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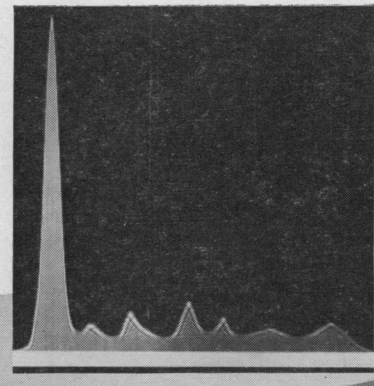
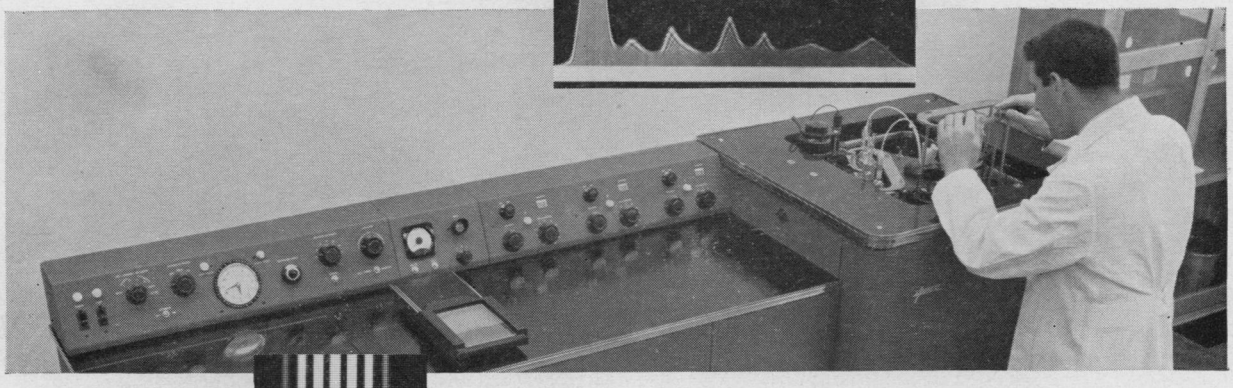
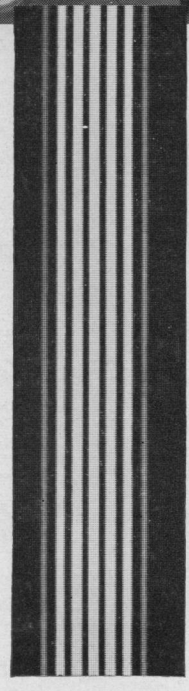


Electrophoresis of human serum diluted 1:6; ascending boundaries. Inclined knife-edge schlieren and Rayleigh fringes.





Typical reference fringe pattern obtained from standard production model.

ELECTROPHORESIS AND DIFFUSION

in one precision instrument

As protein research progresses, biochemists rely more and more upon instruments of high precision for diffusion and electrophoresis studies. Especially critical are the optical measurements needed to obtain accurate diffusion coefficients, absolute electrophoretic mobilities, and information on purity.

An exceptional optical system is one of the outstanding features which have made the Spinco Model H invaluable for exacting work in both electrophoresis and diffusion. Light passes through each operating cell twice, giving double sensitivity. Patterns are sharply defined and peak positions can be precisely determined. Reproducible measurements may be made to better than 1/25 of a fringe, which corresponds to approximately .00025 percent protein.

The optical system is flexible, too. It permits measurements by five different methods – ordinary and cylindrical lens schlieren, Rayleigh and Gouy fringes, and mechanical scanning.

Further versatility is achieved by a rotary cell turret which supports three operating cells. Any combination of diffusion and electrophoresis studies may be performed simultaneously with the three cells.

We'd like to tell you more about the Model H and how it can fit the requirements of your research program. For complete details, please write Spinco Division, Beckman Instruments, Inc., Stanford Industrial Park, Palo Alto, California, for information File H-5.

Sales and service facilities on the Model H are available on the same basis as for Spinco Ultracentrifuges, assuring prompt, efficient service for users here and abroad.

Beckman® / **Spinco Division**

Beckman Instruments, Inc.

S-53

Kodak reports on:

why the radiologists, cardiologists, urologists, internists, laryngologists, and neurosurgeons got together . . . a biochemical reagent and metabolic inhibitor that transforms *Salmonella* . . . a method for forecasting titanic stress in fine detail . . .

