15¢
$5.50 A YEAR

October 10, 1953

VOL. 64, NO. 15 PAGES 225-240

# SCIENCE NEWS LETTER

®

THE WEEKLY SUMMARY OF CURRENT SCIENCE

## Autumn Leaves

See Page 234

A SCIENCE SERVICE PUBLICATION

# Kodak reports to laboratories on:

**an old-fashioned organic brought up to date . . . how to learn the fundamentals of radiography . . . hunting cosmic ray particles without a camera**

## The ant and the star

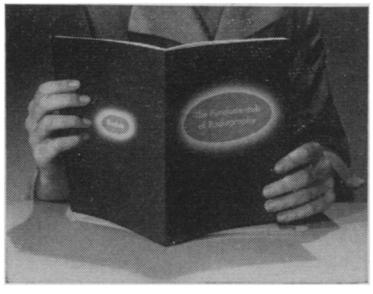
In the age of miracle drugs *Formic Acid*, simplest of carboxylic acids, appears in the *National Formulary*. As *Acidum Formicum*, it presumably possesses some old-fashioned pharmaceutical virtues as a counter-irritant and astringent. We sell it as Eastman 139, but not for this purpose at all. Although many Eastman Organic Chemicals *are* used in clinical investigation, we doubt that there is any great amount of such investigation in progress on *Formic Acid*. We suspect it is included in *N.F.* largely as a holdover from an older day when it was felt there must be medicinal value in a compound obtainable by so interesting a method as the distillation of ants.

The interesting thing about Eastman 139 for chemical purposes is the fact that it is considerably better than 98% *Formic Acid*. Most commercially available formic acid contains 10% of water. If you prefer it more anhydrous than that, then instead of seeking out a bulk supplier and persuading him to specially dehydrate a little of his formic acid for you, it's much simpler and quicker to put Eastman 139 down on your Eastman Organic Chemicals order. But, please, out of respect for the ★ that appears with each item in our catalog classed officially as a drug, append in good conscience the statement, "These chemicals will not be used for drug purposes or sold by us for such use."

*Whether or not* Formic Acid *is of immediate interest to you, you'll find over 3500 other highly purified Eastman Organic Chemicals in our "List No. 38." If you haven't a copy, write to Distillation Products Industries, Eastman Organic Chemicals Department, Rochester 3, N. Y. (Division of Eastman Kodak Company).*

## Radiography

We've just issued, in 100 pages, the rewritten eighth edition of "The Fundamentals of Radiography." The typical reader the authors had in mind is an intelligent and earnest young person who has never previously given much thought to the difference between an anode and a cathode but is willing to learn. Certain of the earlier pages you can probably afford to pass over rather quickly to get to the parts where we review the geometry of x-ray image formation, the effect of kilovoltage on what is shown, scattered radiation and its control, intensifying screens and how to use them, the



selection of film and processing procedures, calculation of exposures, how to get more contrast, how to get more detail, how in general to run a radiographic operation for consistently good results and maximum personal safety. The viewpoint is essentially that of the medical x-ray clinic, but the content can be useful elsewhere—to you yourself or to a newcomer you'd like to interest in the topic.

*To get a copy of "The Fundamentals of Radiography," one simply drops a note to Eastman Kodak Company, X-ray Division, Rochester 4, N. Y. If, however indirectly, it results in an increment to the ranks of the radiographers, we shall feel amply rewarded.*

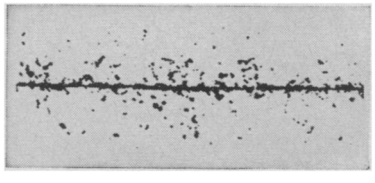
## Hobby?

Not only is there no need for a camera with *Kodak Nuclear Track Plates and Pellicles, Type NTB3*, but one doesn't even need to open the original shipping package to expose them. Their function is to pick up developable tracks of the ceaseless, silent rain of cosmic ray particles that stream through the atmosphere —electrons, protons, deuterons, mesons of the several breeds, positrons, multiply charged heavy ions, V-particles, etc.

(The number of species seems to grow with every meeting where high-energy physics is on the agenda; the theoreticians are way behind on their explanations.)

Any wrapping material we can put around the emulsion not only fails as a shield but even acts as a source of additional ionizing particles knocked out of the material by cosmic radiation. This makes *Type NTB3* just about our most perishable product. We keep no stock, even wait till the last moment to make the emulsion, get it to the physicists by the fastest means, and warn them to process as soon as possible.

Associating *Type NTB3* with urgency in our minds, we hadn't thought till just the other day of a leisurely experiment with them: let us, we said, simply leave a few dozen packages of *NTB3* plates and pellicles on the lab roof for a while, somewhat after the casual manner in which M. Becquerel opened the field of nuclear physics. After processing, will we find tracks of interesting particles and events? How much searching with a good high-power microscope will it take to find the interesting tracks against the



camouflaging background of secondary electron tracks that the professionals avoid by exposing in high-altitude balloons? We'll let you know if we find anything that might be encouraging to the dedicated amateur.

