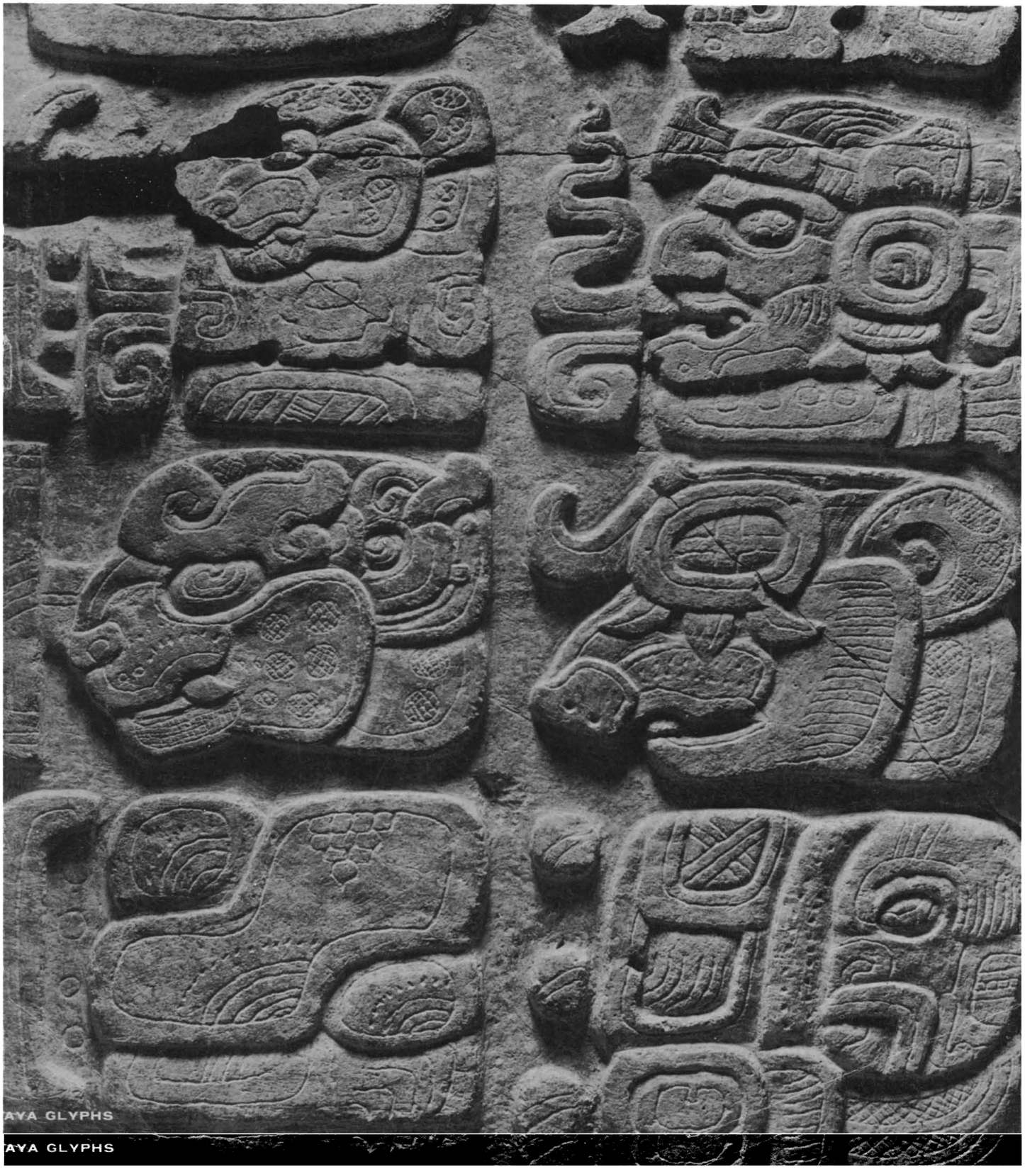
SCIENCE

5 July 1963

Vol. 141, No. 3575

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



AYA GLYPHS

NOW YOU CAN GET THREE COMPLETE AMINO ACID ANALYSES A DAY

(—and use smaller samples to do it!)

The Model 120B Amino Acid Analyzer with the new Accelerated Analysis procedure cuts the time for analyzing a protein hydrolyzate from 22 hours to 6½ hours. This new procedure means you can complete the first run by early afternoon, and get a second run programmed for automatic completion—all in the same working day. A third complete analysis is possible by coming in for two hours in the evening.

Equally good news—you now need less of your valuable sample. As little as 0.05 micromole (less than half the size formerly required with the Model 120B) gives the same accurate results.

Laboratories presently owning Beckman Amino Acid Analyzers (and some own as many as three) can employ the new Accelerated Analysis procedure with only minor changes.

If your work involves analyzing protein hydrolyzates, body fluids, tissue extracts, foods or pharmaceuticals, why not let the Beckman Analyzer take over the repetitive work for you. For more information, write for Data File 120-5.

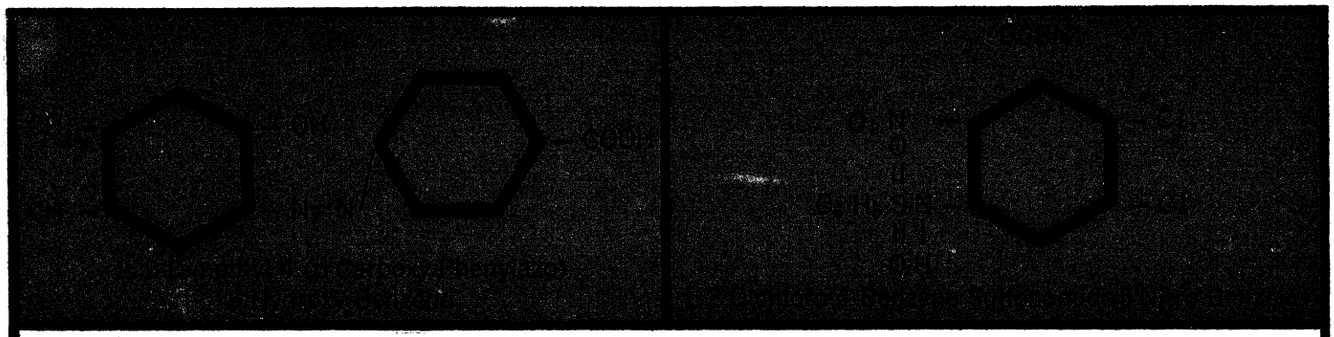
Beckman INSTRUMENTS, INC.

