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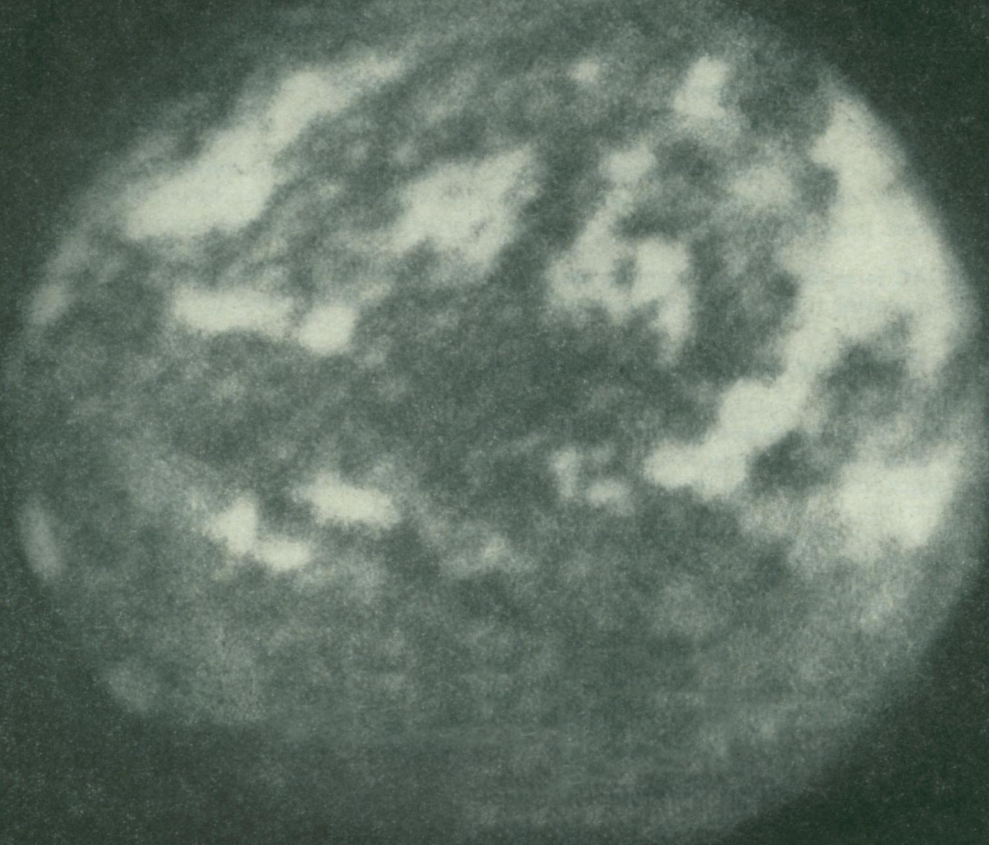
VOL. 75 NO. 15

PAGES 225-240

SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE

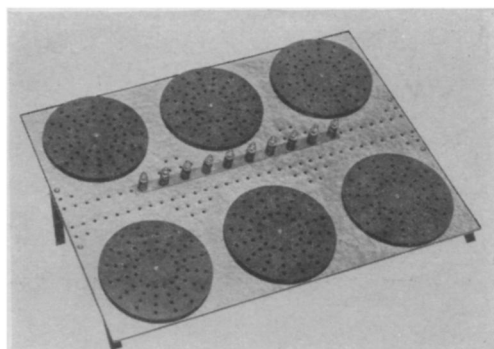


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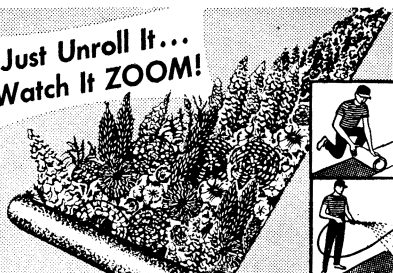
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SCIENCE NEWS LETTER

