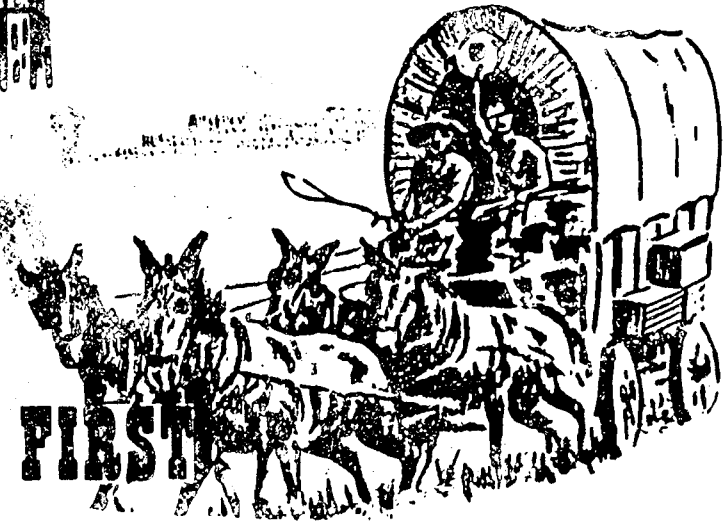


# HEALTH IN COLORADO



THE FIRST  
ONE HUNDRED  
YEARS

HEALTH IN COLORADO

The First One Hundred Years

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## Slow and Sporadic

Even as the triumphant shout of "gold" reverberated from Gregory Gulch, the quest for health - rather than wealth - lured thousands to Colorado's dry, sun-drenched slopes.

The heralded climate also lulled most of those early residents into the erroneous belief that no special effort was necessary to preserve and protect the public health. They took health for granted, acquiring a false sense of security that was to persist into the 20th century.

Thus, for a period of 89 years - from the arrival of the first recorded invalid settler, Andrew Sagendorf, in 1858 to Dr. Florence R. Sabin's post-World War II campaign to popularize public health in Colorado - Coloradoans generally supported health measures and services only during periods of emergency and fear.

The development of public health has been slow and sporadic since the establishment of the first Territorial Board of Health in February, 1876 - six months prior to the achievement of statehood. And even today, in the remarkable era when man has conquered the perils of space, 41 of Colorado's 63 counties operate under that 1876 system of health legislation.

After the explorations of Lt. Zebulon M. Pike (1806-07) and Major Stephen H. Long (1820) were publicized in the East, many traders and trappers came to Colorado in search of beaver and other valuable furs. They were largely a transient population with little or no interest in health and sanitation. They introduced measles and smallpox to the Indians with a resultant heavy toll of Indian lives.

A gathering point for the traders and trappers was Bent's Fort in Otero County, one of the West's most famous trading posts, which also was important in Colorado's health history. A Dr. Hemstead was practicing medicine at Bent's Fort as early as 1846. (The first physician known to have entered the territory, however, was Dr. John Hamilton Robinson, a member of Pike's contingent.) The fort also served, in a sense, as Colorado's first hospital. In 1847, one small room, accommodating two patients on bearskin rugs on the floor, was set aside for the sick and injured.

One of Colorado's first recorded epidemics occurred in 1849, when an outbreak of cholera snuffed out many lives in the Julesburg area. Drainage wells in that area were polluted by the first wagon trains heading west over the Oregon Trail.

Heavy coffee drinkers were believed to have escaped many of the early-day water-borne diseases because of the necessity of boiling the water to make their coffee.

The discovery of gold in 1858 precipitated a migration of 100,000 persons to Colorado. Towns were established almost overnight without regard to environmental sanitation. Human sewage was dumped into the streams, and typhoid soon became rife.

Physicians came to Colorado with the gold seekers, and by the end of 1859, 18 were practicing in the territory. It was the concern of those pioneer physicians, who organized the Colorado and Denver Medical Societies in the early 1870's, that provided the impetus for public health in Colorado.

In 1873, at the instigation of the doctors, open meetings were held to discuss the public health. The physicians badgered Denver city officials about the dangerous insanitary conditions and asked for

sewers, odor abatement, alley cleaning and the regulation of domestic animals.

Dr. Charles S. Elder, writing in "Colorado and Its People," said: "Physicians of the territory were zealous in advertising the advantages of Colorado's climate, but they seriously objected to the smell of the capital city."

Dr. Frederick J. Bancroft of Denver, who was to become president of the first Territorial Board of Health, called Denver "the dirtiest city in the United States," according to Elder.

The discussions of the physicians, including their suspicion that the city water was the source of typhoid fever, were widely publicized. But, Elder recorded, "The city officials and the management of the water company proved immune to the strongest criticism administered in the most heroic doses. They stood together."

The physicians were successful, however, in getting a Territorial Board of Health established to advise the legislature on health laws, administer any laws that might be passed and enforce health regulations. The measure establishing the board was enacted by the Council and House of Representatives of Colorado Territory and signed into law by Governor John L. Routt on Feb. 10, 1876.

The act directed the board to study the vital statistics of the territory; study the influence of the climate upon disease and health in different localities in the territory "for the benefit of the citizens thereof, as well as for the large number of invalids who seek relief in Colorado"; make sanitary investigations and inquiries respecting the cause of disease; and recommend standard works on the subject of hygiene for the use of the schools of the territory. The act also provided for the

appointment by the governor of nine board members, all physicians, and it appropriated \$500 for the board's annual expenses. It did not, however, empower the board to enforce public health rules and regulations.

Members of that first board were Drs. F. J. Bancroft, Denver, president; H. A. Lemen, Denver, secretary; A. V. Small, Trinidad; T. G. Horn, Colorado Springs, W. Edmondson, Central City; T. M. Smith, Fort Collins; R. J. Collins, Georgetown; T. N. Metcalf, Del Norte; and W. H. Williams, Denver.

The board's first report, covering a seven-month period ended Sept. 30, 1876, showed expenditures of \$44.40 for office supplies. The remainder of its appropriation was used to publish the "annual" report. It called to the attention of the authorities and the public its lack of funds:

"When the populace can be persuaded that it is economy to learn and practice the laws of health, appropriations of money to assist them in the attainment of such ends are readily obtained; they become not only willing but anxious to sustain Boards of Health having almost unlimited powers.

"Many of the older communities of the world so fully realize the fact 'that every death implies a total average of 730 days of sickness,' and a consequent curtailment of the wealth of the community in which it occurs proportionate to the productive value of the services of the deceased, that they readily appropriate from the public treasury the comparative pittance required to carry on the work of efficient Boards of Health.

"How much more necessary for our own state, whose 'stock in trade,' to the extent of millions of dollars, is her reputation for salubriousness?

"How important that definite information in reference to the healthfulness of our favored region be heralded to the famishing health seekers of the more populous portions of the new world, as well as the continent of Europe?

"The extent to which this information will be furnished, as well as the rate, will depend largely on the amount the state invests in enterprises calculated to secure and disseminate reliable information, not only among its own inhabitants, but throughout the length and breadth of the land, on such and kindred topics as have already been selected for study."

## The World's Sanitarium

The Board need not have been concerned that Colorado's salubriousness might go unproclaimed.

"No portion of the health frontier, with the possible exception of southern California, received greater nationwide publicity after the Civil War than Colorado," Billy M. Jones wrote in "Health Seekers in the Southwest, 1817-1900."

"By 1876," Jones recorded, "Colorado was being flatteringly referred to as 'The World's Sanitarium.'"