SPINCO DIVISION

Palo Alto, California

International Subsidiaries: Geneva, Switzerland; Munich, Germany; Glenrothes, Scotland.

ANTI-CANCER AGENTS



A mixture of 1, 2 Dimethyl 4 (p carboxy phenylazo) 5 Hydroxy Benzene (CPA) and 1, 2 Dichloro 4 Benzene Sulfonamido 5 Nitro Benzene (DCBN) when fed to mice of the SPFS strain bearing spontaneous mammary cancers, cured permanently about one third of the animals.

The investigators adjudged the permanency of the cure of the cancers when the neoplasm decreased in size, disappeared and remained undetectable for at least 5 months.(1).

The maximal number of cures was obtained with 6 grams of CPA and 0.5 grams of DCBN per kilo of ration. This represents the first case of the cure of such cancers by any chemical agent.

These biochemicals were conceived on the basis of a demonstration that spontaneous cancer differed from normal host tissues in that they synthesized vitamin B_{12}.

Previously it was demonstrated that certain spontaneous mammary cancers of mice differed from normal mouse tissues in that cancer cells synthesized Vitamin B_{12} (2) (3). This metabolic difference allowed the prediction and the realization of antimetabolites poisonous to the cancers that are harmless to the host mice (4) (5).

These new anti-cancer agents, (CPA) and (DCBN) are members of a series of antimetabolites which have been shown to inhibit biosynthesis of Vitamin B_{12} in microorganisms. It was reported that these biochemicals demonstrated no detectable harmful effects on the host mice as the dosage used to bring about the desired results.

CPA and DCBN are available on 24-hour delivery basis anywhere in continental USA. Call 216-662-0212 or write Nutritional Biochemicals Corporation, 21010 Miles Avenue, Cleveland 28, Ohio.

All chemicals described are for chemical and investigational use only. They are not offered for clinical or drug use. The literature reference should not be interpreted as either an endorsement or disapproval of the biochemical by the cited investigator.

(1) D. W. Woolley and J. M. Stewart, Biochem. Pharm. 11, 1163, (1962). (2) D. W. Woolley, Proc. Nat. Acad. Sci. Wash. 39, 6, (1953). (3) D. W. Woolley, Ibid, 41, 111, (1955). (4) D. W. Woolley, Cancer Res. 13, 327, (1953). (5) D. W. Woolley and G. Schaffner, Ibid, 14, 802, (1954).

CPA	DCBN
100 gram bottle, gram $ .95	100 gram bottle, gram $1.25
50 gram bottle, gram $1.03	50 gram bottle, gram $1.35
10 gram bottle, gram $1.10	10 gram bottle, gram $1.45
5 gram bottle, gram $1.20	5 gram bottle, gram $1.60

5 July 1963
Vol. 141, No. 3575

SCIENCE

SCIENCE is published weekly by the American Association for the Advancement of Science, 1515 Massachusetts Ave., N.W., Washington 5, D.C. Now combined with **The Scientific Monthly** ®. Second-class postage paid at Washington, D.C. Annual subscriptions $8.50; foreign postage, $1.50; Canadian postage, 75¢; single copies, 35¢. School year subscriptions: 9 months, $7; 10 months, $7.50. Provide 4 weeks' notice for change of address, giving new and old address and zone numbers. Send a recent address label. Opinions expressed by authors are their own and do not necessarily reflect the opinions of the AAAS or the institutions with which the authors are affiliated. Indexed in the **Reader's Guide to Periodical Literature.**

