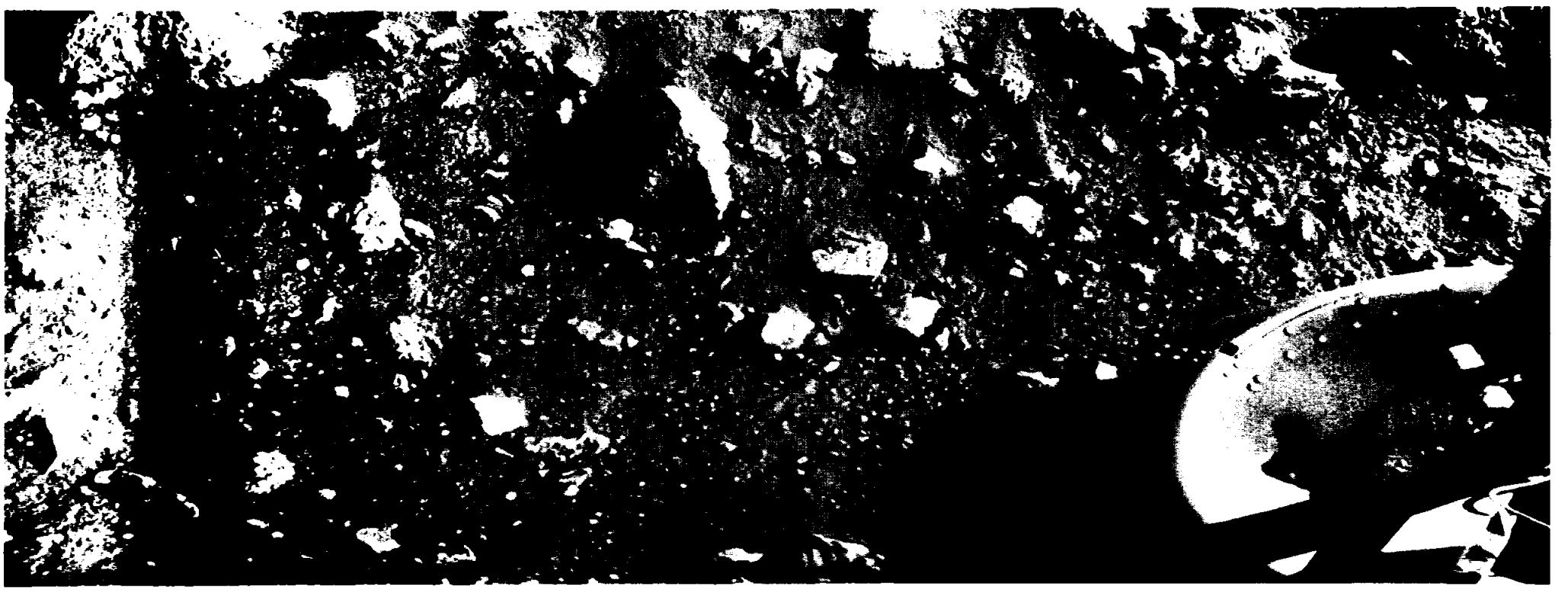

FIRST STEP ON MARS (BY A METAL FOOT) – Viking 1 Lander relayed this first Mars surface photo back to Earth just minutes after landing in the red planet's Chryse Planitia July 20. Finely-granulated material, including sand thrown up on the Lander's footpad at touchdown, is visible in the photo along with angular-faceted rocks of varying sizes. The large rock in the center is estimated to be about four inches across and has three rough facets. Evidence of wind-blown granular material is shown near several of the half-buried rocks. Some detail is visible in the shadow to the left of the footpad due to light scattering either from the spacecraft or from the Martian atmosphere.

ROUNDUP

NASA LYNDON B. JOHNSON SPACE CENTER HOUSTON, TEXAS

VOL. 15 NO. 15 Friday, July 30, 1976

Martian Life Search Begins Aboard Viking

With the problem of Viking 1's jammed soil sampler arm corrected, scientists prepared at *Roundup* press time to begin the search for evidence of Martian life.

The digger was scheduled to reach out Wednesday and scoop up two ounces of the red Martian soil for delivery to the hopper of Viking's three life-detection instruments.

One instrument adds carbon dioxide and carbon monoxide and incubates the sample under artificial sunlight. Two other experiments will involve the introduction to nutrients to the soil.

Additional scoops of dirt will be dropped in an instrument which looks for organic molecules and one which analyzes the inorganic chemistry of the soil.

The soil analysis experiments had been threatened until engineers instructed Viking 1 last Sunday to expel a three-inch long pin which had jammed the digging arm.

Working with a test lander, engineers at the Jet Propulsion Laboratory determined that the boom had not extended far enough to allow the pin that held a cover over the arm to drop out of the apparatus.

Commands were devised and radioed to Viking. Project officials later saw photographic evidence that the arm responded properly – the arrow-shaped pin was shown lying half buried in the Martian soil where it had fallen.

Scientists had all but abandoned hopes at press time of repairing the Viking 1 seismometer which was to measure possible marsquakes. A broken wire was believed to have caused the problem.

