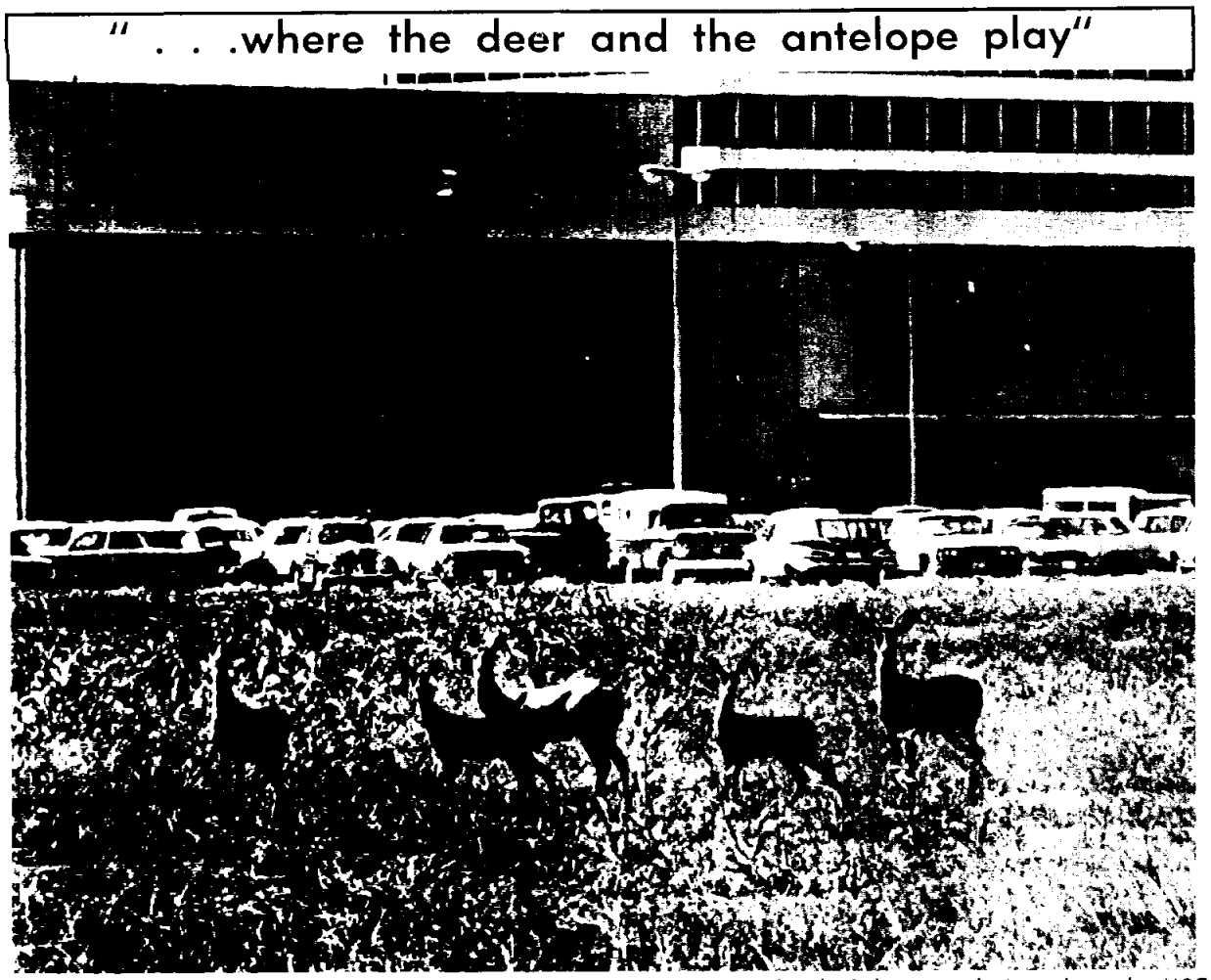


MSC MENAGERIE—Five sets of ears cocked forward October 25 as a herd of deer wandering about the MSC campus caught the whirr of the photographer's shutter. The white-tail deer are probably the last remnant of the wildlife that lived on the MSC site before construction began. In the not too distant past, timber wolves ranged the north shore of Clear Lake as did many other species of now departed critters. (photo by Jack Jacob)

ROUNDUP

NASA MANNED SPACECRAFT CENTER HOUSTON, TEXAS

VOL. 7, NO. 2 NOVEMBER 10, 1967

Two Orbiters Scuttled To Clear Frequencies

An adjustment has been made in the orbit of Lunar Orbiter V and Lunar Orbiters II and III have been crashed to the lunar surface.

Engineers at the NASA Langley Research Center, Hampton, Va., commanded velocity control engine burns on the second and third Orbiters to destroy them by crashing, because their attitude control gas supply was nearly depleted. Their radio frequencies are thus freed for future use.

Lunar Orbiter V's orbit was changed because of an eclipse of the Moon on October 18. The change was intended to assure that the power system of the spacecraft can survive the long period of darkness in the eclipse.

Lunar Orbiter V is normally in darkness once every orbit as it passes through the shadow of the Moon. During that time it operates on battery power because the solar panels receive no energy from the Sun.

Without the orbit adjustment, the October 18 eclipse would occur between two such periods of darkness, lengthening the total time in shadow to an unacceptable period of about five hours.

The orbit adjustment, made at 2:37 pm CDT, October 10, consisted of burning the spacecraft velocity engine for about 41 seconds while Lunar Orbiter V was close to perilune (low point) of its almost-polar orbit. It was the 27th engine burn of the Orbiter program.

The engine burn was intended to lengthen the period of the spacecraft orbit by about 37 minutes.

NASA plans to preserve Lunar Orbiter V in operating condition as long as possible to serve as a tracking target for stations of the Manned Space Flight Network. It provides a training aid for the MSFN station crews and is used to verify computer programs or orbit determination planned for project Apollo.

Lunar Orbiter V began circling the Moon August 5, 1967, and was in its 471st orbit when the orbit was adjusted. It has an estimated lifetime, based on

(Continued on page 8)

Solar Seminar Set November 22

"Oscillations in the Solar Chromosphere" will be the topic of the November 22 solar physics seminar sponsored jointly by MSC and the University of Houston.

Dr. Ian Elliott of Sacremento Peak Observatory will present the talk at 3 pm in the Bldg 31 conference room, Room 193. Employees whose jobs are related to the seminar topic are invited to attend.

TWA Executive Speaks to AIAA Meeting Monday

Robert W. Rummel, vice president of Trans-World Airlines, will be in Houston November 13 to talk about the supersonic jets and huge Jumbo airliners that soon will carry passengers by the hundreds into

Houston's still unfinished Jetero International Airport.

He will address the Houston Section of the American Institute of Aeronautics and Astronautics at the Nassau Bay Hotel at 8 pm, following dinner at 7 and a social hour at 6 with AIAA members.

Rummel, 52, has been vice-president of Planning and Research for TWA since April, 1959. Before that he was vice president in charge of engineering.

Trans-World Airlines has already ordered swift supersonic passenger jets, and will be among those airlines flying

(Continued on page 8)

Apollo IV Launch Planned Thursday

The first flight test of the Apollo Saturn V launch vehicle at *Roundup* press time was scheduled for liftoff Thursday at 6 am CST from Kennedy Space Center Launch Complex 39.

Originally scheduled for launch Tuesday, the launch was postponed for two days when test and checkout procedures feel about 40 hours behind and the handling of hypergolic propellants took more time than was anticipated.

The Apollo/Saturn V is the most powerful space vehicle developed in the United States space program. It is 363 feet tall and its first-stage engines produce 7,500,000 pounds of thrust at liftoff. Weight fully fueled is 6,220,025 pounds. The Saturn V launch vehicle will place 278,699 pounds in a 101-nautical-mile (117-statute-mile) Earth orbit.

Objectives of the Earth-orbital unmanned mission are to obtain flight information on launch vehicle and spacecraft structural integrity and compatibility, flight loads, stage separation, subsystem operation, emergency detection subsystem operation and to evaluate the Apollo command module (CM) heat shield under conditions encountered on return from a Moon mission.

The Apollo IV mission also will test flexible thermal seals to be used in the new outward-opening, quick-release hatch for the command module. On Apollo IV, the command module hatch window has been replaced with a test panel containing simulations of the seals and gaps between the hatch and the surrounding heat shield.

The Apollo IV mission includes several significant milestones in the United States program to land men on the Moon and return them safely to Earth.

- It will mark the first launch from the Kennedy Space Center launch Complex 39;
- The first flight of the integrated Apollo/Saturn space vehicle;
- First flight of the first (S-IC) and second (S-II) stages of the Saturn V launch vehicle;
- First engine restart in orbit of the upper (S-IVB) stage of the Saturn vehicle, and the first demonstration of Apollo spacecraft performance entering the Earth's atmosphere at speeds reached on return from a mission to the Moon.