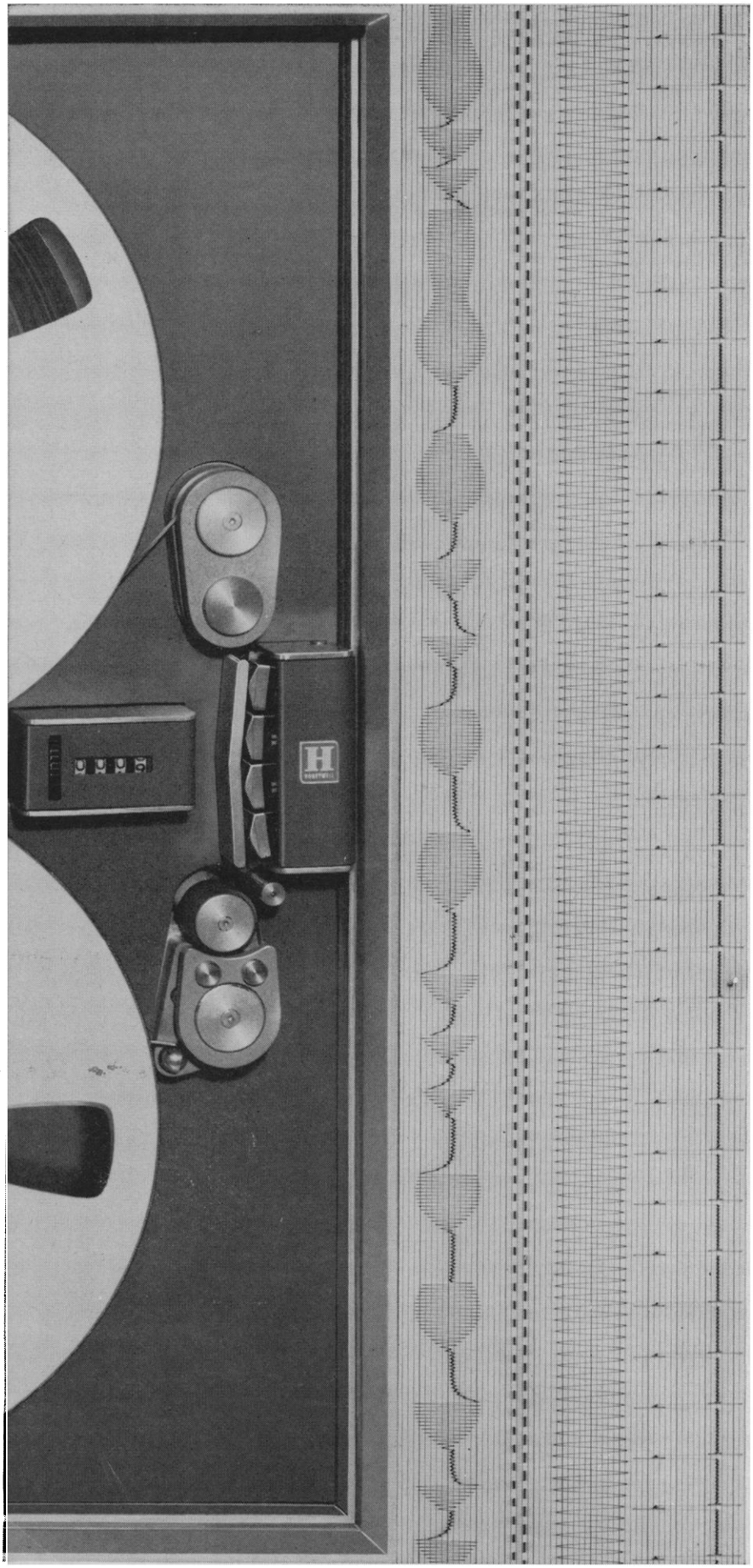
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

Chicago, Ill., 6 W. Ontario St.: HERBERT BURKLUND (312-DE7-4973)
Los Angeles 45, Calif., 8255 Beverly Blvd.: WINN NANCE (213-653-9817)

EDITORIAL CORRESPONDENCE: 1515 Massachusetts Ave., N.W., Washington 5, D.C. Phone: 202-DU 7-7171. Cable: Advancesci, Washington. Manuscripts should be submitted in triplicate, double-spaced throughout. The AAAS assumes no responsibility for the safety of manuscripts. Copies of "Instructions for Contributors" can be obtained from the editorial office.
ADVERTISING CORRESPONDENCE: Room 1740, 11 West 42 St., New York 36, N.Y. Phone 212-PE 6-1858.

COVER

These "noncalendric" glyphs are from the side of Stela 26 in Tikal, a site in the lowland forested Peten region of Guatemala. The architectual complex of Tikal is the largest and most imposing of the Classic period that ended not later than about 900 A.D. See review of *Maya Archaeologist*, page 34.



NOW and/or LATER

To get the most out of analog data, you should be able to see it now or see it later, use it now or use it later.

The ideal combination of recording instruments for making the most of your analog data is a Honeywell tape recorder, such as the compact Honeywell 8100 portable instrumentation recorder/reproducer, used with the Honeywell Visicorder Oscillograph.

For immediate readout, the Visicorder gives you an instantaneous record of 1 to 36 channels of data from DC to 5000 cycles per second. A variety of paper speeds from .1 to 160 inches per second gives you the trace resolution you need. Five models of the Visicorder are available.

At the same time, you can record up to eight channels (plus voice and compensation) of data up to 10,000 cycles on the 8100 portable. Later on, you can play selected portions of your data into the Visicorder. Four tape speeds (1⅞, 3¾, 15, and 30 ips) give you record and playback versatility for whatever frequency you're recording.

In the Honeywell 8100, several head and tape configurations are available (including IRIG). All models have a built-in calibration panel, automatic switching of center frequencies, and a new, improved tape drive that cuts flutter to a minimum and eliminates tape breakage. A built-in monitor scope and voice channel are optional. In addition, Honeywell manufactures complete laboratory tape systems with capacities of up to 60 channels on 2-inch tape.

For complete information about the Honeywell 8100, the Visicorder Oscillograph, and other recording equipment, contact your nearest Honeywell office, or write: Honeywell, Denver Division, Denver 10, Colo. Or call us direct at 303:794-4311. In Canada, contact Honeywell Controls, Ltd., Toronto 17, Ontario.

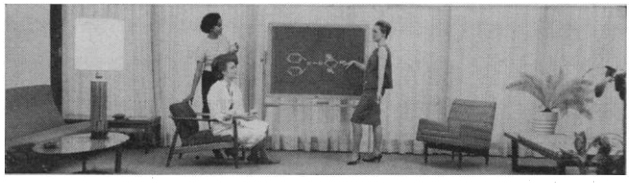
DATA HANDLING SYSTEMS

Honeywell

Kodak reports on:

ionizable, water-soluble NMR standard... advice you may be wise to forget... hot new color films without favors

The song of the protons



Bright chemists who were six years old in 1946 regard magnetic resonance spectra as just another accretion to the culture, like decimal points or hot pyridine. In that year physicists announced that protons in a magnetic field absorb energy from radiation of the same frequency as the precession rate, which is proportional to the field strength.

Actually it is hard to mount a single proton on the end of a pin. In the real world, the protons in a target are subjected to different field strengths, however uniform the applied field. For one thing, electrons in the vicinity of a proton act as little magnets themselves and affect the proton's magnetic environment. But on the average, a proton on the third carbon from the end in a certain molecule finds itself in the same magnetic situation as the proton on the third carbon from the end in another molecule of the same substance in the same liquid sample. Furthermore, their common situation differs significantly from that of a proton linked in a hydroxyl group to an electron-greedy oxygen atom that keeps pulling the orbital covers off.

