Evoloterra

When We First Left Planet Earth

A Celebration

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Planning & Procedure

- The Leader asks questions and makes the toasts. In telling the story, each participant takes a turn, in rotation, reading the paragraphs.
- In the opening paragraph on page 2, *n* = (present year) minus 1,969
- An extra wine glass is used as the Cup of Remembrance and is filled for the toast on page 8. The wine in this cup is not consumed.
- Three participants are pre-selected to read the parts of CAPCOM (Capsule COMmunicator), Neil Armstrong, and Buzz Aldrin. (Pages 12-14).

Structure & Timing

The ceremony is comprised of four parts separated by dinner:

I. Foreword & Introduction
II. Prelude: Genesis and history that led up to the space age
III. The Journey of Apollo 11
Dinner
IV. Epilogue
Dessert[1]

Parts I through III takes about 45-60 minutes. Part IV takes about 5 minutes.

Requirements

1. A single, (central candle) and holder (placed at the table of the leader).
2. A candle in a candle holder for each participant including the leader.
3. Wine (or equivalent) for each participant.
4. An extra wine glass (Cup of Remembrance) for each table.
5. A serving of seeds[2] for each participant.
6. A serving of a green vegetable[3] for each participant.
7. A small serving of fish[4] for each participant.

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[1] The suggested dessert is a shortcake baked in the shape of the infinity sign.
[2] The seed could be peanuts, almonds, etc.
[3] The vegetable could be parsley, mint, or even a lettuce salad.
[4] The fish could be herring, tuna, smoked salmon, etc.

Introduction

On July 20th of each year, we gather to commemorate the wondrous accomplishments achieved by the Human Beings of Planet Earth.

During this celebration we retell the story of the evolving universe, life, and the first landing by humans on the moon of Earth.

What better time to tell the story of our aspirations and accomplishments than on the anniversary of the highest achievement of our hands, hearts, and minds and one of the most dramatic events in modern time, that first landing.

Of all the formal holidays celebrated by the people of Earth, few, if any, recognize the peaceful and productive technological achievements accomplished by human beings as individuals, or as a species.

This, then, is our opportunity:

— to tell the story of the species that not only dreams, but has the ability to make those dreams a reality

— to honor those who advanced our body of knowledge and to recognize the profound significance of thought, reason, and the methods of science

— to become aware of the new and exciting possibilities that technology, derived from our understanding of nature, is opening up to us

Foreword*

Five hundred million years ago, the Moon summoned life out of its first home, the sea, and led it onto the empty land. For as it drew the tides across the barren continents of primeval earth, their daily rhythm exposed to sun and air the creatures of the shallows. Most perished—but some adapted to the new and hostile environment. The conquest of the land had begun.

We shall never know when this happened, on the shores of what vanished sea. There were no eyes or cameras present to record so obscure, so inconspicuous an event. Now, the Moon calls again—and this time life responds with a roar that shakes earth and sky.

When the Saturn V soars spaceward on nearly four thousand tons of thrust, it signifies more than a triumph of technology. It opens the next chapter of evolution.

No wonder that the drama of a launch engages our emotions so deeply. The rising rocket appeals to instincts older than reason; the gulf it bridges is not only that between world and world—but the deeper chasm between heart and brain.

— Arthur C. Clarke

* Arthur C. Clarke. "L'envoi" from the epilogue of First on the Moon.

Armstrong, Collins, and Aldrin with Gene Farmer & Dora Jane Hamblin.
First on the Moon. New York: Little Brown & Company, 1970.

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When We First Left Planet Earth

All gather around the table.

The wine cups are filled.

Prelude

Leader: Why is July 20th different from all other days?

On this day, (n*) years ago, humans first set foot on another world–the moon of Planet Earth. We are gathered here today to celebrate that event, and reflect upon its significance.

Leader: Why is this event so significant to us?

Prior to that day, life on Earth, while thriving in myriad environmental niches, or homes, was confined to that one world. This was the first journey to another world by humans, and the first step toward Earth-based life reaching possible new homes in the unimaginable vastness of the universe.

It demonstrated humankind's unique ability to formulate abstract concepts to accurately describe the workings of the universe and build machines to take advantage of those insights. As we add to our knowledge we continue to fulfill our natural destiny in understanding the universe and our role in it.