Cinefluorography

On the other side of town, on November 14 and 15 of last year, there was held the First Annual Symposium on Cinefluorography of the University of Rochester School of Medicine and Dentistry.

To the masses, many of whom may live longer or at least enjoy themselves more than if this conclave had never convened, it would have been mildly interesting to know that x-ray movies of the innards in action had so far advanced from a stunt (for TV science programs) to a diagnostic routine as to make it a subject for a convention. Very mildly interesting, on a November Saturday which already offered the intellectual challenge of picking point spreads for the football games.

To the 150-odd ambitious, clear-eyed radiologists, cardiologists, urologists, internists, laryngologists, and neurosurgeons who came from all over, it was far, far more than a chance to flee the daily hurly-burly for an unequivocally tax-deductible weekend. At this time and place began the process of shaping into standard working technique all the individual improvisations, frustrations, and foolish pioneer feelings experienced late at night in deserted laboratories by medical men coping with electronics, optics, photographic sensitometry, and random fluctuations at the quantum level.

To certain elements of the electronics industry the symposium brought visions of a well-bred market for advanced merchandise, quite free of the fearful dependence on military spending and of the fearful perils of appliance merchandising. If the electronics boys in 1953 hadn't brought out image amplifiers that multiply fluoroscope image intensity a thousandfold or more so that film can be exposed without frying patients, there would have been no symposium. Their emissaries sat unabashed among the M.D.'s.

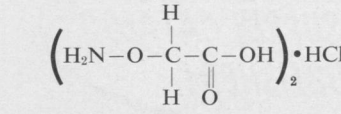
To the University of Rochester it was a chance to become the national cinefluorographic capital. It had become involved with the subject as early as 1929. To have one member of its radiology department such an expert on motion picture quality that he had produced Poe's "The Fall of the House of Usher" to supra-professional cinematic standards had helped enormously. We helped, too.

To us, doomed by our charter to the endless pursuit of monetary gain, the symposium was important for stimulating sales of *Kodak Cineflure Film,* a product which uniquely combines extreme speed to green light with very high contrast. It is obtainable from most x-ray dealers.

To Charles C Thomas, Publisher, Springfield, Ill., the symposium provided a title he is publishing this month, Cinefluorography. *It contains all 19 papers and the discussion thereof. For a free copy of a bibliography of cinefluorography, write Eastman Kodak Company, Medical Division, Rochester 4, N. Y.*

A deft way with ketones

(Aminooxy)acetic Acid Hemihydrochloride, known in the biochemical literature as carboxymethoxylamine hemihydrochloride and with less chance for confusion as



is now going to become even better known as Eastman 5336.

Now that the great virtue of easy availability has been bestowed on this compound, it commands interest on several grounds:*

1) The still mysterious transformation of bacilli and colonies of bacilli into the so-called L form—a bacteriological phenomenon being closely watched—has been shown to be induced in *Salmonella typhosa* by this acid in a narrow concentration range *(J. Bact., 59,775).*

2) Its ability to combine in living organisms with α-ketones, principally pyruvate, makes it a metabolic inhibitor useful as a bacteriostatic agent in preparations of high protein content, such as blood-typing serums and bacterial vaccines *(J. Bact., 55,1).*

3) It is useful as a reagent for the isolation of very small amounts of ketones from unsaponifiables such as cholesterol and its metabolic products *(J. Biol. Chem., 114,539).*

4) It is useful for isolation of α-estradiol from human pregnancy urine *(J. Biol. Chem., 134,591).*

Abstracts of the latter two analytical procedures with Eastman 5336, or List No. 41 of some 3700 other Eastman Organic Chemicals, will be furnished upon application to Eastman Organic Chemicals Department, Distillation Products Industries, Rochester 3, N.Y. (Division of Eastman Kodak Company). The compound itself may be ordered at $3.55 for 5 grams.