Chemists got the point very quickly, thanked the physicists, and took over. Today a central chemical research laboratory without a nuclear magnetic resonance outfit simply doesn't belong to the club. Ours belongs to the club.

Nuclear magnetic resonance service with a smile is available to anybody working in our central lab who is pretty sure of the molecular structure of the contents of a little bottle he carries into Room 258 but would prefer to be a little surer. He comes away with a roll of paper bearing a plot of energy absorbed at 60mc *vs.* magnetic field. One very sharp, high peak at the end of the spectrum is a reference line from tetramethylsilane, $(CH_3)_4Si$, which one mixes in with the sample because it's loaded with protons that are uniformly and heavily shielded by electrons. It has become customary to refer to resonances by how far down they come from the TMS line.

It is too bad that TMS is virtually insoluble in aqueous and ionic solution. Recently the inventor of the TMS gambit fixed this by replacing one of the methyls with a propanesulfonyl.

Inevitably, thank goodness, there arrived a letter which attempted to persuade us that this ionizable, water-soluble version "might be of greater interest to NMR spectroscopists around the country if it were more readily available." Within the week, we replied that production of the requested compound was under way, closing: "Thank you very much for bringing this product to our attention, as we sincerely appreciate knowing what new chemicals are required for today's research."

This was the proper sentiment to express, rather than to admit we had to make it anyway for Room 258. Now it is proper simply to announce that a gram of the compound as 3-(Trimethylsilyl)-1-propanesulfonic Acid Sodium Salt (EASTMAN 8773) *is obtainable for $2.85 from Distillation Products Industries, Rochester 3, N. Y. (Division of Eastman Kodak Company), which happily supplies without charge its List No. 43 of some 4100 other* EASTMAN *Organic Chemicals.*

Stick fast fast

EASTMAN 910 Adhesive came along a few years ago and then it was no longer silly to think of constructing serious setups in the laboratory by simply *sticking* metal parts together, to say nothing of sticking organic materials together. The adhesive sticks so fast (in both senses of that word) and so little goes so far that $5 for a half ounce only *sounds* high.

It has proved a boon to scientific and industrial mankind, but sometimes it doesn't work. Maybe the mating surfaces are not clean. Maybe they do not fit close enough. Maybe too much adhesive has been applied. That is bad for the same reason that a bad fit is bad: little pools are bad. The adhesive should form a very thin, uniform film.

On some materials, polyolefins in particular, surface pretreatment is desirable. Some polystyrenes dissolve a little in the 910 monomer. The dissolved polystyrene sort of slows polymerization. We have also been politely informed that in the case of certain dissimilar or pickled metals a speedup would help.

All right, we'll tell you what to do in these cases. Apply EASTMAN 910 Adhesive to only one surface and wipe the other with a (non-aqueous) solution of phenylethylethanolamine, which we call EASTMAN 910 Surface Activator.

WATCH OUT NOW. For work where you have been getting along well with EASTMAN 910 Adhesive up to now and just want to hurry it along, forget you read this ad. What good would it do to have the bond form before the surfaces can be properly lined up?

So ubiquitous has the little bottle of EASTMAN *910 Adhesive become that it is reasonable to broadcast here an offer of a one-ounce sample of* EASTMAN *910 Surface Activator, with directions. Address Eastman Chemical Products, Inc., Kingsport, Tenn. (Subsidiary of Eastman Kodak Company). If you find we exaggerate the ubiquitousness, please so indicate and enclose $5.*

X marks three hot new color films for still cameras. They have hit the film counters in recent months. They involve no favors from the factory, no special code numbers, no burdensome minimum quantities, all have the same daylight speed: 64.

KODACHROME-X Film is not only faster than KODACHROME II Film, but its higher contrast gives the impression of more sharpness. Blues are richer and reds a little darker. With a CC10R color-correcting filter and 2⅔ stops of extra exposure allowance, it gives proper color rendition at as long as 1000 seconds of exposure time. (Nebulae? What's the proper color of an object so dim that it takes 16 minutes of exposure? Or is the diaphragm stuck so that it cannot be opened wider than a pinhole?)

KODAK EKTACHROME-X Film is twice as fast as the EKTACHROME it replaces and slightly sharper in rendition of edges. Can deliver saturated reds and clean yellows; available in 120, 126, 127, 135, 620, and 828 sizes; offers practical possibility for user-processing, which cannot be claimed for KODACHROME Film.

In 135 and 126 KODACOLOR-X Film, which is processed to color negatives for as many prints as you want, the X likewise indicates a doubling of speed along with improved sharpness and latitude for overexposure, so that only good can come of the change.

