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First, a distinguished family of UV-Vis spectrophotometers

Protein difference spectroscopy needs the Cary 118's accuracy

With difference spectroscopy the life scientist has a valuable probe for investigating the structure of protein macromolecules. It is a very sensitive method for detecting small, discrete changes in a sample which could not be observed with standard absorption procedures, where strong overlapping bands obscure many weaker peaks.

To measure these small absorbance changes, the scientist must have a good spectrophotometer. Because of its unmatched photometric accuracy, the Cary 118 Spectrophotometer is the ideal instrument for difference measurements (at 0.1 abs the accuracy is 0.00035 abs). Such performance is necessary, since even very small errors can sometimes lead to incorrect interpretation of the spectrum.
In practical terms the 118's exceptional performance frees the scientist from concern about the quality of the data. He knows that any peaks recorded on the spectrum result from sample absorption, and not from an instrument artifact.

With the Cary 17 changing absorbance ranges makes a mountain out of a mole hill

Often when recording a UV-Vis spectrum, a particular wavelength region of interest may produce only a small hump on the spectrum, because the sample's absorption is not very great in that area. In such a situation, changing the absorbance range expands the chart scale and makes it possible to see more spectral detail.

With the Cary 17 Spectrophotometer, switching absorbance ranges is convenient and rapid. The instrument is equipped with a universal absorbance/\%T slidedewire so that any of eight absorbance ranges or a 0-100 \%T range may be selected. This feature, along with the coupled wavelength, scan and chart drive, makes it easy to back up the chart and rescan a particular area using expanded scale to increase the sensitivity of the recording. A small, smooth hump becomes a detailed peak.

A second advantage of the range change capability is that absorbance bands with widely divergent molar absorptivities can be recorded on the same chart, a more convenient presentation for most purposes. Too, it requires less sample preparation because no sample dilution is necessary to bring absorbance values on scale.

These spectra of oxidized cytochrome C, recorded on the Cary 118, illustrate one effect of pH on this protein. Spectrum A was recorded with identical sample and reference solutions (both pH 7). For Spectrum B the sample was increased to pH 11, while the reference was unchanged. Perturbation of the tyrosine residues becomes readily apparent.

To obtain further information about the Cary 118's capabilities for difference spectroscopy, kinetics, determining concentration in small-volume samples, quantitative analyses, or even recording derivative spectra, circle Reader Service No. 2.

To demonstrate the advantages of changing absorbance ranges, these spectra of cytochrome C reduced with ascorbic acid were recorded on the Cary 17. Spectrum A (0-0.5 abs range) fully resolves the Soret band at 415 nm, but shows little detail on the peaks at the longer wavelengths. The expanded presentation in Spectrum B (0-1.1 abs range) gives better detail of the \( \alpha \) and \( \beta \) bands at 550 and 520 nm.

Circle Reader Service No. 3 for more information on the Cary 17.

Techtron 635 Spectrophotometer

For life science projects such as gel scanning, kinetics, or thermal denaturation of DNA, the Techtron 635 UV-Vis Spectrophotometer offers exceptional performance at a very low cost. Its ease of operation, large sample compartment, and numerous accessories make it adaptable to almost any routine or research application.

For more information, circle Reader Service No. 4.
When you need an NMR system, see Varian first

Presenting the routine
13C machine

The CFT-20 NMR Spectrometer has two really revolutionary aspects. First, it makes 13C operation routine. Next, it's inexpensive. And if you're currently running 13C spectra, or want to, you know precisely how revolutionary that makes it. Because 13C NMR has never been particularly easy, or low in cost, before. But it is, now.

Let's start with easy operation. Controls are conveniently grouped. But you don't have to twiddle a lot of dials or monitor a lot of meters — every function that could possibly be automated, has been. The magnet has a low profile design to provide maximum accessibility to the air gap for rapid sample changing. All of which results in faster, more efficient throughput.

Now, don't get the idea that just because the CFT-20 is easy to operate and not very expensive, that it's a stripped-down system. Quite the contrary. It features the most up-to-date innovations in NMR technology. For instance.

The CFT-20 comes with a built-in 8K 620L-100 central processing unit. While you can't see it, you'll know it's there because it's loaded with the most straightforward, easy-to-use software you've ever encountered.