VOL. 75 APRIL 11, 1959 NO. 15

Edited by WATSON DAVIS

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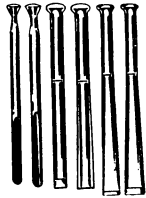
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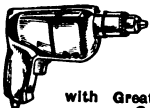
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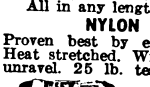
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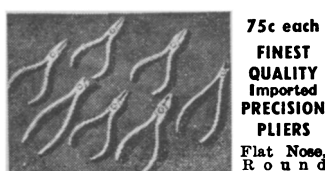
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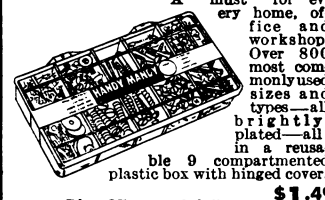


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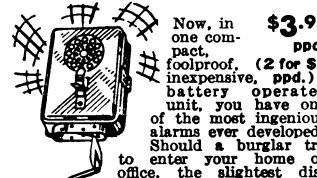
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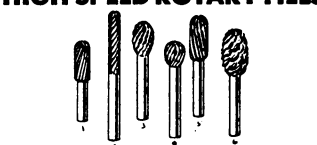
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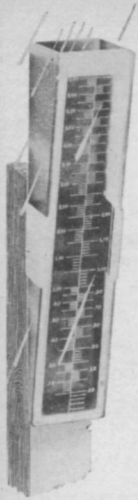
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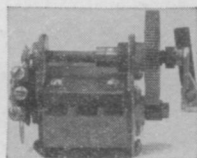


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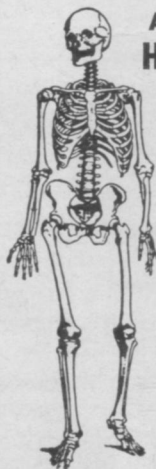


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EDUCATION—What are two assets of Soviet graduate training? p. 234.

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Do You Know

The atmosphere of *Mars* resembles that of the earth at a height of 50,000 feet.

Melting ice in a fiord on the west coast of Spitsbergen has exposed half a *whale* carcass preserved through centuries, flesh and all, in the ice.

Isopropylamine is a pungent, ammonia-like liquid that can be ignited even by a spark; it is used industrially as an intermediate in the synthesis of pharmaceuticals, rubber chemicals, dyestuffs and insecticides.

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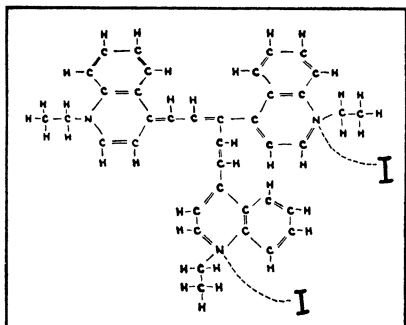
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Old model resonator

Look—with the eye of a quantum mechanic—at this marvelous little molecular resonating machine. For the trifling sum of \$16.65 we can supply 400 quintillion of these machines. They will weigh ½ gram, all told, and will come in a small bottle labeled *Neocyanine* (Eastman 2067).

The two iodines come separately packed in the crystal lattice as ions. The points where they were detached, at the quaternary nitrogens, are positively charged, of course. Either of these two positive charges can be sent skittering back and forth through the branched chain of conjugated carbon atoms to bounce off the third nitrogen atom. All it takes to set the machine resonating thus is a photon of light or infrared that carries the difference in energy between quiescence of the positive charges and resonance thereof.

This little resonator has proved useful for trapping photons and transferring their energy to silver halide crystals. The silver halide thereupon responds photographically to wavelengths it would otherwise miss.

This is a 1925 model. We have since devised thousands of more advanced models of this basic type of resonator, but stock only the above and five other simple ones for off-the-shelf delivery: *Cryptocyanine* (Eastman 1334), *Dicyanine A* (Eastman 1532), *Pinacyanole* (Eastman 622), *Pinaflavole* (Eastman 1842), and *Orthochrome T* (Eastman 623). As dyes they are exceedingly powerful.