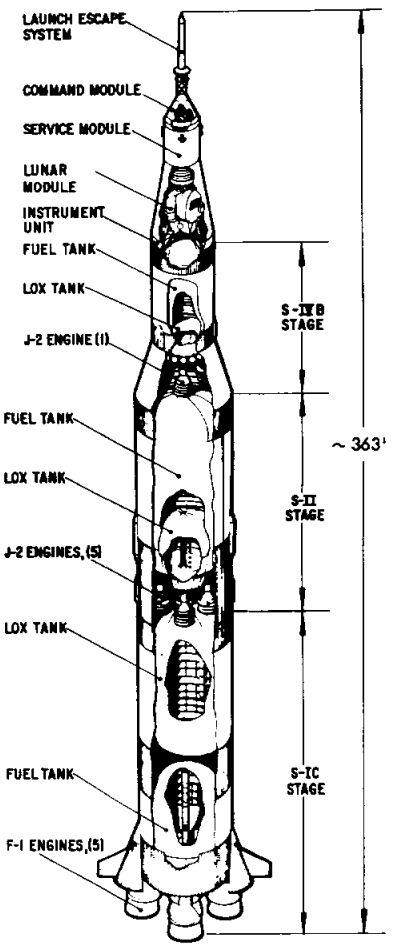
The Apollo IV flight plan calls for the Saturn V launch vehicle to place the Apollo spacecraft and the launch vehicle third (S-IVB) stage into a 101-nautical-mile (117-statute-mile) circular orbit inclined 32.73 degrees to the equator.

After completing two orbits, the third stage will ignite a second time to place the Apollo spacecraft into orbit with an apogee of 9,391 nautical miles (10,800 statute miles).

After separating from the third stage the spacecraft will raise its apogee to 9,890 nautical miles (11,400 statute miles) by firing its service propulsion system (SPS) engine. A second service propulsion system burn during descent from apogee will boost reentry velocity to 36,333 feet-per-second (25,000 statute miles-per-hour, 21,800 knots for the spacecraft command module.

The command module, protected by its heat shield, will reenter the atmosphere, return to Earth, and be recovered about 540 nautical miles (622 statute miles) northwest of Hawaii. Landing will be eight hours, 41 minutes after liftoff.

The spacecraft for the Apollo IV mission consists of a Block I command and service module (CSM) and a lunar module (LM) boilerplate. The service module



SATURN V

(SM) will be separated from the command module before reentry.

The lunar module boilerplate will remain attached to the third stage of the launch vehicle which will follow an orbit similar to that of the spacecraft and reenter the atmosphere over the Pacific Ocean.

The Saturn V launch vehicle consists of three stages and an instrument unit (IU).

The first stage (S-IC) is 138 feet tall, 33 feet in diameter and weighs 307,000 pounds empty. Its fuel and oxidizer tanks have a capacity of 4,400,000 pounds (214,200 gallons of RP-1 kerosene, and 346,400 gallons of liquid oxygen). Its five F-1 engines develop a combined 7,500,000 pounds of thrust at liftoff and burn 15 tons of fuel per second.

The second stage (S-II) is

(Continued on page 2)

First Saturn V

(Continued from page 1)

LAUNCH ROOM—The firing room for the first flight of Saturn V is located on the third floor of the Launch Control Center some three and a half miles back from Launch Complex 39. The LCC is adjacent to the Vehicle Assembly Building. The firing room is the successor to the underground blockhouses used in earlier programs.

81.5 feet tall, 33 feet in diameter and weighs 88,000 pounds empty. Fully loaded it weighs 1,033,000 pounds including 267, 700 gallons of liquid hydrogen fuel and 87,400 gallons of liquid oxygen. Its five J-2 engines provide 1,000,000 pounds of thrust.

The third stage (S-IVB) is 58.4 feet tall, 21 feet eight inches in diameter and weighs 26,500 pounds empty. It carries 230, 000 pounds of propellants—66, 900 gallons of liquid hydrogen and 20,400 gallons of liquid oxygen. Its single J-2 engine develops 200,000 pounds of thrust in space.

The instrument unit is three feet high and 21 feet eight inches in diameter. It weighs 4,750 pounds and contains six major systems — structural, thermal control, guidance and control, measuring and telemetry, radio frequency and electrical.

The Apollo IV spacecraft includes the conical command module, 12 feet high and 12 feet 10 inches in diameter at the base. It weighs 12,000 pounds.

The service module is a cylinder 22 feet high, 12 feet 10 inches in diameter and weighs 55,000 pounds including fuel at launch. It contains the service propulsion system engine which develops 21,500 pounds of thrust.

The lunar module boilerplate, which weighs 29,500 pounds, is contained within the spacecraft lunar module adapter (SLA) which is 28 feet high, and tapers from 22 feet in diameter at the base to 12 feet 10 inches at the top. The spacecraft lunar module adapter weighs 3,900 pounds.

The spacecraft launch escape system atop the command module is 33 feet tall with a base diameter of four feet. It weighs 8,200 pounds including a boost protective cover which fits over the apex of the command module to protect it against aerodynamic heating during launch and from the rocket exhaust of the launch escape system motors. The launch escape system provides the capability to lift the command module from the remainder of the space vehicle in event of an emergency on the pad or shortly after launch. The launch escape system is jettisoned shortly after ignition of the second stage of the launch vehicle.

SANTACRUZ MEETING—

Directorate Publishes Lunar Study Report

The Science and Application Directorate November 6 released a report on the 1967 Summer Study of Lunar Science and Application.

The 398 page report contains the findings of the two week lunar planning session which was held at the University of California, Santa Cruz, California, July 31-August 13, 1967. Purpose of the conference which brought together more than 120 outstanding government, industrial, and university scientists, was the formulation of recommendations for lunar exploration beyond the Apollo mission.

Dr. Wilmot N. Hess, Director of the MSC Science and Application Directorate, was chairman of the session. The report reflects the concerted opinions of a group of outstanding scientists in the fields of geology, geophysics, geochemistry, bioscience, geodesy and cartography, lunar atmospheres, particles and fields, and astronomy.

In the preface, Dr. Homer E. Newell, NASA Associate Administrator, states distribution of the report is to give the national scientific community the benefit of the thinking of this selected group of scientists, and "perhaps to stimulate them to the generation of new ideas which might be beneficial." Dr. Newell specifies 1967 Lunar Science and Exploration "is *not* an official NASA program for lunar exploration and is not to be considered as presenting the official plans of the agency for activities on the Moon."

Edited by John Harris, Technical Assistant to Dr. Hess, the report (NASA SP-157) is available for purchase ($3) by writing to the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia.

Cyclists Trek To *Wurstfest*

The newly-formed MSC motorcycle club, the Space Center Cycles, Friday rode their hogs to the annual New Braunfels Sausage Festival in the heart of Texas' German belt.

The club elected Bill Moore of IESD president at its October 26 meeting. Persons wishing to join the group may call Moore at 2291 or James Skipper at 2170.

Aeromedic Residency Program Held at MSC

By Doug Burns

Development of spacecraft for manned flight is a team effort. Aerospace medicine is the area of medical specialization which has evolved in response to the need for medical expertise in the development and construction of aircraft and manned spacecraft. Aerospace medicine had its beginnings during World War I. Specialized physiological knowledge was needed for selection of airmen trainees. Medical input to aircraft and spacecraft design criteria is an outgrowth of this early application.

The Medical Operations and Research Directorate of MSC is charged with the responsibility for man's safety while aboard a spacecraft. In addition to managing medical research and operations for manned spaceflight, the Medical Directorate sponsors several training programs. The Third Year Residency Program in Aerospace Medicine is one of these programs.

At present there are three aerospace medical resident physicians on board:

Dr. Roy Fagin received his medical degree from Lausanne University in Switzerland. He is a graduate of Ohio State University's Department of Preventive Medicine with a specialization in Aerospace Medicine. This was the first civilian program in aerospace medicine.

Dr. Clarence A. Jernigan received his MD from Baylor University College of Medicine, Houston. He took his primary courses in aerospace medicine while in the US Air Force at Brooks AFB, Texas. He is a graduate of the Harvard School of Public Health with a masters degree in public health. He has also completed part of his residency program in aerospace medicine while in the air force.

Dr. Robert Leet received his MD from Albany Medical College in New York. He received a masters degree from the Harvard School of Public Health with a specialty in aerospace medicine.

A doctor interested in becoming a specialist in aerospace medicine must first be a graduate of an accredited medical school and have completed his internship requirements.

