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ETHLEHEM STEEL
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Steel does more than the daylight
Fine and full natural flavor.

Happy

ere be too much of a good
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breeding regions for hurricanes
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the weather wing will be
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e all of these weather reports
e working out ways to get the pic
reporting. As they are now, the
back-tracking receiving stations
ne, many hours later, the pictures

SPACE AND THE ATOM

over the grouping of these systems
in that they are placed at the proper
latitudes and longitudes can be impre
cise and useless. "We need an impro
ved, automatic analyst," says the weath
Weather Bureau's turn.
Scientists at General Dynamics/Astro
nautics in San Diego, for example, re
vealed that they have been developing
just what the weathermen need: a hand
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pening "mosaic" maps of Tiros cloud
tup. Their skepticism has been bolstered
by several eminent scientists who claim,
as does Philip H. Abelson, director of
the Carnegie Institution's geophysical
laboratory and editor of the influential
Science, that "really important
discoveries about the moon and other
objectives could be studied soon" at rel
atively low cost by unmanned satellites.
The doubters won out last week,
temporarily at least. Convinced that U.S.
space efforts can proceed at a more
measured pace, the House Space Com
mittee suggested that nearly $200 mil
lion be cut from the $3.7 billion NASA
has requested for manned space flight
next year—mostly from the ambitious
Apollo program to put Americans on the
moon by 1970. It also voted to lop
$194 million from the proposed $1.2 bil
lion for purely scientific studies just
what Abelson and his group want to do.
In taking firmer control of NASA's
program, the committee specifically:
• Refused a $15 million proposal for an
other rocket to Venus in 1965. Such a
flight is unnecessary, the committee be
lieves, after Mariner II's historic voyage
last December, when the planet's tem
perature was measured at 800 degrees.
• Rejected a $28 million request for a
series of scientific satellites known as
Surveyor Orbiters, which would relay TV
pictures while circling the moon.
• Revised the Ranger program, aimed
at placing instruments on the moon,
from $135 million to $65 million in doing
so the committee criticized Caltech's
Jet Propulsion Laboratory for the pro
gram's five consecutive failures, insisting
that scientists that JPL's new
emphasis on techniques to put men on
the moon had damaged the Ranger pro
gram. By the weekend, the House had
whacked $313 million from the entire
NASA budget, and there was no
telling how much further the Senate
might slash that number. $90 million
of $100 million would be cut. There
would be no Surveyor this year, and
Ranger's program was pared to the
bone. "It's a sad day for space," said Rep.
Frank J. Becker, Republican of New
York, a space booster. Rep. George Miller, the
committee's soft-spoken chairman,
added wearily: "We're not trying to be a
wet blanket on anybody's program. We're
trying to do what is best for the country."

Anti-Missile American ... Dr. Nicholas Christofilos ... different ... Sperry Gyroscope ... to ... [illegible]

... and to analyzed more accurately ... and to analyzed more accurately
... an instant. The longest delay in it
... electric-setting," promises Morgan
... will be the minute or two it takes
... for the film to be beamed from space
... to earth. [illegible]

The Accelerating Lobby

While no congressman wants to be
blamed for losing the moon race to the
Russians, many have begun wondering
if the trip is worth the $20 billion price
tag. Their skepticism has been bolstered
by several eminent scientists who claim,
as does Philip H. Abelson, director of
the Carnegie Institution's geophysical
laboratory and editor of the influential
Science, that "really important
discoveries about the moon and other
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added wearily: "We're not trying to be a
wet blanket on anybody's program. We're
trying to do what is best for the country."

... are almost essential for survival," Stern-
bach notes. The family's youngest son
continually burned himself by climbing
on radiators and touching the burners
on the kitchen stove. And the oldest
... adjusted, get good grades in school,
and hold down part-time jobs. Most
important, Sternbach reports, "they
are happy."

This *Is* Cricket

They were talking about it in the
crowded pubs along Old Compton
Street in London last week and they
were talking about it in the plush clubs
along Bond Street. They were talking
about it in distressed British tones, and
they were talking about it in gleeful
West Indian singsong. Even the Prime
Minister was talking about it.
What was everybody in England talk-
ing about?
Wrong. Besides that.
The topical topic of conversation was
not sagging morals, but soaring sports:
the West Indian cricket team,
which has captured the imagination of
all Britain just at the time when crick-
et's appeal was fading. The game had
grown dull in recent years, conservative
in its strategy, hesitant in its applica-
tion. Crowds and gate receipts were
dwindling; interest was ebbing; some-
thing was obviously needed to revitalize
what The Times Education Supplement,
published by The Times of London,
called "more than a game . . . a way of
life, a religion, a semipolitical activity,
a paramilitary exercise . . ."
The West Indians came to the rescue
with bold, exciting play, and bold, ex-
citable fans:
"In international matches," says Frank
Worrell, the Barbados veteran who
captains the West Indians, "England
and Australia have so much pride and
prestige riding on the outcome they
have to play safe . . . to get a draw
if they can't win . . . We don't have any-
thing to lose, so we're prepared to take
a chance."
Transcendent. In the current se-
ries of five Test Matches against Great
Britain, the West Indians are taking
chances and took the first match by a
decisive margin. In the second match,
which ended last week, 124,000 spec-
tators paid $156,000 during a five-day
orgy of cricket. The match ended with
a dull draw. The match expired with
the West Indians slightly ahead, and
England still batting. It was the most
tremendous game I have ever seen,"
said Berkeley Gaskin, minister of the
West Indian team.
The wildly enthusiastic West Indian
fans dispersed with such cheers as "Well played, sir," and
"Bowl 'em out," spurred their heroes
with pointed, calypso-accented com-
ments: "That's a wicked one, man.
That's thirteen against me. I tell you,
England find the umpires . . . you need
new willow, mate."
The heroes responded eagerly.
Wes Hall is the Early Pleasures

Frank Worrell: Calypso carnival

of cricket. A solid 6 feet 2 and 189
pounds, Hall can bowl at 90 miles an
hour and he reinforces his speed with
a delivery called "a bouncer," which
translates easily into the American
"beanball." A bouncer strikes the ground
halfway down the pitch (the 66 feet
of turf between bowler and batsman)
then, if properly aimed, whizzes
past the batsman's head. It shakes their
confidence a bit. Hall says. The deliv-
ery is not illegal, but it is not exactly
cricket. It is not cricket either for
players to complain, so the British crick-
eters left the griping to their sports-
writers. Hall's bowling complained
Cardus, the cricket expert of the
Daily Herald, "and the Englishmen de-
fended their bodies and heads as if
attacked by an army of Sonny Listons."
Batsman Garfield Sobers, 27, is
cricket's Willie Mays, a flashy but mas-
terful batsman, and simultaneously
one of Warren Spahn, a master at bowling
with different speeds and deliveries.
He is, in all likelihood, the finest
all-round cricket player in the world
today, and West Indian fans appreciate
him. When you watch Mr. Sobers," said
one West Indian at last week's
Test Match, "King Sobers do not bat-
ter Hall and Sobers do not bowl
Hall and Sobers do not field." The magnitude of Frank Worrell, the
team's captain, the Stan Musial of
cricket, Worrell is 38 years old, nev-
theless, he has been playing cricket since
1947. His skills have dimmed, but
he is still a dangerous batsman, still an

effective bowler, still an adroit fielder,
and, above all, a leader. His standing
is so high with his side, one British
reporter noted, "that he can tell the
gifted Hall how to bowl and the magn-
ificent Sobers how to remedy a faulty
shot. His confidence has released the
talents of his volatile players. Yet by
balance and composed example, he has
always held them together." Worrell, as
J.P.W. Mallalieu wrote in the New
Statesman, "is every English schoolboy
cricketer's ideal of what an English
captain should be." When the current
test series comes to an end, captain
Worrell says he will retire. It is a
threat he often makes—and so far has
never kept.

Old Man and the Tee

After a practice round at The Country
Club in Brookline, Mass., George Bayer,
the longest hitter on the pro tour, offered
a rash prediction. While almost everyone
else was picking one of the Big Three—
Arnold Palmer, Jack Nicklaus, and Gary
Player—to win the 1963 U.S. Open,
Bayer went with 43-year-old Julius
Boros, winner of the Open in 1952 but
a distinct long shot at Brookline. "This
course and the crazy winds are tailor-
made for Julie," said Bayer. "His me-
dium-to-long irons are the best in the
business, he stays put of trouble, and he
never rattles. You can take my word for
it, Julie Boros is going to be damned
tough to beat."
Bayer, who finished in a tie for 42nd
place, was a better prophet than player.
When treacherous traps, extreme heat,
and 40-mile-an-hour winds sent scores
into orbit (of 404 rounds played, only
twelve equaled of bettered par), Boros,
coolly, steadily, and, unspectacularly,
proved unbeatable. After Palmer and
25-year-old Jacky Cupit had bogeyed
away several final-round chances, Boros,
who had come in with a 293 earlier in
the afternoon and had already packed
his shoes and clubs to continue along the
pro "mill," suddenly found himself in a
three-way tie.
In the playoff, with Palmer troubled
by a stomach virus and Cupit by inse-
curity, Boros combined shrewd club
selection, low irons and short shots to beat
Palmer by two strokes. Despite the
wind—still an easy 25 to 30 mph—he
came under par, 70, and became
the oldest American ever to win
the U.S. Open championship.
"All you hear about these days is the
Big Three," said Boros, a Connecticut
native who is a Florida resident, whose
first prize places him high
among the money winners in total earnings
for 1963. "From what you read in the
newspapers, nobody else seems to be
playing any more. Sometimes I've won-
dered if I'm playing myself." Golf's
quiet old man can stop wondering.

... Lewis and Garland. Darin
... actors. It will be taped, tape
... Lear" and the "Lawrence Welk Show,"
... for the more or less mature, as prelude
... to the indescribable Jerry Lewis.

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tion from Japan is the big threat. The makers of low-priced equipment have been hard hit by cheap imports from Japan, principally reels. At New York's

are very scarce and get laws passed that are intended to legislate fish onto their hooks. The only trouble is that fish can't read."

BUSINESS TIDES



Reaching for the Moon

by Henry Hazlitt

THIS May 25 message of President Kennedy to Congress is a profoundly disheartening document. At a time when total planned Federal expenditures (including social security) are already in excess of $100 billion a year, when we are already anticipating record deficits, when taxes on enterprise and investment are already so burdensome that they are reducing incentives and employment and slowing down economic growth, and when we have already piled up enough inflationary tinder to threaten a grave new inflation, Mr. Kennedy calls for bigger spending, bigger deficits, and more burdensome tax rates. His latest proposals increase the inflationary threat still further.

Since he came into office, Mr. Kennedy has put in requests for over $8.5 billion additional spending for the current fiscal year and the fiscal year to end June 30, 1962. A small part of this addition is for defense. But most of it is for new or expanded "welfare" programs, including increased foreign economic aid, increased social security benefits, medical care for the aged, Federal aid to education, housing and urban renewal, increased loans to farmers, to fishermen, to unemployed workers.

"EXPENSIVE STUNT"

And now, on top of all, the President asks us to spend $7 billion to $9 billion over the next five years, and perhaps $40 billion over the next ten years, to land a man on the moon and get him back.

Why? So far as the scientific value is concerned, as Vannevar Bush, former head of the Office of Research and Development during World War II, once said, to characterize the moon program as "a vastly overadvertised stunt" . . . There is nothing a man can do in space that won't be done better, and more cheaply, by instruments. Suppose it cost $1 billion to put a man on the moon. For the same money, we could support 1,000 research projects for 40 years. We need more basic research in physics, chemistry, and biology. We need to finish the job of conquering arthritis. We need to learn more about the genetic code. I believe we can . . . advantage or [illegible] earth than by shooting it into space."

If the scientific value of this stunt is minimal, compared with the cost and with the potentialities of alternative projects, what other purpose would justify it? Propaganda? Instead of trying to outdo the Russians with Buck Rogers marvels, it would be enormously cheaper and more effective to make more propaganda use than we have so far dreamed of making of the freedom and productivity achieved under our private-enterprise system—a freedom and all-around productivity with which no socialist or Communist system can compete at all.

SACRIFICE—FOR WHAT?

The President speaks of the need of making sacrifices. But sacrifices for the mere sake of sacrifice don't make sense. We must sometimes give up what is good today to achieve a greater good tomorrow. Mr. Kennedy is asking us to sacrifice what is good to achieve something of much more questionable value. Monetary stability, the welfare of consumers, the incentive to earn more and produce more, are not minor goods. Before we give them up, we should take a hard look at what we are offered instead.

And we cannot get a quart out of a pint jug. Whatever resources are devoted to new purposes and new projects must be withdrawn from old purposes and old projects. There is no economic fourth dimension. Mr. Kennedy sometimes talks as if there were, and as if a void created by government spending. But whatever the government spends on new programs it must either take from old programs or take from Americans in some form. This means that altered new needs can be met more adequately only if old needs are met less adequately.

True economy means wisdom in spending. It means saving on what is less necessary or less urgent in order to devote limited resources to what is more necessary or more urgent. It means putting first things first, establishing priorities. When the American people are urged to make sacrifices in their living standards in order to shoot a man to the moon, it is time to ask what has happened to our national sense of proportion.

BUSINESS AND FINANCE

stock, the banks and insurance companies that put up the money were chary of Hughes' slapdash management methods and insisted on installing three independent trustees (including ex-Ford chairman Ernest Breech) to vote Hughes' stock and run the airline.

It was clear last week that Hughes was having trouble digesting swallowed pride. Acting through attorneys for Hughes Tool, he sent a letter to the Securities and Exchange Commission complaining that the trustees were "disregarding the best interests of TWA stockholders." While the lawyers admitted that their charges were based on "incomplete" evidence, they did have specific complaints about some of the trustees' moves: (1) A long-term contract that gives TWA's new president



Hughes: No trust for the trustees

Charles Tillinghast a stock option for 50,000 TWA shares (options were never offered under Hughes' management), and (2) a recent TWA order for $187 million worth of Boeing 707 jetliners, which will apparently supersede an order previously placed by Hughes for seventeen Convair jets. Hughes Tool said the lawyers is considering "legal action" against the trustees, banks and all others involved in the deal.

What the "action" might be, no one would say. Neither side had any comment last week, and Hughes characteristically, could not be located. But a lawyer close to the trustees explained things this way: "Hughes is doing a tremendous amount of shooting, but no one, as usual, knows what he's aiming at."

For [illegible] report on spending plans of manufacturers and utilities, see the Newsweek Quarterly Survey of Capital Appropriations on page 82.

One of America's major cement producers

Operating Northern cement producing plants in Detroit, Iowa, Ohio, Michigan, Tennessee, Wisconsin, Georgia, Wisconsin, Pennsylvania, New York and Maryland Annual Capacity 24 Million Barrels



MOORE BUSINESS FORMS"

...says D. F. Wright, Vice President and Controller for General Mills, Inc., one of the many large companies that build control with Moore Business Forms.

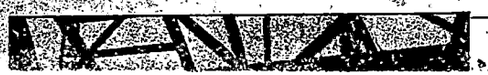
General Mills now fills orders faster, thanks to its automated order-filling system. Efficiency, accuracy and control are other benefits. Customers like having their orders speeded and their deliveries sooner—they can operate with less inventory and release frozen funds.

Here's the system in a nutshell. District offices send salesmen's orders by Teletype to the Buffalo Distribution Center for action the same day. Information is printed by two receivers, creating two sets of documents—one for order-handling, the other for shipping. A punched tape, the by-product of this operation, is used by General Mills' Data Processing Center in Park Ridge, Ill., to set into motion the machinery that prints invoices and statistical reports. The Moore forms used shows final results and the Company's control in print.

"We found valuable the advice and help of someone familiar with data processing and business forms—the Moore man gave us both," Vice President Wright said.

If you would like help in building efficiency and control through your organization, look up the Moore man in the telephone directory or write the nearest Moore office.

Moore Business Forms, Inc. - Niagara Falls, N. Y. - Park Ridge, Ill. - Denton, Texas - Emeryville, Calif. Over 300 offices and factories in North America.



Recovery . . .

THE NEWSWEEK SURVEY

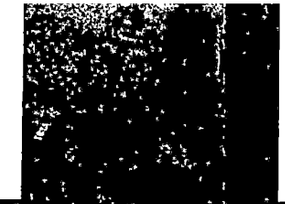
. . . Board Room Spending Gives It a Boost

Photo Copy Preservation

From the Rio Grande to Cape Horn, the shadow of Fidel Castro has cast the whole future of Latin America into doubt. As 1961 draws to a close, the shadow is receding slightly, for there is a light now shining from Washington—the Alliance for Progress. Yet the outlook for 1962 remains gloomy. Here are some of the experiences that make me think so.

At a dinner party in lofty Bogotá, Columbia, a lawyer's wife said archly: "Of course, we're a privileged class—and we intend to retain our privileges."

In San Salvador, capital city of El Salvador, a coffee



help one white U.S. goods will be overpriced to begin with. Lower tariffs are a hazard as well as an opportunity.

Some of the toughest business minds in the country have weighed the problems and come out for freer trade. General Electric chairman Ralph J. Cordiner admits that GE would suffer "plenty" in a low-tariff world. But, he adds: "We'll take our chances." Movie-camera makers were forced to take their chances several years ago when import duties were slashed 40 per cent. The increased foreign competition which followed, notes Bell & Howell chairman Charles H. Percy, "brought out the best of creativity in our industry." Percy's Bell & Howell, for one, has enjoyed an uninterrupted growth of sales and earnings.

Despite America's demonstrated ability to compete (the U.S. will export about $5 billion more than it imports this year), it is disturbing that many free-trade supporters speak out less clearly. When businessmen talk about keeping prices competitive, they zero in on wage levels; when labor speaks, it comes down hard on "top-heavy executive expenditures . . . inflated salaries, bonuses, stock options, expense accounts."

Along with passing the buck, there is also a lot of "yes, but." One big coal producer told me that his industry wants no tariff protection. "We can put our coal down in West Germany cheaper than coal can be mined in the Ruhr," he explains. "In the U.S., no foreign coal causes us concern." However, he adds: "The coal industry has strongly favored quota restrictions on imports of residual oil [which are cutting into coal markets on the East Coast]."

Even the Administration, while talking of free trade, may slap an 8.5-cents-a-pound "equalization" fee on cotton-textile imports.

Mr. Kennedy is right in asking for a new and bold trade program. But if it is shot through with exceptions, it won't be new. It won't be bold. It will be meaningless.

12 Why Go to the Moon?



Astronaut Glenn: He accepts the challenge



by Edwin Diamond
Space and the Atom Editor

New York

At this moment in Washington, and, no doubt, in Moscow, blueprints have been drawn up for the most ambitious single endeavor in human history. The exploration of the moon, in aspiration, it surpasses the adventurous odyssey of Columbus. In size, it dwarfs the wartime enterprise that produced the atomic bomb. The Apollo project will cost $40 billion—$7 billion a year—over the next decade.

Outside the space community, however, there is little appreciation of the grandeur of this program. Only children and science writers appear enthusiastic, perhaps because their taxes are minimal. Taxpayers—58 per cent in a Gallup survey—still ask: Is this trip necessary? And while others accept the space age, they usually do so for the wrong reasons.

The United States, and I would guess the Soviet Union, are not going to the moon for reasons of military superiority. It is much easier to send a hydrogen warhead 5,000 miles across the ocean than it is to hurl one 230,000 miles through space. The drive is not for economic or scientific reasons, even though there are valuable mineral resources and geologic treasures to be mined on the moon. Nor is it all a big moondoggle, intended to provide status for a scientific caste like the Egyptian priests who presided at the ancient pyramids. Finally, the U.S. has not committed itself to the exploration of the moon in order to beat the Russians there. We have no guarantee that we will be first. In fact, it is certain that in the next year or two we will continue to trail behind Red man-in-space achievements. (For example, the January flight which is scheduled to send Lt. Col. John Glenn into orbit for three circuits of the earth will fall far short of the seventeen-orbit feat of cosmonaut Titov. Not until 1963 will a souped-up Mercury capsule duplicate Titov's flight.)

HISTORY AND DESTINY

While all these factors play some part in the thrust to the moon, the pre-eminent reason why the U.S. is going is that, stated in the simplest of terms, we must do so to remain a first-class nation. And precisely because the program is a matter of national pride, there is good reason to believe the U.S. can be first—despite the Soviet lead.

This is not mysticism. Organisms —from cells to societies—must respond to stimuli or atrophy. Arnold Toynbee argues that civilizations grow (the Greeks) or disintegrate (the Romans) depending on their responses to challenges. But there is no need to go back in history to find examples of challenge and response. On the evening of Oct. 4, 1957, when the first sputnik streaked through the night skies, a new era was inaugurated. At the time, those of us who scan the heavens for portents were dazzled by the Red Star ascendant and the emergence of Russia in space. Today, perspectives have changed. If I read the signs correctly, Khrushchev performed an incalculable service for Americans. In the 1960s, the U.S. will reaffirm its pre-eminence, not only in space but in most earth-bound sciences.

What happened in the wake of the sputnik challenge was simply this: The U.S. went into orbit. Social values, the schools, the governmental structure were subjected to scrutiny; the issues, if indeed not the outcome, of the 1960 Presidential campaign and election were sharply defined. The U.S. has successfully put up 63 satellites compared with thirteen for the Russians. And now this great nation is committed to going to the moon.

What if we hadn't responded? One scientist says: "We'd be four years closer to becoming a second-rate nation."

Many, of course, would give a different statement. They hold that the U.S. can find other challenges to meet here on earth. Most Americans, physicist Alvin Weinberg says, would rather belong to the society that first gave the world a cure for cancer than to the society that put the first astronaut on Mars. One reply would be that the U.S. is talented enough to do both. Another reply is that the exploration of the moon—as well as the conquest of disease, amelioration of poverty, and all the goals science now makes possible—is a challenge worthy of a prideful, humane, adventurous nation.

from one, the Kremlin can be expected to launch another offensive in favor of a troika. There will also be a number of proposals for U.N. reform, emanating from those who feel that no system is right in which Gabon (population: 425,000) has an equal vote with the United States.

Yet bumbling, irritating, and irresponsible as it can be, the U.N. will be around for many a year to come. President Kennedy last month called it an organization which the U.S. "can neither abandon nor control"; U Thant recently said "it is still the best hope for getting out of our intolerably dangerous thermonuclear jungle."

I think the world accepts these views.

Winning Formula

Not very long ago, the cause of television drama was considered in the U.S. to be lost as thoroughly as the cause of the single tax. To be sure, this judgment rested on a couple of assumptions—that the only drama worth doing was live drama, and that it had to originate in New York—but nothing had ever happened to challenge them, and they seemed unfortunately sound. But, as the Cuban invasion indicated, it was to be a bad year for assumptions. In the current season, two new dramatic shows have appeared—"The Dick Powell Show" on NBC (Tuesday, 9 p.m. EST) and "Alcoa Premiere" on ABC (Tuesday, 10 p.m. EST)—which are on film, out of Hollywood, and as good in their way, generally, as any weekly dramatic series ever has been.

