

US, Norway Cooperate In Aurora Soundings

The first two pairs of launchings as part of a cooperative Norwegian-US project to measure electric fields associated with aurorae were carried out from Andoya, Norway on August 31 and September 2.

Purpose of the project is to compare two different sounding rocket techniques for measuring electrojet currents associated with aurorae. Three pairs of Nike-Tomahawk rockets are being employed.

In each pair, a barium payload is launched in evening twilight when an aurora is present and an instrumented payload follows.

Orbiter III Orbit Now Simulates Apollo Track

Engineers monitoring the four Lunar Orbiter spacecraft circling the moon have changed the path of Lunar Orbiter III to simulate as closely as possible the orbit in which manned Apollo spacecraft are expected to fly.

The maneuver was accomplished by firing the spacecraft's velocity control engine for 125.5 seconds to lower the apolune or high point of the orbit.

Tracking data now show the spacecraft to be operating in an orbit with a perilune or low point 89 miles above the lunar surface and an apolune of 196 miles. Before the maneuver, Lunar Orbiter III had a perilune of 87 miles and an apolune of 1,133 miles.

The new orbit approaches the 100-mile circular orbit intended for the Apollo command module. It is inclined 21 degrees to the moon's equator, and Lunar Orbiter requires only two hours and 11 minutes for a complete circuit in its new path.

Information about the lunar gravity fields to be obtained from tracking Lunar Orbiter III in its new low orbit will be of value to the Apollo program.

Langley Research Center engineers managing the Lunar Orbiter project report that the maneuver marked the 25th consecutive successful use of the Orbiter's 100-pound-thrust velocity control engine in space.

Lunar Orbiter III left Cape Kennedy on February 4 this year and has been in orbit about the Moon since February 8. Its engine was used on July 17 to raise the spacecraft's perilune to increase its lifetime.

Four spacecraft of the Lunar Orbiter series are operating in orbit around the moon, although communication with one of them, Lunar Orbiter IV, is no longer possible.

The active spacecraft serve as valuable tracking targets for stations in the NASA Manned Space Flight Network which uses them for crew training exercises and for evaluating the orbit determination computer programs to be used in the Apollo missions. The Lunar Orbiter III maneuver was accomplished August 30 at 2:39 pm CDT.

The time interval between successive launchings can vary from five minutes to two hours depending on auroral distribution and the visibility of the barium clouds emitted by the rockets.

A favorable comparison of results from the two techniques would mean that the barium method could be used to deduce electric fields associated with aurorae and changes in aurorae over a longer period than is possible at present.

In addition to the primary objective, magnetic field measurements are being conducted to provide information on electrojet currents associated with aurorae, and low energy particle measurements are being carried out.

The Royal Norwegian Council for Scientific and Industrial Research (NTNF) and NASA are cooperating, with each agency bearing the costs of its own responsibilities. NASA is providing six Nike-Tomahawk sounding rockets, three barium release payloads, three instrumented payloads, and the loan of a sounding rocket launcher. NASA is also furnishing camera and television equipment located at the launch site and at the remote optical sites of Tromso and Gravidal, Norway.

Scott, Collins Speak at AIAA

MSC pilots David R. Scott and Michael Collins will be the featured speakers at the September 18 meeting of the Houston Section of the American Institute of Aeronautics and Astronautics.

The pilots will describe their personal observations as US space pilot representatives to this year's Paris Air Salon. Scott was pilot on Gemini VIII and Collins was pilot on Gemini X.

The AIAA meeting will be at the Holiday Inn on NASA Road 1, with a social hour at 6 pm, dinner (\$3.50/person) at 7 and the program at 8. For reservations call Lea Dunaway at 591-2621 or HU 8-3117.

Surveyor V Flight Averts Failure Despite Helium Pressurant Leak

Mission failure was averted Sunday night when Surveyor V successfully soft landed on the moon's Sea of Tranquility. The mission was in danger when a leak was discovered in vernier engine fuel helium pressurant following a midcourse correction.

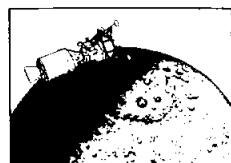
It was feared that all helium would be lost before the vernier engines were ignited to slow the spacecraft to touchdown speed after main retrorocket burnout.

Alternate missions, such as switching to a highly-elliptical earth orbit for earth photography, were considered but the helium leak rate tapered off to the point where project officials felt there was a high probability of a successful soft landing.

ROUNDUP

NASA MANNED SPACECRAFT CENTER

HOUSTON, TEXAS



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Apollo IV Prelaunch Testing Starts at Launch Complex 39

Flight simulations, prelaunch checkouts and developmental testing in support of the next two Apollo missions were underway at MSC and Kennedy Space Center this week.

Spacecraft systems verification tests were conducted on Apollo IV spacecraft at KSC Launch Complex 39, and liquid hydrogen cold-flow tests of

ground equipment were completed. A series of flight simulations for Apollo IV and Apollo V/LM-1 were run this week in the Mission Control Center.

Apollo IV, the first flight test of the Saturn V launch vehicle, was moved on its mobile launch tower from the KSC Vehicle Assembly Building to Launch Complex 39 on August 26.

The first manned-flight configured Lunar Module, LTA-8, was scheduled to arrive at MSC late this week for thermo-vacuum testing in the Space Environment Simulation Laboratory. The test program is in support of the first manned LM flight next year.

LTA-8 incorporates changes recommended by the Apollo 204 Review Board, such as extensive replacement of flammable materials with non-flammable or low-flammability materials, and inclusion of a water fire extinguisher system.

A fire suppressant system has also been installed in the SESL Chamber B where LTA-8 thermo-vacuum testing will be done.

After subsystem checkout and man-rating, LTA-8 will undergo testing with a two-man crew, James Irwin and John Bull, under simulated spaceflight thermo-vacuum extremes.

(Continued on page 2)

Lunar Sample Scientists Attend LRL Briefing

United States and foreign scientists selected by NASA to perform detailed studies of the first lunar samples returned by Apollo crews are scheduled to attend a three-day briefing of the Lunar Receiving Laboratory at MSC September 18-21, 1967.

Primary objective of the program is to familiarize the 110 scientists with the collection and handling procedures the returned moon samples will undergo in the Lunar Receiving Laboratory at MSC. Preliminary analysis of the approximately 40 pounds of lunar surface samples will be conducted within the LRL before samples are released to the principal investigators.

The principal investigators who represent the American scientific community and six foreign countries were selected by the NASA earlier this year.

The US principal investigators represent 21 universities, two industrial firms, three private institutions and 10 government laboratories.

The foreign investigators represent 16 scientific institutions in Canada, England, Finland, Germany, Japan and Switzerland.

During the three day stay at MSC, the scientists will attend briefings on the Apollo mission, as well as a detailed tour and briefing on the handling procedures and operations of the multi-level LRL.

The MSC conference is being sponsored by the Science and Applications Directorate.



BETSY ROSS WOULDN'T RECOGNIZE IT—A crew of workmen at NASA Michoud Assembly Facility smooth out one of four silk-screened adhesive-backed six by 12-foot flags on the liquid oxygen tank of a Saturn V first stage S-IC.

An Atlas-Centaur launch vehicle placed Surveyor V into its lunar trajectory September 8 after liftoff at 2:57 am CDT from Kennedy Space Center. The flight lasted 65 hours.

Like the four previous Surveyors, Surveyor V's mission is to perform a soft-landing in the Apollo area of interest on the moon and to take television pictures of the lunar surface around its landing site.

Surveyor V was the first of the series, however, to carry an instrument to study the chemical characteristics of the lunar soil and it was the first to attempt a landing in the eastern portion of the Apollo zone.

The landing site was at 24° ELong and 1° NLat. This is in

the southern part of the Sea of Tranquility, 60 miles east of the crater Sabine and 24 miles north of the crater Moltke. The site is 36 miles southwest of the landing site of Ranger VIII.

The landing in the East put great demands on Surveyor's soft-landing system. The spacecraft approached its landing target at 47 degrees off the vertical, requiring a large gravity turn during the crucial terminal descent sequence. By contrast, Surveyor I's angle of approach was only six degrees and Surveyor III's was 25 degrees.

