harvard, Tulane, Louisiana, South Carolina, and California. A similar task will eventually be carried out by the splendid institutes recently opened in Bogotá, Mexico and Lima, and planned in Caracas. It is also one of the avowed purposes of the Finlay Institute in Habana and the Gorgas Memorial Institute in Panama; is already in effect at the Oswaldo Cruz Institute at Rio; and receives constant attention in the North Argentine Mission at Jujuy.

**Dentistry.**—Largely by virtue of American leadership, dentistry has risen from its old subordinate rank to the category of a science and its public health value is emphasized by recent studies on focal infection, mottled teeth, dental caries and nutrition.

**Sanitary Engineering.**—Some of the outstanding public health achievements must be summarized; among them is one of the essentials, a pure water supply. A serious
study of the relation of water supplies and typhoid started after outbreaks at Plymouth, Pennsylvania (1885), Lowell (1890), and Lawrence (1891). Although filters had been introduced in the United States in 1871-72, as late as 1900 only 6.3 per cent of the urban population used filtered water; by 1910 the proportion had risen to 20 per cent, and is now much higher. The tentative use of chlorine for the disinfection of water began in 1893 (Lawrence, Massachusetts), but spread only after the beginning of the century (1908, Johnson); it now embraces over 90 per cent of the surface supplies in the United States. In 1897 the American Public Health Association published its standard methods for water examination which have contributed so much to clarify the subject. The importance of safe water supplies is receiving increasing recognition throughout Latin America. In Argentina, for instance, about 50 per cent of the entire population is already benefited by public improvements of this nature. The proportion is smaller in other countries, but in all rapid progress is being made in this direction, and the waterworks just opened in some cities, including Bogotá and Orizaba, and under construction in others, for instance Caracas, represent the latest ideas. In Argentina, a national institution, Obras Sanitarias, watches over the water supplies of the whole country.

Pasteurization dated back a few decades but it was applied to milk shortly before 1890 by Soxhlet. Shortly afterwards it began to be used on a large scale in the United States, largely through Caillé's and Jacobi's endeavors. It was also in America that Babcock devised (1892) his lactometer which revolutionized the milk industry, and that the thermal death point of pathogenic germs in milk (1899, Th. Smith; 1906, Rosenau) was determined.

One of the most fruitful developments in this field has been sanitary engineering, the science devoted to the betterment of human environment. Divisions of sanitary engineering now exist in practically all national and many local health departments. Sanitary engineering concerns itself with a number of allied problems: sewage disposal, milk sanitation, malaria control, housing, rat proofing, ventilation, and industrial hygiene. In rural sanitation, perhaps the most pressing health problem confronting all American countries, this help proves invaluable in the solution of the two basic questions: water supply and sewage disposal.

INDUSTRIAL HYGIENE.—In industrial hygiene the inception of the national movement in the United States may be placed in 1906 with the organization of the National Committee on Child Labor and the American Association on Labor Legislation, followed by the first American Congress on Industrial Diseases (1910) and the constitution of the National Safety Council and the enactment of State legislation making certain workmen's diseases compensable (1911). In Latin America the publication (1910-11) of Bunge's book on industrial diseases and labor legislation proved a landmark. The entire movement took a decidedly Pan American aspect with the recommendations made on child and women's labor and general factory sanitation at the Washington (1919) and Santiago, Chile (1936) labor conferences.

SOCIAL WORK.—Among the most valuable factors in the extension of health protection has been social work. Public health may be only a small sector of this

---

14 Haldane's and Smith's (1892), Billings', Mitchell's and Bergey's (1895), and Flügge's (1905) experiments revolutionized our knowledge of ventilation. The katathermometer for measuring the loss of heat from the human body was introduced by Hill in 1928.

15 One of the services furnished by the Pan American Sanitary Bureau most in demand is advice by its field sanitary engineers.
immense field, but certainly not the least important and probably the best tilled. Beginning perhaps in its modern conception with district nursing in the '70's, its use in 1902 in Baltimore by medical students under Dr. C. P. Emerson, and its application in 1905 to psychiatry in the Massachusetts General Hospital and the Bellevue Hospital, social work has made notable strides. The first nurses' settlement was founded in New York City in 1893. By 1912 a National Organization for Public Health Nursing was created, and the number of public health nurses rose from 130 in 1900 to not less than 11,000 in 1920 and about 24,000 at present. An offshoot of this movement, social service in the United States, numbers tens of thousands in its personnel. Not less than 35 social service schools, practically all affiliated with universities, exist in the United States. The social service schools in Chile enjoy deserved prestige, one of them organized in 1925 being the first in Latin America, and similar institutions elsewhere, for instance, in Buenos Aires and Caracas, are developing rapidly.¹⁸

