

EARTH SWINGS IN SIX-LAYER OCEAN OF AIR

Both Animal and Vegetable Life Depend Upon Atmosphere.

BY DAVID DIETZ
Times-Howard Science Editor

We live at the bottom of an ocean. Ordinarily we forget this fact. But when we come to study the weather, we are reminded of it.

We walk around on the bottom of the oceans of water. And when we ride in airplanes or airships we are swimming in the ocean of air just as fish swim in the oceans of water.

Our weather is the result of currents and shifting conditions in this ocean of air. And, of course, life itself is possible because of this ocean. Life requires the oxygen in the atmosphere. But if the atmosphere were pure oxygen, life would not last very long.

If we breathed an atmosphere of pure oxygen, it would increase the chemical activities of our bodies to a point where we could not survive. Fortunately, the atmosphere is only about one-fifth oxygen. The remainder is chiefly nitrogen, an inert gas which takes no direct part in the chemical activities which are associated with breathing.

But the other constituents of the atmosphere have their roles in the scheme of life. Plants require the carbon dioxide which is in the atmosphere.

Plants also require the nitrogen, but they can not use it in its pure form. It is available to them only after certain bacteria, the so-called nitrogen-fixing bacteria, have changed it into soluble salts which the roots of plants can absorb from the soil.

Pull Saves Air

The force of gravitation is responsible for the earth retaining an atmosphere.

The tendency of the molecules of gas which make up the atmosphere to fly off into space.

This tendency is counteracted by the earth's gravitational pull.

The atmosphere is densest closest to the earth's surface. As one ascends into it, it grows thinner and thinner.

If the atmosphere had a uniform density from top to bottom, it would extend only to a height of five miles above the earth's surface.

At a height of thirty miles, the air is only one-hundredth as dense as it is at the earth's surface. At a height of fifty miles, the atmosphere has become so thin that it does not exert any appreciable pressure. There is some air at this height, however, as is proved by the refraction or bending of the sun's rays, and by the fact that meteors or "shooting stars" become visible at this height.

Just how far the atmosphere does extend is a matter of opinion. Some authorities think that there may be slight traces of air at a height of 200 miles. Dr. Willis Luther Moore, former chief of the United States weather bureau, is of the opinion that the atmosphere gives out at a height of about 100 miles.

Meteorologists are very much interested in studying the upper reaches of the earth's atmosphere, because they think that many of the weather conditions at the surface are the result of what is going on at high altitudes.

Six Atmospheric Layers

Meteorologists divide the earth's atmosphere into six layers, or to state it more technically, into six concentric "atmospheres."

The innermost layer, the one next to the surface of the earth, is called the troposphere. It extends up to a height of about six miles.

The second layer is called the stratosphere. It is sometimes called the isothermal layer because its temperature is everywhere and at all times the same, about 100 degrees below zero on the Fahrenheit thermometer.

The third layer is at a height of about thirty-six miles. It is known as the meteoric region because meteors become visible in this layer.

The fourth layer is at a height of about fifty miles. It is called the Kennedy-Heaviside layer, in honor of the two scientists who advanced theories about its behavior. Radio fans are familiar with it. It is the layer of electrified or ionized air which acts as a "ceiling" to reflect radio waves.

The fifth layer is known as the auroral layer. It is extremely thin and extends upward from a height of sixty miles. The auroral displays are thought to occur in this layer.

Some authorities place a sixth layer beyond the auroral layer. It has been called the empyrean layer, and gradually trails off into the emptiness of outer space.

MAN AND HORSE DEAD IN RACE TRACK MISHAP

Spectator Victim of Fatal Heart Attack in Kendallville Excitement.

By United Press

KENDALLVILLE, Ind., Aug. 19.—A man and horse were dead and three harness race drivers were in Lakeside hospital here today after an accident at the Kendallville fair ground track.

In a 2:16 miles pacing event Friday, seven drivers were unseated.

Marion Eddy, 68, a spectator, died of a heart attack Friday night, brought on, physicians said, by the exertion.

Injured drivers were Davy E. Jones, Van Wert, O., broken collar bone and bruises; Walter Wilson, Hicksville, O., bruises and possible internal injuries, and Ben Ogers, La Porte, broken leg.

Wilson's horse died of injuries.

Sixteen horses were in the race, which was won by a mare, Laura Belle.

\$125 STOLEN AT HOTEL

Money Taken From Office Desk in Ambassador.

A thief "registered" at the Ambassador hotel, Ninth and Pennsylvania streets, Friday, according to reports to police.

Robert Shanklin, employee of the hotel, said that \$125 was stolen from a desk in the office. He named a young man as a suspect and asked police to search for him.

SPANISH YOKE LIFTED FROM CUBA

Americans Step In and Liberty at Last Comes to Isle

The battleship Maine was blown to bits with the loss of 266 lives Feb. 15, 1898. Barely had the explosion's low thunder died away over a startled Havana before Spanish "Volunteers" derisively drank "Maine Soup" in a waterfront bodega and in the northern republic the cry "Remember the Maine!" swept unprepared Americans into war. Following is another of the series on Cuban history.