Sufferers of assorted ailments were flocking to the territory, but for tuberculars and asthmatics, it had become a mecca.

Sagendorf, who arrived by ox team in Denver on Nov. 6, 1858, was a victim of tuberculosis. According to Jones, Sagendorf had been so ill that "boards were carried in the bottom of the wagon to build a coffin for him, as it was generally believed by the others in the caravan that he would die before reaching the new country. He not only recovered but spent the remaining 54 years of an 86-year life span in helping to build up Denver. He was the first secretary of the Auraria Town Company and later was instrumental in consolidating Auraria and Denver."

The contributions of scores of others, who, like Sagendorf, came to Colorado to recover, were responsible for much of the development of the state.

In addition to dealing with matters of climate in its first report, the Territorial Board of Health also called attention to the mineral springs of Colorado - another major factor in the territory's appeal to the ailing.

Dr. T. G. Horn, a member of that first Board, made an extensive report on the mineral springs of Colorado, conceding, as he did so, that he found the "greatest difficulty" arriving at the real value of the use of medicinal waters:

"It is impossible for us to say how mineral waters act, yet this is no objection to their use, for how many drugs do we use daily without a knowledge of how they act? Yet they do act, and just as we want them. Another objection is, that like patent medicines, they are highly recommended for all diseases that humanity is heir to, while ignorance prevails as to their composition. This may be true to some degree, but while it is a fact that the medicinal virtues of many springs are overestimated by owners, and that they do contain elements unknown to the profession, they are in no way more so than many of our best remedies of the present day."

In glowing rhetoric, Horn concluded:

"Our state abounds with mineral springs, and that of the most beneficial known to humanity. Add to this our pure mountain air, our beautiful scenery, level roads, cool, refreshing nights, and we can only conclude that God, in his wisdom, created Colorado and endowed her with all the prerequisites to make her a paradise for diseased humanity: for young as we are, and as little as we now know in regard to the curative effect of our springs water and climate, yet there is no part of this state not especially adapted to the relief of some particular disease."

Horn's impression that Colorado was a panacea for illness was widely shared.

In 1880, Dr. Samuel Edwin Solly of Colorado Springs, himself a tubercular who had come to Colorado to recover, estimated that one-third of the state's population had migrated to Colorado to seek health for themselves or their families. (One of the more famous of those was the legendary John H. (Doc) Holliday, who died of tuberculosis at Glenwood Springs in 1887.)

### Authority Lacking

When Colorado was admitted to statehood on Aug. 1, 1876, the Territorial Board of Health went out of existence. Its successor - the first State Board of Health - was established by act of the first General Assembly on March 22, 1877, and charged with the collection and study of vital statistics as a means of determining the causes of illness and death, the control of epidemics and contagious disease, and advice on proper sources of water supplies and places of sewage disposal.

But the fledgling State Board was hampered by the same drawbacks which curtailed activities of the Territorial Board - lack of authority and lack of funds. The Board, in reality, was little more than a discussion group.

It tried to collect vital statistics with scant success. Many physicians considered the reports to health officials a nuisance - an attitude, unfortunately, which still is evident. The collection of statistics in 1877 also was difficult because of the sparse population in many areas of Colorado and the peripatetic tendency of both physicians and their patients.

Nevertheless, the Board did issue a partial mortality report for 1877, the first official vital statistics report issued in Colorado. It gave these 12 principal causes of death in Denver in their order of frequency:

|                  | Number | Per Cent |
|------------------|--------|----------|
| Consumption      | 63     | 24.7     |
| Diphtheria       | 20     | 7.8      |
| Scarlet fever    | 14     | 5.4      |
| Pneumonia        | 14     | 5.4      |
| Diseases - heart | 13     | 5.0      |

|                        |    |      |
|------------------------|----|------|
| Diarrhoeal diseases    |    |      |
| (five years and under, | 10 | 3.9  |
| 8; over five years, 2) | 6  | 2.3  |
| Typhoid fever          | 6  | 2.3  |
| Diseases - kidney      | 6  | 2.3  |
| Infantile convulsions  | 5  | 1.9  |
| Puerperal diseases     | 5  | 1.9  |
| Croup                  | 4  | 1.5  |
| Congestion of lungs    |    |      |
| All other diseases,    |    |      |
| including 7 cases of   |    |      |
| old age between 70 and | 89 | 34.9 |
| 97 years of age        |    |      |

In addition to the 255 deaths, the Board listed 373 births in Denver during the same period but explained the number was "very deficient because the same checks cannot be enforced."

The Board also reported on a smallpox epidemic which swept the southern portion of Colorado in 1877. Using information obtained from Catholic priests in Trinidad and Walsenburg, the Board reported:

"The smallpox visited in severe form the counties of Las Animas, Huerfano, and Costilla, with a fatality of one death to every 23 inhabitants in Las Animas County; one death to every 10 inhabitants of Huerfano County; and one to every 16 of its inhabitants in Costilla County; footing up 844 deaths in the three counties."

The Board's next epidemic report covered an outbreak of typhoid fever in Denver in the summer and fall of 1879, and also in 1880. In 1879, when Denver's population ranged from 33,000 to 35,000, an estimated 1,200 cases of typhoid fever occurred. The disease also was prevalent the following year, but only half as many cases were estimated.

"The total number of death certificates returned to the city physician declaring typhoid fever to be the cause of death was 40 for 1879 and 57 for 1880 to October 20th," the Board reported. "That functionary, however, declares it to be his opinion that the returns of the deaths for the year 1879 were very imperfect...."

The Board blamed the epidemic on foul air, filth-sodden soil and polluted water. It contended that the contents of both cesspools and privies were escaping into the surrounding porous soil and sand, thus contaminating the earth, the air and the well water alike.

A high incidence of typhoid fever was to plague Denver and Colorado for another 50 years and give the state "a black eye" on the public health countenance.

## Frustrations Continue

The State Board of Health, like the predecessor Territorial Board, realized quickly that a \$500 annual appropriation was barely enough to carry out its routine work. In 1880, however, it voted to pay its secretary, a physician member of the Board, \$100 a year from that allocation. F. J. Bancroft thus became the first paid public health employee in the state service.

The frustration of trying to control disease, gather statistics and make meaningful recommendations on so niggardly a budget and without authority gradually eroded the board. One by one, the members quit. Meetings were discontinued after the state auditor refused to approve vouchers - a stubborn practice that was to demoralize health workers and hinder operations throughout the ensuing years. Only two Board members remained in 1885, and when their terms expired on June 31, 1886, the Board ceased to exist.

In 1892, Mayor Platt Rogers of Denver named Dr. H. K. Steele as the city's health officer. With the help of two assistants, Henry Sewall and W. P. Munn, Steele started a hospital for persons with communicable disease. Colorado's first public hospital had been established in Denver in 1860 by a former city health officer, Dr. J. F. Hamilton. It was in operation, however, only until he joined the Army a year later.

The first private hospital in the state - St. Joseph's - was established in Denver by the Sisters of Charity in 1873. In 1890, the state's first tuberculosis sanitorium - a forerunner of today's world-famous National Jewish Hospital - opened in Denver.

Sporadic outbreaks of cholera had occurred in Colorado, but the fear of a nationwide epidemic in 1892 was responsible for the appointment of the next State Board of Health in September of that year. Asian cholera had been carried into the port of New Orleans and reportedly was spreading. Colorado citizens wanted someone to be responsible for quarantining persons suspected of carrying the infection into the state.

