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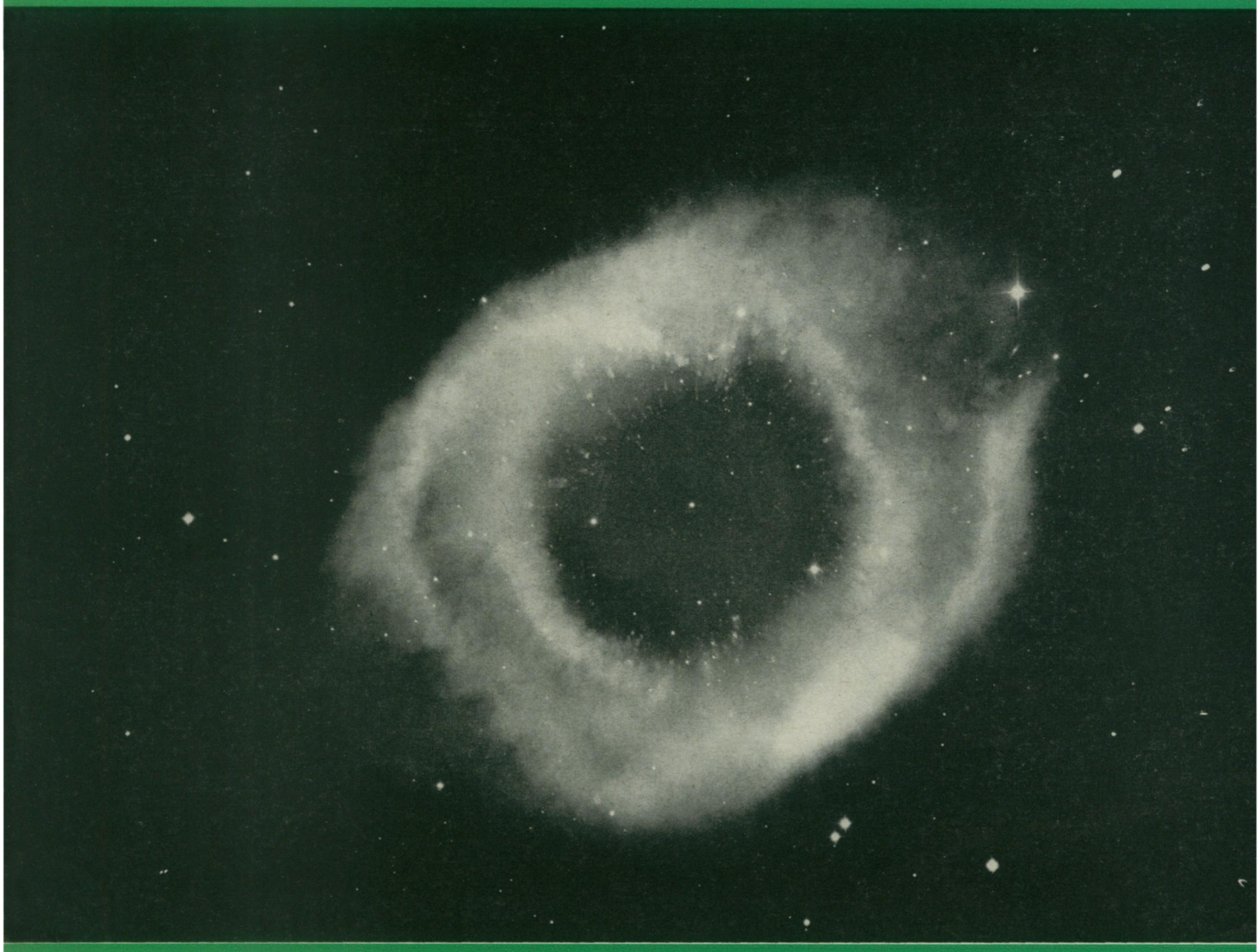
THE WEEKLY SUMMARY OF CURRENT SCIENCE



Ring Nebula

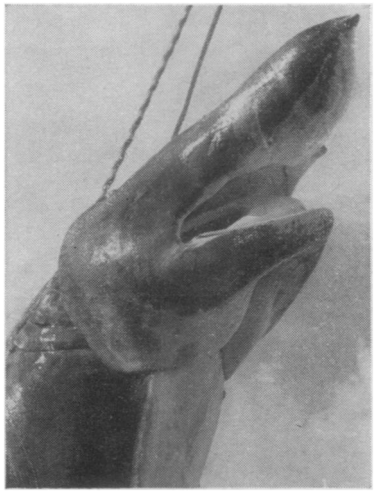
See Page 294

A SCIENCE SERVICE PUBLICATION

Kodak reports to laboratories on:

a deceptively simple isoprene polymer... a new idea in photographic emulsion making... a tip for x-ray diffractionists

Fascinating hydrocarbon



This is a *basking* shark, so called because the non-pregnant female of the species loves to lie near the surface and bask, exposing the tip of her nose, her dorsal fin, and the top of her tail.