BY FORREST DAVIS
Times Special Writer

HAVANA, Aug. 19.—A "Thin Blue Line," with "Teddy" Roosevelt charging valorously somewhere near its head, swept up San Juan hill against accurate Spanish Mauser fire and the worse odds of garrulous General Shafter's staff blunders. Victory!

On the seaward side beyond Santiago de Cuba, Admiral Cervera ventured to run the blockade for a strategic dash down the coast to Cienfuegos. His men-of-

war were the pride of all Spain, but Sampson and Schley promptly shelled them to the bottom of the beach.

This took place in the first week of July, 1898. We had declared war for Cuba's liberation in April. On May 1, Dewey, in far Manila, had riddled Spain's Asiatic fleet.

Nothing but victories. By mid-August, Spain, weary, half-starved and impoverished, had been hauled out of the last of the colonial possessions that went to make up the sixteenth century's most splendid empire.

Cuba, Puerto Rico, the Philippines had fallen to the casually trained, scandalously fed, but straight-shooting Americans.

In the jungles surrounding Santiago—an ancient city incised by mountains toward the easterly end of Cuba's southern coast—the "boys in blue" romantically sang the national anthem as the Stars and Stripes appeared over enemy positions.

When the invalided expeditionary forces reached Montauk Point, L. I., later in the summer, such as had survived shrapnel, the Mausers, yellow fever, "Alger" beef and incredibly bad sanitary provisions, roared "There'll Be a Hot Time in the Old Town Tonight."

In retrospect, as the Rough Rider "Teddy" dickered with Boss Platt for the Republican nomination for Governor, the Cuban adventure appeared a lively summer's outing.

On Broadway, Dewey, Schley, Hobson and divers "boys in blue" were heroes. Statesmen, clergy, editors plausibly thanked providence that we expeditiously had so routed the Spanish tyrant.

On July 25, the commandant of the Spanish



Above: "The Charge up San Juan Hill," by Chase Emerson, from "Our War with Spain," by E. S. Brooks.

Above:
The Battleship
Maine, sunk in
Havana Harbor,
Feb. 15.
1898, the
tragedy
that precipitated
the Spanish-
American war.
Right, Colonel
Theodore
Roosevelt
as commander
of the Rough
Riders.



sent to the interests and the protection of the United States."

So Cuba's bitterly won freedom was qualified in 1898—as in 1933, when the Roosevelt government, solicitous for the harmony and welfare of the Cuban people, undertakes an unarmed, deftly diplomatic intervention against Machado.

The political suzerainty of the United States is easy, and, in the main, considerate; the rule of Spain crushed Cuba. Politically, our motives are those of protection of ourselves and Cuba. Spain's

and Stripes appeared over enemy positions.

When the invalided expeditionary forces reached Montauk Point, L. I., later in the summer, such as had survived shrapnel, the Mausers, yellow fever, "Alger" beef and incredibly bad sanitary provisions, roared "There'll Be a Hot Time in the Old Town Tonight."

In retrospect, as the Rough Rider "Teddy" dickered with Boss Platt for the Republican nomination for Governor, the Cuban adventure appeared a lively summer's outing.

On Broadway, Dewey, Schley, Hobson and divers "boys in blue" were heroes. Statesmen, clergy, editors plausibly thanked providence that we expeditiously had so routed the Spanish tyrant.

On July 25, the commandant of the Spanish

No one can doubt that Cuba, as far as its relations with a foreign power go, is a paradise under the leading strings of Washington and Wall Street in comparison with its state under Madrid.

The only point in the analogy is to show that the Cuban patriots and the professional men educated in American universities and exiled thousands of political suspects to the African prison camps.

Thirteen thousand estates, including De Céspedes', were confiscated, and dozens of noble Spanish families enriched by the spoils.

This rebellion ended with the treat of San Juan, when General Campos, the "great pacifier," offered liberal exchange for surrender.

The insurgents surrendered, many were imprisoned and deported and the reforms failed to materialize. But the rebellion had forged leaders for the Cuban cause.

Thomas Estrella Palma, who retired to Central Valley, N. Y., and a boys' school, but became first president of the liberated republic; General Maximino Gomez, military hero of the 1898, and scores of others high and humble.

The free Cuba of 1898 satisfied them as an accepted compromise. Most of them lived to shape its development in close association with the giant of the north through whose military offices they had sundered the Spanish bond.

Their principal address was the

treasury of the United States."

So Cuba's bitterly won freedom was qualified in 1898—as in 1933, when the Roosevelt government, solicitous for the harmony and welfare of the Cuban people, undertakes an unarmed, deftly diplomatic intervention against Machado.

The political suzerainty of the United States is easy, and, in the main, considerate; the rule of Spain crushed Cuba. Politically, our motives are those of protection of ourselves and Cuba. Spain's

and Stripes appeared over enemy positions.

When the invalided expeditionary forces reached Montauk Point, L. I., later in the summer, such as had survived shrapnel, the Mausers, yellow fever, "Alger" beef and incredibly bad sanitary provisions, roared "There'll Be a Hot Time in the Old Town Tonight."