The study of the chemical characteristics of the lunar surface is carried out by an alpha

(Continued on page 2)

In PLT 'Anne Frank Diary' Cast



SCRIPT REVIEW—The director and three of the cast of Pasadena Little Theater's current production of "The Diary of Anne Frank" confer on a script passage. Left to right are director Jo Simmons, wife of Bill Simmons of P&PD, Jim Myers, Philco-Ford, Helen Crupain, wife of Howard Crupain, Philco-Ford, and Alan Glines of Flight Control Division. "Diary" began a four-week run September 7 with performances Thursday, Friday and Saturday nights at 8:30. Tickets (\$2 for adults, \$1 for students under 18) are available at the Theater, HU 6-9976, or at Foley's ticket counters.

Apollo IV

(Continued from page 1)

In other MSC development testing, Apollo command module boilerplate 28-A next week will undergo landing impact testing at the full-scale Land and Water Impact Test Facility. The tests are in support of the first manned Apollo mission and will duplicate Launch Complex 34 pad abort landing characteristics.

The boilerplate will be dropped from a height of 16 feet at a velocity of 32 feet per second on a sand surface resembling Cape Kennedy beach areas.

Boilerplate 28-A is equipped with a full spacecraft heatshield and contains spacecraft components in the 120-degree impact area of the "toe" or forward section of the command module. Crew couches and dummies will be installed and the spacecraft fully instrumented to obtain impact dynamics and stress measurements.

Spacecraft heatshield components can be refurbished for additional testing if necessary.

Astronomers Set Saturn Viewing

The planet Saturn will be the focus of attention September 22 when the MSC Astronomical Society holds its next public observation night.

After 10 pm that night, Saturn will be well placed for viewing. Saturn presently is about 793 million miles from earth. The rings are tilted about eight degrees to earth line-of-sight, making them clearly visible and reflecting light to make Saturn appear as bright as a first-magnitude star.

A new satellite was discovered last year orbiting just outside Saturn's rings, bringing the number of known satellites to 10.

The ninth Saturn satellite was discovered in 1898. It is expected that on the observation night Titan, Saturn's largest satellite, and perhaps several others will be visible.

The observation site will be in Shoreacres Park on Oakdale Street in Shoreacres — about four miles south of LaPorte just off SH 146. Refreshments and insect repellent will be available. If it is cloudy, the observation will be slipped to the following day. KMSC radio at HU 8-1131 will have latest information if the weather is marginal.

William Chanis/CF22 Ext 4371 is the MSC Astronomical Society contact.

Surveyor V Successfully Soft Lands

(Continued from page 1)

scattering experiment. The alpha scattering instrument is lowered to the lunar surface and bombards it with alpha particles from a radio-active source. By measuring the interaction of the particles with atomic nuclei of

elements in the lunar surface, it is possible to determine which elements are present.

The alpha scattering device replaces the surface sampler which was flown on Surveyors III and IV.

In another change from previous spacecraft, Surveyor V's two mirrors which permit taking pictures under the spacecraft are convex instead of flat to increase the field of view. In addition, the smaller of the two mirrors has been repositioned so that it views the area of the lunar surface which the alpha scattering instrument contacts when deployed.

The launch vehicle for this mission was Atlas-Centaur 13 which had a two-burn capability so that it could launch Surveyor V toward the moon from a parking orbit.

Surveyor V's flight lasted 65 hours from lift-off to touchdown. A large solid propellant retro-rocket and three small vernier rocket engines under radar control slowed Surveyor from a lunar approach speed of 6,000 miles per hour to about three miles per hour. The engines cut off at the 13-foot mark and the spacecraft fell free to the lunar surface, touching down about 10 miles per hour.

At launch, Surveyor V weighed 2,216 pounds. The retrorocket, which was jettisoned after burnout, weighed 1,395 pounds. After expenditure of liquid propellants and attitude control gas, Surveyor V landed on the moon weighing about 616 pounds.

In addition to data provided by the TV camera, Surveyor E will also provide data on the radar reflectivity, mechanical properties, and thermal conditions of the lunar surface.

Surveyor I soft-landed on the moon June 2, 1966, and returned 11,150 high-quality photographs of the lunar surface.

Surveyor II was launched Sept. 20, 1966, but the mission failed when one of the three vernier engines failed to ignite during an attempted midcourse maneuver. Surveyor III soft-landed on the moon April 19, 1967, returned 6,319 photographs and provided 18 hours of operation of the surface sampler.

Launched July 14, 1967, Surveyor IV performed well until the last few seconds of burn of the retrorocket when all communications with the spacecraft were lost. An engineering team which studied the failure could not pinpoint the cause of the failure of the mission, and determined that the Surveyor V mission should proceed, since there was a relatively low probability of recurrence of the several postulated causes studied.

The Surveyor program is directed by NASA's Office of Space Science and Applications. Project management is assigned to NASA's Jet Propulsion Laboratory operated by the California Institute of Technology, Pasadena. Hughes Aircraft Co., under contract to JPL, designed and built the Surveyor spacecraft.

NASA's Lewis Research Center, Cleveland, is responsible for the Atlas first stage booster and for the second stage Centaur, both developed by General Dynamics/Convair, San Diego, Cal. Launch operations are directed by Kennedy Space Center, Fla.

Tracking and communication with the Surveyor is the responsibility of the NASA/JPL Deep Space Network (DSN).

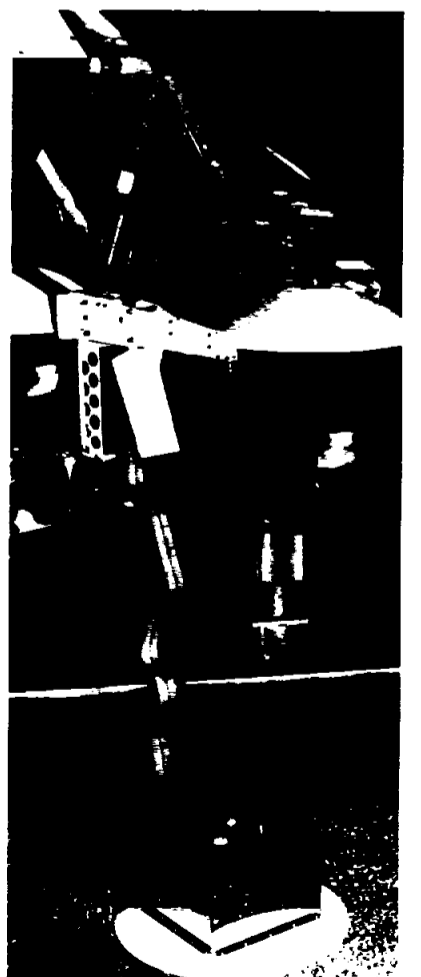
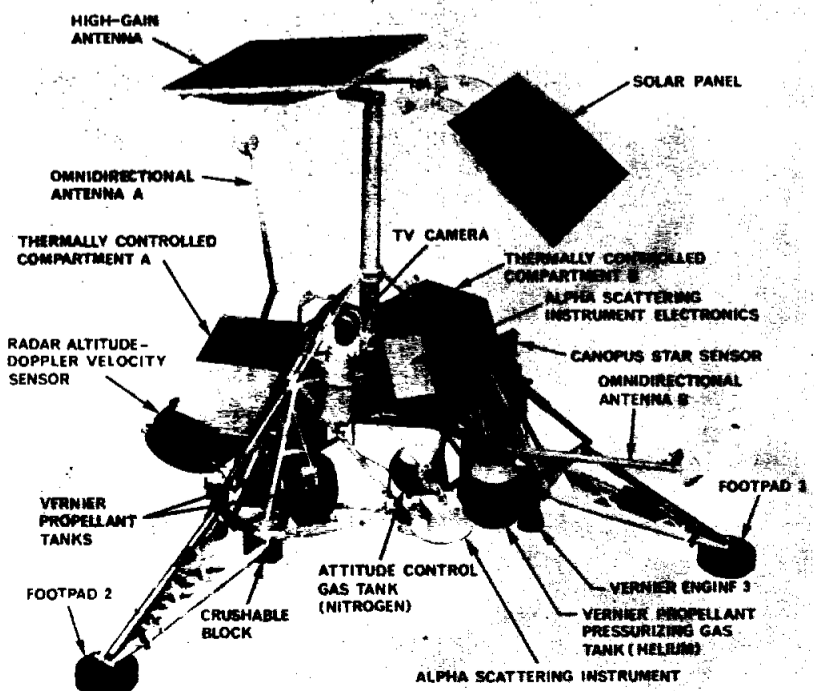
The DSN stations assigned to the Surveyor program are Pio-

neer, at Goldstone in California's Mojave Desert; Robledo, Spain; Ascension Island in the South Atlantic; Tidbinbilla near Canberra, Australia; and Johannesburg, South Africa. Data from the stations will be transmitted to the Space Flight Operations Facility in Pasadena, the command center for the mission.