You interface with the instrument through use of a built-in teletype equivalent keyboard and an alpha-numeric oscilloscope display. Simply type out a command, and away you go. Oh, and the oscilloscope will also show you the free induction decay, Fourier transformed spectra, and your pulsed lock signal, as well.

The magnet is double-thermally-insulated for long-term stability. And the air gap is wide enough to handle a 10 mm sample at room temperature, or an 8 mm sample at variable temperature.

There's a built-in magnetic tape cassette for rapid program loading. And those are only a few examples of the CFT-20's many innovative standard features.

Finally, the price. It's incredibly low. Far less than you'd expect to have to pay for a spectrometer that makes 13C NMR analysis an everyday operation. For more information, including a brochure and price list, see your local Varian representative, or circle Reader Service No. 5.
The latest in liquid and gas chromatography

New LC/UV chromatograph features selectable detector wavelength

Now you can make LC measurements at the maximum absorption wavelength of virtually any compound, because the detector on this new system operates between 210-780 nm with no sacrifice in efficiency. Versatile, it is almost a universal detector that can be used with gradient elution. Minimum detectable quantities are nanogram amounts as shown in the adjacent chromatogram. Cell volume is small, only 8 microliters, so that peak spreading is minimized.

Two well proven instruments are combined in this LC-UV system. The liquid chromatograph may be one of Varian’s high performance models such as the 4200, 4100, or 4000. The spectrophotometer portion of the system is a Varian Techtron 635 fitted with special thermostatted flow cells for HPLC. These cells are actually a matched pair, one containing the sample solution, the other the reference solution.

The Techtron 635 has a carefully matched optical path with a common plane focal point in both sample and reference beams. In addition to helping minimize noise and drift, this also allows wavelength scanning. Precise thermostating with the water-jacketed cell is also important in decreasing noise and drift. Overall system noise is less than ±5 x 10^-4 absorbance unit from 210 to 780 nm. Drift is lower than 10^-2 absorbance unit/hour, highly respectable performance for any LC detector!

Wavelength scanning. An additional capability of the LC-UV system is the wavelength scanning provided by the Techtron 635. A chromatographic analysis can be stopped at a peak by placing the pump in idle without shutting off the system. The Techtron 635 can then be used as a scanning spectrophotometer to obtain an absorption spectrum which is adequate for positive qualitative analysis. When the scan is completed, the separation can be instantaneously started up as if there had been no interruption.

Systems synergism. This new LC-UV system is analogous to GC-MS (gas chromatography-mass spectrometry) where the sample separating ability of chromatography is supplemented by the higher sensitivity, flexibility and qualitative ability of the spectrometer.

Details, including chromatograms and instrument specifications, are yours for the asking. Just circle Reader Service No. 6
Make your GC automatic with Varian's NOW generation, multi-mount sampler

...60-sample capacity
...vertical or horizontal mounting
...mount two samplers on many GCs

Actually, we call this a second generation automatic sampler because the first generation died before it reached our drawing boards. Euthanasia. We knew scientists didn't need another "me-to" product, so we leap-frogged into the future.

Now, with this new automatic sampler, you can run your gas chromatograph overnight, unattended, and have chromatograms from 60 samples (contained in four 15-vial quadrant holders which fit into a carrousel unit) by morning. Or, if you'd like to run it continuously for longer periods, each 15-vial holder can be easily removed after its samples are analyzed and replaced with new samples — all while the unit is operating!

Reproducibility is excellent. For example, on the raw peak areas of a paraffin sample, percent standard deviations of 0.42% have been obtained. On normalized areas, percent standard deviations of better than 0.18% have been achieved. Precision which not even a skilled operator can attain.

Here are other reasons why the Aerograph sampler becomes the new standard:

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Choice of sample sizes. You can inject either of two adjustable sample sizes.

Repetitive injections. Make 1, 2, or 3 injections from each sample vial.

The latest in electronics. Using second generation electronics for autosampling gives total automation capability, including external commands from computers or other sources. And this new Autosampler fits the standard injector inlet of virtually all Aerograph gas chromatographs and many others also.

