

# Scientists Seeking Answer To Collision Of Rock, Space Ship

New York, N. Y. (Scientific American Feature) — What happens when a small rock speeding through space at the rate of 40 miles per second collides with a space ship approaching in the opposite direction at the rate of 10 miles per second?

Scientists are now experimenting to learn the answer. Collisions of such violence do not occur between objects of appreciable size on earth. Bullets from even the highest powered rifles fail to attain a muzzle velocity of even one mile per second.

A start on this fascinating aspect of space-age research has been made, nonetheless, by

A. C. Charters and his colleagues in the hypervelocity ballistic range branch of the National Aeronautics and Space Administration.

"Our experiments, which as yet extend only a little past 20,000 feet per second, show that high-speed impact differs sharply from the process at lower speeds," Dr. Charters reports. "To study the phenomena of violent collisions we have thus far simply fired projectiles into targets and observed the craters produced by the impact. At low velocities the projectiles were spheres of tungsten carbide; at high velocities, hard ball-bearing steel. The targets

were massive blocks of soft lead, aluminum, granite and copper. Speeds varied from a few hundred feet per second to 20,000.

**Deep, Narrow Cavity**

"At low speeds the projectile penetrated a metal target intact and made a deep, narrow cavity like a nail hole. The penetration increased steadily with velocity; doubling the velocity increased penetration by a factor of about 2.5. This relationship holds for a number of different materials. A second feature of low-velocity impact is that the projectile retains

its spherical shape as it forces its way into the target.

"At some velocity, depending on the strength of the projectile and target, the projectile no longer withstands the forces of impact and starts to deform or, if it is brittle, to break into pieces. In our experiment this transition zone appeared at the approximate velocity of 1,500 feet per second. As the velocity is increased beyond the critical

point, a ductile projectile mushrooms in front as though it were trying to turn itself inside out. The rate at which the penetration increases with velocity begins to fall off. A crater is formed in the target material that widens with projectile velocity and begins to approach a hemispherical shape.

**Virtually No Strength**

"Eventually, at about 8,000 feet per second in our experiments, the shape of the crater becomes almost precisely hemispherical. At still higher speeds the penetrating power of the projectile again increases with velocity at a constant rate, but now, when the velocity is doubled, the factor of increased penetration is only 1.6. Clearly another transition zone has been crossed.

"At the highest velocity we

**PROCESS DEFINED**  
Toledo—Beneficiation is any process by which the yield of metal from ore is increased.

**COFFIN NEEDS**  
Peiping—Wood for coffins provides one of the heaviest drains on Chinese forests.

**SUBMARINE LOSS**  
Washington—The German navy lost 78 of its U-boats during World War II.

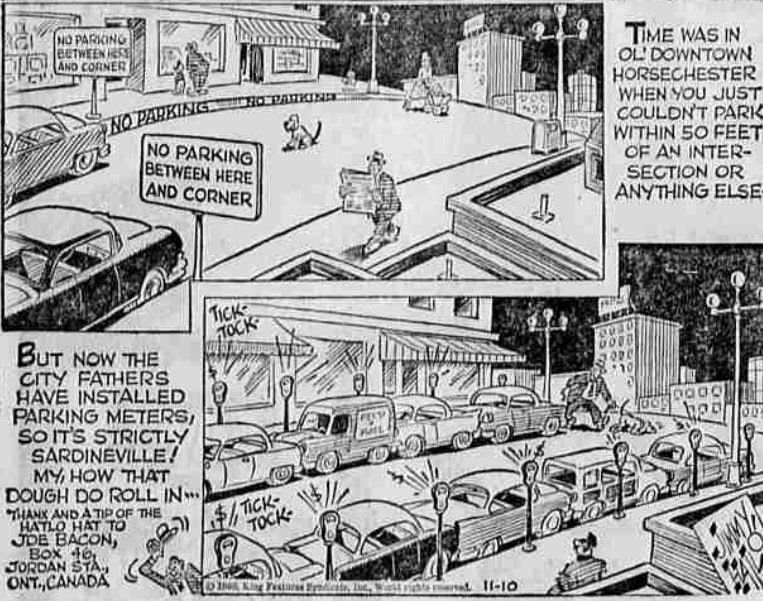
sunnyside up  
or over easy!



