

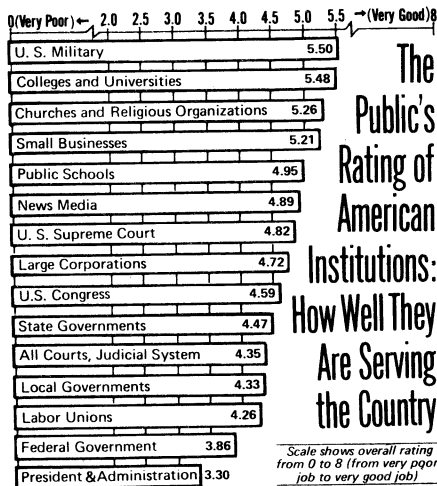
## Poll shows military as 'most admired'

Though feelings toward the military ran low during the Vietnam war, and there still remains a somewhat unenthusiastic response of young people to the volunteer Army, there are signs that attitudes are changing. In a cross-sectional survey conducted by the University of Michigan's Institute for Social Research, the military was ranked as the most admired institution in the United States, with Congress, universities and religious organizations running close behind. The President and his Administration were rated the lowest; the Federal Government and labor unions ranked next to the bottom. Willard Rogers, director of the survey analysis, believes that "This may be a sign that the military's prestige is recovering from the Vietnam war."

The Michigan poll's high rating of the military contrasts with an eighth-place rating for the military found in a 1973 poll by the National Opinion Research Center (SN: 3/9/74, p. 518).

Between October and November 1973, the Michigan pollsters asked 1,444 Americans how good a job each of 15 major institutions were doing for the country and questioned them about the honesty and morality of the leadership of 10 of these institutions. The U.S. Supreme Court was seen as the institution with the highest integrity, and small business leaders and military officials were viewed as having high standards of honesty and morality. Labor union officials incurred the poorest appraisals.

Public esteem for large corporations has fallen over the past quarter of a century, though they still were rated



positively. Sixty percent of the people questioned said that the good things big businesses do outweigh the bad; 17 percent were of the opposite opinion. When the identical question was asked in 1950, 76 percent felt that positive aspects outweighed the bad, and 10 percent took the opposing view. Jobs were the most frequently mentioned benefit of big business while power over other institutions, the Government in particular, and pollution and wastefulness of resources were mentioned as the harmful aspects of corporations.

The survey also found that people would like to see a redistribution of power—a reduction of the power and influence of corporations, labor unions, news media, the President and the Federal Government and more power invested in Congress, the U.S. Supreme Court, as well as state and local government. □

## Space detective stops a suicide

On Jan. 28, while on an extended journey, the subject suddenly freaked out, jerking about until observers began to fear a threat of suicide. They managed to quiet the subject down, but the same behavior reappeared a few weeks later. Fortunately, a sharp detective was on the case.

The subject was the Mariner 10 spacecraft, which, thanks to weeks of day and night work by the detective, now has a new lease on life.

The freakout occurred when flight controllers at Jet Propulsion Laboratory in Pasadena were putting the spacecraft, only a week away from its encounter with Venus, through a maneuver that would measure how accurately it could be turned on its roll axis. The maneuver had just gotten underway when one of the controllers

abruptly declared, "I think I've got a stuck jet."

One of the 12 gas jets used to control the probe's orientation was refusing to shut down. Not knowing what was wrong, officials decided to turn off the entire spacecraft and reconnoiter. In the 30 minutes that had elapsed, Mariner had blown a sixth of its entire control gas supply away into space.

The cause was a mystery. The symptom was a rapid oscillation in the roll-control equipment that caused the gas jet, which was innocently doing its job of trying to hold the spacecraft steady, to fire continuously.

Mariner's life was at stake. Without gas it would be virtually dead in space, and even without the roll gyro, heart of the roll-control "loop," its usefulness would be sharply curtailed. □

Enter the detective. Ted Kopf, a JPL guidance and control analyst on the Mariner team, had recently finished work on a hugely detailed computer model of a gyro and the symptoms that would be produced by different kinds of malfunctions. Aided by a copy of the gyro and a reconstruction of its related circuitry, Kopf began a weeks-long search, rejecting possibilities one after another. Only one candidate, a short circuit between the device controlling the gyro's movement in its mounting and the sensor monitoring it, was capable of creating an oscillation of the proper frequency, but it could not keep the oscillation going.

Frustrated, the detective went back to the source: a voluminous structural analysis that had been prepared before the mission by the spacecraft's builder, the Boeing Co. in Kent, Wash. For more days and nights he pored through column after column of complex numbers, none of them arranged with rapid trouble-shooting in mind. Finally, a theory began to form in his mind. It was an improbable combination of factors requiring just the right positioning of the spacecraft's solar panels, high-gain antenna, magnetometer boom and structural framework. If everything was just so, he reasoned, the vibration frequencies of all those components could conceivably reinforce one another to produce a strong, lasting shake, which would make the gyro think that it had to correct for stronger jet firings than were taking place.

"It was a beautiful piece of detective work," says Gene Gibberson, Mariner project manager at JPL. To be certain, Kopf called Boeing, which rechecked its own data and reported that, yes, the possibility of such a reinforcement had been foreseen, but that no one had expected it to be significant.

Two weeks ago, facing a critical maneuver, the controllers ran a test. Orienting the critical parts in the presumably non-reinforcing positions required by the maneuver, they turned on the roll control. No oscillation.

With the problem solved, and with the added reassurance that it had not signified any equipment breakdowns, last Thursday and Friday the controllers aimed Mariner toward the next phase of its mission: a second encounter with Mercury, on Sept. 21.

The maneuvers will send the spacecraft past Mercury's southern sunlit quarter about 29,500 miles out, to give good photo coverage of the south pole and the meridian nearest the sun, which were only in the most distorted photos from the first encounter six weeks ago. A nightside pass, however, is still a possibility, to study Mercury's interaction with the solar wind. □