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New, easiest-to-use digital integrator . . .

Aerograph Model 485

With only four controls to adjust, the new Model 485 Integrator is the easiest one yet to use. It produces accurate and reliable peak area and retention time measurements with minimum set-up time and is designed for liquid as well as gas chromatography and for unattended automated analyses.

A built-in printer and extensive use of integrated circuits and state-of-the-art design combine reliability with convenience. Key features include: continuously variable filtering, 0.1 μV/sec slope sensitivity, 20mV (±10mV) baseline correction range, 4 digits of retention time, 8 digits of peak area, and 10 digits of total area for large peaks. Automatic separation of small peaks high on a solvent peak tail, area reject and integrate delays, and peak start and stop marks round out the 485’s capability.

Analyze the easy way with the new Model 485. For details, circle Reader Service No. 8.

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7
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KODAK IRTRAN 6 Optical Material looks like this.

More importantly, like this.

There are also five other KODAK IRTRAN Materials.

Transmittance as measured through polished, uncoated surfaces.

A little frankness, because there is too much to lose when people come to distrust advertising:

The IRTRAN Optical Materials are no longer the latest thing in infrared-transmitting optical materials. But when the latest thing does come along, it usually gets compared in one aspect or another with the IRTRAN Materials. Favorably and proudly, of course. We, in turn, are proud to report that the IRTRAN Materials are still growing healthily in demand for an apparently widening variety of applications, most of which we know little about.

We do know quite a bit about the properties of these materials. The information has been packed into a 52-page brochure available as Kodak Publication U-72 on request from Kodak Apparatus Division, Rochester, N.Y. 14650, or through the Reader Service Number indicated below. The brochure is full of tables, graphs, and such prose as this:

Usually a little guidance will enable an optical shop technician (with the help of the inestimable wisdom of optical experience) to achieve the kind of polish he'd like to get. If he can supply the experience, we'd be glad to contribute the guidance. In addition to Table 24 on page 49, the following comments are applicable to specific IRTRAN Materials:

IRTRAN 1—Technique similar to glass-working, but use diamond powder for polishing.

IRTRAN 2—Technique similar to glass-working, but use Linde powders for polishing.

IRTRAN 3—Thermal coefficient of expansion is moderately high, so it is best not to cause excessive thermal shock. Should preferably preheat to 100-125°F before blocking to heated wax. Polishing with Linde C powder, then Linde A, then finishing with 1/4-micron diamond powder has been found to be preferable to any polishing shortcuts.

IRTRAN 4—Of all the IRTRAN Materials, this is the most difficult one to polish well. Back in the old days, an old-time optical shop worker would rely on a slug of tobacco juice now and then to keep this one polishing well. IRTRAN 4 has the coarsest grain structure of all IRTRAN Materials; occasionally a grain will "pull out" while polishing. There's no recourse except to continue polishing below the grain pull-out.

IRTRAN 5—The chief requirement in finishing this material is patience. As hard as it is, many, many hours, sometimes days, may be necessary to achieve a satisfactory polish.

IRTRAN 6—This material is capable of a beautiful polish when handled appropriately in the polishing and cleaning sequence. Using Linde A polishing compound all the way through, polish until an original gray sheen is reached. Then discard the working lap and complete the polish with a fresh polishing lap and polishing compound. When cleaning the final surface, always use fresh, clean solvent that has never been used before. Xylo or trichloroethylene can be used first, followed by alcohol. Pat dry with fluffy diaper cloth; never rub dry.
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Circle No. 20 on Readers' Service Card for Information
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Approval of New Drugs

In his report on drug regulation (News and Comment, 23 Feb., p. 777), Nicholas Wade says that the Food and Drug Administration (FDA) was saved “from having to answer on possibly embarrassing points of detail” because my paper is unpublished, but that its answer to “the general thesis” was “quite effective.” This comment deserves a reply.