The public soon learned, however, that the new Board, shackled by inadequate laws, lacked the power to quarantine cholera suspects or anyone else with a contagious disease.

Physicians and other concerned citizens drafted two public health measures late in 1892. One was to create and empower local boards of health, and the other was to create a State Board of Health and define its powers and duties, make an appropriation therefor and provide for the punishment of violations thereof. An annual budget of \$5,000 was proposed, but that amount was cut in half and earmarked for emergencies only when the bills were passed in 1893.

The new Board of Health - the state's third - was appointed in April, 1893. The only funds available for its operation, except in health emergencies, were those collected from fees and for embalmers' examinations.

The Board was successful, however, in 1895 in establishing a small laboratory in cooperation with the City of Denver in City Hall, primarily to do diphtheria culture work. (The first antitoxin for the treatment of diphtheria had arrived in Denver in November, 1894.) Health officials examined the throats and noses of children attending public institutions. If they harbored diphtheria germs, they were denied admission. A total of 1,487 examinations were conducted during the laboratory's first year of operation. Denver recorded 224 cases of diphtheria in 1895.

Public apathy took its toll of the third Board, as it had previous bodies dedicated to the public health. By 1900, four members had resigned because they were unable to support a health program under the existing laws and with inadequate funds. Replacements were named, and the Board continued.

Late in 1900, the Board hired its first employees - a stenographer and a clerk to compile vital statistics. The following year - 1901 - the Board issued its first complete mortality report, which indicated 1,303 deaths from tuberculosis for the year, 333 from typhoid fever, 316 from scarlet fever and 212 from diphtheria.

Outbreaks of typhoid - frequently traced to contaminated drinking water - were a source of continuing concern to the Board. There was virtually no bacteriological purification of the water supply, even in the principal city of Denver. Dr. William C. Mitchell, who later was to serve as bacteriologist for the State Board of Health, was instrumental in 1903 in getting the Denver Union Water Company to adopt the slow sand method of filtration. The city later added a copper sulphate solution to destroy algae and other fungi. Still later, the Denver water was treated with calcium hypochlorite and liquid chlorine. The result of each sanitary improvement was a consistent lowering of Denver's typhoid death rate. Denver was to lag for another 60 years, however, in providing an adequate sewage disposal system.

## The Welcome Cools

About 1900, it was discovered that tuberculosis is a communicable disease, and the climate started to lose its appeal as a major therapeutic factor in control of the disease. Rumors abounded that Colorado was considering quarantining tuberculars. An editorial in the Jan. 25, 1902, edition of the Journal of the American Medical Association, repeating the rumor, prompted a retraction request from the State Board of Health. The Board's statement said, in part:

"We hereby certify on our honor as professional gentlemen that, so far as we are aware, no member of the Colorado State Board of Health ever proposed the subject of preventing tubercular persons entering the state... that on the contrary, in February, 1900, the Colorado State Board of Health issued a circular containing the following: 'That this climate has saved the lives of many who have come early cannot be doubted. There is no need to talk of quarantining against consumption. Such a course is both unnecessary and impracticable. Doubtless, many persons with advanced tuberculosis should not be sent here, but for those who can be benefited by coming, Colorado should have nothing but a warm welcome.'"

Despite the Board's sentiment, the welcome apparently started to cool. Jones recorded that the tuberculars were "rejected as the unwelcome bearers of a lecherous bacteria."

Dr. Henry Sewall dealt with some of the problems created by Colorado's tuberculous population, estimated in the early 1900's at from one-fifth to one-third of the total:

"Let fame pronounce a locality as curative for tuberculosis, and at once invalids flock there and, ere long, that place becomes a hot-bed of the disease, and dangerous for well people to visit. There has been no deterioration of the climate, but the lack of sanitary care of the agents of infection has proved that geographical location is but a minor factor in determining the origin and course of the disease. All municipalities which have a reputation for the amelioration of tuberculosis have to meet the problem of caring for poverty-stricken consumptives who have emigrated from various parts of the country with barely more financial means than sufficient to pay the railway fare. The charitable organizations of Denver, at least, have been burdened greatly by this class of cases."

Concern for the social welfare aspects of tuberculosis, to which Sewall alluded, rather than the public health aspects was to dominate the consideration of tuberculosis in Colorado for years to come.

As the medical profession increasingly prescribed bed rest for tuberculosis patients, tuberculosis hospitals were placed in operation throughout the state. At one time, there were 17 such hospitals.

## Awareness Brings Duties

On April 8, 1901, the State Board of Health reported that every county in the state had a physician as health officer. A good bit of the health officers' time was consumed in promoting immunizations and trying to enforce quarantines. Scarlet fever, smallpox, diphtheria and typhoid were prevalent in many areas.

In 1902, an order of the Montrose County Board of Health, requiring the vaccination against smallpox of all school children, was challenged in the courts, and the judge ruled against the health board. The State Board of Health recommended to the State Superintendent of Public Instruction that all pupils be immunized before being permitted to attend school. The recommendation - without the force of law - was largely ignored. Finally, in 1906, after an outbreak of smallpox at Victor, the local school board issued compulsory vaccination orders. That edict also was challenged in the courts, but it was held reasonable and proper. Since then, local officials have been able to compel immunizations in the public schools of Colorado.

By 1904, the State Board of Health had five employees, and the payroll totaled \$375 a month.

In 1907, the General Assembly created and funded a pure food division under jurisdiction of the Board, and it also authorized a state system of birth and death registration. The vital statistics function was not funded, however, until 1910, by which time the Board's staff had increased to 13 employees.

Gradually, as it became aware of problems, the legislature gave additional authority to the Board to protect the public health.

In 1909, the Board was charged with the inspection and licensing of hospitals, dispensaries and sanatoriums, and an upgrading of standards began for those institutions.

About the same time, mounting concern over tuberculosis in the state led to: (1) the organization of the Colorado State Committee for the International Congress on Tuberculosis, the first of five names by which the organization was known before it finally became the Colorado Tuberculosis Association 10 years later, and (2) the passage of legislation abolishing public drinking cups and compelling tuberculosis registration.

The TB Association, which by 1912 had broadened its scope to fight all communicable diseases, played an important role in the development of public health in Colorado. It sponsored many activities for the betterment of the public health, including health crusades and traveling clinics, and it laid the framework for public health nursing services in the state.

In 1913, the TB Association, in cooperation with the State Board of Health, conducted the first concerted educational campaign to call attention to the contamination of Colorado's waters.

The Board and the State Health Department kept up their antipollution efforts and sought statutory authority to fight pollution repeatedly over the ensuing years, but it was not until 1966 that the General Assembly finally passed a comprehensive water pollution control law, and then it vested control in a separate commission.

The Board of Health was composed only of physicians until 1916, when two lay members were appointed to the Board. By that time, the Board had five divisions - vital statistics, medical inspection, bacteriology, chemistry, and food and drugs.

Five other divisions were created in the next 19 years, these being: plumbing inspection (1917); venereal disease (1918) changed to social hygiene (1925); public health nursing (1922) enlarged to child hygiene and public health nursing (1925); sanitary engineering (1925); and administration (1925). Also in 1925, medical inspection was changed to epidemiology.

In 1922, Denver experienced a smallpox epidemic. Mitchell described it:

"What started as a mild epidemic... soon became a veritable conflagration. There were not enough nurses to take care of the cases. In the year 1922, there were 270 deaths from smallpox in Denver. Smallpox cadavers were piled high in some of the rooms of the County Hospital, and finally the U. S. Government detailed Dr. Thomas Parran to come to Denver to take charge of the situation."

