

15¢

\$5.50 A YEAR

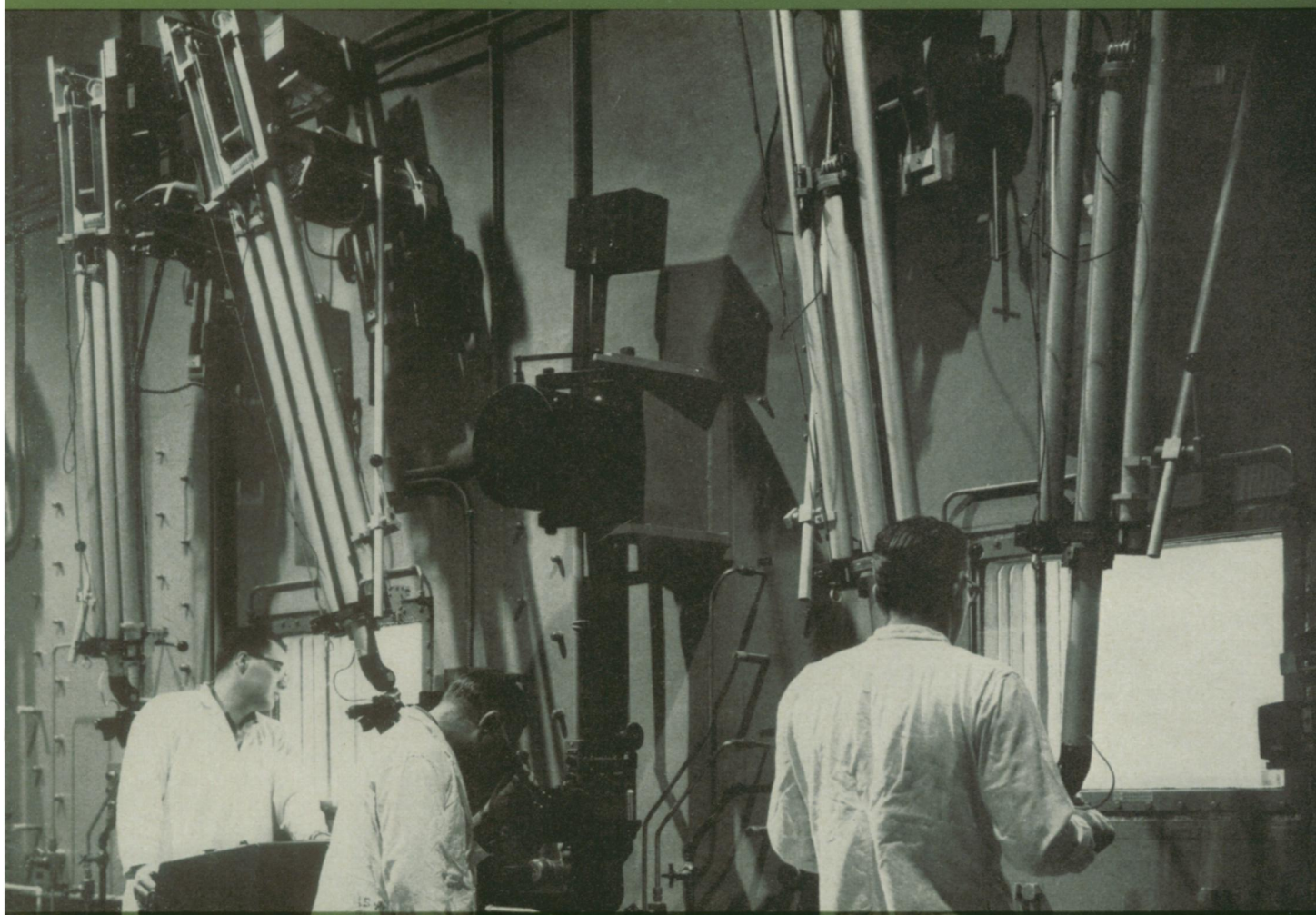
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SCIENCE NEWS LETTER

®

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Radiochemistry Facility

See Page 294

A SCIENCE SERVICE PUBLICATION

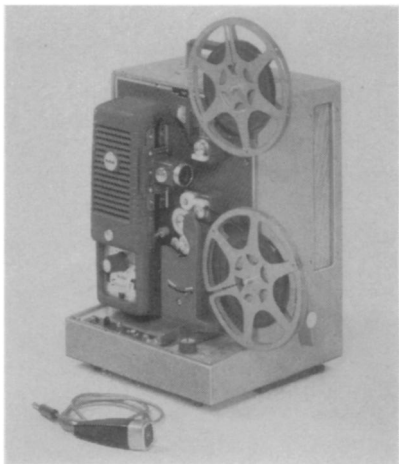
Kodak reports on:

walking a .030" fence to communicate by sight and sound... lenses for the new phosphors

The paradox of 8

How would you like a good sound recorder that also shows movies? For \$345 list.