First, the ground rules for the FDA’s answer were their own; they have had copies of my paper since late last year. More important, the “embarrassing points of detail” include every substantive point of my analysis. It was not my purpose to malign the FDA for perversely holding good drugs from the market, or to claim that the 1962 Kefauver amendments have never benefited consumers. Thus, much of the FDA’s testimony was irrelevant. I attempted an overall assessment of the working of the 1962 amendments, and my finding that, taken as a whole, the amendments have produced fewer benefits than costs was never rebutted by the FDA. Specifically, among the results of my research that still await rebuttal are:

1) The pre-1962 decline in drug innovation has a perfectly sensible economic explanation (a decline in drug market growth in the mid-1950’s) that fails to rationalize the low post-1962 innovation rate.

2) The decline in innovation since 1962 has been too substantial to attribute all or even any great part of it to preemption of ineffective drugs. Many effective drugs are not marketed, not because the FDA is perverse, but because the cost burden of the amendments on the process of drug development makes their development unprofitable.

3) When conservative estimates of the value forgone because potentially effective drugs are not developed is set off against estimates of the consumer savings attributable to the amendments, the net balance is decidedly unfavorable to the consumer.

4) The probable costs of delayed introduction of unusually effective drugs, an inevitable result of the added testing required to satisfy the amendments, exceed manyfold a generous estimate of the value of improved drug safety that the amendments are likely to produce. These points cannot be rebutted by simple extrapolation of trends, selected examples of the FDA’s competence, or contrary assertions. Quite apart from the shortcomings of the FDA’s testimony, I regret that the FDA chose to view my research as a specific critique of that agency. The FDA happens to be the instrument Congress chose for administering the amendments. However, the inherent defect is in Congress’s mandate to the FDA, and it would be unreasonable to look to the FDA rather than to Congress for repair of that defect.

SAM PELTZMAN

Department of Economics, University of California, Los Angeles 90024

Nicholas Wade quotes Henry E. Simon as stating that every year, between 3 and 5 percent of those hospitalized, or 1.5 million people, are admitted primarily because of drug reactions. Strongly implicated as causes are the risky nature of prescription drugs and the lack of skill and discrimination in their use by physicians.

These ominous figures are shocking and hard to believe, as no doubt they were intended to be. However, serious inflation has occurred between the original work and final citation.
Around the world, thousands of researchers prefer the Sorvall RC2-B Automatic Superspeed Refrigerated Centrifuge for routine, RIA and experimental work. No rival centrifuge has a record that equals the RC2-B's long history of scientific successes. It's the time-proven superspeed performer. Only the RC2-B gives you Sorvall's exclusive, patented Gyro-Action Direct Drive: unmatched for smooth acceleration, run and deceleration. What's more, you get speeds to 20,000 rpm and forces to 48,200 g with a 400 ml rotor and without a vacuum pump. An electronic control governs speeds precisely from 750 rpm on up, provides fast acceleration to all speeds and maintains pre-set speeds despite line voltage fluctuations. A superior temperature control makes it almost impossible for unstable temperatures to spoil your samples. Other benefits: a big, smooth-walled, stainless steel chamber. Quiet, easy, pushbutton operation. Fuss-free maintenance. Automatic programming with eight angle and horizontal rotors—plus the extra zonal capability of our SZ-14 Reorienting Density Gradient Zonal Rotor, which is free of rotating or complex seal assemblies. The GK continuous-flow insert in the SZ-14 can process up to 1,100 ml per minute and collect up to 800 ml of sediment. The names of Du Pont and Sorvall both stand behind the performance and service you can count on, with the RC2-B. For complete details about the world of ways it can help you, simply write to Du Pont Company, Instrument Products Division, Sorvall Operations, Newtown, Conn. 06470. Or phone (203) 426-5811.
The Simmons data derive from a review paper by K. L. Melmon (1), who cites five research studies to substantiate his figures (2–5). The first of these, the work of Seidl et al. at the Johns Hopkins Hospital, has been cited elsewhere (7) as the basis for a national projection of 1.5 million drug-caused admissions. Seidl et al. had reported that 5 percent of patients were admitted with a drug reaction; a later study by the same group showed 1.7 percent of admissions because of a drug reaction (8).

In the Johns Hopkins studies (2, 8), these percentages represent admissions to medical wards. Since 20 percent of admissions to Johns Hopkins are to medical services, about 0.4 percent of all patients are admitted to that hospital primarily because of drug reactions. It is unlikely that the experience of a major teaching hospital and referral center like Johns Hopkins can be extrapolated to all hospitals. But doing so would give a figure closer to 120,000 than 1.5 million. The inflationary factor thus appears to be about 10.

