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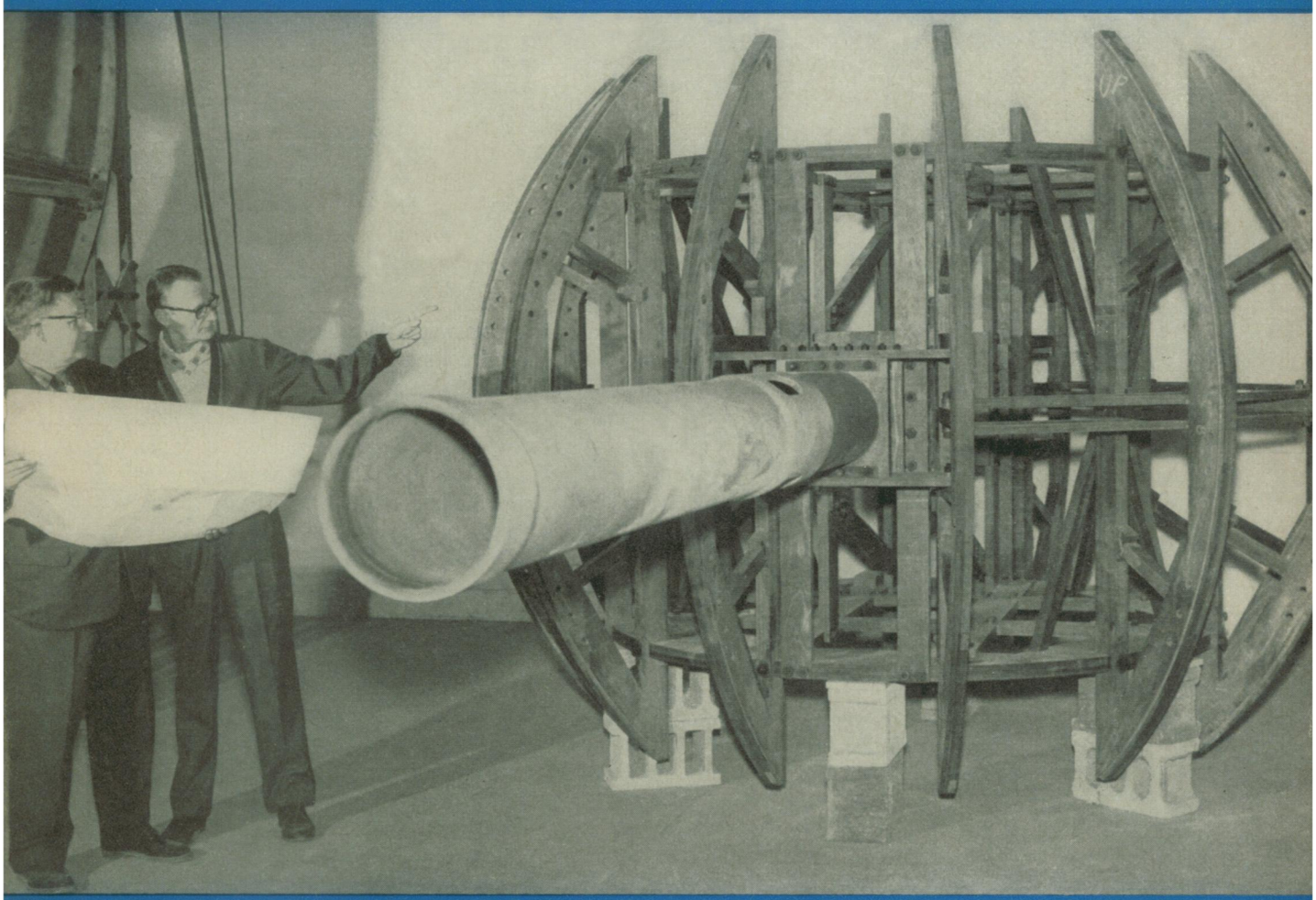
SCIENCE NEWS LETTER