Prices 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

5 July 1963, Volume 141, Number 3575

SCIENCE

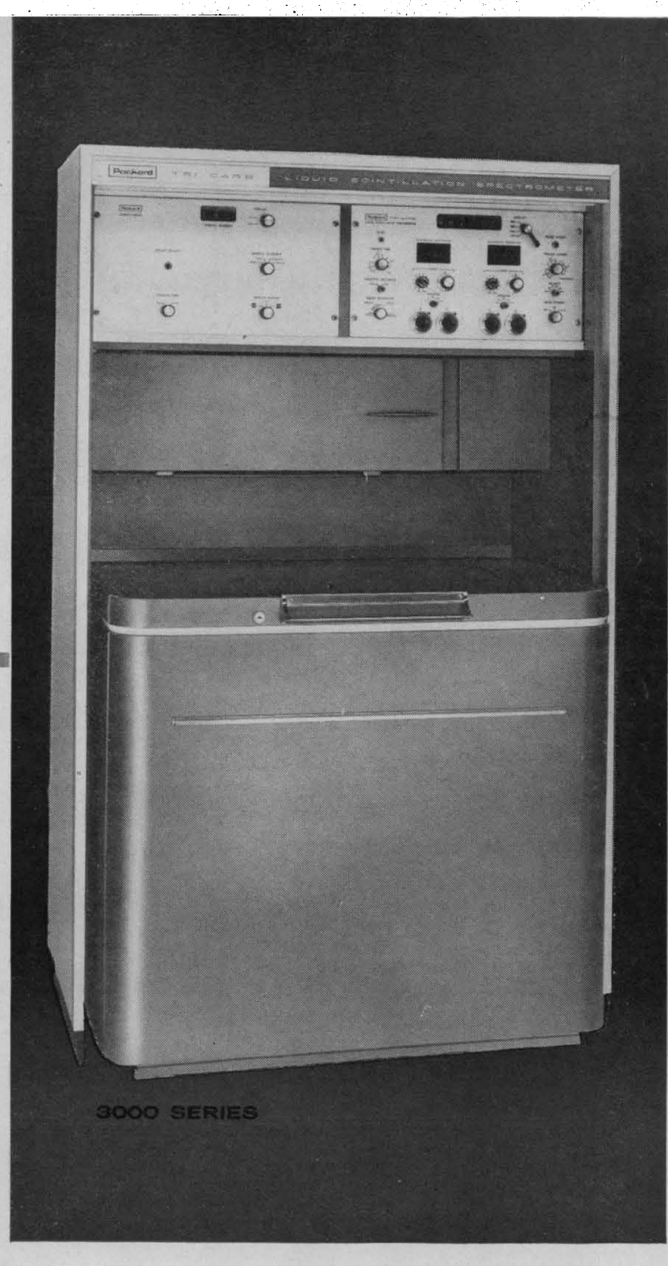
The First Director

Toward the end of World War II, President Roosevelt asked Vannevar Bush, director of the Office of Scientific Research and Development, how science and government might most usefully collaborate after hostilities ended. In *Science, the Endless Frontier,* Dr. Bush replied with the proposal that there be established a national science foundation as a permanent agency of government. It took the federal government 5 years to decide to adopt this recommendation. It took the first National Science Board and President Truman only a brief time to decide to invite Alan T. Waterman to become the foundation's first director.

Fortunately for the foundation and for American science, he accepted. Now, after serving for over 12 years, Dr. Waterman has retired. When we look back over those years, it is abundantly clear that the foundation has been managed wisely and skillfully. In this appraisal we join many others. On 21 June the National Science Board honored Dr. and Mrs. Waterman with a farewell dinner. This pleasant reunion of several hundred friends and admirers provided an opportunity for expressions of appreciation and gratitude from President Truman, who first appointed Dr. Waterman as the foundation's director; President Eisenhower, who reappointed him for a second term; and President Kennedy, who asked him to continue in office after that term had expired. Vannevar Bush, for the first time since the foundation was established, gave publicly his assessment of its progress. A dozen years ago, he said, a number of rocks were clearly visible as the foundation started on its course. How the foundation avoided coming to grief on these rocks was the theme of Dr. Bush's testimonial to the skill of its first pilot.

The confidence of Congress, the respect of other agencies of government, and the loyal support of scientists in this and other lands have all been earned when none of these was assured at the beginning. In any enterprise of this magnitude, and under circumstances requiring the charting of policies in controversial areas, some amount of dissatisfaction would be inevitable. But in looking back now on the foundation's first dozen years, perhaps the most remarkable thing is that when so much could have gone awry, so little did, and so much work of a first-class nature was accomplished. For this we can thank an able staff, a thoughtful and devoted National Science Board, and, chief among these, a skillful and patient director.

Now the foundation is in fresh hands. The new director will have his problems and his successes, and so will those who follow him. But the first director occupies a unique position in the history of a successful institution. Whatever glories other men have since brought to the University of Chicago, William Rainey Harper stands alone as its first president, and no matter what has been and will be accomplished by a chain of successors, Joseph Henry will live in memory as the first Secretary of the Smithsonian Institution. Each had a greater range of choice than did his successors, a greater opportunity to doom the new institution to mediocrity or to point it toward high achievement. In like fashion, Alan Waterman will be remembered as the first director of the National Science Foundation, the wise head who steered it through its formative years and set it on its course of great and growing usefulness.—D.W.



3000 SERIES

WHAT'S NEW IN THE NEWEST TRI-CARB® SPECTROMETERS?

everything!

- 13-dynode photomultiplier tubes with signal pulse summation for highest efficiency and best isotope separation.
- Rugged, "light-lock" detector assembly with new graded shielding and high-speed sample loading.
- Fast coincidence circuitry with wide dynamic range for best performance.
- *Completely separate* channels *(two or three)* of pulse height analysis for optimum channel selection.
- Precision gain control and fast-recovery linear amplifiers for greatest accuracy.
- Highly stable and linear pulse-height analyzers for best operation with fast liquid and slow crystal pulses (switch selection).
- High-speed (20 megacycle) scalers with in-line, numerical display for greatest counting accuracy and best legibility.
- Built-in automatic background subtraction for convenience and for accuracy of ratios calculated automatically.
- Low activity sample reject to save valuable counting time where many samples contain no material of interest.
- Highest quality digital printers or calculators for fastest and most reliable data presentation.
- Compact console designs to take minimum floor space and no bench space.

The incomparable new 3000 and 4000 Series Tri-Carb Liquid Scintillation Spectrometers embody more than a score of major design and operating improvements. The result: sensitivity, accuracy, and reliability of a degree never before achieved in liquid scintillation counting equipment. These ultra-modern instruments are available in configurations and with capabilities to match any research budget or counting requirement. Your Packard Sales Engineer can provide complete details and performance data. Write for illustrated Bulletin.