The State Board of Health also was confronted with the problem of venereal disease in the state. As early as 1893, the exploitation of persons with venereal disease had become of such great concern that the legislature passed a measure prohibiting "the advertisement of substances to cure private diseases, prevent conception or produce abortion."

On Feb. 7, 1916, the Board passed a regulation making venereal disease reportable by physicians. Names and addresses of the patients were not required, and the Board had little success fighting VD. In 1918, the legislature created a venereal disease division and empowered the Board to promulgate regulations covering all phases of VD.

The legislature also passed legislation creating a 28-bed state detention home for women infected with venereal disease. The home operated from April, 1920, to October, 1925, when it closed because of lack of funds.

The division of venereal disease operated free VD clinics at various locations in the state until 1933 when appropriations for the division were stopped. Venereal disease control was not resumed until 1937.

Today, Colorado's venereal disease statutes are considered among the most progressive in the nation, but public health officials still encounter the incomplete reporting which plagued them in 1916. Colorado is one of 14 states with laws permitting physicians to treat minors for VD without parental consent, that provision having been added to the statute in 1967.

## Nursing Services Established

Public health nursing was initiated in Colorado on Nov. 7, 1889, when a group of women volunteers, known as the Denver Flower Mission, organized to visit Denver's sick. They hired two nurses in 1892, and a third in 1905 and incorporated as the Visiting Nurse Association.

In the period 1921 - 1925, the Colorado Tuberculosis Association established public health nursing services in 11 counties and also participated in traveling clinics, which started operation in 1922 under funds provided by the federal Sheppard-Towner Act of 1921. Other participants were the State Board of Health, University of Colorado Extension Division, Colorado Welfare Bureau and Colorado State Dental Association.

Colorado was a forerunner in using the traveling clinic concept, and the clinics were tremendously successful. They reached virtually every county in the state with a program which included a conference on child welfare, public health and community problems; free physical examinations of children, particularly those of pre-school age; and exhibits on child welfare and public health.

The American Red Cross also was a leader in the establishment of public health nursing services in Colorado. It had organized a chapter in each of the state's 63 counties during World War I, and the financial resources of these local chapters were used to provide public health nursing after the war ended. Rather than limiting its activities to treatment of the sick poor, as had been done in the past, the Red Cross concentrated on the prevention of sickness. This generalized nursing service was known as the Town and County Nursing Service.

As the TB Association and the Red Cross exhausted their funds, local sponsors assumed the cost of public health nursing services. These included county commissioners, school boards, women's groups and the like.

In 1925, the State Board of Health named its secretary and executive officer, Dr. S. R. McKelvey, to head a newly-created Division of Administration. But a gubernatorial veto of the Health Department's appropriation left him without funds except for travel and incidental expenses.

On Jan. 30, 1928, an outbreak of meningococcus meningitis in Longmont, Lafayette, Louisville, Superior, Erie, Frederick, Firestone and Dacona precipitated a State Board of Health order banning all public gatherings, closing schools and placing the Columbine Mine and the Town of Serene in Weld County under strict quarantine and isolation. It marked the first time the Board had taken such drastic action.

The Great Depression depleted the public health nursing ranks and stifled other badly-needed public health services. By 1935, only 17 counties had public health nursing services.

The Depression also caused the demise in 1932 of the state's first organized health department - the Otero County Health Department which had been organized in 1924 under the auspices of the International Health Board, in cooperation with the Board of County Commissioners.

The Otero unit was reestablished in February, 1938. Twelve other local units, serving 85 per cent of Colorado's population, have been organized since then. These include Weld County, 1938; El Paso City-County, 1939; Denver, 1939; Las Animas, 1944, enlarged to Las Animas-Huerfano, 1951; Tri-County, 1948; Northeast, 1948; San Juan Basin, 1948; Mesa

County, 1949; Pueblo City-County, 1952; Boulder City-County, 1954; Jefferson County, 1958; and Larimer County, 1968.

In 1933, the Colorado Administrative Code changed the name of the State Department of Health to the Division of Public Health, with control remaining in the State Board of Health.

## Sewage and Filth Diseases

Sewage disposal continued to rank as a major public health problem in Colorado, with most of the cities and towns brazenly dumping untreated sewage into the rivers and streams.

Denver was among the worst violators, creating an open sewer of the South Platte River whose waters were used downstream to irrigate fruit and vegetable crops.

Through efforts of women's clubs and the Denver Medical Society, the citizenry finally was aroused in 1934 and passed a \$3 million bond issue to correct the sewage problem. Half of that amount was to be used to divert Western Slope water for use as a dilution factor. The rest of the money was used to build a magnetite type filter plant, which became operational in 1937.

Denver's grandiose plan didn't work out as anticipated. The diversion water ended up in Clear Creek and never got over to the sewage plant for dilution. And the first of the revolutionary type filters clogged up within a year. By 1941, the new plant had failed to operate properly, leaving the city with only inadequate primary sewage treatment just as its population started to mushroom.

The seriousness of the sewage situation had been graphically portrayed in October, 1934, by some deplorable statistics made public by Dr. Edward N. Chapman of Colorado Springs.

Dr. Chapman pointed out that 3,500 children under the age of two had died in Colorado in the 11-year period 1924-1934 from diarrhea alone.

"These dead babies would populate a town the size of Montrose," he wrote in "Colorado Medicine."

"A child born in Colorado between 1929 and 1931, in a county having our average death rate, faced five times the chances of dying from diarrhea that he would have faced had he been born in the average Nebraska county."

Now, Colorado started receiving publicity far different from the glowing accounts of former years on the climate and the mineral springs.

A "New Republic" editor, Bruce Bliven, wrote a scathing editorial in his nationally-circulated magazine, which said:

"That Colorado is indeed a pleasant land, everyone who has been there is glad to testify. As a vacation resort, however, its merits need to be described with a certain amount of qualification. For the painful truth is that Colorado's health record is a shockingly bad one, and it is still more painful to confess that this bad record is the fault of her own citizens.

"Colorado has an extraordinarily high incidence of so-called 'filth diseases,' and there is the best reason to believe that this is because nearly all of her chief cities refuse to install proper sewage disposal plants.

"As a result, sewage from these cities (and conspicuously from Denver, which contains one-quarter of the state's population) gets into the rivers of the state. Water from these rivers is used in irrigation; vegetables are polluted, and are then eaten....

"Reports of the U. S. Public Health Service and of a special committee of the Colorado State Medical Society confirm each other in every particular in indicating that Colorado has an inexcusably bad record

in regard to filth diseases. In the years 1920-29, for example, there were 8.2 deaths from typhoid fever per 100,000 population in Colorado and only 6.6 deaths in the entire public health registration area of the United States, although general conditions in Colorado are such that its health record ought to be better than average.

"Filth diseases are particularly hard on children, which perhaps explains why the infant mortality in Colorado in 1929 was 91.3 per 1,000 live births and only 68 throughout the rest of the registration area. Deaths from diarrhea and enteritis among babies under two years of age were 37.9 in Colorado and only 29.7 elsewhere. The infant mortality rate in this state is reported to be 80 per cent higher than in Kansas, 36 per cent higher than in Wyoming, 64 per cent higher than in Utah and 92 per cent higher than in Nebraska.

"Of 68 large cities in the United States, 48 have a lower typhoid death rate than has Denver. It is noteworthy that each year widespread attacks of diarrhea and dysentery begin just about the time that Colorado-grown vegetables reach the market. So seriously do the federal authorities view the situation that they have even considered refusing to permit the interstate transportation of Colorado-grown vegetables. Incidentally, it should be noted that the supply of domestic drinking water in Colorado is considered good, and that no relationship has ever been traced between the state's milk supply and the annual outbreaks of diarrhea and dysentery."