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### They'll Do It Every Time By Jimmy Hatlo



### 4-H NEWS

The Lake Creek General 4-H club held its first meeting at the Lake Creek Grange hall Nov. 4, with 18 members attending.

Officers elected were president, Mark Flint; vice president, Victor Halsel; secretary, Alice Woolfolk, song leader, Mary Ann Gardner; reporter, Tom Perry, and treasurer, Raphael Gardner.

Leaders for the individual clubs are Robert Fisher, beef and sheep; Ed Peile, hog; Larry Perry, horse; Jody Walch, camp cookery, and Alice Woolfolk, junior leader.

The next meeting will be in February at the Lake Creek Grange hall. The beef, hog and sheep clubs will meet Dec. 2 at the Robert Fisher home, and the horse club will meet Dec. 9 at the Garth Flint home. Refreshments were served by the club leaders.

Tom Perry, Reporter

**CAN CLATTER CALMED**  
Heonor, England—(UPI)—Tenants here are being supplied with rubber garbage can lids, so that miners on the night shift can get some sleep.

## VETERANS' DAY TREATS

Enjoy the National Guard-American Legion dance tonight. Have a nice breakfast with the VFW tomorrow, have fun during the day's festivities, drive carefully and SAVE MONEY with these fine buys!

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Lean Fresh



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- T Bone Steaks Well trimmed aged lb. 98¢
- Cube Steak Tenderized from our best beef lb. 98¢

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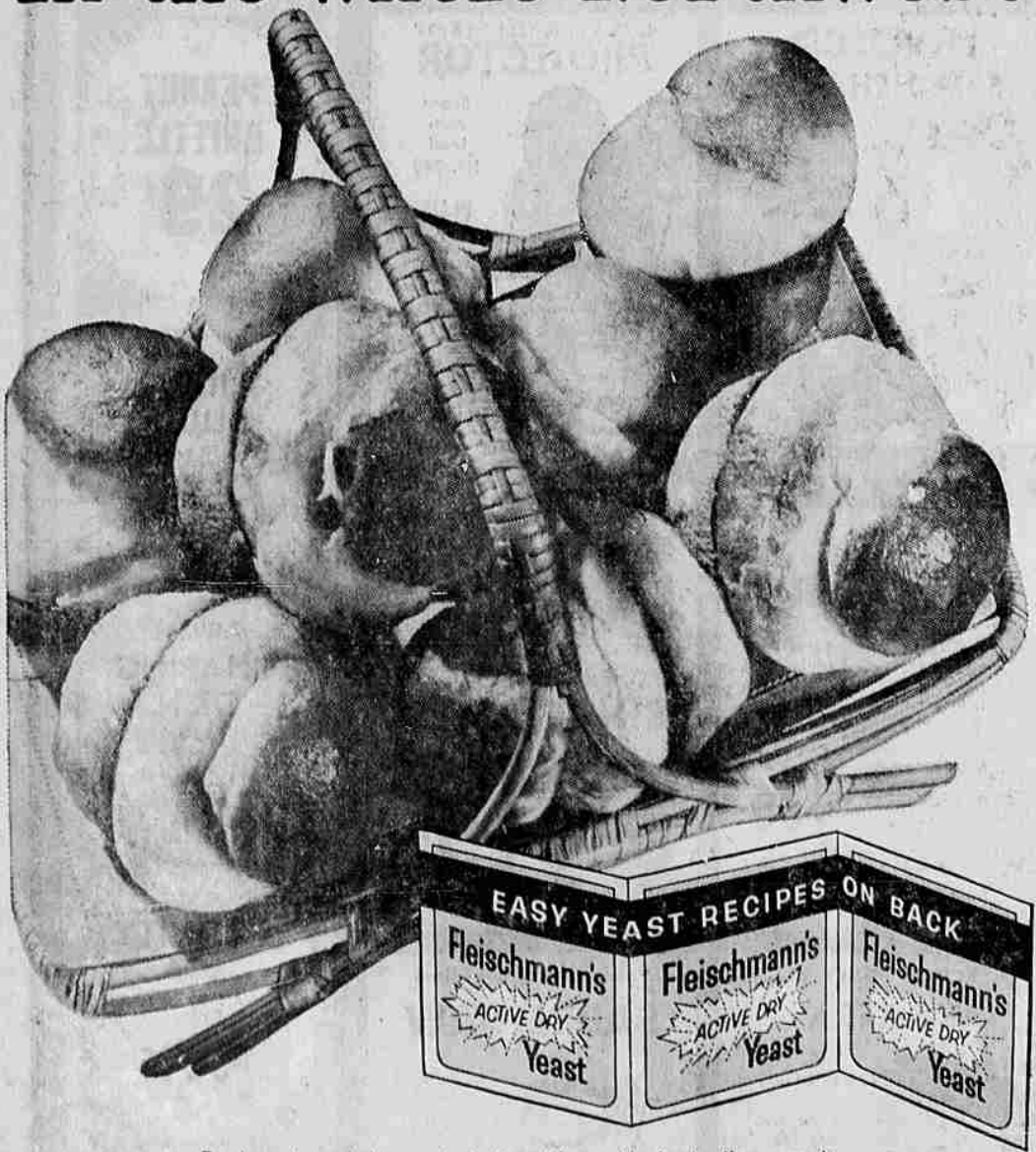
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Fresh Country Style 3 lbs. \$1