Not that either program bears any resemblance to the fragile, intimate, Chekhovian mood pieces that once issued nearly every night from New York and created for television a dramatic form all its own. The Powell shows are old-fashioned Hollywood movies, as loaded with formula as baby's good-night bottle. With rare exceptions, they are either whodunits or jaunty adventure tales (Powell himself struts through a third of them), as slick as owl grease and downright claustrophobic in their determination to stay on the surface. But with equally rare exceptions, they are handled with enough intelligence and care in casting, production, and writing to give the formula some of its childhood appeal.

"Alcoa Premiere" has shown far greater diversity of aim and execution. It brought off one brilliantly intricate spy thriller, in which Charlton Heston, directed by his chariot, displayed acting skills that Imperial Rome never dreamed of. But the show has also had its utterly serious episodes, using the dramatized documentary form to tell of the rehabilitation of psychotic soldiers, or of the successful effort of Lt. Wallace Brown to resist brainwashing for nearly three years in a North Korean prison.

Sarajevo: This week Alcoa is doing another of these documentary dramas: "The End of a World," which concerns itself with events leading up to the potting of the Archduke Francis Ferdinand by Gavrilo Princip at Sarajevo. Powell's show (which is sponsored, curiously enough, by Reynolds Aluminum) is as lighthearted as ever this week—a whodunit called "The Fifth Caller," with Michael Rennie as a Scotland Yard inspector and Eva Gabor as an imperiled amnesia victim. If the script—created by Helen Nielsen from her own novel—is not quite as debonair as most, it at least has the presence of mind to give Elsa



Rennie and Gabor (foreground): She has nothing to say

Lanchester, playing a vacant-eyed religious fanatic, a few choice lines: "I bottle. With rare exceptions, they are stall up upstairs and play the organ while you meditate" and "Death is an illusion—that is the title of one of [our leader's] pamphlets." Miss Gabor is given almost nothing to say except "I don't remember . . . don't remember," which is itself an indication of keen script-writing intelligence.

Morgan's Back

A thriving if not overwhelmingly large cult of personality has nourished itself for more than two decades now by sucking on a cactus leaf named Henry Morgan. Morgan, an off-again on-again performer currently stirring things up on a Los Angeles station, brings first-rate intellectual equipment to bear with nasal, sardonic irreverence on everything from fallout to elevator shoes.

When two or three Morgan fans are gathered together they like to recall some of his more perverse triumphs.

Books: His guests frequently include a sprinkling of kooks ("We deal in names, news, and nuts, but we don't let the nuts know they are"). Morgan has something to say about every topic, including the Congo: "Why is it all we ever see are pictures of natives in Join clothes? I've stayed in hotels on the Congo that were better than anything I'm living in now. But we never see those."

So far, Morgan's pronunciamentos have cost him only one sponsor, and the delighted station rewarded him two weeks ago with a new two-year contract, though at this stage satirist Morgan is declaring: "There's nothing left to be funny about."



Derek W. Elliott

SPACE ~~SCIENCE & EXPLORATION~~ History DEPT.

NATIONAL AIR AND SPACE MUSEUM
SMITHSONIAN INSTITUTION
WASHINGTON, D.C. 20560

(202) 357-2828
(202) 357-1660

AIR&SPACE
Smithsonian

Myron Bretholz
Business Assistant

SMITHSONIAN INSTITUTION
370 L'Enfant Promenade, S.W. - 10th Floor
Washington, D.C. 20024 (202) 287-3757



RITA CIPALLA
CHIEF, PUBLIC AFFAIRS AND MUSEUM SERVICES

NATIONAL AIR AND SPACE MUSEUM
SMITHSONIAN INSTITUTION

WASHINGTON, D.C. 20560
(202) 357-1552

National Aeronautics and
Space Administration

NASA

Headquarters
Washington, D. C. 20546
AC 202 ~~755-8330~~ 453-8365

H. Robert Sunkes - As promised -

Vera Hirschberg
Senior Protocol Officer
Office of Public Affairs

NASA

ALAN LADWIG
OFFICE OF EXPLORATION
NASA
WASHINGTON, D.C. 20546

W - 202/453-8928
H - 703/237-4195

FAX - 202/426-0408
TELEMAIL - ALADWIG

THE WHITE HOUSE

WASHINGTON

1989 JUL 19 P3:02

July 19, 1989

INFORMATION

MEMORANDUM FOR THE PRESIDENT

THROUGH: CHRISS WINSTON CW

FROM: EDWARD E. McNALLY EMW

SUBJECT: MARS ANNOUNCEMENT AND THE 20TH ANNIVERSARY OF THE APOLLO MOON LANDING

I. SUMMARY

Attached for your consideration and review are draft remarks for tomorrow morning's address commemorating the Apollo 11 Moon landing -- and directing the Vice President and the Space Council to chart a course for the manned exploration of Mars.

II. DISCUSSION

At approximately 10:00 a.m. on Thursday, July 20, 1989, you are scheduled to arrive at the National Air & Space Museum to participate in a photo op in front of the lunar module, along with the Vice President and the three Apollo 11 astronauts.

You will then proceed outside to the steps of the museum, where a crowd of approximately 5,000 people -- including NASA VIP's and nearly every living astronaut -- will hear brief comments by the Apollo 11 veterans. You will be introduced by the Vice President.

Your keynote address is scheduled to last approximately 15 minutes, and is expected to be prepared for TelePrompter.

(McNally/Simon)
July 19, 1989 2:05 p.m.
Draft Four (APOLLO)

PRESIDENTIAL REMARKS: 20TH ANNIVERSARY OF APOLLO MOON LANDING
THE STEPS OF THE AIR AND SPACE MUSEUM
WASHINGTON, D.C.
THURSDAY, JULY 20, 1989, 10:30 A.M.

Thank you, Mr. Vice President, for your introduction and for your skillful leadership of the National Space Council.

And thanks to all of you, who have braved the crowds and heat to join us today. Behind me stands one of the most visited places on Earth -- a symbol of American courage and ingenuity. And before me stand those on whose shoulders this legacy was built -- **the men and women of the United States astronauts corps.**

We are very proud to be part of this unprecedented gathering of America's space veterans -- and to share this stage with three of the greatest heroes of this or any other century -- **the crew of Apollo 11.**

It's hard to believe 20 years have passed. Neil and Buzz -- who originated the moonwalk 15 years before Michael Jackson ever thought of it.

And Michael Collins -- former director of this amazing museum -- and the brave pilot who flew alone on the dark side of the Moon, while Neil and Buzz touched down. Mike -- you must be the only American over age 10 that night who didn't get to see the Moon landing.

Later this evening, after the crowd disperses and the sun goes down, a nearly full Moon will rise out of the darkness and

shine down on an America that is prosperous and at peace. For those old enough to remember that historic night 20 years ago -- step outside tonight with your children or grandchildren. Lift your eyes skyward, and tell them of the flag -- the American flag -- that still flies proudly in the ancient lunar soil.

And for those who were not yet born, or then too young to recall -- you who are the children of the new century -- raise your eyes to the heavens and join us in a great dream -- an American dream -- a dream without end.

Project Apollo. The first men on the Moon. Some called it quixotic. Impossible. It had never been done. **But America dreamed it. And America did it.**

It began on July 16, 1969. The sun rose a second time that morning as the awesome fireball of the Saturn Five lifted these three pioneers beyond the clouds. A crowd of one million -- including half the United States Congress -- held its breath as the Earth shook beneath their feet -- and our view of the heavens was changed for all time.

Three days and three nights they journeyed. It was a perilous, unlikely, breathtaking voyage.

Each of us remember the night.

Barbara and Doro were with me in our red brick house on the outskirts of Washington, where we had moved to represent Houston in Congress. Twelve-year-old Marvin was on a trip out West with family friends, and remembers stopping at a roadside motel to watch. Jeb was just 16 that summer, teaching English and

listening by radio in a small Mexican village, where electricity had yet to arrive.

The landing itself was harrowing. Alarms flashed -- and a computer overload threatened to halt the mission while Eagle dangled thousands of feet above the Moon. Armstrong seized manual control to avoid a huge crater strewn with boulders. With new alarms signalling a loss of fuel -- and the view now blocked by lunar dust -- Mission Control began the countdown for a mandatory abort.

America -- indeed the whole world -- listened with a lump in our throat and a prayer on our lips. Only 20 seconds of fuel remained. And then out of the static came the words: [[PAUSE]] **"Houston. Tranquility Base here. The Eagle has landed."** [[PAUSE]]

Within one lifetime, humankind had traveled from the dunes of Kitty Hawk to the dust of another world. Apollo is a monument to our Nation's unparalleled ability to respond swiftly and successfully to a clearly stated challenge -- and to America's willingness to take great risks for great rewards.

We had a challenge. We set a goal. And we achieved it.

So today is not only an occasion to thank these astronauts and their colleagues -- the thousands of talented men and women across the country whose commitment, creativity, and courage brought this dream to life. It is also a time to thank the American people for their <u>faith</u> -- because Apollo's success was made possible by **the drive and daring of an entire nation**

committed to a dream.

In the building behind me are the testaments to Apollo and to what came before -- the chariots of fire flown by Armstrong, Yeager, Lindbergh, and the Wrights. And in the National Archives -- across this great expanse of grass -- are preserved the founding documents of the idea that made it all possible -- the world's greatest experiment in freedom and diversity.

And here -- standing between these twin legacies -- is a fitting place to look forward to the future.

Because the Apollo astronauts left more than flags and footprints on the Moon. They also left some unfinished business. For even 20 years ago, we recognized that America's ultimate goal was not simply to go there and go back -- **but to go there and go on.**

Mike Collins said it best: The Moon is not a destination -- it's a <u>direction</u>.

Space is the inescapable challenge to all the advanced nations of the Earth. And there is little question that, in the 21st Century, humans will again leave their home planet for voyages of discovery and exploration. What was once improbable, is now <u>inevitable</u>.

The time has come to look beyond brief encounters. We must commit ourselves anew to a sustained program of manned exploration of the solar system -- and yes -- the permanent settlement of space. We must commit ourselves to a future where Americans and citizens of all nations will live and work in

space.

Today the U.S. is the richest nation on Earth -- with the most powerful economy in the world. And our goal is nothing less than to establish the United States as the pre-eminent spacefaring nation.

From the voyages of Columbus -- to the Oregon Trail -- to the journey to the Moon itself -- history proves that we have never lost by pressing the limits of our frontiers.

Indeed, earlier this month, one news magazine reported that Apollo paid down-to-earth dividends -- declaring that man's conquest of the Moon "would have been a bargain at twice the price." They called Apollo "the best return on an investment ... since Leonardo da Vinci bought himself a sketch pad." [[PAUSE]]

In 1961, it took a crisis -- the space race -- to speed things up. Today we don't have a crisis. We have an opportunity.

To seize this opportunity, I'm not proposing a 10-year plan like Apollo. I'm proposing three of them.

First, for the coming decade -- for the 1990's -- Space Station Freedom -- the critical next step in all our space endeavors.

Then, for the new century -- [for the first decade] -- **back to the <u>Moon</u>. Back to the future.** And this time -- **back to <u>stay.</u>**

And third -- [for the second decade of the new millennium] -- a journey into tomorrow, a journey to another world -- **a manned mission to Mars.**

Each mission will lay the groundwork for the next. And the pathway to the stars begins, as it did 20 years ago, with you -- the American people. And it continues just up the street there -- to the American Congress -- where the future of the space station -- and our future as a spacefaring nation -- will be decided.

Yes, we are at a crossroads. Hard decisions must be made now as we prepare to enter the next century.

As William Jennings Bryan said -- just before the last turn of the century: "Destiny is not a matter of chance -- it is a matter of choice. It is not a thing to be waited for -- it is a thing to be achieved."

To those who may shirk from the challenges ahead -- or who doubt our chances of success -- let me say this:

To this day, the only footprints on the Moon are American footprints. The only flag on the Moon is the American flag. And the know-how that accomplished these feats is American know-how. **What Americans can dream -- Americans can do.**

And 10 years from now -- on the 30th anniversary of this extraordinary and astonishing flight -- the way to honor the Apollo astronauts is not by calling them back to Washington for another round of speeches. It is to have Space Station Freedom up there, operational, and underway -- a new bridge between worlds -- and an investment in the growth, prosperity and technological superiority of our Nation.

And the space station will also serve as a stepping stone to

the most important planet in the solar system -- Planet Earth.

As I said in Europe a few days ago, environmental destruction knows no borders. A major national -- and international -- initiative is needed to seek new solutions for ozone depletion, global warming, and acid rain. This initiative -- "Mission to Planet Earth" -- is a critical part of our space program. And it reminds us of what the astronauts remember as the most stirring sight of all. It wasn't the Moon or the stars. It was the Earth -- tiny, fragile, precious, a blue orb -- rising above the arid desert of Tranquility Base.

The space station is a first and necessary step for sustained manned exploration -- one that we're pleased has been endorsed by Senator Glenn, and Neil Armstrong, and so many of the veteran astronauts we honor today. But it is only a first step.

Today I am asking Vice President Quayle to lead the National Space Council in determining what's needed for the next round of exploration -- the necessary money, manpower and material -- the feasibility of international cooperation -- and realistic timetables and milestones along the way. The Space Council will report back to me as soon as possible with concrete recommendations to chart a new and continuing course to the Moon and Mars and beyond.

There are many reasons to explore the universe, but 10 very special reasons why America must never stop seeking distant frontiers -- the 10 courageous astronauts who made the ultimate sacrifice to further the cause of space exploration. They have

taken their place in the heavens -- so that America can take its place in the stars.

Like them, and like Columbus, we dream of distant shores we've not yet seen.

Why the Moon? Why Mars? Because it is humanity's destiny "to strive, to seek, to find..." **And because it is America's destiny to lead.**

Six years ago, Pioneer 10 sailed beyond the orbits of Neptune and of Pluto -- the first man-made object to leave the solar system. Its destination unknown. It has now journeyed through the tenures of five Presidents -- four billion miles from Earth.

In the decades ahead, we will follow the path of Pioneer 10. We will travel to neighboring stars, to new worlds, to discover the unknown. It will not happen in my lifetime, and probably not during the lives of my children. But a dream to be realized by future generations must begin with this generation. **We cannot take the next giant leap for mankind tomorrow -- unless we start with a single step today.** [[PAUSE]]

To all of you here -- and especially the astronauts -- we wish you good luck in your quests, wherever they may take you. Godspeed you, one and all. And God bless the United States.

# # #

THE WHITE HOUSE

WASHINGTON

July 17, 1989

INFORMATION

MEMORANDUM FOR CHRISS WINSTON

FROM: EDWARD E. McNALLY

SUBJECT: ADDITIONS YOU REQUESTED FOR MOON LANDING SPEECH

I. SUMMARY

Attached for your consideration are the draft "inserts" that you requested (via Christina from Europe) be prepared for the Moon landing speech.

II. DISCUSSION

A. One More Applause Line

(Insert at the middle of page 3 -- after "The Eagle has landed.")

"And in July of 1969 -- while a vocal few burned flags here on Earth -- these quiet heroes planted one on the Moon."

B. "Mission to Planet Earth" paragraph

(To be inserted after the 4th full paragraph near the bottom of Page 6 of "Draft Two," following the words: "...growth, prosperity and security of our Nation.")

"And the space station will also serve as a stepping stone to the most important planet in the Solar System -- Planet Earth.

"As I said in Europe a few days ago, environmental destruction knows no borders. A major national -- and international -- initiative is needed to seek new solutions for ozone depletion, global warming, and acid rain. This initiative -- 'Mission to Planet Earth' -- is a critical part of our space program. And it reminds us of what the astronauts remember as the most stirring sight of all. It wasn't the Moon or the stars. It was the Earth -- tiny, fragile, precious -- rising above the arid desert of Tranquility Base."

(To "bridge" this insert, the last full paragraph on page 6 also needs a minor insert: "Whether for 'Mission to

Planet Earth' or for sustained manned exploration, the space station is a first and necessary step -- one that we're pleased has been endorsed by...")

C. Substitute for "Beam Me Up" joke on page 1

(Simplest alternative: Same joke -- but substitute in the name of Dick Truly -- former Space Shuttle astronaut and now the Administrator at NASA -- who will be onstage and speak just before the Apollo astronauts and the President.)

"We hope that neither the motorcade nor the metal detectors caused too much delay. In the future, I'll just signal Dick Truly at NASA and say: 'Beam me up.'"

(Alternative jokes)

"In preparation for your visit, I did some research. I learned that, in order to reach the moon, a spacecraft must reach a speed of nearly 25,000 miles per hour. [[PAUSE]] Of course, your mileage may vary."

(or)

"You know, Alan Shepard was America's first man in space -- and also the first astronaut to swing a golf club on the moon. [[PAUSE]] That's one small step for a man. One giant bogey for mankind."

(or)

"Senator John Glenn was another of our original astronauts. Part of his mission was to search for signs of intelligent life out there. It turned out to be excellent training for his work inside the Congress."

(or)

"From their ranks will emerge the men and women who will one day walk on Mars -- and we can establish once and for all whether Shirley MacLaine ever lived there."

D. Alternative Jokes for the Astronauts Barbecue

"Who would have dreamed that someday we'd be attending a barbecue with men who left footprints on the moon? Someone said that would happen the year Hugh Hefner ties the knot."

(or -- after the two "Jake Garn" jokes --)

"Today Jake says his flight was all a mistake. When he heard the shuttle described as 'the ultimate flight experience' -- he assumed they were talking about Donald Trump's."

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RECORD #

PAGES 9

DTG 151331Z

RELEASER

FROM/LOCATION

1. Jim Ciccone / Paris, France

TO/LOCATION/TIME OF RECEIPT

1. Vice President Quayle
2. Director Darman
3. Counsel Gray
4. Fred McClure
5. Jim Pinkerton
6. Bill Kristol / VP ofc.
7. John Gardner
   Chriss Winston - FYI

TOR 151354Z Cn)

INFORMATION ADDEES/LOCATION/TIME OF RECEIPT

1.
2.

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89 JUL 15 A10:20
SITUATION ROOM

SPECIAL INSTRUCTIONS/REMARKS:

Please fax your comments to Paris, France.

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WHCA FORM 8, 15 OCTOBER 84

STAFFED IN PARIS, FRANCE

Document No. _____

SENSITIVE

WHITE HOUSE STAFFING MEMORANDUM

DATE: 07/15/89 ACTION/CONCURRENCE/COMMENT DUE BY: NOON Sunday 07/16

SUBJECT: PRESIDENTIAL REMARKS: 20th ANNIVERSARY OF APOLLO MOON LANDING

(07/15 1:00 p.m. draft two)

	ACTION	FYI		ACTION	FYI
VICE PRESIDENT	☐	☑	MCCLURE	☑	☐
SUNUNU	☐	☑	NEWMAN	☐	☐
SCOWCROFT	☑	☐	PORTER	☑	☐
DARMAN	☑	☐	STUDDERT	☑	☐
BATES	☐	☐	UNTERMEYER	☐	☐
BREEDEN	☐	☐	WINSTON	☐	☑
CARD	☐	☑	Kristol	☑	☐
CICCONI	☐	☑	Pinkerton	☑	☐
DEMAREST	☑	☐	Rogers	☐	☑
FITZWATER	☐	☑	_____	☐	☐
GRAY	☑	☐	_____	☐	☐
HAGIN	☐	☐	_____	☐	☐

REMARKS:

Please provide any comments/recommendations directly to Chriss Winston in the Senior Staff Office, Rm. 1051, by NOON, Sunday 07/16, with an info copy to Jim Cicconi, Rm. 1051. Thanks

RESPONSE:

SENSITIVE

James W. Cicconi
Assistant to the President
and Deputy to the Chief of Staff
Ext. 2702

(McNally/Simon)
July 15, 1989 1:00 p.m.
Draft Two (APOLLO)

PRESIDENTIAL REMARKS: 20TH ANNIVERSARY OF APOLLO MOON LANDING
THE STEPS OF THE AIR AND SPACE MUSEUM
WASHINGTON, D.C.
THURSDAY, JULY 20, 1989, 10:00 A.M.

Thank you, Mr. Vice President, for your introduction and for your skillful new leadership on the National Space Council.

And thanks to all of you, who have braved the crowds and heat to join us today. Behind me stands one of the most visited places on Earth -- a temple to American courage and ingenuity. And before me stand those on whose shoulders this legacy was built -- the men and women of the United States astronauts corps.

NASA
Gene Marconetti
453-8345

We hope that neither the motorcade nor the metal detectors caused too much delay. In the future, I'll just signal the Vice President and say: "Dan -- Beam me up."

We are very proud to be part of this unprecedented gathering of America's space veterans -- and to share this stage with three of the greatest heroes of this or any other century -- the crew of Apollo 11.

It's hard to believe 20 years have passed. Neil and Buzz -- the originators of the moonwalk.

And we also honor Michael Collins -- former director of this amazing museum -- and the brave pilot who flew alone on the dark side of the Moon, while Neil and Buzz touched down. Mike -- you must be the only American over age 10 that night who didn't get to see the Moon landing.

Later this evening, after the crowd disperses and the sun goes down, a nearly full Moon will rise ~~out of the ocean to the~~ in the east and shine down on an America that is prosperous and secure. For those old enough to remember that historic night -- step outside tonight with your children or grandchildren. Lift your eyes skyward, and tell them of the flag that still flies proudly in the ancient soil of ~~Tranquility Base.~~ the moon.

And for those who were not yet born, or then too young to recall -- you who are the children of the new century -- raise your eyes to the heavens and join us in a great dream -- an American dream -- a dream without end.

Project Apollo. The first men on the Moon. They called it quixotic. Impossible. It had never been done. But America dreamed it. And America did it.

It began ~~on the morning of~~ near dawn on July 16, 1969. The sun rose a second time as the awesome fireball of the Saturn Five lifted these three pioneers beyond the clouds. A crowd of one million -- including half the U.S. Congress -- watched live as the Earth shook beneath their feet -- and our view of the heavens was changed for all time.

~~Three~~ 4 days and ~~three~~ 4 nights they journeyed. It was a perilous, unlikely, breathtaking voyage.

Each of us remember the night.

Barbara and Doro were with me in our ~~white frame~~ brick house on the outskirts of Washington, where we had moved to represent Houston in Congress. Twelve-year-old Marvin was on a trip out

West with family friends, and remembers stopping at a roadside motel to watch. Jeb was just 16 that summer, teaching English and listening by radio in a small Mexican village, where electricity had yet to arrive.

The landing itself was harrowing. Alarms flashed -- and a computer overload threatened to halt the mission while Eagle dangled thousands of feet above the Moon. Armstrong seized manual control to avoid a huge crater strewn with boulders. With new alarms signalling a loss of fuel -- and the view now blocked by lunar dust -- Mission Control began the countdown for a mandatory abort.