Meanwhile, state health officials were striving to get Denver to clean up its sewage. On Aug. 15, 1932, they met with health officers and county and city officials from Morgan, Weld, Adams and Denver counties to discuss the irrigation of vegetables with untreated sewage. Two months later, on Oct. 19, 1932, a committee of the Board met with Mayor George D. Begole of Denver regarding the pollution of the Platte by Denver sewage.

Considerable public awareness of stream pollution was achieved but no remedial action. Finally, on Oct. 26, 1934, the Adams County district attorney filed suit, seeking an injunction against the City of Denver to abate the public sewage nuisance. The State Board of Health resolved to "render all honorable and reasonable support in the legal move."

Continued pressure resulted in a favorable vote on a municipal sewage disposal plant in Denver, but the problems didn't end there. A burgeoning population and inadequate treatment facilities continued to plague the Capital City until March, 1967, when a \$17 million Metropolitan Denver Area Sewage Disposal plant was put into operation.

Denver was the first of many cities against which the State Board of Health threatened to bring action, or did bring action, in the slow, laborious effort to clean up Colorado's rivers and streams.

By the time the State Water Pollution Control Commission assumed authority over both domestic and industrial wastes in 1966, more than 97 per cent of Colorado's population served by some form of sewage collection system was being served by secondary (or complete) treatment facilities. The achievement was outstanding and placed Colorado well ahead of most states.

## Little Thought to Prevention

The Board's accomplishments in water pollution control - as in all other areas of public health - were achieved by plodding and perseverance, usually without either public support or public funds.

Coloradoans generally gave little, if any, thought to the concept of prevention. For years, they considered public health a charity function - and little more.

Until passage of the Social Security Act in 1935, the State Board of Health operated much as a skeleton organization. Little health work was accomplished in the state other than the handling of routine office matters by a very small staff.

Dr. C. E. Waller of the U. S. Public Health Service, who did a survey of public health in Colorado at the request of the Board in 1930, pointed out that the divisions had been created one at a time as a particular interest developed in an activity. He said:

"While numerous agencies and organizations have interested themselves in various phases of public health activity within the state, the development of official facilities and functions has been based upon expediency rather than upon a well planned program evolved through careful study of the public health needs and resources of the state.

"Public health functions have been distributed here and there among various state departments and institutions with the result that no less than seven different official agencies are now doing some health work on a statewide basis.

"As would be expected, there has been thus created a situation in which overlapping, duplication, lack of coordination, and improperly balanced programs are preventing the state from realizing full value for the amount being expended for the protection of the public health."

Waller advocated a strong health department and the centralization in it of all functions relating to the protection of the public health. He also recommended that county health work be subsidized by the state.

The fragmentation of which Waller spoke continues to exist to some extent, and the subsidization of county health work remains a knotty problem with which health officials and state legislators still struggle.

Tuberculosis control was a good example of an area of overlapping. In 1935, a Division of Tuberculosis Control was organized in the State Department of Public Welfare. Welfare's primary responsibility was to provide hospitalization for welfare recipients with tuberculosis, and the Tuberculosis Assistance Act provided a \$50,000 annual appropriation for that function.

A Division of Tuberculosis Control was established in the Division of Public Health two years later - in 1937. At that time, public health assumed all other tuberculosis control activities but with only limited initial success inasmuch as many persons considered tuberculosis control a relief program rather than a public health program.

The two agencies went their separate ways in tuberculosis assistance and control until 1962, when they reached agreement on a coordinated Tuberculosis and Assistance Control Program with unified direction, correlated personnel and a single office in the State Health Department building. A single physician now heads both the tuberculosis control and tuberculosis assistance efforts.

Colorado has made outstanding progress in tuberculosis control since the days of Andrew Sagendorf and the other health seekers. As of Dec. 31, 1968, all of the state's known active tuberculosis cases were on drug therapy, ranking Colorado first in the nation in this category of care of tuberculosis patients. The national average of known active tuberculosis cases on therapy is about 55 per cent. The total number of persons on the Colorado tuberculosis case register as of Dec. 31 was 2,026. Of that number, 1,884 were at home (133 of which were active cases), 115 were hospitalized for tuberculosis and 27 were inactive cases in an institution for another reason.

## A Political Football

The Social Security Act of 1935 made federal funds available for health and sanitation work in the state, and Colorado, under the leadership of Dr. Roy L. Cleere who on March 4, 1935, had been named secretary of the State Board of Health and executive officer of the State Division of Public Health, moved quickly to take advantage of the federal funds.

In 1935, the Division had a total appropriation of \$40,000 and 14 employees.

In 1936, funds were allotted for maternal and child health work and crippled children's services. Public health nursing had been a function of the State Division of Public Health since 1922, but now, with additional funds, it became a viable function. There were 79 public health nurses in the state in 1936. By 1939, that number was to increase to 180 - 80 of whom were employed by the State Board of Health.

In 1937, funds were provided to hire sanitarians for the control of milk and milk products - an area which before then had been badly neglected.

Entrance into the milk sanitation area also marked the beginning of a long, running battle between Dr. Cleere and the State Civil Service Commission.

Civil Service tried to force upon the Board a milk inspector Dr. Cleere felt was unqualified, and he refused to hire the inspector. Civil Service then withheld certification of the July, 1937 payroll for the entire Division of Public Health.

It was only the first of many bouts with Civil Service over Dr. Cleere's insistence that staff members had to have public health qualifications to serve in his department.

The Denver Post of Sept. 1, 1937, reported:

"A showdown in the political fight which is raging over control of the Colorado State Board of Health was forecast for Wednesday night when the city hall-statehouse machine is expected to make another attempt to oust Dr. R. L. Cleere as secretary and executive officer. He heads an administrative setup with great patronage possibilities and the expenditure of \$322,000 a year."

The hassle stretched into 1940, and finally on Nov. 8 of that year, the Civil Service Commission accused Dr. Cleere of contumacy, said he was not in the classified service and held he was not entitled to a pay check.

Loyal allies, including the Colorado Medical Society, came to the physician's defense.

On Jan. 12, 1941, District Judge Henry A. Hicks ruled that the Commission had no power to cancel Dr. Cleere's provisional appointment, but he didn't get back on the payroll until Feb. 27, when the Commission finally dismissed the ouster action.

He was not certified to his post until Nov. 7, 1946, after topping five applicants in competitive oral and written exams for executive director of the State Health Department.

Politicians were to look on the Health Department as a "political football" until passage of the Sabin Health Laws in 1947.

Meanwhile, the State Board of Health continued to cope with the growing concerns of public health as best it could.

In 1937, the first dentist was appointed to the Board, and in 1941, a Dental Health Division was created to promote the fluoridation of public water

supplies and good dental health and to provide dental and orthodontic care to indigent children.

The gradual addition of subdivisions over the years had created this breakdown of function in the Division of Public Health by 1941: administration, epidemiology, sanitary engineering, food and drugs, laboratories, vital statistics, plumbing, maternal and child health, dental health, tuberculosis control and public health nursing.