Pork Chops Center Cut 69¢ lb.

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FAB Giant	reg. .87	SALE .75	SAVE 12c
TIDE Giant	reg. .87	SALE .75	SAVE 12c
PUREX 1/2 Gal.	reg. .39	SALE .33	SAVE 6c
PUREX Gallon	reg. .63	SALE .53	SAVE 10c
SNOWDRIFT 3-lbs.	reg. .89	SALE .59	SAVE 30c
LASAGNA IXL	reg. .69	SALE .49	SAVE 20c
COFFEE Maxwell, 2 lb.	reg. 1.49	SALE 1.19	SAVE 30c
DOG FOOD VETS	reg. 3-20	SALE 12/.89	SAVE 27c
ALKA SELTZER Small	reg. .29	SALE .19	SAVE 10c
ALKA SELTZER Large	reg. .54	SALE .39	SAVE 15c
COUGH SYRUP Pertussin	reg. .79	SALE .59	SAVE 20c
VA-TRO-NOL VICKS	reg. .47	SALE .39	SAVE 8c
TOOTH PASTE Gleam; fam. size.	reg. .83	SALE .69	SAVE 14c
TOOTH PASTE Colgate fam. size.	reg. .83	SALE .69	SAVE 14c
PEACHES BAGLEY 2 1/2	reg. .27	SALE 4/.89	SAVE 19c
PINEAPPLE Del Monte 2 1/2 slice.	reg. .47	SALE 2/.89	SAVE 5c
PINEAPPLE Dole; 2 1/2 crush	reg. .43	SALE 2/.79	SAVE 7c
SUGAR 25 lbs.	reg. 2.89	SALE 2.59	SAVE 30c
RADIANT MIX 1 lb.	reg. .53	SALE .39	SAVE 14c
MINCE MEAT Borden 28 oz.	reg. .63	SALE .49	SAVE 14c
NAPKINS ZEE White	reg. 2/.25	SALE 2/1.99	SAVE 6c
INSTANT COFFEE Folgers 6 oz.	reg. 1.17	SALE 1.59	SAVE 18c
INSTANT COFFEE Folgers 10 oz.	reg. 1.89	SALE 1.59	SAVE 30c
YEAST Fleischmann's dry cake	reg. 3/.17	SALE 1c ea.	SAVE 14c

Cauliflower Snowy White 19¢ each

Yams Puerto Rican's Best 9¢ lb.

Danish Squash 5¢ ea.

Snoboy Crisp Cello Celery Hearts each 19¢

Danish Squash Absolutely No Bones ea. 5¢

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Cranberries 1-lb. Pkg. ea. 19¢

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