An identical seismometer is aboard Viking 2 which is set to swing into Mars orbit Aug. 7, and land in early September.

Scientists are confident they will be able to find a safe landing spot for Viking 2 somewhere along a belt 20 degrees to the north of Viking 1's Chryse Desert base.

Ham Standard Picked to Build EVA Spacesuits for Shuttle Crews

NASA has selected Hamilton Standard Division of United Technologies, Inc., of Windsor Locks, Conn , for negotiations that will lead to the award of a contract for development and production of space suits to be used by men and women during Space Shuttle flights.

The contractor's proposed cost of the basic cost plus award fee contract is about $15 million through September, 1980.

The suit will provide Space Shuttle crew members protection and life support while they work outside the Shuttle in Earth orbit. The design follows an "adjustable fit" concept instead of being custom made for individual astronauts as in earlier programs.

Under terms of the contract to be negotiated, Hamilton Standard will provide hardware and necessary spares to assemble seven suits and supporting equipment. The contract also will call for training, manpower and equipment necessary to support the program at various NASA field centers.

There are two options in the contract each of which will permit NASA to obtain six additional suits and supporting equipment.

The suits will be manufactured in small, medium and large sizes. In a recent announcement NASA said it was seeking applicants for the Shuttle astronaut program and noted that candidates may vary in height from five feet to six feet four inches.

The suit system consists of the basic suit and a support system which includes breathing atmosphere and cooling components. The life support backpack will be an integral part of the suit.

The Garrett Corp., AiResearch Manufacturing Co., of Torrance, California, was the other bidder

Technical direction of the contract will be performed by JSC.

Remote Sensors Study Gulf Stream Dynamics

Spacecraft, aircraft and watercraft teamed up during June in an experiment to observe the Gulf Stream using remote sensing techniques about 580 kilometers (300 miles) east of NASA's Wallops Flight Center, Wallops Island, Va.

Objectives were to test the ability of various remote sensors including active and passive microwave radar to measure the boundary and magnitude of the Gulf Stream from space.

The satellite remote sensing techniques tested in the experiment use infrared signatures to identify the Gulf Stream boundary from space photographs. Also a precision altimeter on the NASA Geodynamic Experimental Ocean Satellite 3 (GEOS-3) satellite is capable of measuring surface deviations in the ocean within 20 centimeters (8 inches) and from these measurements the velocity of the current can be calculated.

In addition to the GEOS measurements, the National Oceanic and Atmospheric Administration's NOAA-4 weather satellite was used. A WFC-54 research aircraft from Wallops made three flights and carried instruments to measure the current by observing wave interactions. Instruments were provided by Wallops Flight Center, NASA's Langley Research Center, Hampton, Va., and the Naval Research Laboratory, Washington, D.C.

Surface measurements were made by the research vessel Advance II from the Cape Fear Technical Institute, Wilmington, N.C., and manned by ocean scientists from North Carolina State University at Raleigh.

Remote sensing techniques, such as those tested in the experiment, promise to provide global-scale synoptic measurements in near real time. This is not possible through use of the traditional methods which require closely spaced ship stations or buoys to obtain the necessary measurements. Because of the time and space requirements of these methods, they are inadequate for studying fast changing or large scale phenomena.

Scientists are interested in a better understanding of the Gulf Stream since it carries a tremendous amount of heat energy which influences the global balance of energy in the atmosphere and the ocean and since it carries nutrients that are important for fishing. This balance affects weather and climate as well as coastal water movement.

Data from satellites is expected, among other things, to permit more effective planning of use of coastal waters, as in the cooling of nuclear power plants and construction of off-shore drilling rigs and airports located on man-made islands.

Singer Gets SimCom Pact

NASA Monday selected the Singer Company Simulation Products Division, Binghamton, NY for award of a contract for maintenance, modification and operational support of the JSC simulation complex. Space shuttle flight crew simulators in the complex initially will be the Shuttle Procedures Simulator and the Crew Procedures Evaluation Simulator, with later addition of the Orbiter Aeroflight Simulator and the Shuttle Mission Simulator.

The initial two-year cost-plus-award-fee contract is valued at an estimated $6.5 million, with two optional extensions of 24 and six months. The contract covers systems and hardware engineering, software development, drafting and illustration, mod installation and testing, logistics, maintenance and operational support.

Newman Takes Hq PAO Post

Robert A. Newman July 26 was named NASA Assistant Administrator for Public Affairs reporting to the Associate Administrator for External Affairs. Newman will be responsible for all agency information services except for technical publications.

Newman, 46, holds BA degrees in journalism and sociology from the University of Missouri. Prior to joining NASA, he was vice president of community affairs for TRW, Inc., Cleveland, Ohio. He is a native of Childress, Texas.

SUMMER ENGINEERS – Karen Johnson, Greg Tracy and Margaret Wilson – all University of Oklahoma engineering majors – began work at JSC in early June as summer interns. The three received $2500 scholarships under the NASA National Aerospace Fellowship Program.

American Indian Summer Interns Begin Engineering Duties at JSC

Three $2500 scholarships have been awarded to JSC Native American summer interns for the 1976-77 academic year. Karen Johnson, Margaret Wilson and Greg Tracy who are engineering majors at the University of Oklahoma began working at JSC in early June.