Make your movies with a regular 8mm camera. If you want a suggestion, it could be a Brownie Movie Camera, which starts as low as \$24.50 list. Have your film processed. Either then or after editing, have the dealer send it to us for *Kodak Sonotrack Coating*, a magnetic stripe .030" wide between the sprocket holes and the edge of the film. Project with the new *Kodak Sound 8 Projector* and into the little microphone speak your comments. In case of afterthoughts, solecism, or fuzzy rhetoric, hit the knob (excellent brakes) and the "record" switch, reverse, throw into forward, and record



again. This takes care of erasing. Start again in the middle of a sentence if you wish. No waiting to reach recording speed. Project again to listen back. When completely satisfied with telling the story in English, you can erase and retell it on the same film in the Luganda tongue.

This is quite a system of communication. Use it to instruct your Swaziland branch office. Report to the home office on whether the breakwater at Pago Pago needs rebuilding and how the swallows come in for the landing at Capistrano. Save days of literary toil. What few words the movies leave to be said are more convincing when heard in accompaniment to the sight of the action. (As for combined records of the children's voices and swiftly changing ways, shame on sentiment!)

We owe you an explanation of why you have heard very little hitherto about 8mm sound movies. A paradox

bedevils the manufacturer. To yield accustomed quality of performance, he has to build the machine more than twice as good as a 16mm sound rig, but he is expected to sell it for less than half the price. For accomplishing this, they don't even award Nobel Prizes.

Because of the very small width of the magnetic stripe and the relatively high tracking force, the magnetic head must be hard physically so that the gap shall not wear down to another dimension and thus lose sound quality. At the same time it must be soft magnetically to conduct but not retain flux.

We wish we could boast that the practically wear-proof aluminum-iron alloy we use for the .020"-wide head was developed by us, but actually it was developed by the Naval Ordnance Laboratory for their own purposes. We do, though, lay claim to the credit for a system that gives 70 to 5500 cycles/sec frequency response while running at only 2.4 inches/sec—as at 16 frames/sec. It does even better at 24 frames/sec speed. We went to some lengths, engineeringwise, to provide the latter speed when we heard that some segments of the motion picture industry might be offering 8mm rental prints of their theater releases.

Demonstrations cheerfully given where the "Kodak" sign is displayed. Say distinctly: Kodak Sound 8 Projector.

Heat from the tubes

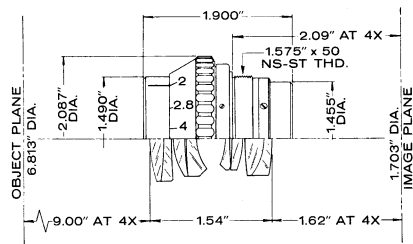
Create a stream of electrons, focus them into a sharp pencil, and write or draw with it. Great Zeus! *There* is an idea worth noting in the history of man's climb upward from the slime! Whither it will lead tomorrow can only be guessed at. Today there are contracts to be fulfilled (and possibly money to be made) by finding a lens to image some smart writing from a cathode-ray tube to photographic material and then doing something further smart from there.

A lens? It so happens that you have come to the right place, you there with the black boxes. Your suspicion may well be justified that the old photo-enlarging lens which images your c-r tube on a piece of drugstore film could be missing some of the voluminous detail being poured forth so ferociously by your black boxes. (Better not to disclose what happens in them. Kodak, too, makes mysterious black boxes. It's the American way.)