*'Tis a speculation whether progress in these matters was advanced or retarded by Hans Thacher Clarke's leaving us 32 years ago to build Columbia University's great Department of Biological Chemistry. (Aminooxy)acetic acid was first synthesized in Germany in 1893. It is astounding what a large proportion of all organic chemicals later found interesting for one reason or another were first synthesized in Germany in 1893. Apparently this one, like so many others, just lay there in the literature until Professor Clarke suggested it for reaction with carbonyl compounds. Shortly after the suggestion proved fruitful, he and a collaborator came out with an improved synthesis of the compound. At this point, had he still been heading up the production of Eastman Organic Chemicals, he would doubtless have added it to our list, making it conveniently available to all way back in 1936 and thus advancing progress. But if he hadn't quit to be a college professor, he'd be tied up in a lot of dull business routine. This would have retarded progress because he wouldn't have been sitting around with graduate students and research scholars tossing out brilliant suggestions that are still gaining momentum a quarter century later. Anyway, the synthesis we use for Eastman 5336 now is not identical with Dr. Clarke's. A Texan who tried his synthesis reported she wound up with merely ammonium chloride unless she was very careful.

Photoelasticity by the slice

Westinghouse, long known as a hotbed of photoelastic activity, has been nice enough to cast upon the waters of industrial co-prosperity a piece of technique that could help sell more *Kodak Contour Projectors.* No time must be lost in spreading the word.

Westinghouse took one of these projectors of ours and turned it into a magnifying polariscope. This they did in the interest of reaching reasonable decisions on the mechanical design details to enable a nuclear reactor pressure vessel to withstand the titanic stresses that it must bear.

Scale models were built out of a certain transparent epoxy resin which not only exhibits the well known differential retardation between light polarized parallel and perpendicular to the stresses, but can retain the effect "frozen in" after the pressure is released and the model is literally sliced up in various planes of interest to the stress analysts. The *Kodak Contour Projector* is what brings the analyst in close, past the gross structure of the pattern, to the all-important fine details where structural failure starts.

Don't bother Westinghouse for a description of the optical, mechanical, and electrical additions they've made to the projector. It's enough that they are publishing a full description of the analytical method (Proceedings of the Society for Experimental Stress Analysis, *17,* No. 1). *They're not interested in selling projectors. Eastman Kodak Company, Special Products Division, Rochester 4, N. Y., is.*

Price quoted is 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

posed changes in the Internal Revenue Code designed to increase private and corporate gifts to institutions of higher education. The whole amount was spent during the year.

During 1958 the Association entered into an agreement with the National Science Foundation to administer a program of fellowships for one, two, or three summers for high-school teachers of science and mathematics who were deemed qualified for individually arranged programs of study to increase their competence in the subject fields. The contract with the National Science Foundation was negotiated during 1958, but no funds were received during that year. Expenses in 1958 amounted to $11,453.45. These expenses were covered by funds received from NSF during 1959.

Investment Account

The Association maintains a separate investment account in which endowment and investment funds are segregated from current funds and from grants for special activities. During 1958 the Association transferred to the investment account $190,604.14 of current funds. The transfer was made in order to earn a higher rate of interest on funds not immediately needed for operating expenses. Records of the total amount of money and of earnings are maintained in such a fashion as to permit return to the operating account at any time of whatever amount of this money may be needed. For investment purposes, however, the amount is merged with the Association's endowment funds. Consequently, in the figures given in the following table it is impossible to show how much of the several kinds of securities should be credited to endowment funds and how much to current operational funds. The combined account was distributed as follows at the end of 1958:

U.S. Government bonds	$164,196.87
Industrial bonds	197,387.60
Preferred stocks	58,908.59
Common stocks	283,986.84
Total	$704,479.90

Of the above total, $190,604.14 consists of operating funds and $513,875.76 of endowment funds. The latter figure is $19,300.83 above the total for the endowment fund at the end of 1957. All of these figures are at cost or book value rather than at the market value of the securities held. During the year the Association received $23,545.51 in dividends and interest. The return was at the rate of 3.8 percent on the amount of money invested. (Neither the book nor the market value, but the actual amount of money that at various times had been put into the investment account, was used to calculate the rate.) The yield on the market value was 3.4 percent. The income was used as follows:

Investment counsel and cost of servicing securities	$ 2,345.44
Grants to affiliated academies of science	4,324.50
Transferred to operating funds for life and emeritus members	6,036.00
To the Gordon Research Conferences	1,877.73
Award and expenses of Newcomb Cleveland Prize	1,350.00
Expenses of Socio-Psychological Prize	350.00
Increase in value of endowment funds	7,261.84
Total	$23,545.51

During the year the Association also gained $8992.47 from the sale of securities.