America listened with a lump in our throat and a prayer on our lips. Only ~~17~~ 20 seconds of fuel remained. And then out of the static came the words: [[PAUSE]] "Tranquility Base here. The Eagle has landed." [[PAUSE]]

Within one lifetime, humankind had traveled from the dunes of Kitty Hawk to the dust of another world. Apollo is a testament to our Nation's unparalleled ability to respond swiftly and successfully to a clearly stated challenge -- and to America's willingness to take great risks for great rewards.

We had a challenge. We set a goal. And we achieved it.

And it reminds us that -- not only is this an occasion to thank our astronauts for their courage and skill -- we also thank the American people for their faith -- the drive and daring of an entire nation committed to a dream.

In the building behind me are the testaments to Apollo and

to what came before -- the chariots of fire flown by Armstrong, Yeager, Lindbergh, and the Wrights. And across this great expanse of grass are preserved the founding documents of the idea that made it all possible -- the world's greatest experiment in freedom and diversity.

And standing here between these twin legacies, it is a fitting place to look forward to the future.

Because the Apollo astronauts left more than flags and footprints on the Moon. They also left some unfinished business. For even 20 years ago, we recognized that America's ultimate goal was not simply to go there and go back -- but to go there and go on.

Mike Collins said it best: "The Moon is not a destination -- it's a direction."

Space is the inescapable challenge to all the advanced nations of the Earth. And there is little question that, in the 21st Century, humans will again leave their home planet for voyages of discovery and exploration. What was once improbable, is now inevitable.

The time has come to look beyond brief encounters. We must commit ourselves anew to a sustained program of manned exploration of the solar system -- and yes -- the permanent settlement of space.

Today the U.S. is the richest nation on Earth -- with the most powerful economy in the world. And our goal is nothing less than to establish the United States as a permanent, spacefaring

nation.

From the voyages of Columbus -- to the purchase of Alaska -- to the journey to the Moon itself -- history proves that we have never lost by pressing the limits of our frontiers.

Vera Hirschberg 453-8304

Indeed -- it is now estimated that -- for every dollar NASA invested in ~~the Moon program -- Apollo returned~~ research + development, were returned seven to eight dollars in benefits to our economy, ~~were returned~~.

In 1961, it took a crisis -- the space race -- to speed things up. Today we don't have a crisis. We just have an opportunity.

[To do this, I don't have a 10-year plan like Apollo. I have three of them.

First, for the coming decade -- for the 1990's -- Space Station Freedom -- the critical next step in all our space endeavors.

Then, for the new century -- for the first decade -- back to the <u>Moon</u>. Back to the future. And this time -- back to <u>stay.</u>

And third -- for the second decade of the new millennium -- a journey into tomorrow, a journey to another world -- a manned mission to Mars.]

Each mission will lay the groundwork for the next. And the pathway to the stars begins with you -- the American people. And it continues just up the street there -- to the American Congress -- where the future of the space station -- and our future as a spacefaring nation -- will be decided.

Yes, we are at a crossroads. Hard decisions must be made

now as we prepare to enter the next century.

As William Jennings Bryan said -- just before the last turn of the century: "Destiny is not a matter of chance -- it is a matter of choice. It is not a thing to be waited for -- it is a thing to be achieved."

To those who may shirk from the challenges ahead -- or who doubt our chances of success -- let me say this:

To this day, the only footprints on the Moon are American footprints. The only flag on the Moon is the American flag. And the know-how that accomplished these feats is American know-how. What Americans can dream -- Americans can do.

[And 10 years from now -- on the 30th anniversary of this extraordinary and astonishing flight -- the way to honor the Apollo astronauts is not by calling them back to Washington for another round of speeches. It is to have Space Station Freedom up there, operational, and underway -- a new bridge between worlds -- and an investment in the growth, prosperity and security of our Nation.

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Today I am asking Vice President Quayle to take the lead ~~the National Space Council~~ in considering what's needed for the next round of exploration -- the necessary money, manpower and material -- the possibility of dramatic international cooperation -- and

realistic timetables and steps along the way. The ~~Space Council~~ will report back to me as soon as possible with concrete recommendations -- a ~~roadmap for the year 2000~~ and beyond -- charting a new and continuing course to the Moon and Mars and beyond.]

There are at least 10 reasons why America must never stop seeking distant frontiers -- the 10 courageous astronauts who made the ultimate sacrifice to further the cause of space exploration. They have taken their place in the heavens -- so that America can take its place in the stars.

Like them, and like Columbus, we dream of distant shores we've not yet seen.

[Why the Moon? Why Mars?] Because it is humanity's destiny "to strive, to seek, to find..." And because it is America's destiny to **lead**.

Six years ago, Pioneer 10 sailed beyond the orbit of Neptune and Pluto -- the first man-made object to leave the solar system. Its destination unknown. It has now journeyed through the tenures of five Presidents -- four billion miles from Earth.

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To all of you here -- and especially the astronauts -- we wish you good luck in your quests, wherever they may take you.

Godspeed you, one and all. And God bless the United States.

# # #

THE WHITE HOUSE
WASHINGTON

July 18, 1989

MEMORANDUM FOR CHRISS WINSTON

FROM: BOB SIMON

SUBJECT: ADDITIONAL COMMENTS ON MOON LANDING SPEECH

On page 5, graph 2, I have had trouble checking this assertion.

NASA Administrator Richard Truly has used similar language in a recent speech and is rather widely quoted by other NASA types. To back this up, NASA has two studies, one from 1971 and one from 1988. Frankly, I question a number of the key assumptions used in the studies and don't think their conclusions are supported by the evidence. For this reason, I recommend deleting this sentence.

As a substitute, Ed and I suggest restoring this paragraph from the first draft:

> Indeed, earlier this month, one news magazine reported that Apollo paid down-to-earth dividends -- declaring that man's conquest of the Moon "would have been a bargain at twice the price." They called Apollo "the best return on an investment ... since Leonardo da Vinci bought himself a sketch pad."

If you decide to keep this sentence, given NASA's willingness to support its accuracy, I suggest the following rewrite:

> "Indeed -- it is now estimated that -- for every dollar NASA invested in research and development, seven to eight dollars in benefits were returned to the economy."

This wording reflects the studies' conclusions more closely without addressing the studies' underlying assumptions.

(McNally/Simon)
July 13, 1989, 7:00 p.m.
Draft One (MOON)

PRESIDENTIAL REMARKS: 20TH ANNIVERSARY OF APOLLO MOON LANDING
THE STEPS OF THE AIR AND SPACE MUSEUM
WASHINGTON, D.C.
THURSDAY, JULY 20, 1989, 10:00 A.M.

Thank you, Mr. Vice President, for your introduction and for your skillful new leadership on the National Space Council.

And thanks to all of you, who have braved the crowds and heat to join us today. Behind me stands one of the most visited ~~places~~ museums on Earth -- a temple to American courage and ingenuity. And before me stand those on whose shoulders this legacy was built -- **the men and women of the United States astronauts corps.**

We hope that neither the motorcade nor the metal detectors caused too much delay. In the future, I'll just signal the Vice President and say: "Dan -- Beam me up."

We are very proud to be part of this unprecedented gathering of America's space veterans -- and to share this stage with three of the greatest heroes of this or any other century -- **the crew of Apollo 11.**

It's hard to believe 20 years have passed. Neil and Buzz -- we hear that when they asked one young kid if he knew which American made the first moonwalk, he answered: "Sure -- Michael Jackson."

And we also honor Michael Collins -- former director of this amazing museum -- and the brave pilot who flew alone on the dark side of the moon, while Neil and Buzz touched down. Mike -- you

must be the only American over age 10 that night who didn't get to see the moon landing.

Later this evening, after the crowd disperses and the sun goes down, a fat, nearly full moon will rise ~~out of the ocean to~~ in the east and shine down on an America that is prosperous and secure. For those old enough to remember that historic night -- step outside tonight with your children or grandchildren. Lift your eyes skyward, and tell them of the flag that still flies in the ancient soil of ~~Tranquility Base~~ the moon -- haunting us -- taunting us to return.

And for those who were not yet born, or then too young to recall -- you who are the children of the new century -- raise your eyes to the heavens and join us in a great dream -- an American dream -- a dream without end.

Project Apollo. The first men on the moon. They called it quixotic. Impossible. It had never been done. **But America dreamed it. And America did it.**

It began ~~on the morning of~~ near dawn on July 16, 1969. The sun rose a second time that morning as the awesome fireball of the Saturn Five lifted these three pioneers beyond the clouds. A crowd of one million -- including half the U.S. Congress -- watched live as the earth shook beneath their feet -- and our view of the heavens was changed for all time.

~~Three~~ Four days and ~~three~~ Four nights they journeyed. It was a perilous, unlikely, breathtaking voyage.

We remember the night of the landing the way we remember the other signposts of that tumultuous decade: The first American in orbit. The assassination of a young President. The songs of the Beatles. The voice of Martin Luther King. Brave men and helicopters in the jungles of a distant land.

It was the summer of Woodstock and the Amazin' Mets. And like these other moments, America shared the moon landing in our living rooms, television screens glowing blue as dusk fell across the land.

Barbara and Doro were with me in our white frame house on the outskirts of Washington, where we had moved to represent Houston in Congress. 12 year old Marvin was on a trip out West with family friends, and remembers stopping at a roadside motel to watch. Jeb was just 16 that summer, teaching English and listening by radio in a small Mexican village, where electricity had yet to arrive.

The landing itself was harrowing. Alarms flashed -- and a computer overload threatened to halt the mission while Eagle dangled thousands of feet above the Moon. Armstrong seized manual control to avoid a huge crater strewn with boulders. With new alarms signalling a loss of fuel -- and the view now blocked by lunar dust -- mission control began the countdown for a mandatory abort.

America listened with a lump in our throat and a prayer on our lips. Only 17 seconds of fuel remained. And then out of the

static came the words: [[PAUSE]] **"Tranquility Base here. The Eagle has landed."** [[PAUSE]]

Within one lifetime, humankind had traveled from the dunes of Kitty Hawk to the dust of another world. Apollo is a testament to our nation's unparalleled ability to respond swiftly and successfully to a clearly stated challenge -- and to America's willingness to take great risks for great rewards.

We had a challenge. We set a goal. And we achieved it.

And it reminds us that -- not only is this an occasion to thank our astronauts for their courage and skill -- we also thank the American people for their faith -- **the drive and daring of an entire nation committed to a dream.**

In the building behind me are the testaments to Apollo and to what came before -- the chariots of fire flown by Armstrong, Yeager, Lindbergh and the Wrights. And across this great expanse of grass -- behind ~~granite~~ limestone pillars and beneath 2-inch-thick glass -- are preserved the founding documents of the idea that made it all possible -- the world's greatest experiment in freedom and diversity.

And standing here between these twin legacies, it is a fitting place to look forward to the future.

Because the Apollo astronauts left more than flags and footprints on the Moon. They also left some unfinished business. For even twenty years ago, we recognized that America's ultimate goal was not simply to go there and go back -- **but to go there and go on.**

NASA Press conf. 5-26-89

Mike Collins said it best: "The Moon is not a destination -- it's a direction."

Space is the inescapable challenge to all the advanced nations of the Earth. And there is little question that, in the 21st century, humans will again leave their home planet for voyages of discovery and exploration. What was once improbable, is now inevitable.

The time has come to look beyond brief encounters. We must commit ourselves anew to a sustained program of manned exploration of the solar system -- and yes -- the permanent settlement of space.

Once tiny countries like England and Portugal enjoyed sustained prosperity and security through their primacy as seafaring nations. And when they lost the mastery of the seas -- they lost hold of the helm of their peoples' own destiny.

Marsh

Well, I wasn't elected President to preside over America's decline to a second class nation. Today the U.S. is the richest nation on Earth -- with the most powerful economy in the world. And our goal is nothing less than to establish the United States as a permanent, spacefaring nation.

From the voyages of Columbus -- to the purchase of Alaska -- to the journey to the Moon itself -- history proves that we have never lost by pressing the limits of our frontiers. No nation ever went bankrupt by expanding its fleet. No nation regrets that its exploration went too far.

Of course, many doubted Columbus. And many doubted JFK. But ours is not a nation of doubters. It is a nation of doers.

When President Kennedy made his declaration in 1961, an American news magazine asked "Why Go to the Moon?" -- and one of their columnists labeled the program "an expensive stunt."

Twenty years later, that same magazine reports that Apollo paid down-to-earth dividends -- declaring that man's conquest of the Moon "would have been a bargain at twice the price" -- and calling Apollo "the best return on an investment...since Leonardo da Vinci bought himself a sketch pad."

Indeed -- it is now estimated that -- for every dollar invested in the moon program -- Apollo returned seven to eight dollars in benefits to our economy.

In 1961, it took a crisis -- the space race -- to speed things up. Today we don't have a crisis. We just have an opportunity.

Hesitation and indecision have thwarted that opportunity. Well, it's time to end the soul-searching -- and start the searching out there. Because our leaders must recognize what our people already know: It is time to do more. It is time to go back -- ~~to go~~ back into space and forward into our dreams. ~~for good~~.

To do this, I don't have a 10-year plan like Apollo. I have three of them.

For the coming decade -- for the 1990's -- Space Station Freedom -- the critical next step in all our space endeavors.

For the new century -- for the first decade -- **back to the Moon. Back to the future. And this time -- back to stay.**

And next -- for the second decade of the new millennium -- a journey into tomorrow, a journey to another world -- **a manned mission to Mars.**

Some will say these goals are audacious and premature. They forget that -- on the day John F. Kennedy called on Congress to fund a flight to the Moon and back -- America had a grand total of 15 minutes and 22 seconds of manned space experience.

JFK's Speech 5-25-61 Shepard's flight 5/5/61

In fact, this new venture is a journey that begins here on Earth. Each mission will lay the ground work for the next. And the pathway to the stars begins with you -- the American people. And it continues just up the street there -- to the American Congress -- where the future of the space station -- and our future as a spacefaring nation -- will be decided.

Yes, we are at a crossroads. Hard decisions must be made now as we prepare to enter the next century.

speech in Wash. DC Feb. 22, 1899 see file

As William Jennings Bryan said -- just before the last turn of the century: "Destiny is not a matter of chance -- it is a matter of choice. It is not a thing to be waited for -- it is a thing to be achieved."

To those who may shirk from the challenges ahead -- or who doubt our chances of success -- let me say this:

To this day, the only footprints on the moon are American footprints. The only flag on the moon is the American flag. And

the know-how that accomplished these feats is American know-how. **What Americans can dream -- Americans can do.**

And 10 years from now -- on the 30th anniversary of this extraordinary and astonishing flight -- the way to honor the Apollo astronauts is not by calling them back to Washington for another round of speeches. It is to have Space Station Freedom up there, operational, and underway -- a new bridge between worlds -- and an investment in the growth, prosperity and security of our nation.

The space station is a first and necessary step for sustained manned exploration -- one that we're pleased has been endorsed by Senator Glenn, and Neil Armstrong, and so many of the veteran astronauts we honor today. But it is only a first step.

Today I am asking Vice President Quayle to lead the National Space Council in considering what's needed for the next round of exploration -- the necessary money, men and material -- the possibility of dramatic international cooperation -- and realistic timetables and steps along the way. The Space Council will report back to me as soon as possible with concrete recommendations -- a road map for the Year 2000 and beyond -- charting a new and continuing course to the Moon and Mars and beyond.

There are at least 10 reasons why America must never stop seeking distant frontiers -- the 10 courageous astronauts who made the ultimate sacrifice to further the cause of space exploration. They have taken their place in the heavens -- so that America can take its place in the stars.

Like them, and like Columbus, we dream of distant shores we've not yet seen. "Come, my friends," wrote Tennyson, "'tis not too late to seek a newer world. Push off...for my purpose holds to sail beyond the sunset, and...all the western stars."

Why the Moon? Why Mars? Because it is humanity's destiny "to strive, to seek, to find..." **And because it is America's destiny to lead.**

On the day before he died, President Kennedy declared that this nation had tossed its cap over the wall of space. The metaphor became real six years ago, when Pioneer 10 sailed beyond the orbit of Pluto -- the first man-made object to leave the solar system -- its destination unknown. It has now journeyed through five Presidents -- four billion miles from Earth.

As Kennedy predicted, we will follow. This will not happen in my lifetime, and probably not during the lives of my children. But a dream to be realized by future generations must begin with this generation. **We cannot take the next giant leap for mankind tomorrow -- unless we start with a single step today.**

And perhaps one day my grandson George P. will stand on that windswept rock at Walker's Point -- beside his own grandchild -- and point confidently to the stars -- to eternity -- and to the future of this great nation.

To all of you here -- and especially the astronauts -- we wish you good luck in your quests, wherever they may take you. Godspeed you, one and all. And God bless the United States.

# # #

(McNally/Simon)
July 15, 1989 1:00 p.m.
Draft Two (APOLLO)

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Thank you, Mr. Vice President, for your introduction and for your skillful new leadership on the National Space Council.

And thanks to all of you, who have braved the crowds and heat to join us today. Behind me stands one of the most visited places on Earth -- a temple to American courage and ingenuity. And before me stand those on whose shoulders this legacy was built -- the men and women of the United States astronauts corps.

We hope that neither the motorcade nor the metal detectors caused too much delay. In the future, I'll just signal the Vice President and say: "Dan -- Beam me up."

We are very proud to be part of this unprecedented gathering of America's space veterans -- and to share this stage with three of the greatest heroes of this or any other century -- the crew of Apollo 11.

It's hard to believe 20 years have passed. Neil and Buzz -- the originators of the moonwalk.

And we also honor Michael Collins -- former director of this amazing museum -- and the brave pilot who flew alone on the dark side of the Moon, while Neil and Buzz touched down. Mike -- you must be the only American over age 10 that night who didn't get to see the Moon landing.

Later this evening, after the crowd disperses and the sun goes down, a nearly full Moon will rise ~~out of the ocean to the~~ in the east and shine down on an America that is prosperous and secure. For those old enough to remember that historic night -- step outside tonight with your children or grandchildren. Lift your eyes skyward, and tell them of the flag that still flies proudly in the ancient soil of ~~Tranquility Base.~~ the moon.

And for those who were not yet born, or then too young to recall -- you who are the children of the new century -- raise your eyes to the heavens and join us in a great dream -- an American dream -- a dream without end.

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[And 10 years from now -- on the 30th anniversary of this extraordinary and astonishing flight -- the way to honor the Apollo astronauts is not by calling them back to Washington for another round of speeches. It is to have Space Station Freedom up there, operational, and underway -- a new bridge between worlds -- and an investment in the growth, prosperity and security of our Nation.

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realistic timetables and steps along the way. The Space Council will report back to me as soon as possible with concrete recommendations -- a ~~roadmap for the year 2000~~ and beyond -- charting a new and continuing course to the Moon and Mars and beyond.]

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Like them, and like Columbus, we dream of distant shores we've not yet seen.

[Why the Moon? Why Mars?] Because it is humanity's destiny "to strive, to seek, to find..." And because it is America's destiny to <u>lead</u>.

Six years ago, Pioneer 10 sailed beyond the orbit of Neptune and Pluto -- the first man-made object to leave the solar system. Its destination unknown. It has now journeyed through the tenures of five Presidents -- four billion miles from Earth.

In the decades ahead, we will follow the path of Pioneer 10. We will travel to neighboring stars, to discover whatever lies waiting for us. It will not happen in my lifetime, and probably not during the lives of my children. But a dream to be realized by future generations must begin with <u>this</u> generation. We cannot take the next giant leap for mankind tomorrow -- unless we start with a single step today.

To all of you here -- and especially the astronauts -- we wish you good luck in your quests, wherever they may take you.

Godspeed you, one and all. And God bless the United States.

# # #

THE WHITE HOUSE
WASHINGTON

July 15, 1989

MEMORANDUM FOR CHRISS WINSTON

FROM: ROBERT SIMON

SUBJECT: 20th ANNIVERSARY OF MOON LANDING SPEECH
ASTRONAUT BARBECUE SPEECH

Only minor changes to the Barbecue speech:

Page 1, graph 4: change Shephard to Shepard.

Page 2, graph 1: I will defer to OMB's comments on the last sentence in this paragraph ("In the budget we proposed..." However, checking in Building a Better America shows that this sentence is wrong. As a substitute sentence, I suggest: "That's why I proposed a 22% increase in NASA's budget next year."

Page 3, graph 3: delete the words "on Earth" from the last sentence. "Good luck, and Godspeed" were the last words spoken from launch control at Cape Kennedy, not the last words spoken from earth.

Just a few small, but important changes to the 20th Anniversary speech:

Page 2, graph 1: I suggest removing the words "out of the ocean to" so the phrase reads "a nearly full Moon will rise in the east and shine..."

Page 2, graph 1: Change the words at the end of paragraph from "Tranquility Base" to "the moon." Sadly, the flag at Tranquility Base was knocked over by the blast of Apollo 11 taking off. To my knowledge, the other five U.S. flags on the moon are still "flying."

Page 2, graph 4: Ed wants the following rewrite: "It began near dawn on July 16, 1969. The sun rose a second time that morning as the awesome fireball....." etc.

Page 2, graph 5: Change to "Four days and four nights they journeyed." Apollo 11 lifted off on July 16 and reached the moon on July 19, but the landing was not until July 20.

Page 2, graph 7: Change "white frame house" to "brick house."

Page 3, graph 2: Change "17 seconds" to "20 seconds".

Page 4, graph 3: The Michael Collins quote is a paraphrase, so the quotations marks should be removed.

Page 5, graph 2: I have not yet been able to verify this fact about the dollar benefits of Apollo. Leave it in if you want, because I think I can verify it on Monday.

Page 7, top graph: The phrase "a roadmap for the year 2000" should be deleted, since we are talking about programs that will extend way beyond 2000.

Page 7, graph 4: Add the words "Neptune and" before "Pluto." Because of a quirk in the orbital path of Pluto, Neptune as been this solar system's outermost planet for much of the 1980s, including 1983, when Pioneer 10 crossed Neptune's orbit and left the solar system. By adding Neptune to this sentence, we preserve factual accuracy for all the astronomy buffs out there, without needlessly confusing the general public, which believes that Pluto is always the outermost planet.

Page 7, graph 5: I strongly suggest adding a new sentence 2: "We will travel to neighboring stars, to new worlds, to discover what lies waiting for us." It doesn't commit the President to anything specific, but it does put him on record as the first President in history to support the goal of manned exploration of other solar systems whenever the necessary technology becomes available.

SHOW TIMES

Seven Days a Week

9:55 am	To Fly!
10:30 am	The Dream Is Alive
11:20 am	On The Wing
12:00 pm	To Fly!
12:35 pm	The Dream Is Alive
1:20 pm	Living Planet
2:00 pm	To Fly!
2:35 pm	The Dream Is Alive
3:20 pm	Flyers
4:00 pm	To Fly!
4:35 pm	The Dream Is Alive
5:25 pm	On The Wing
6:05 pm	To Fly!
6:40 pm	The Dream Is Alive
7:25 pm	To Fly!
*8:00 pm	Double Feature

Show times are subject to change or cancellation. Check with the Information Desk on the first floor.