"It's going to help me finish my last year of school," said Karen Johnson, computer science engineering major. Johnson works in the Flight Control Division where she works with the documentation the Display Electronic Unit (DEU) for the Space Shuttle Program.

"I'm learning about the hardware of DEU in which I've always had an interest. Since working at JSC, it has given me a chance to work with engineers and that's a big help," she said.

Johnson, a Cherokee, serves on the Dean's Advisory Committee and maintains a 3.5 grade point average. After graduation the senior plans to attend graduate school.

The scholarships were granted under NASA National Aerospace Fellowship Program (NAFP). According to NASA Minority Research program manager Jurgen Pohly, "the program is to encourage members of minority groups and women to undertake professional careers in scientific and engineering fields, so that the supply of highly trained persons in space related sciences and technology will be more representative of the population of the United States, and thereby provide NASA with future needed employees."

Pohly said the program was established during the 1974-75 academic year to outstanding students who have completed their sophomore year. The University of Oklahoma (UofO) is one of the seventeen schools selected to enter the program.

Next year an additional position will be open for a Native American at UofO to increase the enrollment to four students, Pohly added.

"The scholarship will help a lot," said Margaret Wilson, Choctaw and junior electrical engineering major. Wilson said she entered the field because of her interest in mathematics and science. Presently, Wilson is employed in the Flight Control Division where she works with the detail design specification road map for software in guidance.

After graduation, Wilson plans to attend graduate school or continue to work.

Presently, there are 28 American Indian students enrolled in the University of Oklahoma's College of Engineering.

George Thomas, UofO NAFP administrator, said the students were selected to work at JSC because of academic performance and special interest. Thomas said the office recruit students from a number of high schools and also get them involved in the summer's "First American Engineers Program." Most of the students in the program have been recruited from Oklahoma, New Mexico, and Montana.

Since the establishment of the newly formed college, three students have graduated. "Beginning this Fall we are expecting a total enrollment of about 40-45 students," he added.

The administrator said, "We like to graduate 15 students a year and see more Indian students graduating nationally."

"Since I began working with NASA, it has given me greater insights and a new outlook of the space program," said Greg Tracy, junior chemical engineering major.

Tracy is employed in the Experiment Systems Division where he is working on the trace gas analyzer for the Shuttle Orbiter.

He added, "At first I believed NASA was more of an academic atmosphere with a great deal of research and design, but there are also a lot of administrative duties. The center has given me a different attitude of the working experience."

As a member of the Osage tribe, Tracy said he wants to make the internship a productive one in an effort to make it a worthwhile experience for more American Indian students.

Under the Bureau of Indian Affairs program, Arizona State University, New Mexico State University, and Oklahoma State University are the major suppliers of Native American engineering majors numbering to a total of 68 students.

The BIA field office Albuquerque Education Resources Center has the responsibility in assisting Native American students to continue their education and training beyond high school for the advancement of the American Native people, according to Leroy Falling, higher education assistance specialist.

Falling said the agency provides funds to students who are at least one-fourth degree blood quantum of American Indian, Eskimo, or Aleut; who are of tribes served by educational purposes enrolled in an accredited college or university and those students who have a need for financial aid.

ROUNDUP

NASA LYNDON B. JOHNSON SPACE CENTER HOUSTON, TEXAS

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

Editor: Richard Finegan Photographer: A. "Pat" Patnesky

Money, Manpower Govern Rec Center Improvement

The Recreation Center (facilities) portion of the recent EAA survey has been the most difficult to evaluate because yes/no answers often do not agree with comments that follow.

Responses to question 1 indicate that only one-third of the respondees regularly use the Rec Center, while three-quarters believe the Rec Center is responsive to employee desires, has adequate hours and that Center events receive adequate publicity.

A significant number of comments dealt with the poor condition of the tennis courts, and this will be covered in the project list below. Another recurring comment is about the need for handball courts. Funds are not available to build an indoor court and requests to use the Astronaut Gym courts have been refused. EAA is looking into outdoor court costs and will provide the information to the Exchange Council.

Even though three-fourths of the respondees say they feel Rec Center operation hours are adequate, a large number believe the Rec Center should not be open during working hours but stay open later on Fridays, and on Saturdays and Sundays. They point out that the Center is open more during working hours when employees cannot use it than during off-hours when they can. The comments also will be passed along to the Exchange Council.

Rec Center project status, in order of employee preference, is as follows:

*Water lines to picnic areas with bubblers and faucets are being installed.

*Tennis court mods: funds have been made available to add one court, resurface existing courts and revamp lighting, but because of the cost JSC and Hq approval must be obtained. Construction is expected to begin late this year.

*The Universal Gym set for the exercise room has been bought and installed.

*Bldg 207 locker room mods: men's locker room expansion is presently precluded by enlargement of the exercise room to accomodate the Universal Gym. Locker storage will be alleviated by replacing some present lockers with smaller ones. Addition of an exhaust fan has not yet been approved.

*Painting the building is a continuing maintenance task done on an as-required, manpower-available basis.

