

Does The Earth Catch New Diseases From Comets?

Lord Kelvin's Idea That the Original Germ of Life May Have Come to Our Earth on a Meteor Suggests an Explanation of Some of Our New Epidemics

By Dr. W. H. Ballou

THE recent fall of a meteor into Lake Michigan—a meteor so great that the flaming out of its incandescence when it struck our atmosphere was visible in three States—has served to focus the attention of science upon the fact that our earth is under its greatest known visitation of comets and to cause scientists to ask what consequences may reasonably be apprehended therefrom.

Thirteen of these mysterious pilgrims in the void will be visible either to the eye or to the glass during this Winter and early Spring.

But what connection can there be, it will first be asked, between the fall of a meteor, no matter how tremendous, and a comet? The answer is that science has finally proved that while some comets are only masses of gas the majority of them are formed of enormous swarms of meteors of all dimensions, sometimes surrounded by a vast cloud of intermingled gases and dust, and sometimes without the gaseous envelope save when closest to the sun, when the well nigh inconceivable heat of that luminary volatilizes a portion of their components.

Through the operation of various forces these cometary nuclei formed of meteors are sometimes partly broken up, sometimes entirely scattered. In the first case the units torn from the attraction of the cometary mass become comparative outlaws and add to the scattered particles which the earth meets in its progress through space.

In the latter case they become diffused meteor swarms which periodically produce what we call "shooting star showers." The most notable of these phenomena was Biela's comet, which broke up into two such swarms, ceasing to be a comet as such, but since that time regularly encountering the earth when our planet's orbit and their own orbits intersect, and dropping in on us more or less numerously when they do so intersect.

The Lake Michigan meteor might have been, and most probably was, a fragment from some such party or wholly disrupted cometary visitor.

This, then, is the connection which science has established between meteors and comets. To the question of what consequences may reasonably be apprehended either from comets or meteors which have made up their mass it may be said that the most startling conclusion is that the old belief of pestilence following in their wake may have a great deal of truth in it. It is, in fact, entirely possible that comets can, and actually have, sprinkled our world with disease germs.

The ancient superstition is that the "hairy stars" were harbingers both of war and pestilence. That war can be caused by them is, of course, absurd. But let us examine the evidence that disease can be communicated by them.

It was the great philosopher, Herbert Spencer, who said that there was no human belief, no matter how apparently wild, that did not have its origin in fact. It would seem that a belief so widespread and so time-worn as the comet-war-pestilence one ought to have records to support it. As a matter of fact there are such records, but the trouble in accepting them as final is a lack of knowledge of other conditions which might have brought about the consequences ascribed to the comets. The Chinese, whose astronomical observations are the oldest we have, record at least ten epidemics following great comets. The pestilence which decimated Asia and Europe in the fifteenth century, and which we know as the Black Death, occurred the year after the visit of a great comet. The most modern coincidence, if it can be so called, was the outbreak of that mysterious disease we call influenza, which began eight months after we were last immersed in the tail of Holley's comet.

How could a comet passing us millions of miles away deposit disease germs upon the surface of our planet? How could it cast living organisms into and through our

of Our New Epidemics

A Photograph of Donati's Comet Whose Tail, as Shown in the Picture, Met with a Mysterious Accident in Space, Thus Proving That It Was Composed of Substantial Matter.



The Hon. John Collier's Remarkable Painting "The Black Death," the Plague Which Swept Asia, England and Europe Shortly After the Appearance of a Great Comet.

atmosphere from such a distance? And how could such living organisms survive the cold of outer space?

Science declares that the process can be carried on in two ways: by the presence of ultra-microscopic organizations in the gas and almost infinitely finely divided dust of a comet's tail, and by their presence inside meteors disrupted from the nucleus. As for the cold of outer space—it is proven that certain malignant bacilli we know not only can live under such cold, but seem to derive strength from it. As for the heat engendered by friction with the atmosphere in the meteor's fall—that is answered in the following quotation from the "Making of the Earth," by the distinguished Dr. J. W. Gregory, Professor of Geology at the University of Glasgow.