Entrance and Tickets

The box office, located on the first floor of the Museum, opens at 9:30 a.m. Tickets are available then for all showings that day.

Admission

Admission fees per show are $2.25 for adults, $1.25 for children, students and senior citizens.

Group Reservations

Group reservations (minimum of 25 persons) must be made at least 2 weeks in advance. Call (202) 357-1400 Monday-Friday, 9 a.m.-5 p.m., or write Tour Scheduler, National Air and Space Museum, Washington, D.C. 20560.

*Double Feature:
Hail Columbia and *The Dream Is Alive*
Admission: $3.50 and $2.00

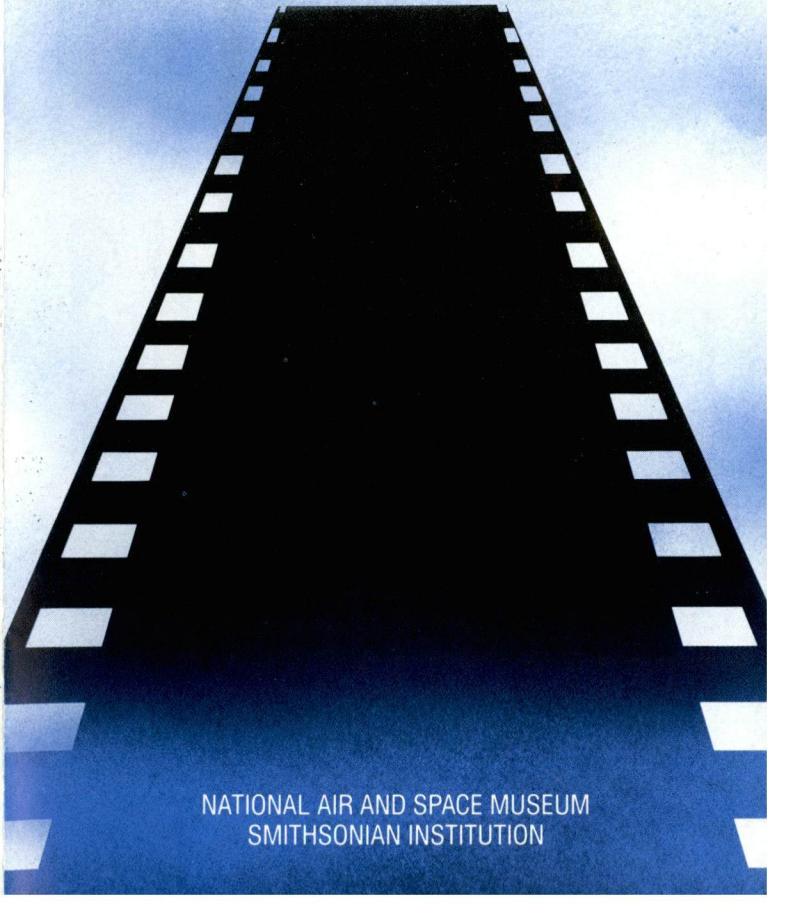
For details call (202) 357-1686

NATIONAL AIR AND SPACE MUSEUM
6th St. and Independence Ave. S.W.
Washington, D.C. 20560

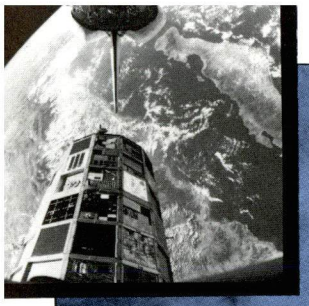
6/89

SAMUEL P. LANGLEY

THEATER



NATIONAL AIR AND SPACE MUSEUM
SMITHSONIAN INSTITUTION



THE DREAM IS ALIVE

Get a window seat aboard the next Space Shuttle. *The Dream Is Alive* offers an insider's view of America's space program.

The film features spectacular in-flight footage shot by 14 astronauts on three separate missions. See astronauts at work both inside and outside the spacecraft; the deployment of scientific and communications satellites; the dramatic capture and repair of the "Solar Max" satellite and the first walk by an American woman astronaut, Kathy Sullivan.

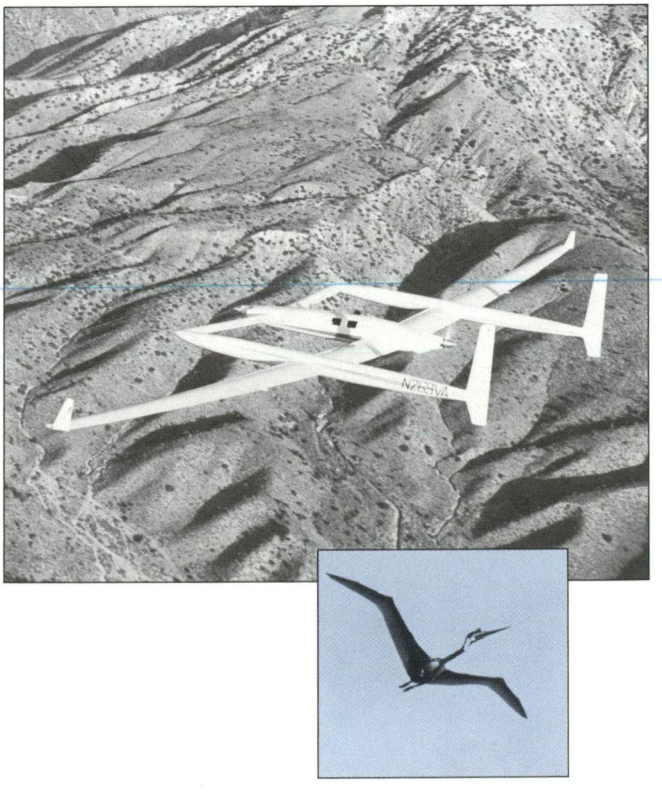
The Dream Is Alive was produced by Imax Systems Corporation and sponsored as a public service by Lockheed Corporation and the Museum.

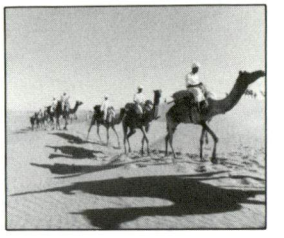
ON THE WING

Experience the wonder of flight in all its forms — from birds and insects to kites and aircraft. Fly over the Andes with a mighty condor. Marvel as a 65-million-year-old pterosaur comes to life. Thrill to a tower jumper with gossamer wings as he leaps from a medieval castle wall.

On The Wing crisscrosses the globe, from Europe, China and the remote mountains and jungles of Peru to the Florida Wildlife Refuge and the deserts of the American Southwest in its quest to record the remarkable diversity of flying creatures and manned aircraft.

On The Wing was produced by Francis Thompson Inc. and sponsored as a public service by Johnson Wax and the Museum.





LIVING PLANET

See the marvels of the world unfold before your eyes. *Living Planet* is an armchair tour of the great monuments of past civilizations: the Acropolis in Athens, the Cathedral of Chartres and India's Taj Mahal. Get a bird's eye view of our planet, from the hustle and bustle of Manhattan's crowded streets to the stunning natural beauty of the Earth.

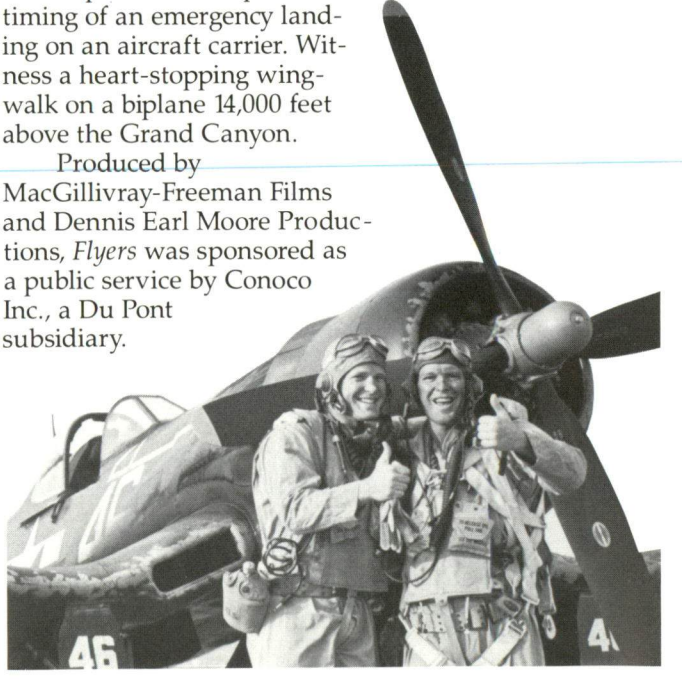
Living Planet was produced by Francis Thompson Inc. and sponsored as a public service by Johnson Wax.

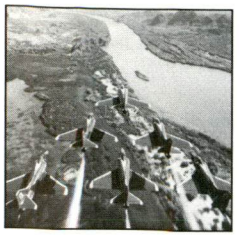
FLYERS

Climb into the cockpit with two daring pilots. Thrill to their exploits as they soar, swoop and dive over land and sea in a series of spectacular aerial sequences.

Experience the split-second timing of an emergency landing on an aircraft carrier. Witness a heart-stopping wing-walk on a biplane 14,000 feet above the Grand Canyon.

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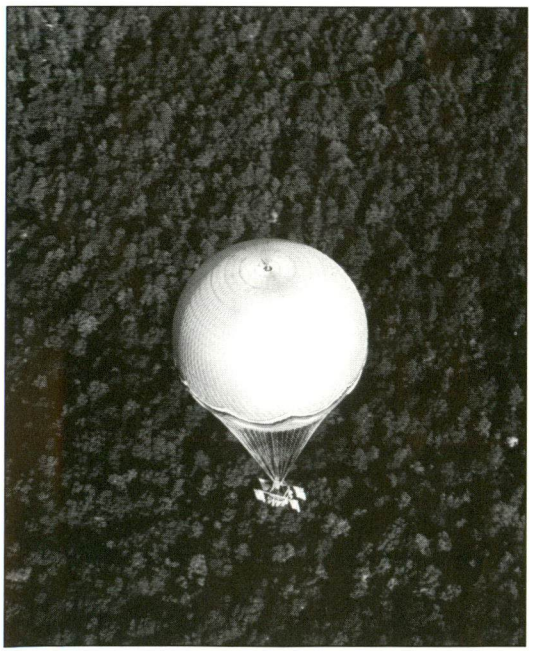




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To Fly! was produced by MacGillivray-Freeman Films for Francis Thompson Inc. and sponsored as a public service by Conoco Inc., a Du Pont subsidiary.



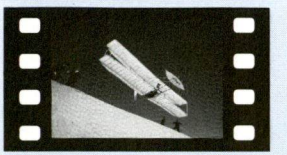
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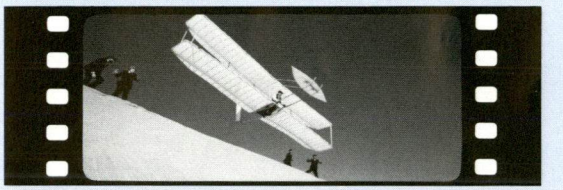
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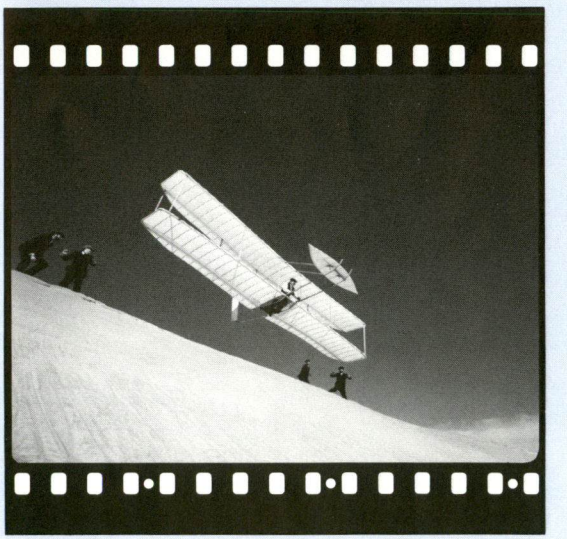
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LOG OF APOLLO 11

NASA
National Aeronautics and Space Administration

Foreword

This is a log of some major day-by-day activities of Apollo 11, the first manned lunar landing mission 10 years ago.

This flight attained the national goal, set by President Kennedy in 1961, of landing men on the Moon and returning them safely to Earth within the decade of the 1960s.

The mission was launched precisely on time from Kennedy Space Center at 9:32 a.m. EDT on July 16, 1969.

The activities of the Apollo 11 crew were viewed live around the world by the largest television audience in history.

The returning spacecraft splashed down in the Pacific, southwest of Hawaii at 12:51 p.m. EDT, July 24, after a flight of 8 days, 3 hours, 19 minutes.

# # # # #

LOG OF APOLLO 11

July 16, 1969

9:32 a.m, EDT -- On schedule to within less than a second, Apollo 11 blasts off from Launch Pad 39A at Cape Kennedy, Florida, to start what is looked upon as the greatest single step in human history -- a trip to the Moon, a manned landing and return to Earth.

Watching is a worldwide television audience and an estimated million eyewitnesses. Standing three and one-half miles away on the sandflats or seated in grandstands are half the members of the United States Congress and more than 3,000 newsmen from 56 countries.

Strapped to their couches in the command module atop the 363-foot, 7.6-million-pound thrust space vehicle are three astronauts, each born in 1930, each weighing 165 pounds, all within an inch of the same height -- five feet, 11 inches. They are Commander Neil A. Armstrong, civilian and ex-test pilot; Command Pilot Michael Collins and Lunar Module Pilot Edwin E. (Buzz) Aldrin, Jr., the latter two, officers of the U.S. Air Force.

The launch comes after a 28-hour countdown. It takes place in highly suitable weather, with winds 10 knots from the southeast, temperature in the mid-80s and clouds at 15,000 feet.

At 4:15 a.m., the astronauts had been awakened. After a breakfast of orange juice, steak, scrambled eggs, toast and coffee, they began suiting up at 5:35 a.m. At 6:27 a.m., they left in an air-conditioned van for the launch pad eight miles away. At 6:54 a.m., Armstrong entered the command module and took position on the left. He was followed five minutes later by Collins on the right and Aldrin in the center.

Two minor problems that developed in the ground equipment, a leaky valve and a faulty signal light, were corrected while the astronauts were enroute to the pad.

The Apollo access arm retracted at 9:27 a.m. Eight and nine-tenths seconds before launch time, the first of the Saturn V's first stage engines ignited. From the viewing stands, the flame appeared as a bright yellow-orange star on the horizon. Soon the other four engines fired and the light of the first engine became a huge fireball that lit the scene like a rising Sun. No sound was heard. For two seconds the vehicle built up thrust.

The hold down clamps were released and the space vehicle began moving slowly upward from the pad, as near 9:32 a.m. as human effort could make it.

As it reached the top of the service tower, the hard-edged clattering thunder of the firing engines rolled over the scrubby Florida landscape and engulfed the viewers like a tidal wave. They witnessed the beginning of the fifth manned Apollo flight, the third to the vicinity of the Moon and the first lunar landing mission.

From Launch Control the last words were: "Good Luck and Godspeed." Commander Armstrong replied: "Thank you very much. We know this will be a good flight."

9:35 a.m. -- The spacecraft is 37 nautical miles high, downrange 61 nautical miles and traveling at 9,300 feet per second or about 6,340 miles per hour. Armstrong confirms the engine skirt and launch escape tower separations.

9:44 a.m. -- With the three Saturn stages fired one after another and the first two jettisoned, Apollo 11 enters a 103 nautical mile-high Earth orbit, during which the vehicle is carefully checked by the astronauts and by the ground control crew.

12:22 p.m. -- Another firing of the third-stage engine, still attached to the command service module, boosts Apollo 11 out of orbit midway in its second trip around the Earth and onto its lunar trajectory at an initial speed of 24,200 miles an hour.

12:49 p.m. -- While the spacecraft moves farther and farther from Earth, the lunar landing craft, code-named Eagle, is unpacked from its compartment atop the launch rockets. The astronauts first fire some explosive bolts. These cause the main spaceship, given the name Columbia, to separate from the adapter and blow apart the four panels that make up its sides, exposing the lunar module (LM) tucked inside. They stop the spacecraft about 100 feet away -- 34 feet farther than they were supposed to -- turn the ship around, facing the landing craft, and dock head-to-head with it. The docking complete, the LM's connections with the adapter are blown loose and the mated command/service and lunar modules separate from the rocket and continue alone toward the Moon.

2:38 p.m. -- By dumping its leftover fuel the third rocket stage is fired into a long solar orbit to remove it from Apollo 11's path.

2:43 p.m. -- With the flight on schedule and proceeding satisfactorily, the first scheduled midcourse correction is considered unnecessary.

2:54 p.m. -- The spacecraft is reported 22,000 nautical miles from Earth and traveling at 12,914 feet per second. Crew members keep busy with housekeeping duties.

8:52 p.m. -- Mission Control at Houston, Texas, says good night to the crew as they prepare to go to sleep two hours early.

10:59 p.m. -- Because of the pull of Earth's gravity, the spacecraft has slowed to 7,279 feet per second at a distance of 63,880 nautical miles from Earth.

July 17

8:48 a.m. -- Mission Control gives Apollo crew a brief review of the morning news, including sports developments. They are informed about the progress of the Russian space ship Luna 15 and that Vice President Spiro T. Agnew, ranking government official at the Apollo 11 blastoff, has called for putting a man on Mars by the year 2000.

12:17 p.m. -- Midcourse correction is made with a three-second burn, sharpening the course of the spacecraft and testing the engine that must get them in and out of lunar orbit.

7:31 p.m. -- Astronauts begin first scheduled color telecast from spacecraft, showing view of the Earth from a distance of about 128,000 nautical miles. During the 36-minute transmission, views are also shown of the inside of the command module.

9:42 p.m. -- Mission Control bids the crew goodnight.

July 18

9:41 a.m. -- Mission Control lets astronauts sleep an hour later than scheduled on the third day of the outward journey. After breakfast, they begin housekeeping chores, such as charging batteries, dumping waste water, and checking fuel and oxygen reserves. Announcement is made to them that course corrections scheduled for afternoon will not be necessary.

2:57 p.m. -- Astronauts are given report on day's news.

4:40 p.m. -- One of the clearest television transmissions ever sent from space is begun, with the spacecraft 175,000 nautical miles from Earth and 48,000 from the Moon. It lasts an hour and 36 minutes. While in progress, the hatch to the LM is opened and Armstrong squeezes through the 30-inch wide tunnel to inspect it. He is followed by Aldrin.

10:00 p.m. -- Mission Control tells the crew goodnight.

11:12 p.m. -- Velocity of spacecraft has slowed to 2,990 feet per second just before entering the Moon's sphere of influence at a point 33,823 nautical miles away from it.

July 19

6:58 a.m. -- Astronauts call Mission Control to inquire about scheduled course correction and are told it has been cancelled. They are also advised they may go back to sleep.

8:32 a.m. -- Mission Control signals to arouse crew and to start them on breakfast and housekeeping chores.

10:01 a.m. -- Astronauts are given review of day's news and are told of worldwide interest in Moon mission.

10:31 a.m. -- Collins reports: "Houston, it's been a real change for us. Now we are able to see stars again and recognize constellations for the first time on the trip. The sky is full of stars, just like the nights on Earth. But all the way here we have just been able to see stars occasionally and perhaps through monoculars, but not recognize any star pattern."

10:42 a.m. -- Armstrong announces: "The view of the Moon that we've been having recently is really spectacular. It fills about three-quarters of the hatch window and, of course, we can see the entire circumference, even though part of it is in complete shadow and part of it's in earthshine. It's a view worth the price of the trip."

12:58 p.m. -- The crew is informed by Mission Control: "We're 23 minutes away from the LOI (Lunar Orbit Insertion) burn. Flight Director Cliff Charlesworth is polling flight controllers for its status now." Then quickly, seconds later: "You are go for LOI." Aldrin replies: "Roger, go for LOI."

1:13 p.m. -- Spacecraft passes completely behind the Moon and out of radio contact with the Earth for the first time.

1:28 p.m. -- The spacecraft's main rocket, a 20,500-pound-thrust engine, is fired for about six minutes to slow the vehicle so that it can be captured by lunar gravity. It is still behind the Moon. The resulting orbit ranges from a low of 61.3 nautical miles to a high of 168.8 nautical miles.

1:55 p.m. -- Armstrong tells Mission Control: "We're getting this first view of the landing approach. This time we are going over the Taruntius crater and the pictures and maps brought back by Apollos 8 and 10 give us a very good preview of what to look at here. It looks very much like the pictures, but like the difference between watching a real football game and watching it on TV -- no substitute for actually being here."

About 15 minutes later he adds: "It gets to be a lighter gray, and as you get closer to the subsolar point, you can definitely see browns and tans on the ground."

And a few moments still later: "When a star sets up here, there's no doubt about it. One instant it's there and the next instant it's just completely gone."

3:56 p.m. -- A 35-minute telecast of the Moon's surface begins. Passing westward along the eastern edge of the Moon's visible side, the camera is focused especially on the area chosen as a landing site.

5:44 p.m. -- A second burn of the spacecraft's main engine, this one for 17 seconds, is employed while the spacecraft is on the back side of the Moon to stabilize the orbit at about 54 by 66 nautical miles.

6:57 p.m. -- Armstrong and Aldrin crawl through the tunnel into the lunar module to give it another check. The spacecraft is orbiting the Moon every two hours.

July 20

9:27 a.m. -- Aldrin crawls into the lunar module and starts to power-up the spacecraft. About an hour later, Armstrong enters the LM and together they continue to check the systems and deploy the landing legs.

1:46 p.m. -- The landing craft is separated from the command module, in which Collins continues to orbit the Moon.

2:12 p.m. -- Collins fires the command ship's rockets and moves about two miles away.

3:08 p.m. -- Armstrong and Aldrin, flying feet first and face down, fire the landing craft's descent engine for the first time.

3:47 p.m. -- Collins, flying the command ship from behind the Moon, reports to Earth that the landing craft is on its way down to the lunar surface. It is the first Mission Control has heard of the action. "Everything's going just swimmingly. Beautiful!" Collins reports.

4:05 p.m. -- Armstrong throttles up the engine to slow the LM before dropping down on the lunar surface. The landing is not easy. The site they approach is four miles from the target point, on the southwestern edge of the Sea of Tranquility. Seeing that they are approaching a crater about the size of a football field and covered with large rocks, Armstrong takes over manual control and steers the craft to a smoother spot. His heartbeat has risen from a normal 77 to 156.