*Approximately 20 trees have been planted around the Rec Center and parking lot.

*Maintenance equipment shelter and compound, although receiving little employee support in the survey, is a necessary project. Rec Center employees maintain the grounds with Rec Center equipment such as tractors and mowers – all of which deteriorate rapidly if left in the open. Moreover, some of the equipment has been damaged by children playing on it. Shelter construction has been deferred due to lack of funds.

Suggestions for Rec Center operation and additions are being compiled and will be turned over to the Exchange Council (EAA does not operate the Rec Center) for consideration when the 1977 projects list is completed.

Considerations such as overall employee interest, space, manpower and available money determine what can be done.

Dean J. Shutt Earns August Co-op Award

Purdue University senior Dean J. Shutt has been named JSC Cooperative Education Student of the Month for August.

Shutt, who is scheduled to receive a degree in aeronautical engineering in December, was nominated for the honor by Thomas L. Moser, head of the Structural Design Section of the Structures and Mechanics Division.

In nominating Shutt, Moser cited his outstanding performance and "the significant contributions that he has made to the Shuttle Program and to the development of Large Space Structures."

Moser noted an independent

(Continued on page 3)

ABWA Names JSC's Driver Boss of Year

JSC Financial Management Division chief Dr. Robert E. Driver was named Boss of the Year by the American Business Women's Association Clear Lake Area Chapter at its June meeting.

Driver was nominated for the award by Lois Bradshaw of the FMD Administration and Finance Office. "My boss originally was educated as an engineer and was employed at JSC as an engineer," wrote Bradshaw. "His interest in self development led ultimately to full-time graduate study and a PhD in management and finance. He is amiable and consistently willing to take the time to assist others with their problems. Moreover, he is a progressive and innovative manager willing to explore new techniques leading to accuracy and efficiency."

JSC Propulsion and Power Division chief Joseph G. Thibodaux was last year's ABWA Boss of the Year.

ABWA, with 83,000 members in 1,300 chapters, strives to promote professional, educational, cultural and social advancement of business women.

EAA ATTRACTIONS

TICKETS

Dean Goss Dinner Theater: comedy *Love in E-Flat*, $16/couple Tickets good only Thur-Fri-Sun through September 7.

No Windmill Dinner Theater tickets will be available during August.

Also available at Bldg 11 Exchange Store 10 am to 2 pm: ABC Interstate theater tickets, $1.50, free Disney Magic Kingdom Club cards and Six Flags Funseekers Club cards; Sea Arama adults $3.25, children $2.25. Houston Astros gift coupons, $4 box seats, $3.15 reserved seats.

Shamrock-Hilton Theater Under the Stars production of *Cabaret*, EAA discount of $2.50 off each ticket: $4 for Thursday night instead of $6.50, and $7 instead of $9.50 for Friday and Saturday nights. EAA has tickets in the following quantitites: 12 July 30, 8:30 pm; 8 Aug. 1, 7:45 pm; 8 Aug. 5, 8:30 pm; 16 Aug. 6, 8:30 pm; 12 Aug. 12, 8:30 pm; 10 Aug. 20, 8:30 pm; and 8 Aug. 22, 8:30 pm.

OOPS!

Some numbers were criss-crossed in the last *Roundup*; the number to call for the 5-days to Stop Smoking Plan is 2310, not 2130.

That number – 2310 – is the new EAA extension and will travel with the EAA President from now on. It is listed in the July JSC telephone directory on page xii under EAA. Use the extension when calling on EAA business. As the friendly recording says, "your call will be returned shortly."

COUNTRY-WESTERN DAINCE

By popular demand the Music Masters from Kurten, TX (that's sort of Bryan suburb) will play dirt-kickin' music for the second 1976 EAA Country-Western Dance September 11.

Refreshments will start at 7 pm and be served until 1 am, and a barbecue dinner will be served from 8 to 9 pm. Music starts at 9.

Why two country-western dances in one year? Because they are fun! Tickets at $9/person will be on sale in the Bldg 11 Exchange Store from August 2 through September 3.

NEW JSC DANCE CLASSES

New dance classes for JSC federal and onsite industry employees begin August 4 at the Gilruth Recreation Center and continued each Wednesday for 10 weeks. Call Elaine Simon at 333-3508 or Bill Simon at ext 4027 for details.

PLANT SWAP

If you don't know what to do with all those new shoots, cuttings and other plant-life overabundance, bring them to the August 10 EAA plant swap in the Gilruth Recreation Center picnic area from 4:15 to 5:30 pm. Bring your excess plants to trade, swap or just give away in the early-American barter tradition. Everyone is welcome.

ALLEY THEATRE

The Alley Theatre Corporate Subscription program is once again being offered to all NASA and industry employees. Under this program season tickets are offered for next year's five performances at a low price of $19.95.

See your EAA representative for an Alley Theatre brochure which will explain the program to those of you who are not already familiar with it. The brochure also contains an order form for your subscriptions. If you are planning to attend the Alley next year, fill out the order form, enclose a check payable to Alley Theatre or indicate a charge plan on the form, and send to Patty Holmes, EG3 (X-3066).

