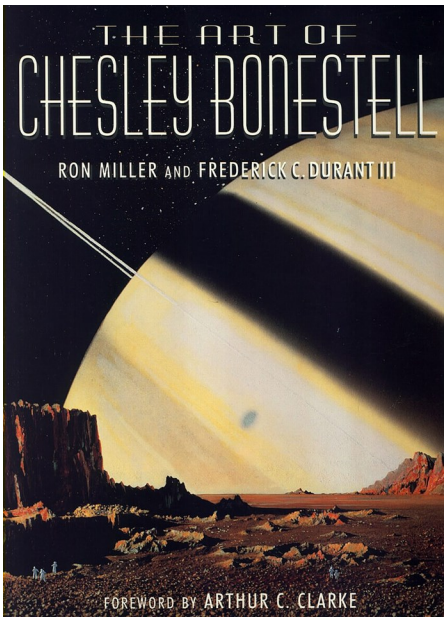
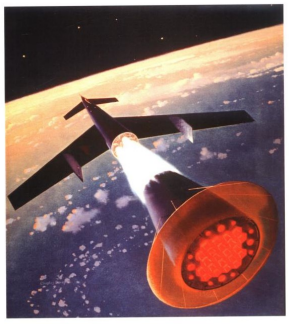


Award winner Ron Miller & Black Cat Studios

Ron Miller, winner of the 2002 Hugo Award (World Science Fiction Society) for Best Related Work: The Art of Chesley Bonestell

The Chesley Bonestell Archives of Melvin H. Schuetz

A Chesley Bonestell Space Art Chronology



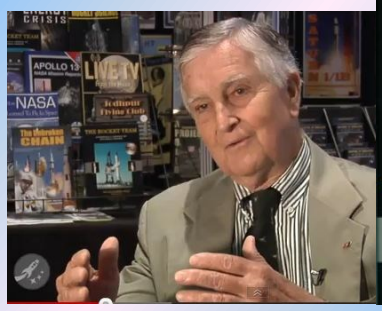
Melvin H. Schuetz

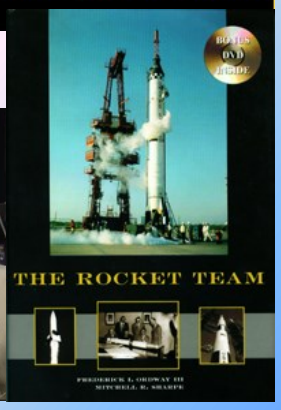
www.bonestell.com

A former satellite controller in the U.S. Air Force and private industry, Melvin H. Schuetz has researched and collected publications from around the world containing Bonestell's art for more than four decades. His book, A Chesley Bonestell Space Art Chronology, is a unique reference bibliography containing detailed listings of over 750 publications which have included examples of Bonestell's space art.

Space scientist and well-known author of visionary books on spaceflight. Ordway was in charge of space systems information at the Marshall Space Flight Center from 1960 to 1963 and before that performed a similar function for the Army Ballistic Missile Agency. For many years he was a professor at the University of Alabama's School of Graduate Studies and Research. However, his greatest contribution has been to the popularization of space travel through dozens of books that he has authored or coauthored. He was also technical consultant to the film 2001: A Space Odyssey and owns a large collection of original paintings depicting astronautical themes. Ordway was educated at Harvard and completed several years of graduate study at the University of Paris and other universities in Europe.

www.cgpublishing.com





Frederick Ira Ordway III

Co-Author with Mitchell R. Sharpe of The Rocket Team

Dreams of Space, Books & Ephemera

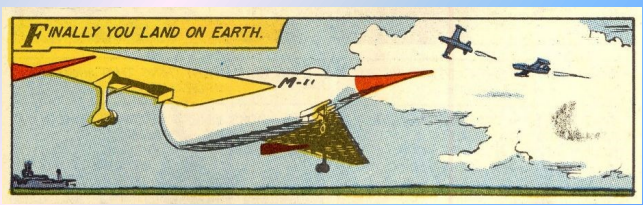
Non-Fiction Children's Books about Space Flight from 1945 to 1975

http://dreamsofspace.blogspot.com/

Classics Illustrated were comic books intended to educate as well as entertain. They often were fictional "classic" books in comic book form such as Moby Dick. They also had a special series called "The World around Us." These were non-fiction comic books about topics of interest.

Classics Illustrated. Illustrated by Gerald McCann, Sam Glanzman and John Tartaglione. The Illustrated Story of Space (80 pages), 26 cm, softcover.