For a discussion of the working parts from which such ultra-subminiaturized electronic machines can be built by the skillful worker, see a paper entitled "A Century of Progress in the Synthesis of Dyes for Photography." As long as our supply of reprints lasts, we can send you a copy free. Write to Distillation Products Industries,

Eastman Organic Chemicals Department, Rochester 3, N. Y. (Division of Eastman Kodak Company). The latest catalog, No. 41, lists some 3700 other compounds for research.

The cyanine dyes possess interest not only in applied physics but in biology as well. Many of them have strong and useful antifilarial, anthelmintic, and bacteriostatic activity. That the inhibition of E. coli by one of them has been found reversible by crude yeast and liver extract fascinates us.

The one-hoss-shay principle

Hereby, we place on the market the *Kodak X-Omat System* for processing industrial x-ray film.

Into a slot a human being feeds miscellaneous sizes, shapes, and lengths of film. Each film emerges dry and ready to read 13 minutes later in time and 10'10" away in space. There another human being picks it up and conveys it to an inspector who is now only 13 minutes short of the ability to look at will through solid metal and know what he is seeing.

X-ray film is a delicate proposition. It has emulsion on both sides. Processing artifacts in industrial radiographs are intolerable. You have to take the sizes as they come, in any order. You can't hook them together like a train. You can't put them in carriers. You have to move them on rollers like a printing press. The rollers have nothing to grip but wet gelatin, and they mustn't leave a mark on it. You have to build in foolproof guarantees that at each point in the system the film will be in an exactly specified physical and chemical condition. Breach these tolerances and you're manufacturing silver-flavored gelatin pudding. And because the human beings might lose count or be wasteful, the machine should automatically meter the replenishment solutions to the length of film processed.

Kodak chemists and mechanical engineers, knowing film intimately, solve such problems for each other in return for their paychecks.

Who needs it? Remember Oliver Wendell Holmes' poem about the deacon's one-hoss shay that lasted 100 years to the day because no part was first to give way. Radiographs show inhomogeneities, places where trouble gets its first foothold. With proof in hand that there aren't any such, one

needs little shay insurance, less extra weight as security against hidden weakness. Today, in the more advanced fields of endeavor, extra weight is intolerable for technical reasons. By reducing the waiting time for radiographs from 1½ hours to 13 minutes, the *X-Omat System* ought to make extra weight economically intolerable too, in a pleasing number of instances.

The Kodak Industrial X-Omat Processor lists for \$37,450. If you think you might buy one, write Eastman Kodak Company, X-ray Division, Rochester 4, N. Y.

Millimicroseconds to months

When you let light fall on film, you are running a photochemical reaction. Bunsen and Roscoe, a pair who didn't flinch in the face of the obvious, formalized the observation that the amount of product resulting from a photochemical reaction must be proportional to the amount of energy used—intensity of illumination times its duration.

Later other scientists in turn covered themselves with glory by discovering that for photographic exposure this was not strictly true, and still others won Ph.D.'s by explaining why not. Intensity and duration slip the shackles of reciprocity a little. Over the broad spectrum of durations from millimicroseconds to months, a certain optimum rate of feeding energy to a silver halide emulsion is encountered. The manufacturer can roll the optimum somewhat one way or the other.

Calls for shifting it to favor the effectiveness of very dim light come from astronomers, among others. From an observatory director's viewpoint, cutting hours off exposures is like having more telescopes.

Business is brisker, though, on the other end of the scale. To more and more users of photography a hundred-thousandth of a second sounds like a terribly long time. Well-read types, they fear the deviation from reciprocity. To allay those fears, we offer them something new to read, a free pamphlet bearing the title "Kodak Films for Short Exposure-Time Applications."

It is obtainable from Eastman Kodak Company, Special Sensitized Products Division, Rochester 4, N. Y.

Prices are subject to change without notice.

This is another advertisement where Eastman Kodak Company probes at random for mutual interests and occasionally a little revenue from those whose work has something to do with science

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