We wish to advise that we have procured a quantity of basking shark liver oil and have molecularly distilled from it a colorless, high-boiling cut which is 90-95% *Squalene.*

About this deceptively simple isoprene polymer there appears to be plenty to investigate, aside from the riddle of why the basking shark and the cacao shark of East African waters accumulate so much of it. Its presence in olive oil and absence from vegetable oils likely to be palmed off as olive oil arouses the investigational instincts of law enforcement bodies. It is a precursor of cholesterol. Though it is a normal component of human sebum, in topical application it is reported to cause loss of hair without signs of inflammation. (Unfortunately, a consulting firm we hired to check this observation failed to confirm it.)

Squalene *is one of the products obtainable from Distillation Products Industries, Eastman Organic Chemicals Department, Rochester 3, N. Y. (Division of Eastman Kodak Company).*

Royal Pan

Once in a while the orderly flow of progress in photographic technology makes a gush, and then you have something as important as a basic advance in emulsion making. It's fairly rare.

What has happened is that at long last we have found some stretch in the chains that lock graininess and light sensitivity in mutual bondage. We can make an emulsion that gives less graininess without yielding sensitivity, or we can have sensitivity without paying in graininess. The latter seemed the better choice for the first commercial application, which we call *Kodak Royal Pan Film.*

Its graininess is perhaps even a little less than that of the highly satisfactory *Kodak Super Panchro-Press Film, Type B* (fastest Kodak film hitherto offered the press photographer, a connoisseur of emulsion speed), but at the practical gamma of 0.7 it has twice the speed. Exposure Index is 200 for daylight, 160 for tungsten. Its characteristic curve combines the best features of *Kodak Super-XX Panchromatic Sheet Film* and *Kodak Super Panchro-Press Film, Type B.* There is more exposure latitude, more development latitude, more detail in the dark areas, more detail in the light areas, less need for dodging in printing.

If your work, business, or hobby has been crying out for faster sheet film, all you need do now is send someone out to the nearest Kodak dealer for some Kodak Royal Pan Film. *There might be several press photographers at the counter ahead of him.*

Advice on diffraction

The atomic number of chromium is 24, of copper 29, of molybdenum 42. *K*-emission from targets of one or another of these elements is commonly used for x-ray diffraction work. The higher the atomic number, the shorter the wavelength of the *K*-radiation. It takes more photographic silver to stop—and therefore respond to—short-wavelength photons than those of longer wavelength. Thus it comes about that for chromium *K*-radiation, as example, there is considerably less difference between the speeds of our slowest and fastest x-ray films than there is for the *K*-radiation from molybdenum.

Kodak Industrial X-ray Film, Type K is our fastest for x-ray diffraction. Like most x-ray films, it has emulsion on both sides. There is also *Kodak Single-Coated X-ray Film.* It has a little more than half the speed of *Type K* for chromium *K*-radiation but less than a quarter of *Type K* speed for molybdenum *K*-radiation. (The profusion of *K*'s here is purely coincidental; we can clear up the confusion, if any, by sending you our free chart "Kodak Films for X-ray Diffraction.") There may be instances where an x-ray diffractionist needs this higher speed for the shorter-wavelength radiation but is inconvenienced by the parallax associated with the presence of two images on opposite sides of the base.

Though we doubt this combination of circumstances comes up frequently, we can perform a slight but perhaps useful service by showing a couple of easy ways to remove one of the images. Economically this has advantages over the tricky and expensive business of launching a special, extra-silver-rich, single-coated film. Researchers with modest budgets who regard film as the least expensive and most versatile x-ray receptor for diffraction patterns will agree, we hope.