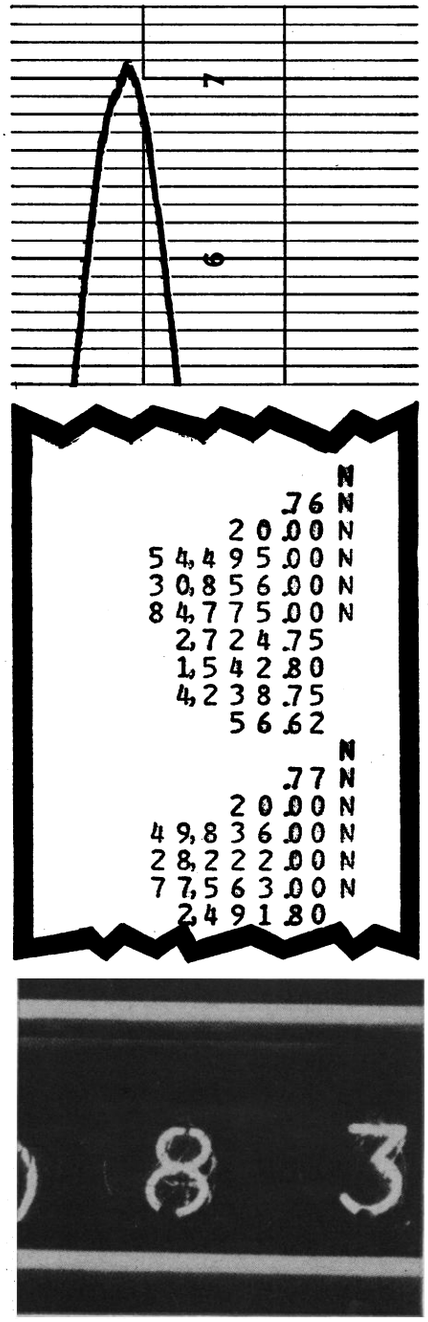
Packard

PACKARD INSTRUMENT COMPANY, INC.

BOX 428 • LA GRANGE, ILLINOIS • AREA CODE 312 • 485-6330

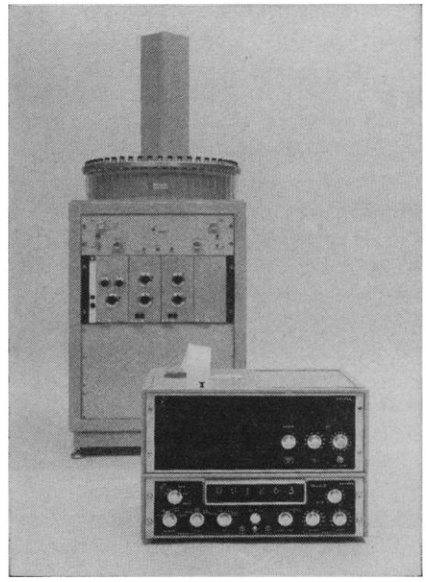
Collect accurate data in less time with these reliable Nuclear-Chicago instruments

The instruments shown here can satisfy many of your needs in radioactivity counting equipment. Whether you want a simple gas-flow detector or an automatic spectrometry system, Nuclear-Chicago offers an instrument to do the job reliably, conveniently, accurately, and efficiently. Consult your Nuclear-Chicago sales engineer for information.

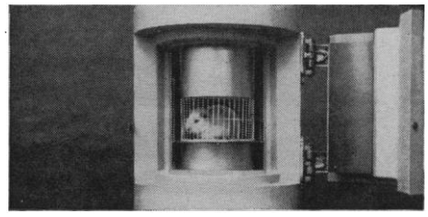


Gamma counting

Gamma emitting isotopes can be analyzed faster and with better precision using Nuclear-Chicago manual or fully automatic gamma counting systems. These advanced systems are designed around high-efficiency scintillation detectors. They are available with a wide variety of pulse-height spectrometers engineered specifically for gamma discrimination. The lead shielding supplied is more than adequate to maintain a low background level.



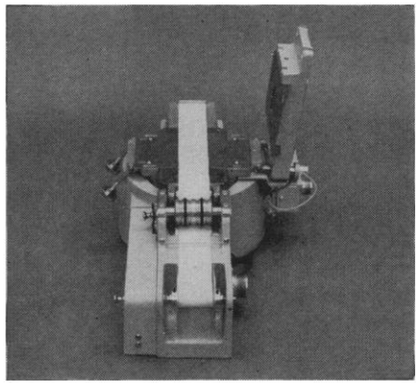
Model 1070 Sample Changer featured with Nuclear-Chicago automatic gamma counting systems is designed for small-volume solid or liquid samples. It handles up to 50 samples in bottles or test tubes and is available in systems with 2-inch or 3-inch crystal well scintillation detectors. Also offered in this reliable line of gamma counting systems is a wide variety of solid-state analyzer and monitoring instrumentation, including single or dual channel analyzers and single or dual scaler/timer combinations.



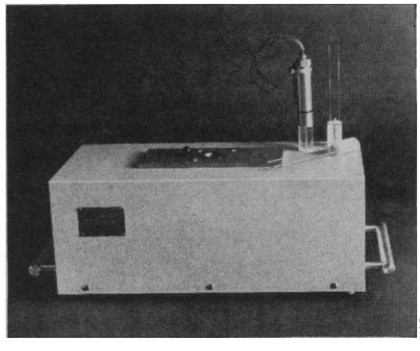
Tobor is the practical solution to many of your gamma-counting problems especially if your samples vary in volume or if they are as large as laboratory animals and human forearms. Measurements with Tobor are highly reproducible because counting efficiency is uniform over a wide range of sample volumes. Sodium iodide crystals or plastic scintillators up to seven inches in diameter can be furnished.

Radiochromatography

The data producing capabilities of analytical radiochromatography now can be expanded through the use of Nuclear-Chicago's new systems for qualitative and quantitative determinations. These versatile systems detect and record radioactivity in paper, thin-layer, liquid-column, or gas chromatography procedures.