Contains illustrated stories on training for space, the first rocket to the Moon, the history and use of the rocket, the launch of Vanguard 1 and the construction of a space station. "The World Around Us" (#5) January 1959.



Afterword about the Collier's Spaceflight Series

By Dr. A. A. Jackson, October 30, 2013

Before the 1952-1954 Collier's series was finished, there appeared the book, *Across the Space Frontier*, Ryan, Cornelius, (Ed.); Kaplan, Joseph; von Braun, Wernher; Ley, Willy; Whipple, Fred L.; Haber, Heinz; Schacter, Oscar, illustrated by Chesley Bonestell, Fred Freeman, Rolf Klep, published by The Viking Press, 1952. And the book, *Conquest of the Moon*, Wernher von Braun, Willey Ley, Fred Whipple, illustrated by Chesley Bonestell, Fred Freeman, Rolf Klep, publisher: Viking Press, 1953.

These books were dynamite to my 13-year-old mind. I still have my copies of the first printings.

Only many years later (like 50 years later) did it occur to me that the Viking Press series was quite subpar. The books are of fair to middling manufacture. Especially in that the paintings and illustrations are all on plain paper. Bonestell art demands enameled paper. The books are interesting because they contain some expansion and elaboration of the prose material in the Collier's series.

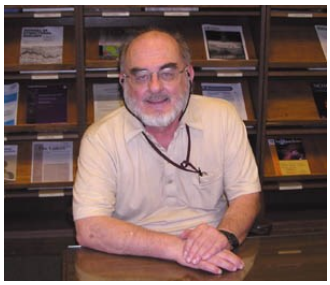
Then came, *The Exploration of Mars*, Ley, Willy; Wernher Von Braun, published by Viking, 1956 (a much better-manufactured book).

But! I wondered what became of *Can We Get to Mars? / Is There Life on Mars?* Collier's (1954). *The Mars Project* by von Braun was written in 1948. A shortened version was published in German in 1952 and in English in 1953 and was the motivation for Cornelius Ryan's Collier's series. The 1954 Collier's issue, which was first popular realization of the 1948 manuscript, never appeared as a book. In 2005 *The Mars Project* version that contained von Braun's novel did appear, alas without von Braun's excellent popularization in the 1954 issue of Collier's. With the Walt Disney television series in 1955, von Braun had changed his mind about the Mars Expedition and scaled it back.

With my complete collection (eight issues of the magazine from that two-year period) of the Collier's spaceflight series, I thought, for about 20 years, why?! Why didn't anyone ever publish the whole Collier's series? So much is missing is missing from the Viking Press books… some of Bonestell's paintings, a bunch of Fred Freeman's illustrations and paintings. Also never reprinted in book form: most of the exposition in the issues about spacesuits, simulation instruction and emergency training using the escape capsules and space medicine.

Books covering the rest of the material were never produced. Here we have, thanks to Douglas Yazell and his efforts, we have the complete series, reprinted page by page using high resolution. *[Thanks also go to our volunteers in Houston, around the USA, and around the world.]* Special thanks go to Scott Lowther for his work, including supplying most the original magazine issues, and Art Dula for work relating to the copyright status of the Collier's series.

The Collier's spaceflight series was unique and influential, and now, finally, accessible on the Web.



Dr. A. A. Jackson, Visiting Scientist at the Lunar and Planetary Institute (LPI). Image credit: LPI.

GILLOON AGENCY

Wernher von Braun, Ryan

COLLIER'S CREDITS..

THE name Dr. Hubertus Strughold will ring a bell with readers who recall our symposium on Man's Survival in Space (Collier's, February 28, 1953), of which the doctor, head of the Department of Space Medicine at Randolph Field, Texas, was a member. We Credit him now because Dr. Wernher von Braun and staffer Cornelius Ryan found much relevant information in Dr. Strughold's book, The Green and Red Planet (University of New Mexico Press), when our writing team tackled the discussion of a 355,000,-000-mile journey to Mars.

Dr. Strughold's thesis is perhaps more easily assimilated than Dr. Wernher von Braun's authoritative volume, The Mars Project (University of Illinois Press), because it does not contain such formulas as Dr. von Braun's

$$\dot{v} = \frac{F_1 + A_{e,1}(p_{e,1} - p_a) - c_D \cdot A_1 v^2\gamma/2g_0}{1/g_0\,(W_{e,1} - W_1 \cdot t)} - g_0 \cos\vartheta \quad (4.1)$$

for "the ascent track" of a space ship. But friend Wernher's scientific books are not particularly intended for your library or ours, and anyway that's where "Connie" Ryan comes in—to give you the facts in nontechnical verbiage.