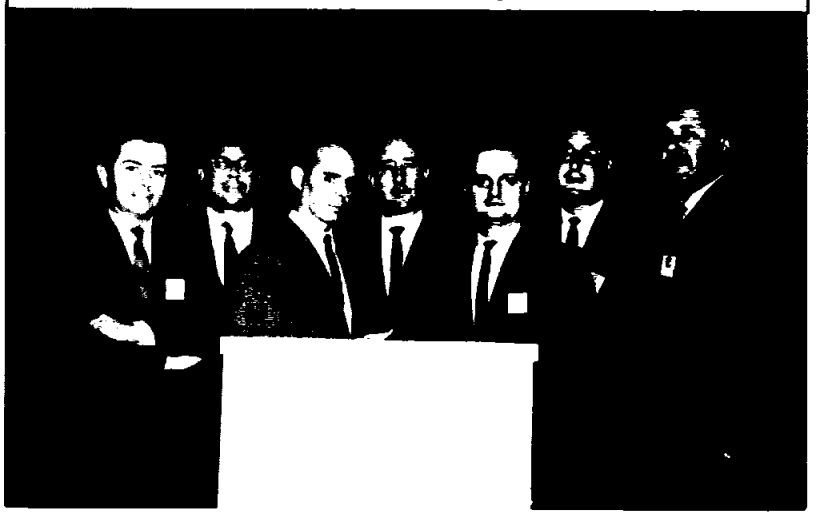
The initial three years of training in aerospace medicine are broken down into two phases, two years of classroom training during which time a masters of science degree in public health or in aviation medicine is earned, and then one year of supervised residency. Following this initial training period, three additional years of experience in the field of aerospace medicine must be completed before final tests are administered and the specialty degree is conferred.

During the supervised third year residency at MSC timely rotational assignments are planned so that the residents are provided the opportunity to take full advantage of research projects and operational support activities related to the manned spaceflight schedules. They will have the opportunity to observe and evaluate real-time biomedical data and to perform post-flight analyses.

Medical residents are encouraged to author research reports during their stay at MSC. In addition, residents serve as personal physicans to flight crews and their families to better understand all factors which may influence a pilot's health. Upon completion of their residency program in June, 1968, the residents will all have gained some insight into the complexity of the problems associated with manned spaceflight.

Career opportunities in aerospace medicine are available in three areas: in the federal service working in agencies such as NASA, the Federal Aviation Administration, and the military services; in industry working with aircraft and spacecraft manufacturers and with the airlines; and in teaching or research work.

Toastmasters Top Echelon



NEW OFFICERS—The MSC Toastmasters Club recently installed new officers for the coming club year. Left to right are outgoing president Maurice Tremblay, educational vice-president William H. Harris, former area governor W. M. Greene, administrative vice president Jerry Haptonstall, president Ed Kusik receiving gavel from Greene, treasurer J. Kochner and secretary R. Mercado. The Club meets at 6 pm on the first and third Wednesdays at the Sheraton Kings Inn on NASA Road 1. Men interested in joining the Toastmasters may call Haptonstall at Ext 7361.

Flight Controller Hopes He Won't Be Needed

By Milt Reim

One flight controller in Mission Control Center-Houston says he prefers not to have to do anything as far as controlling the IV spacecraft on the Apollo IV mission, but if he must, he will.

Joseph E. Borches, a propulsion systems engineer, on loan to NASA from North American Rockwell, is the flight controller. He mans a special console in MCC-H that will come into play only if all other means of controlling the Apollo IV spacecraft fail.

This special console is in MCC-H for the first time and will be used only on unmanned missions. This system was available on one previous mission but was not used. The mission was Apollo 202 and control consoles were at remote sites in Carnarvon, Australia and on board the *Rose Knot* and *Coas-Tal Sentry* tracking ships.

Borches was control console operator on the *Rose Knot* for Apollo 202. In addition to the MCC-H console for control of Apollo IV, if needed, consoles are aboard the *Vanguard* tracking ship and at Carnarvon.

If the onboard spacecraft computer develops a problem or some other onboard failure that would knock out the guidance and navigation system of the spacecraft, Borches or one of the remote site control console operators will take over control of the spacecraft.

On the console are meters or visual displays that give the attitude of the spacecraft as determined by telemetry sent back to earth from the orbiting vehicle. Supplied with the desired attitudes from the guidance or retro officers to complete the mission, Borches can send real-time commands through any of the remoted tracking stations that will fire the reaction control system thrusters to change the spacecraft's attitude and orient it to the proper position. He would do this by pushing a series of buttons on the console and observing the dials and visual displays that tell him the attitude of the spacecraft. It appears to be a simple operation but can be very tricky, according to Borches.

Borches said it would be much like flying a drone aircraft from the ground via remote control. By pressing the real time command buttons on his console in MCC-H, he would be doing basically what a man onboard could do with the manual hand controller. In addition to being able to command the spacecraft to pitch, yaw, or roll to the desired attitude, he has another button on his console that will send a real-time command to separate the command and service module for reentry and landing. The real-time commands would be sent via the UHF communication link to the spacecraft from the ground.

AFGE Hears Brandon

Floyd Brandon, Chief, Personnel Division, will be the guest speaker at Lodge 2284, AFGE, meeting Monday in Bldg 30 Auditorium at 5 p.m.

Brandon will speak on the budget cut, its impact on MSC, potential steps planned for action, and attempt to clear some of the many rumors now circulating through the Center. All MSC employees are invited to this meeting to hear Brandon and to ask questions.

Logistics Group Forms Chapter In MSC Area

The Society of Logistics Engineers (SOLE), a professional association for industry and government personnel engaged in the field of logistics, was chartered in July 1966. Logistics has been defined as "the art of applying science to the planning, handling and implementation of personnel, material, and facilities including life-cycle design, procurement, production, maintenance, and supply support."

The primary purpose of SOLE is to engage in educational, scientific, and literary endeavors to advance the art of logistics technology and management. These activities are expected to lead to professional certification programs and to the incorporation of logistics disciplines into professional curricula leading to university degrees.

A Houston chapter of the Society of Logistics Engineers was formed in April 1967. H. P. Douglas of the Lockheed Electronics Company is president. Douglas emphasizes that the local chapter will embrace every logistics specialty including maintainability, systems and equipment maintenance, maintenance support equipment, human factors, training and training equipment, spare parts, overhaul and repair, handbooks, field site activation and operation, field engineering, facilities, packaging, materials handling and transportation.

"Our goal is to upgrade the thinking of industry and government toward the entire field of support operations. We are confident that those companies who participate in this society are going to realize improved methods, efficiency and reduced costs," said Douglas.

Industry and government employees interested in knowing more about the society should call Douglas at HU 8-0080 or any of the following: Jim Henley, Philco-Ford, HU 8-1270, and Paul Truitt, Brown and Root-Northrop, HU 8-2500, representing industry; Capt. Robert Kirkbride, HU 3-2601, representing the US Air Force; or Leo Wourms, HU 3-3031, representing NASA.

One Saturday in October . . .

MSC MELANGE—More than 7000 MSC employees and their families turned out for the October 14 annual MSC picnic in Galveston County Park to swarm over kiddie rides, watch Doc Rail and his waterski/kite show, eat 13,175 wads of cotton candy, eat 7100 servings of barbecue and trimmings, watch the antics of Arabia Shrine clowns and circus band, eat some more while the teenybopper set gyrated to the twang of a combo with amplifiers turned up full bore. Then they ate some more—12,196 snowcones, 11,930 bags of popcorn—and finally went home to the antacid nostrums.

La Salle's random landfall gave Texas its sixth flag, and even in defeat, he was the Magnificent Failure

La Salle's Landing Near Indianola

by E. M. Schiwetz

HE WAS a strange man, this native of Rouen. Born of wealthy (though not ennobled) parents, he had a good education in arts and sciences and in the Church. One who knew him called him a man "of a large soul . . . designing, bold, undaunted . . . not to be discouraged at anything . . . steady in adversity."

But the strong man had grievous faults. To offset his excellent qualities, his behavior could be intolerably haughty, his will too unbending, and his discipline so rigid that it "drew on him an implacable hatred . . ."

From an early age, the interests of this scholar-adventurer lay in the New World. While others measured its resources in terms of gold and gain, he yearned to expand it for the glory of France. For him, far horizons held more lure than the glint of gold. His was the restless spirit, the inquisitive urge to explore strange lands and uncharted seas.

Such was the character of Rene Robert Cavelier, Sieur de La Salle—a man who tossed aside a life of wealth and ease for the discomforts of an existence among savages. One who preferred painted Indians to powdered courtiers, his destiny took him thrice from his native France to the New World. And at the end of his third journey, hiding among tall reeds on a wild Texas plain, lay mutinous men with murder in their hearts.

La Salle had high hopes for the third voyage, which began from La Rochelle on July 24, 1684. Some years earlier, he had journeyed to the mouth of the Mississippi. There he had planted the *fleur-de-lis* flag and claimed the land for France, naming it Louisiana in honor of his sovereign, Louis XIV.

Reasoning that whoever controlled the Mississippi could control the continent, La Salle sailed now for the mouth of that great river. He proposed, according to one account, to (1) establish a fortified post on the Gulf of Mexico within one year after his arrival there and (2) to fortify on the Mississippi, about 50 leagues above its mouth and organize an expedition against the Spaniards in northern Mexico.