Consolidated Balance Sheet

At the end of 1958, the consolidated balance sheet of the Association, which includes both operating and investment funds, showed the following assets:

Cash on deposit	$ 167,292.92
Investments at cost	
Operating account	704,479.90
Investment account	223,049.52
Land	115,875.00

Building (less depreciation)	723,214.03
Equipment (less depreciation)	67,884.53
Money owed to the Association	69,651.55
Total	$2,071,447.45

These assets were partially offset by the following liabilities:

Prepaid dues and subscriptions for which members and other subscribers had not received *Science* or other services	$370,601.39
Unexpended balance of grants from National Science Foundation, Carnegie Corporation, and Rockefeller Foundation	89,751.42
Accounts payable to others	98,993.57
Remainder of mortgage on building payable in 7½ years	137,788.46
Held for Gordon Research Conferences	39,083.28
Total	$736,218.12

The difference between assets and liabilities represents the Association's net worth. At the end of 1958, the net worth was distributed as follows:

Endowment funds:	
For research	$ 205,547.28
For general purposes (used to pay subscription costs for life and emeritus members)	206,213.57
For the Newcomb Cleveland Prize	27,210.00
For the Socio-Psychological Prize	29,901.60
For creating emeritus life memberships	3,751.83
Value of land	115,875.00
Value of building and equipment (less depreciation and mortgage)	653,310.10
Unallocated reserve	93,419.95
Total	$1,335,229.33

Auditor's Report

The Association's financial records for 1958 were audited, as they have been for a number of years, by the firm of G. P. Graham and Company. The tables presented above differ in form from those included in the auditor's report, and the explanations of sources of income and nature of expense are usually given in greater detail. In a few instances items have been reclassified from the auditor's report to provide more meaningful groupings. Except for such rearrangements, there are no differences between the figures presented here and those reported in the audited account, to which was attached a letter ending: "In our opinion the accompanying statements present fairly the financial position of the American Association for the Advancement of Science as at December 31, 1958, and the results of its operations for the year ended on that date, and were

prepared in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year. Respectfully submitted, G. P. Graham and Company, by G. R. Bowers."

DAEL WOLFLE
American Association for the Advancement of Science

Forthcoming Events

October

1–4. American Soc. of Industrial Designers, Asheville, N.C. (Mrs. R. R. Larisch, ASID, 15 E. 48 St., New York 17.)

4–7. American Inst. of Mining, Metallurgical and Petroleum Engineers, fall, Dallas, Tex. (E. O. Kirkendall, AIMMPE. 29 W. 39 St., New York 18.)

4–9. Society of Motion Picture and Television Engineers, semi-annual conv., New York, N.Y. (C. S. Stodter, SMPTE. 55 W. 42 St., New York, 36.)

5–7. Aeronautical Communications, 5th symp., Utica, N.Y. (L. G. Cumming, Inst. of Radio Engineers, 1 E. 79 St., New York 21.)

5–7. Association of Medical Illustrators. 14th annual, Seattle, Wash. (J. W. Phillips, Univ. of Washington College of Medicine, Seattle.)

5–7. Chemical Engineers, annual, Essen, Germany. (Dr. Miessner, VDI-Fachgruppe, Verfahrenstechnik, Rheingaullee 25, Frankfurt-am-Main.

5–7. National Assoc. of Corrosion Engineers, Northeast regional, Baltimore. Md. (T. J. Hull, NACE, 1061 M & M Bldg., Houston, Tex.)

5–8. American Acad. of Pediatrics, Chicago, Ill. (E. H. Christopherson, 1801 Hinman Ave., Evanston, Ill.)

5–9. American Soc. of Anesthesiologists, Bal Harbour, Fla. (J. W. Andes, 188 W. Randolph St., Room 1101, Chicago, Ill.)

5–9. Audio Engineering Soc., 11th annual, New York, N.Y. (AES, P.O. Box 12, Old Chelsea Station, New York 11.)

5–10. Society of Automotive Engineers, aeronautical meeting and aircraft manufacturing forum, Los Angeles, Calif. (R. W. Crory, Meetings Operation Dept., SAE, 485 Lexington Ave., New York 17.)

5–16. Institute of the Aeronautical Sciences, biennial Anglo-American conf., New York, N.Y. (R. R. Dexter, IAS, 2 E. 64 St., New York 21.)