In retrospect, as the Rough Rider "Teddy" dickered with Boss Platt for the Republican nomination for Governor, the Cuban adventure appeared a lively summer's outing.

On Broadway, Dewey, Schley, Hobson and divers "boys in blue" were heroes. Statesmen, clergy, editors plausibly thanked providence that we expeditiously had so routed the Spanish tyrant.

On July 25, the commandant of the Spanish

No one can doubt that Cuba, as far as its relations with a foreign power go, is a paradise under the leading strings of Washington and Wall Street in comparison with its state under Madrid.

The only point in the analogy is to show that the Cuban patriots and the professional men educated in American universities and exiled thousands of political suspects to the African prison camps.

Thirteen thousand estates, including De Céspedes', were confiscated, and dozens of noble Spanish families enriched by the spoils.

This rebellion ended with the treat of San Juan, when General Campos, the "great pacifier," offered liberal exchange for surrender.

The insurgents surrendered, many were imprisoned and deported and the reforms failed to materialize. But the rebellion had forged leaders for the Cuban cause.

Thomas Estrella Palma, who retired to Central Valley, N. Y., and a boys' school, but became first president of the liberated republic; General Maximino Gomez, military hero of the 1898, and scores of others high and humble.

The free Cuba of 1898 satisfied them as an accepted compromise. Most of them lived to shape its development in close association with the giant of the north through whose military offices they had sundered the Spanish bond.

Their principal address was the

treasury of the United States."

So Cuba's bitterly won freedom was qualified in 1898—as in 1933, when the Roosevelt government, solicitous for the harmony and welfare of the Cuban people, undertakes an unarmed, deftly diplomatic intervention against Machado.

The political suzerainty of the United States is easy, and, in the main, considerate; the rule of Spain crushed Cuba. Politically, our motives are those of protection of ourselves and Cuba. Spain's

and Stripes appeared over enemy positions.

When the invalided expeditionary forces reached Montauk Point, L. I., later in the summer, such as had survived shrapnel, the Mausers, yellow fever, "Alger" beef and incredibly bad sanitary provisions, roared "There'll Be a Hot Time in the Old Town Tonight."

In retrospect, as the Rough Rider "Teddy" dickered with Boss Platt for the Republican nomination for Governor, the Cuban adventure appeared a lively summer's outing.

On Broadway, Dewey, Schley, Hobson and divers "boys in blue" were heroes. Statesmen, clergy, editors plausibly thanked providence that we expeditiously had so routed the Spanish tyrant.

On July 25, the commandant of the Spanish

No one can doubt that Cuba, as far as its relations with a foreign power go, is a paradise under the leading strings of Washington and Wall Street in comparison with its state under Madrid.

The only point in the analogy is to show that the Cuban patriots and the professional men educated in American universities and exiled thousands of political suspects to the African prison camps.

Thirteen thousand estates, including De Céspedes', were confiscated, and dozens of noble Spanish families enriched by the spoils.

This rebellion ended with the treat of San Juan, when General Campos, the "great pacifier," offered liberal exchange for surrender.

The insurgents surrendered, many were imprisoned and deported and the reforms failed to materialize. But the rebellion had forged leaders for the Cuban cause.

Thomas Estrella Palma, who retired to Central Valley, N. Y., and a boys' school, but became first president of the liberated republic; General Maximino Gomez, military hero of the 1898, and scores of others high and humble.

The free Cuba of 1898 satisfied them as an accepted compromise. Most of them lived to shape its development in close association with the giant of the north through whose military offices they had sundered the Spanish bond.

Their principal address was the

treasury of the United States."

So Cuba's bitterly won freedom was qualified in 1898—as in 1933, when the Roosevelt government, solicitous for the harmony and welfare of the Cuban people, undertakes an unarmed, deftly diplomatic intervention against Machado.

The political suzerainty of the United States is easy, and, in the main, considerate; the rule of Spain crushed Cuba. Politically, our motives are those of protection of ourselves and Cuba. Spain's

and Stripes appeared over enemy positions.

When the invalided expeditionary forces reached Montauk Point, L. I., later in the summer, such as had survived shrapnel, the Mausers, yellow fever, "Alger" beef and incredibly bad sanitary provisions, roared "There'll Be a Hot Time in the Old Town Tonight."

In retrospect, as the Rough Rider "Teddy" dickered with Boss Platt for the Republican nomination for Governor, the Cuban adventure appeared a lively summer's outing.

On Broadway, Dewey, Schley, Hobson and divers "boys in blue" were heroes. Statesmen, clergy, editors plausibly thanked providence that we expeditiously had so routed the Spanish tyrant.

On July 25, the commandant of the Spanish

No one can doubt that Cuba, as far as its relations with a foreign power go, is a paradise under the leading strings of Washington and Wall Street in comparison with its state under Madrid.

The only point in the analogy is to show that the Cuban patriots and the professional men educated in American universities and exiled thousands of political suspects to the African prison camps.