Your Corporate Subscription coupon books will be mailed to you just prior to the opening of the 76-77 season in October. The deadline for placing orders under this special program is August 15, so don't delay in getting your orders in the mail.

SAILING AT THE REC CENTER?

The Annapolis Sailing School at Watergate Yachting Center is offering reduced rates to JSC federal and onsite industry employees for a 12-hour sailing course – four hours in the classroom, and eight hours afloat. Classes will meet Monday nights August 16, 23, 30 and September 13 from 6:30 to 9:30 pm.

Course fee has been reduced from $98 to $75. To enroll, stop by the Gilruth Recreation Center and pick up a coupon to give to Hugh Jones at WYC. Each class is limited to four persons, and the school can conduct two classes simultaneously.

SOFTBALL STANDINGS

All leagues are one week from completion.

MONDAY B LEAGUE

Name	W	L	Pct.
Fokkers	3	2	.600
Oreos	3	2	.600
Hustlers	2	3	.400
Singer	2	3	.400

MENS A LEAGUE

Name	W	L	Pct.
Blazers	5	1	.833
Mets	5	1	.833
Dynamos	4	2	.666
Dreamers	3	3	.500
Sopac	3	3	.500
Bandits	2	4	.333
Nads	2	4	.333
Dudes	0	6	.000

WEDNESDAY B LEAGUE

Name	W	L	Pct.
Animals	5	1	.833
Marvels	5	2	.714
Rats	4	3	.571
Nerds	3	4	.429
Turkeys	0	7	.000

MENS C LEAGUE

Name	W	L	Pct.
Boas	5	1	.833
Heat	5	1	.833
SMD	5	1	.833
Marx Bros.	2	4	.333
Moon Pies	2	4	.333
TTA Oldtimers	2	4	.333
Oreos	2	4	.333
Rookies	1	5	.166

THURSDAY B LEAGUE

Name	W	L	Pct.
Dreamers	5	0	1.000
Green Demons	3	2	.600
MDAC	1	4	.200
Red Fokkers	1	4	.200

WOMENS LEAGUE

Name	W	L	Pct.
Blazers	7	0	1.000
Rookies	3	2	.600
Roadrunners	2	5	.286
WYSIWYG	2	5	.286
Kentron	2	6	.250

LEAGUE SPORTS:

Last call for softball! Deadline for rosters and entry fees is Tuesday, August 3. The leagues will start August 16th.

Dorothy Davis Picked July JSC Secretary

"She has established an excellent rapport with the other secretaries in the Division as well as with the clerical and professional people with whom she comes in daily contact," said Driver in the award nomination.

"Her outstanding contributions rest in the manner with which she promotes harmony not only within the secretarial elements of the Division but among the professional staff as well. She has a unique ability to accomplish this while at the same time achieving the desired results. Her ability to react to contingency situations and exceptionally heavy workloads continues to be outstanding. She consistently blends tact and discretion with mature judgment and common sense."

Dorothy S. Davis, secretary to Financial Management Division chief Dr. Robert E. Driver, has been selected JSC Secretary of the Month for July.

Co-op Award

(Continued from page 2)

stress analysis performed by Shutt of a brazed joint in the tubing of the Orbiter Environmental Control and Life Support System.

The analysis showed that thermal stresses on the stainless steel tubing during the brazing process were contributing to failures which had been observed, Moser said.

Shutt's analysis was provided to the Orbiter contractor for assistance in resolving the problem.

The co-op student was also a major contributor on establishing the structural design, optimization and method of manufacture of a demonstration-test article of the Large Space Structure, Moser said.

The test structure is a candidate to fly on one of the Shuttle development flights. Such structures will be utilized as for Satellite Solar Power Stations.

Shutt has completed his last work period at JSC and is on leave without pay to complete work toward his degree.

Roundup Swap-Shop

Swap Shop advertising is open to JSC federal and on-site contractor employees. Goods or services must be offered as advertised, without regard to race, religion, sex or national origin. Non-commercial personal ads should be 20 words or less, and include home telephone number. Typed or scribbled ad copy must be received by AP3/Roundup by Thursday of the week prior to publication.

VEHICLES

68 Ford Fairlane 4-dr, 289, automatic, good cond, good work car. $650. 333-3690.

73 Chevvy Malibu, 350-hp, air, radio, pwr, 38K miles. Cherry, 477-4543.

76 Kawasaki 125, brand new, never ridden — won in contest, retail value $800, sell $700. 482-1051.

75 tractor-type riding mower, 8-hp, B-S eng, 34-in floating head w/twin blades, elec start, lites, 30 hrs run time, pneum tires, $450. Alexander, 482-0920.

75 Granada 2-dr, pwr, 302 V8, air, AM. Boone, 488-6380.

74 Honda CL-450 DOHC, backrest, bars, 9,800 miles, $900. 944-4529 or 487-2763.

74 Toyota Celica, 17K miles, AM/FM, 4-spd, air, brown w/vinyl top, $3200. 944-4316.

71 Suzuki TM 400MX, plastic fenders and tank, Wiseco piston, new rear tire, $250 firm. 482-1009.

72 Datson 240Z, air, auto, AM/FM, orange, new tires, 51K miles, $2900. Thompson, 482-6550.

69 Chevvy Impala 2-dr, air, radio, 327 eng, fair cond, $400 or best offer. Lynn, 946-3907.

75 Mercury Monarch, brown w/tan vinyl top, 2-dr, air, small V8, AM, $4000. Huss, 488-6310 after 5.

Huffy Silver Thunder motocross bike, like new, $65. 554-3754.