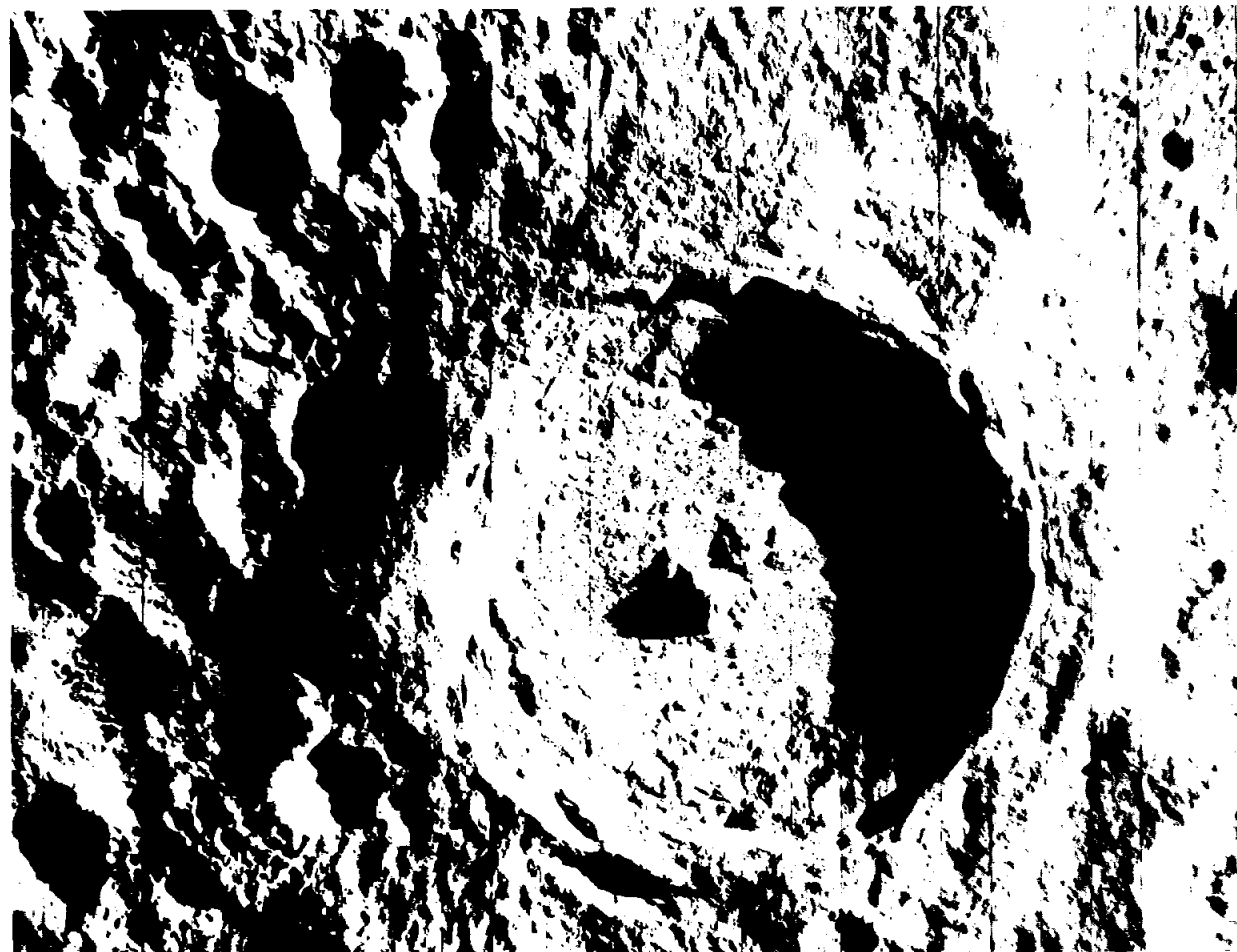


SURVEYOR

(LANDED POSITION)



SCATTERGUN—Surveyor V carries aboard an alpha scattering instrument which is lowered to the lunar surface to measure through bombardment by alpha particles the interaction of atomic nuclei of elements present in the lunar surface.



SPLASHPOINT—Lunar Orbiter V's wide-angle camera snapped this photo of the crater Tycho from an altitude of 135 miles which tends to confirm the theory that Tycho was formed by impact of a large meteorite. Tycho is about 56 miles wide from rim to rim and is three miles deep. Ejecta rays extend more than 1000 miles from the crater.

Lunar Orbiter V's Photos Confirm Crater Tycho Formed by Meteorite

Lunar Orbiter V's cameras have revealed flow patterns characteristic of hardened fluid material on the floor of the moon's Tycho Crater.

Preliminary study of the new photographs returned by NASA spacecraft tends to confirm the prevailing theory held by scientists that the big crater was formed by a great meteorite crashing into the visible side of the moon.

Some scientists believe much of the fluid material ejected when the big three-mile-deep crater was formed may have resulted from the intense heat generated by the meteorite's impact.

Berlitz to Teach Spanish Classes For MSC Club

The MSC Spanish Club has selected the Berlitz School of Languages to conduct beginning and advanced Spanish conversational classes at MSC. Advanced classes began Tuesday and are held each Tuesday at 5:15 pm in Bldg 13 Room 108. Two beginner classes begin tonight—one at 5:15 pm and one at 7 pm—at the same location.

The 7 pm Friday class has several openings. To enroll in the class or join the Club, call Jose R. Perez at 5431.

Club meeting day has been changed to Monday, with the next meeting scheduled for September 18 at which Mrs. D. Suarez will give a slide-illustrated lecture on Spain. Meetings and classes are all at the same location.

Aprenda a hablar en español asistiendo a nuestras clases y juntas.

They also suggest that the appearance of the dark halo results from the manner in which pulverized ejected material was deposited. In the dark halo area, this material may have traveled outward from the impact point in a "base surge" close to the moon's surface, giving a wind-swept appearance to the terrain.

One theory is that lake-like areas with flat surfaces in the dark halo area may be actual volcanic material brought up from beneath the moon's surface along fractures induced by the impact. These volcanic substances may have flooded into scattered low areas outside the crater.

The most detailed photo in a series of three Tycho pictures affords scientists the first close-up view of the crater floor, providing new clues about its origin. Orbiter's high resolution telephoto picture shows fractures, flow markings and protruding dome-like hills with exposed layers.

These features resemble the pseudo-volcanic rocks in large Canadian craters in Central and Northern Quebec, which scientists believe were formed by meteorites striking the earth. These craters were explored after they were recognized only a few years ago by scientists examining aerial photographs of the area.

In these large earth craters, the fallback material ejected by the enormous impact was welded under the accompanying heat and flowed, rendering the upper layers indistinguishable from normal volcanic rocks. Orbiter's new pictures of Tycho provide the first example of this type of rock scientists have seen on the moon.

Considered the moon's most spectacular surface feature by many observers, Tycho is 56 miles in diameter. Rays extending more than 1,000 miles from the crater indicate the distance to which fluid material and particles were hurled when it was formed.

The first photo in the group released by NASA shows Tycho on the moon's full visible face, as photographed from Earth by the Lick Observatory, Mt. Hamilton, Cal. The second picture, taken August 15 by Orbiter V with its wide-angle lens, is a view looking almost directly down into the crater. The third photo, taken simultaneously with the spacecraft's telephoto lens, shows a small portion of the crater floor in great detail. Both spacecraft pictures were taken from orbit 135 miles above the moon's surface.

As photographed from earth, Tycho's dark halo is plainly visible, extending out 30 miles, with a second, bright halo extending about 90 miles farther out. The rays radiating from the crater extend over a large area on the Moon's visible side.

Scientists believe the bright halo was formed by ejected material raining on the moon's surface in a ballistic trajectory, as it traveled outward from the impact point.

Tycho, named for Tycho Brahe, a 16th Century Danish astronomer, is located in the moon's southern hemisphere at 11° W Long and 43° S Lat.

The Tycho region is one of the 36 areas of high scientific interest on the moon photographed by Orbiter V on the final mission of the Lunar Orbiter program.