Leader: How did this fulfillment begin?

About 14 billion years ago, the Big Bang happened. In the earliest seconds, symmetries were broken and the forces of nature came into being. Particles joined to form atoms, atoms formed molecules. As the universe continued to expand and cool, stars came into being.

At the end of their lives, in implosions that are among the most energetic events in the universe, the stars produced the heavier elements. Eventually, among the remains of the earlier stars, new stars were born with planets that formed around them. And the planets were abundant with the elements created by the earlier stars. In the presence of energy from a local star, elements combined to form complex molecules including the building blocks of life. In the eons that followed, the

* n = (present year) minus 1,969

relentless stream of energy from the star continued to drive chemical evolution on the nearby planets, and then biological evolution on at least one of them.

Leader: We light this candle to symbolize the Sun, our source of free energy.

[Light the central candle]
[Distribute the seeds, green vegetable, and fish]

Very early in the existence of the planet we call Earth, the third from the star we call Sol, at a place and time when conditions were right, a carbon-based molecule came about that could replicate itself. Within its double-helix structure was embodied a chemical code–instructions that generate living organisms. We call this molecule deoxyribonucleic (de ok´ si ri´ bo noo kle´ ik) acid, or DNA.

Leader: Why is DNA important?

DNA is the basis of life as we know it, and allows life on Earth to reproduce and evolve. It is found in the nucleus of every living cell.

Leader: The seed is the domain of the DNA and a symbol of life's potential. As we eat it, let us reflect on DNA's importance to life on Earth.

[Eat seeds]

After a while, some organisms developed the ability to harness the energy from the Sun through a process we call photosynthesis (pho to syn the sis).

Leader: Why is photosynthesis important?

Photosynthesis allows the plants to utilize the energy of sunlight to split the carbon-oxygen bonds of carbon dioxide from the atmosphere, and the hydrogen-oxygen bonds of water, to assemble their very structure from those liberated atoms and, in the process, release the freed oxygen into the atmosphere.

Leader: The green vegetable represents the photosynthesizers. As we eat it, let us reflect on the contribution of plants, that with the energy from the Sun, create the food, and release the oxygen, we need to exist.

[Eat green vegetable]

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Using the energy around them and the ability to reproduce and adapt to changes in their environment, the first simple life forms were able to prosper and multiply. Life produced order from chaos, locally reducing entropy.

First, as single-cell organisms, then as colonies of specialized cells, life took form with ever-increasing complexity. Responding to changes in the environment and other challenges to existence, life became varied and versatile.

Some forms of life explored, and then inhabited, the dry environments beyond the ocean. As time went on, Life continued to fill all possible homes it could occupy, being bound only by gravity and the upper reaches of Earth's atmosphere.

Leader: The fish represents the early forms of animal life. As we eat it, let us reflect on the progression from simple life forms to ones more complex, driven by Life's ability to adapt to occupy every possible home and way of living.

[Eat fish]

Leader: Let us drink to Life filling the seas and covering the land.

[Drink wine]

Leader: How did we evolve from early life forms?

Life took many various forms. Those which best adapted to changes and challenges in the world about them thrived and multiplied.

As single cells joined together to form complex organisms, so complex life forms joined together in groups which gave each member a greater chance of survival. Thus, cooperation evolved as a favorable characteristic.

From one of these groups emerged a species that could judge distances by sight, had hands that could hold and grasp, walked upright, and could know and understand the world about them. These were our early ancestors who harnessed fire, made and used tools, and became aware of their own existence. Intelligence had evolved as a favorable characteristic.

We are the children of our parents, the descendents of ancestors, ancient and forgotten. Each of us is directly linked, by an invisible thread of heredity that disappears into the depths of time, binding us not to just our ancestors, but to the earliest forms of life, which thrived in the oceans and basked in the sunshine of the earliest days of planet Earth; even further, to the stars themselves, where the very atoms that today form our bodies, were forged.

Leader: We light candles to remind us that the processes that yielded the ever more complex and diverse forms of life, which ultimately led to us, were driven by the energy from our home star, the Sun. And as living beings we carry a flame of life that started as a spark in the distant past, that has been passed, generation after generation, down through time.