The Mars story begins on page 21 and will comprise part of the third book on space travel that Cornelius Ryan has edited since Collier's began to explore the subject two years ago.

★ ★ ★

EFFORTS to improve American schooling long ago became a permanent agendum on our editorial calendar, which is why, when we were casting about for a quick and comparatively inexpensive answer to the current shortage of schoolroom facilities, we consulted The Architects Collaborative, of Cambridge, Massachusetts. This eight-member partnership is inspired by seventy-year-old Walter Gropius, whose architectural achievements cover every kind of service and design man can dream about. Well equipped by experience and imagination, the Collaboratives co-operated with Collier's in detailing the plans for the modern school plant we sponsor in this issue.

Credits to the hard-working team (identified below)—and a special one for Mr. Gropius for having recently received in Brazil the Grand Prix International d'Architecture (Premio São Paulo) from the hands of President Getulio Vargas in the presence of the diplomatic corps.

★ ★ ★

SPEAKING of schools, we have proud and selfish reasons for mentioning a Creditable new magazine called Omnibus. Vol. 1, No. 1 of this fat (53-page) periodical, jammed with articles, stories, drawings and advertisements, was produced on a duplicating machine by sixth-grade students in Oceanlake, Oregon. Preliminary work on the project included a thorough study of seven leading magazines by the editors, who finally "decided to use Collier's as a model because it has so many different kinds of features." The youthful staff regretted the lack of a Letters department, but explained logically that it was their first issue and no mail was at hand. Typical Omnibus cartoon: on the sidewalk one flea asks another, "Shall we walk or take a dog?" The last (editorial) page Omnibusly warned: "Let Collier's look to their laurels . . . There's only room at the top for one and we won't quit until we are there!" Respectful note to the Omnibus staff: Confronted by this spirit of competition, we shall indeed do as you advise. P.S. Perhaps this item will find a place in your indubitably now flourishing Letters column.

—GURNEY WILLIAMS

SAMUEL ROSENBERG

The designers of the Collier's school included this architectural team: Benjamin Thompson, Sarah Harkness, Norman Fletcher, Chester Nagel, Walter Gropius, Jean B. Fletcher, John C. Harkness, Louis A. McMillen

Collier's, April 30, 1954

IS THERE LIFE ON MARS?

By DR. FRED L. WHIPPLE

Chairman, Department of Astronomy, Harvard University

Astronomers—planning to give the great red planet its closest scrutiny in history this summer—are nearer than ever before to answering the most fascinating question of all

ON JULY 2d, the planet Mars, swinging through its lopsided orbit around the sun, will be closer to the earth than at any time since 1941. All over the world, scientists will train batteries of telescopes and cameras on the big red sphere in history's greatest effort to unravel some of the mystery surrounding this most intriguing of the planets.

Next to Venus, Mars is our closest planetary neighbor. Even so, it will be 40,000,000 miles away as it passes by this summer (compared to 250,000,000 miles at its farthest point from the earth); on the most powerful of telescopes it will look no larger than a coffee saucer. Still, it will be close enough to provide astronomers important facts about its size, atmosphere and surface conditions—and the possibility that some kind of life exists there.

We already know a great deal.

Mars's diameter is roughly half the size of the earth. The Martian day is 24 hours, 37 minutes long, but its year is nearly twice as long as ours—670 Martian days. During daylight hours, the temperature on Mars shoots into the eighties, but at night a numbing cold grips the planet: the temperature drops suddenly to 95 below zero, Fahrenheit.

There is no evidence of oxygen in Mars's thin blue atmosphere. Moreover, its atmospheric pressure is so low that an earth man couldn't survive without a pressurized suit. If life of any kind does exist on Mars it must be extremely rugged.

Through the telescope, astronomers can clearly see Mars's great reddish deserts, blue-tinted cloud formations and—especially conspicuous—its distinctive polar caps.

The Martian polar caps cover about 4,000,000 square miles in the wintertime—an area roughly half the size of the North American continent. But as they melt in spring, strange blue-green areas develop near their retreating edges. Some months later these color patches, now covering great areas of the planet's surface, turn brownish. Finally in the deep of Martian winter they're a dark chocolate color. Do these seasonal color variations indicate some sort of plant or vegetable life? That's one of the riddles we'd like to solve.

