

15c
\$5.50 A YEAR



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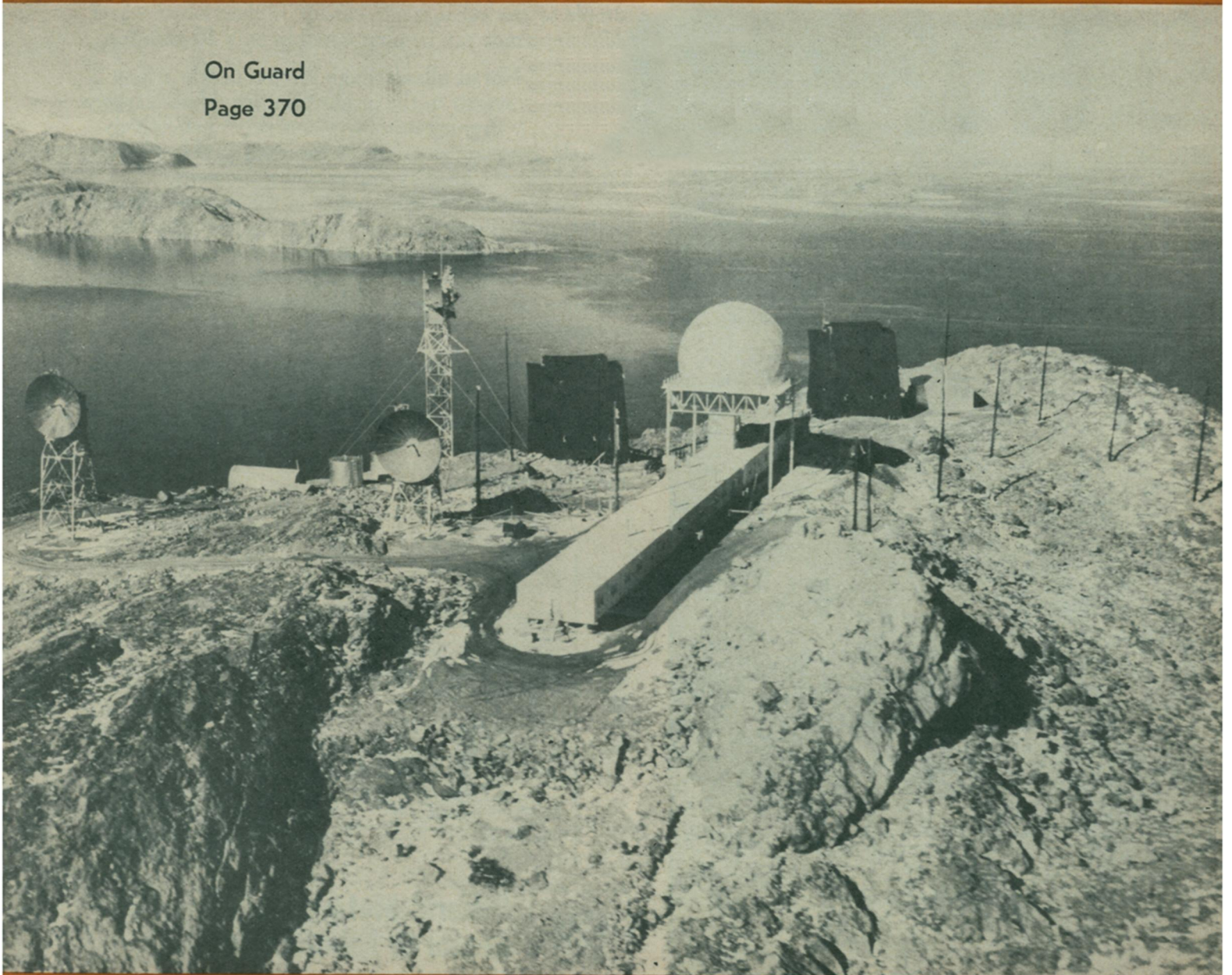
SCIENCE NEWS



SCIENCE NEWS LETTER[®]

THE WEEKLY SUMMARY OF CURRENT SCIENCE

On Guard
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A SCIENCE SERVICE PUBLICATION

We've managed to measure next to nothing

One part in a billion. Hard to even imagine.

A second in 31 years. A single bean in a line of peas laid end to end from New York to Berlin. Our research chemists are isolating, identifying, and measuring similar amounts of hydrocarbons in exhaust gas.

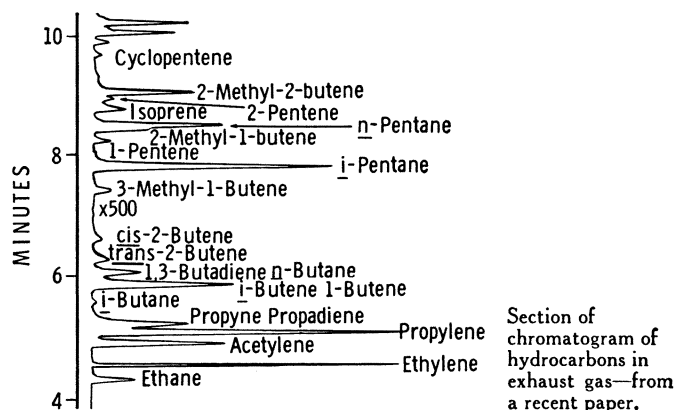
It's done by gas chromatography—using new techniques developed in over 10 years of intensive research on analytical methods.

From a diluted exhaust sample with total hydrocarbons of 2.3 parts per million, taken from the GM Research smog chamber, more than 60 hydrocarbons can be separated and measured down to 1 part per billion. The process is remarkably fast and accurate. In a 10-milliliter sample of raw exhaust gas—about $\frac{1}{3}$ fluid ounce—over 100 compounds can be pinpointed in only 20 minutes.

Academic? Not at all, although it's frequently a long step from research to the production line. Hydrocarbons differ widely in smog-forming potential. To effectively evaluate proposed solutions to the smog problem, we must be able to identify and measure the more reactive compounds. Our studies in the microworld of analytical chemistry are just beginning to contribute the data we need . . . new knowledge about how exhaust control systems, fuel composition, and engine variables influence the distribution of individual hydrocarbons in exhaust gas.

Often in industrial research, practical problems stimulate development of advanced techniques. That isn't new. Sometimes, though, the advances go a step beyond the practical . . .

To a new frontier.



**General Motors
Research Laboratories**

Warren, Michigan 48090

MARK OF EXCELLENCE