1967 YOC Participants Honored at Luncheon

Participants of the Manned Spacecraft Center's 1967 Youth Opportunity Campaign gathered at the MSC Cafeteria August 31 for a Final Awards Luncheon.

Speakers were introduced by Diana Dorr, coordinator of the program, and Silvie Gaventa presented certificates of completion to all YOC participants. A letter from The Honorable Hubert H. Humphrey, Chairman of the President's Council on Youth Opportunity, was awarded to each participant as an expression of appreciation and encouragement for continued education.

Dr. Joseph Kerwin, scientist-pilot, addressed the group, and presented Outstanding YOC certificates to award winners

Proxie Hawkins, Glenda Joynson, Irma Lang, Beverly Walker, and Kenneth Parker. Patricia Caney, Suzette Chappell, Jerald Harris, Mirian Kincheon, and Marcia Kirkwood received Honorable Mention certificates, also presented by Dr. Kerwin.

Floyd D. Brandon, Chief, Personnel Division, expressed appreciation to all persons—supervisors, counselors, and participants—who helped make the 1967 Youth Opportunity Campaign at MSC an outstanding success. To conclude the program, seven of the YOC participants presented a skit which they themselves had written, produced, and directed, and which depicted their experience gained through the YOC program.



OUTSTANDING MSC YOC's—MSC pilot Dr. Joseph P. Kerwin, center, presents Outstanding Youth Opportunity Campaign Certificates to award winners Proxie Hawkins, Glenda Johnson, Irma Lang, Beverly Walker and Kenneth Parker.

Space Biomed Results Have Earth Application

A booklet addressed to biomedical researchers has been issued by the National Aeronautics and Space Administration describing a plan to stimulate secondary use of space research results in solving medical problems.

Work of biomedical teams of scientists and engineers at three non-profit research institutes under contract with the NASA Office of Technology Utilization is described. Their activities are part of a program to spread knowledge resulting from space research.

The teams work with universities, hospitals and other research institutions to define specific medical problems to which space technology may be applicable. They then search for potential solutions to those problems in aerospace research centers, libraries, and industrial plants. When promising ideas are found, the teams help biomedical workers evaluate them for use in clinics, hospitals, and medical laboratories.

Biomedical researchers who are interested in taking part in the program may write to one of

the cooperating research institutes. Copies of the booklet may be obtained from the Technology Utilization Division, Code UT, NASA Headquarters, Washington, D. C. 20546.

Bay Chorus Starts Rehearsals, Seeks Voices from MSC

The Bay Area Chorus will begin rehearsals on Sunday, September 17 at 7:30 pm at the Clear Lake City Recreation Center.

As in the past, the chorus will present free Christmas Concert in the MSC auditorium during December. An invitation is extended to all MSC employees who enjoy singing choral music to join the chorus—basses and tenors are particularly needed.

Clare Schweickart, president of the chorus, has announced that Paul Harrison will be directing this year. He is music director at North Shore High School and choir director for the First Methodist Church, La Porte.



Landing in Florida

ONE WARM June morning in 1527, just 35 years after Columbus had discovered the New World, five Spanish ships spread sail in the harbor of San Lucar de Barrameda and steered for the West Indies. In command was one-eyed, bearded, barrel-chested Panfilo Narvaez, whose booming voice "sounded as if it came from a cavern." Thwarted in an earlier attempt to unseat Hernando Cortez as *conquistador* of Mexico, Narvaez had wangled from his monarch a commission as Governor of a project to conquer and colonize the country between *El Rio de las Palmas* (the Rio Grande) and Florida.

If they had known what lay before them, none but the bravest among those 600 soldiers and colonists would have sailed beyond sight of their homeland. For theirs became one of the most remarkable stories of hardship and death in all the annals of American exploration.

Desertions and death by hurricane cut the expedition in half before its work was well begun. Of the remaining 300 men, only four lived to tell a tale of incredible suffering in their transcontinental trek from Florida to the Pacific coast of Mexico. In this, the first such journey made by

white men, they spent seven years—most of it on foot.

Though the Narvaez Expedition failed in its mission, one of its four survivors brought back to Spain the first accounts of that vast new land which later became the southern United States. He was Alvar Nunez Cabeza de Vaca, treasurer and high sheriff of the expedition. Peril was no stranger to this adventurous son of a proud Spanish family. He had fought 15 years before in the bloody battle of Ravenna, in the Italian campaigns, returning alive but *muy destrozado*—badly shattered and broken. Now, in his middle thirties, he was embarked on a venture from which he would escape even more narrowly with his life.

The *Relaciones*, or accounts which Cabeza de Vaca wrote of his adventures with the Narvaez Expedition, were first published in Zamora, Spain, in 1542. Written with dignity and restraint and with high regard for truth, the *Relaciones* out-rival, for sheer adventure, many a swashbuckling novel. His simple but dramatic account of the years he spent in Texas among the Indians before he finally escaped with three companions make Cabeza de Vaca of special interest to Texans.

On his eyewitness stories of Texas and its aboriginals, the first told by a white man, this story is based.

Trouble in the Indies

One of the ancients is said to have remarked, after a disastrous voyage, "I was shipwrecked before I went aboard." Some 120 men of the Narvaez Expedition must have had premonitions of evil, too. When the ships made port at Santo Domingo to take on supplies, these men yielded easily to blandishments of the islanders and deserted Narvaez. This may have infuriated the Governor, but it saved their lives.

In Cuba, the next stop, fresh trouble was in store. A friend of Narvaez offered provisions if the fleet could be sent to Trinidad for them. The Governor dispatched Cabeza de Vaca and Juan Pantoja with two ships to fetch the supplies.

Shortly after the two ships arrived in port, a great hurricane struck, wrecking the town and the ships as well. De Vaca wrote mournfully of the destruction:

"The sea began to rise very high . . . the rain and the tempest had increased to such a degree . . . all the houses and churches fell, and it was necessary in order to move upright,

that we should go seven or eight holding on to each other that the wind might not blow us away . . ."

Sixty crew members had perished when the two ships were lost. When Narvaez re-joined the survivors later, he told how he had saved the other ships by finding a sheltered port and riding out the storm. In the face of the recent disaster, and at the insistence of his fearful men, the Governor agreed to postpone departure for the new lands until the advent of spring. It was now November, 1527.

Late February of 1528 found the expedition under full sail. With Diego Miruelo as pilot, Narvaez obviously had in mind going directly to the *Rio de las Palmas*, in northeastern Mexico.

Either Miruelo failed miserably in his assignment, or fate itself was against Narvaez. The second day out, the fleet ran aground on shoals and remained there, stranded and helpless as beached whales, for 15 days. It remained for a storm to come forcibly to their rescue. Lifting them headlong from their predicament, high winds sent the little ships hurtling off the shoals.

But new winds brewed treachery. No sooner were the ships under way after the first storm abated than fresh gales came up and drove them off course again, until at length the expedition found itself again near the harbor of Havana. But as the ships tried to make port, still another storm came up from the south, driving the fleet northward toward Florida. Here the Spaniards landed on April 15, 1528, on a peninsula between Tampa Bay and the Gulf of Mexico. On the following day, with due ritual and ceremony, Narvaez took possession of the land for Spain.

Disaster in Florida

From the first, Indians in Florida were sullenly hostile. By manner and gesture, they clearly told Narvaez to leave—

the sooner the better. But the greedy Governor had already spotted a few gold trinkets worn by the natives. When told they came from a place called "Apalachen," Narvaez resolved at once to find this golden kingdom and strip it of its treasure.

Calling a council, the Governor proposed that the ships be sent along the coast to the *Rio de las Palmas*, with the rest of the expedition proceeding overland. Obviously, he had no conception of the distance involved or the seriousness of the supply problem.

Cabeza de Vaca spoke out against the plan, reminding Narvaez of the poor condition of his men and horses, to say nothing of meager supplies. The Governor turned with a derisive bellow upon his treasurer and sheriff. If Cabeza de Vaca were afraid, taunted Narvaez, he could take command of the ships and go in them with the women and such crewmen as were necessary. Cut to his pride's quick, the crestfallen sheriff replied that he would go with the expedition to the last man. As he wrote later, Cabeza de Vaca did not want to " . . . give occasion for it to be said I had opposed the invasion and remained behind for timidity, and thus my courage to be called in question. I chose rather to risk my life than put my honor in such position."