There are similar problems with Simmon's claim that "once in hospital, between 30 and 30 percent of all patients have a drug reaction." Melmon cites two sources for such an estimate: Seidl et al. (2) report that 13 percent had drug reactions while hospitalized to which Melmon adds the 5 percent with reactions present on admission to get 18 percent. Hoddinott et al. (3) report that 15 percent of patients had probable drug reactions to which Melmon adds another 15 percent with forgotten doses and other errors in drug administration to get 30 percent.

Again, both these studies were done on medical wards. It is as wrong to say that 13 or 15 percent of all hospitalized patients have a drug reaction (although this may be true for one ward) as it would be to say that 100 percent of all hospital patients are pregnant, because this may be true for one ward. Perhaps it is more important to note that no reaction-incidence study has yet screened out those minor symptoms which are known to occur as "adverse nondrug reactions" (9) in people who take no medication. A placebo-controlled study might yield more realistic figures.

The source material also fails to support the estimate that, for patients with drug reactions, "the length of their stay is about doubled as a result." The authors cited by Melmon to back up this claim (2–5) all agree that there is a positive correlation between length of hospital stay and number of drug reactions observed; but all also agree that very likely "the long hospital stay was the factor predisposing to the occurrence of adverse episodes" (4) and not the other way around.

Finally, these excessive estimates tend to link the adverse reaction problem with the introduction of new drugs. Actually, surveys of drug reactions show that it is the older drugs, such as quinidine, digitalis, and insulin, used in medical practice for over 30 years, which are most often found at fault (5). Advances in drug technology may thus help reduce the real incidence of undesirable side effects from medical treatment.

HARRY WIENER
Pfizer, Inc., New York 10017

References

Another Scientist in Congress

Constance Holden (News and Comment, 18 May, p. 720) writes that there is only one scientist in Congress—Mike McCormack (D—Wash.). Another scientist in Congress is James G. Martin (R—N.C.), who was, until his election to the House of Representatives last fall, associate professor of chemistry at Davidson College.

LOCKE WHITE, JR.
Department of Physics,
Davidson College,
Davidson, North Carolina 28036

Taxation and Energy Conservation

The letter from P. de Haen concerning conservation of gasoline (13 Apr., p. 137) deserves comment. European governments tax automobiles on the basis of taxable horsepower, which is a meaningless number calculated from
piston displacement. The tax was designed (at the beginning of the century), and works in practice, as essentially a property tax, and I would therefore dispute any claim that European governments have superior wisdom in matters of energy conservation.

The actual horsepower that can be obtained from a given piston displacement can be anywhere between 30 and 150 horsepower per liter of displacement (and even more for motorcycle engines), depending on the sophistication of design, and therefore taxable horsepower bears no relation to actual horsepower. In addition, gasoline mileage obtained on the road depends very little on engine horsepower (actual or taxable), but on factors such as gross vehicle weight, overall thermal efficiency of the engine with all accessories (for example, power steering or air conditioning), efficiency of power transmission to the driving wheels (which is noticeably less with automatic transmission than with manual), average speed, and, last but not least, presence or absence of smog controls, and driving habits (the proverbial “lead foot”).

In this connection, crash-safety standards increase vehicle gross weight, and smog controls reduce the thermal efficiency of the engine; thus both factors tend to increase gasoline consumption per mile traveled. In this way energy conservation comes into direct conflict with safety and environmental considerations, and we are no longer faced with an either-or proposition, but with a much more difficult question of trade-off: How much increased energy consumption is the crash-safety and smog control worth?

On the whole, taxation calculated from piston displacement has had an inhibiting influence on engine design, and for this reason the Europeans have not been too keen on smog control (not to mention the noise factor) at home, for it is difficult to put effective smog (and noise) controls on a small-displacement engine and still have some power left (for example, I understand that Renault is pulling out of the North American market after 1975 largely for this reason).