While Armstrong flies the landing craft, Aldrin gives him altitude readings: "Seven hundred and fifty feet, coming down at 23 degrees... 700 feet, 21 down... 400 feet, down at nine... Got the shadow out there... 75 feet, things looking good... Lights on... Picking up some dust... 30 feet, 2 1/2 down... Faint shadow... Four forward. Four forward, drifting to the right a little... Contact light. Okay, engine stop."

When the 68-inch probes beneath three of the spacecraft's four footpads touch down, flashing a light on the instrument panel, Armstrong shuts off the ship's engine.

4:18 p.m. -- The craft settles down with a jolt almost like that of a jet landing on a runway. It is at an angle of no more than four or five degrees on the right side of the Moon as seen from Earth. Armstrong immediately radios Mission Control: "The Eagle has landed."

Aldrin, looking out of the LM window, reports: "We'll get to the details around here, but it looks like a collection of just about every variety of shapes, angularities and granularities, every variety of rock you could find. The colors vary pretty much depending on how you're looking.... There doesn't appear to be much of a general color at all; however, it looks as though some of the rocks and boulders, of which there are quite a few in the near area... are going to have some interesting colors to them."

Houston, Tranquility Base

A few moments later he tells of seeing numbers of craters, some of them 100 feet across, but the largest number only one or two feet in diameter. He sees ridges 20 or 30 feet high, two-foot blocks with angular edges, and a hill half a mile to a mile away.

Finally, in describing the surface, Aldrin says: "It's pretty much without color. It's gray and it's a very white, chalky gray, as you look into the zero phase line, and it's considerably darker gray, more like ashen gray as you look up 90 degrees to the Sun. Some of the surface rocks close in here that have been fractured or disturbed by the rocket engine are coated with this light gray on the outside, but when they've been broken they display a dark, very dark gray interior and it looks like it could be country basalt."

The first task after landing is that of preparing the ship for launching, of seeing that all is in readiness to make the ascent back to a rendezvous with the command spacecraft orbiting above.

6:00 p.m. -- With everything in order, Armstrong radios a recommendation that they plan to start the EVA (Extra Vehicular Activity), earlier than originally scheduled, at about 9:00 p.m. EDT. Mission Control replies: "We will support you anytime."

10:39 p.m. -- Later than proposed at 6:00 p.m., but more than five hours ahead of the original schedule, Armstrong opens the LM hatch and squeezes through the opening. It is a slow process. Strapped to his shoulders is a portable life support and communications system weighing 84 pounds on Earth, 14 on the Moon, with provision for pressurization; oxygen requirements and removal of carbon dioxide.

Armstrong moves slowly down the 10-foot, nine-step ladder. On reaching the second step, he pulls a "D-ring," within easy reach, deploying a television camera, so arranged on the LM that it will depict him to Earth as he proceeds from that point.

Down the ladder he moves and halts on the last step. "I'm at the foot of the ladder," he reports. "The LM footpads are only depressed in the surface about one or two inches... the surface appears to be very, very finegrained as you get close to it, it's almost like a powder."

10:56 p.m. -- Armstrong puts his left foot to the Moon. It is the first time in history that man has ever stepped on anything that has not existed on or originated from the Earth.

"That's one small step for a man, one giant leap for mankind," Armstrong radios. Aldrin is taking photographs from inside the spacecraft.

The first print made by the weight of man on the Moon is that of a lunar boot which resembles an oversized galosh. Its soles are of silicon rubber and its 14-layer sidewalls of aluminized plastic. Specially designed for super-insulation, it protects against abrasion and has reduced friction to facilitate donning. On Earth, it weighs four pounds, nine ounces; on the Moon, 12 ounces.

Armstrong surveys his surroundings for a while and then moves out, testing himself in a gravity environment one-sixth of that on Earth. "The surface is fine and powdery," he says. "I can pick it up loosely with my toe. It does adhere in fine layers like powdered charcoal to the sole and sides of my boots. I only go in a small fraction of an inch. Maybe an eighth of an inch, but I can see the footprints of my boots and the treads in the fine sandy particles.

"There seems to be no difficulty in moving around as we suspected. It's even perhaps easier than the simulations...."

Feeling more confident, Armstrong begins making a preliminary collection of soil samples close to the landing craft. This is done with a bag on the end of a pole.

"This is very interesting," he comments. "It's a very soft surface, but here and there... I run into a very hard surface, but it appears to be very cohesive material of the same sort... it has a stark beauty all its own. It's like much of the high desert of the United States."

He collects a small bagful of soil and stores it in a pocket on the left leg of his space suit. This is done early, according to plan, to make sure some of the Moon surface is returned to Earth in case the mission has to be cut short.

11:11 p.m. -- After lowering a Hasselblad still camera to Armstrong, Aldrin emerges from the landing craft and backs down the ladder, while his companion photographs him.

"These rocks... are rather slippery," Armstrong says. The astronauts report that the powdery surface seems to fill up the fine pores on the rocks, and they tend to slide over them rather easily.

Armstrong fits a long focal length lens into position on the TV camera and trains it upon a small, stainless steel plaque on one of the legs of the landing craft. He reads: "Here men from the planet Earth first set foot on the Moon. July 1969 A.D. We came in peace for all mankind." Below the inscription are the names of the Apollo crew and President Nixon.

Armstrong next removes the TV camera from its fixed position on the LM and moves it away about 40 feet so it can cover the area in which the astronauts will operate.

As scheduled, the astronauts set up the first of three experiments. From an outside storage compartment in the LM, Aldrin removes a foot-long tube containing a roll of aluminum foil. Inside the roll is a telescoped pole that is driven into the lunar surface, after which the foil is suspended from it, with the side marked "Sun" next to the Sun. Its function will be to collect the particles of "solar wind" blowing constantly through space so that they can be brought back and analyzed in the hope they will provide information on how the Sun and planets were formed.

11:41 p.m. -- From a leg of the spacecraft, the astronauts take a three-by-five-foot, nylon United States flag, its top edge braced by a spring wire to keep it extended on the windless Moon and erect it on a staff pressed into the lunar surface.

Taken to the Moon are two other U.S. flags, to be brought back and flown over the houses of Congress, the flags of the 50 states, the District of Columbia and U.S. territories, the United Nations flag, as well as those of 136 foreign countries.

11:47 p.m. -- Mission Control announces: "The President of the United States is in his office now and would like to say a few words to you." Armstrong replies: "That would be an honor."

11:48 p.m. -- The astronauts listen as the President speaks by telephone: "Neil and Buzz, I am talking to you from the Oval Room at the White House. And this certainly has to be the most historic telephone call ever made.... For every American this has to be the proudest day of our lives. And for people all over the world I am sure they, too, join with Americans in recognizing what a feat this is. Because of what you have done, the heavens have become a part of man's world. As you talk to us from the Sea of Tranquility, it inspires us to redouble our efforts to bring peace and tranquility to Earth. For one priceless moment, in the whole history of man, all the people on this Earth are truly one."

As the President finishes speaking, Armstrong replies: "Thank you, Mr. President. It's a great honor and privilege for us to be here representing not only the United States but men of peace of all nations. And with interest and a curiosity and a vision for the future. It's an honor for us to be able to participate here today."

The two astronauts stand at attention, saluting directly toward the television as the telephone conversation concludes.

Armstrong next sets up a folding table and opens on it two specimen boxes. Using tongs and the lunar scoop, a quantity of rocks and soil are picked up and sealed in the boxes, preparatory to placing them in the ascent stage of the landing craft.

Aldrin, meanwhile, opens another compartment in the ship and removes two devices to be left on the Moon, taking each out about 30 feet from the ship. One is a seismic detector, to record moonquakes, meteorite impact or volcanic eruption, and the other a laser-reflector, a device designed to make a much more precise measurement of Earth-Moon distances than has ever been possible before.

July 21

12:54 a.m. -- After checking with Mission Control to make sure all chores have been completed, experiments set up, and photographs taken, Aldrin starts back up the ladder to reenter the LM.

1:09 a.m. -- Armstrong joins Aldrin in the landing craft.

1:11 a.m. -- The hatch is closed. The astronauts begin removing the portable life support systems on which they have depended for two hours and 47 minutes.

4:25 a.m. -- Astronauts are told to go to sleep, after attending to final housekeeping details and answering a number of questions concerning the geology of the Moon.

9:44 a.m. -- Shortly after arousing Collins, still circling the Moon in the Command/Service Module, Mission Control observes: "Not since Adam has any human known such solitude as Mike Collins is experiencing during this 47 minutes of each lunar revolution when he's behind the Moon with no one to talk to except his tape recorder aboard Columbia."

11:13 a.m. -- The astronauts in Eagle are aroused. Aldrin announces: "Neil has rigged himself a really good hammock... and he's been lying on the hatch and engine cover, and I curled up on the floor."

12:42 p.m. -- Answering a question raised before they went to sleep, Aldrin reports: "We are in a boulder field where boulders range generally up to two feet, with a few larger than that.... Some of the boulders are lying on top of the surface, some are partially exposed and some are just barely exposed."

1:54 p.m. -- Ascent engine is started and LM, using descent stage as a launch pad, begins rising and reaches a vertical speed of 80 feet per second at an altitude of 1,000 feet.

The astronauts take with them in the ascent stage the soil samples, the aluminum foil with the "solar wind" particles it has collected, the film used in taking photographs with still and motion picture cameras, the flags and other mementos to be returned to Earth. Behind they leave a number of items, reducing the weight of the ship from 15,897 pounds as it landed on the Moon to 10,821 pounds.

The largest item left behind is the descent stage, that part of the landing craft with the plaque on one of its spidery legs. Others include the TV camera, two still cameras, tools used in collecting samples, portable life support systems, lunar boots, American flag, rod support for the "solar wind" experiment instrument, laser beam reflector, seismic detector and a gnomon, a device to verify colors of objects photographed.

5:35 p.m. -- Eagle redocks with Columbia while circling on the back side of the Moon.

7:42 p.m. -- The landing craft is jettisoned.

July 22

12:56 a.m. -- While on the back side of the Moon, with the LM 20 miles behind the CSM, the transearth injection burn of Apollo 11 is begun, with the spacecraft traveling at 5,329 feet per second at an altitude of about 60 nautical miles.

4:30 a.m. -- Astronauts start sleep period.

1:00 p.m. -- Astronauts begin waking for first full day of return trip.

1:39 p.m. -- Spacecraft passes point in space, 33,800 nautical miles from the Moon and 174,000 from the Earth, where the Earth's gravity takes over and begins drawing the astronauts homeward.

4:02 p.m. -- Midcourse correction is made to readjust the flight path of the spacecraft.

9:08 p.m. -- Eighteen minutes of live TV transmission to Earth begins.

July 23

2:14 a.m. -- Crew starts sleep period.

12:20 p.m. -- Crew awakens. Begins relaxed checking of systems and conversation with Mission Control.

3:56 p.m. -- Spacecraft passes midway point of journey homeward, 101,000 nautical miles from splashdown.

7:03 p.m. -- Final color television transmission begins.

July 24

6:47 a.m. -- Crew awakens and begins to prepare for splashdown.

12:21 p.m. -- Command and service modules are separated.

12:35 p.m. -- Command module reenters the Earth's atmosphere.

12:51 p.m. -- Spacecraft splashes down 825 nautical miles southwest of Honolulu and about 13 nautical miles from the recovery ship, the U.S.S. Hornet.

1:20 p.m. -- Hatch of command module opens and frogman hands in isolation suits.

1:28 p.m. -- Astronauts emerge from the spacecraft in isolation suits and are sprayed with a disinfectant as a guard against the possibility of their contaminating the Earth with Moon "germs."

1:57 p.m. -- Astronauts arrive by helicopter on the flight deck of the Hornet. Still inside the helicopter, they ride an elevator to hangar deck and then walk immediately into the mobile quarantine trailer in which they will remain until they arrive at the Lunar Receiving Laboratory at Houston early July 27.

3:00 p.m. -- President Nixon welcomes the astronauts, visible through a window of the trailer. Speaking over an intercom, he greets them, extends them an invitation to attend a dinner with him August 13, and tells them:

"This is the greatest week in the history of the world since the Creation.... As a result of what you have done, the world's never been closer together.... We can reach for the stars just as you have reached so far for the stars."

3:55 p.m. -- The command module arrives on board the Hornet, after traveling 952,700 nautical miles since July 16.

So ends man's first mission to the Moon. It has lasted 195 hours, 18 minutes and 35 seconds or a little more than eight days. It is recognized as the most trouble-free mission to date, almost completely on schedule and successful in every respect.

# # # # #

MOONWALK



NASA

Striding toward infinity

1969

'Here men from the planet Earth first set foot on the moon. We came in peace . . .'

For once, the whole world *was* watching. At least 6 million people—one sixth of the earth's population—at the time—sat in silent communion before their television sets, waiting for news that men had touched down on the face of the moon. But at that moment, 4:16 p.m. EDT, July 20, Apollo 11 astronaut Neil Armstrong had a crisis on his hands. After a flawless, three-day voyage 240,000 miles into space, Armstrong was easing his tiny lunar module, the Eagle, down to the Sea of Tranquility when alarm lights went off on the control panel. His on-board computer guidance system had overloaded, causing the spacecraft to overshoot its intended landing site by nearly four miles. Now, strapped into a standing position much like an old-time trolley driver, Armstrong assumed manual control, executed a fish-hook turn backward and started looking out the window for an alternative site. His pulse rate was 156.

The Eagle had less than 60 seconds of descent fuel left, and mission control in Houston was commencing the countdown for a mandatory abort. Although the ascent engine's fuel tank was still full, the astronauts had already entered the so-called dead man's zone less than 50 feet above the lunar surface. If Armstrong tried to pull out at the last moment, he wouldn't have room to clear the lunar mountain ranges. For 22 seconds, while co-pilot Edwin E. (Buzz) Aldrin Jr. called out velocities and altitudes, Armstrong hovered over a field of jagged boulders until he spotted what appeared to be a suitably flat clearing. He brought the Eagle in for touchdown with only 18 seconds of fuel to spare.

Six hours and 38 minutes later, Armstrong climbed down the Eagle's ladder and carefully pressed his left boot into the moon's powdery plain. "That's one small step for man, one giant leap for mankind," he said, an aphorism he had composed himself on the trip from Earth. Twenty minutes later Aldrin joined him; together they unveiled a plaque: "Here men from the planet Earth first set foot on the moon, July 1969 AD. We came in peace for all mankind."

They stayed a scant 125 minutes, cavorting about the surface and scooping up 48 pounds of lunar rock and particles. Then they returned to the Eagle and the next morning, lifted back into orbit to rejoin crew mate Michael Collins in the command module Columbia. Space has little margin for error, and no room for sentiment. The Eagle was jettisoned, and became another piece of celestial trash.

As the venerable science-fiction novelist Arthur C. Clarke observed, the Apollo crew had "opened the door to infinity." Each man has been slow to walk through. In the three years after the Eagle landed, the Apollo program seemed to convert the impossible into the inevitable. Five more times, astronauts landed on the moon; by the last mission, most of the world wasn't watching. Out of that boredom was born aimlessness, the ailment from which America's space program still suffers. After glorious Apollo came the space shuttle: a vehicle designed to serve too many disparate functions, none of which fires the imagination. In the wake of the Challenger disaster three years ago, NASA was thrilled merely to get the shuttle flying again.

Once the nation was consumed with the space race. We don't talk that way anymore. If we did, we'd find that the folks out in front are Russians. But they, too, are adrift, speaking of Mars while contenting themselves with setting endurance records in orbit. Now they know a great deal about the effects of prolonged space travel on everything from loneliness to the loss of calcium. Thus far that knowledge hasn't led them anywhere but in giant circles.

By contrast, Apollo paid down-to-earth dividends. Man's conquest of the moon would have been a bargain at twice the price; it was the best return on an investment in research and development since Leonardo da Vinci bought himself a sketch pad. The total NASA budget from 1959-1973, the year after the last lunar landing mission, was $50 billion. But over the past two decades, Apollo technology has spawned many more billions of dollars' worth of new products and new industries.

The list of "direct" spinoffs from Project Apollo includes Teflon-coated cookware, freeze-dried foods, shatterproof eyeglasses, quartz-crystal watches, cordless power hand tools such as the Dustbuster vacuum cleaner, artificial limbs made from ultralight spacecraft composites, mass spectrometers for surgery, the heart pacemaker and various weather and communications satellites used by corporations and consumers all over the globe.

The list of "indirect" spinoffs from Project Apollo features one of the most revolutionary gadgets of modern times: the home computer. Back in the late 1950s, the state-of-the-art computer was the size of a city block. The space program encouraged an extraordinary process of miniaturization that down-sized master computers. As it happened, the Eagle's 17-pound model was not equal to its task. But its development helped spark the personal-computer revolution.

Great explorers have the habit of peaking young and coming to ends that don't match their early glory. Columbus died in obscurity. Magellan was killed in the Philippines. Hudson was set adrift by mutineers and was not heard from again. By that measure, the Apollo 11 crew hasn't fared so badly. But none have turned their space adventures into box-office successes. Our popular taste in heroes seems to run more to icons than to real men: schoolboys may line up around the block to win the signature of the bloke who played Luke Skywalker, while the men who first walked on the moon walk among us barely the stuff of footnotes.

Collins, 58, seems the most at peace with his postastronaut life. After serving as director of the National Air and Space Museum in Washington, he turned to writing books about space. Former lunar module pilot Aldrin, 59, has had the most personal problems. Following his return to Earth, he suffered a series of severe mental breakdowns requiring hospitalization and drug therapy. He also went through two failed marriages and frustrating careers as a car salesman, rancher and lecturer. Recently remarried for a third time, Aldrin is now a space consultant, commercial pitchman and writer.

Former commander Armstrong, 58, had the greatest potential for stardom but chose to maintain a low profile. After retiring from NASA in 1971 he became a professor of engineering at the University of Cincinnati. He did a series of TV commercials for Chrysler, but stopped short of trying to be Chuck Yeager. He is now a partner in a computer-software firm based in Lebanon, Ohio. Armstrong has not written a book about his "giant leap," and still refuses to grant interviews to would-be biographers.

Like other space veterans, the Apollo 11 crewmen have expressed disappointment with the present program. Armstrong favors the launch of a permanent orbiting space station. Collins says the nation should aim for Mars. At a recent press conference Aldrin said he hoped the 20th-anniversary celebration would be an occasion for a new beginning. It hasn't happened and he believes his hopes may be just "wishful thinking."

Thinking wishfully—having a desire—may be just what NASA needs. The crucial element still lacking in America's space effort is what President George Bush calls the "vision thing"—an inspirational goal like John F. Kennedy's challenge in 1961 to land a man on the moon before the end of the decade. "We choose to go to the moon in this decade and do the other things," Kennedy said at the ground-breaking of the Manned Spacecraft Center in Houston, "not because they are easy, but because they are hard . . . because there is new knowledge to be gained and new rights to be won, and they must be won and used for the progress of all mankind . . . And therefore, as we set sail, we ask God's blessing on the most hazardous and dangerous and greatest adventure on which man has ever embarked." That adventure merely began with Apollo 11. Twenty years later, it is time for man to make the next "giant leap" into the cosmos—for all mankind.

HARRY HURT III

A NEWSWEEK *correspondent, Hurt is the author of "For All Mankind," a history of the Apollo program.*

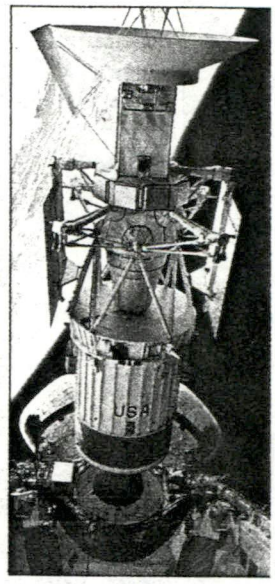
1989

The high point for America's space program this summer may have already come and gone. In May the crew of the space shuttle Atlantis slid open its cargo bay and gently eased an imposing interplanetary craft out into space. Called the Magellan, this unmanned explorer will travel through the heavens for 15 months, leisurely orbiting the sun until caught by the gravitational fields of Venus. For 243 days, Magellan's special radar gear will pierce the veil of that shrouded planet. If Magellan follows its schedule, we'll feel a goose bump or two in September 1990.

Deferred gratification, that's what NASA has to offer. Just ask the nation's astronomers who have been waiting since 1986 for the launch of the Hubbell Space Telescope, which, when lofted free of the distorting effects of the Earth's atmosphere will be able to see clear to the edge of the universe. The launch of the Hubbell has been pushed back again to early 1990. Not that NASA doesn't have a few plans for this summer. In August, Voyager 2, which was launched in 1977, will complete its tour of the outer solar system by passing within 3,000 miles of Neptune. The radio signals that brought back the first detailed glimpse of Uranus three years ago will do the same this year for distant Neptune.

NASA is supposed to get some direction next month from President George Bush, who is scheduled to make a space-policy address on the 20th anniversary of the Apollo landing. If Bush has any bold new ideas, administration aides aren't saying. In any case, he will be under tight budget constraints (NASA's funding, measured in constant dollars, has declined by about 25 percent since 1969.) Bush's one public step has been to appoint Vice President Dan Quayle to head the National Space Council. Quayle's most visible move so far has been to seek the advice of novelist Tom Clancy, whose best-known work is a thriller about submarines.

MARY HAGER



NASA

Magellan aloft

makes them prime targets for the mining of extraterrestrial materials. These asteroid assay missions will no doubt have the full attention of several multinational and Fortune 500 corporations.