[The lit central candle is used to light the candle of the first guest in the direction of the reading rotation. The flame then progresses around the table(s) by lighting each guest's candle from the previous candle and ends at the candle of the Leader.]

Leader: Let us drink to life, and humanity's uniqueness among all life forms.

[Drink wine]

Leader: How did we develop the tools that allowed us to ultimately leave our birth planet?

Our species developed belief systems that gave meaning to the unexplainable and rules that organized social interaction. Eventually, within a paradigm in which life was seen as a cycle of birth, death, and reincarnation, a new idea—that we are here only once—was introduced. With that came an awareness of, and a reverence for, the preciousness of life which inculcated a sense of urgency that motivated, and ultimately drove, innovation and achievement.

We invented agriculture and economic systems, and developed cities that allowed specialization and transference of resources. These inventions provided sufficient time to allow some to think about the workings of the world and to further develop the mind's tools of writing, mathematics, and philosophy.

Driven by curiosity and economic advantages, explorers sought out the unknown. With reports of their new discoveries came challenges to the established views about the world and universe in which they lived.

At first, our understanding of the universe was limited. Some placed themselves at its center and believed that all existence, including our own sun, revolved around them. Then, Copernicus (co per´ na kas) reasoned that it was the Earth and planets that revolved around the Sun.

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As time went on, the scientific method was developed by Bacon, Galileo, and others, in which theories were formulated to fit observed facts rather than distorting reality to fit preconceived ideas.

Using the new methods of science, the workings of the universe began to be revealed. Kepler discovered that the planets travel in ellipses, rather than circles, which led to his laws of planetary motion.

Newton provided profound insights into the relationship between matter, force, and acceleration, and contributed the laws of inertia and the law of universal gravitation. These explained the motion of both earthly and planetary objects in a rigorous mathematical way. In addition to inventing the reflecting telescope and explaining the white-light spectrum, Newton founded the modern science of physics and, concurrently with Leibnitz (Leap´ nits), originated the calculus.
Gutenberg's invention of the printing press allowed the new wisdom to be made available to many people. This, in turn, sped the advancement of knowledge.

The structure of the matter of the universe was being understood. With the insights of Mendelyeev (men dye lye' ef), the relationships among the elements were seen in an orderly and systematic way. With this knowledge, embodied in what is called The Periodic Table of the Elements, we began to understand and control chemical processes.

The theories of Coulomb (ku´ lom), Gauss (gous), Ampère, Faraday, Maxwell, and others, expanded our understanding of electricity and magnetism. Kelvin, Joule (jewel), Carnot, (car no´) and others developed the theories of thermodynamics which related heat and mechanical energy and the conversion of one into the other.

With new understandings of physics, technologies were developed that included Watt’s steam engine and Franklin’s electricity. The concept of interchangeable parts allowed mass production which ushered in an era known as the Industrial Revolution. Technology abounded and produced a great wealth of resources which brought forth new discoveries yielding yet more technological advances.

Observations of the natural world, coupled with the scientific method, led Darwin to propose a theory in which the processes of nature alone could explain the development and diversity of all of earthly life, including ourselves. This gave us a new perspective on our place in the universe.

Einstein developed the Theory of Relativity and with Curie, Bohr, Dirac (di rak´), Heisenberg, Schrodinger (shre´ ding er), and others, contributed to the Quantum Theory. This refinement of Newton's theories provided new understanding about the relationship of space and time, and the interchangeability of matter and energy. This gave us access to the virtually unlimited resource of the power of the atom.

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Leader: What part did these developments play in our leaving Earth?

The discoveries and new knowledge of the scientists provided the basis for the technologies that eventually allowed us to leave the planet. The theories of physics, chemistry and thermodynamics provided the basis for the engines that powered our machines on Earth and beyond.

Gesner (ges-nar) invented a process to extract, from oil shale and coal, a liquid he called kerosene which would later be derived from petroleum to provide energy not only for rockets, but for the development of industrialized civilization itself.

Cailletet (ka e' tay) and Pictet (pek' tay) liquefied air and started a race for colder temperatures that led to liquid oxygen, and by the work of Dewar, liquid hydrogen. Having these gases in liquid form would be critical for rocket propulsion and spaceflight.