There's another big question mark: Mars's so-called canals. Although most modern astronomers have long since discounted the once popular theory that the faint tracings seen by some on Mars are actually a network of waterways (and, therefore, perhaps constructed by intelligent beings), we still don't know what they are—or if they exist at all.

The "canals" have had a controversial history. They were first reported in 1877 by an Italian astronomer named Giovanni Schiaparelli who said he had seen delicate lines tracing a gridlike pattern over vast areas of the planet. He called them *canali*—"canals" or "channels."

Since Schiaparelli, many astronomers (especially Dr. Percival Lowell, who established an observatory for the primary purpose of studying Mars) have reported observing the delicate veinlike lines. Others, just as keen-sighted, have spent years studying the Martian face without once seeing the disputed markings.

This year we may get an opportunity to clear up the canal confusion once and for all. An American team, sponsored jointly by the National Geographic Society and Lowell Observatory, will photograph Mars from Bloemfontein, South Africa, where Mars will appear almost directly overhead nightly during early July. The U.S. team, using new photographic techniques and the latest in fast film emulsions, expects to get the most detailed photographs of the planet yet obtained.

But great as the 1954 Mars observation program promises to be, it's only the curtain raiser for 1956, when Mars will approach to within 35,000,000 miles of the earth. Not for another 15 years, in 1971, will it be so close again.

When all the findings have been evaluated we may be able to make some intelligent guesses as to the possibility of life on Mars. Chances are that bacteria are the only type of animal life which could exist in the planet's oxygenless atmosphere. There also may be some sort of tough, primitive plant life—perhaps lichens or mosses which produce their own oxygen and water. Such plants might explain the changing colors of the Martian seasons.

There's one other possibility.

How can we say with absolute certainty that there isn't a *different* form of life existing on Mars—a kind of life that we know nothing about? We can't. There's only one way to find out for sure what is on Mars—and that's to go there. ▲▲▲

Rocket expert Dr. Wernher von Braun discusses the problems of a trip to Mars on the pages that follow

Near wheel-shaped space station 1,000 miles from the earth, built especially for assembly of the Mars expedition, weightless workers put together

Can We Get to MARS?

By DR. WERNHER von BRAUN with CORNELIUS RYAN

Chief, Guided Missile Development Division, Redstone Arsenal, Huntsville, Alabama

Man's trail-blazing journey to Mars will be a breath-taking experience—with problems to match

CHESLEY BONESTELL

the 10 rocket ships required for the flight. Three of the huge space craft have torpedo noses which convert to planes for landing on the planet

THE first men who set out for Mars had better make sure they leave everything at home in apple-pie order. They won't get back to earth for more than two and a half years.

The difficulties of a trip to Mars are formidable. The outbound journey, following a huge arc 355,000,000 miles long, will take eight months—even with rocket ships that travel many thousands of miles an hour. For more than a year, the explorers will have to live on the great red planet, waiting for it to swing into a favorable position for the return trip. Another eight months will pass before the 70 members of the pioneer expedition set foot on earth again. All during that time, they will be exposed to a multitude of dangers and strains, some of them impossible to foresee on the basis of today's knowledge.

Will man ever go to Mars? I am sure he will—but it will be a century or more before he's ready. In that time scientists and engineers will learn more about the physical and mental rigors of interplanetary flight—and about the unknown dangers of life on another planet. Some of that information may become available within the next 25 years or so, through the erection of a space station above the earth (where telescope viewings will not be blurred by the earth's atmosphere) and through the subsequent exploration of the moon, as described in previous issues of Collier's.

Even now science can detail the technical requirements for a Mars expedition down to the last ton of fuel. Our knowledge of the laws governing the solar system—so accurate that astronomers can predict an eclipse of the sun to within a fraction of a second—enables scientists to determine exactly the speed a space ship must have to reach Mars, the course that will intercept the planet's orbit at exactly the right moment, the methods to be used for the landing, take-off and other maneu-

vering. We know, from these calculations, that we already have chemical rocket fuels adequate for the trip.

Better propellants are almost certain to emerge during the next 100 years. In fact, scientific advances will undoubtedly make obsolete many of the engineering concepts on which this article, and the accompanying illustrations, are based. Nevertheless, it's possible to discuss the problems of a flight to Mars in terms of what is known today. We can assume, for example, that such an expedition will involve about 70 scientists and crew members. A force that size would require a flotilla of 10 massive space ships, each weighing more than 4,000 tons—not only because there's safety in numbers, but because of the tons of fuel, scientific equipment, rations, oxygen, water and the like necessary for the trip and for a stay of about 31 months away from earth.