72 Chrysler Town & Country wagon, all pwr, 3 seats, air, lugrack, radio/tape, xtra clean, $2450. 337-1160.

75 Chevvy Open Road camper van, slps 4, stove w/oven, sink, water htr, refrig, toilet, furn w/thmst, stereo tape/FM, aux batt and 110v hookup, like new 6000 miles. 471-4419.

73 Honda XR75 K1 stock, never raced, kids uninterested, $275. Ardoin, 538-2367.

74 VW Dasher 2-dr, auto, air, AM/FM, $3600. 485-3251 or 485-1858.

22-ft Cobra mini motorhome, Chevvy chassis, xtras, 18K miles, xlnt cond, $16,500. 488-3170 or 488-3377 after 5.

26-in woman's London Flyer bike, Sturmey-Archer 3-spd gear/coaster brake; 26-in man's Western Flyer, S-A 3-spd gear, mechanically good, esthetically poor, $15 each. Eggleston, 334-2897.

Boy's 26-in bike, good cond, $20. 333-2509.

74 Duster, air, pwr, radio, auto, vinyl top. 333-4606.

73 BMW 2002, metallic green, AM/FM stereo, air, new radials, xlnt cond, $4800. 472-5563 or after 7, 487-2637.

53 Chevrolet, 2nd owner, good cond, 50K orig miles, $180. 472-5563 or after 7, 487-2637.

65 Rambler 4-dr Classic, good body and tires, need clutch, first $150. Johnston, 644-3978.

Schwinn 10-spd boy's bike, 18-in frame, Varsity, xlnt cond, $80. 333-2622.

Rent motorhome $125/wk plus 6 cents/mile (incl ins), also daily rates. 471-5161.

Honda CL-70 street bike. $125. White, 554-2916.

75 Honda CB-360T w/sissybar, 600 miles, $795. 534-6098.

Credit Union repos: 74 Olds, 72 Chevvy Nova, 68 Chevvy, 75 VW Rabbit, 74 Datsun. Cars may be inspected from 10 am to 2 pm August 2-4; bids close at 5:30 pm Aug. 4 and be opened Aug. 5. CU reserves the right to refuse all bids, and cars will be shown by appointment only. Call 488-7070.

74 Honda 550-4, super shape, family pet, $900; 73 Yamaha TX500, wife's bike — polished more than ridden, showroom new, $800. Grow, 479-4249.

PETS

AKC-reg female beagle, Ch-sired. 333-2436.

WANTED

One female roommate to share with El Lago and Dickinson students attending A&M, Fall 76. Kranz, 534-4125.

PROPERTY & RENTALS

CLC townhouse, 2-bdr, 2-bath, no pets, deposit req, $325/mo. 488-5017.

Choice wooded lot on Lake Livingston at Waterwood, marina, golf, tennis, stables, etc, buyer's terms. Boone, 488-6380.

Two bedroom apartment, By-The-Sea Condominium. West Beach, Galveston, fully equipped and furnished, few summer weeks left for unusually low price of $260 per week for firm reservation, Clements 474-2622.

20 acres wooded land south of Livingston, $750/acre cash. Parker, 440-6147.

Galveston Gulf-view lot, underground utils, $10,000. Parker, 440-6147.

HOUSEHOLD ARTICLES

Heathkit GR-900 25-in color TV kit partially built, $400. 488-3263.

Spanish coffetable w/black slate top, $200; black-wood Bentwood rocker, $75. 482-0367.

Cherry wood French Provinical bdr suite: twin beds, dresser w/mirror, chest drawers, nitestand, vanity w/chair, $300; Bamboo style sofa, chair, ottoman, coffeetable, two endtables, two lamps, like new, $500; Singer Futura sewing machine, cherry wood French Provincial cabinet, xlnt cond, $400; handcrafted porch swing, beautiful, $50. Hardy, 333-4782 evenings.

Tandberg 1600X open-reel stereo tapedeck, superb cond, $135. 488-3966.

30-in Frigidaire Flair range and eye-level oven, $125. Klotz, 488-4514.

Norge 19-cu ft refrig, harvest gold, xlnt cond, $150. 482-5489 after 6.

Mediterranean living room tables by Riverside, $175; table lamps; $35; chair, $95; all like new. 488-6012.

Paint the easy, professional way: rent 1-hp paint spray compressor w/3-gal tank and 25-ft material/air hose. 334-1138.

Beige satin drapes 136-in wide by 92 in long, good cond but need cleaning, $25. 333-4669.

Newlyweds have practially new Amana Radarange oven but no place for it, xlnt cond, sell $350. Garcia, 333-4880 or 333-2916.

Used 16-cu ft Frigidaire refrig, side-by-side, works but needs defrost coil, white, 7 yrs old, $125. Nygren, 332-4280.