With him on this most enterprising of all his ventures went the *Joly*, a French warship of 36 guns; the bark *La Belle*, a small vessel of six guns; the supply ship *Aimable*, laden with goods to make the settlement; and the ketch *St. Francis*, carrying ammunition and some merchandise bound for Santo Domingo.

LOUIS XIV, described as a man of foxlike cunning, had driven a hard bargain with La Salle. The King agreed to provide soldiers and supplies, but La Salle was bound to refund the cost of the enterprise if it failed after three years.

Some 30 volunteers joined the expedition at La Rochelle, many of them gentlemen eager for adventure and the thrill of the unknown. For colonists came several families, as well as "girls matrimonially inclined." Accompanying La Salle were two nephews and his brother, Abbe Jean Baptiste Cavelier, founder of the order of the Christian Brothers and later canonized by the Church. With him, too, was a "trusted subordinate," one Henri Joutel, who wrote a complete chronicle of the expedition.[1] A number of clerics, mechanics, and workmen joined the adventurous band before it sailed.

MISFORTUNE befell almost before the voyage was well under way. Some 50 leagues out of La Rochelle, the *Joly's* bowsprit shattered, and all vessels turned into Rochefort for repairs. Some thought it no accident, but a piece of deviltry contrived by the ship's jealous and rebellious captain, Beaujeu, a man bitterly vocal in his resentment of La Salle's authority. The Crown had sown seeds of discontent and mutiny when it decreed that Beaujeu would be in command "in what concerns maneuvers," while La Salle "is to determine the route." Other campaigns have failed on less serious divisions of command.

With damage repaired and the voyage resumed, other vexations tightened relationships between the two commanders. Beaujeu muttered of the discomfort of "being on an overcrowded ship with an ill-tempered man." As for La Salle's ability as an explorer, Beaujeu boasted contemptuously that he would know as much as anyone about the country where they landed "at the end of a month." When he proposed to La Salle that the fleet put in at Madeira for water, and was refused, he stormed off to sulk and plot new frustrations for his tormentor. A short time later, he took small vengeance by outstripping the other ships and landing on the opposite side of Santo Domingo from the port agreed upon.

Here, fresh trouble waited. Sickness struck, and a large number of men had to be carried ashore. La Salle himself fell victim of the malady, lapsing into delirium and then into unconsciousness. His brother, the faithful Abbe Jean, nursed him back to health, but in the long period of illness Beaujeu worked overtime at the job of spreading distrust and ill will toward the ailing commander.

NOW came new and serious disaster. Hardly had La Salle recovered from his illness than he was driven into a relapse by news that the *St. Francis*, with its precious load of goods and ammunition, had been captured by the Spaniards. It was a cruel blow, and a council of pilots was called to determine how to proceed. They agreed to steer for the western point of Cuba.

After sighting Cuba and going ashore briefly on the Isle of Pines, where La Salle shot an alligator, the three ships sailed at last into the Gulf of Mexico. They badly overshot their mark. Whether through bad luck or because La Salle had only the latitude of the place he sought and not its longitude, the fleet sailed at least 400 miles to far southwest of the Mississippi's mouth.

Early in 1685, when the ships came upon an island (thought by some to be Galveston), Joutel wrote in his *Journal:*

"We were very near the Shoar, when we discover'd a number of naked Men marching along the Banks . . . Monseiur de la Sale was very well pleas'd to see them, imagining they might give him some Account of the River he sought after; but to no Purpose . . . they knew nothing of what he ask'd . . ."

Weighing anchor, the little fleet sailed on.

By now, La Salle must have been uneasy. His men grew restive, food and water were short, and he realized a landing must be made soon, to maintain morale and replenish supplies.

Seeking a place to land, they came at length to what is now identified as Pass Cavallo, an opening between Matagorda Island and Matagorda Peninsula. A scouting party, including La Salle himself, went ashore, found fresh water, and "kill'd a good Store of Ducks, Bustards[2] and Teal, and the next Day two Goats . . ."

By the middle of February, after a siege of foul weather and more exploration ashore, La Salle resolved to establish a temporary settlement.[3] He gave orders to bring the ships through the pass into the bay. Thus was set the stage for the next in an already grim succession of disasters.

Sounds were taken to determine the depth, stakes were set to indicate a course to steer through the pass, and the captains were ordered to proceed cautiously under short sail at high tide. Whether through bad seamanship or deliberate malice, the captain of the *Aimable* spread full sail and charged through the pass, running his ship aground. High winds and waves later split the helpless craft, scattering her cargo far and wide, most of it floating out to sea. La Salle took the crushing loss with fortitude, as Joutel explains:

"This Misfortune was so much greater, because that Vessel contain'd almost all the Ammunition, Utensils, Tools and other Necessaries for Monsr de la Sale's Enterprise and Settlement. He had need of all his Resolution to bear up against it; but his Intrepidity did not forsake him, and he apply'd himself, without grieving, to Remedy what might be."

Here was a grievous state of affairs. With his ketch captured by the Spaniards, with Beaujeu sullen and uncooperative, and with his supply ship beaten to shreds on a sandbar, even the stout-hearted La Salle was discouraged. But he bore up as best he might, salvaged what he

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" Schiwetz. Many of the places described in the series are within weekend driving distance of MSC.

[1] Joutel's *Journal of La Salle's Last Voyage* provided the basis for this article

[2] Cranes or brants.

[3] Historians generally place this as the point of land near the site of Old Indianola.

could, and the little camp rapidly took shape on the point of land. Boards washed ashore and brought ashore from the wrecked *Aimable* were used to build rude shelters.

While the settlement was being made, Beaujeu hatched a final piece of revenge. Hoisting sail on the *Joly*, he sped through Pass Cavallo, leaving La Salle under the impression he would return. Instead, he headed straight for France and was heard from no more. The party was thus left abandoned with only the bark *La Belle*.

Canoes were needed, and La Salle sent a small party to an Indian village to barter for some. While there, his men found that the savages had come upon some bales of Normandy blankets from the wreck of the *Aimable*. La Salle dispatched a party under Ensign du Hamel to bargain for the blankets, instructing the young officer to take them by honest and peaceful means. Instead, du Hamel frightened the Indians away and made off with the blankets, which the savages took as an act of war. That same night, camped along the shore, their fires blazing brightly, the party of Frenchmen was surprised by a volley of arrows which killed two gentlemen and gravely wounded others. One of La Salle's nephews, himself bearing three wounds, carried the alarm to the settlement.

CONCERNED by this sinister turn of events, La Salle resolved to build a fort, using "many pieces of Timber the Sea threw up." Afflictions followed fast, with malcontents and a weak-hearted few deserting the settlement. Joutel noted that:

"A Spaniard and a French Man stole away and fled, and were never more heard of. Four or five others follow'd their Example, but Monsieur de la Sale having timely notice, sent after them, and they were brought back. One of them was condemn'd to death, and the others to serve the King ten years in that Country."

Meanwhile, with the fort well advanced, La Salle began a program of ceaseless exploration. Still believing the Mississippi might not be far away, he made numerous journeys in search of it, scouting the surrounding country. During one of his absences, those remaining at the fort sighted a Spanish vessel, no doubt dispatched that way in search of the interlopers. Luckily for the garrison, the ship passed on without sighting the settlement.

PARTLY in the interest of better concealment from coasting Spaniards, and partly because a more favorable location was needed, La Salle decided to move his settlement and fort farther inland. A footnote at this point in Joutel's *Journal* locates the second fort on the Lavaca River, called by Joutel *le Riviere aux Boeufs* (River of Bullocks) for the great herds of buffalo that roamed along it. Dr. Herbert E. Bolton, however, holds that the place was "on the west bank of the Garcitas River, about five miles above its mouth, and on the highest point of the cliff-like bank of that stream." The Garcitas and Lavaca Rivers are in the same general area, and Joutel describes the location as follows:

"We were in about the 27th degree of North latitude, two Leagues up the Country, near the Bay of St. Lewis[4] and the Bank of the River *aux Boeufs*, on a little Hillock, whence we discover'd vast and beautiful Plains, extending very far to the Westward, all level and full of Greens, which afford Pasture to an infinite Number of Beeves and other Creatures."

All the while, La Salle continued to explore, ever hopeful that the Mississippi might be near. In his optimist's mind, every stream he found gave promise of being a tributary of the Father of Waters. But a sense of futility was spreading among his men. Even the faithful Joutel, who by now spoke of the Mississippi as "the fatal River," blamed it for all their woes.