The Wright brothers, von Karman, and others, developed the technology of aerodynamics which allowed the beginning of controlled travel away from the surface of our planet.

Edison, Tesla, Bell, Marconi, Armstrong, and others, provided ideas and creations from which the electronics and communications industry would rise. This led to the invention of television, by Baird and Farnsworth, that provided the means to see from afar and brought the world community closer together.

Based on the work of Turing and von Neumann (noi´ man), computers would ultimately allow us to design machines, compute trajectories, and control our rockets and space vehicles.

Tsiolkovski (tseel kov´ ski) in Russia, Goddard in America, and Oberth in Germany, independently developed the theoretical basis for rocketry. A half century before the launch of the first satellite, Tsiolkovski offered this insight:
"The Earth is the cradle of humanity, but one cannot live in a cradle forever."

Building on the theoretical foundations established by Goddard, the development of modern rocket technology was led by von Braun and Korolev (kor ol yov). With his vision, technical abilities, and political skill, von Braun would shape and drive the American space program from post World War II through the Apollo era.

Leader: Let us toast those advances in science and technology that contribute to the betterment of humankind.

[Drink wine]

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Leader: How did men first land and return from the Moon?

Twelve years before the event we recall tonight, the Space Age began. On October 4, 1957, a rocket launched by the Soviet Union placed the first artificial satellite, named *Sputnik*, in orbit of Earth. A few months later the United States launched its first satellite, *Explorer I*. After the passage of a little more than three years, the Russian Yuri Gagarin became the first human to orbit the Earth. The American John Glenn following a few months later.

A contest had developed between two great nations of Earth. In what was to become known as the Space Race, each would try to demonstrate superiority over the other through technical achievement and vying for "firsts." It became clear that the ultimate victory would go to the first to land a man on the Moon.

In 1961, eight years before the landing, the American leader, President Kennedy, committed the nation to the goal of, within the decade, placing a man on the Moon and returning him safely to Earth. His speech, given at Rice University in Houston, Texas in 1962, echoed the human desire for adventure, challenge, and exploration:

> "But why" some say, "the Moon?" And they may well ask, "Why climb the highest mountain? Why thirty-five years ago fly the Atlantic? Why does Rice play Texas?"
>
> We choose to go to the Moon! We choose to go to the Moon in this decade and do the other things not because they are easy, but because they are hard. Because that goal will serve to organize and measure the best of our energies and skills. Because that challenge is one that we're willing to accept, one that we are unwilling to postpone, and one that we intend to win.

The American manned journeys into space began with Project Mercury whose astronauts utilized a small, one-man capsule. The missions of Project Mercury began cautiously, but grew in complexity as confidence built that humans could not only survive in space, but could actually command their craft.

Shortly afterward came Project Gemini with its spacecraft that carried a crew of two. The Gemini program flew missions to prepare for the lunar expedition.

On one mission, an astronaut left the spacecraft protected only by his space suit. This built confidence that an astronaut could function independently from his spacecraft when the time came to walk on the Moon.

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On another mission, the astronauts remained in Earth orbit for two weeks to test their endurance of weightlessness for a time equivalent to that required for the journey to the Moon and back.

On many of the missions the astronauts would maneuver their Gemini spacecraft to rendezvous and dock with another Earth-orbiting vehicle which developed the techniques and skills necessary to meet in orbit. This would ultimately be used during the journey to the Moon.

During this time, robot spacecraft orbited and landed on the Moon, providing vital information about that world. This was the beginning of what would be called The Golden Age of Planetary Exploration when robot spacecraft would be sent to observe almost all of the planets, and the moons of the planets, of Sol's System.

While Gemini was flexing the muscles of our new space capabilities, engineers were developing the launch system for Project Apollo that would be mighty enough to deliver fifty tons of spacecraft, and the astronauts, to the Moon.

The Apollo Saturn V (five) was a multi-staged rocket that stood three hundred sixty-five feet tall and at launch weighed six and a half million pounds. The payload it would loft into space and ultimately to the Moon was the Command Module, a conically-shaped capsule that was the living quarters for the crew of three, its attached Service Module that provided power, life support and propulsion, and the Lunar Module (LEM) for transit to and from the Moon's surface.

Then, tragedy.