State health laws and amendments enacted over the years have included: communicable disease control - 1893; vital statistics - 1908, 1912, 1967; tuberculosis control - 1893, 1967; venereal disease control - 1918, 1967; plumbing - 1919; food and drug - 1919; sanitary engineering - 1919; restaurant inspection and licensing - 1935; sewage effluent - 1959; radiological health - 1965; mandatory testing for phenylketonuria (PKU) - 1965; air pollution control - 1966, 1967, 1968, 1969; water pollution control - 1966, 1967, 1968; solid wastes disposal - 1967; and pet shop and kennel licensing - 1967.

The State Legislature also has enacted measures establishing two divisions within the State Health Department - the Division of Alcoholism in 1961 and the Division of Water Pollution Control in 1966. In addition, several legislative measures have provided for the appointment by the governor of advisory committees to the Department, such as the Radiation Advisory Committee and the State Health Facilities Advisory Council. Similarly, legislation resulted in the creation of the Air Pollution Variance Board.

In 1941, the Colorado legislature reorganized the state government through passage of a measure known as the Administrative Code of 1941. Under this act, the Division of Public Health became a division of the executive branch of the government under the direct supervision of the governor. The secretary

of the State Board, Dr. Cleere, became the executive officer of the Division of Public Health.

The period during World War II was one of trying to maintain the status quo as manpower demands for the military and defense effort caused an acute shortage in the ranks of health workers. In Colorado, health officials stepped up venereal disease surveillance and maintained a close liaison with both the military forces and industry on VD, occupational health and other matters.

The war did tend, however, to have a salutary effect on public health. Many Coloradoans who were called to active duty during the conflict were exposed to modern sanitary methods and became aware, for the first time, of the importance of good sanitation practices.

They, along with many post-war newcomers to Colorado, who came from established eastern communities with adequate health facilities, formed the nucleus of a population starting to become health-oriented.

## The People Win

The turning point for public health in Colorado came late in 1944 with the appointment of Dr. Florence Rena Sabin, a 74-year-old retired physician, as chairman of a Subcommittee on Health of the State's Post-War Planning Committee.

Dr. Sabin had been an eminent scientist - one of the first women to earn an MD from Johns Hopkins University and the first woman member of the Rockefeller Institute for Medical Research. But her appointment was not made for that reason. It was a happenstance, instead.

Governor John Vivian had established the Planning Committee, with a number of important subcommittees, to get the state moving again after the static period of World War II. He had not included a subcommittee on health on his list or a woman among his appointees - an oversight called to his attention by the late Frances (Pinky) Wayne, a Denver Post reporter and a fervent feminist. Miss Wayne not only badgered the chief executive to add a subcommittee on health, but she also insisted upon the appointment of Dr. Sabin to head it.

Elinor Bluemel, in her "Florence Sabin - Colorado Woman of the Century," recorded that Vivian's advisors assured him Dr. Sabin wouldn't give him any trouble - that she was a nice little old lady who'd spent her whole life in the cloister of the laboratory.

Assured that the pleasant woman in the old-fashioned clothes would "upset no applecarts," the governor appointed her to the unpaid subcommittee post.

The appointment, however, was to mark the beginning of a lot of "upset applecarts" and a new era for public health in Colorado.

Dr. Sabin was aware that before she could launch her campaign for public health, she would have to have documented evidence of conditions in Colorado. She persuaded the governor to ask for a health survey of the state, the American Public Health Association (APHA) to make the study and the Commonwealth Fund to foot the bill.

APHA assigned Dr. Carl E. Buck to the study, which proved to be an eye-opener. He studied and analyzed vital statistics and arranged the data until it told a vivid story of Colorado's glaring deficiencies. For example, 47 states had lower death rates from scarlet fever, 44 lower death rates from diphtheria, 43 lower death rates from diarrhea and enteritis, 43 lower death rates from pneumonia, 42 lower death rates from rheumatic fever and 42 lower infant mortality rates.

Buck estimated that 8,245 deaths from preventable and controllable causes in the period 1940-1944 could have been prevented had existing knowledge concerning preventive medicine and health protection been universally applied throughout Colorado. Those 8,245 persons who died needlessly in the five-year period represented almost three times the 2,699 Coloradoans who had died or were missing in World War II.

Buck pointed out that the state was contributing to public health less than 10 cents per capita, and the state allocation for health amounted to only 14 per cent of the total health expenditures.

And his report was blunt about the political machinations of the Health Department. He said:

"Unless public health can be freed from politics by establishing a real State Department of Public Health and by completely reorganizing the State Civil Service System, there is little hope of improving Colorado's none-too-enviable health record. Public

health is altogether too important to the people of any state to have it so placed in the government as to be so completely susceptible to political machinations and maneuvering."

Buck labeled the Civil Service Commission "a formidable barrier to the procurement of good people and a disgrace to the state."

The Buck report was not destined to gather dust on a shelf. It was all the ammunition Dr. Sabin needed. She wasted no time letting Coloradoans have both barrels.

On March 29, 1946, Dr. Sabin invited 59 of the state's leading citizens to dinner at the Brown Palace Hotel to kick off her campaign to elevate the low status of health in Colorado. She announced that out of 20 major causes of death in the United States, Colorado exceeded the national average in 13 causes, and the purposes of her committee would be to lower that rate to the national average.

The dinner meeting was the first of many which Dr. Sabin called to discuss health and for which she usually picked up the tab. One time she invited the Civil Service Commission to discuss the need for adequately trained professional health personnel; the next time it was the dairy interests to talk about the mandatory vaccination of herds and the pasteurization of milk; then the tuberculosis groups came to exchange ideas on a 100-bed tuberculosis hospital or wing to be related to Colorado General; the sanitary engineers broke bread with the Sabin committee and discussed adequate sewage disposal.

William F. McGlone, Denver attorney, who later was to become president of the State Board of Health, was a member of Dr. Sabin's executive committee.

Dr. Sabin later explained the purpose of her dinner meetings in an article, "The People Win for Public Health in Colorado":

"At each meeting we invited guests who were either groups that would be affected by the proposed development of health services, or experts who could help us with special knowledge and advice. Thus, we planned to forestall opposition in advance....

"One of the outstanding achievements of the program was the full cooperation that was won between the State Medical Society...and the Public Health Services. Two members of the Public Policy Committee of the State Medical Society became members of the health committee and made a liaison between the two groups. We finally presented common bills to the legislature, jointly drawn and jointly sponsored. Indeed the Medical Society gave up its tax exempt status and increased its dues that it might support an active lobby.

"Another important success in our health program is that we have won the support of the Dairy Industry for health inspection. Like the dairy groups in some other states, our group had long feared and fought health inspection of their industry. We had many conferences with them, indeed initiated by their inviting me to a luncheon where I proved a bump-tious guest by asking them why they fought us and by asking one of their number to join the health committee. He gave us much help and we had conferences with members of the Dairy Association, with all the experts on the subject of milk in Colorado, both from the federal and state groups. We came to full agreement on the need for higher standards and improved practices for production and processing of milk and milk products, but the Dairy Industry wanted to have it

designated by law that a dairyman must be on the Board of Health to represent their industry. We refused to accept the principle of representation by any group by law, and much to their surprise, we won our point in the legislature. We did not oppose the idea that the Governor might choose a dairyman-for the Board of Health, and indeed he did appoint both a producer and a processor and now the State Department of Health and the Dairy Industry will work together with good will to a common purpose. I find this an interesting example of a method of dealing with a controversial issue of long standing; namely, extended discussions to determine all the many details on which adjustments can be made, and the very few, or even one principle which is judged too critical for compromise."

In addition to winning over the vested interest Dr. Sabin took her fight to the people after the Buck recommendations had been translated into eight specific legislative bills - five establishing services for health and making appropriations therefor and three for the control of specific diseases.