IN MAY, 1686, misfortune struck again. The *La Belle* ran aground and was lost, leaving the settlement only canoes and rafts. La Salle returned late that year from his longest journey thus far, still without having found his "fatal River" and with only eight of the 20 men who had set out with him. Undaunted, he prepared at once to leave again . . . on the journey that was to be his last. Joutel wrote:

"We set out on the 12th of January, in the Year 1687 . . . Monsieur de la Sale, Monsieur Cavelier, the Priest, his Brother, Father Anastasius, the Recolet, Messieurs Moranget and Cavelier, Nephews to Monsieur de la Sale, the Sieurs Duhaut, the Elder, l'Arcleveque,[5] Hiens, Liotot, Surgeon, young Talon, an Indian, and a Footman belonging to Monsieur de la Sale."

In some of the latter persons named, La Salle had made some fateful choices.

The first day's stop was at a place the Frenchmen called *le Boucon*, not far from the fort, so named because they had often "dry'd Flesh" there. Meat so dried was called *Boucaner*, from the Indian word. (Pirates took the name of *buccaneers* because they relied to a great extent on boucaner for food.)

The third day out, the little party came upon a lone Indian, who fled for his life but was captured. Most of the men resolved to kill the poor savage, but La Salle would not have it. He treated the fellow kindly, gave him food and tobacco, and sent him on his way. It was a gesture that paid off handsomely in good relations later. Soon after, when a large party of Indians drew near, the savages and La Salle's party met in peace, both sides laying down their arms, then "smoaking and eating" on friendly terms.

ON THE party proceeded, crossing several rivers, among them the Colorado, at a place designated by some historians to have been near the site of modern Columbus, Texas. Joutel tells of other meetings with Indians along the way, and of a visit to a tribal village, where the elders received them well and gifts were exchanged.

Toward the middle of March, Moranget was guilty of an error in judgment that brought on his own death and may have touched off a smouldering conspiracy to kill his uncle.

Two buffalo had been killed and the flesh smoked. Liotot, Hiens, Duhaut and others had laid aside the marrow bones "to roast them, and eat the flesh that remained on them, as was usual to do." Moranget denied them this privilege, inflaming them to bloody revenge. Since the party had split before this incident, with La Salle and others going on ahead, the way was clear for the conspirators to carry out their plot.

That night, Liotot took an axe while some of the others stood guard and gave the sleeping Moranget, one of La Salle's nephews, "Many Strokes on the Head . . . " La Salle's footman and Indian were also hacked to death. According to Joutel, who was told later of the triple murder:

"The Indian and the Footman never stir'd, but the Sieur Moranget had so much Vigour as to sit up, but without being able to speak one Word, and the Assassins obliged the Sieur de Marle to make an End of him, tho' he was not in the Conspiracy."

With murder already done to his nephew and servants, La Salle's fate was sealed. To save their own skins, the mutineers had to kill their commander. Meanwhile, La Salle had grown uneasy at not having word from the group behind. On the 20th of March, he left Joutel in command of the forward party and went back to find the others. He went back to his death. Joutel tells the story as related to him by Father Anastasius Douay, who accompanied La Salle and saw him murdered:

"Duhaut passed the River, with Larcheveque. The first of them spying Monsieur de la Sale at a Distance, as he was coming towards them, advanc'd and hid himself among the high Weeds, to wait his passing by, so that Monsieur de la Sale suspected nothing . . . saw the aforesaid Larcheveque at a good Distance from him, and immediately ask'd for his Nephew Moranget, to which Larcheveque answer'd, That he was along the River. At the same Time the Traitor Duhaut fired his Piece and shot Monsr. de la Sale thro' the Head, so that he dropp'd down dead on the Spot, without speaking one Word."

FATHER Anastasius stood frozen with fear, expecting the same fate, but the assassins "put him out of that Dread, bidding him not to fear, for no Hurt was intended him . . . " Then they stripped La Salle's body and dragged it among the bushes, where they left it for beasts to devour. A later statement by Douay declares that the body was buried and a cross set up on the grave. This may be doubted. Francis Parkman, a noted historian of the La Salle epic, observes that Douay did not "always write honestly," and that he probably invented the story of the burial to cover his own dereliction in having failed to discharge that duty. The site of the assassination is believed by many to have been near the present town of Navasota, Texas, where a statue is erected to La Salle's memory. E. W. Cole, who made an exhaustive study of La Salle in Texas, places the assassination site farther to the northeast, in Cherokee County.

With La Salle dead, Duhaut assumed command. Those who had taken no part in the conspiracy feared for their lives—all but La Salle's brother, the Abbe Jean. According to Joutel, the Abbe:

" . . . could not forbear telling them, that if they would do the same by him, he would forgive them his Murder, and only desir'd them to give him a Quarter of an Hour to prepare himself: They answer'd, They had Nothing to say to him; that what they had done was the Effect of Despair, to be reveng'd for the ill Usage they had receiv'd."

THE justice due such men came, in their turn, to each of the conspirators. Duhaut was the first to go, being killed by Hiens in an argument over a division of tools. Ruter, who was with Hiens, killed Liotot in the same argument, shooting the surgeon through "with three Balls."

Some time later, after living together in mistrust and fear, the survivors split up. Seven whose hands were clean proceeded toward Canada, among them Joutel and La Salle's brother. The murderers, knowing what fate awaited them the minute they set foot on French soil, remained with the Indians in Texas.

Joutel and the Abbe, after many adventures and great hardship, finally reached Canada, arriving at Montreal in August, 1688. As for the traitors who stayed in Texas, a footnote to Joutel's *Journal* declares:

"Never were mutiny, conspiracy and assassination more signally and justly followed by retribution than in the fate of these miscreants . . . Exiled, by their own deeds, from Canada; in fear of their Spanish neighbors, whose dominion they had invaded, they were finally overwhelmed by an Indian attack, many of them butchered and the fort laid waste. Compulsory domestication among their savage captors was the fate of the rest; and when, in 1689, the Spanish general Alonzo de Leon visited the ruined fort of St. Louis in Texas, they were handed over to him, and expiated their sins in the naval service or prisons of Spain."

Thus ended the third and last voyage of La Salle, patriot and explorer. Though the enterprise ended in failure and death for him, it strengthened France's claim to a greater part of the New World.

Curiously enough, the three-year agreement between La Salle and Louis XIV was paid in full. La Salle paid for the venture — with his life — three years after the agreement was made. Though he seemed to fail, it was a failure on a magnificent scale.

Death of La Salle *by E. M. Schiwetz*

[4] Matagorda Bay.

[5] Should be Larcheveque.

Credit Union Straight Talk

By Paul Sturtevant

Let's talk about "Bum Deals"

We think it is a "Bum Deal"

- If you're making loan payments ALL over town
- If you're paying extra for credit life insurance
- If you're paying extra fees of any kind
- If you're paying a higher rate of interest than you'd pay at the Credit Union
- If they won't tell you exactly what the dollar cost of the credit is
- Or if you're not getting your money's worth for any of a dozen other reasons

Your Credit Union says: Don't make life tougher than it has to be! If your credit picture adds up to a "bum deal," stop in and let's talk about it. Perhaps we can show you how you can pay up all your bills with one low-cost Credit Union loan. Often we can reduce your total payments too.

In the future, make a special effort to steer clear of all the "bum deals." Stop at the Credit Union for honest, helpful suggestions whenever you're planning a purchase that has to be financed. Don't forget . . . not for profit but for service . . . that is your Credit Union motto.

Extend TRW Pact

NASA has announced a one year extension to TRW, Inc. of Redondo Beach, California to perform spacecraft analysis for Apollo.

The extension which carries the contract through June 1968 is valued at $10.7 million. TRW has been performing since August 1965 mission planning and spacecraft analysis for the Apollo Spacecraft Program Office (ASPO), under this contract. The extension for Spacecraft analyses increases the cost of the contract to $65.5 million.

Under the terms of the extension, TRW will perform studies, technical fact finding, and analyze, and investigate spacecraft systems of the Command and Service and Lunar Modules. TRW furnished data provides basis for decision making by ASPO.

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

WORKSHOPPERS—Dr. Nelda Lawrence, University of Houston professor of business education and office administration, standing, discusses a human relations problem with MSC executive secretaries, during the first Executive Secretarial Workshop.

AAP Environmental Control System To Undergo Manned Chamber Tests

A flight prototype of an environmental control system designed for potential use in extended Apollo Applications missions is being installed in Crew Systems Division altitude chamber preparatory to long-duration manned-system tests for early 1968.

The system, a modified Apollo ECS, incorporates several manned spaceflight firsts. These include a two gas system of nitrogen and oxygen, including a controller and cryogenic supply system, a molecular sieve for the removal of carbon dioxide from the spacecraft cabin atmosphere, an electrolytic silver ion generator for water sterilization and a system using the vacuum of space to dry solid waste material.

The equipment, designated the Environmental/Thermal Control and Life Support System (ETC-LSS), is the result of combined studies by Crew Systems life support engineers and the AiResearch Division of Garrett Corporation. Crew Systems and Garrett employees worked together in the design, development and fabrication of the new system. Extended tests were conducted on all ETC-LSS life-critical equipment prior to its shipment and installation in the Life Systems chamber. These tests not only confirmed the operation of the new and advanced components but also confirmed the long life capability of Apollo ECS components.