In heroic endeavors that push the boundaries of the unknown, some are called to risk the ultimate sacrifice. In one such event, three American astronauts—Grissom, White, and Chaffee—lost their lives during a mission rehearsal on the launch pad when a fire broke out in their Apollo capsule. But from the ashes arose a new determination and a better design for the Apollo that yielded the superb machine that would ultimately safely carry men to the Moon and back home.

Leader: All rise.

[The Remembrance Cup is filled]

Leader: We have poured an extra glass of wine in remembrance of those who lost their lives in the quest for knowledge. Let us now raise our cups to honor them.

[To symbolize our loss, we do not drink]

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We recognize that exploration is often accompanied by great risk. We raise our cups to the courage, and to the memory, of all who have given their lives seeking the far horizon and, in so doing, make it safer for those who follow.

[A moment of silence is observed]

Leader: Please be seated.

In December 1968, the mission of Apollo 8 became the first manned expedition to the region of the Moon. Astronauts Borman, Lovell, and Anders, orbited the Moon ten times and then returned to Earth. For the first time in history, humans were captured by the gravity of another world.

Building on the lessons of Gemini, Apollo 9 orbited the Earth to prove the ability of the astronauts in the Command Module to separate from the third stage and then rendezvous and dock with the Lunar Module. These were critical maneuvers that would have to be performed in lunar orbit.

Apollo 10 flew to the Moon and further tested the systems and procedures in a dress rehearsal for the lunar landing of Apollo 11—the mission that would irrevocably mark the time when life from Earth first reached another world.

Apollo 11

Leader: What were the events of that historic mission?

July 16th, 1969 was a hot, humid day at Cape Canaveral, Florida, USA. The Saturn V was poised on its launch pad with all systems "go." Aboard Apollo were three astronauts, Mission Commander Neil Armstrong, Command Module Pilot Michael Collins, and Lunar Module Pilot Edwin Aldrin.

People around the world pondered the significance of what was about to happen as they watched television or listened to radio. With excitement building, they waited as the seconds ticked away towards lift-off. An age-old dream was about to become reality.

> Twelve… eleven… ten… nine… ignition sequence starts…
> six… five… four… three… two… one… zero.
> All engine running.
> LIFT-OFF! We have a lift-off, thirty-two minutes past the hour.
> LIFT-OFF ON APOLLO ELEVEN…
> Tower cleared.

In what was to be a perfect launch, the mighty Saturn V thundered from the launch pad on seven and a half million pounds of thrust generated by its five F-1 engines that for almost three minutes consumed liquid oxygen and kerosene at the incredible rate of fifteen tons per second. Then, burning liquid oxygen and liquid hydrogen, the Saturn's second stage with its five J-2 rocket engines took over.

Twelve minutes into the historic mission, after a burn of its single J-2 engine, the Saturn's S-IVB (S four B) third stage with Apollo entered a 118 mile-high Earth orbit traveling five miles per second.

At two hours and forty-four minutes into the mission, the third stage engine was re-ignited and accelerated Apollo to seven miles per second. It now had the necessary speed and trajectory that would deliver it to the Moon.

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A little more than three hours after launch, fifty-six hundred miles from Earth, the mated Command Module and Lunar Module separated from the Saturn third stage. Apollo then maneuvered and left the S-IVB third stage forever, its task complete. The Saturn V had performed admirably.

Leader: Let us toast the success of the launch and all who made it possible.

[Drink wine]

The journey from the Earth to the Moon would take three Earth days. At two and a half days (61 hours, 40 minutes), the spacecraft passed the equipotential gravity point between the Earth and the Moon after which it rapidly accelerated toward the new world.

At 75 hours, 6 minutes, the Service Propulsion System (SPS) engine was fired to slow Apollo, allowing it to enter lunar orbit. Its initial orbit of 70 by 194 miles was lowered to 62 by 76 miles five hours later by another burn of the SPS engine.

Once established in orbit, the Lunar Module and its systems were checked out in preparation for the descent to the Moon. At 100 hours into the mission, with Armstrong and Aldrin aboard the Lunar Module Eagle, named after a bird that was the symbol of the nation that built it, and Collins aboard the Command Module Columbia, the two spacecraft separated.

[Designated participants read the following]

CAPCOM: Eagle, Houston. We're standing by; over . . .