Formula M-236 is our designation

for a beaut of a lens. It represents our response to the heat being put on our end of the c-r recording business by the tube makers. As long as their phosphors couldn't show any finer detail than 10 lines per millimeter on the tube face, it was silly to fuss over the lens. Now that they can put down 100 lines per millimeter, a basic fact of lens design must be faced. A lens designed for distant objects, as most photographic lenses are, cannot function at its best for 4:1 reduction.*

M-236 is designed for 4:1 reduction. Here, for the guidance of the man who needs to design equipment around the finest cathode-ray tube lens currently available on special order, and to the intense boredom of the man who doesn't, are the dimensions:



The lens is achromatized for P-16 phosphor. When the diaphragm is wide open to the $f/2.0$ mark, the edge of the 1.700"-diameter image gets 35% as much illumination as the center. If that image size is too small, or if you use P-11 instead of P-16, we have several other c-r lens designs of longer focal length and for lesser reduction.

As to the resolution, we could quote a lot of numbers that are obviously supposed to make your jaw hang slack but don't mean a thing until you pick the film to use with the lens. For this you must be prepared to answer questions on how much voltage to light the tube, how much time to record, how many seconds to process (!), how to be read, etc.

Then you get in touch with Eastman Kodak Company, Special Products Division, Rochester 4, N. Y. No obligation, of course, but what did you say the color of your money was?

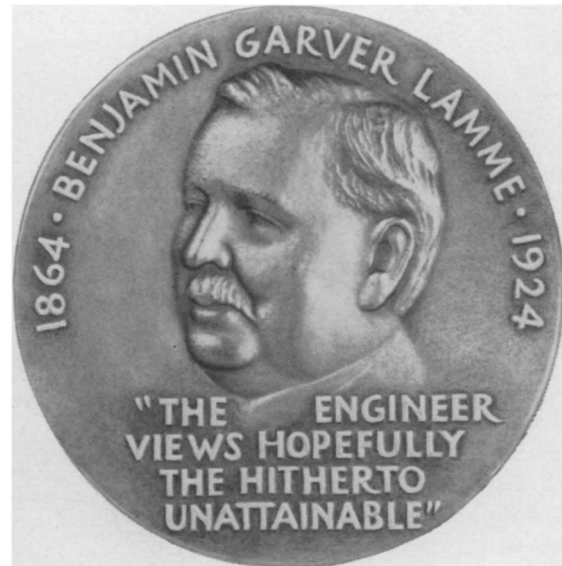
*Visitors to Rochester are sometimes permitted a glimpse at a mathematician of ours who thinks, after some years of immersion in matrix algebra, that by and by he will be able to write a computer program which, for any set of circumstances whatever, will design the best possible lens.

Prices quoted 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

Kodak
TRADE MARK

HAROLD S. BLACK, LAMME MEDALIST



A MAN WINS A MEDAL...AND STRENGTHENS A PHILOSOPHY

The search for the “hitherto unattainable” sometimes ends in strange places.

For years Bell Laboratories engineer Harold S. Black pondered a problem: how to rid amplifiers of the distortion which unhappily accumulated as signal-transmission paths were made longer and amplifiers were added. There had been many approaches but all had failed to provide a practical answer.

Then one day in 1927 the answer came—not in a research laboratory, but as he traveled to work on the Lackawanna Ferry. On a newspaper, Mr. Black jotted down those first exciting calculations.

Years later, his *negative feedback principle* had revolutionized the art of signal amplification. It is a principal reason why telephone and TV networks can now blanket the country, the transoceanic cable is a reality, and military radar and missile-control systems are models of precision.

For this pioneer achievement, and for numerous other contributions to communications since then (some

60 U. S. patents are already credited to him), Mr. Black received the 1957 Lamme Medal from the American Institute of Electrical Engineers. He demonstrated that the seemingly “unattainable” often *can* be achieved, and thus strengthened a philosophy that is shared by all true researchers.

He is one of many Bell Telephone Laboratories scientists and engineers who have felt the challenge of telephony and have risen to it, ranging deeply into science and technology. Numerous medals and awards have thus been won. Two of these have been Nobel Prizes, a distinction without equal in any other industrial concern.

Much remains to be done. To create the communication systems of the future, we must probe deeper still for new knowledge of Nature’s laws. We must continue to develop new techniques in switching, transmission and instrumentation for every kind of information-bearing signal. As never before, communications offer an inspiring challenge to creative men.

BELL TELEPHONE LABORATORIES

WORLD CENTER OF COMMUNICATIONS RESEARCH AND DEVELOPMENT