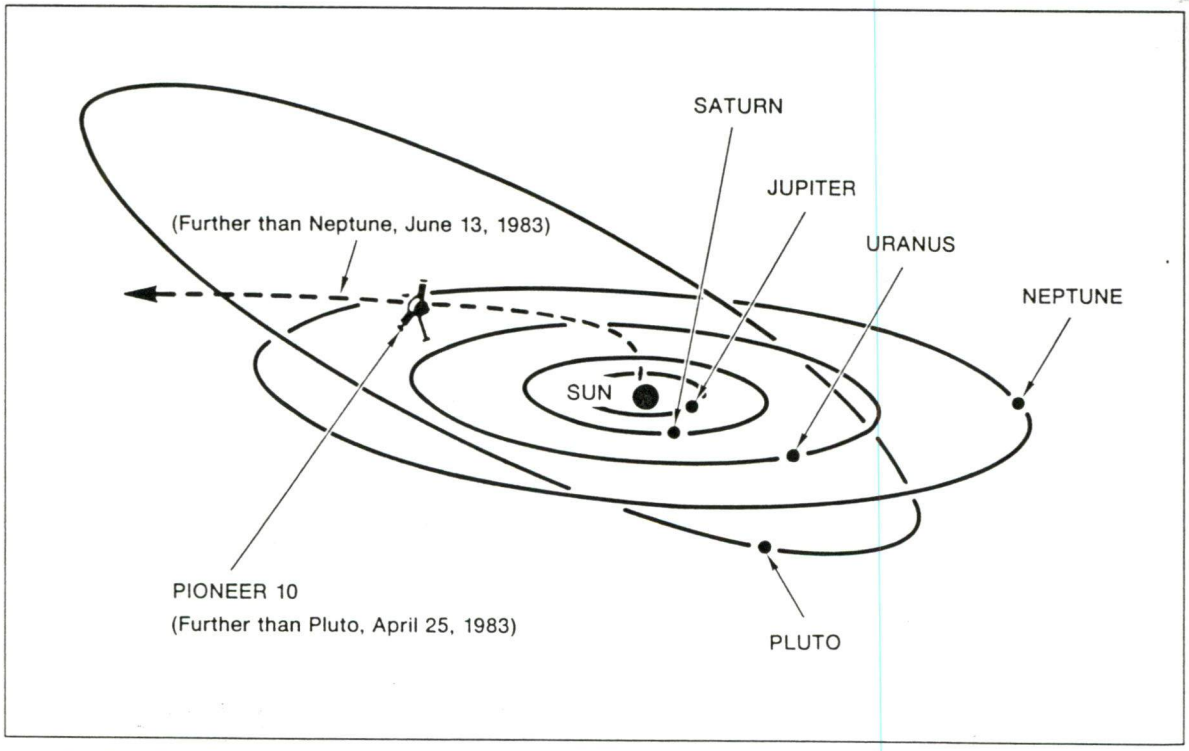
OUTWARD TO THE GIANTS

The Little Spacecraft that Could

June 13, 1983, is a historic date, but only the rare person could tell you why it should be remembered. That was the date that the hardy little spacecraft *Pioneer 10*, launched more than a decade earlier (on March 3, 1972), left our sun's solar system forever to wander throughout the immense Milky Way galaxy. It was the first man-made object to leave our local neighborhood of the universe.

At the historic crossover point, when the spacecraft went beyond the orbit of Neptune (now the most distant planet), it was 2.81 billion miles (4.52 billion kilometers) from earth. Round-trip communications with the amazing spacecraft take about nine hours at the speed of light, and scientists hope they can continue communicating with *Pioneer 10* until the early 1990s, when it is some 5 billion miles (8 billion kilometers) from its planet of origin. As the first human artifact to leave the solar system, *Pioneer 10* is a triumph of human ingenuity and engineering skill. But it did so much more, and so much more for the first time, that it deserves to be known as the earth's most famous spacecraft.

The main mission of *Pioneer 10* was to journey to giant Jupiter and its retinue of moons



ABOVE AND FACING PAGE: *The little spacecraft that could. Why is June 13, 1983, a historic date? It is the first time a robot spacecraft (and human artifact) left the solar system forever. When* Pioneer 10 *was launched on March 3, 1972, scientists were not even sure it would survive its flight through the asteroid belt.* Courtesy TRW.

some 620 million miles (998 million kilometers) from earth and survey this mysterious planet up close for the first time. It accomplished this scientific feat, and attained many other firsts along the way. Because *Pioneer 10* was the first spacecraft to fly beyond Mars, scientists did not even know if it could survive its flight through the rocky debris of the asteroid belt. But it did, thus paving the way for the Voyager spacecraft that would follow and reveal marvels that rivaled the human imagination.

When this exemplary robot flew past its destination planet, Jupiter, its data streams of 1,024 bits a second produced some 500 photographs. The images were computer reproductions of digital data, which recorded 64 different intensities of red and blue light. In just one second, 1,000 intensities were measured, coded, and sent back as data to earth to be reconstituted into two-color images that showed a giant, turbulent planet without a solid surface. *Pioneer 10* confirmed, among many other discoveries, that Jupiter was composed of liquid hydrogen.

The 570-pound (259 kilogram) spacecraft carried twelve scientific instruments that could answer more than a dozen scientific questions. It could respond to commands from earth from as far away as 2 billion miles (3.2 billion kilometers); maneuver in space and face its high-gain dish antenna toward earth; keep the precise time and maintain temperature; and store over 50,000 bits of data for transmission to the home planet.

The spacecraft's flight stability was attained by a controlled spin of five revolutions per minute. Nuclear energy—in the form of four radioisotope thermoelectric generators (two each at the end of two 9-foot, 2.7-meter, booms—powered *Pioneer 10* and its sister craft that followed. The modest 8-watt radio transmitter, with the help of powerful receivers on earth, has stood the test of more than a decade. But its signal is extremely weak when it reaches the earth, on the order of 20,000 trillionths of a watt. If this infinitesimal amount of energy were collected for nineteen million years, it still would only light up a Christmas tree for 1/1,000th of a second.

And then there is the famous plaque, a message sent with eternal hope to other intelligent life in the universe. This gold-anodized plaque, bolted to the mainframes of both *Pioneer 10* and *11*, uses as its key the most common element in the universe—the hydrogen atom. Along with other basic information about our solar system is a drawing of a human female and male. That the plaque was put on *Pioneer 10* and *11* at all says much about the human spirit.

Once every million years or so, *Pioneer 10* may come close to another star system, but the odds of this cosmic bottle ever being found by other intelligent life must be considered dim. But again, the act of placing it on the spacecraft perhaps tells more about us than the entire primitive machine that carries it. Farewell, good *Pioneer 10*; may the thousands of stars and billions of years be kind to you.

A Tough Flight to Follow

The sister spacecraft to *Pioneer 10*, *Pioneer 11*, had several firsts of its own. Identical in design and instrumentation, *11* was more than a backup mission. Its historic significance is that it was the first spacecraft to fly past the majestic planet of Saturn after its swing around Jupiter.

Launched almost a year after its trajectory-blazing sister craft, on April 6, 1973, it too passed through the once feared asteroid belt without damage and on then on to Jupiter. It flew past the giant on December 3, 1974, at a much closer distance than did *Pioneer 10*—26,725 miles (43,000 kilometers) versus 81,000 miles (130,000 kilometers). And its trajectory by Jupiter was different also; it flew over the planet's north and south poles for the first time, regions not seen from earth.

On went *11* toward Saturn, where no spacecraft had ventured before. Even the experts did not know if it could survive its passage near the rings of Saturn. As *Pioneer 11* swept by Saturn and its moons on September 1, 1979, it provided the first close-up images of the planet shaped like a flattened sphere, the swirling atmosphere with a large white spot, and the wondrous rings. The on-board instruments found out that Saturn, like Jupiter, radiates about twice as much

7/12/89

Dear Bob,

Since all of the remarks by Adm. Truly and the Apollo 11 crew are very brief, there are no written versions. I doubt if there will be any written versions.

Following is the information you requested on the Voyager and Pioneer spacecraft.

I am enclosing the Voyager 2 status report for this week.

Voyager 1 is about 38 Astronomical units (AU) from the Sun and headed outward from the Solar system. (One AU is 93 million miles)

Pioneer 10 is 47 AU from the sun. It is beyond Pluto. It has one of the gold plaques on it. more than 4 billion miles

Pioneer 11 is 29 AU from the sun. It is just about to the orbit of Pluto. It has the other gold plaque on it. Both Pioneer 10 and 11 are still collecting data and will continue to do so until the late 1990's if all goes well. They do not have imaging capability (i.e. no pictures).

I hope this information has been helpful.

Dot Zukor

Facing Death in Space

Even Christopher Kraft—director of flight operations at the Johnson Space Center, whose familiar face and calm professional manner gave assurance to millions of TV viewers during the Apollo years—believed that astronauts would die in space. Kraft, who retired from NASA in 1982, admitted that at least twice in his career he thought the crews of troubled missions were doomed. He did not believe the *Gemini 8* crew would ever get back to earth, and he stated that the *Apollo 13* crew was saved by the "luck of God."

While the Russians lost cosmonauts on space missions during the early years of the Space Age, the United States lost its astronauts on the ground. Three Americans died in an Apollo spacecraft fire during a simulated test, their rocket still on the pad at Cape Kennedy. Four more astronauts died in air crashes. During the ten years it took the United States to reach the moon, no American astronauts died in space. Twenty-seven men flew to the moon, and twelve men walked on its surface without a single death in spaceflight.

After the tragic fire of *Apollo 1* on January 27, 1967, a cartoon appeared in the *Los Angeles Times*. Drawn by Paul Conrad, it showed the specter of death wearing a space suit. He held a Mercury spacecraft in one hand and a Gemini in the other. A smoldering Apollo spacecraft was in the background. The caption read: "I thought you knew, I've been aboard on every flight."

When President Kennedy said the United States was going to the moon, some respected experts gave the tremendous undertaking only a one in ten chance of success. Early during program planning, the question of odds came up, because reliability of any engineered system is directly linked to the amount of time allowed for design, production, and testing, and to the amount of money that can be spent. NASA had to decide early on what odds they would accept in their lunar venture. Should 50 percent of the missions be successful? Should 9 out of 10 astronauts come back alive? Or should the reliability factor be such that 999 out 1,000 astronauts lived to tell about their flights in outer space?

This basic question of how safe Apollo hardware and software should be was debated for weeks, but no one was willing to make that decision. It was, after all, the base upon which the Apollo pyramid—the twentieth century's greatest legacy to the future of humankind—would be built.

Finally the engineering team sought the advice of Robert Gilruth, director of the Manned Spacecraft Center. Gilruth told them that a 50 percent success rate was too low and unacceptable. "We can make 9 out of 10," he said. "Maybe 99 out of 100, lose 1 man out of 100 on lunar missions."

Walt Williams, director of the Mercury program, responded: "That's ridiculous. Make it 1 in a million."

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ABOVE: *A commemorative plaque and fallen astronaut sculpture were left on the surface of the moon by* Apollo 15 *astronauts Dave Scott and Jim Irwin. The plaque listed in alphabetical order 14 U.S. astronauts and Soviet cosmonauts who had died while serving their space programs up to that time—July 1971.* Courtesy NASA.
PRECEEDING PAGES: *The shipwrecked crew of unlucky* Apollo 13 *was lucky to return to earth alive. There were times when no one, including the crew, thought they would survive the ordeal after the explosion. Their lifeboat was the moonship* Aquarius, *which they jettisoned just before reentry.*

NASA PRESS CONFERENCE

APOLLO XI 20TH ANNIVERSARY

PARTICIPANTS: NEIL ARMSTRONG
EDWIN "BUZZ" ALDRIN
MICHAEL COLLINS

MODERATOR: DAVID GARRETT, NASA NEWS CHIEF

NASA HEADQUARTERS
WASHINGTON, DC

FRIDAY, MAY 26, 1989

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MR. GARRETT: We will start with a brief statement from each of the Apollo XI astronauts -- Neil Armstrong, Michael Collins, and Buzz Aldrin, and then move right into Q&A.

Neil?

MR. ARMSTRONG: This crew has had this kind of session every five years for some peculiar reason. Ten years ago, I did make a statement endorsing the concept of permanent presence in space, and I guess that I still feel that's a worthy objective. I hope that Space Station Freedom becomes a reality before we have another 10 years go by.

MR. GARRETT: Mike?

MR. COLLINS: You know, the only thing that makes me any different from any of you is that I've seen the earth from a far distance and seen the moon up close. I think the impressions I get are first of the earth, is that it's a very small and a very fragile planet and should be treated as such, a very small object. And the moon, as I think back on it, I don't really think of it so much as a place as a direction. I think the moon, to me, represents "out there." And at this stage in the development of NASA, of the space program, I think "out there" really points to Mars. So that when I think of the moon today, I really don't think of it as a destination but as a stepping stone to more interesting places like Mars and perhaps Titan I of Saturn's moons.

MR. GARRETT: Buzz?

MR. ALDRIN: I have some of these, but I'm not going to make use of it. Apollo, to me, was a response to a challenge. It has been termed by many as one of the most audacious endeavors in human history, to move outwards. About a year ago, I elected to make an

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effort at putting down some of my reflections as to what I thought the significance was of the putting together of that event and the achieving of it, and it's available in the form of "Men from Earth" right now.

I had hoped that, along with that, the situation might be appropriate for this 20th anniversary approaching to become a catalyst to chart a new course,

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perhaps because I got caught up in the enthusiasm of the '60s and of achievement that we were all a part of. Perhaps wishful thinking, I felt that this situation would be a very right one for the leadership of our nation to chart a course, a bold course, for human expansion outward becoming a bit more specific. I see that -- I'm doing some work with the exploration office -- we're beginning to refine some of the choices, and certainly by the time that the anniversary of Columbus, 1992, comes around, I feel certain that we will have a course charted for human expansion outward.

I think at this particular opportunity, it's the 20th anniversary, it would be very helpful if we could get some refining of just what the time span might be by our leadership, so that in the interim we could begin to more clearly focus some of the short-term objectives that we have toward the fulfillment of human expansion outward.

MR. GARRETT: Okay, we're ready for Q&A. Let's start here with John Holliman. Please, John -- please everyone give your name and affiliation before you start.

Q John Holliman, Cable News Network. A question for all three of you, if I can. What is the best thing and the worst thing that has happened to the United States space program in the 20 years since the three of you went to the moon? Maybe Mr. Armstrong first.

MR. ARMSTRONG: Well, it's not something I focus on. I don't focus on bests and worsts and firsts and superlatives. There's been a lot of good things happen and history will judge their importance. I'm not capable of doing that.

MR. COLLINS: Well, I think clearly the worst thing in my mind was the explosion of the Challenger. The best thing, probably, the grand tour of the planets which is about to culminate this August in the flight by Uranus.

MR. ALDRIN: Well, I certainly feel the best achievement, the best part was the achievement of Apollo and the continuing to expand on that while we had the wherewithal. And the worst was the gradual demise of that.

MR. COLLINS: Let me interject -- I understood your question to be

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since the end of Apollo onward --

MR. ALDRIN: I understood it that way too. (Laughter.)

MR. GARRETT: Okay. Answers don't always -- (laughs).

Okay. Yes?

Q Bill Heinz (sp) with the Chicago Sun Times.

MR. GARRETT: Bill, please wait for the mike. We have other people that are --

Q All right. Bill Heinz of the Chicago Sun Times. How are you? For Neil Armstrong. In Houston on the 5th of July, I believe it was, of 1969, I asked you if you had thought of any memorable words to say as you landed on the moon. You said you had not. Then, on the 20th when you did land, you gave us some very memorable words indeed. And I'm wondering when it came to you exactly what would be the appropriate thing to say?

MR. ARMSTRONG: You're talking, I'm sure, about "Hello, Houston. Tranquility Base here. The Eagle has landed"? (Laughter.) Well, that was --

Q No, no, -- no --

MR. ARMSTRONG: -- I thought that was kind of self-evident at the time -- (laughter).

Q No, that's not the one. I'm sorry, Neil. What I was speaking of was "a small step for a man; giant leap for mankind."

MR. ARMSTRONG: Well, it was -- it was a statement that was natural in the sense of the time. It was a step and a step, and I thought about it really after we got there.

Q Okay, yeah.

MR. ARMSTRONG: Yes.

MR. GARRETT: Kathy Sawyer.

Q Kathy Sawyer (sp) from the Washington Post. I'd like to hear from each one of you what, if you were on President Bush's advisory staff, what would you recommend he do next? What course would you chart to promote the human expansion into space? Would you go to the moon first, and then Mars? The other way around, or some different scenario?

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MR. ARMSTRONG: Well, the advisory council, which has recently been re-established under the current administration, I suppose has that charge, and I don't know how they're attacking it. I would recommend that they not really spend a lot of time reviewing current programs, but they take a longer look so that they can put the policies in place that will establish the programs of the '90s and the next century.

MR. COLLINS: I'm very much pro-Mars. I think that this country

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should establish now a long-range goal with no firm timetable, but a long-range goal of exploring and setting up a colony on Mars, and invite participation by other nations, and that we -- that is the one goal that to me, I think, would have a unifying and perhaps even an electrifying effect upon NASA, this country, our space program and the space business around the globe.

I'd certainly like to see a gradual evolutionary program expanding outward that includes whatever is necessary moving toward permanent presence in the solar system. And I contrast that with going to the moon several times and then essentially pulling back from that for a long period of time. Who knows exactly when we'll get back to the moon? I just don't think that that sort of thing ought to be done to Mars, that we go there on several expeditionary adventures and then not follow up on it. I'd like to see an evolutionary program, and I would see that more than likely involving both lunar exploitation and a movement outward toward Mars and the commonality of the equipment that's needed to carry those out.

MR. GARRETT: John Bisney (sp)?

Q John Bisney with United Stations Radio -- I guess, for Neil or Buzz. A book that came out a couple of years ago about the building of the LM described a scene of some concern in the MOCR (ph) a few minutes after you landed -- some gauges showing apparently a frozen slug of fuel in one of the descent-stage fuel lines close to a valve. And they were quite concerned about it to the point that the Grumman engineering manager, John Corson, was recommending you ought to just lift off right away.

I assume that you two have become aware of this in the intervening years. Do you talk about that when you found out -- how much danger do you think you were really in? Should you have lifted off right away?

MR. ARMSTRONG: Well, I do recall the incident but I don't recall my reaction at the time. It was something that was being monitored and I do not recall any enthusiasm on our part for rapid liftoff. (Laughter.)

MR. ALDRIN: I don't really recall being made aware of that particular situation. And it wouldn't have been in real time. It would have been after the fact, and there wasn't much we could do about it since we weren't the repositories of the most up-to-date information. The people in Mission Control certainly were.

Q I'm Paul Hoferstein (sp) here, with USA Today. And a question for Neil or for Buzz. Gentlemen, scientists tell us

that the footprints that you left on the moon could be there for hundreds, perhaps even thousands, of years from now. Could you give us some of your thoughts on that sense of permanence that you've established up there? Do you ever think about that at all?

MR. ARMSTRONG: No, I haven't. I kind of hope that somebody goes up there one of these days and cleans them up. (Laughter.)

Q (Inaudible) -- with Netherlands Television. I have a question first of all for Mr. Aldrin. In the last minutes before landing on the moon, you had communication with Steve Bales in mission control about alarm signals on your computer screen, 1201, 1202, 1204. Could you describe exactly what happened and what your reaction was?

And a question for Mr. Armstrong: Did you realize, Mr. Armstrong, that after you shut off your engines after landing on the moon you had only between 7 and 17 seconds of fuel left?

MR. ARMSTRONG: First, we were communicating with Charlie Duke, some of you will remember that, but he was communicating with Steve Bales. And with regard -- I can let Buzz talk about the -- his understanding of the alarms, because he was spending a lot of his attention on that at the time, while I was -- I had a certain interest in the fuel gauge.

The fuel gauge is not very accurate. The gauge itself and the gaging system was not accurate. We had a low level sensor port, which told us that the fluid level got down to a certain part, and that was kind of a finite point in time -- of fuel left. That didn't really particularly worry me at that point in time. We were used to flying the lunar landing training vehicle with very low amounts of fuel, very few number of seconds left before touchdown. And at that point, we were at a low enough altitude that probably if we'd had fuel exhaustion, the landing gear was capable of the fall that we would have had into the -- and we would have kept attitude (?) control, so it wasn't a thing that really concerned me.

MR. ALDRIN: If you remember, we -- in the early part of power descent, we're face down. And I might add that we also -- because we were engaged in this first rather audacious maneuver, power descent, for the first time,

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we felt that, you know, things could possibly not happen exactly the way things might want them to, so we wanted everything in our favor. And one of those was to be sure that our way home was assured, and that meant being able to catch Mike wherever he might be. And the radar was a little bit more accurate than our eyeballs were. So we felt it only natural to leave the rendezvous radar on, and it was reflected in the checklist.

As we were face down, the landing radar was not receiving any information. When we (got ?) around, shortly thereafter, at 30,000, 25,000 feet, I'm not sure exactly when, the computer popped out some of these program alarms, which light a caution warning, blank the diskey display, and give a code as to what it is.

And I think it caught both of us unawares. It diverted our attention from whatever else we were doing, and primarily at that point, I was doing a sequential scan of in the cockpit and relaying to Neil what the computer was displaying so that he was able to begin to look and adjust to the scene he was seeing out the window right away.

So, when things like that happen out of the ordinary, we will get diverted -- our attention. But fortunately, some of the simulation prior to flight had indicated that perhaps some of the mission controllers needed a bit more information as to what some of those computer overloads, or whatever the alarms might be, and they had done some homework on that. I was not aware that that had happened or that something similar to that had happened in a simulation. I think the backup LM pilot was flying with Neil at the time.

Essentially, it was a diversion of attention, and it involved things that were happening that were beyond our ability to fully comprehend. But fortunately, because all of that information was being sent back down to the ground, they knew the status of things and could make a value judgment, and we certainly had every reason to have high confidence in them.

So it continued to be a bit of a nuisance from that point on, even though it changed from one alarm to the other. I think, had the first program alarm occurred at 500 feet, where Neil took over manually, it might have caused considerably more concern and diversion of attention. I might also indicate

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that we were at a significant disadvantage in comparison to succeeding flights in terms of the autopilot that was available to us. It was significantly improved later on in the ability to give this control of the space craft back to the computer so that it could null out the motion over the surface to zero, or as best it could, and then it could -- we could control the rate of descent on down. But once Neil took over, it was up to him to, through changing attitude control, to null out those translation rates. And that's a significant increase in the talent level needed, and he was certainly up to it.

MR. GARRETT: Okay, Harry?

Q Harry Rosenthal, the Associated Press. The three of you became heroes at a time when the United States was very short of heroes and was looking for some. And yet, you, Mr. Armstrong, more than the other two, but all three of you sort of disappeared off the face of the Earth and you didn't reappear until you were on the Challenger Commission. Why did you retreat so much when NASA probably could have used your celebrity to keep the space program going?

MR. ARMSTRONG: Gosh, I didn't know that I did that. (Light laughter.) I was here in Washington for a time running the aeronautics program of NASA. And then I went back to the university, and they -- the folks at the university would be very surprised that they're considered to be "off the face of the Earth." But I thought that was -- that was a worthwhile thing for me to be doing, and I'm glad I did.

Q (Off mike) -- you stayed out of the public eye when you could have been -- the other two wrote books. You didn't write -- you haven't written a book of memoirs; publicity appearances that could have helped, you weren't part of. That's the kind of thing I mean.

MR. ARMSTRONG: Well, I was pleased doing the things I was doing. I guess that's the sum and substance of it.

MR. GARRETT: This gentleman here.

Q Alan Silverman (sp?) from Voice of America for Mr. Armstrong. Twenty years ago, the whole world was with you when you took that one small step. Today, many people seem to get a rap of being blase about the space program -- maybe I should say many of our editors have become

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become blase about the space program. What would you say would be needed or what should be done to get people more excited about human endeavors in space?

MR. ARMSTRONG: Well, it's human nature to adapt very quickly to new situations. We sort of are amazed by, enthralled by, then bored by, and eventually forget some new things usually within one revolution of the Earth around the sun. That's the way humans are. And so it's of great surprise to me that so many people remember something that happened 20 years ago. (Laughs.)