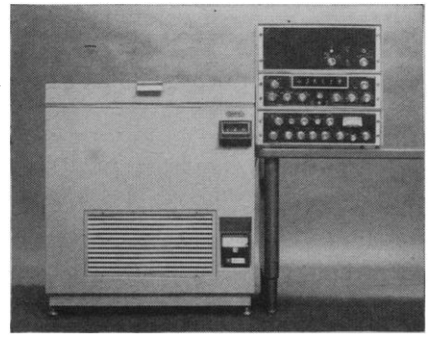
Model 1032 Actigraph is the only strip chromatogram scanner that offers 4-pi detecting geometry with a choice of window or windowless operation. By scanning both sides of the strip, the Actigraph virtually doubles the sensitivity of the 2-pi method and delivers correspondingly higher resolution. Efficiencies of 10% for carbon-14 and 2% for tritium can be obtained with a background of 15 counts per minute or less. For thin-layer chromatography techniques an adapter kit, Model 1039, is available for use with Actigraph systems. This low-cost assembly permits automatic scanning of the 2-inch-wide glass plates used in thin-layer studies.



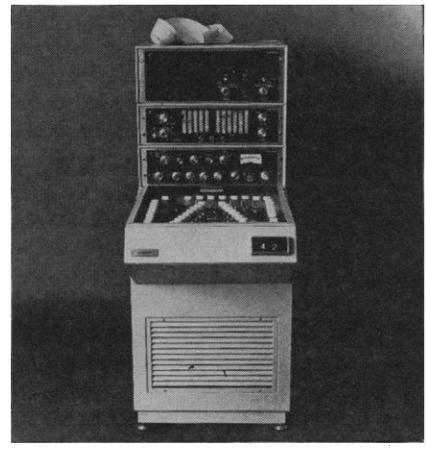
Chroma/Cell bench top detector systems automatically and continuously monitor the radioactive effluent of a liquid chromatography column. Efficiencies are as high as 28% to 40% for carbon-14 and 1% to 2.5% for tritium; background rates are low. Data presentation options include fast digital print-out and analog recording with choice of linear or logarithmic ratemeters and single-channel, dual-channel, or integrating graphic recorders. Chroma/Cell detectors are also available separately for use with your present Nuclear-Chicago Liquid Scintillation Spectrometer.

Liquid scintillation counting

The new Series 6700 LiquidScintillation Systems permit routine, accurate counting of any sequence of carbon-14 and tritium samples with differential efficiencies as high as 78% and 40% respectively. These systems offer important time-saving conveniences: fast data print-out, automatic calculation of counts per minute and channels ratios, large capacity sample changer, and selective sample programming.



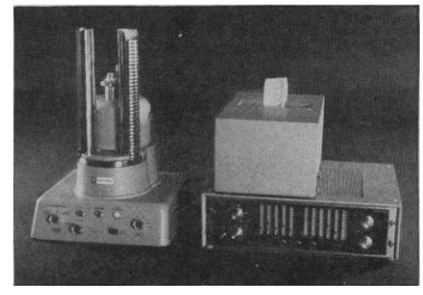
Models 6724 and 6725 are automatic systems with controlled-temperature chambers that maintain optimum counting environment for up to 150 samples. A solid-state, three-scaler/timer provides preset time, preset count, or time/count.



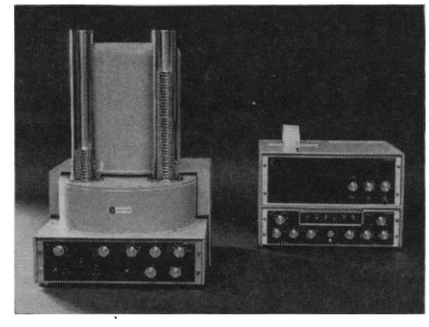
Model 6746 is an economical, single-scaler three-channel system that delivers high counting efficiency in room temperature operation. The compact single scaler/timer supplied with this 50 sample automatic system provides time and count print-out and can be used with other Nuclear-Chicago automatic equipment.

Automatic planchet counting

Nuclear-Chicago's automatic planchet counting systems for solid-phase beta emitting isotopes insure precise geometrical reproducibility for every sample. Each system is offered with monitoring instruments that provide fast digital read-out of time, count, and sample number, as well as automatic calculation of counts per minute.



Proved reliability has established Model 1040 as the most widely accepted automatic changer for samples of 1¼ inch diameter or smaller. This instrument will handle over 70 samples, and it can be operated with a windowless or thin-window gas-flow detector. Included in the read-out options available with 1¼ inch planchet systems is the Model 8710 Decade Scaler. This versatile new instrument offers sample number, time, and count print-out at a modest price.



Low specific activity beta samples require minimum background rates for best accuracy. Nuclear-Chicago's new Spectro/Shield systems effectively deliver this accuracy by reducing net background to approximately one count per minute. The detector can be operated in either the window or windowless mode. Spectro/Shield's automatic changer accommodates up to 150 samples as large as 2 inches in diameter.

ences, Palace of Culture and Sciences, Dworkowa 3, Warsaw)

2–16. Carpatho-Balkan **Geological** Assoc., 6th congr., Warsaw, Krakow, Poland. (St. Wdowiarz, Instytut Geologiczny, Grzegorzecka 81, Krakow)

6–9. **Physicians of Serbia**, 4th congr., Vrnjacka Banja, Yugoslavia. (Yuogslav Acad. of Sciences and Arts, Zrinski trg. 11, Zagreb 1)

8–14. **Germination**, intern. symp., Greifswald, East Germany. (H. Borriss, Botanisches Institut der Universitaet, Grimmerstrasse 88, Greifswald)

10–13. Testing and Research Laboratories for **Materials and Structures**, 17th meeting of the permanent commission, Warsaw, Poland. (Polish Acad. of Sciences, Palace of Culture and Sciences, Dworkowa 3, Warsaw)

12–13. **Tumor** Congr., Bratislava, Czechoslovakia. (Czechoslovak Medical Soc., Na Cvičišti 2, Prague 6)

16–19. Oscillographic **Polarography**, 2nd intern. conf., Smolenice, Czechoslovakia. (Dr. Pelnar, Czechoslovak Chemical Soc., Hradcanske nam. 12, Prague 1-Hradcany)