"Lord Kelvin maintained that life may have come to the earth as a spore borne by a meteorite from some other world. This is certainly a possible explanation of the arrival of life upon our earth; for spores may retain their vitality for prolonged periods, and can survive exposure to the most intense cold. Hence, if a world were shattered by the disruptive approach of another heavenly body some of the fragments might carry with them germs which might retain their vitality even during a long journey through the intense cold of our outer space.

"The most serious danger to the germ

would be that of being burnt when the meteorite is heated by friction with the earth's atmosphere; but if the spore lay in a deep crack it might remain quite cold, although the surface of the meteorite were rendered white hot; for the heat due to friction with the atmosphere is only sufficient to fuse a very thin skin on the surface of a large meteorite. The interior remains intensely cold."

While the possibility that such was the source of life upon our earth is minimized, it will be seen that the possibility of certain forms of life originating in this manner is admitted.

Disease germs belong in a class of very low organisms, akin to the lowest type of fungi, which seem to be part animal and part vegetable. In some cases it is difficult to tell where the plant leaves off and the animal begins. Most of such organisms breed by spores, which correspond to seeds of higher plants. Spores, however, differ vastly in their methods and periods of germination. The mass of them germinate under normal conditions, like plants in general, conditions of favorable temperature, moisture and soil. Others

will only germinate under varied high temperatures or varied low temperatures. We have fungi and kindred germs, for instance, which can only germinate under terrific heat.

Given a great forest conflagration and thousands of such low organisms will breed after the flames have died; their spores opening, their mycelium (plant) running rapidly in the form of white threads, which soon bear fruit. Again, there are organisms the spores of which will only germinate under conditions of intense cold, snow and ice.

Apply these conditions to germs of low organization, both animal and plant in organization, to germs borne by a comet. Besides such germs as breed under normal conditions and which, as Dr. Gregory points out, would be protected within the meteor, such germs as are favored by the intense cold of space far from the sun, and such germs as lie dormant until friction and the approach to the sun cause terrific

How the Earth Was Bathed in the Tail of Halley's Comet During the Fall of 1910. A, is the Head of the Comet; B, the Earth; C, the Intersecting Point of Earth's Orbit D and the Comet's Orbit E, Showing How Narrowly Actual Collision Was Missed. A Little After Our Immersion in the Comet's Streamers Began the Outbreak of a New Form of Influenza Plague in Manchuria and the East.

heat, might readily be projected on to the earth's surface.

But where, it will be asked, could the comets derive such organisms? How could a comet "catch the disease" in the first place.

This leads us to the question of what comets are. Lord Kelvin, Sir Oliver Lodge, the famous French astronomer, Flammarion, and a host of other scientists dead and living held and hold that the majority of the comets are fragments of worlds torn to pieces by some cause or another—the debris of shattered planets. Others hold that the most of them are stuff left over after the shaping of our sun and his family. Or, as Professor Shipley, of San Francisco, who has compiled the list of visiting comets, puts it:

"They are composed of star dust, gases and meteoric matter, gathered from far outskirts of the parent nebula from which

In those comets which originated in destruction of worlds the organisms would have been carried away with the debris and remained dormant in the cold of space. There is practically no limit to this dormancy of certain organisms. Bacilli remaining in this condition for ages in the dust of the sun-baked deserts and the frozen soil of the Southern Pole have revived in the laboratories. Proof of such tragedies in space are ample in the stony meteors, as I pointed out in a recent article of mine in this magazine.

The most marvelous comet visitant of all expected this year by many is the Mexican war observer, Di Vico's long-period chap, labeled 1846 iv. While this comet has until 1922 to get here, its period of 75.71 years has an uncertainty of three years, according to von Hepperger, who defined its elements, and hence is generally expected now. It was first discovered by Professor W. C. Bond, at the Harvard Observatory, on February 26, just before the outbreak of the Mexican War. Two days later it was picked up by Professor F. Di Vico at the Rome, Italy, observatory, for whom it was somehow named instead of Bond.