It was a choice, made in pride and anger, that almost cost him his life.

With his fleet sent away, Narvaez set out on May 1, 1528, with 300 men in search of Apalachen. When they found it, nearly two months later (near the site of modern Tallahassee), Apalachen turned out to be nothing but a miserably poor native village. Bitter with disappointment, the Spaniards were hungry and tired enough to trade all the gold and jewels they had dreamed about for the reality of corn, beans, and pumpkins.

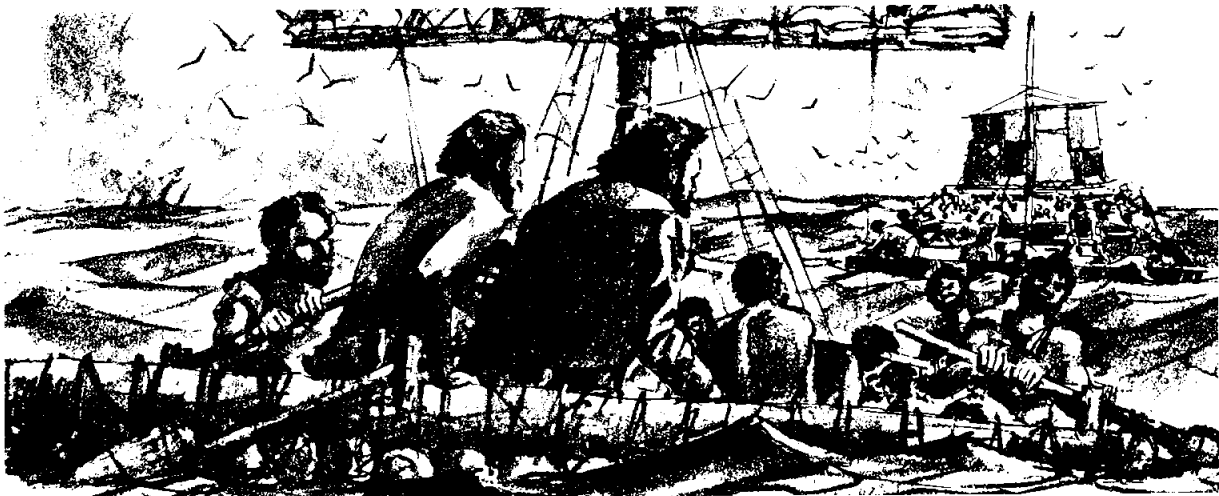


Indies Hurricane

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Shipwrecked Spaniard was first to see Texas



tered. De Vaca found himself and his crew alone on the open sea. At day's end, however, two other boats hove in view—the nearer craft under command of Narvaez.

Approaching within hailing distance, Cabeza de Vaca called out to the Governor that they join the third craft and keep together. Narvaez replied that "... he wished to reach the shore; that if I wished to follow him I should order the persons of my boat to take the oars ..."

This De Vaca tried to do, but found his men too weak to keep up with Narvaez, who had chosen for his crew the strongest men in the expedition. When he called on the Governor for a tow rope, Narvaez selfishly replied that "... each should do what he thought best to save his own life; that he so intended to act; and saying this, he departed with his boat." It was fitting justice, perhaps, that Narvaez was doomed to lose his life in the waters of the Gulf

some time later, while Cabeza de Vaca survived.

Deserted by his commander, Cabeza de Vaca succeeded after some effort in joining the third boat—but a furious storm soon separated the two. Things by now had reached an almost hopeless state. As Cabeza de Vaca would record later, "Because of the winter and its inclemency, the many days we had suffered hunger, and the heavy beating of the waves ... all who were on my boat were fallen on one another, so near to death that there were few among them in a state of sensibility."

Somehow, De Vaca summoned up strength and will to remain awake and hold weakly to the steering oar. Then, just before dawn, his ear caught the roar of surf breaking upon a beach. It was not far away. At sunup, they were delivered in this manner:

"Near the shore a wave took us, that knocked the boat out of

water the distance of the throw of a crowbar, and from the violence with which she struck, nearly all the people who were in her like dead, were roused to consciousness. Finding themselves near the shore, they began to move on hands and feet, crawling to land into some ravines. There we made fire, parched some of the maize we brought and found rain water. From the warmth of the fire the people recovered their faculties, and began somewhat to exert themselves. The day on which we arrived was the sixth of November (1528)."

After a 45-day Odyssey, the Spaniards in Cabeza de Vaca's crew had come to rest upon the coast of Texas. Just exactly *where*, historians cannot precisely agree upon. But it is generally thought to have been Galveston, or an island near Galveston. One authority makes a good case for Velasco, pointing out that it may have been Velasco Island before it sanded up, joined the mainland, and became Velasco Peninsula.

(The September 29 *Roundup* will carry the concluding portion of the account of Cabeza de Vaca's hardships in what was to become Texas—servitude among the Indians and an eight-year Odyssey across Texas and Mexico to join their countrymen.)

After a month or so of fruitless exploration in that vicinity, and with perhaps a third of his men sick, the ill and dispirited Narvaez decided to take to the sea. It was high time. Already, an incipient mutiny had been put down at the last moment by an appeal to the Spaniards' sense of duty and honor. How Narvaez must have longed, at that time, for some way to recall the ships he had sent away!

It was one thing to agree that in the sea lay their salvation. It was quite another to put the proposal into action. The Spaniards had no ships, nor the means to build any. According to Cabeza de Vaca, "This appeared impossible to every one; we knew not how to construct, nor were there any tools, nor iron, nor forge, nor tow, nor resin, nor rigging ... and above all, there was nothing to eat while building."

In the desperation of their plight, the Spaniards improvised ways to put together a few clumsy craft. One man made a bellows of deerskins. Others melted down their stirrups, armor, spurs, and other metal objects to make the nails, saws, and hatchets they needed. From pine trees they extracted resin to caulk the craft. And from the tails and manes of horses they fashioned ropes and rigging.

By September 20, 1528, they had five crude, flat-bottomed barges. Into them two days later piled 242 men, leaving the clumsy craft so crowded that "water came up to within one span of the gunwales." It was a situation that might have spelled disaster on a placid lake, much less the open Gulf. Without a navigator among them, and hardly an experienced sailor, the desperate men put out to sea.

Shipwrecked on Texas

Picking its way close to shore as far as possible, the forlorn little flotilla steered past Pensacola Bay and came to the area of present Mobile. Here two

men went ashore for water and never returned. Back to sea went the rest, and soon found themselves in dangerous circumstances. Their food supplies had dwindled perilously low and their water was useless; the horsehide waterbags had rotted. Men died in agonies of thirst, and survivors were so weak they could hardly pull an oar.

On they toiled somehow, with only prayer to sustain them, until they came at length to the mouth of the Mississippi. Here they found water fresh enough to drink, but as they tried to enter into the stream a great current combined with northerly winds to drive them back into the Gulf.

After a few days of agonizing voyage, the boats became scat-

The history of Texas from its earliest exploration through its colonization and growth into a republic, and finally as a state of the Union, is an extremely interesting history. Through the courtesy of Humble Oil and Refining Company, articles from Humble's *Texas Sketchbook* will appear in the *Roundup* during the next several months. The articles were written by F. T. Fields. Pencil sketches and watercolors accompanying the articles are by the noted Texas artist E. M. "Buck" Schwetz. Many of the places described in the series are within weekend driving distance of MSC.



CAST ASHORE IN TEXAS

100 Years Federal Service



OLD TIMES—Eight Technical Services Division employees recently received service awards from Technical Services Division chief Jack A. Kinzler, right. Left to right are Kenneth D. Easley, 15 years; Fredrick W. Hake, 15 years; Thomas J. Richards, 10 years, Richard E. Stanton, five years, John H. Allen, Sr., 15 years, and Lawrence M. Magers, 10 years. Not in photo: Cecil C. Jackson and Ramon Z. Petrowski, both 15 years.

Federation Speaker



WAGE OUTLINE—Walter C. Stallard, Personnel Division, spoke on "The Wage Board Classification Program at MSC" at the September 11 meeting of Lodge 2284 American Federation of Government Employees. Philip T. Hamburger, assistant to the MSC Director for congressional relations, will be the AFGE October meeting speaker.

The *Roundup* is an official publication of the National Aeronautics and Space Administration Manned Spacecraft Center, Houston, Texas, and is published every other Friday by the Public Affairs Office for MSC employees.

