



**RECORD-SHATTERING RIDE**—Lt. Col. John P. Stapp of the U. S. Air Force is strapped into the sled in which he reached the new world ground speed record of 632 miles an hour, then was jolted to a dead stop in 1.4 seconds. The purpose of the run, made at Holloman Air Development Center, New Mexico, was to explore human tolerances during a high speed bailout from jet planes. The sled, propelled by nine rockets, was stopped by water brakes that subjected him to an average force 27 times greater than gravity for a little more than a second. He withstood wind forces of more than two tons, but suffered no ill effects except two black eyes, caused by his eyeballs being thrown against the eyelids during the stop, and small blisters on his skin from dust particles in the air.

## PHYSIOLOGY

## Pilot's Eyes Displaced

➤ PILOTS AND crew members of jet and rocket ships will have trouble reading fuel gages, airspeed indicators and compasses when their aircraft changes direction abruptly at high speeds, even if they are wearing conventional anti-blackout suits and take the prone, supine and semi-supine positions intended to protect them.

The reason is that the lenses of the eyes are pulled out of place by the force of gravity as this increases.

Studies showing that increased g forces reduce visual acuity, and the displaced lens theory to explain it were reported by William J. White of the Aero Medical Laboratory, Wright-Patterson Air Force Base, Ohio, at the meeting of the American Association for the Advancement of Science in Berkeley, Calif.

The experiments leading to the findings were made by Mr. White and Lt. Warren R. Jorve. Further protective devices must be designed if the human operator is to take full advantage of the aircraft's maneuverable potentialities, Mr. White said.

The experiments are part of a continuing search to determine all the effects on pilot and crew members of the high performance jet and rocket propelled aircraft. Engineering advances made it possible for the aircraft to withstand tremendous structural strains over long periods of time, but man still has the same body, the efficiency of which is affected by blood circulation, vision and consciousness, Mr. White said.

Effects of acceleration are apparent as weight. One g equals a man's weight, two g doubles it, three g triples it, etc. In conducting experiments in g forces, Aero Medical Laboratory personnel use a centrifuge that looks like a cab mounted on a rotating arm, much like a merry-go-round. Visual acuity was measured with the checkerboard targets that are standard with the Ortho-Rater.

Mr. White and Lt. Jorve reject the theory that the reduction they observed in visual acuity was due to reduction in blood supply to the head region of the body.

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## ANTHROPOLOGY

## Man and Monkeys Differ More Than Was Thought

➤ MAN IS less closely related to monkeys on the evolutionary family tree than scientists have supposed, Dr. Sherwood L. Washburn, University of Chicago anthropologist, told the meeting of the American Anthropological Association in Detroit, Mich.

The error has been due to wrong counting of the bones in the spine.

In the past, Dr. Washburn said, it has been generally assumed that there was a continuity of the evolutionary pattern between all three groups (monkeys, apes and men) because of a similar distribution of spinal vertebrae.

Scientists counted in man 12 vertebrae attached to the ribs and five in the lower back. The count for apes and monkeys was practically the same, with 12 rib vertebrae and seven in the lower back.

However, this count was wrong, Dr. Washburn said. In the case of the monkeys, the two lower rib vertebrae should be counted with the lumbar, or lower back vertebrae, making the count ten and nine instead of 12 and seven.

The reason why these two lower rib vertebrae should be counted with the lumbar vertebrae in the monkey is that they serve an entirely different function in monkeys from what they do in man or in the great apes.

In monkeys, the lumbar vertebrae and the two vertebrae formerly counted as rib vertebrae are large and extremely well-muscled. In apes and man, the lower vertebrae are relatively small and not at all heavily muscled.

The difference is due to the fact that monkeys run on all fours while apes and men walk erect.

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## OCEANOGRAPHY

## Northeast Pacific Ocean Was Colder Century Ago

➤ TAKING A dip in the Gulf of Alaska or the northeast Pacific Ocean 100 years ago was a colder proposition than it is today.

This and other aspects of the sea temperature for this area were described at the meeting of the American Association for the Advancement of Science in Berkeley, Calif., by Margaret K. Robinson of the Scripps Institution of Oceanography, La Jolla, Calif.

Reporting the results of an analysis of 16,103 observations made between 1941 and 1952 with a bathythermograph (BT), an instrument that measures temperature against depth, Miss Robinson stated that 19th century observations showed that the average temperature was lower.

The observations for the 19th century, numbering 707, were taken in 16 years between 1816 and 1889.

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