Professor Shipley thus describes what we will see when this celestial wonder bursts upon our telescopes:

"At first it will be a faintly glowing, spherical object of hazy, nebulous aspect, later developing a nucleus of star-like lustre, approaching our region of space with ever accelerating speed; its enveloping gases, frozen solid by inconceivably low temperature of far distant space, will begin to glow and expand in the warm rays of the energizing sun. The hydrocarbonic substances, in which the more or less solid nucleus is enveloped, will first be vaporized by the solar heat, then minute particles of cometary dust will be drawn sunward by gravity, and then violently repelled by the pressure of the solar light waves, the latter being more potent than gravitation."

I would like to point out his reference to the hydro-carbonic substances in his description of the Di Vico comet. You cannot have hydro-carbons except through the agency of living organisms. The fact that this comet reveals them proves that it was once a part of a world closely akin to our own.

As for the great Lake Michigan meteor—it is not at all probable that we have anything to fear from any possible contents it may have borne. It is most likely that it struck into atoms when it struck the cold waters of the lake, and the disruptive shock minimizes its potential dangers. The description, however, of its tremendous flame shows that it must have been rich in hydro-carbonic substances and that it was therefore a fragment of a world once rich with life and wiped out by the hand of Destiny reaching through the Cosmos.

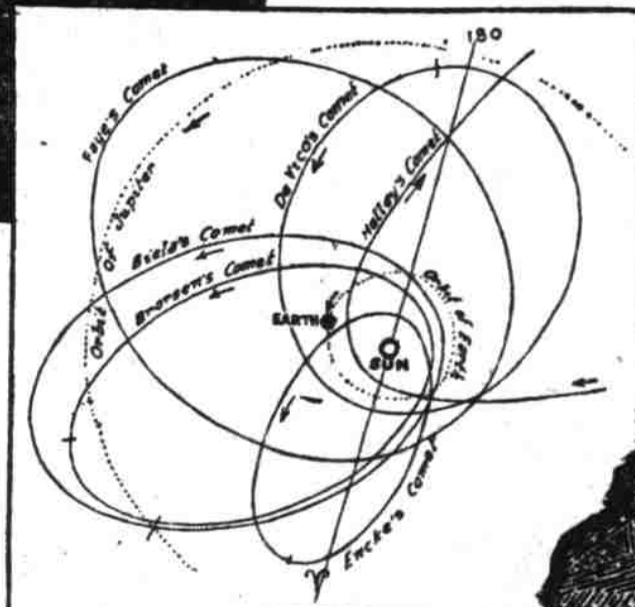
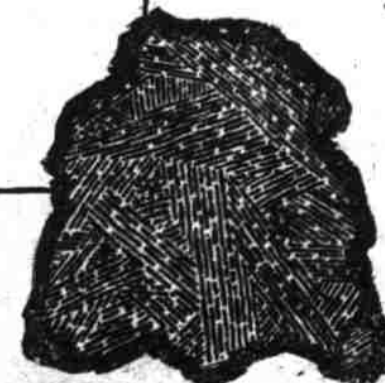


Diagram of the Orbits of the Best Known Comets, Showing Their Paths Around the Sun and Their Intersection With the Orbit of the Earth.



A Cross Section of a Meteorite Showing the Narrow Belt of Matter Fused by Friction with the Atmosphere and the Cracks and Crevices Where Whole Colonies of Bacilli Could Lurk Untouched by the Heat Generated by the Meteorites Fall.

our planets were derived. Had the cosmic material been more abundant within the sphere of attraction of the comets' developing nuclei, they would in time have become small planets, perhaps only to be captured later by the giant Jupiter as satellites, or by Saturn, Uranus or Neptune, with orbits becoming ever more nearly circular as a result of collision with still richly diffused nebular material, acting as an effective medium."