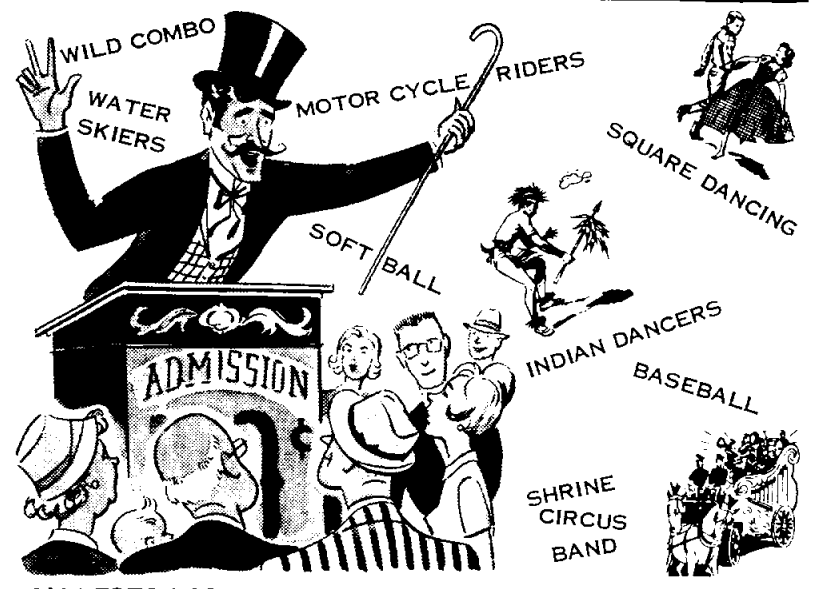
Director Dr. Robert R. Gilruth
Public Affairs Officer Paul Haney
Editor Terry White
Staff Photographer A. "Pat" Patnesky

Long fight with short stick . . .



EXHIBITS

JUST LOOKIT THE ANNUAL NASA PICNIC



GALVESTON COUNTY PARK - SATURDAY, OCTOBER THE 14TH
DON'T FORGET...HANG ON TO BOTH ENDS OF YOUR TICKET FOR FOOD & DRINK

Spectroscopists To Hear Slavin

Walter Slavin of Perkin Elmer Corporation, Norwalk, Connecticut, will be the featured speaker at the September 21 meeting of the Houston Section of the Society for Applied Spectroscopy. Slavin will talk on "Atomic Absorption Spectroscopy, Instrumentation and Applications."

Slavin is one of the foremost authorities in atomic absorption spectroscopy; has been active in instrument design with Perkin Elmer Corp. and is probably best known for his methods development in this discipline. Slavin graduated from the University of Maryland in 1950 with his degree in physics and mathematics.

The SAS meeting will be at Ye Olde College Inn at 6545 Main Street (Near Rice University) and non-members are invited to attend. Cocktails are at 6 pm courtesy of Perkin Elmer Corporation, dinner at 7 pm (\$5/person) and the technical session at 8 pm.

Co-op of Month



THOROUGH—Texas A&M aeronautical engineering major Alan L. Briscoe is in the Advanced Operations Planning Section of Flight Control Division where his supervisors describe him as having "demonstrated a remarkable degree of initiative and is able to originate action on his assignments without being told every detail. The quality and thoroughness of his work on his immediate assignment of evaluating advanced flight control display systems is comparable to that of more highly trained engineers."

The Suggestion Army



IDEA FOLKS—MSC Suggestion Awards went to 23 MSC employees in ceremonies last month. Director of Administration Wesley L. Hjernevik, second row left, made the presentation of awards. Seated, left to right: Nancy M. McBride, Dawn G. Hoyle, Beulah M. McCaghren, Margaret E. Ward, Mattie Sue McGehee, Lee M. Brubaker, Mary Langston and Katy V. Snyder. Second row: Hjernevik, Lawrence A. Hayman, Campbell P. Canup, Wilfred A. Brugger Jr., Dr. Walter W. Kemmerer, Phillip M. Stallings, Alpha L. Fisher, Jr., Kenneth W. McCaghren and Robert M. Bernardin. Third row: Eddie A. Tarkington, E. S. Shropshire, Robert H. Allmond, Raymond A. Donatto, John W. Morar and Joseph M. Schmitt. Inset shows Geri Vanderloef who was recovering from surgery at the time of the ceremony and received her award in her hospital room.

Roundup Swap-Shop

(Deadline for classified ads is the Friday preceding Roundup publication date. Ads received after the deadline will be run in the next following issue. Send ads in writing to Roundup Editor, AP3. Ads will not be repeated unless requested. Use name and home telephone number.)

FOR SALE/RENT-REAL ESTATE

3-2-2 brick contemporary in Bayou Chantilly, Dickinson 2109 sq ft, sunken lvg room, fam room w/corner fireplace, built-ins, utility room, walkin closets, centra heat/air, draperies, antique-gold carpeting, terrazzo, enclosed patio fenced, 10 min to MSC, no city taxes. \$23,200. GI-no down. R. L. Latta, 534-4380.

4-2 1/2-2 1/2. trees, all brick landscaped. Every convenience. Corner lot. Mervin Hughes, 591-2287.

3-1-2, large den, lvg room, carpet, drapes, central heat, air. Double fenced lot, utility room. Low equity, \$95.00/month. K. C. Kern. HU 6-8215 after 9:00 p.m. or HI 7-0677 after 7:00 pm.

1 1/2 acres restricted residential lot. Surrounding lots developed. Near Alta Loma on FM Road 1764. H. L. Day, 877-1152.

3-2-2 carpets, drapes, central air, fishing pier privileges, bay view lot, proximity NASA \$26,500, Ann Hardeman GR 1-4776.

FOR SALE-AUTOS

67 Corvette Coupe, 427 engine, 3 dual carbs, FM, air, pwr steer, 4-speed close-ratio trans, 3.70 rearend, 10,000 miles. P. R. Charlton, 944-0208.

67 Pontiac Le Mans. Black with white vinyl top. Wire wheel covers, air, power, AM/FM, other extras. Under warranty. Bill Dozier, RI 8-0536.

65 Sunbeam Tiger, Ford 260 V-8, 20,000 miles, konis, mags, excellent condition. Gary Watros, 591-4168.

65 Mustang, 2 plus 2, 289 hp, autotrans, GTO package, pwr. brakes & steering, rally pack. Low mileage, one owner \$1600. Don Heywood, Dickinson 534-3979.

63 Dodge Polara, 4 Dr. Ht. Has A/C, power steering, power brakes, good tires. Excellent Condition. \$825. Gene Nitsch, HU 4-5628.

66 Corvair Corsa convertible, 4-speed, 180 h.p., turbo-charger, radio, heater, madeira maroon with black top, slight damage to left rear fender. \$1400. Diana Guy 877-2107.

61 VW sedan, good condition, new tires, \$545, Ted Sampsel, GR 1-0172.

62 Chevrolet station wagon. Top mechanical condition, 6 cylinder standard transmission, \$495. J. V. Bailey 534-5468 Dickinson.

Getting married and must sell either blue 67 Mustang hardtop, 8,000 miles, automatic, air, power steering and brakes, AM radio, white walls, tinted glass, etc., Zeibart rust-proofing, or red 67 Sunbeam Alpine, 7,000 miles, wire wheels, AM/FM radio, tanneou. Has Chrysler 50,000 mi/5 yr. warranty. Bob Schmitz, HU 4-4856 after 5.

Late 63 Austin-Healey Sprite. New top, wire wheels, good shape, red, \$750. Carol Yeager, GR 7-1354.

Moving, must sell! 55 Chrysler: 4 dr., heavy trailer hitch, good condition, excellent work and fishing car, \$210 Robert Pierce, 946-9210.

67 Ford Falcon Futura, green, 4-door, 6 cylinder, automatic, 6000 miles, bank loan balance or take up payments, G. Moseley, MI 4-7245.

64 Crown Imperial Chrysler 4-dr hardtop, fully equipped 2-tone green, excellent condition. D. R. Wolf, MI 2-8949.

62 Pontiac Tempest 2 door, A/C, WW, R, H, \$500. R. Latta, Dickinson 534-4380.

67 Austin Healey 300 Mk III, immaculate condition, 7800 miles under warranty. John Hirasaki, 591-3779.

FOR SALE-MISCELLANEOUS

AKC registered collie, 1 1/2 years, obedience tng. William Callegari, 729-4394.