No better manifestation of this spirit can be brought out than the noble provisions in the 1937 Brazilian Constitution and the recent enactment of social security laws. Chile was the pioneer in such legislation, and its 1924 sickness and disability insurance law stands out as a model with its wide range of activities. Similar but less comprehensive laws have been adopted in Ecuador (1935), the United States (1935) and Peru (1936), for specific groups in Argentina, Brazil, Colombia, Cuba, and Uruguay, and are under study in other countries, such as Mexico and Venezuela.¹⁷

Child welfare¹⁸ assumed a more definite form with the creation in the United States of the first division of child hygiene in New York in 1908, the first national conference on infant mortality in 1909, mothers' aid laws beginning in 1911, and the organization of the national Children's Bureau in 1912. Here again inter-American congresses have endowed the movement with a truly Pan American aspect which has manifested itself in provisions for the protection and care of motherhood, premarital examinations, children's charters, care of the handicapped, school hygiene, child labor, juvenile courts, etc.

The maternal and child welfare divisions recently created in a number of countries—for instance, Argentina, Brazil, Mexico, Uruguay, Venezuela—evidence another phase of the interest in this all-important subject.

Eugenics and Biometrics.—These were placed on a safe and promising basis through the studies of Galton (1889) and Pearson (1897), and especially the revival and confirmation by Vries (1900) of Mendel's forgotten laws (1865). The role of inheritance has become better defined, and definite steps to protect the unborn have been taken through sterilization of the unfit and premarital examinations.

Mental hygiene.—This is a typically American product which, since it was introduced in 1908 by Beers to fill a long-felt want, has been adopted practically everywhere, especially in Latin American countries, in a number of which mental hygiene societies have been constituted.

Social Disease.—The same ideal is also at the basis of the modern campaigns against so-called social diseases and conditions, tuberculosis, venereal troubles, leprosy, heart disease, infant mortality,
cancer, underfeeding, poor housing, etc. Nowhere has more progress been made than in the field of tuberculosis control. One of the signposts had been the opening of Trudeau's sanatorium in 1884. The creation of the Brazilian (1900) and the Argentine (1901) Leagues, the Phipps Institute (1903), and the American Tuberculosis Association (1904) were significant steps in the campaign which, enlisting public and private effort, has brought tuberculosis morbidity and mortality to their present low records. Similar endeavors in other countries where difficulties are even greater will undoubtedly yield like success, as is already apparent.

The increase of cancer naturally awoke the concern of sanitarians. The organized campaign must be dated from 1913, when the first cancer hospital was opened and the American Society for the Control of Cancer organized in the United States. Argentina followed suit with the opening of the Institute of Experimental Medicine (1923). We find now similar if less elaborate establishments in Rosario, Santa Fe, Rio, Santiago, Bogotá, Medellín, Habana, Lima, San Juan, Montevideo, Caracas, and finally Washington. The campaign in progress is practically continental, being based everywhere on the principle of education of the laity and the medical profession to the need of early, and when required, free diagnosis and treatment.

Venereal trouble, the social disease par excellence, could not fail to attract the attention of preventive medicine. Campaigns against syphilis have been carried on ever since the discovery of America. In his presidential address to the American Medical Association in 1876, Sims, the first of the great American surgeons, earnestly pleaded for a firm stand against this menace to society. The antivenereal movement in America, however, entered a new phase with the organization of the American Social Hygiene Association (1914), with the measures taken during the World War to preserve the health of the soldiers, and finally with the appointment (1936) of Dr. Thomas Parran as Surgeon General of the United States Public Health Service, the appropriation by the United States Congress (1938) of adequate funds for control purposes, and the enactment of pre-marital and pre-natal examination laws. This campaign has assumed a truly Pan American character, as evidenced by the laws enacted in Argentina and Chile, the work conducted by the Gaffrée-Guinle Foundation in Rio and the Samaritan Hospital in Bogotá, and the improved organization in such countries as Guatemala, Honduras, Mexico, and Peru.