One of the most important of the measures draft for the 1947 legislature created a new Department of Public Health, taking it from the administrative branch of state government and establishing two divisions - the State Board of Health as the advisory, consultative and judiciary branch, and an executive division consisting of the state health officer and his staff.

Another important measure was permissive legislation enabling the establishment of county, city-county and multiple-county health units.

Paying her own personal expenses and getting out in all kinds of weather on all kinds of roads, Dr. Sabin stumped the state in the cause of health. Federal funds enabled the Sabin committee to employ an executive secretary, Herbert Moe, who organized the community meetings throughout the state.

The little old lady who'd lived a cloistered scientific life "came alive" at the podium. She'd first discuss the general public health situation in Colorado and then go into specifics on the sewage, milk or communicable disease situation in the area where she was speaking. She then explained the proposed health bills, which very quickly were dubbed "the Sabin bills."

Wherever Dr. Sabin took her grassroots campaign, she won zealous converts to public health - particularly among the women.

Health became such a "hot" issue that both political parties in the state included health planks in their 1946 platforms. (A polio epidemic that same year (900 cases) and the closing of the Pueblo State Fair to children under 18, because of the outbreak, also focused public attention on health.)

Gordon Gauss, veteran statehouse reporter for The Associated Press, recalled a corridor conversation between two legislators which he overheard when the Sabin bills came up on the floor.

"Are you going to vote for them?" asked one legislator.

"Hell, yes!" his colleague replied. "I'm not going to have all the women in my district against me."

All of the Sabin bills but one passed by an overwhelming vote with only minor amendments in the

1947 legislative session. The so-called cow health bill - directed at the control of brucellosis in cattle - was the only complete defeat that year, but it also cleared the legislature the following session.

## Health To Match the Mountains

The reorganized State Health Department moved quickly to provide the health to match the mountains which Dr. Sabin had envisioned.

Three new sections (health education, hospital facilities and veterinary medicine) were added by Jan. 1, 1948, bringing to 19 the specialized sections in the Department. A greater budget and more qualified personnel made it possible to provide more consultation and direct service to local areas.

Before the Sabin measures were passed, only four counties had health departments. By 1948, there were eight single or multiple county health units providing basic public health service to 18 counties.

Also early in 1948, 22 laboratories in the state were approved by the State Health Department to perform premarital and prenatal blood tests.

The Maternal and Child Health Section placed special emphasis on immunization against diphtheria and smallpox by assisting local health officers and local physicians in organizing clinics. For the first time, a planned program was established directed at a reduction of the death rate from whooping cough and measles. New prenatal or post-natal clinics were established in four communities and new or additional well-child conferences in 11 communities.

The Crippled Children's Section inaugurated a statewide rehabilitation and physical therapy program for polio victims. (Polio was to continue as a majorcrippler and killer until after widespread distribution of vaccine at Stop Polio Sundays held throughout Colorado in 1962 with the full support

and cooperation of the Colorado Medical Society. The State Health Department, however, started distributing Salk vaccine to children and pregnant women in 1954. Colorado's worst polio year was 1951 when 1,065 cases were recorded.)

The State Health Department also in 1948 expanded laboratory services without charge to physicians, dentists and public health workers throughout the state.

For the first time in Colorado history, every licensed restaurant was inspected in 1948 by a state or local health department sanitarian.

Also that year, the State Board of Health passed regulations concerning the production and processing of milk and dairy products, demanding a high degree of sanitation and requiring pasteurization of all milk and milk products for human consumption after June 1, 1949.

The Department also started an exhaustive scientific study of stream pollution prior to the setting of standards governing sewage treatment. And the Board adopted new codes on water supplies and plumbing to enhance the quality of drinking water and protect the public health.

In cooperation with the University of Colorado Medical Center, the Department developed an extensive premature infant care program to reduce the infant deaths attributed to complications of premature birth. In connection with the program, the Department distributed 18 incubators to strategic locations throughout the state.

By 1949, a Social Service Section had been added to the Department to provide consultative service on any social problem related to health.

1949 also marked the actual beginning - after months of preliminary work and planning - of one of Colorado's most successful public health programs - the hospital construction program made possible by the passage in August, 1946, of the federal Hill-Burton program. The 27-bed Delta Memorial Hospital was the first project completed under the program in Colorado.

In the next 20 years, 98 Colorado health facilities would be constructed with Hill-Burton funds administered through the State Health Department.

The 1949 legislature, following the pattern established in 1947, passed several measures designed to improve health conditions in the state. Among them were a hamburger bill defining hamburger, ground beef or chopped beef, limiting the fat content and prohibiting the use of coloring in any fresh meat; a flour enrichment bill; and a measure giving the State Health Department licensing authority over plants handling fluid milk for human consumption.

The Department also initiated a migrant health program in 1949 with the establishment of a clinic at the Fort Lupton labor camp.

## Growing Pains

Colorado's population jumped 32.4 per cent in the decade 1950-1960, and the state's fantastic growth created numerous public health problems over and above the simple factor of numbers. While the overall population increased, 34 of the 63 counties recorded population losses as more and more persons flocked to urban areas. Major public health problems involving housing, sewage, water supplies, air pollution and solid wastes disposal were intensified. Rural areas started finding it increasingly difficult to support basic health services and sufficient medical facilities.

In 1960, for the first time, the various services of public health were mobilized under one roof as the State Health Department occupied a new headquarters building at 4210 East 11th Avenue in Denver. As demands for health service continued to grow, however, the 58,000 square feet of office and laboratory space were to prove inadequate, and construction of a 25,000-square-foot wing addition began in 1969.

The Colorado Health Department was among the first official agencies in the nation to indicate concern over the potential exposure of uranium miners to radioactivity. Thus, in cooperation with the U. S. Public Health Service, it began a study in 1950 to determine the effects from exposure to small amounts of radioactive ores over a long period of time, the amounts and kinds of radiation existing in the mines and mills, the contamination of water supplies by radioactive materials, the effects of radiation on plant life and the effects that working radioactive ores have on persons living in the area but who are not directly exposed.

Colorado was to continue its leadership in radiological health throughout the years, conducting

comprehensive monitoring and surveillance programs in connection with nuclear oil and gas stimulation explosions and nuclear generating plants, regulating uranium mill tailings piles and doing radon gas level studies in both mines and uranium communities. On Jan. 16, 1968, the Department assumed the regulatory authority over virtually all radioactive materials used within Colorado following signing of a formal agreement with the Atomic Energy Commission (AEC).

Progress also was noted in other areas of public health.

In 1960, the Department started a streptococcus detection program, which was to become one of the nation's most successful public health programs and a model for the entire country. Its objective - the primary prevention of rheumatic fever and rheumatic heart disease - is being accomplished. In 1959, Colorado recorded 256 cases of rheumatic fever. In 1968, the number of cases dropped to an all-time low of 45 - an 82.5 per cent reduction in the nine-year period. The State Health Department processed a record 222,000 strep cultures in 1968 - 16.2 per cent of which were positive.

Late in 1961, Colorado participated in field trials for both the killed and live attenuated measles vaccine - the first step in a vigorous campaign public health officials were to wage against the serious childhood disease. By 1969, the incidence of measles had been greatly reduced in Colorado. In the first half of the year, only 114 cases of measles were recorded in the state - a 76 per cent reduction from the 469 recorded for the comparable period of 1968.