The ETC-LSS is being installed in an Apollo Command Module inside the 20-foot diameter altitude chamber in CSD Life Systems Laboratory, Building 7. A six foot diameter cylindrical chamber, attached to the command module forward hatch, will simulate the use of Lunar Module Laboratory during the lengthy manned tests. The cylinder's interior volume is 230 cubic feet, approximately equal to that of the Lunar Module.

A three-day manned test to confirm system performance is planned for the equipment prior to the longer test, tentatively scheduled for 56-days duration. Engineers of Crew Systems will serve as test subjects during both tests.

The tests scheduled for early 1968 will be conducted in a two-gas atmosphere with a cabin pressure of 5 psi. During the 56-day test equal emphasis will be placed on evaluating the long-duration effects on the crew, including the physiological effects of the two-gas system, and the long-term operation of all ECS components, including the performance of the molecular sieve.

The three-man test crew will be able to move around the two compartments – the command module and the cylinder-like LM – with ease. They will operate, mostly in a shirt sleeve environment, donning pressure suits during simulated launch, EVA or reentry or emergency phases of the long duration test.

The molecular sieve, which is a regenerable carbon dioxide removal subsystem, will be operational during the shirt-sleeve periods of the test. The sieve, unlike the lithium hydroxide cannisters presently used in the Apollo ECS, requires no replacement for continued use and as a result will save approximately 300 pounds in weight and 13 cubic feet of storage space for a 56-day mission.

As with many of the advance components, the theoretical capability of the molecular sieve has been known for sometime. However the current program is the first to integrate these advanced components into an actual spacecraft with a specific mission objective.

AAP TESTBED—AiResearch technician Don Dhute pokes his head through the side hatch of an Apollo command module inner pressure hull which will be home base for a manned test next year for the prototype Apollo Applications environmental control system. The cylinder above the apex hatch simulates the volume of the Lunar Module crew station. The tests will be run in the CSD Life Systems Laboratory 20-foot vacuum chamber.

Senior Secretaries Attend Four-Day MSC Workshop

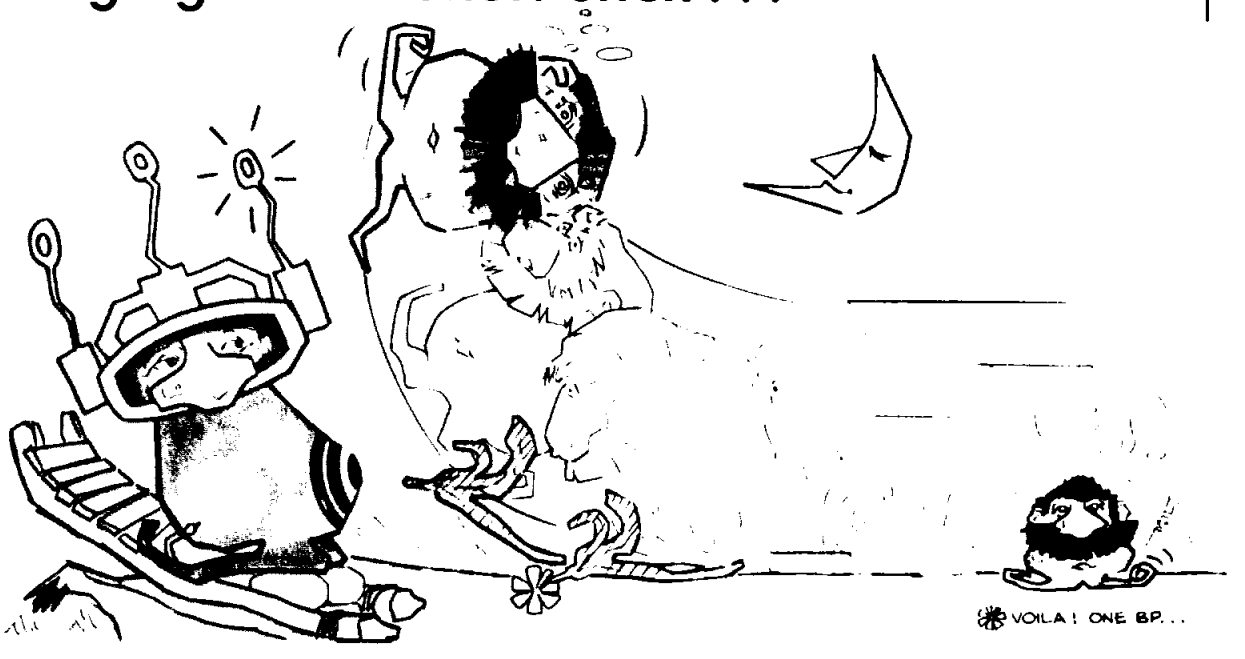
Twenty-five senior secretaries attended MSC's first Executive Secretarial Workshop to be conducted at the Center. The Workshop, developed and conducted by the University of Houston especially for MSC secretaries, convened three hours each afternoon, October 16-20.

Conceived to fill the void in MSC's Secretarial Development Program at the senior secretary level, the Workshop was designed to explore new ideas and practices; to provide secretaries a better understanding of their duties; and, in general, to better equip the secretaries to function as professionals. Development was coordinated by Dr. Nelda Lawrence, Professor of Business Education and Office Administration at the University of Houston.

Discussion topics and leaders included Secretarial Distinctives in Human Behavior, Dr. Nelda Lawrence; Work Systems and Good Management, Dr. James Lemaster; Updating Skills and Techniques to Insure Efficiency, Elizabeth Seufer; and English Usage for Better Written and Oral Expression, Dr. W. Arthur Allee.

Another Workshop is scheduled for March, 1968.

Long fight with short stick . . .



CLOTH WITH A GRIP—Jack Naimer of Crew Systems Division demonstrates a sample of a fabric pile fastener he invented in 1962 while investigating Navy signal flag improvements for the Navy Supply Systems Command. Naimer forsees many commercial as well as space applications for his invention, although it is not being produced commercially at the present time.

MSC Man Invents Fabric Pile Fastener

A fabric specialist in Crew Systems Division who has patented a new separable fastening fabric is looking to the day his invention will find commercial application.

Although Jack Naimer admits that his invention may never replace the button or zipper, he hopefully predicts his handiwork will find a useful place in holding things together.

Naimer, an aerospace technologist, has been an MSC employee since April, 1967. He received his Bachelor of Science Degree in Chemistry from the College of the City of New York. Prior to coming to MSC, he worked for the Navy Supply Systems Command in Bayonne, New Jersey. It was while Naimer was working for the Navy looking into improvements in signal flags that he conceived his novel approach to separable fastening fabrics. His invention was patented in 1962.

The fasteners are made from pile fabric components. The male element is a pile fabric interspersed with monofiliments which have minute mushroom shaped beads on their terminal endings. The female element is another pile fabric with a multiplicity of loops. Adhesion is schieved when the mushroom-shaped beads engage the loops. Naimer states that the peel and shear strength of his product can be engineered to most any degree dictated by end-use requirements. Within the period of normal usage, there should be little loss of either shear or peel strength.

Separable fastening fabrics are made in the following manner: the male and female elements are woven on conventional velvet or plush type looms in wide widths. The tips of the monofilaments of the male element are then exposed to heat and as they melt, the mushroom shaping occurs.

Although his product is not being manufactured at present, Naimer has been granted commercial rights. A product of this nature has many applications in industry. It can be used to fasten seat covers, fasten access panels in airplanes, and on clothing instead of hooks or buttons.

While it has been five years since he patented his product, Naimer feels that the market for fastening products has not been fully exploited. One problem to be overcome is to make the product nonflammable so that it can be used in areas where flammability is a major consideration.

IEEE Meets Tuesday, Hears Microcircuit Man

R. C. Gallagher of Westinghouse Aerospace Division's Solid State Laboratory Tuesday will speak to the aerospace and electronic systems group of the Houston Chapter of IEEE.

His topic will be "Microcircuits for the Systems Engineer."

The meeting will be at the Holiday Inn on NASA Road 1 with cocktails at 6, dinner ($3.50/person) at 7 and meeting at 8. For reservations, call Dianne at Ext 2871.

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

For RENT: Unfurnished apt. in home in Nassau Bay for conservative MSC employee. (No real estate agents please). 591-2510, nights.

3 Br., 2 baths, formal lvg. rm. & dining rm., breakfast rm., fully equiped kitchen, 16X17' paneled family rm. with built-in book shelves & woodburning fireplace, central heat & air cond., carpet, 2 car garage, 6' private cedar fence, landscaped, 3 blocks of school, 5¾% loan, J. R. Baker, HU 8-0095.