If we have to tax automobiles in order to conserve fuel, let us avoid dictating design criteria (piston displacement, horsepower, number of wheels) and simply tax by vehicle weight, or tax fuel directly; in the latter case we probably cut down on unnecessary travel as well. If we tax fuel directly or tax by vehicle weight, we will likely end up with smaller cars using less gasoline, but if we insist on “zero pollution” and “total safety,” we will end up driving 5-ton battering rams getting 1 mile to the gallon.

W. Forst
Department of Chemistry, Université Laval, Québec G1K 7P4, Canada

Highway Salting

A report entitled “Release of mercury from contaminated freshwater sediment by the runoff of road deicing salt” of which I was a coauthor, appeared in Science in 1972 (10 Mar., p. 1142). The results showed that the addition of sodium or calcium chloride to artificially contaminated sediments increased the relative amount of mercury in the water in equilibrium with the sediments by two to five or more orders of magnitude.

Since that report was published, I and others have shown that increasing concentrations of chloride do indeed result in the release of mercury but that the amount of mercury released is dependent on the type of sediment, the pH, redox conditions, and the chemical form of the mercury. In naturally contaminated sediments, the mercury has generally been bound very strongly, and little release has occurred.

Unfortunately a number of environmental groups have cited the report as a strong argument against the use of road deicing salt. In view of the fact that mercury, except when associated with an unusual industrial pollution activity, is not present in significant amounts in most sediments, and because the amount of mercury that might be released by chlorides depends on a specific set of conditions which may not occur in the natural environment, I do not believe the contents of the report can be used as a reason for banning highway salting.

More comprehensive studies under realistic field conditions are needed in research involving the environmental sciences. Extrapolation of laboratory data to field conditions can often lead to inaccurate conclusions.

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19-23. Role of the Cell Surface and Cell Interactions in Development and Differentiation, 7th intern. congr., Intern. Soc. of Developmental Biologists, Montreal, Canada. (B. Messier, ISDB, Dept. of Anatomy, Université de Montreal, P.O. Box 6128, Montreal 101)


19-29. International Assoc. of Agricultural Economists, 15th intern. congr., Sao Paulo, Brazil. (V. J. Pellegrini, Rua Xavier Silveria H 57, Apr 102, Copacabana, RÌ de Janeiro, Brazil)


20-23. American Health Congr., jointly by American Hospital Assoc., Catholic Hospital Assoc., American Nursing Home Assoc., and Health Industries Assoc., Chicago, Ill. (L. Mays, AHC, 840 N. Lake Shore Dr., Chicago 60611)

20-24. Texturization Theory, Determination and Control of Physical Properties of Food Materials, Amherst, Mass. (C. Rha, Agricultural Engineering Bldg., Univ. of Massachusetts, Amherst 01002)


20-29. Genetics, 13th intern. congr.; Berkeley, Calif. (S. V. Andrews, Dept. of Genetics, 345 Mulford Hall, Univ. of California, Berkeley 94720)

21-22. Society of Logistics Engineers, Hunt Valley, Md. (R. R. Harvey, SOLE, P.O. Box 164, Hunt Valley)


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26-31. American Chemical Soc., 166th natl. mtg., Chicago, Ill. (Meetings Manager, ACS, 1155 16th St., NW, Washington, D.C. 20036)
26-31. International Soc. of Neurochemistry, 4th intern., Tokyo, Japan. (Y. Tsukada, Dept. of Psychology, School of Medicine, Keio Univ., Shinjuku, Tokyo)
27-29. Comparative Virology, 2nd intern. conf., Mont Gabriel, P.Q., Canada. (E. Kurstak, Univ. of Montreal, P.O. Box 6128, Montreal 101, P.Q., Canada)
27-1. Leucocyte Culture Conf., 8th, Uppsala, Sweden. (K. Lindahl-Kiessling, Inst. for Medical Genetics, Univ. of Uppsala, V. Agaton 24, S-752-20 Uppsala)
28-30. Association for Computing Machinery, Atlanta, Ga. (G. Smith, ACM, 1133 Ave. of the Americas, New York 10036)
28-30. International Conf. on Radiation and Remote Probing of the Atmosphere, Univ. of California, Los Angeles. (J. G. Kuriyan, Dept. of Meteorology, Univ. of California, Los Angeles 90024)