Two each 4x8, 3x8, 2x8 antique smoked-glass mirrors; French provincial tables, commode, step, and 36-in scalloped marbletop tables, Spanish recliner, misc items. Henrietta, 481-6821 after 5.

GE elec washer & dryer, xlnt cond, $150 for both; Wards 100 vacuum cleaner, like new, $20. Burchard, 534-6190.

MISCELLANEOUS

Royal standard manual typewriter, pica, good cond, $40. Cooper, 482-1009.

4x10-ft rabbit hutch w/divider for two separate rabbit nests, $15. Eggleston, 334-2897.

BFG Lifesaver radials: one XL200 HR78-15, $25; two XL100 HR70-15, $30 ea; pocket calculator w/chrgr, $25. Winston, 488-7513.

Patio cover: 26 1x12 white aluminum panels, 4 skylite panels, gutters, screened support frames for two sides, door, $350. 482-2369.

Remington 513-T .22 target rifle, Lyman aperture sights, adj trigger, bull barrel, xlnt, $115. 488-3966.

Alter/repair men's & ladies clothing: cust fitting, waist, length, crotch, zippers, side seams — anything. 473-9871.

St. Augustine primary school (5500 Laurel Creek) now enrolling pre-K thru 8, Montessori method, departmentalized 5 thru 8. 946-8968.

Celestron 10 telescope w/clock drive, Unitron finderscope, eyepieces, xtras, $1250. Erickson, 488-1901.

12x15-in Merc prop, $15; Merc 6-3/4-gal gastank, $10; Sears elec trollmotor, $35; 4.80x12 wheel/tire, $25. Colton, 483-3541.

WIDESCREEN MARSCAPE – This first panorama beamed back from the Martian surface by Viking 1 Lander covers 300 degrees around the Chryse Planitia landing site. A plateau-like prominence on the left horizon is much brighter than foreground material between rocks – some of which suggest to observers at JPL whimsical names like the Midas Muffler rock (oval rock in left foreground) and VW Beetle rock (on horizon, left center). The horizon is about three kilometers away from the Lander, and projections at or near the horizon may represent the rims of distance impact craters. A horizontal cloud stratum can just be discerned halfway between the horizon at the top of the panorama. Spacecraft components, from left to right, are Earth-command low-gain receiver antenna, housing for sample arm, camera calibration color charts, magnetic properties experiment mirror, and the high-gain dish antenna for direct Lander-to-Earth communications.

Viking may confirm (or deny) wishful thoughts on Mars life

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Legend has it that some 50 years ago a celebrated newspaper publisher sent this telegram to a famous astronomer: "Wire collect immediately," the telegram demanded, "500 words on whether there is life on Mars." The astronomer dutifully replied 250 times: "Nobody knows, nobody knows, nobody knows, ..." But despite this confession of ignorance asserted with dogged persistence by an expert, no one paid any attention; and, from that time to this, we hear authoritative pronouncements by those who think they have deduced life on Mars and by those who think they have excluded it.

The first purported evidence of life on Mars came almost exactly a century ago, in 1877, when an Italian astronomer, Giovanni Schiaparelli, peering at Mars through a new telescope outside of Milan and at a time when Mars was close to the Earth, saw to his astonishment a network of single and double straight lines which seemed to criss-cross the planet, "like the lines on a fine steel etching." Schiaparelli named them *canali*, which in Italian means channels or grooves. The word was promptly mistranslated into English as canals, a name by which they have been known ever since.

The American astronomer, Percival Lowell, was entranced by what he believed was the explanation of the canals, and erected a major observatory and devoted his life to the problem. The canals of Mars, Lowell eloquently argued, were canals: an intricate network of waterways constructed by a race of hydraulic engineers in a planet-wide water conservation project. The idea of a noble species of dedicated engineers gamely surviving through their technical ingenuity on an increasingly arid planet caught the romatic imagination of the public, particularly after it passed into popular fiction in the works of Edgar Rice Burroughs and others.

The only trouble is that the canals of Mars do not exist. The Mariner 9 spacecraft orbited Mars for a full year in 1971-72, and photographed the planet pole to pole with a discrimination of fine detail 100 times better than the astronomers of Lowell's time could possibly have managed. Mariner 9 was only 1,600 kilometers (1,000 miles) from the Martian surface compared with the 40 million kilometers (25 million miles) which separate Earth and Mars at their closest approach, and Mariner 9 did not have to look through the ocean of air which hampers astronomical observations from the surface of our planet.

A few of the canals may be great rift valleys, or the accidental alignment of impact craters, or linear streaks of dark dust; but no canal network as described by Schiaparelli and Lowell exists on Mars and the most generous assessment of the "canal problem" is to mark it down to the imprecision of the human hand-eye-brain combination: The canals were drawn at the telescope during brief moments of relative steadiness of the Earth's turbulent atmosphere.