Write Eastman Kodak Company, X-ray Division, Rochester 4, N. Y., for a reprint on removing the second image, for a copy of the x-ray diffraction film selection chart, or for the address of the nearest Kodak X-ray Dealer. It is he who can sell you 25 feet of 35mm Kodak Industrial X-ray Film, Type K *for $2.61 or 100 sheets of 4" x 5"* Kodak Single-Coated X-ray Film *for $7.43.*

Prices quoted are 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 . . .

F. E. CREVER
T. TROCKI

Mr. Crever is Manager—Engineering and Projects Department—Knolls Atomic Power Laboratory.

Mr. Trocki is Manager—Coolant Systems Sub-Section, Knolls Atomic Power Laboratory

". . . Ship propulsion appears to be the earliest practical application for a mobile atomic power plant and consideration of some fundamentals of a nuclear power plant will make the reasons apparent. As conceived today, a nuclear power plant differs from a conventional plant mainly in the method of heat production and heat transfer to a thermodynamic fluid, which is expanded in turbomachinery to produce power in the conventional way. In a plant using steam as the thermodynamic fluid, the nuclear reactor and steam generation equipment will replace the boiler and its accessories. Although the reactor core itself can be of relatively small dimensions, the shielding required around it increases the overall volume and weight of a reactor by a considerable factor. Furthermore, the reactor coolant and heat transfer fluid is made radioactive in passing through the reactor and all of the machinery through which it flows must be shielded. The shielding around the reactor core proper is called the primary shield, and the shield around the heat transfer equipment, the secondary shield. As the amount of shielding is practically independent of power output, a nuclear power plant of low power will be penalized excessively with respect to its power output. As the power output of a reactor-steam generation plant is increased, the equipment volume and shielding around it does not increase in direct proportion to the power; hence, a more favorable relationship is reached between power output and plant space and weight. Power plants for propulsion of larger power ocean-going vessels (of the order of 10,000 HP and above) are of sufficiently large power output to fall within the favorable range for a nuclear power plant of current design.

at the AIEE, New York

A. W. EADE
J. J. FRAIZER

Mr. Eade and Mr. Fraizer are with the Meter and Instrument Department

At the high speeds military planes fly today, the pilot simply doesn't have time to read indicators and coordinate information presented to him. To offset this situation, many new flight-control systems are presently undergoing development.

A good example of what is taking place is the automatic jet-engine control system developed by GE for the North American F86D Sabrejet. Here seven separate measurements are integrated, allowing the pilot to increase or decrease his thrust by simply moving a throttle; there's no danger of his overspeeding or overheating the engine.

Many proposals have been made to consolidate instruments so that one indicator would serve where formerly three or four were needed. Again, for example, an engine-performance indicator has already been proposed that will replace four separate indicators. This single indicator will at a glance show engine speed and temperature and oil and fuel pressure. The fuel and oil pressure portions of this gage would merely be OFF-ON devices, with a green flag indicating safe, and a red flag unsafe, pressure ranges. On the surface this appears to be a particularly good feature, for airmen often only glance at an accurately marked gage to check the pointer's relative position.

The progress made in the first 50 years of flight has been nothing short of astonishing. And there's reason to expect that it will continue to be even more so in the future. So far as instrumentation is concerned, you can look for a greater consolidation of instruments as the speed of flight moves upward and more use of flight-control systems in place of individual instruments and controls.

G.E. Review

G. R. FUGAL

Mr. Fugal is Manager—Employment Practices—Employee and Plant Community Relations Services

Group-administered safety education, as generally utilized by industry, is relatively ineffective. It does not really accomplish what management thinks it accomplishes. A general redirection of effort toward a continuing, individualized, personalized instruction is needed. The effectiveness of this type of training has been demonstrated.

The problem of training the employee to work safely is not so much the act, for example, of teaching him to put on his gloves. It is more than that. There is the additional factor of establishing in the employee's daily conduct the habit of wearing his gloves. Further, management must recognize that the factors of skill and understanding can be trained into the employee only with diligence and patience. Such learning takes a long time, and management must discard its ideas that these factors that enter so definitely into the safety-training activity can be acquired by the employee through the "shot in the arm" variety of industrial education.

During recent years increasing numbers of educators have campaigned for individualized instruction in the schoolroom, pointing to the superior results obtained over other methods. This experimentation provides an industrial education counterpart to the claims advanced by the formal educators in that the great individual differences in the attitudes, abilities, and habits of workers are recognized.

at the Lowell, Mass. Industrial Safety Council