66 model 30-in Kenmore gas automatic range, over/under double oven, white. Cost \$450; sell for \$300. William Callegari, 729-4394.

B-flat Clarinet, Cartier professional model, new pads, good corks, with case, \$55. Fred Jaap, 534-4927, Dickinson.

Air compressor, 2-cylinder, 5 cu ft/min, 25 gal tank, automatic control, 1 1/2 horsepower 110-220 volt motor, \$95. Pesman, HU 2-7692.

Alcort Sunfish sailboat complete with dacron sail, sail bag and cartop carrier. \$385. Walt Fruland, MI 5-2897.

English Pointers—AKC reg. top show and field stock, liver & white pups available September, \$100-\$150. Rita Heywood, Dickinson 534-3979.

Boys 26 in. bicycle, Sears model, good condition, \$12. J. H. Willis, HU 4-3647.

Kodak Instamatic 100 with case in excellent condition. Also Polaroid Swinger in excellent condition. \$10.00 each. J. Hutchins, MI 3-5894.

SBE-33 complete mobile rig. 15-80 meter bands, \$225. D. A. Young, 925-3312 Alta Loma.

56 cu. ft. G.E. frost-proof refrigerator, 10 in. tricycle, toy fire engine, net play pen, part-a-crib, baby swing-a-matic (7 ft. and 9 ft.), coordinated braided rugs, free 7 week-old kittens. James Hannigan, 534-4292 Dickinson.

12 by 18 ft. beautiful gold carpeting, 100% nylon, with padding. Used 2 months. \$125. 9 by 12 ft. gold tweed blend carpeting, no padding. \$40. Diana Guy, 877-2107.

Hallcrafters transceiver—for auto, airplane, boat or home. Citizens Band 12 channel model, CB-12. Never used. Cost \$160.00 asking \$95. Vince Lipovsky, HU 8-2293 or 877-4288.

1967 Hondo 75, white like new, less than 1700 miles, ready to go, \$225. Gerald Waddell, League City, 932-3881.

Buckskin quarter horse, been used for beginners riding. R. F. Fletcher, Ext. 6205 (no home phone).

AKC reg. Labrador pups, yellow and black. W. A. Chandler, 3016 Longwood Ln, Dickinson, 534-3118.

65 hp Mercury outbd mtr ('64) elec start w/alternator, long shaft, controls, and tachometer, runs on 50:1 fuel mix B. F. McCreary, 946-5583.

Selmer flute in excellent condition—no missing pads. Paid \$200, will sell for \$65 firm price. LeAnne Bible, 944-0835.

Heathkit DX-40 transmitter, Eico 720 transmitter, and crystals for 80, 40, and 15 meter novice bands. All in good condition. Nancy Pollock, WI 5-6825, Texas City.

M1 Carbine hunting ammunition, 10c a round. Also will load your 243, 270, 308, or 30-06 brass for \$3.00 a box. J. Wells, HU 6-5817.

Colt 45, Commander automatic, like new with new holster and 57 rounds ammo. \$70. Jim Cooper, 591-2723.

Guitar-seldom used, beginners model \$7.50. Jay Gordon after 3 pm, 486-0704. 16 gauge modified choke model 12 Winchester pump. Near perfect condition. Price \$100. Harrison F. Rees, 534-5655.

Moving, must sell! Hotpoint refrigerator, \$50; Roper gas range, 2 broilers, new oven thermostat, clock, \$75; Sears Coldspot air-conditioner, used 2 summers, 1650 BTU, 220

volts, \$170; white vinyl easy chair, \$10. Robert Pierce, 946-9210.

1962 Cushman Truckster, 3-wheel scooter with enclosed cab and pickup truck type body. Engine in excellent condition, just completely overhauled. Body in very good condition. \$200 or best offer. R. A. Vogt, HU 8-4069.

Lowrey transistorized electric organ—2 manual, full pedal board, Leslie speaker, many extras, including bench. Walnut finish, 2 yrs old, but like new. Cost \$1450. Will sell for \$900. Can be financed at \$25/mo. James Weaver, 932-2371.

Electric floor scrubber, polisher and waxer. \$15. James Weaver, 932-2371.

Eight hours of live entertainment plus food and beverages. Tickets for the October 14 MSC Picnic on sale in the cafeteria and from picnic representatives in each building.

Miscellaneous electronic test equipment for sale or trade. R. B. Lang, HU 8-0149.

Sofa bed, green-gold toned cover, \$30. B. Puckett, 591-4707.

Toy Collie, female, not registered, has rabies and distemper shots, de-wormed, 6 months old, ginger color, very friendly, \$70, C. E. Chassay, HU 7-2940.

Franciscan "Desert Rose" dinnerware, service for four, plates, cups & saucers, bread & butters, soups, plus 2 small desert dishes, cream & sugar, large serving dish, large meat platter, one salad plate, salt & pepper and four matching 10-oz glasses. All for \$25.00; brand new bicycle exerciser \$7; bamboo table, needs some refinishing \$5; modern solid walnut & cord chair (folds up) \$10; 45 gallon aquarium stand and fluorescent light \$10 (will throw in 45 gallon tank needing resealing). Vanderoef, HU 2-7540.

Will trade excellent Bundy Clarinet for good 2-wheel utility trailer or 10-12 ft. aluminum V boat. L. V. Lindley, 877-3046.

10 ft Sailoar fully found, dacron, sail gunter rigged, includes oars, \$435. Eric Swarthe, 591-4378.

3.5 hp Sears outboard, aircooled, almost new, with 6 gallon cruise tank. \$110. Eric Swarthe, 591-4378.

Coleman 2 burner portable gas stove. Needs minor repairs; rural mail box w/poles; USAF officer uniforms, current styles, incl. mess dress—blouses 36-38R, pants 32"X33"; best offer for each, Gary McCollum, HU 7-2047.

26 ft Cruise Along, twin-screw cabin cruiser, 2X135; radio, depth finder. \$2,750 includes haul and painting hull. D. E. Fielder, 649-6243.

Nice dresser and night stand, good condition. J. Whiteley, HU 6-3804 after 5.

Polaroid Camera, 250 with flash attachments, new. Code-a-Phone, answers telephone automatically and records messages. Fountainette, dispenses cold soda and three drinks. Ann Hardeman, GR 1-4776.

AKC registered German Shepherd pups. Healthy, reasonably priced. Barbara Williams, HU 4-1524 after 5 and weekends.

Black and silver-black AKC Poodle puppies. \$35 to \$50. C. Allday, HU 7-2323.

Amplex stereo tape unit, model 861, speakers-mikes, in warranty. Will trade for amateur equipment or sell. Deepfreeze, 17 cu. ft. chest type, good condition \$75. Pickup canopy for LWB—fleetside, pickup \$150. Gordon Pulliam, HU 8-2250.

Contemporary dining room suit: table, 2 arm chairs, 2 side chairs, upholstered, good condition, \$125. J. W. Bilodeau, HU 2-7990.

WANTED

Ride wanted, Clear Lake area to U of H campus. Will negotiate time and drive or share expenses. Clark Neily, Ext. 5348 (no home phone).

Ride to Bldg. 2, 8:30-5, from 1100 block Westheimer (near Tower Theater). Roger Diamond, JA 9-0172.

Dinette set—at least 6 chairs. Can be modern or contemporary style. No early american. Bob Hymer, MI 9-0416 after 6 pm.

Ride from Baytown to Bldg. 4, 7:30 to 4, E. Phelps, 582-5295.

Gentleman cat, any breed, as temporary companion for amorous lady Persian. Owners and neighbors desperate. F. L. Greene, 591-2305.

Lady engineer or similar to share 2-bedroom apartment in NASA area, Ann Accola, 591-4596.

Jeep—old, used, cheap. Roy Alford, 932-2857.

Edger/trimmer, gasoline powered, good condition, Gary McCollum, HU 7-2047.

Tryouts Start Saturday For 'Inherit the Wind'

"Inherit the Wind," Pulitzer Prize-winning play by Jerome Lawrence and Robert E. Lee, will be the next Clear Creek Country Theater production and is scheduled for a six-performance run to begin November 9.

Dave Goldenbaum of Apollo Spacecraft Program Office and president of the Country Theater will direct the play. "This play will put me face to face with the most complex challenge of my 30-year career as a director," said Goldenbaum.