*A dozen 1″ x 3″* Kodak Nuclear Track Plates, Type NTB3 *cost $6.40 in 25-, 50-, or 100-micron emulsion thickness. Orders are placed with a local Kodak Industrial Dealer, whose name is obtainable from Eastman Kodak Company, Industrial Photographic Division, Rochester 4, N. Y. Larger sizes, 150- and 200-micron emulsions on plates, and pellicles cost more. A pellicle, by the way, is a sheet of unmounted emulsion one-quarter millimeter thick.*

Price quoted is subject to change without notice.

**This is one of a series of reports on the many products and services with which the Eastman Kodak Company and its divisions are . . . *serving laboratories everywhere***

Kodak
TRADE-MARK

# What General Electric people are saying . . .

## C. W. LaPIERRE

*Mr. LaPierre is Vice President and General Manager—Aircraft Gas Turbine Division*

". . . In my opinion, research and development organizations, including our many capable universities, should always be primarily interested in exploration which leads to establishing principles. They should not attempt, by themselves, to direct the course of aviation progress. For example, they should establish the operating limits on a particular material or the relative merits of different thermodynamic cycles. But they should not try to dictate how their findings should be used. This responsibility must be left to the designer. Research and development organizations should work with the industry in helping establish limitations and principles; they should anticipate problems and solve them. Their solutions make it possible for the aircraft industry to overcome obstacles that might otherwise delay progress for years.

But regardless of *who* conducts our research and development projects, or how they are conducted, the nation's efforts in this field must not be allowed to dwindle.

The Soviet has, and will undoubtedly continue to hold, the advantage of mass—mass of manpower and material. We cannot hope to overtake them on those two scores. But our system of government is such that it encourages freer thinking and more rapid development. Our defense lies in the ability to outdevelop them—to neutralize their ponderous weight of arms with more advanced machines and methods. Our nation is blessed with the brain power and facilities to press this advantage. Our danger lies in the curse of lethargy that would allow them to lie fallow.

*at The Air Force Association*
*Washington, D. C.*

## A. W. SCHMITZ and H. L. PALMER

*Mr. Schmitz is Manager of Equipment Engineering, Industry Control Department*

*Mr. Palmer is Manager of Electronic, Regulator and Aircraft Engineering, Industry Control Department*

". . . Today's high production speeds require controls with swiftness of response that can no longer be supplied manually. Self-regulating controls are the answer. At the same time, there's a constant evolution of control principles and amplifying means to obtain even faster speeds of response, and more accuracy of performance.

In the 1930's, the amplidyne—or rotating amplifier—was applied in industry where the sensitive capabilities of electronic tubes weren't needed, and where there was reluctance to use such fragile equipment. In subsequent years, however, control equipments were designed using the electronic tube and amplidyne in combination. Today, by contrast, the trend is toward replacement of both types with the static, or magnetic, amplifier.

Of tremendous help to the engineer in solving the complex control problems that lie ahead will be mechanical and electronic calculating machines. For in addition to solving mathematical equations, they can be used to simulate the electric machinery for which the control is designed. Thus, a more thorough test of the control can be made in the factory prior to installation at the customer's plant. This new technique has already reduced installation and tune-up time to a high degree.

Controls of the future may well include computers and information-storage devices to permit measurement and integration of operating factors in a process. That is, the control itself will make necessary calculations and automatically correct the process to get the desired end product. When we reach this stage of control, our nation's industrial productivity will have no limits.

*G.E. Review*

## C. F. GREEN

*Dr. Green is Engineer—Advance Developments, Aeronautic & Ordnance Systems Division*

". . . The successful conduct of the rocket flight of a complex piece of experimental equipment is an arduous undertaking. Not only is it necessary to have equipment operating properly and reliably without personal attention; but also it is necessary to co-ordinate a large field of operations involving final missile assembly, handling and firing details, a network of optical and radar tracking stations, a system of radar receiving stations, a range safety group for protection of inhabitants and for command cut-off of rocket motor power in the event of a probably dangerous trajectory and a recovery group. Because of the large number of people involved in a firing, the date and hour of firing is fixed considerably in advance. Deadlines are not easy to meet with varied pieces of laboratory type equipment. There are problems of doing adequate pre-flight check-out of equipment under difficult field conditions—such as extreme temperatures, sand storms, rain, hail and winds. In general, each flight, since it carries different equipment, separately engineered for its particular requirements, places special problems upon the missile men as well as the experimental agency or agencies, all working together with a common incentive to accomplish the planned objectives.

*at Oxford University*
*Oxford, England*