Eagle, Houston. We see you on the steerable; over.

Aldrin: Roger. Eagle. Stand by.

CAPCOM: Roger. How does it look?

Aldrin: The Eagle Has Wings!

Leader: As Columbia continued in lunar orbit, the Eagle's historic descent to the surface of the Moon began. The descent engine fired briefly to place it in a 68 by 10 mile orbit. At 102 hours, 33 minutes, 4 seconds, the reaction control system fired for seven seconds to settle the propellants in their tanks. Then the final descent burn began. As the Eagle's velocity slowed, it descended on an arcing trajectory toward its destination, the Sea of Tranquility.

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When the Eagle reached a point 400 feet above the lunar surface on its continuing descent, it was angled 11 degrees from vertical. The world listened to the words coming from distant space charting the progress of the landing craft and its intrepid crew.

Aldrin: Thirty-five degrees. Thirty-five degrees…

Seven fifty, coming down at twenty-three…

Seven hundred feet, twenty-one down, thirty-three degrees…

Six hundred feet, down at nine-point-eight forward…

Three hundred fifty, down at four…

Three hundred thirty, three and a half down.

We're pegged on horizontal velocity…

Three hundred feet, down three and a half… Forty-seven forward.

Down one a minute. One and a half down…

seventy. Got the shadow out there…

fifty, down at two and a half. Nineteen forward…
Altitude-velocity lights… Three and a half down,

Two hundred twenty feet. Thirteen forward… Eleven forward, coming down nicely…

Two hundred feet, four and a half down… Five and a half down…

One hundred sixty. Six and a half down, five and a half down, nine forward… Five percent… Quantity light…

Seventy five feet, things looking good…

Down a half. Six forward…

Leader: At this point, Eagle was very close to the Moon. The success of the landing was now dependent on Armstrong's visual piloting ability. This was complicated by the descent-engine exhaust which was kicking up radial fans of dust that obscured his view. As the craft passed 60 feet, it was critically low on propellant. There remained, for the descent, one minute of fuel.

CAPCOM: 60 seconds.

Aldrin: Lights on. Down two and a half.

Forward…

Forward…

Good…

Forty feet, down two and a half…

Kicking up some dust…

Thirty feet. Two and a half down…

Leader: Armstrong had to be careful in these last few critical seconds to make sure that there were no boulders in the landing area or sideways velocity on the vehicle as it settled into the surface. A tipped lander would mean death.

Aldrin: Faint shadow…

Four forward…

Four forward. Drifting to the right a little.

Six… Down a half…

CAPCOM: 30 seconds.

Armstrong: Forward drift?

Aldrin: Yes. Okay… CONTACT LIGHT… Okay. Engine stop. ACA out of detent. Mode control both auto. Descent engine command override off. Engine arm off. Four thirteen is in.

CAPCOM: We copy you down, Eagle.

Armstrong: Houston, Tranquillity Base here…
The Eagle has landed.

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Leader: Let us drink to the flight of the Eagle and all who made it possible.

[Drink wine]

Leader: Once settled, all systems were checked out to ensure that it was safe to stay for the planned time. Then, preparation began for the historic first walk on the surface of the Moon.

At 109 hours, 2 minutes, over six hours after landing, the Eagle's hatch was opened. In his space suit, Armstrong crawled backward onto the porch of the lander. As he backed down the first few rungs of the ladder he activated the television cameras allowing millions on Earth to share the momentous event.

Armstrong: I'm at the foot of the ladder. The LEM footpads are only depressed in the surface about one or two inches. Although the surface appears to be very, very fine grained, as you get close to it, it's almost like a powder. Now and then, it's very fine…

I'm going to step off the LEM now…

THAT'S ONE SMALL STEP FOR A MAN…
ONE GIANT LEAP FOR MANKIND.

Leader: On July 20, 1969 AD, at 109 hours, 24 minutes, 15 seconds—four and a half days after leaving Earth—Armstrong took the first step onto the surface of another world. Let us toast the historic event.