4 bdrm, lg paneled family rm, 1½ story brick w/cathedral ceiling, central A/C and heat; all elec. blt-ins (garbage disposal, dishwasher & stove); w-w carpets, custom made drapes in living rm, family rm and kitchen; 1½ baths; 2050 sq. ft. living space; near intermediate school, very good school district. Located in Dickinson (Plantation Estates) 13 mi. so. MSC. $23,000. H. M. Starnes, 534-5397 after 6.

3-1-1 newly painted. 14'X24' screened covered patio one year old. Large corner lot, fenced back yard, new carpet and hot water heater, three blocks from Genoa Elementary School. $600 down and $87 per month. Will consider trade on larger house. Pratt, 946-7357.

In Seabrook, rancher style 3 bedrm, 2 bath, 2 car garage, large den, fireplace, dining room, separate lvg rm, Galveston Bay Access, extra large lot, professionally landscaped. $30,000. R. E. Pryor, GR 4-2350.

3 bedrm, 2 bath house. $500 equity, 4½% G. I. loan. Will also rent for $100/mo. with option to buy if preferred. Edgewood addition, Belfort area, 6134 Ridgeway. Doris Gosset, RE 4-5519.

FOR SALE—AUTOS

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

Tonneau cover (black) for Austin-Healy 100. Occasional four seater. In exclnt cond. Best offer over $35. R. W. Armstrong, 762-5927.

65 Ford Wagon Country Sedan. Bluebook value—wholesale $1265, retail $1650. See, drive, make offer. R. H. Fritz, 488-4130 or OL 8-8634.

66 Chevy Impala 283 Sports Coupe, $1795, good condition. Box Arceneaux, 643-3837 after 5.

Trade for fiberglass boat and ski rig—clean 62 Dynamic Olds 88 (value $750), E. L. Wright, 877-3059.

65 Buick LeSabre convertible, full power & air, cleanest in Houston, $2145. Lerdon, 591-4322.

58 Ford Stn Wgn (Country Sedan), air, radio. Best offer over $125. Carter, 591-2295.

59 Triumph TR3, new tires, paint, radio & heater, very good condition, $650. D. C. Pollard, HU 7-0024.

61 VW deluxe sedan, blue. Immaculate inside and out. New tires, brakes and muffler. Has seat belts and radio. Engine recently overhauled. Must see to appreciate, $695. Jack Stanley, 944-8359.

64 T-Bird, loaded, $1795. 63 Eldorado convertible, $1795. 27 Model-T, original, $850. R. E. Pryor, GR 4-2350.

58 Ford Custom, 289 T-Bird eng., white, 2-door, heater, good rubber, new exhaust sys. (exhaust, muffler, tailpipe) carb. kit, no oil, good gas, $250. Jack Wells, PR 1-2234.

63 Ford Galaxie 4-door sedan, fully equipped, show room condition, 30,000 miles, autumn gold. Glenn L. McDuffie, HO 8-6895.

FOR SALE—MISCELLANEOUS

Lowrey transistorized electric organ-2 manual, full pedal board, Leslie speaker, many extras, including bench. Walnut finish, 2 yrs old, like new. Cost $1450. Will sell for $900. Can be financed at $24/mo. James C. Weaver, 932-2371.

25-in, 1959 table model Zenith TV, B&W, good condition. 12X14 ft. cotton beige carpet, excellent condition, Mrs. Edward H. White, 877-2231.

Numismatic Investments: profit potentials 10%—100% and more. Contact Richard K. Osburn, Box 58273, Houston 77058. 591-2186.

Anyone interested in photographs of the MSC-EAA Picnic on Oct 14 call Forrest Sealey after 5 pm at 946-3451.

Framus 12-string guitar, 1 year old, excellent condition, cost new w/case $205. Will sell for $100. W. P. Gravett, MI 4-4468.

2 calves, 1 heifer, 1 bull. Each about 400 lb. J. J. Monroe, HU 2-1061.

Range $65. dishwasher $50; summer tux, 39 long $5; child's pedal surrey, $20. Ben Locher, GR 1-4387.

Helmet, Bell 50TX. Racing, size 7⅛. Never worn and in original box. The preferred competition helmet at $32. A safe Christmas at $25. Ken Cashion, HU 2-7917.

35mm camera, Yashica Lynx-5000 and Ultrablitz Cornet 100 electronic flash unit, excellent condition. $60 for both. Original value $110. Russell Lewis, GR 9-1197.

Free puppies (3) mixed breed, Dachshund and Cocker Spaniel. Males only, short hair, excellent house pet. Chuck Finch, 944-6133.

Bunk beds, oak, complete with guard rail and ladder. $50. M. Waln, 588-4148.

19-inch B&W Admiral portable television set. Very good condition. $60 includes an attractive stand. Bob Allgeier, 591-4627.

Brand new modern contemporary bedroom suite. Never used, still in crates, slight mar in transit. Will be repaired. Name-brand. Sell wholesale price. Richard Rees, GR 4-2049, before 1 and after 4 p.m.

Kenmore 600 automatic portable dishwasher, like new, formica top, $125. C. D. Haines, 5783 Bellfort, MI 3-7134.

65 Allstate "Compact" Motorscooter, 60 c.c., 3200 mi., good condition, includes helmet, $75. N. Lingle, GR 4-2400 after 5.

Instrument flight instruction, Cessna 172/Skyhawk. Full panel, beacon, heated-pilot, dual altimeters, cylind. and carb. temps., man. press., triple clocks. NARCO; dual MK XII A transceivers, dual VOA-9 VOR/ILS Nav., UGR-2 glideslope, ADF-31, UDI-4 DME/GS, UAT-1 transponder. KING; 3 light marker beacon, 12-B master radio control. TELEX; dual boom mikes and earphones. Also, instruction toward commercial, multi-engine, and instructor ratings. Story Musgrave, 877-1416.

Boys 20-inch bicycle, $5. Harold Kosel, Dickinson 534-5818.

Blonde formica bar, 4 ft. long trimmed in black w/brass foot rail and two bar stools, in good condition. $15. H. M. Starnes, Dickinson 534-5397.

Bicycle exerciser and vibrating belt, reducing machine, $8 each. 16 ft. Glaspar boat with 75 HP Johnson, tilt trailer and accessories. In water, will demonstrate, $1095. Charles Clarke, 877-2426.

Elliptical pool table, 48" X 52", $125. Scuba gear, wet suit (medium), tank, single hose regulator, depth gauge compass, spear guns etc. J. P. Dawson, HU 8-0631.

16'8" Helton boat, 40hp Johnson motor, big-wheel tilt trailer. Good for Bay fishing or skiing. Good condition. L. W. Croom, 944-5624.

Beautiful AKC registered Bassett Hound puppies. Deposit will hold for Christmas. Gary W. McCollum, HU 7-2047.

Wigs, wiglets, falls, and accessories. Prices range from $13.95 to $290. Choice of 81 colors. 100% human hair, perfect Christmas gift. Mary Thompson, 932-3636 after 4.

Dinette set, round fruitwood Formica top with 4 matching chairs. Excellent condition, $85. Lerdon, 591-4322.

Fender skirts for 1952, 53, 54 Ford. With original primer coat only. Excellent. 2 for $1. D. C. Pollard, HU 7-0024.

Genuine Alaskan parka for a man, size medium. Wolf skin, perfect for the ski slopes. Matching woman's parka also available. Layton A. B. Klotz, HU 8-1514.

King Size mattress and box spring. 11' x 14' beige cotton rug, Mrs. A. C. Bond, 877-4103.

Heath 5" scope with manual, $25. Dumont 3" scope with spare CRT, $10. Frank Blattner, 946-6623.

1966 model 11 in. GE portable TV. New condition. UHF-VHF, built in antennas. Blue with white trim. Weighs less than 10 pounds. E. K. Axel 474-3798.

5 year old mare. Good reiner and disposition. Has new shoes, all shots and been wormed. $200. W. W. Petynia, 877-4605.

AKC Golden Retrievers, beautiful champion sired pups, 7 weeks old, also 2½ year old obedience trained female, will retrieve. Jon Morar, 877-1229.

Maple desk, 7 drawers, 42"W, 30"H, 20"D. Excellent condition, Ed Lattier, 534-2756, Dickinson.

Peterson reclining stroller with canopy and basket, folds flat, like new, cost $25, sell $15; Boy's wardrobe (from 6 months to 3 years) play clothes and dresswear, also western outfit and 2 pair cowboy boots size 7½D and 10½D. David Bell III, 591-2340.

Pickup Camper, like new, contains water tank, pump & basin, ice box, closet, pantry, storage compartments; butane stove & tank; jacks; foam double bed & table; all built-ins & insulated. $650. C. D. Haines, MI 3-7134.

WANTED

Used typewriter for home use. Prefer standard but will consider heavy duty portable. C. W. Bird, HU 6-8546.