Doesn't surprise me.

Q But would you say there's anything that could or should be done? Any leadership or any direction you could go in that would at least spark that interest?

MR. ARMSTRONG: Well, I'm sure the editors will all be interested in anything new. In your business news is what's happening today.

Q Patrick O'Neal (sp?) from Network 10 Australia. If you had a hit list, Mr. Aldrin, people responsible for playing down, and making the space program unpopular, who would be on that hit list?

(Laughter.) (Pause.)

MR. ALDRIN: I certainly haven't approached the subject by trying to look for leaders who've been against us. I've more been looking for those that I can rally around behind or to follow me and my thoughts. I don't know. I think that's a little unfair to ask us to point a finger at leaders and others.

Q Do you think leadership is, in fact, lacking from a political level?

MR. ALDRIN: Well, I think certainly what set us on our course for Apollo to go to the moon has been characterized by most everybody as strong leadership and clarity of purpose, in response to a rather unique international and national situation. And I think all of us who'd like to see continued activities in human exploration are scratching our heads and trying to wonder how can we recreate something of that nature, so that we can maintain, or regain, or attain what I think we'd all like to see, and that's leadership in the community of nations in the world

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in what this nation is able to do. We all feel that we're up to that, and it certainly takes more than just a little bit of interest here and there. It takes the interest of the people as evidenced to the Congress that it wants to stay doing what they're doing. And, of course, they have the purse strings, but they're not going to chart a course without the leadership of the Executive Branch.

MR. GARRETT: This gentleman here in the white coat --

Q Les Dore (ph), Final Frontier Magazine. Today a lot of people, or a number of people anyway, hold up the Apollo program as a negative in the sense that, in thinking about going to Mars, we're urged to avoid an Apollo-type spectacular. And I'm wondering if any of you, with the benefit of 20 years of hindsight, think that we should have done anything differently from the way we did it, and if so, what effect do you think it would have on the American space program today?

MR. ARMSTRONG: Well, I've heard those sorts of comments by others before. And there may be merit and truth to those views. Nevertheless, I am personally delighted as an individual and am delighted for my colleagues and our country that, even if it was a bad idea, we did it. (Laughter.)

MR. GARRETT: (Off mike.)

Q Frank Miles, Independent Television News, London. Since one of the main purposes of the Apollo program as a whole was to gather moon rock, and during the course of the six landings, 850 pounds, some seven and a half hundredweights, was gathered. And I gather that in excess of 90 percent of that still lies untouched in a vault in Texas. Would you like to comment, Mr. Armstrong or Dr. Aldrin?

MR. ARMSTRONG: Yeah, I think that was superb idea. It may be that we don't have the opportunity to return to the moon in the next decade or two for whatever reasons. During that time period, new analytical techniques and experimental devices will be invented which will allow far more understanding of those samples than we have available to us with our current equipment and techniques. So the fact that we're saving large amounts of that rock for future use, I think, is perceptive and wise.

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Now, when we hear that people aren't getting enough samples to do what they want to do, why, then one has to balance those two sides. But it's good.

MR. ALDRIN: Frank, with all due respect, I really don't think we'd have rallied behind the program if the objective of Apollo was to bring back moon rocks. I think there may have been other ways to do that. It was a response to a challenge, and in a sense, it was sort of byproduct. And I think the purpose was to demonstrate a capability and hopefully sustain that, and then along with that, accomplish as much information gathering and increase in knowledge and scientific return as possible. I think if any of those rocks that have not been looked at yet would contain clues as to whether there might be ice or water at the poles, we'd just jump at the chance to look at them and find out. I think they have a reasonably good idea of what the content is of what they haven't looked at yet.

Q (Off-mike.)

MR. GARRETT: Wait -- wait for the mike. We have people all over the country and the world listening to this. They can't hear the questions if you don't wait for the mike, please.

Q I'm Eda Molinari (sp), Familia Cristiani, Italy. How did your great experience change your inner life, to you, the three of you?

MR. ARMSTRONG: Well, before 1969, the press conferences were much smaller -- (laughter).

MR. GARRETT: Okay, let's --

Q Dick Juliano (sp) from AP Radio. For Mike Collins and Buzz Aldrin: It's estimated that it costs as much as $300 million to launch a space shuttle, and it could cost $30 billion to build the space station. That money could build a lot of houses here in the United States and feed a lot of hungry children. What would you say to Americans to justify the resources that go into space, as opposed to being spent here at home?

MR. ALDRIN: Well, I'd look at the numbers. We're putting less than 1 percent of our budget into the space program. I certainly think it's well worth that and more. We could carry out, I think, a very credible, expansive program for less than 2 percent of our budget. I don't really believe it's up to us to make value judgments as to

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exactly how that ought to be spent. I think we're expected to be firm advocates for the business that we were in for a good bit of our life, and I think we certainly are. We advocate expansion of space activities as much as possible.

MR. COLLINS: You know, I would just say that it's the responsibility of a government to take care of present needs and to anticipate future directions. And it seems to me that less than a penny on the federal dollar is not an excessive amount to look toward our future.

We're a nation of explorers. If we had pursued the logic that says you have to take money from the space program and put it into restoring the cities, we would never have ventured beyond Jamestown or Plymouth, because certainly they were squalid little settlements with problems that dwarf the problems of cities today, and we never would have gotten west beyond the Appalachian Mountains had we decided to render those little colonies perfect before we continued our exploration. And I think that the same thing is true today.

Q Tom Crystal (sp?) with Frontier Net. Certainly, the moon landing, the first moon landing was a major event of the 1960s. I'd like to get your thoughts on the effects of that event in terms of how it affected -- how we look at the world and just really the changes that it made in society. You know, the Apollo 11 landing was, in effect, a catalyst to a lot of other things, and I'd like to sort of get your perspective on this whole thing that you did out of this one event. For anyone.

MR. ARMSTRONG: I'm not sure I understand --

MR. ALDRIN: I think it would be a great understatement to say that it was the most significant event that happened in my life. Professionally, I felt that I was developing myself in an understanding of how one carries out activities through the orbital relationships. So I look back on my participation in Apollo, not only as a crewman, but also as one who had the opportunity to make some contributions in the techniques of how we carried that out. Certainly, it changed

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my image of myself because of the image that was changed throughout the world of me, and then the ability to -- perhaps trying to live up to that to your standards and to my standards was a most significant challenge.

I think that right now I'm very satisfied with my ability to project my talents to be very useful to the space program in terms of how we might carry out expeditions and evolutionary missions to Mars. I'm very satisfied with what I'm putting together in that area, and that's one of the creative, innovative analyses from the orbital standpoint as to how to do that in a really innovative way of getting to Mars.

Q Yes. I'm Linda Scott (sp) from CONUS Communications. Aside from the changes in your personal lives, what do you believe was your most important contribution to the manned space program?

MR. ARMSTRONG: I don't have any answer. I can't think of anything. (Laughter.)

MR. COLLINS: I'll think of one for him. He did his job very well. (Laughter.)

Q Tina Garner (sp), KTRK-TV, Houston. Any of you -- Mr. Armstrong or Mr. Aldrin -- remember from your training, particularly the Lunar Landing Training Vehicle, what rememberances do you have of that training session -- or those training sessions?

MR. ARMSTRONG: Well, I recall that very well, not just because I was involved in it at Houston, but because I had been involved with it far earlier. Even before there was a Lunar Module, we were looking at something that eventually became the LLRV, which later became -- in subsequent development, became the LLTV. So, I had been with it for a decade almost. And it was a wonderful device that was risky, and in fact, we lost a few of them along the way, difficult to manage, but yet,

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was an essential ingredient in our preparing to do the final descent to touchdown in the lunar module. And if we were going to have problems, I think it's very fortunate that we had them here in the lunar landing training vehicle where you had an ejection seat that could get you out of trouble rather than have them close by the surface of the moon.

Q Dan Billow (ph) with WESH-TV in Orlando. Would any of you recreate the few moments that -- during which you were entering the Apollo space craft on the morning of launch, and what do you remember of that, and do you remember the man who, I believe, was helping you into the spacecraft? I believe his name was Guenter Wendt.

MODERATOR: Neil?

MR. ARMSTRONG: Well, we had fortunately a glorious morning on that July Sunday morning. Guenter Wendt, often known as the "Pad Fuehrer," held his position with patience and perseverance. He had done so for many years, and I think only recently retired from that job after holding the position for some decades. He was always reliable. And he was always a great source of amusement.

MR. ALDRIN: By circumstance I was treated to a particularly memorable, pleasurable moment while the pad leaders and other people inserting, or installing, Mike and Neil into the spacecraft, I had what seemed like about 20 minutes waiting by myself, up at some level two-thirds of the way up or whatever it was, that I had to just walk around briefly and with my litte air-conditioning unit pumping life support breathing into me rather coolly. I could watch the sun rise and watch the waves coming in moments before this giant Saturn was going to burst into action and propel off.

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And it was a most memorable moment, looking out and seeing some evidence of the millions of people and yet not any precise indication that there were that many people paying attention to what we were doing at that very moment, and here I was just wandering around. They didn't know that I was wandering around the upper portions of this, looking out at them.

It's a bit similar to the brief realization that went through my mind without crystallizing itself into words at the time when we were on the surface, shortly after both of us were out on the surface, of how unique, how ironic it is that two people are so far away from home and yet, at the same time, more people are paying attention to what it is we're doing. That's generally not the case. The further away from home you get, the less people care about you're doing.

Q Twenty years ago --

MR. GARRETT: Wait for the -- this young lady here, Jim.

Q Muriel Pearson (sp), CBS News. This is a question for all of you. What was the moment of greatest personal fear for each of you during the flight -- besides knowing that you'd have to face all of us when you got back? (Laughter.)

MR. ARMSTRONG: Well --

MR. ALDRIN: Compared to that, all the rest are sort of pale and insignificant. (Laughter.)

MR. ARMSTRONG: I would just answer that I think probably the thing you fear most is the unexpected. We were -- used to spend a lot of time practicing our responses to various kinds of failures and abnormal circumstances. And I think we felt fairly comfortable with most of the kinds of things that might happen. The ones you worry about are the ones you didn't foresee and didn't properly prepared yourself for.

MR. COLLINS: Well, I would say, you know, flying to the moon is a long and delicate daisy chain of events; any link in the chain, if it gets severed, ruins the whole thing. The one that -- it wasn't fear, but it was mistrust. The one that I mistrusted the most was the rendevouz part. That was the thing that was on my mind primarily was bringing these two vehicles -- bringing this ungainly looking critter back up from the surface of the moon succesfully.

MR. GARRETT: Okay. Let's go. Can we get the mike over to John Getter (ph) back there?

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Q John Getter (sp?), KHOU-TV. Gentlemen, I think what we're all struggling to try to explain here -- maybe you can help us with -- is an understanding of what was different then from what is now that allowed the whole world to get behind such a project for a short time? Is it simply that the Russians aren't as bad a guys as they used to be, that we have done this, that we don't have a dynamic president in the White House? Is it some combination? Is it just the times? What? And I'd be curious to hear from all of you on that.

MR. ARMSTRONG: It, of course, is a question of interest to many people; difficult to categorize. I'm not sure that I am better able than any one of you to respond to that question. We all search for ways to make the right decisions and encourage the enthusiasm and support of the public at large for those right decisions. And perhaps there are some other thoughts that might contribute to your answer.

MR. ALDRIN: I think we all sense what you're trying to point at. Those years that were ripe for a commitment of that nature in the '60s were ones of international uncertainty and perhaps a bit of a questioning of where our technical competence was relative to some of the unknowns, exactly what the Soviets were able to do then.

A lot of that certainly has changed now, but I think we all sense that there's an experiential increasing of technology and capabilities to do things, and certainly space is a challenge to go out there. And I think just naturally we would like to expect responses to come to that challenge of the frontier, the cutting edge of technology demonstrations, to respond with a significant -- of growing series of achievements.

That's a difficult thing to respond to, because the capability technically does exist to do a lot of things, but also their price tag begins to go up rather significantly, and that tends to put things a little bit -- space them out a little. But once

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establishing an expectation of interesting, significant achievements of technology in space, I think we'd all just naturally like to see them continuing on in some fashion.

Q Mr. Collins, the same question.

MR. COLLINS: Well, the world in the '80s is a lot more complicated than the world of the '60s, at least in this country. President Kennedy said that we were going to land a man on the moon and return him safely to earth -- that was his goal. President Bush, whom I consider to be a president as dynamic as Kennedy, I think, in today's climate, would have to say, "I think we ought to dedicate ourselves to the goal of perhaps considering appointing a commission, after due deliberation with the Congress -- (laughter) -- of investigating the feasibility of certain long-range goals for the space program, perhaps even including a mission to Mars" -- (laughter). It's just, you know, it's just a sign of the times. The times are a lot more complicated today, plus there were a couple of precipitating events that caused Apollo to be launched that do not exist today.

Q Max Gomez from KYW-TV in Philadelphia. Let me try to put a slightly different spin on that same question, and see if we have any better luck. You've all expressed some significant support for an expanded role of America and space exploration and a permanent place in space. The public, I think the problem is, they don't understand exactly why is it important that we continue to explore. And is that important for America? Is it important for perhaps mankind in general to continue to explore? And then, just as importantly, because it's part of the argument that keeps going back and forth even within NASA, does man need to be a part of that exploration?

MR. ARMSTRONG: A long question. Certainly, I don't view manned flights and robotic or unmanned flights as being adversarial in any way. That Magellan probe to the surface of Venus has gone places that I don't think any of my

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colleagues or myself want to go. And similarly, with Galileo, that will go places where man will never go. I have great difficulty in visualizing man going those places. There are places are limited to robotics. They're the only thing that can do the job. On the other hand, at this juncture, their ability to analyze unforseen events is limited, and consequently, man can be amused and amazed and a robot can be neither.

But I think it's a good question and a fair question and, probably, the question and it is -- you know, what is it about exploration, and I think it's just inherent in the human condition. I don't know whether we have an exploration gene or whether it's something that we acquire. I think we have a curiousity gene and that's very, very close to exploration, but people have always gone where they've been able to go. Some people have. Some tribes have been happy to stay in the rain forest, but if you go back to the littoral nations of Western Europe, they've always had an obsession to go out to the far corners of the globe and it's just inherent in us and I think particularly in this country. We are a nation of explorers. I mean, we've started on the East Coast, we went to the West Coast and then vertically. I mean, starting with the Wright brothers, Yeager through the sound barrier, Armstrong and Aldrin on the moon, it's in our tradition, it's in our culture, it's a fundamental thing to want to go, to touch, to see, to smell, to learn and that I think will continue in the future.

Q Is it important to keep doing it?

MR. COLLINS: Yes. Hell, yes, it is. Part of the human condition.

MR. ALDRIN: In the last year in doing some research with my co-author for "Men from Earth," I've been able to reflect a lot more and to verify in my own mind just how much of a continued space race was going on. And even though glasnost has not opened up confirmation of exactly what the true nature of the Soviet lunar landing program was, it certainly seems conceivable to me that something akin to a Challenger could have opened the door to Leonov and Sevastyanov being known as the first two individuals to be on the moon, and I think that our space program, had that occurred, would have had a bit more continuity to it, between then and now, in trying to continue to catch up. I think the

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international situation and a position of leadership, as we view nations beginning to catch up and, in some ways, surpass us in their abilities and space achievements. Certainly, the French, the Japanese and the Soviets are moving into capabilities for manned exploration in the future.

And I don't think we can be followers as long as it appears now to take to put something together to be responsive. The fact that we could respond so rapidly, in an eight-year period, from a challenge to do something that was very nebulously understood, to be able to achieve it -- it seems to -- projections now seem to take a good bit longer, so catching up would be more difficult. So, I think leadership is one where we need to be on the cutting edge to be able to do what we choose we do in the future.

MR. GARRETT: Okay, we're going to take a question I understand we have from our overflow auditorium down on the fifth floor. If you will state your question, name and affiliation, please.

Q Yes, Chris Rauche with Scripps League Newspapers. A question to all three of you. If you could relive one moment of the mission, which moment would you pick and a brief reason why.

MR. ARMSTRONG: I didn't understand it.

Q: If you could pick one moment of the Apollo XI mission to relive now, which moment would you pick and a brief reason why.

MR. ARMSTRONG: I guess I would pick a moment when I was looking out the window and looking at a full earth from a long distance.

MR. ALDRIN: I'm most aware of my observational limitations to see exactly what's happening in rapid-pace events. And I'd like to replay again by being there the last 20 seconds, 10 seconds before touchdown and 10 seconds after. I'd just like to run through that again.

MR. COLLINS: I remember most vividly the picture of the lunar horizon and the LM ascent stage in the foreground with these two guys in it, and then the earth popping up at that instant so you have all three lined up. You've got three billion people over there, two people here, and that's it. (Laughter.) That's what I remember.

MR. ALDRIN: And the one behind the camera that had the foresight to record it on film.

MR. GARRETT: I'd say we'll have one more question from down below. Is there a question from the fifth floor?
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Q My name is Jeff Nesmith (?). I'm with the Cox Newspapers. Mr. Armstrong, your experiences have excited millions of people, yet it seems like you're kind of bored and even a little resentful, sometimes, of the excitement other people feel about what you have experienced. Why do you suppose that's true? Why do you think you leave that impression with people?

MR. ARMSTRONG: Well, I can't put myself in your eyes. That's not the way I feel, but if that's your perception, I'll ask you to explain it to me.

MR. GARRETT: Okay, Howard?

Q Howard Benedict, Associated Press. There were some reports that the original flight plan called for Buzz to be the first man to get out and walk on the moon, and Mike Collins, in his book, "Carrying the Fire," mentions or hints at dispute between Neil and Buzz over this. In fact, he mentions a particularly stormy night when you, over a bottle of scotch, settled some of your disputes. How did it -- was there a dispute between you two over who should be the first on the moon? And how was that selection made? For Neil and Buzz.

MR. ARMSTRONG: Well, both of these gentlemen have written on that subject and I haven't, so I'll just tell you that, although they may or may not have known what my feelings, in fact, were at the time, that I had zero input, no input whatever, into that decision.

Q Peter Ford, WRC-TV in Washington. We'd like to get some fresh voice tape for a voiceover for all that video you sent back from the moon. I wonder if the three of you could each recall, or give a brief commentary and your response to the feelings you had: Mike, when you first came up over the moon into lunar orbit; Buzz, when you were going into that 20 seconds you just described you'd like to relive; and Neil, when you stepped down on the moon on the surface.

MR. COLLINS: I thought I just did. (Laughter.)

Q Can you describe when you came up over there -- when you first came in there, when you first came into lunar orbit and you realized you were really close to making history.

MR. COLLINS: I don't know. I would talk separately about that, I guess.

Q Then Buzz, could you recall what you saw and what you felt in that 20 seconds or in the 10 seconds you said you would like to relive?
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MR. ALDRIN: I think the reason I selected those is because there were events happening rather rapidly, and I could tell you that my feelings were "gee, golly, fantastic, is this really happening;" but no, I knew I was there. I was trying the best to be as receiving a human as I could. Why? To savor the moment so I could tell you about it afterwards? No, to respond if needed to some requirement on my part to be responsive. In general, I think when things were happening in a hurry, that was our feeling, our sense.

MR. ARMSTRONG: I'm not certain I understand the question, but I'll answer anyway. (Laughs.) The touchdown itself from my point of view was a real high in terms of elation. Not so much for the instant, but because it marked the achievement that a third of a million people had been working for a decade to accomplish. And it was a feeling of we -- a third of a million people -- managed it.

Q Vincent Deljulaise (ph) from UPI. Had America kept going to the moon over the last 20 years, would we have seen, in your gentlemens' opinions, manned colonies there, perhaps an observatory of some type, and what is the feasibility of establishing a moon-based telescope and perhaps colonies or even cities on the moon?

MR. ARMSTRONG: That's a largely hypothetical kind of question, but had we had a continuing lunar program over the subsequent two decades, I'm sure that we would have devised habitable modules that were enjoyable, and processes for developing lunar resources, extracting oxygen from the rocks and hopefully finding hydrogen which is the -- perhaps the most missing element -- hydrogen and carbon are very rare up there, and would have developed a lot of science in that time period.

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Would it have cost a lot? Probably. Maybe we weren't aware of it, or I wasn't at the time, but I think the signs were clear to those in management that, by the time we reached there, there was an ending to the Apollo program somewhere downstream in terms of the number of landings that we could accomplish, and I guess an option is to stretch those out over a period of time, but that generally costs a good bit more.

Hindsight or retrospect is always a -- you're treated to be more brilliant in looking back on it, but certainly, I think we did the best at the time with what we had left. We flew Skylab, a remarkable achievement and a great opportunity. I think it was overshadowed by the fact that we continued on landings and it was a bit of a letdown, but to have built two of those and flown one, and then allowed it to burn up; when we now look at the difficulties we have gathering together the funding, the support for something of a smaller volume, maybe less achievement, we certainly shouldn't have let that one come down. We should have flown the second one, and I think the course of the space program would have changed enormously had we done that. I'm sure that we would have liked to have continued on and established a particular base, including a telescope on the far side, and that certainly is one of the premium objectives that a science return to the moon will have as one of its goals.

Q Mr. Collins, do you have an opinion on that?

MR. COLLINS: On the moon, no. No, I'm Mars. (Laughter.)

Q Elisa Teichner (sp) from REI, Italian television. A question to Mr. Aldrin and to the other two gentlemen, also, regarding more the future than the past. What do you think that the 20-year-olds of today know about your expedition, and what do you think the impact of your great enterprise was on the new generation, and do they know about it? How do they feel about it?

MR. ALDRIN: Well, I think the first person to begin to project a difference in those that grew up since that time, that I can recall at least chatting with, was Buckminster Fuller.

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He had a definite sense that those who grew up since Apollo looked at life differently than those of us that perhaps experienced portions of the Depression. There are not the same limits to those who grow up seeing that one could achieve such an audacious thing as land on the moon when you look right now and you're nowhere near doing that. That is a tremendous achievement back in the past. And you just feel naturally that you can recreate that. So I think that there's a sense of a potential that is maybe not being exercised that may exist in those that have grown up since then.

MR. COLLINS: Well, I was -- I don't know what to say to 20-year olds. Mostly, they have more answers than we have. But, you know, I would try to say that it is possible to pick a goal, to work toward it, to work very hard toward it, and to be successful in it, even though that goal is very complicated and all-consuming, and that whatever young people choose to do with their lives, they can in some ways use Project Apollo as a model for how to organize themselves into pursuing their own goals and doing them well.

Q For Neil or Buzz -- in subsequent flights, several of the moonwalkers exercised points of personal curiosity in this unique environment. And I don't recall your reporting such activities. Was there any point of personal -- such as hitting a golf ball or dropping a hammer and a feather together in the vacuum? Was there any personal point of curiosity, such as that, that you either pursued or wanted to and didn't get a chance to?

