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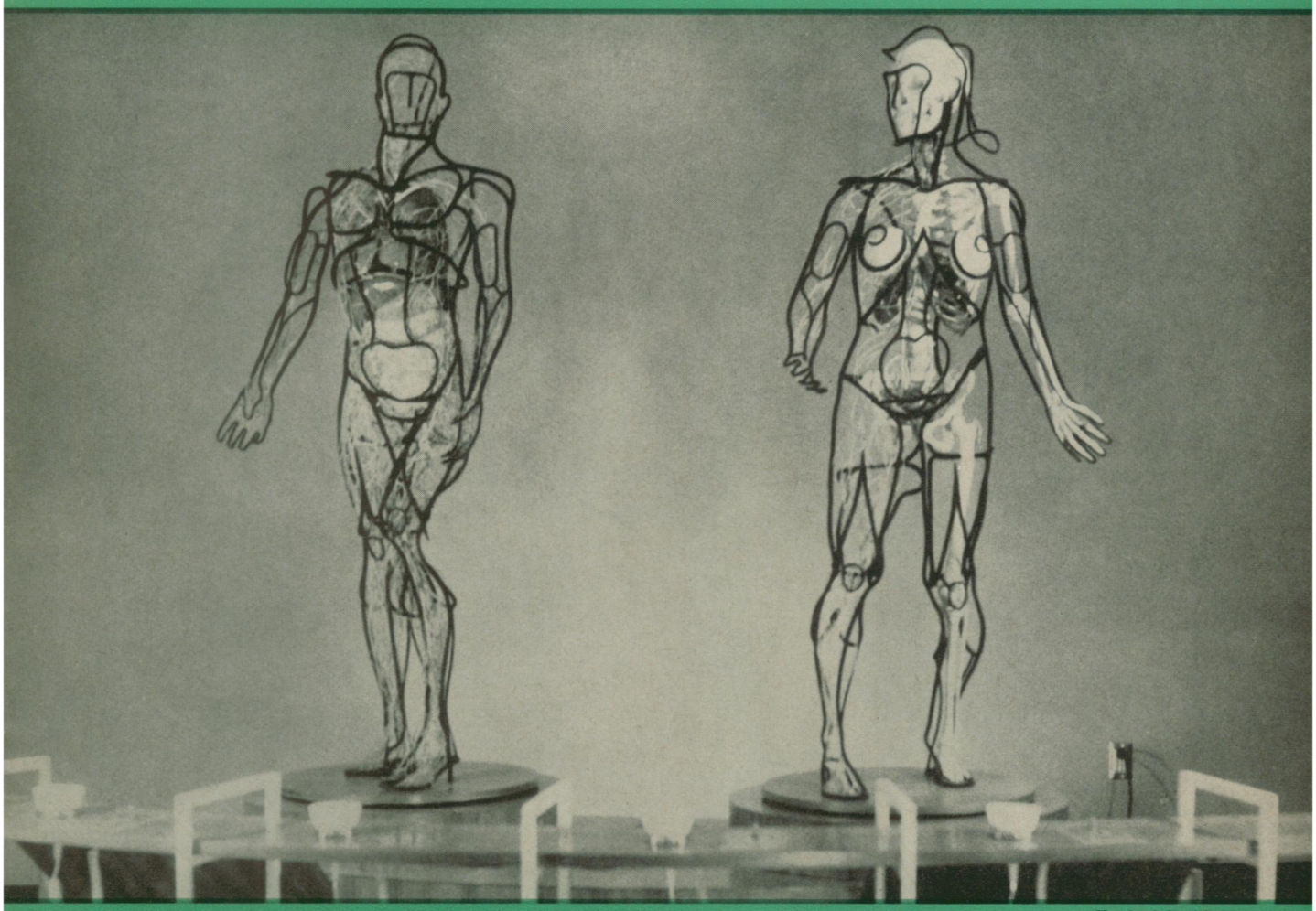
April 13, 1963

