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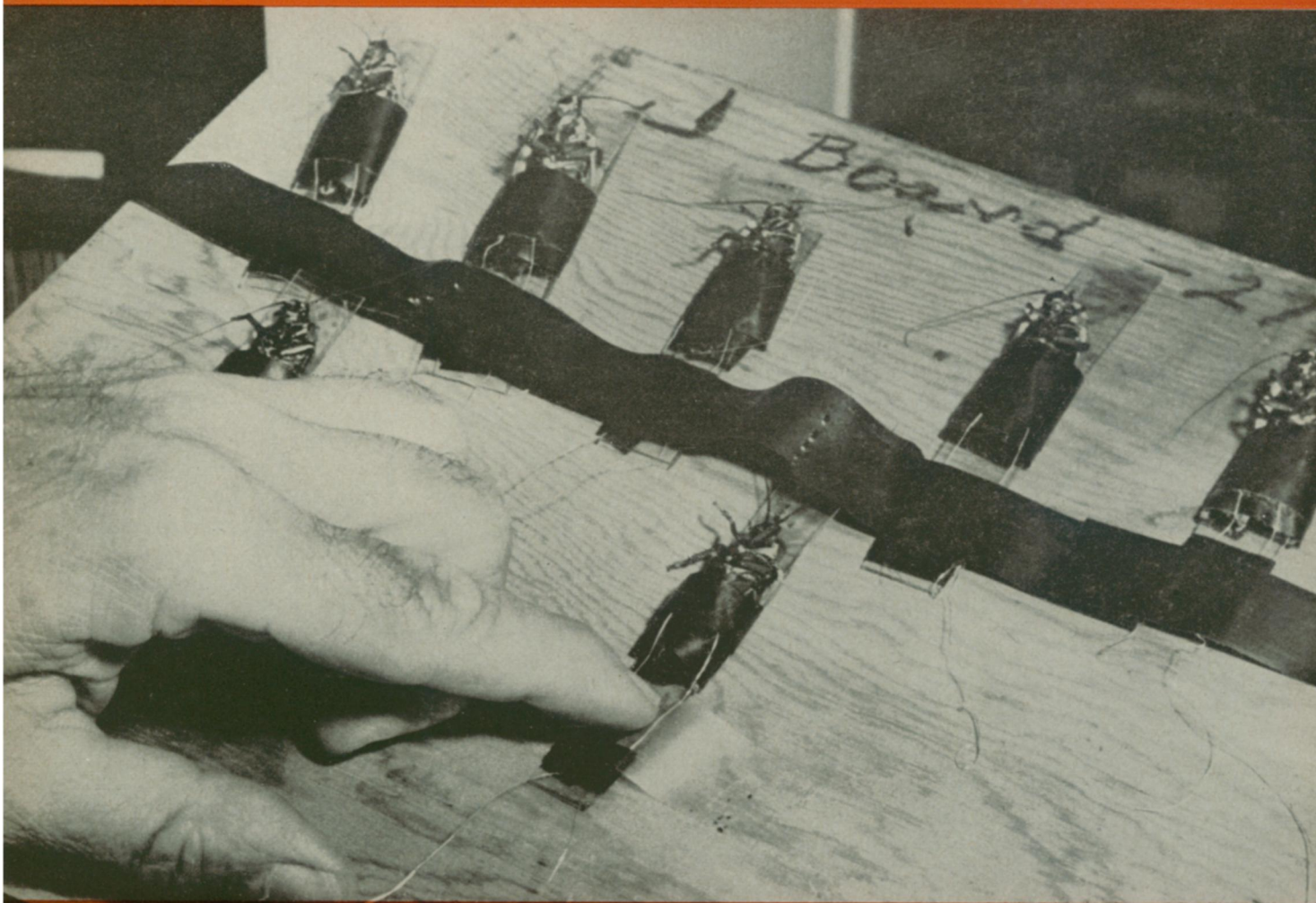
September 14, 1963

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SCIENCE NEWS LETTER

®

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Fremont Davis

Cockroach Astronauts

See Page 165

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HOT

Don't touch. At 650°C a red-hot metal is transforming from one solid state to another. And careful observation of its change in phase can tell us more about the influence of thermal history on the mechanical properties of metals. Strength. Hardness. Toughness.