Likewise, astronomers of Lowell's time observed seasonal changes, an increasing contrast, a sharpening of boundaries between adjacent bright and dark markings on the planet's surface. Some also reported color changes. These variations were called the "wave of darkening," which was reported to move from the shrinking polar cap in early spring towards and across the equator in the summer. Lowell and others attributed these seasonal changes to the growth and proliferation of Martian plants imagined to constitute the dark areas, and likened the wave of darkening to the sprouting of vegetation and the growth of leaves on deciduous trees in the Earth's Northern Hemisphere. Again Mariner 9 has dampened this interesting idea. Close observations have shown that the changes almost certainly are due to the redistribution of bright and dark dust by Martian winds, varying with the seasons.

A number of other supposed proofs of life on Mars – the "green" color of the dark areas, the reappearance of the dark areas after being covered by bright powder during a Martian dust storm, and the supposedly anomalous motion of the innermost moon of Mars – all turn out to have other explanations. Is life on Mars therefore excluded? Not at all. Mars is certainly colder than the Earth, it has a thinner atmosphere, less oxygen, less ozone (ultraviolet light from the Sun reaches the surface of the planet) and no abundant liquid water. These are environmental conditions which would instantly kill an unprotected human being on Mars. But life is not the same as human life and there are a wide variety of terrestrial microorganisms able to survive indefinitely under Martian conditions; and if they are provided, even briefly, with a little liquid water they are able to reproduce. Since terrestrial microbes which have evolved on the Earth are able to survive and possibly grow under Martian conditions, Martian organisms, if any, should be much better adapted to the apparent inclemencies of the Martian environment.

For some reason it is thought to be a sign of caution to admit the possibility of microbes on Mars but to exclude peremptorily the possibility of macrobes – organisms large enough for us to see unaided were we on Mars. But there seems to be no evidence for or against Martian macrobes, and, for all we know, there is a thriving population of large organisms on the planet. Nothing in our present understanding of Mars excludes this possibility. A hundred thousand years ago the Earth was burgeoning with life – indeed because the number of humans was still small, there was then a much richer variety of organisms than there is today. But had Mariner 9 been put into orbit about the Earth a hundred thousand years ago, it would have been able to photograph no clear signs of life whatever. Today the situation is different because human engineering enterprises, both urban and agricultural, have remade the landscape of the Earth.

Mars today might have a dense population of varied and robust organisms, both microbes and macrobes. If so, we have no way to predict what those organisms are like except that evolution seems clearly to imply that they would not closely resemble the organisms of Earth – they have spent too long adapting to an extremely different environment to be much like us. Mars might have life which is tenuously hanging on in a world enveloped in what looks very much like an ice age. Perhaps there are spores and hibernating forms awaiting the return of more Earth-like conditions; or perhaps there is no life at all, but only fossils and other signs of a now-extinct biology. Alternatively, Mars might be lifeless today and lifeless in the past. We simply do not know which of these circumstances characterizes the planet.

But any one of these cases is of substantial interest. If Mars has now or ever had living things, we will have for the first time in human history an opportunity to test the generality of the process which on Earth we call life. We will be able to determine how different from Earthly organisms life can be. Whatever form of life exists on Mars its implications for biology and for our view of ourselves would be breathtaking: because if life has independently arisen on two rather different adjacent planets, the argument that life is a commonplace in the Milky Way Galaxy will become almost compelling. If on the other hand Mars proves to be lifeless, we have the classic scientific situation, the experiment and the control. We will then be able to approach the important question of why life arose on the Earth but did not on Mars. The answer to that question is bound to illuminate profoundly our understanding of the origin of life.

Fortunately, the epoch of ambiguity about Martian biology, the time when the only responsible answer is "nobody knows," is drawing to an end. Because two exquisitely instrumented landing capsules called Viking will search the Martian surface for the possibility of life.

"We have touchdown..."

"Touchdown! We have touchdown!" Those were the words that brought cheers of relief and excitement from members of the Viking Flight Team at 7:12 am CDT, Tuesday, July 20. A long night of anxious anticipation had been rewarded with the successful landing of Viking 1 on Mars, and the degree of success was acknowledged by the exclamation "unbelievable" during the virtually perfect entry and landing sequence. The accuracy of the event was so precise that the landing occurred within 17 seconds of the predicted time, and the terminal velocity – predicted to be 8 feet per second, ±3 feet per second – had an actual velocity of 8.2 feet per second. The initial success was a preview of the camera operation and picture production quality that astonished flight team members, hundreds of guests, and a national television audience a short time later.

The reconstruction of the pictures on television monitors at the Viking Control Center was punctuated by cheers of congratulations among the participants, many of whom had been involved on the program for up to fifteen years, and by a congratulatory telephone call from President Ford. The President reminded the Flight Team that July 20th was a day worth celebrating in the history of our nation's space program, for it was on July 20, 1969 that Neil A. Armstrong became the first inhabitant of our planet to set foot on the Moon.

NASA Administrator Dr. James C. Fletcher, told a large press corps at the press conference following the landing, "We've gained one more important objective in the exploration of our solar system, with the hope and vision of more to come."

James S. Martin, Jr., Viking Project Manager, pointed to the incredible performance of the Lander during the landing and initial picture acquisition, and expressed his appreciation to the entire flight team and to the "10,000 people across the country who deserve a part of the credit given to me!"

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