September

1-7. Electroencephalography and Clinical Neurophysiology, 8th intern. congr., Marseille, France. (G.-C. Lairy, Laboratoire d'E'EG, H6pital Henri Rousselle, 1, rue Cabanis, Paris 14e France)
2-6. Victimology, intern. symp., World Psychiatric Assoc., Jerusalem, Israel. (I. Drapkin, Organizing Committee of Criminology, Faculty of Law, Hebrew Univ. of Jerusalem, P.O. Box 4051, Jerusalem)
2-7. International Congr. on Mercury, sponsored by the Inst. Tecnologico Metalurgico Emilio Jimeno-Univ. of Barcelona, and the Comision de las Minas de Almaden y Arrayanes, Barcelona, Spain. [Secretaria del Congreso, Facultad de Ciencias (Pedralbes), Univ. de Barcelona, Barcelona-14]
2-10. Society of Protozoologists, Clermont-Ferrand, France. (D. M. Hammond, Dept. of Zoology, Utah State Univ., Logan 84321)
2-14. Tropical Medicine and Malaria, 9th intern. congr., Athens, Greece. (E. M. H. Mofidi, School of Public Health, Univ. of Tehran, Tehran, Iran)
3-7. Molecular Sieves, 3rd intern. conf., Eidgenossische Technische Hochschule and the Swiss Chemical Soc., Zurich, Switzerland. (W. M. Meier, Inst. for Kristallographie der ETH, Sonneggstr. 5, 8006 Zurich)
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1973, 344 pp., $19.50

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edited by J. F. DANIELLI, M. D. ROSENBERG, and D. A. CADENEAD
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5-12. Plant Pathology, 2nd intern. congr., Intern. Soc. for Plant Pathology, Minneapolis, Minn. (J. E. Mitchell, Dept. of Plant Pathology, Univ. of Wisconsin, Madison 53706)
8-15. Chemotherapy, 8th intern. congr., Athens, Greece. (P. Kontomichalou, P.O. Box 1554, Athens)
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1-4. American Acad. of Family Physicians, Denver, Colo. (R. Tusek, AAP, Volker Blvd. at Brookside, Kansas City, Mo. 64112)


1-5. American Soc. for Laboratory Animal Science, 24th annual, Miami Beach, Fla. (Joseph J. Garvey, AALAS, 2317 W. Jefferson St., Joliet, Ill. 60435)

1-5. Symposium on Remote Sensing in Oceanography, American Soc. of Photogrammetry, Orlando (Disney World), Fla. (J. S. Beazley, 330 Ponce St., Tallahassee 32303)

1-6. International Congr. of Rheumatology, 13th, Kyoto, Japan. (S. Sasaki, Japanese Rheumatism Assoc., Shimbunkaikan 63, 3-8-4 Ginza, Chuo-ku, Tokyo, Japan)

3-5. Clinical Orthopedic Soc., Cleveland, Ohio. (M. L. Clayton, COS, 2045 Franklin St., Denver 80205)

4-6. Refractories Div., American Ceramic Soc., Bedford, Pa. (F. P. Reid, ACS, 4055 N. High St., Columbus, Ohio 43214)


5-6. Southeastern Cancer Research Assoc., Atlanta, Ga. (W. E. Criss, Dept. of Obstetrics and Gynecology, Univ. of Florida College of Medicine, Gainesville, 32601)

5-6. Psychopharmacology Symp., World Psychiatric Assoc., Wroclaw, Poland. (A. Bukowczyk, Krazewskiego 25, Wroclaw)

5-9. Sigma XI, Fontana, Wis. (T. T. Holmes, SX, 345 Whitney Ave., New Haven, Conn. 06511)

6-12. American Concrete Inst., Ottawa, Ont., Canada. (ACI, Box 4754, Redford Stat., 22400 W. Seven Mile Rd., Detroit, Mich. 48219)

6-13. World Federation for Mental Health, 25th congr., Sydney, Australia. (A. Stoller, Mental Health Authority, 300 Queen St., Melbourne CI, Australia)

7-11. Clay Minerals Soc. (10th mtg.) and Clay Minerals Conf. (22nd), Banff, Alta., Canada. (J. E. Gillott, Dept. of Civil Engineering, Univ. of Calgary, Calgary 44, Alberta)

7-11. International Iron and Steel Inst., 7th annual congr., Johannesburg, South Africa. (ISSI, 5 President Champ de Mars, 1050 Brussels, Belgium)

7-11. Life Assurance Medicine, 11th intern. congr., Mexico City, Mexico. (J. Rendon, Edificio Bancomer, Apto Postal M-7817, Mexico, D.F.)