Here at the General Motors Research Laboratories, our understanding of metals and the ancient art of heat treating is being extended by basic studies of solid state transformations at elevated temperatures.

Aiding the experimental side of these investigations is the thermionic emission microscope. With it, our metal physicists can study dynamic processes in metals *as they occur*.

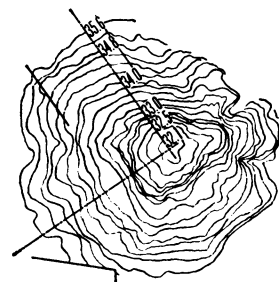
Here's how. Electrons "boiling off" a heated metal sample serve as the image source in this special electron microscope. Changes in the metal—phase transformations, recrystallization, and grain growth—are recorded by motion picture camera.

Results are being analyzed in several ways. For one, rates of micro-structural changes are being directly measured—some for the first time. For another, observations of the nucleation and growth of annealing twins have suggested a way of measuring the stacking fault energy of the austenite phase in plain carbon steels.

These studies, of scientific import today, will provide information helpful in fabricating the materials of tomorrow. They typify General Motors' continuing search for a better way.

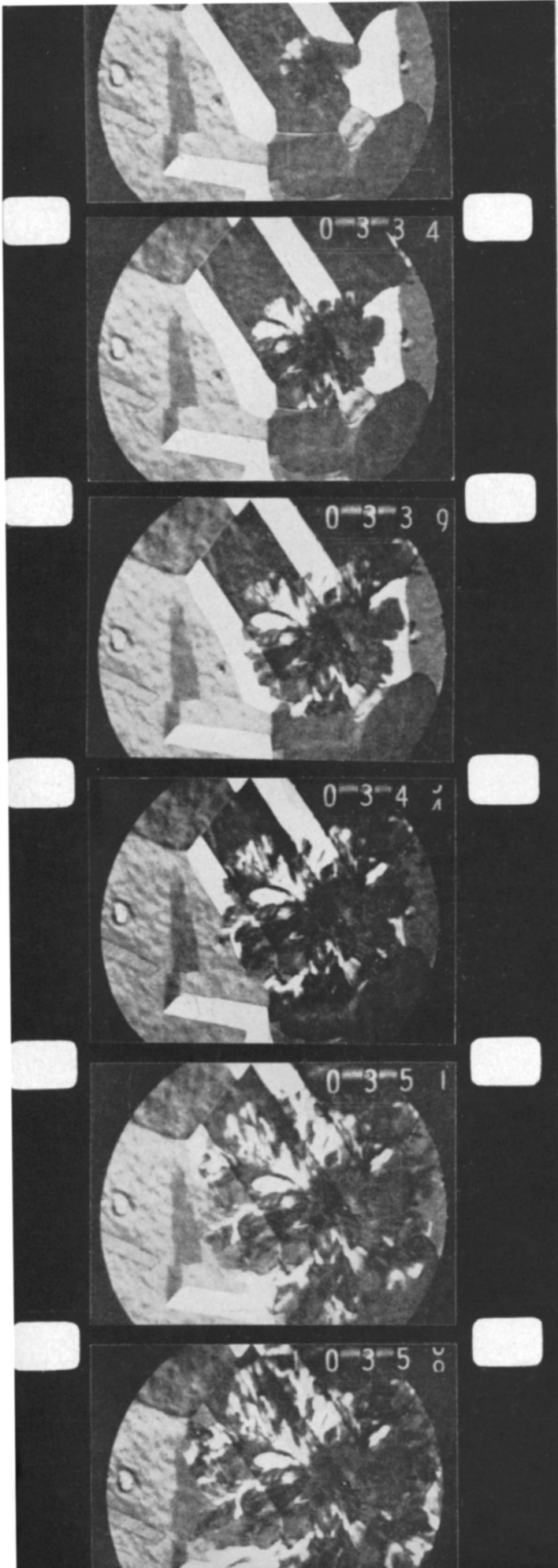
General Motors Research Laboratories

Warren, Michigan



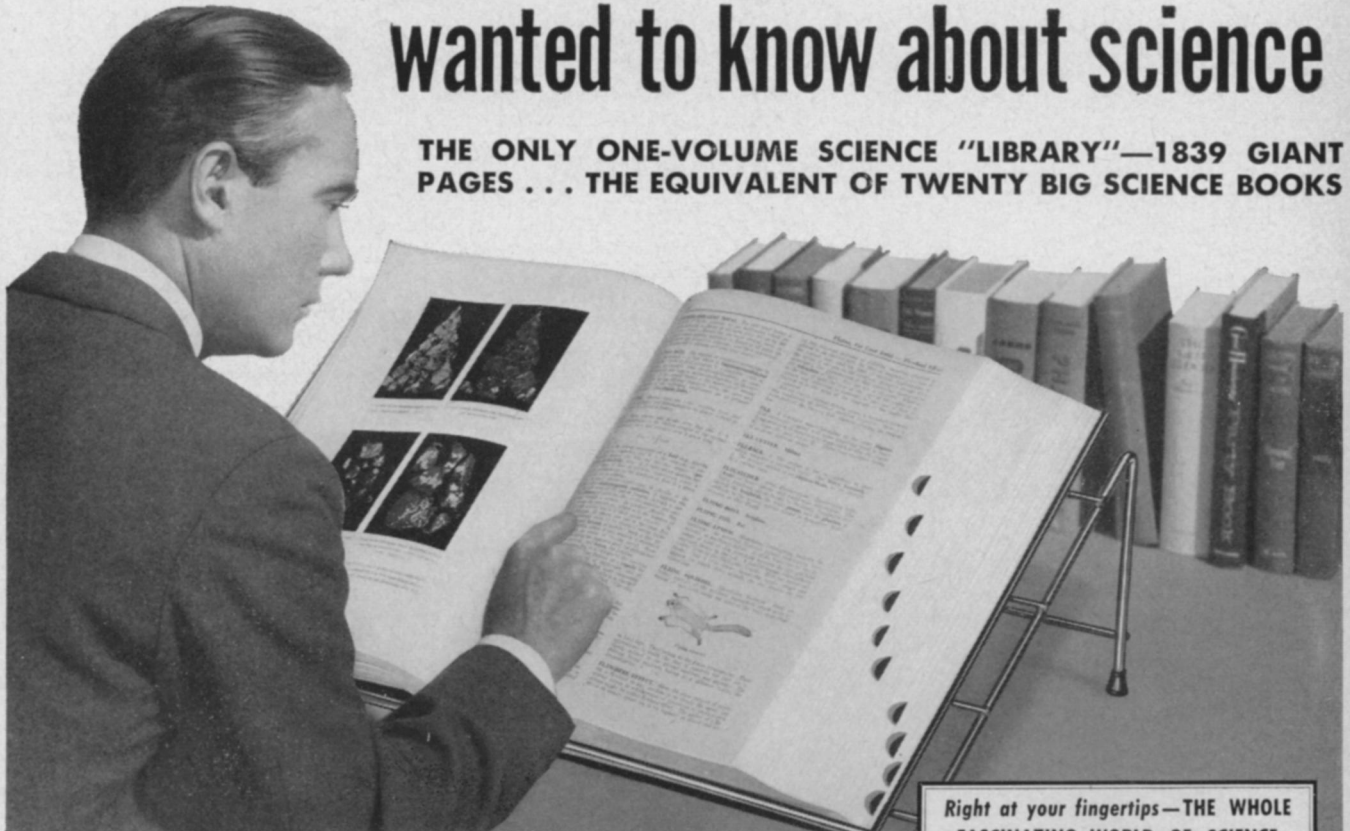
Time-contour map used for growth rate measurements.

Austenite transforming to pearlite in steel over a 3-second interval.



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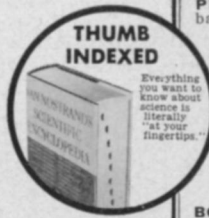
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