VOL. 83, NO. 15 PAGES 225-240

SCIENCE NEWS LETTER

®

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Cleveland Health Museum

Vesalius Models

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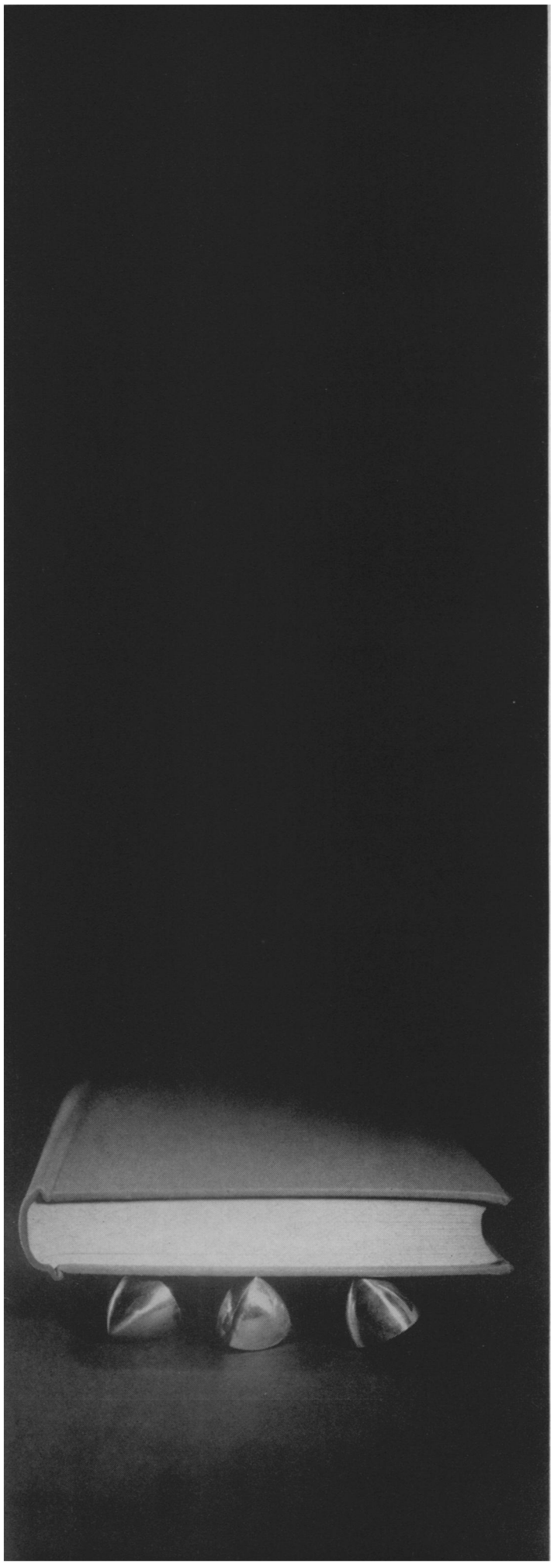


One of a series briefly describing GM's research in depth

How do you know it's round?

The objects at left are not round.

But lay a heavy book on them and push. The book glides smoothly with no vertical component of motion.

Or measure them with a micrometer caliper. Like a sphere, their "diameters" are everywhere constant.

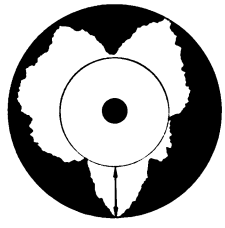
They are members of a family of surfaces having constant width. It's their less brazen cousins that are troublesome, though. Many machined parts, for instance, may be constant in diameter but out of round. Bearing balls. Journals. Holes. You name it. A smidgen of out of roundness would remain invisible to the eye and undetectable by two-point measurements.

Prompted by automotive and space-age needs, engineers at our Research Laboratories have been developing new techniques for measuring, analyzing, and specifying these subtleties of surface geometry. For example, they built a special roundness measuring instrument about a precision spindle. Called the Roundicator, it detects roundness deviations of less than 1 millionth of an inch on parts up to 18 inches in diameter. Scaled up some 30 million-fold, that's about a 3-foot dimple on an Earth-size ball.

These pioneering studies of roundness and its ramifications are typical of how General Motors engineers are finding a better way—through research in depth.

General Motors Research Laboratories

Warren, Michigan



0.000053 in.

"Roundicator" chart of a 1-in. standard used to check micrometers. Diameter is constant to within 11 microinches, but disc is out of round by 53 microinches.