## The Air Deteriorates

With the growing urbanization of Colorado's population, the crisp, clear air which once lured thousands of health seekers to the state started to deteriorate.

In 1962, the State Health Department took the initiative in conducting the first statewide study to determine the nature and extent of air pollution in Colorado.

The following year, an air pollution control section was established in the Department, and the Department started a comprehensive air monitoring and testing program. The State Board of Health, designated by Governor John A. Love as the official state air pollution control agency for implementation of the Federal Clean Air Act, took the lead in Colorado's campaign for clean air with the drafting and approval of a model air pollution ordinance.

On July 7, 1964, the Department placed in operation a mobile air quality laboratory capable of identifying and measuring all smog-producing chemicals in the air. A measure passed by the 1964 session of the legislature called for the testing of particulates, haze and gases, and required the Health Department to notify those communities which failed to meet standards. But it delegated no enforcement power.

In its report to the 1965 session of the legislature, the Department pointed out that it had the technical equipment and knowledge to assess air pollution but could do virtually nothing about the problem without additional legislation. It recommended eight specific measures to conserve Colorado's vital air resource, including the establishment of emission standards and the abatement of air pollution nuisances anywhere in the state.

A year later, the 1966 General Assembly enacted an air pollution control act, establishing ambient air standards, giving the state and local air pollution control authorities concurrent jurisdiction over violators, and creating an air pollution variance board to hear and rule on requests for variances, or exceptions, from the law.

In the next three years, the State Board of Health approved the designation of air pollution control basins in the metropolitan Denver area, El Paso County, Pueblo County, Mesa County, Larimer-Weld Counties, and Garfield County.

Major amendments to the air pollution control law were enacted in 1969, and additional amendments are likely from year to year inasmuch as the state legislature has reserved for itself the authority to establish air quality standards.

An emission inventory conducted by the Department in 1969 indicated the severity of the air pollution problem as a result of Colorado's continuing urbanization. It showed that 90 per cent of the air pollution in the state occurs in 7.5 per cent of the total land area in which 82 per cent of the state's population lives. Seventy-four per cent of Colorado's pollution comes from transportation, 5 per cent from industry, 5 per cent from power generation, 12 per cent from refuse incineration, open burning and agricultural burning, and 4 per cent from space heating.

## Measuring Up

The 60's have been a period of acceleration, turbulent change and ever-expanding concerns for public health in Colorado.

The concept of public health has broadened from frontier concern with the mineral springs to embrace such space-age subjects as radiation, nutrition, arthropods, accident prevention, noise pollution, alcoholism and drug dependence, and pesticides.

Many of the communicable diseases of former years have been brought under control through the organized services of public health, new vaccines, better sanitation practices and greater public sophistication about disease prevention.

The vital statistics no longer reflect a bleak picture for Colorado. In 1967, for example, the state's infant death rate was 22.9 per 100,000 live births, compared with a national rate of 22.1, and the maternal death rate was 25.6, considerably lower than the national rate of 28.0. The last death from typhoid fever in the state occurred in 1958; from diphtheria in 1963, and before that, in 1959; from smallpox in 1948. No smallpox has been reported in Colorado since 1948, when there were two cases, including the last smallpox fatality. And in the last 30 years, there's been a 60 per cent decrease in the death rate from influenza and pneumonia.

Increased attention is being given to the chronic illnesses, particularly heart disease and cancer. New concepts are being applied to the total problem of mental illness. Programs for the prevention of mental retardation, such as the statewide phenylketonuria screening program, are being accelerated.

The fight against environmental pollution is being waged vigorously on all fronts, although victory awaits technological advances, increased public awareness and better corporate citizenship.

Emergencies still occur to test public health - and invariably it measures up.

There are two recent classic examples:

When devastating floods inundated the Arkansas and Platte River valleys in 1965, public health was on the job immediately, testing and chlorinating water supplies, making sure that flood-damaged food, drug and beverage supplies were disposed of, administering typhoid shots, supervising rodent and insect control and the disposition of dead animals, providing detailed information for flood victims on personal health protective measures, determining where aerial insecticide spraying should be done to help control a build-up of mosquitoes and checking flooded warehouses for hazardous materials.

Governor John A. Love singled out the State Health Department for praise in that emergency and wrote Dr. Cleere that his "outstanding leadership gives me great pride in the Department of Public Health."

On July 3, 1968, a diagnosis of bubonic plague was made in a six-year-old Denver girl, and state health officials, in cooperation with Denver and federal health officials, promptly started an epidemiological investigation. The plague was traced quickly to tree squirrels, which were dying in great numbers in a heavily populated area of northeast Denver. By July 9, a full-scale field control program was in operation with squirrel traps and DDT bait boxes placed throughout the infected area. Laboratory technicians worked around the clock to keep up with the analyses on dead squirrels.

By July 19, the outbreak of plague among squirrels was contained. The count at that time was 47 squirrels positive for plague out of approximately 200 specimens. Because of prompt action by health officials, no additional human cases occurred.

The establishment of the health insurance benefits, or Medicare, program by Title 18 of the Social Security Act has brought important new responsibilities to the State Health Department. The Department is charged with certifying whether hospitals, nursing homes and other long-term care facilities, home health agencies and private laboratories are eligible for payment for care of the elderly under the Social Security hospital insurance and supplementary medical insurance trust fund.

The Department's Hospital and Nursing Home staff conducts regular surveys of all of Colorado's 87 hospitals and 184 nursing homes in connection with its regular licensure program. New standards for all health facilities, plus regular Health Department-sponsored training courses, are insuring a high quality of care for the patient, who is paramount in all Departmental concerns.

When the state government was reorganized in 1968, the General Assembly recognized the vital importance of public health to the citizenry by re-establishing the Colorado Department of Health as one of the 17 departments of the state government.

The nine-member Board of Health was continued as the rule-making, advisory, policy-forming, appellate body, and the Division of Administration as the administrative and executive branch of the Department.

1969 After struggling for years with a skeleton crew, the State Health Department today has a well-qualified staff of 350 employees, representing 143 different job classifications. Specialists

provide expertise in dozens of areas. Among them are physicians; dentists; social workers; nurses; dental hygienists; accountants; health educators; an attorney; a journalist; radiation physicists; industrial hygienists; a systems analyst; nutritionists; an entomologist; physical, occupational and speech therapists; audiologists; sanitarians; sanitary engineers; an architect; a medical records librarian; virologists; microbiologists and chemists.

Public health nursing - frequently referred to as the "backbone" of public health - is well established. A total of 697 professional public health nurses are employed in Colorado. The ratio of public health nurses to patients is the most favorable in the nation - 29.4 nurses per 100,000 population compared with a national average of 18.8.

The Department's annual budget approximates \$11 million, with federal allocations accounting for more than 60 per cent of that amount. The figure includes federal hospital and health facility construction funds which are channeled through, but not used by, the Department.

## What Does the Future Hold?

Public health has achieved outstanding progress in Colorado, but it cannot stand still.

The services of the 13 organized local health departments reach only 22 counties in the state. The 41 remaining counties - for all practical purposes - continue to operate under the original 1876 system of health legislation. For many sparsely populated areas and for communities which have exhausted their tax-levying capabilities, the provision of adequate health services is virtually impossible.

Methods must be found to equalize health services and make them available to every resident of and visitor to Colorado, which has become the year round playground to the nation.

Those methods presently are being explored by an American Public Health Association (APHA) evaluation of the administrative, legal and financial structure of public health in Colorado.

It is the first study of health services in the state since the Buck study of 1946-47, which led to the Sabin Health Laws.

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