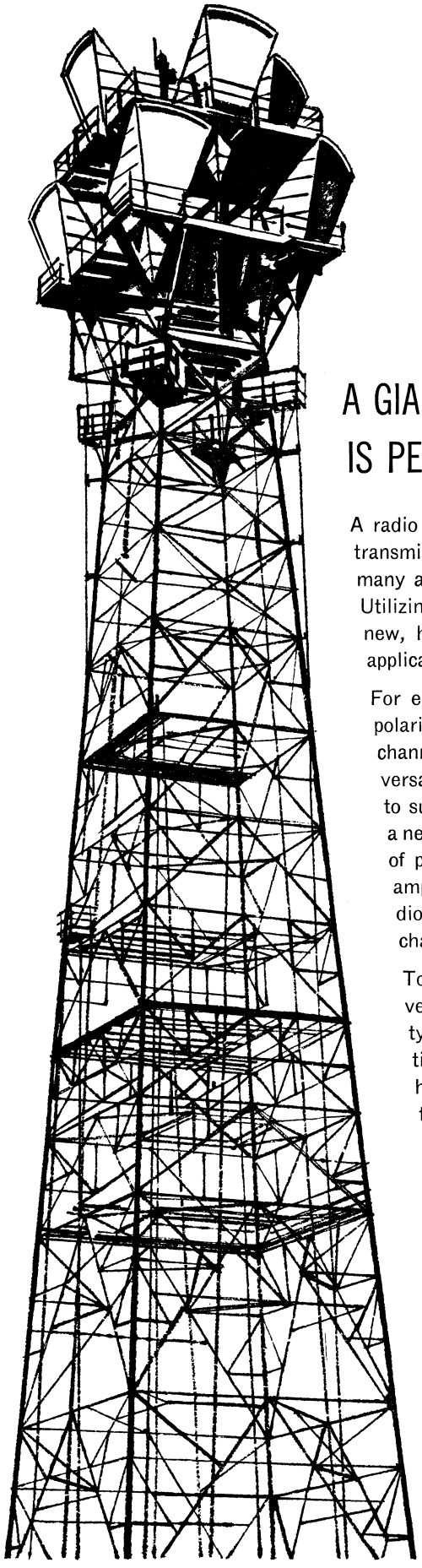
THE WEEKLY SUMMARY OF CURRENT SCIENCE



Rotor Structure

See Page 7

A SCIENCE SERVICE PUBLICATION



A GIANT RADIO HIGHWAY IS PERFECTED FOR TELEPHONY

A radio relay system operating at 6 billion cycles per second and able to transmit 11,000 voices on a single beam of microwaves—several times as many as any previous system—has been developed at Bell Laboratories. Utilizing the assigned frequency band with unprecedented efficiency, this new, heavy-traffic system was made possible by the development and application of new technology by Bell Laboratories engineers and scientists.

For example, they arranged for the waves in adjacent channels to be polarized 90 degrees apart, thus cutting down interference between channels and permitting the transmission of many more telephone conversations in the same frequency space. They developed ferrite isolators to suppress interfering wave reflections in the waveguide circuits; and a new traveling wave tube that has ten times the power handling capacity of previous amplifiers and provides uniform and almost distortionless amplification of FM signals. They devised and applied a new high-speed diode switching system which instantly switches service to a protection channel when trouble threatens.

To transmit and receive the waves, the engineers applied their invention, the horn-reflector antenna. Elsewhere, this versatile antenna type is brilliantly aiding space communication research in the reception of radio signals from satellites. For radio relay, a single horn-reflector antenna can efficiently handle both polarizations of the 6000 megacycle waves of the new system; at the same time it can handle 4000 and 11,000 megacycle waves used for existing radio relay systems. Thus it enables all three systems to share economically the same radio towers and routes.

Produced by the Bell System's manufacturing unit, Western Electric, the new system is now in operation between Denver and Salt Lake City, and will gradually be extended from coast to coast. This new advance in radio technology is another example of how Bell Telephone Laboratories works to improve your Bell communication services.

BELL TELEPHONE LABORATORIES

World center of communications research and development

Kodak reports on:

the deftness of enzymes . . . a polypropylene puzzle . . . strange dances in the movies

Creatine dissembled

Eastman 7911 N-Amidinoalanine 10 g. . . $4.80

Also known as dl-α-guanidinopropionic acid. Physiologists call it alacreatine. Physiologists want to know it better. Some physiologists, anyway. Particularly those interested in vitamin E. Nobody—absolutely nobody—is more interested in vitamin E than we are. Matter of business.

Deplete an animal of vitamin E and creatine shows up in urine. Creatine is $NH_2-C(=NH)-N(CH_3)-CH_2-C(=O)OH$. Normally creatine is used by combining with adenosine triphosphate to make phosphocreatine. After phosphocreatine yields up its energy, creatinine is left. Creatinine is anhydride of creatine. Vitamin E somehow mixed up in this. Creatine-to-creatinine ratio in urine is therefore good index of vitamin E status. OK.

Alacreatine is $NH_2-C(=NH)-N(H)-CH(CH_3)-C(=O)OH$. Note that difference from creatine is position of methyl group. Feed alacreatine to rats and what happens in 6 weeks? They become very weak, as in nutritional muscular dystrophy from lack of vitamin E (*Nature, 187*, 421). (Different etiology from human muscular dystrophy.)

Does alacreatine take place of genuine creatine in combining with ATP? Good question. Good answer could come from someone who buys our alacreatine for further studies. Might beat us in learning new fact about behavior of vitamin E. Would be consolation to know he at least used our alacreatine.

We make alacreatine by reacting thiourea with ethyl bromide to yield ethyl isothiourea hydrobromide, then add this with alkali to alanine. Product splits out with ethyl mercaptan. Ethyl mercaptan stench pretty well worn out as subject for levity.

