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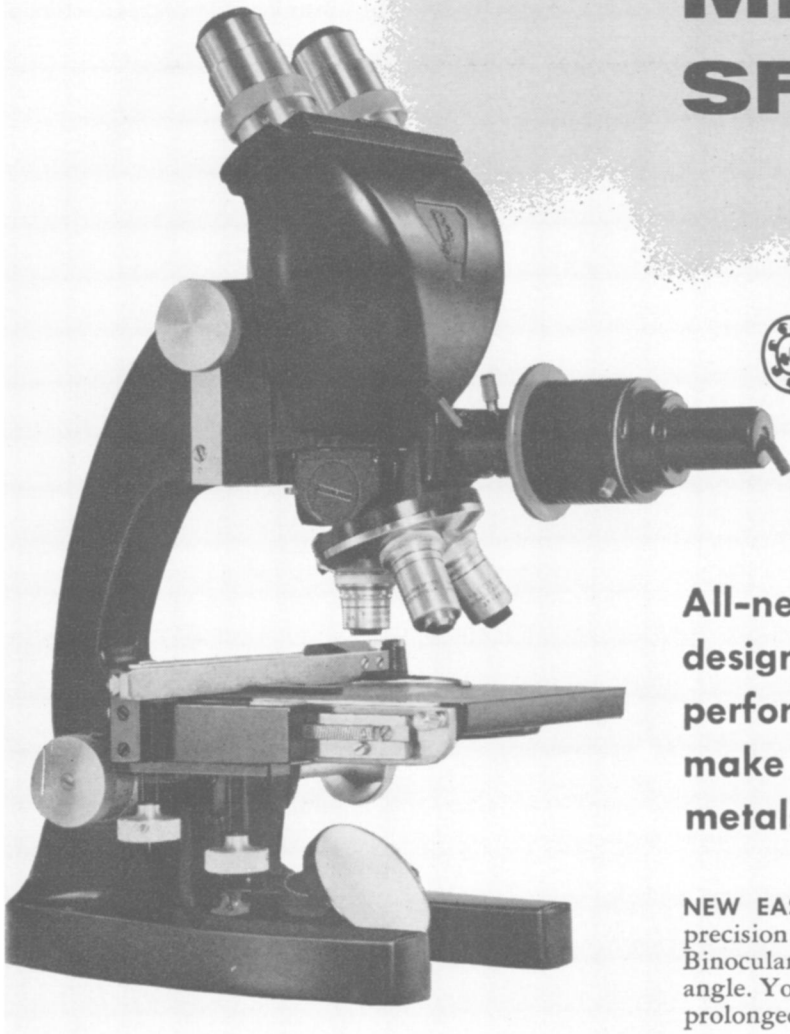

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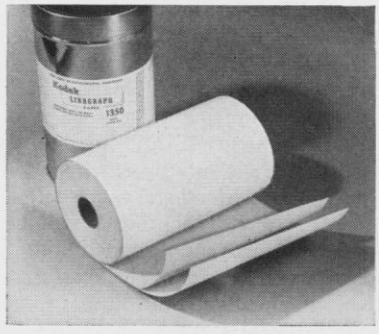
Kodak reports to laboratories on:

dual wound recording paper . . . replacing protein in ruminant diets . . . 59 years of radiographic tricks

Two at a time



Why not put up *Kodak Linagraph Paper* in a dual winding to give an extra copy of an important oscillograph record? Why not balance the two emulsions for equal density of the traces and make the top strip extra thin so that the bottom record comes out good and sharp?

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Thirty wether lambs

They took thirty wether lambs of fine wool breeding at Ames, Iowa, and fed them various non-protein nitrogen compounds. They were exploring the biochemistry behind the current drive for replacing protein with urea, which is cheaper, in ruminant diets. It has been shown that all ten essential amino acids are synthesized in the rumen when urea supplies all the nitrogen. But no sheepman (or cattleman) dares supply all his nitrogen that way. What makes it dangerous? asked the men of Iowa State.