[Drink wine]

[Normal participant reading-rotation resumes]

While on the Moon the astronauts gathered rock specimens and deployed scientific instruments. During a televised ceremony, they planted the flag of the United States of America and then unveiled a plaque which read:

Here men from the planet Earth first set foot upon the Moon
July 1969 A.D.
We came in peace for all mankind

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Half an Earth day later, the astronauts readied Eagle for the first leg of their return to Earth. With Columbia in the proper position for lunar orbit rendezvous, Aldrin and Armstrong, aboard Eagle, fired the single ascent stage engine, and leaving the descent stage behind, they climbed into orbit.

At 127 hours and 45 minutes into the mission, Eagle and Columbia successfully docked. After the astronauts and their treasure of Moon rocks were safely aboard Columbia, the Eagle, its job complete, was separated from the Command Module.

Shortly before the 135-hour point, while behind the Moon, a burn of the Service Propulsion System accelerated Columbia to escape the Moon's gravity on a trajectory that would take them home.

In a free fall for a little over two days, the Command Module, Columbia, with its still attached Service Module, accelerated toward the Earth. Then Columbia separated from the Service Module and endured a fiery entry into the atmosphere at 25,000 miles per hour. It was further slowed by parachutes and splashed down in the Pacific Ocean where the capsule and crew were soon recovered by the aircraft carrier, USS Hornet.

The mission was a success. The astronauts were considered heroes by people all over the world. The Moon rocks were shared and studied by scientists around the world, and the Command Module Columbia was put on display in a place of honor in the Smithsonian Museum in Washington D.C.

Leader: Let us drink to commemorate the mission of Apollo 11, and all who made it possible.

[Drink wine]

Leader: We now commence the feast to celebrate the wondrous accomplishments of the human beings of planet Earth, and the first landfall on another shore in the infinite sea of the universe.

[Dinner is served]

Epilogue

[Following dinner]

Leader: Today we have told the story of the creation and evolution of the universe, Earth, life, and technology, and recounted the story of our first landing on another world, the moon of planet Earth.

And so, what has been before leads forward to what is now, and what will be…

We recognize that our destiny is to inhabit the stars, stepping forth from our blue and white homeworld to fill the galaxy:

— Knowing that life is precious and fragile, and that sentient life is a treasure of the universe, we seek to understand and protect that life…

— Being creatures of finite span in an infinite universe, we seek to seed our kind throughout this universe, creating new homelands, extending our reach, and guaranteeing our survival as a species . . .

— Being creatures of wonder and abstraction, we seek to fill our minds with the understanding of the universe…

— Being creatures of flesh and blood, we seek the resources for an abundant life within this universe…

— Being creatures of caution and aggression, aware that other sentient life may exist, we proceed intelligently on a path as yet untrod by humankind…

— Being creatures of unlimited vision and extensive hope, we embrace the lengthening of full life and stand resolute in the face of mortality…

— Being creatures of revelry and players at the paradox, we seek to fill our lives with joy and pleasure, following with amusement our own venturing.

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And so, for joy and for wonder, to protect, to grow, to explore and to live, we step onto an unfolding path that leads outward from our lone homeworld.

We begin this journey with the filling of the near space surrounding our homeworld, Earth—extending ears, eyes, hands, and finally building homes and work places, filling the empty spaces with life.

We will create human outposts throughout our solar system, which will become cities floating free between, and set upon and within Earth's sister worlds. And these cities will form a community that will bring the wealth and variety of resources, knowledge, and adventure, within Sol's system, to the children of the Earth.

And, as our own system is filled with the variety of humankind, we will lift our eyes to the far horizon, that which has drawn us first across, and inevitably up from the homeworld and has filled our minds with wonder and desire, and we will sail forth to the stars…

Assembled: To the stars!

Commemoration

by
Judith L. Freed
August 11, 1996

Seven candles burning bright
Six are red and one is white
We gather here upon this date
Man on the Moon to celebrate

On the 20th of July in '69
A drama as to stretch the mind
Man from Earth his foot did place
Upon the Moon in Outer Space

How did Man come to such a task
To reach this goal that we may ask
Because of Men who dared to dream
This Cosmic plan did Science scheme

A journey such as none had done
The quest of who would be the one
To touch the Moon and place the flag
The race was on no time to lag

To land upon another World
The mind of Science would be hurled
And leave our flag for all to know
That dreaming dreams can make it so