CLIMAXES.—The dates and names given above often represent but climaxes in a long trail of trials and endeavors. In fact, the progress achieved largely owes its rapidity to prompt and regular interchange of information through journals, books and meetings, to coordination and cooperation among the various sciences, to linking of problems at first sight widely separated, through application of knowledge from multiple sources, to the general spread and availability of findings apparently disconnected. "Mind begets mind," said Harvey. In the history of civilization Greece shines like a bright focus in which the beams of antique thought converged. Modern science focuses on its problems the light from a thousand stars of knowledge, so that no aspect may remain in the dark. Pure science gathers information disregarding whether it may or may not be needed. Applied science puts it to use when required. One is power, the

\[20\text{ From the modest experiments of Laveran and Mesnil (1902) Ehrlich visualized the golden opportunity which chemotherapy could find in the gigantic dye factories in Germany.}\]
other is force at work. Chemistry and Physics are revolutionizing the world and Medicine has learned to use the weapons put within its reach to redeem humanity from sickness and death.

AMERICAN CONTRIBUTIONS—It is indeed true that science is international and its deeds are the heritage of humanity. Yet the worker who toiled hard and successfully for a noble cause has more legitimate grounds for satisfaction than those who merely shared in its benefits. The Americans may feel justly proud of their contributions to medicine and public health. European ideals led the early colonists in their explorations of coast, forest and stream. A similar story may be told in the world of intellect. That time is long past.

The children of Columbus’s hemisphere have applied in the physical and mental domains qualities of their own. The old reproach that they were avid consumers but poor producers no longer holds. The Americans can now export ideas which others put to use and even appropriate, as they once did with quinine and rubber. Out of nearly 6,000 medical journals in the world, probably almost one-fifth are published in the Americas. The soil of democracy has proved receptive to the seeds of science.21

There is hardly any medical field in which Americans have failed to leave their

21 A series of articles on leading scientific institutions in Latin America is being published in the “Boletín de la Oficina Sanitaria Panamericana.”
imprint. The names of Finlay, Reed, Ricketts and Maxcy must appear in any chapter of medicine dealing with the role of insects in disease. No more names will be listed, as the roster would show a whole army. Alastrim, jungle yellow fever, verruga peruana, American trypanosomiasis, Rocky Mountain spotted fever, tularemia, pinto, granuloma coccidioides, are all conditions on which the leading, if not the only, contributions are American. In the field of nutrition American names appear in the very first rank, as in the modern conceptions of focal infection, anociassociation, disinfection, contact, anesthesia, ophiology; the marked advances in the fields of etiology (erysipelas, pinto, scarlet fever, trypanosomiasis, typhus fever, yellow fever), diagnosis (diphtheria, dysentery, smallpox, intestinal parasites, plague, trypanosomiasis, tuberculosis) and therapeutics (diabetes, osteomyelitis, pernicious anemia, intestinal parasites, nutritional disorders, scarlet fever, tuberculosis); and finally in public health, as shown by the spectacular increase in life expectancy, the success against such diseases as diphtheria, tuberculosis, typhoid and the quasi-extinction of others, as smallpox, yellow fever, typhus fever. In surgery and dentistry methods and operations galore are known by the names of Argentine, Cuban, Peruvian and United States practitioners.

Definite American features in the health movement have been the insistence on education rather than compulsion, on prevention rather than cure, the practical character of the measures proposed, the tendency to make scientific knowledge available to all at the earliest moments. Definite objectives, vision, and vast goals characterize the Pan American mind, as shown by Briggs' dictum that public health is purchasable by the sponsorship of periodic health examinations; Finlay's, Gorgas' and Cruz' dreams of eradicating yellow fever; Ashford's and Rangel's plans to fight tropical anemia; Sedgwick's wish to eliminate waterborne diseases; Penna's and Ribas' combat against smallpox; Brazil's and Amaral's suppression of snake-bite deaths; Carter's and Licéaga's ambition to control malaria; Sims' and Parran's campaign against venereal disease; Cumming's and Long's drive against plague. Perhaps no better illustration can be offered than the construction of the Panama Canal. Given up as hopeless by the French, in spite of their engineering skill, the Americans shouldered the task and succeeded by putting into effect health principles just discovered through Cuban and American joint efforts.

MARTYRS.—"So loved her that they died for her," sang the bard of the Commemoration Ode. Carrión, Ótero, Lazear, McClintick, Lemos Monteiro, Noguchi, form, with their many unknown colleagues, a noble legion of heroes of medicine—all fallen while searching for means to help their fellow men.