All that information can be computed scientifically. But science can't apply a slide rule to man; he's the unknown quantity, the weak spot that makes a Mars expedition a project for the far distant, rather than the immediate, future. The 70 explorers will endure hazards and stresses the like of which no men before them have ever known. Some of these hardships must be eased—or at least better understood—before the long voyage becomes practical.

For months at a time, during the actual period of travel, the expedition members will be weightless. Can the human body stand prolonged weightlessness? The crews of rocket ships plying between the ground and the earth's space station about 1,000 miles away will soon grow accustomed to the absence of gravity—but they will experience this odd sensation for no more than a few hours at a time. Prolonged weightlessness will be a different story.

Over a period of months in outer space, muscles accustomed to fighting the pull of gravity could shrink from disuse—just as do the muscles of people who are bedridden or encased in plaster casts for a long time. The members of a Mars expedition might be seriously handicapped by such a disability. Faced with a rigorous work schedule on the unexplored planet, they will have to be strong and fit upon arrival.

The problem will have to be solved aboard the space vehicles. Some sort of elaborate spring exercisers may be the answer. Or perhaps synthetic gravity could be produced aboard the rocket ships by designing them to rotate as they coast through space, creating enough centrifugal force to act as a substitute for gravity.

Far worse than the risk of atrophied muscles is the hazard of cosmic rays. An overdose of these deep-penetrating atomic particles, which act like the invisible radiation of an atomic-bomb burst, can cause blindness, cell damage and possibly cancer.

Scientists have measured the intensity of cosmic radiation close to the earth. They have learned that the rays dissipate harmlessly in our atmosphere. They also have deduced that man can safely venture as far as the moon without risking an overdose of radiation. But that's a comparatively brief trip. What will happen to men who are exposed to the rays for months on end? There is no material that offers practical protection against cosmic rays—practical, that is, for space travel. Space engineers could provide a barrier by making the cabin walls of lead several feet thick—but that would add hundreds of tons to the weight of the space vehicle. A more realistic plan might be to surround the cabin with the fuel tanks, thus providing the added safeguard of a two- or three-foot thickness of liquid.

The best bet would seem to be a reliance on man's ingenuity: by the time an expedition from the earth is ready to take off for Mars, perhaps in the mid-2000s, it is quite likely that researchers will have perfected a drug which will enable men to endure radiation for comparatively long periods. Unmanned rockets, equipped with instruments which send information back to earth, probably will blaze the first trail to our sister planet, helping to clear up many mysteries of the journey.

FRED FREEMAN

Small Meteors Could Do Little Damage

Meteors, for example. Many billions of these tiny bullets, most of them about the size of a grain of sand, speed wildly through space at speeds of more than 150,000 miles an hour. For short trips, we can protect space ships from these lightning-fast pellets by covering all vital areas—fuel tanks, rocket motors, cargo bins, cabins and the like—with light metal outer shields called meteor bumpers. The tiny meteors will explode against this outer shell, leaving the inner skin of the ship—and the occupants—unharmed.

But in the 16 months of space travel required for a visit to Mars, much larger projectiles might be encountered. Scientists know that the density of large meteors is greater near the red planet than it is around the earth. If, by some chance, a rock the size of a baseball should plow through the thin shell of one of the rocket ships it could do terrible damage—especially if it struck a large, solid object inside. A meteor that size, traveling at terrific speed, could explode with the force of 100 pounds of TNT. In the cabin of a space vehicle, such an explosion would cause tremendous destruction.

Fortunately, meteors that size will be extremely rare, even near Mars.

Dime-sized chunks are more likely to be encountered. They will be a danger, too, although not so bad as the larger rocks. They'll rip through the bumper and skin like machine-gun bullets. If they strike anything solid, they'll explode with some force. If not, they'll leave through the other side of the ship—but even then they may cause trouble. Holes will have to be plugged to maintain cabin pressure. The shock wave created by the meteors' extreme speed may hurt the ship's occupants: there will be a deafening report and a blinding flash; the friction created by their passage through the cabin atmosphere will create enough heat to singe the

Illustration shows how the landing planes are assembled in 600-mile Martian orbit. Pointed noses are removed from three of 10 ships that made trip from earth; wings and landing gear are fitted to them. Cutaway of plane in the foreground shows personnel, tractors in ship