6. American Assoc. of Poison Control Centers, 2nd annual, Chicago, Ill. (A. S. Blank. AAPCC, Connecticut State Dept. of Health, Hartford 15.)

6–8. Aeronautical/Astronautical Problems of High Speed Flight, Stanford, Calif. (E. Haynes, Deputy Director, Aero Sciences Directorate, Air Force Office of Scientific Research, Washington 25.)

6–9. High Temperature Technology, intern. symp., Asilomar, Calif. (Public Relations Office, Stanford Research Inst., Menlo Park, Calif.)

7–8. Advanced Propulsion, 2nd symp. (classified), Boston, Mass. (Lt. Col. P. Atkinson, Propulsion Div., Air Force Office of Scientific Research, Washington 25.)

7–9. Vacuum Technology, symp., Philadelphia, Pa. (American Vacuum Soc., Box 1282, Boston, Mass.)

7–11. International Conv. on Nutrition and Vital Substances, 5th, Konstanz-Zurich, Switzerland. (Secretary General, Benmeroderstrasse 61, Hannover-Kirchrode, Germany.)

8–10. American Assoc. of Textile Chemists and Colorists, natl. conv., Washington, D.C. (G. P. Paine, AATCC, P.O. Box 28, Lowell, Mass.)

8–10. American Ceramic Soc., Bedford, Pa. (F. P. Reid, ACS, 4055 N. High St., Columbus 14, Ohio.)

8–10. American Soc. of Tool Engineers, semi-annual, St. Louis, Mo. (H. E. Conrad, ASTE, 10700 Puritan Ave., Detroit 38, Mich.)

8–10. Biology of Pyelonephritis, intern. symp., Detroit, Mich. (E. L. Quinn, Henry Ford Hospital, W. Grand Blvd. at Hamilton, Detroit 2.)

8–10. Optical Soc. of America, annual, Ottawa, Canada. (S. S. Ballard, Dept. of Physics, Univ. of Florida, Gainesville.)

9–13. American Soc. of Civil Engineers, Los Angeles, Calif. (E. S. Kirkpatrick, ASCE, 33 W. 39 St., New York 18.)

11–16. American Acad. of Ophthalmology and Otolaryngology, Chicago, Ill. (W. L. Benedict, 15 Second St., SW, Rochester, Minn.)

11–16. American Inst. of Electrical Engineers, fall general, Chicago, Ill. (N. S. Hibshman, AIEA, 33 W. 39 St., New York 18.)

11–16. American Soc. for Testing Materials, Pacific area natl., San Francisco, Calif. (R. J. Painter, ASTM, 1916 Race St., Philadelphia 3, Pa.)

12–14. Clay Conf., 8th natl., Norman, Okla. (C. G. Dodd, Eighth Natl. Clay Conf., Univ. of Oklahoma, Norman.)

12–14. Electronics Conf., 15th annual natl., Chicago, Ill. (NEC, 228 N. La Salle St., Chicago 1, Ill.)

12–16. Macromolecules, intern. symp. (IUPAP), Wiesbaden, Germany. (W. Mauss, Intern. Symp. on Macromolecules, c/o Kalle & Co., Rheingaustrasse 25, Wiesbaden-Biebrich, Germany.)

12–19. Venereal Diseases, intern. cong. (by invitation), London, England. (G. E. W. Wolstenholme, Ciba Foundation, 41 Portland Pl., London, W.1, England.)

13–17. International Union against the Venereal Diseases and the Treponematoses, London, England. (Institut Alfred Fournier, 25, Boulevard Saint-Jacques, Paris 14e, France.)

14–16. Parenteral Drug Assoc., annual conv., New York, N.Y. (H. E. Boyden, Parenteral Drug Assoc., 130 E. 59 St., New York 22.)

14–17. American College of Chest Physicians, 25th, Albuquerque, N.M. (M. Kornfeld, 112 E. Chestnut St., Chicago 11, Ill.)

15–16. American Ceramic Soc., Glass Div., Wernersville, Pa. (F. P. Reid, ACS, 4055 N. High St., Columbus 14, Ohio.)

15–17. Academy of Psychosomatic Medicine, Cleveland, Ohio. (B. B. Moss, Suite 1035, 55 E. Washington St., Chicago 2, Ill.)

15–17. National Soc. of Professional Engineers, fall meeting, Seattle, Wash.