Nature makes creatine by two-step method also. In kidney an amidine group from arginine transfers to glycine to make glycocyamine. In liver the glycocyamine takes on methyl group from methionine, becomes creatine. It's all done with enzymes. Nature neater, cheaper, makes more useful product.

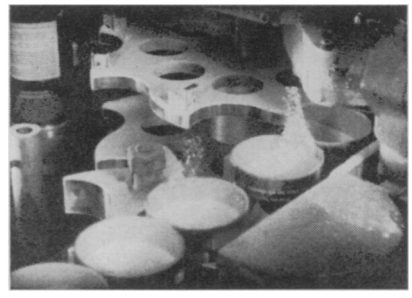
If inconvenient to get from nature, get Creatine *from us also as Eastman 951. Also offer* Creatinine *as Eastman 918.* Creatinine Hydrochloride *as Eastman 7642,* Creatinine Zinc Chloride *as Eastman 1272, and some 3800 other Eastman Organic Chemicals. Complete catalog from Distillation Products Industries, Rochester 3, N. Y. (Division of Eastman Kodak Company.)*

Is knowledge power?

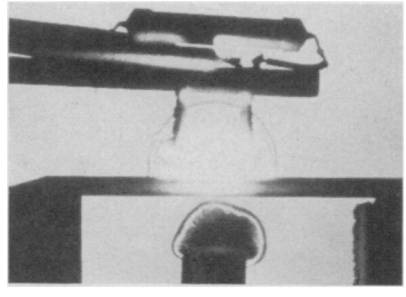
For a year now, reports have been coming in from molders that *Tenite Polypropylene*, viscosity for viscosity, molds better than other polypropylenes. We are pleased about this, of course, but also embarrassed not to know why.

Samples of Tenite Polypropylene *are available from Eastman Chemical Products, Inc., Kingsport, Tenn. (Subsidiary of Eastman Kodak Company.)*

Favor for the high-speed congress



Dust Performs for Plant's Pollution-Control Movies, *Chem. Week*, 84:84, 86, May 2, 1959. (Procter & Gamble uses high-speed motion-picture sequences for the qualitative control of in-plant dust.)



The Ignition of Explosives by Radiation, J. Eggert, *J. Phys. Chem.*, 63:11-15, Jan., 1959; also in *Photochemistry in the Liquid and Solid States*, edited by F. Daniels, J. Wiley, N. Y., 1960, pp. 147-53. (High-speed photography proves that the detonation of nitrogen iodide starts before the light flash ends, showing that only a fraction of the energy is used for the detonation.)

Lathe Check Formation in Douglas-fir Veneer, *Forest Products J.*, 10:139-40, March, 1960. (High-speed motion pictures were used to analyze production variables.)

Time after time we have visited a customer proud of some accomplishment with high-speed movies. He is willing to show us—eager, delighted to show us. The projector is started and we watch. We see a collection of strange objects. We don't know for sure what they are. Little seems to be happening. After quite a while, a new object enters the scene from the left. Shortly another new object comes up from the bottom. The two dance around each other, touch, and exit from the top of the frame. All is again static on the screen. After another while the reel comes to its end and we jump to our feet exclaiming hearty congratulations.

He deserves congratulations, probably. If we had lived with the problem as he has, the objects in the picture might have seemed no stranger than the face in the bathroom mirror; the dance might have been the triumphant, forceful, sudden, undisputed clincher to a vexatious problem; the all-purpose enthusiasm of the born salesman might have meant more.

Nevertheless, we need not be ashamed. We help scientists and engineers use high-speed photography by manufacturing a group of films to the stringent mechanical requirements of high-speed cameras. *Kodak Plus-X Reversal Film* we make for reversal processing to a fine-grain positive. *Kodak Tri-X Reversal Film* is four times as fast. *Kodak Double-X Panchromatic Negative Film*, which is a bit faster yet and very sharp, is picked when a quick negative will suffice or when several prints may be wanted later. *Kodak Royal-X Pan Recording Film* is picked only when light is very limited indeed; *Kodak Linagraph Ortho Film*, for accentuated sensitivity to green light; *Kodak High Speed Infrared Film*, for sensitivity to 9000A, with a maximum from 7700A to 8400A; *Kodachrome Film*, for color, with low-cost commercial processing widely available; *Ektachrome ER Film*, for color at exposure index of 160 or higher.

Another thing. A bibliography on high-speed photography. Every item our library knows. Forty-six pages of items like the specimens at the immediate left. No pictures, though. No charge either. Coverage extends into 1960. Got it ready to distribute to the Fifth International Congress on High-Speed Photography in Washington in October. Doomed to a short life, since the Congress promptly generated so many *new* papers on high-speed photography that the abstracts alone run from p. 609 to p. 682 of the September, 1960, issue of the *Journal of the Society of Motion Picture and Television Engineers.*

Eastman Kodak Company, Photorecording Methods Division, Rochester 4, N. Y., would be glad to send the bibliography or answer questions about the above-named films.

Price subject to change without notice.

Kodak
TRADE MARK

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