To Armstrong Aldrin Collins too
With courage and hope these precious few
Did take us there upon that day
The Moon no longer dreams away

So we remember from now on
That Man has been and Man has gone
To dream and seek and hope and search
And bring us back the Universe

The Cast (as of July 2017)

Aldrin, Jr., Edwin Eugene	American astronaut	1930 -
Ampère, André-Marie	French physicists	1775 - 1836
Anders, William Alison	American astronaut	1933 -
Armstrong, Edwin Howard	American engineer & inventor	1890 - 1954
Armstrong, Neil Alden	American astronaut	1930 - 2012
Bacon, Sir Francis	English philosopher	1561 - 1626
Baird, John Logie	Scottish engineer and inventor	1888 - 1946
Bell, Alexander Graham	American scientist	1847 - 1922
Bohr, Niels Henrik David	Danish physicist	1885 - 1962
Borman, II, Frank Frederick	American astronaut	1928 -
Cailletet, Louis-Paul	French physicist and inventor	1832 - 1913
Carnot, Nicolas Leonard Sadi	French physicist	1796 - 1832
Chaffee, Roger Bruce	American astronaut	1935 - 1967
Collins, Michael	American astronaut	1930 -
Copernicus, Nicholaus	Polish astronomer	1473 - 1543
Coulomb, Charles-Augustin de	French physicist	1736 - 1806
Curie, Marie Sklodowska	Polish chemist	1867 - 1934
Darwin, Charles Robert	English evolutionist	1809 - 1882
Dewar, Sir James	Scottish chemist and physicist	1842 - 1923
Dirac, Paul Adrien Maurice	British physicist	1902 - 1984
Edison, Thomas Alva	American inventor	1847 - 1931
Einstein, Albert	German physicist	1879 - 1955
Faraday, Michael	English physicist	1791 - 1867
Farnsworth, Philo Taylor	American inventor	1906 - 1971

Franklin, Benjamin	American scientist	1706 - 1790
Gagarin, Yuri Alekseyevich	Russian Cosmonaut	1934 - 1968
Galilei, Galileo	Italian astronomer	1564 - 1642
Gesnar, Abraham Pineo	Canadian geoligist	1797 - 1864
Gauss, Karl Friedrich	German mathematician	1777 - 1855
Glenn, John Herschel	American astronaut	1921 - 2016
Goddard, Robert Hutchings	American physicists & inventor	1882 - 1945
Grissom, Gus	American astronaut	1926 - 1967
Gutenberg, Johann	German printer	1397 - 1468
Heisenberg, Werner Karl	German physicist	1901 - 1976
Joule, James Prescott	English physicist	1818 - 1889
Kelvin, William Thomson	English physicist	1824 - 1907
Kennedy, John Fitzgerald	American president	1917 - 1963
Kepler, Johann	German astronomer	1571 - 1630
Korolev, Sergey Pavlovich	Soviet rocket engineer & designer	1907 - 1966
Leibnitz, von, Gottfried Wilheim	German mathematician	1646 - 1716
Lovell, James Arthur	American astronaut	1928 -
Marconi, Guglielmo	Itialian physicist	1874 - 1937
Maxwell, James Clerk	Scottish physicist	1831 - 1879
Mendelyeev, Dmitri Ivanovich	Russian chemist	1834 - 1907
Newton, Sir Isaac	English mathematician philosopher	1642 - 1727
Oberth, Hermann Julius	German physicist & engineer	1894 - 1989
Pictet, Raoul-Pierre	Swiss physicist	1846- 1929
Schrodinger, Erwin	Austrian physicist	1887 - 1961

Tesla, Nikola	Austro-Hungarian-American physicist	1856 - 1943
Tsiolkovski, Konstantin Eduardovich	Russian/Soviet rocket scientist	1857 - 1935
Turing, Alan Mathison	English mathematician	1912 - 1954
von Braun, Wernher	German engineer	1912 - 1977
von Karman, Theodore	Hungarian-American engineer	1881 - 1963
von Neumann, John	Hungarian-American mathematician	1903 - 1957
Watt, James	Scottish inventor	1736 - 1819
White, Edward Higgins	American astronaut	1930 - 1967
Wright, Orville	American inventor	1871 - 1948
Wright, Wilbur	American inventor	1871 - 1948

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