Want in Car Pool beginning as soon as possible from 5727 Hirondel to Building 30, 8:00 to 4:30 shift. Jim Hill, RE 3-4920.

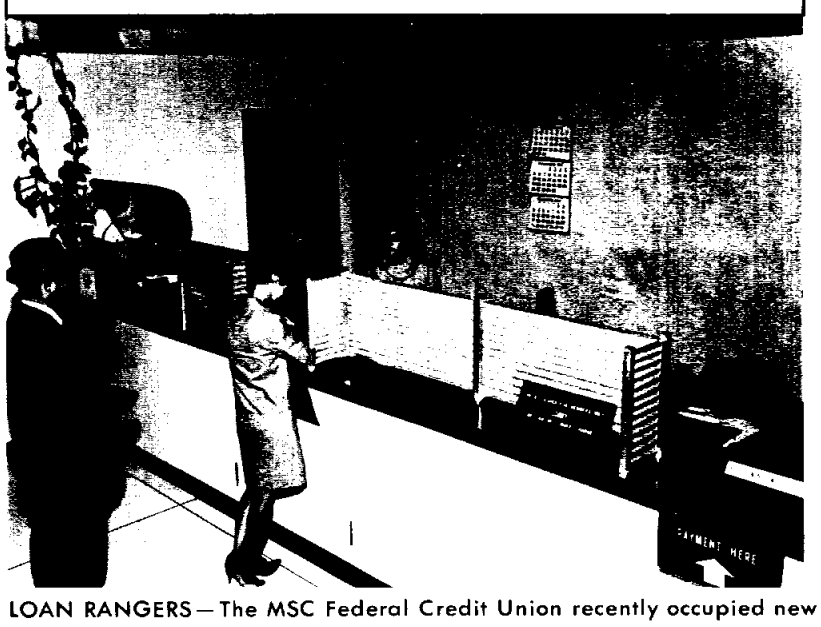
Slide projector and movie screen. Charles Clarke, 877-2426.

Riders to Denver and return. Leave Saturday, December 23, return Sunday, December 31. Drive straight through. Share expenses. Mark Thomas, MI 9-5739 after 6.

LOST

1965 graduation ring, initials DFG. Reward. David Guettner, UN 4-3567.

In New Quarters



LOAN RANGERS—The MSC Federal Credit Union recently occupied new offices in the Bldg 11 Cafeteria and will hold open house during the week of November 20. The first 1000 visitors, in addition to free coffee and gifts, may register for two door prizes. Credit Union office hours are 10 am to 2:30 pm Monday through Friday, and 10 am to 4:30 pm on payday Mondays. The November ticket drawing was won by Antone Alber, who selected tickets to "The Unsinkable Molly Brown." The last drawing will be December 1. To be eligible, one $5 share deposit must be made for each chance.

PACKING 'EM IN—Weekend MSC open house visitors stand sardineswise in the Auditorium lobby waiting their turn to walk up the ramp and peer into the cockpit of Gemini V. In addition to the displays of flight hardware and models in the lobby, a changing array of spaceflight motion pictures is shown on the half hour in the auditorium during the Sunday afternoon open house. More than a million and a half people have visited MSC since the first open house in June 1964.

1.7 MILLION VISITORS—

Auditorium Expansion Doubles Available MSC Display Area

By Bob Gordon

Its visitor attendance nearing the 1.7 million mark, MSC has undertaken an expansion program which will double the public display area in the Building 1 auditorium.

Construction is underway on an addition to the south end of the auditorium building. The addition, which adds 8,500 sq. feet of exhibit space, is scheduled for occupancy and opening for public visitors during the first quarter of 1968. The Bldg 1 display area is the focal point of interest during special visitor programs and weekend open-house schedules.

More than 1.5 million persons have visited the center since MSC's initial "Open House" on June 6-7, 1964. Since the start, the display area in the auditorium along with several other buildings on site has been open for visitor viewing.

The addition to the south end of the building will increase the display area to more than 14,000 sq. feet. Existing display area, the lobby in front of the auditorium, consists of 6,200 sq. feet.

The addition, a windowless high-bay area, is designed specifically for displays. Special-effect lighting well mounted in the ceiling and highlight displays, exhibits and models on the floor.

Included in the plans is a mezzanine which will house several offices plus an area for smaller manned spaceflight artifacts. Mezzanine visitors may also view exhibits and spacecraft models which will hang from the uni-strut ceiling.

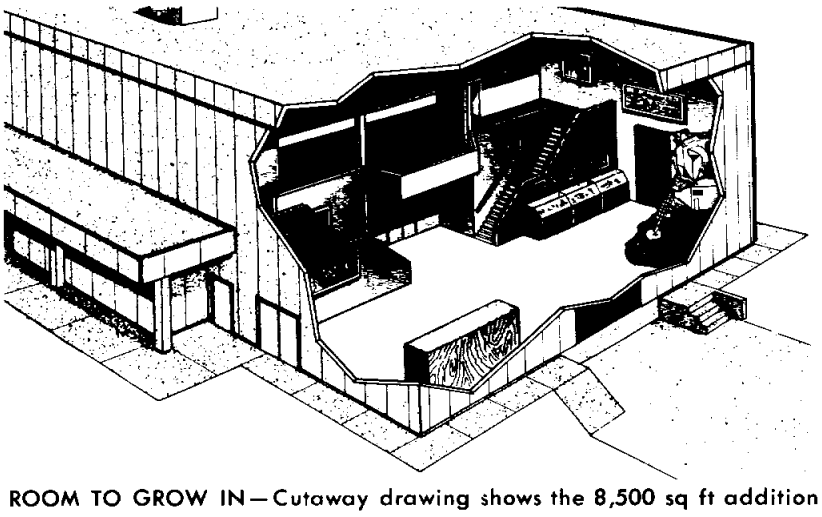
The existing corridor on the east side of the auditorium will provide access to the addition and the existing lobby exhibit area.

Present planning calls for highlighting Mercury and Gemini program flight items and exhibits in the front lobby area. A special viewing stand is planned for Gordon Cooper's Faith 7 Mercury spacecraft and the spacecraft flown by Cooper and Charles Conrad during the eight-day flight of Gemini V.

The west corridor will be devoted to displays of the early development of the aircraft and rocket systems. Displays on the technological transition from the Gemini program to Project Apollo will occupy the east corridor which leads to the high-bay addition.

The new 8,500 sq. foot of exhibit space will be devoted to Apollo. This will include permanent exhibits on mission profile, and cutaways of spacecraft and launch vehicles and flight hardware. Room for transient displays reflecting program changes and advancements is also planned for the new area.

Plans for a special opening program are being by management. Completion of the addition is scheduled for February 1968.



ROOM TO GROW IN—Cutaway drawing shows the 8,500 sq ft addition to the auditorium which will increase the display space to more than 14,000 sq feet. The new high-bay exhibit area will be devoted primarily to telling the Apollo story.

Two Orbiters Scuttled

(Continued from page 1)

the amount of control gas aboard, of about one year.

Lunar Orbiter II was the oldest of the fleet of photocraft launched by NASA between Auust 10, 1966, and August 1, 1967. It had been circling the Moon since November 10, 1966. Its reduced supply of attitude control gas made its ability to survive the October 18 eclipse very doubtful, and it was destroyed to free its radio frequency for future use.

Indications are that it crashed the Moon's surface at 98° ELong and 4°SLat. Its velocity control engine burn decreased its speed by some 160 miles per hour, allowing it to fall to the surface of the Moon.

The engine ignition, 28th in the Orbiter program, occurred at 12:55 am CDT, October 11 when the spacecraft was near the apolune (high point) of its orbit.

Lunar Orbiter III, likewise running low on control gas, was crashed at 1:33 am CDT, October 9. It is believed to have hit the Moon's surface at 91.7° WLong and 14.6° NLat. Its engine burn of 32 seconds, 26th in the Orbiter series, was made at apolune of about 215 miles and slowed the spacecraft by some 118 miles per hour.

Lunar Orbiter III was launched February 4, 1967 and began circling the Moon on February 8.

Lunar Orbiter I was launched August 10, 1966 and impacted the Moon October 29 after completing its photographic mission. Orbiter IV was launched last May 4. Radio contact was lost July 24, after the satellite completed its photo mission.

AIAA Meeting

(Continued from page 1)

350-passenger Jumbo transports into and out of American cities—including Houston.

Rummel has been with TWA since 1943. He has been TWA's chief engineer, and was chairman of the airline's jet planning committee before the jet plane joined the commercial airways.

He is also a member of the NASA Research Advisory Committee on Aircraft Operating Problems, one of NASA's top.level coordinating groups. Most of the members of the Houston Section of AIAA are engineers with MSC or the aerospace industries which work closely with MSC. Rummel is also a member of AIAA.

Tickets for the meeting can be obtained from Lea Dunaway at HU 8-3117 or 591-2621. Cost is $3.25 per person.