7-13. Neurological Surgery, 8th intern. congr., Tokyo, Japan. (S. Ishii, Dept. of Neurosurgery, Juntendo Univ. Hospital, Hongo, Bunky-ku, Tokyo)


8-10. National Electronics Conf. and Exhibition, 29th, Chicago, Ill. (NEC, Inc., Oakbrook Executive Pl. No. 12, 1211 W. 22 St., Oak Brook, Ill. 60521)

8-10. Society for Industrial and Applied Mathematics, Iowa City, Iowa. (J. K. Cullum, IBM-T. J. Watson Research Center, Yorktown Heights, N.Y. 10598)

8-12. International Drivers' Behaviour Research Assoc., Zurich, Switzerland. (T. E. A. Benham, Room 9C7, 10, Paul Dunne Dr., P.O. Box 222, Courbevoie, France)


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Meteorological Monographs, v.12, no.34
Published February 1972

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RECENT DEATHS

Lillian Blake, 53; associate professor of psychology, Howard University; 7 May.

Dean S. Carder, 75; retired research seismologist, Earthquake Mechanism Laboratory, U.S. Coast and Geodetic Survey; 12 February.

James E. Davis, 94; former head, physiology department, Los Angeles College of Osteopathic Physicians and Surgeons; 19 March.

Bertram R. Levy, 40; professor of mathematics, New York University; 27 March.

Burton J. Moyer, 61; professor of physics and dean, College of Liberal Arts, University of Oregon; 21 April.

Clyde W. Mullen, 82; former associate professor of agronomy, Kansas State University; 9 April.

Robert C. Murphy, 85; Lamont Curator of Birds, American Museum of Natural History; 19 March.

Victor H. Rosen, 61; clinical professor of psychiatry, Yale University; 5 February.

Myron F. Rosskopf, 65; chairman, mathematical educational department, Teachers College, Columbia University; 31 January.

Paul J. Sedgwick, 76; professor emeritus of botany, Syracuse University; 2 February.

Leslie A. Stauber, 65; retired professor of zoology, Rutgers University; 27 March.

S. Smith Stevens, 66; director, Laboratory of Psychophysics, Harvard University; 19 January.

G. William Svetich, 44; associate professor of chemistry, University of North Dakota, 30 December.

Vincent J. Tempone, 39; professor of psychology, University of Arizona; 9 January.

H. Hudnall Ware, Jr., 74; former chairman, obstetrics and gynecology department, Medical College of Virginia; 6 February.

Leo K. Yanowski, 71; professor emeritus of chemistry, Fordham University; 26 March.

Kimball Young, 78; former professor of psychology and sociology, Northwestern University; 1 September.

M. X. Zarrow, 59; professor of biobehavioral sciences, University of Connecticut; 23 January.

John E. Gibson, dean of engineering, Oakland University, to dean, School of Engineering and Applied Science, University of Virginia. . . David C. White, professor of engineering, Massachusetts Institute of Technology, to director, Energy Laboratory at M.I.T. . . Robert M. Epstein, professor of anesthesiology, College of Physicians and Surgeons, Columbia University, to chairman, anesthesiology department, University of Virginia. At the Massachusetts Institute of Technology: Martin Deutsch, professor of physics, to director, Laboratory for Nuclear Science, succeeding Peter T. Demos, now director, Bates Linear Accelerator. . . James E. Brooks, associate provost, Southern Methodist University, to vice president and provost of the university. . . Norman C. Nelson, dean, Louisiana State University School of Medicine, to dean, Medical School, University of Mississippi Medical Center. . . Elizabeth H. LeDuc, professor of life sciences, Brown University, to dean, biological and medical sciences division at the university.