MR. ALDRIN: I seem to recall some people saying they thought maybe I was a little reckless in prancing around rather early in being on the moon. That was well thought out and planned and, in retrospect, when I got back I expected people to have gotten the calipers out and measured precisely the rate of motion and trying to relate that to mobility. But instead, they were satisfied with a subjective response of a human saying that it was much easier to move around than we thought.

I just think we didn't have the luxury, during the time we had, to be able to follow through on something that we might have decided

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of a personal nature, nor did we beforehand have the freedom perhaps to entertain taking advantage of time for personal activities. I think the time that humans spent on the moon is precious, and I -- as neat as it might be to do some interesting, neat little facetious tricks to lighten the moment, I just had a responsibility to do the most with the time that we had.

MR. ARMSTRONG: I can't really add anything. I didn't have any ideas that were any better than those that were presented us for our (EVA/EBA?) work, so we were delighted to try to get those done.

Q Greg Linebaugh (sp) Space Explorer Magazine. Would you guys tell us some of your career plans in the next five years until you're subjected to the 25th anniversary press conference?

MR. ARMSTRONG: Career plans? Was that -- career plans?

MR. GARRETT: I think that's what it was.

Q What you're going to do in the next five years.

MR. ARMSTRONG: Keep doing what we're doing, try to do it better -- (chuckles).

MR. COLLINS: I'm trying to -- I'm trying to earn my living as a writer. I'm writing a book on Mars. I intend to continue writing. I don't know what after the Mars book, but I'll think of something.

MR. ALDRIN: About five years ago, I was exploring some creative ways of continuous cycling trips between Earth and Mars, and then I turned -- or Earth and the Moon -- and then I turned that attention onto Mars, and it now seems to be gathering a bit of favor within the exploration office. That is a spaceship that continues to move around the sun, and swings by Mars and Earth, and Mars and Earth, and we can get on it and off it as it swings by. And so I want to continue to pursue those activities of individual contribution with whoever will listen.

I just finished writing a book. I need a lot of help, rather than Mike, who can -- seems to be able to do this by himself. And I had envisioned being able to deal a little bit more with the lessons of Apollo as it may apply directly to what our choices are for the future, but it didn't get done. So I think that there's some unfinished business in terms of thinking of recording some things within the next five years. We may not get the commitment to go off to Mars this year, but we may get it by '92 or by '94 or so. I'm going to be in there pushing and pulling, see if I can't take the benefit of my experience in some way. Even though the technical parts of it are not that financially rewarding, if I can tell a

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story to someone else, why, maybe there's an ethical honorarium that can be -- come my way that can compensate maybe for not the direct return for what I feel is a direct creative contribution.

MR. GARRETT: Okay, these gentlemen have very busy schedules. We're going to take two more questions and then wrap up this session. Go ahead, right here.

Q Greg Barr (sp) with Space Daily. Twenty years ago, it seemed that it was very natural and appropriate for a government agency to take on the Apollo project and accomplish it. Today, it seems to be problematic in terms of cost and so on, whether we continue to do missions of that scale. Would you say that -- well, for any of you or all of you -- would you stand behind recommendations that more stress or emphasis should be put on getting private entrepreneurs and the commercial sector involved

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in a more rapid fashion than is being accomplished today.

MR. ARMSTRONG: Well, of course, that concept has been encouraged in recent years. I think predominantly the problem is that the projects are quite massive and it's very difficult to do little projects that are within the reach of typical industrial concerns. And consequently, it takes some united effort, and because many of the activities are regulated by the governments involved, why, the government is to some extent a participant in any case.

Q Annie Grow (?), with the Orlando Sentinel. You all have been quite circumspect and diplomatic thus far in talking about the likelihood for significant funding for all the ventures that you are advocating so strongly. Do any of you in fairly frank terms here in diplomatic Washington want to talk about what you think is the likelihood in the next four years of the Bush administration of getting the kind of money you want?

MR. ARMSTRONG: I have no idea.

MR. ALDRIN: I think all we can do is hope.

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END

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WALT WHITMAN, "Nature and Democracy-Morality," *Specimen Days and Collect,* 1882.

107 I believe in Democracy because it releases the energies of every human being.

WOODROW WILSON, in a speech in New York City, September 4, 1912.

108 The beauty of a democracy is that you never can tell when a youngster is born what he is going to do with himself, and that no matter how humbly he is born, no matter where he is born, no matter what circumstances hamper him at the outset, he has got a chance to master the minds and lead the imaginations of the whole country.

WOODROW WILSON, in a speech to the Chamber of Commerce in Columbus, Ohio, December 10, 1915.

109 I am all kinds of a democrat, so far as I can discover—but the root of the whole business is this, that I believe in the patriotism and energy and initiative of the average man.

WOODROW WILSON, in a speech in Philadelphia, June 29, 1916.

67. DESTINY

See also FATE

1 Destiny is not a matter of chance, it is a matter of choice; it is not a thing to be waited for, it is a thing to be achieved.

WILLIAM JENNINGS BRYAN, in a speech in Washington, D.C., February 22, 1899.

2 Alas! that one is born in blight,
Victim of perpetual slight, . . .
And another is born
To make the sun forgotten.

RALPH WALDO EMERSON, "Destiny," in *Poems,* 1847.

3 The world is mathematical, and has no casualty, in all its vast and flowing curve. Success has no more eccentricity than the gingham and muslin we weave in our mills.

RALPH WALDO EMERSON, "Power," *The Conduct of Life,* 1860.

4 There is no chance, and no anarchy, in the universe. All is system and gradation. Every god is there sitting in his sphere.

RALPH WALDO EMERSON, "Illusions," *The Conduct of Life,* 1860.

5 The thirst for adventure is the vent which Destiny offers; a war, a crusade, a gold mine, a new country, speak to the imagination and offer swing and play to the confined powers.

RALPH WALDO EMERSON, "Boston," *Natural History of Intellect,* 1893.

6 This nation, this generation, in this hour has man's first chance to build a Great Society, a place where the meaning of man's life matches the marvels of man's labor.

LYNDON B. JOHNSON, in his acceptance speech at the Democratic Party National Convention, August, 1964.

7 Every man meets his Waterloo at last.

WENDELL PHILLIPS, in a speech on November 1, 1859.

8 There is a mysterious cycle in human events. To some generations much is given. Of others much is expected. This generation of Americans has a rendezvous with destiny.

FRANKLIN D. ROOSEVELT, in his acceptance speech at the Democratic Party National Convention, June, 1936.

9 The longest day must have its close—the gloomiest night will wear on to a morning. An eternal, inexorable lapse of moments is ever hurrying the day of the evil to an eternal night, and the night of the just to an eternal day.

HARRIET BEECHER STOWE, *Uncle Tom's Cabin,* 1852.

10 This day we fashion Destiny, our web of Fate we spin.

JOHN GREENLEAF WHITTIER, "The Crisis," 1848.

Bush Family on 7/20/69

ages

Pres + First Lady - home 5161 Palisades Lane, NW
don't remember watching
might have met Frank Borman (505-524-4050)

30 Doro - doesn't remember watching

35 Neil - remembers watching, doesn't remember where he was, maybe K-Port or Canada

33 Marvin - on a 3 week trip out west in a Winnebago, pulled over + watched in a motel near Colorado Springs.

36 Jeb - in Mexico teaching - he was in a town with no electricity but the people still heard about it. He remembers how it enhanced the image of the US in the eyes of the Mexicans. They were proud of the US accomplishments.

43 George - Valdosta, Ga. doesn't remember watching
in the Air Force

6/26/89

GALILEO

The past is always prologue, and never more so than in the exciting march of science in space. Just two months ago we sent the Magellan spacecraft on a trip to Venus, to map its red-hot surface with a radar that can look through the incredibly thick clouds that cover the planet. Now, this October, we will really extend our outward exploratory reach. The Shuttle will launch NASA's vastly sophisticated three-ton Galileo spacecraft on a carom course through the solar system, using the gravity of Earth and Venus to speed Galileo on its six-year trip to Jupiter. There Galileo will drop a probe from orbit toward the surface to measure for the first time the composition and dynamics of the Jovian atmosphere. Galileo will then orbit the giant gas planet for two years to study its energetic behavior and to survey its moons. Some of these are the size and complexity of small planets, with actual atmospheres of their own and one even has volcanoes on its surface. Jupiter and its moons and its ring and its magnetic field and its hydrogen-helium atmosphere and its mysterious sources of internal energy remain a scientific target of absolutely first-class importance today, nearly 400 years after Galileo first saw the four large satellites move brightly across the face of the planet. By 1997, after completion of this eight-year odyssey, we will have gotten from the study of Jupiter solid answers to some fundamental questions about our solar system--about its history, its evolution, and even its future.

6/26/89

HUBBLE SPACE TELESCOPE

From the beginning of human consciousness, the eyes of man have turned upward to the sky and toward the stars with wonder and curiosity and awe. Next spring we will extend the reach of the eyes of man outward in space nearly to the edge, and back in time nearly to the beginnings, of the universe. The Space Shuttle will launch the 13-ton Hubble Space Telescope into orbit around the Earth. From its place 300 miles up in space, above the interference of the Earth's atmosphere, and routinely revisited by the Shuttle for maintenance and improvement, the Hubble will be the first permanent space astronomical observatory serving the scientific interests of mankind. The size and quality of optics are extraordinary: they will multiply by seven the reach of the best earth-based telescopic instruments. The mirror is so smooth it is like an earth so perfectly round that its tallest mountain would be five inches high. It can point with the precision of pinpointing a dime 200 miles away. It will see objects and events 14 billion light years away--that's most of the way light could have come since the birth of the universe. Knowledge is strength; human civilization will be incomparably strengthened by the whole new class of knowledge, the whole new class of discoveries, that this great space observatory will begin to create next year. Perhaps we cannot travel these incredible distances, but now we can observe, first hand, the activities of our universe.

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$1.3 billion

US-CANADA MARKET

TOP 100 ALL-TIME FILM RENTAL CHAMPS

Following list updates VARIETY's annual compilation of the All-Time Rental Champion Films, which have returned the most film rentals to their distributors from release in the U.S. and Canada. (Film rentals are that portion of boxoffice ticket sale grosses remitted by exhibitors to the film's distributor.)

Complete alphabetical list of about 2,000 titles is displayed elsewhere in this issue, including all films with rentals of $4-million or more. In addition to new 1987 and 1988 releases, UA's 1962 picture "The Manchurian Candidate" enters that list for the first time this year at $4,180,630 in rentals, by virtue of its successful 1988 reissue performance.

The rentals figures listed here are absolute dollar figures for each film, reflecting actual amounts received by the distributors, with estimates made in the case of recent releases. They are listed in descending order by level of performance, though pictures from different eras cannot be compared directly because of ticket price inflation and the advantage of numerous reissues for older films, among other factors.

Note: Film title is followed by name of director ("Anim" indicates an animated feature which may or may not have a director credited); producer or production company; original distribution company plus present distributor, if different (e.g., MGM/UA), plus differing U.S. and Canadian distribs if relevant; year of release; and total rentals received through December 1988.

Rank-Title	Director-Producer-Distributor-Date	Total Rentals
1.	▲**E.T. The Extra-Terrestrial** (S. Spielberg; S. Spielberg/K. Kennedy; U; 1982)	$228,618,939
2.	**Star Wars** (G. Lucas; G. Kurtz; Fox; 1977)	193,500,000
3.	**Return Of The Jedi** (R. Marquand; H. Kazanjian/G. Lucas; Fox; 1983)	168,002,414
4.	**The Empire Strikes Back** (I. Kershner; G. Lucas/G. Kurtz; Fox; 1980)	141,600,000
5.	▲**Ghostbusters** (I. Reitman; Col; 1984)	130,211,324
6.	▲**Jaws** (S. Spielberg; R. Zanuck/D. Brown; U; 1975)	129,549,325
7.	**Raiders Of The Lost Ark** (S. Spielberg; F. Marshall/H. Kazanjian/G. Lucas; Par; 1981)	115,598,000
8.	**Indiana Jones And The Temple Of Doom** (S. Spielberg; R. Watts/G. Lucas/F. Marshall; Par; 1984)	109,000,000
9.	**Beverly Hills Cop** (M. Brest; D. Simpson/J. Bruckheimer; Par; 1984)	108,000,000
10.	▲**Back To The Future** (R. Zemeckis; B. Gale/N. Canton/S. Spielberg/F. Marshall/K. Kennedy; U; 1985)	104,408,738
11.	**Grease** (R. Kleiser; R. Stigwood/A. Carr; Par; 1978)	96,300,000
12.	▲**Tootsie** (S. Pollack; S. Pollack/D. Richards; Col; 1982)	96,292,736
13.	**The Exorcist** (W. Friedkin; W.P. Blatty; WB; 1973)	89,000,000
14.	**The Godfather** (F. Coppola; A. Ruddy; Par; 1972)	86,275,000
15.	**Superman** (R. Donner; P. Spengler; WB; 1978)	82,800,000
16.	**Close Encounters Of The Third Kind** (S. Spielberg; J.&M. Phillips; Col; 1977/1980)	82,750,000
17.	▲**Three Men And A Baby** (L. Nimoy; T. Field/R. Cort; BV; 1977)	81,313,000
18.	**Beverly Hills Cop II** (T. Scott; D. Simpson/J. Bruckheimer; Par; 1987)	80,857,776
19.	**The Sound Of Music** (R. Wise; Fox; 1965)	79,748,000
20.	**Gremlins** (J. Dante; M. Finnell/S. Spielberg/F. Marshall; K. Kennedy; WB; 1984)	79,500,000
21.	**Top Gun** (T. Scott; D. Simpson/J. Bruckheimer; Par; 1986)	79,400,000
22.	**Rambo: First Blood Part II** (G.P. Cosmatos; B. Feitshans/A. Vajna/M. Kassar; Tri-Star; 1985)	78,918,250
23.	*The Sting (G.R. Hill; T. Bill/M.&J. Phillips; U; 1973)	78,212,000
24.	▲**Who Framed Roger Rabbit** (R. Zemeckis; R. Watts/F. Marshall/S. Spielberg/K. Kennedy; BV; 1988)	78,000,000
25.	▲**Gone With The Wind** (V. Fleming; D. Selznick; MGM/UA; 1939)	77,641,106
26.	▲**Rocky IV** (S. Stallone; R. Chartoff/I. Winkler/UA; MGM/UA; 1985)	76,023,246
27.	**Saturday Night Fever** (J. Badham; R. Stigwood; Par; 1977)	74,100,000
28.	***National Lampoon's Animal House** (J. Landis; M. Simmons/I. Reitman; U; 1978)	70,826,000
29.	**Crocodile Dundee** (P. Faiman; J. Cornell; Par; 1986)	70,227,000
30.	▲**Fatal Attraction** (A. Lyne; S.R. Jaffe/S. Lansing; Par; 1987)	70,000,000
31.	**Platoon** (O. Stone; A. Kopelson; Orion; 1986)	69,742,143
32.	▲**Rocky III** (S. Stallone; I. Winkler/R. Chartoff; MGM/UA; 1982)	66,262,796
33.	**Superman II** (R. Lester; P. Spengler; WB; 1981)	65,100,000
34.	▲**Coming To America** (J. Landis; G. Folsey Jr./R. Wachs; Par; 1988)	65,000,000
35.	***Snow White And The Seven Dwarfs** (Anim; W. Disney; RKO/BV; 1937)	61,752,000
36.	**On Golden Pond** (M. Rydell; B. Gilbert/ITC/IPC; U/AFD; 1981)	61,174,744
37.	**Kramer Vs. Kramer** (R. Benton; S.R. Jaffe; Col; 1979)	59,986,335
38.	▲**One Flew Over The Cuckoo's Nest** (M. Forman; S. Zaentz/M. Douglas; UA; 1975)	59,939,701
39.	**9 To 5** (C. Higgins; B. Gilbert; Fox; 1980)	59,100,000
40.	▲**Smokey And The Bandit** (H. Needham; M. Engelberg; U; 1977)	58,949,938
41.	**Stir Crazy** (S. Poitier; H. Weinstein; Col; 1980)	58,364,420
42.	▲**The Karate Kid Part II** (J. Avildsen; J. Weintraub; Col; 1986)	58,362,026
43.	▲**Good Morning, Vietnam** (B. Levinson; M. Johnson/L. Brezner; BV; 1987)	58,103,000
44.	▲**Crocodile Dundee II** (J. Cornell; J. Cornell/J. Scott; Par; 1988)	57,300,000
45.	**Star Trek IV: The Voyage Home** (L. Nimoy; H. Bennett; Par; 1986)	56,820,071
46.	▲**Rocky** (J. Avildsen; R. Chartoff/I. Winkler; UA; 1976)	56,524,972
47.	**Star Trek** (R. Wise; G. Roddenberry; Par; 1979)	56,000,000
48.	**An Officer And A Gentleman** (T. Hackford; M. Elfand/Lorimar; Par; 1982)	55,223,000
49.	***American Graffiti** (G. Lucas; F. Coppola; U; 1973)	55,128,175
50.	**Porky's** (B. Clark; D. Carmody/B. Clark/M. Simon/Astral Bellevue Pathé; Fox; 1982)	54,000,000
51.	**The Towering Inferno** (J. Guillermin; I. Allen; Fox/WB; 1975)	52,000,000
52.	**Every Which Way But Loose** (J. Fargo; R. Daley; WB; 1978)	51,900,000
53.	▲**Big** (P. Marshall; J.L. Brooks/R. Greenhut; Fox; 1988)	50,800,000
54.	**Jaws II** (J. Szwarc; R. Zanuck/D. Brown; U; 1978)	50,431,964
55.	**Terms Of Endearment** (J.L. Brooks; M. Jurow/J.L. Brooks; Par; 1983)	50,250,000
56.	**Love Story** (A. Hiller; H. Minsky; Par; 1970)	50,000,000
57.	**Heaven Can Wait** (W. Beatty/B. Henry; W. Beatty; Par; 1978)	49,400,000
58.	***The Color Purple** (S. Spielberg; S. Spielberg/K. Kennedy/F. Marshall/Q. Jones/Guber-Peters; WB; 1985)	47,900,000
59.	**Blazing Saddles** (M. Brooks; M. Hertzberg; WB; 1974)	47,800,000
60.	**The Best Little Whorehouse In Texas** (C. Higgins; T. Miller/E. Milkis/R. Boyett/RKO; U; 1982)	47,333,927
61.	▲**Bambi** (Anim; W. Disney; RKO/BV; 1942)	47,265,000
62.	▲**Doctor Zhivago** (D. Lean; C. Ponti; MGM/UA; 1965)	47,116,811
63.	**Butch Cassidy And The Sundance Kid** (G.R. Hill; J. Foreman; Fox; 1969)	46,039,000
64.	**Airport** (G. Seaton; R. Hunter; U; 1970)	45,220,118
65.	**Mary Poppins** (R. Stevenson; W. Disney; BV; 1964)	45,000,000
66.	**Aliens** (J. Cameron; G.A. Hurd; Fox; 1986)	43,700,000
67.	▲**The Karate Kid** (J. Avildsen; J. Weintraub; Col; 1984)	43,432,881
68.	**The Graduate** (M. Nichols; L. Turman; Avemb; 1968)	43,388,189
69.	**Out Of Africa** (S. Pollack; U; 1985)	43,103,469
70.	**The Ten Commandments** (C.B. DeMille; Par; 1956)	43,000,000
71.	**The Jerk** (C. Reiner; D. Picker/W.E. McEuen; U; 1979)	42,989,656
72.	▲**Rocky II** (S. Stallone; R. Chartoff/I. Winkler; UA; 1979)	42,169,387
73.	**The Poseidon Adventure** (R. Neame; I. Allen; Fox; 1972)	42,000,000
73.	**Arthur** (S. Gordon; R. Greenhut; Orion/WB; 1981)	42,000,000
75.	**Back To School** (A. Metter; E. Endler/M. Endler/H. Ramis/C. Russell; Orion; 1986)	41,900,000
76.	▲**The Goodbye Girl** (H. Ross; R. Stark; MGM/WB; 1977)	41,839,170
77.	▲**Cinderella** (Anim; W. Jackson; W. Disney; RKO/BV; 1949)	41,087,000
78.	**Stripes** (I. Reitman; D. Goldberg/I. Reitman; Col; 1981)	40,886,589
79.	**Airplane** (J. Abrahams/D.&J. Zucker; H.W. Koch/J. Davison; Par; 1980)	40,610,000
80.	**Trading Places** (J. Landis; A. Russo; Par; 1983)	40,600,000
81.	**Any Which Way You Can** (B. Van Horn; F. Manes; WB; 1980)	40,500,000
82.	**Alien** (R. Scott; G. Carroll/D. Giler/W. Hill; Fox; 1979)	40,300,000
83.	**Lady And The Tramp** (Anim; W. Disney; BV; 1955)	40,249,000
84.	**Star Trek II: The Wrath Of Khan** (N. Meyer; R. Sallin/H. Bennett; Par; 1982)	40,000,000
84.	**Cocoon** (R. Howard; R. Zanuck/D. Brown/L.F. Zanuck; Fox; 1985)	40,000,000
86.	**The Golden Child** (M. Ritchie; E. Feldman/R. Wachs; Par; 1986)	39,723,089
87.	**The Jungle Book** (Anim; W. Reitherman; W. Disney; BV; 1967)	39,500,000
88.	**Star Trek III: The Search For Spock** (L. Nimoy; H. Bennett; Par; 1984)	39,000,000
89.	**Smokey And The Bandit II** (H. Needham; H. Moonjean; U; 1980)	38,911,468
90.	**Young Frankenstein** (M. Brooks; M. Gruskoff; Fox; 1975)	38,823,000
91.	▲**101 Dalmatians** (Anim; W. Disney; BV; 1961)	38,562,000
92.	▲**WarGames** (J. Badham; H. Schneider/L. Goldberg; MGM/UA; 1983)	38,519,833
93.	**Police Academy** (H. Wilson; P. Maslansky; Ladd/WB; 1984)	38,500,000
94.	▲**Fiddler On The Roof** (N. Jewison; UA; 1971)	38,251,196
95.	▲**Poltergeist** (T. Hooper; S. Spielberg/F. Marshall; MGM/UA; 1982)	38,248,762
96.	▲**Apocalypse Now** (F. Coppola; UA; 1979)	37,960,163
97.	**Annie** (J. Huston; R. Stark; Col; 1982)	37,316,783
98.	**Superman III** (R. Lester; P. Spengler/I. Salkind; WB; 1983)	37,200,000
99.	**A Star Is Born** (F. Pierson; J. Peters; WB; 1976)	37,100,000
100.	**10** (B. Edwards; B. Edwards/T. Adams; Orion/WB; 1973)	37,000,000

Legend: ▲ = film new to list or with increase in rentals since last report.
** = rentals figure corrected since last report.*

Filling a Position? Looking for a Career Change?
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