Casting tryouts will be held Saturday and Sunday at 2 pm at the Country Theater in League City. Goldenbaum said that he will cast 47 men, eight women and four teenagers into parts in the play which is based upon the courtroom battle between William Jennings Bryan and Clarence Darrow in the Tennessee trial of high school teacher William Scopes, accused of teaching Darwin's theory of evolution.

About 30 of the cast will have occasional lines as townspeople and spectators during the trial and will also sing and shout hymns during a spectacular pre-trial prayer meeting. Leading male parts will be those of Darrow, Bryan, Scopes, the judge, editor-critic H. L. Mencken and the Reverend Brown. Leading female roles are Scopes' fiancée Rachel Brown and Mrs. Bryan, with strong support from the other six adult women in the cast. A boy and girl in the 12-13 age bracket also have strong roles.

"Being in the cast of a first-class play can be a tremendous experience, and I urge MSC people to come to tryouts," said Goldenbaum. "The fun of playing a walk-on role or bit part can be a revelation. And don't worry about lack of experience—I'll teach all the tricks and build the confidence."

Stage manager and set builder for "Inherit the Wind" will be Leroy Proctor of IESD. Jill Royce, wife of Northrop's Scott Royce, will produce the play. Designing and operating lighting will be John Harned of Lockheed. Kay Soens, wife of Robert P. Soens, Engineering and Development Directorate, will be in charge of furniture and properties.

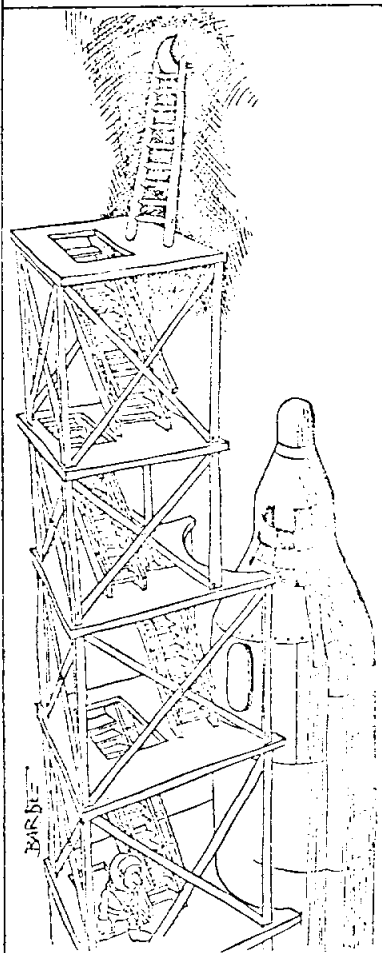
MSC and contractor employees wishing to take part in backstage activities should contact the director or any of the persons named above.

Awardee



Arminta Yanez
Regional Audit Office
Sustained Superior Performance

Lunar Landing — British View



—Filched from Punch

Cost Reducers



ACHIEVEMENT AWARDS—Cost Reduction Program Achievement Certificate awards recently were made to William R. Kelly, left, ASPO Spacecraft Support System Contract Engineering Branch chief, and to Robert F. Nugent, ASPO Ground Support Equipment Branch.



BACK TO THE INDIANS—Not a mating dance of birds but two members of the Latonka Indian Dancers who will entertain at the fifth annual MSC Picnic October 14 at Galveston County Park.

Varied Entertainment Scheduled At MSC Annual Picnic October 14

More than 100 performers will be on hand to entertain at the fifth annual MSC Picnic October 14 in Galveston County Park. Entertainers include dance groups, a motorcycle exhibition, ski show, circus band, clowns, musical combos and exhibition ballgames.

A Levi-attired square dance group, the Wheeler-Dealers, will

do-si-do in an exhibition of western square dancing. Getting equal time will be the Latonka Indian Dancers, a dance group of 40 boys and girls who recently won the Texas Indian Hobbyist Association Championship. The Latonka Dancers have been asked by the Alabama-Coshatta Indians to perform on the reservation—one of the few white hobbyist groups to be so honored.

The Shriners will hold a motorcycle exhibition and the Arabia Shrine Circus Band will wander about the Park providing oompah-pah circus music to accompany the barbecue-beer-sodapop fare. Several Shrine Circus clowns will also be on hand to entertain the small fry.

Water ski expert Doc Rail will skim across the surface of Clear Creek in a water ski exhibition. Meanwhile, back ashore, the second-place Flight Control Division baseball team will challenge the top league team, the Lone Stars, to a playoff game. Softball and volleyball games are planned for the girl-types.

Dancing and listening music will be provided by the John Sylvia combo. Trophies and prizes will be awarded winners of the many contests and games planned for every age group.

Because of the large number of cars expected, attendants will man the parking lots. Those planning to come to the picnic by boat are reminded to be sure that their boats can pass safety inspections.

Picnic tickets are for sale in the MSC Cafeteria or from picnic representatives in each building. Prices run \$1.50 each for adults, \$1 for children 6-11, and \$.50 for children 5 and under. The tickets bear printed instructions on the stub-for-food-and-drink procedure.

Betty Schick at 3371 and Rita Sommer at 2397 are still seeking volunteers to help out in all the pre-picnic chores that have to be done.

Clostridium Tetani Will Get You if You Don't Watch Out

by Evelyn D. West, Chief Nurse

A small pox vaccination and tetanus immunization are now offered, on a voluntary basis, to each MSC employee in conjunction with the annual physical examination performed at the dispensary.

Not long ago, smallpox was deadly. Between 1900 and 1925, there were over 40,000 cases reported in the United States. Since 1942, there has been a rapid decline due to the enactment and enforcement of international vaccination laws.

The only way to prevent smallpox is by being immunized every three years, but there is no way to determine the duration of immunity from any one vaccination.

Tetanus immunization is recommended to protect you. Injuries incurred both indoors and outdoors may result in infection caused by *clostridium tetani*—an organism that has a worldwide distribution which may remain viable for ten years or longer under optimal conditions.

Now you know the immunizations are available, so it is up to you to realize their importance and to take advantage of this opportunity.

ROUNDUP

SECOND FRONT PAGE

Moonscape May Have Vast Mineral Wealth

There long has been speculation that the moon may hold tremendous wealth in minerals. Is this just folklore or is there enriched ore to be found in the rocky and forbidding lunar hills?

The rich ore deposits may be there, according to National Aeronautics and Space Administration studies of a phenomenon known as "sputtering."

Sputtering is peculiar to a high vacuum environment such as exists on the moon. The NASA studies show that one of the results of sputtering can be the enormous enrichment of metals.

Under high vacuum conditions, solar protons or heavier ions hit or bombard material and may knock atoms from its surface. This is sputtering.

When this occurs on the moon, the atoms may be driven deeper into the surface where they recombine; they may be driven on to other lunar surface protuberances and recombine; or they can escape the moon entirely.

It is this last action that makes sputtering a metallurgist's dream

come true. For a consequence of the escape is enriched metals.

Recent observations of the phenomenon of sputtering indicate that some of the moon's surface, perhaps as much as one per cent, may have been removed from the moon during its lifetime. If this is so, the lunar surface may be imbedded with metal of untold wealth.

Observations of sputtering and its effects have been made possible in recent years by NASA scientists who succeeded in generating high (near lunar) vacuum conditions in a laboratory.

Previously such generation was impossible and scientists were unable to observe the effects of the lunar environment on the materials and the space components that would be used to send men and machines to the lunar surface.

The importance of such observations for the successful achievement of manned and unmanned lunar missions is obvious.

A barnstorming stunt at Long Beach, California, was to have far reaching consequences. Frank Hawks maneuvered his SJ-1 close beneath Earl Dougherty's "Jenny". Wesley May crouched on Hawks' wing, and as they neared the trailing ladder he leaped for it. Seconds later, May unstrapped a 5-gallon gas can from his back and poured its contents into the "Jenny's" tank. This was aeronautics' first "rendezvous," and with a little license, "docking."

On an Apollo lunar mission, critical rendezvous and docking maneuvers occur twice. On the way to the moon, the Apollo crew will reverse position of the manned craft, dock with the Lunar Module, and extract the LM from the Saturn/spacescraft adapter section.

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Later, upon leaving the lunar surface, the LM ascent stage will climb to an altitude of some 80 miles and dock with the orbiting mother craft.

While rendezvous may not be a new technique for airmen, it's considerably more difficult in space, especially 250,000 miles from earth.

And of course, everything has to work right, the first time.