INTERNATIONAL AMERICAN COOPERATION. International health cooperation was still a moot question in the New World in 1890. It is a fact that international sanitary conferences had been held at Montevideo in 1873, Washington in 1881, Rio in 1887 and Lima in 1888, but their scope had been invariably restricted and no practical achievements had followed. All of them had, however, contributed valuable suggestions, even prepared drafts of international conventions, and brought out clearly the need of an agreement on troublesome quarantine procedures, which, through lack of standardization and scientific basis, handicapped commercial intercourse and disturbed international comity. The Washington Conference made history
as Finlay then and there boldly proclaimed to a skeptical audience the novel idea that an independent vector was necessary for the spread of yellow fever. This Conference also recommended several far-reaching measures, the execution of which was to be long postponed, namely, use of international bills of health, international reporting of health conditions and creation of international health bureaus.

Inter-American health cooperation has now been placed on a solid and stable basis through the series of Pan American Sanitary Conferences having their inception in 1902, thanks to the foresight of such men as Licéaga, Ulloa, Wyman and Moore. Ten of these meetings, with increasingly marked success, have been held, the last one in Bogotá in 1938, as well as three Conferences of National Directors of Health, the last one in 1936; another is about to meet in Washington. The place of these assemblies from a more purely medical standpoint is taken by Pan American congresses on medicine, surgery, and special subjects such as psychiatry, tuberculosis, urology, radiology, and ophthalmology.

At its Brooklyn meeting in 1889, the American Public Health Association instructed its secretary to invite the health authorities of Mexico, Central America, Cuba and Colombia (then including Panama) to cooperate in the work of the society. In response to this invitation, Mexico sent representatives to the meeting in Charleston in 1890, accepted membership then as Cuba did in 1902, and was host to the Association in 1892, 1906, and 1930, as Cuba was in 1905 and 1911. The Mexicans, Licéaga in 1895 and Orvañanos in 1906, and the Cuban, Finlay, in 1903, were elected Presidents of the Association—as has also been the case with a number of Canadians—and several countrymen of theirs have been elected to important places on the governing council on different occasions in the recent past.

The Americans have not failed to participate in the world-wide field through representation on such bodies as the International Bureau of Public Health created in 1909, and the Health Organization of the League of Nations, dating from 1923. It may be well to point out that the international health center of the Americas, the Pan American Sanitary Bureau, preceded (1902) both these bodies. The Bureau has steadily increased its usefulness and scope, especially since Surgeon General Hugh S. Cumming became its Director in 1920. The Pan American Sanitary Code was adopted in 1924, and new demands for its services have arisen. The Pan American Sanitary Bureau is continuing and developing its cooperative work with all the American Republics, and an increase of funds was approved for this purpose by the Tenth Pan American Sanitary Conference.

In the medical field the Americans have likewise made their presence felt internationally through effective representation and valuable contributions, and acting as hosts to an increasing number of important meetings.

**Rockefeller Foundation**—An event of international bearing was the endowment in 1909 of the Rockefeller Foundation which, with the creation of its International Health Division in 1913, extended its scope from hookworm control to other tropical plagues and finally to improvement of medical education and training of health personnel.

**Red Cross**—By 1890 Red Cross societies had just been organized in a few American countries: Peru (1879), Argentina (1880), United States (1882), Costa Rica (1885). They now exist in every

---

23 Although he retired from the United States Public Health Service in 1936, Dr. Cumming has continued at the head of the Bureau.
Republic on the Western Continent, vying with each other in effective work in public catastrophes, their action in peacetime having eventually gathered importance at least equal to their activities in periods of war.

FROM MULE TRAILS TO SKYWAYS.—After crawling for centuries, Medicine began walking about fifty years ago and traveled by automobile from the beginning of the xxth century. It is now journeying on wings at ever greater speed. Its aim now as in Hippocrates' time is to help ailing mankind, but, not content with curing, it tries to prevent disease before it takes root in the human body. From its former static and to that extent negative attitude, Medicine has become positive and even dynamic. From thoughts of disease it has turned to the establishment of health.

While bloody strife rages elsewhere, the far nobler pursuit of Health, Happiness and Life still engages the nations of Columbus' world.

The Americas are entitled to the credit of not only proclaiming but making a reality of the great human rights: the right to justice; the right to freedom; the right to education; the right to equality. They are advancing and consolidating the Supreme Heritage, the lack of which makes all others null and void—the Right to Health.