Simply that ammonia is released into the blood, they found. No harm is done—unless the urea feeding is overdone to a certain critical and fatal point. Likewise ammonium formate, ammonium acetate, and ammonium propionate can release lethal concentrations of NH_3 in the rumen. Not so the amides, for the rumen has little amidase; on propionamide, formamide, or biuret sheep may safely graze, as far as ammonia is concerned. The Iowans therefore looked further at these.

Formamide turned out to have some toxicity problems of its own, but propionamide was fine, gave the same weight gain as urea, and in one trial was equivalent to conventional protein at the replacement level of 30 percent. Propionamide appears to release ammonia at a rate just sufficient for adequate protein synthesis by rumen microorganisms, once they and the lambs get used to it.

One thing is sure. If *Propionamide* ever achieves practical importance for stock feeding it will have to come down in price many times below what it had to fetch as the highly purified Eastman 675 which we shipped to Ames for these experiments. Somebody other than we will doubtless be manufacturing it. If so, it won't be the first time that a compound becomes a big item of commerce from a lead it first gave as an Eastman Organic Chemical.

After all, there are a lot of them . . . some 3500 organic compounds sitting on our stock shelves and set down in our List No. 39. If you don't have the list, write to Distillation Products Industries, Eastman Organic Chemicals Department, Rochester 3, N. Y. (Division of Eastman Kodak Company).

The soft x-ray

Because so many professional opinions on periodontoses, pelves, porosities, and the like are reached from observations on our x-ray film, we find ourselves with the resources to do little things for our friends, who are legion.

For example, a bibliography on soft x-ray microscopy, microradiography, electron radiography, and geometric x-ray microscopy.* It lists every paper and article on those subjects known to us, except that unlike our bibliographies of vitamin E, this is not annotated. The arrangement is alphabetical by authors, whether they be of the industrial, medical, metallurgical, botanical, zoological, entomological, or fine arts persuasions or just plain physicists.

The earliest reference was published April 13, 1896, in *Comptes rendus hebdomadaires des séances de l'Académie des sciences* by F. Ranwez under the title, "Application de la photographie par les rayons Röntgen aux recherches analytiques des matières végétales." The most recent is dated August, 1955, and deals with electron radiography in the investigation of postage stamps. Among the 350-odd items that lie between these two, you will find "Ueber Weichstrahlaufnahmen mit der Gleichspannungsmaschine 'Trifas' der Elektrizitätsgesellschaft 'Sanitas'" (H. Chantraine, *Fortschritte auf dem Gebiete der Röntgenstrahlen vereinigt mit Röntgenpraxis, 38:* 534-541, September, 1928) and "Микрорентгенография" (С. В. Гречишкин, *Вестник рентгенологии и радиологии, 20:* 397-408, 1938).

Sending out free copies of the microradiography bibliography is easy for Eastman Kodak Company, X-ray Division, Rochester 4, N. Y. We'll go beyond that. If you'll give us the details of your problem, we'll do our best to answer questions about the use, handling, and behavior of sensitized materials in experimental radiographic work. But you wouldn't want us to do your research for you, would you?

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*For the casual reader:

Soft x-rays are those of wavelength longer than about 0.25 Å. They are so easily absorbed that exceedingly thin or low-density materials, quite transparent to the ordinary x-rays of the healing arts, cast informative shadows. If the shadows are of microscopic details, if they are caught on very fine-grain film in close contact with the specimen, and if this film image is greatly enlarged in printing, that is *microradiography.* A switch in this technique is to use hard x-rays (wavelength shorter than 0.050 Å) that can knock electrons out of a sheet of lead and let differences in absorption of the electrons by the various parts of the specimen tell the story on film. This is *electron radiography.* Still another way of doing x-ray microscopy is to use a very tiny but intense x-ray source and keep it so close to the specimen that it casts greatly enlarged sharp x-ray shadows on the film, which can then be even further enlarged in projection printing. This is *geometric x-ray microscopy.*

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*

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