16–21. Stable **Isotopes**, 3rd work meeting, Leipzig, Markkleeberg, East Germany. (East German Acad. of Sciences, Mohrenstrasse 39, Berlin W. 8)

16–21. **Postmagmatic Ore Formation**, conf., Prague, Czechoslovakia. (M. Shtemprok, Central Geological Inst., Malostranski nam. 19, Prague 1)

16–21. **Slavists**, 5th intern. congr., Sofia, Bulgaria. (Bulgarian Acad. of Sciences, 7th November St., 1, Sofia)

18–21. Biogenic **Macromolecules**, Physical Chemistry, Jena, East Germany. (Inst. for Microbiology and Experimental Therapy, Reuthenbergstrasse 11, Jena)

18–22. **Otorhinolaryngology**, intern. conf., Budapest, Hungary. (Hungarian Acad. of Sciences, Akademia utca. 2, Budapest)

23–27. Industrial **Chemistry**, Intern. Assoc., 3rd congr. and exhibition, Belgrade, Yugoslavia. (I. S. Stankovic, Yugoslav Federation of Chemists and Technologists, Kneza Miloša Br. 7/III, Belgrade)

23–28. Czechosolovak **Medical** Soc., 21st intern. postgraduate medical course (on pancreas diseases and disorders of the digestive tract), Karlovy Vary, Czechoslovakia. (Czechoslovak Soc. of Physiatry, Czechoslovak Medical Soc., Albertov 7, Prague)

24–28. Role of **Atomic Electrons** in Nuclear Transformations, Warsaw, Poland. (M. Sujikowski, Polska Akademia Nauk, Instytut Fizyki, ul. Hoza 69, Warsaw)

25–27. **Nitro-compounds**, intern. symp., Warsaw, Poland. (T. Urbanski, Inst. of Technology, Politechnika Koszykowa 75, Warsaw 10)

25–28. **Anesthesia**, intern. symp., Budapest, Hungary. [Symposium Internationale Anaesthesiologiae, Sebeszeti Klinika (Surgical Clinic), Ul. ut. 78, Budapest 8]

September 1963 (no dates)

Cardiology, intern. congr., Budapest, Hungary. (G. Gottsegen, Natl. Inst. of Cardiology, Magyvard ter. 1, Budapest 9)

Chemicals, 3rd Ostrava colloquium, Ostrava, Czechoslovakia. (Regional Committee, Czechoslovak Scientific-Technical Soc., Section for Chemical Industry, Ostrava)

Crude Oil conf., Czechoslovak Scientific-Technical Soc. (Section for Chemical Industry and group for liquid fuels), Zaluzi, near Most. (Industrial Branch, Czechoslovak Scientific-Technical Soc. of the Natl. Enterprise "Chemicke zavody Ceskoslovenskosovetskeho pratelstvi," Zaluzi)

Czechoslovak **Ophthalmological** Soc., 27th congr., Prague. [E. Dienstbier, First Ophthalmological Clinic, Faculty of General Medicine, Charles Univ., U nemocnice 2 (499) Prague]

Pharmacological and Clinical **Evaluation of Drugs**, symp., Prague, Czechoslovakia. (Czechoslovak Acad. of Sciences, Narodní Tr. 3, Prague 1)

Neuropsychiatrists, 2nd congr., Ohrid, Yugoslavia. (Neuropsychiatric Clinic, Skoplje, Yugoslavia)

Electrical **Thermodynamics and Kinetics**, intern. committee, 14th meeting, Moscow, U.S.S.R. (Acad. of Sciences of the U.S.S.R., Lenin Prospekt 7, Moscow)

October 1963

1–4. **Virology**, 3rd natl. conf., Bratislava, Czechoslovakia. (M. Ihnata, Inst. of Virology, Czechoslovak Acad. of Sciences, Narodní Tr. 3, Prague 1)

2. Electronic **Calculating Machines**, 4th colloquium, Magdeburg, East Germany. (Mathematics Inst., Technische Hochschule Otto von Guericke, Boleslav-Beirut-Platz 5, Postschiessfach 124, Magdeburg)

2–4. **Rehabilitation** in Internal Medicine, congr., Czechoslovak Medical Soc., Karlovy Vary. (A. Mecl, Internal Medicine Hospital, Klimentska ul. 1, Prague, Czechoslovakia)

3–4. Statistical **Quality Control**, 8th colloquium, Magdeburg, East Germany. (East German Acad. of Sciences, Subcommission on Statistical Quality Control, Section for Applied Mathematics and Mechanics, Mohrenstrasse 39, Berlin W. 8)

15–18. **Electrotechnology**, 8th intern. colloquium, Ilmenau, East Germany. (Ilmenau Inst. of Electrotechnology, Ilmenau)

16–18. **Medicinal Plants**, intern. conf., Sofia, Bulgaria. (Bulgarian Acad. of Science, 7th November St. 1, Sofia)

23–25. **Surgery** Section, Czechoslovak Medical Soc., congr., Brno. (J. Novak, Surgical Clinic, Inst. for Postgraduate Medical Training, Prague 8, Czechoslovakia)

30–1. **Industrial Medicine**, 8th natl. congr., Marianske, Lazne, Czechoslovakia. (F. Nuzl, Div. of Occupational Diseases and Industrial Toxicology, State Medical Facility, Marxova 13, Plzen, Czechoslovakia)

30–1. **Modern Therapy**, conf., Prague, Czechoslovakia. (L. Kremlicka, Ophthalmology Faculty, Inst. for Postgraduate Medical Training, Bulovka Hospital, Prague 8-Liben)

Chemical Engineering, Machine-Building, and Automation, 9th natl. conf., Karlovy Vary, Czechoslovakia. (Industrial Branch, Czechoslovak Scientific-Technical

Soc., Chemoprojekt, Stepanska 15, Prague 1)

Technical **Microbiology**, Berlin, East Germany. (East German Acad. of Sciences, Mohrenstrasse 39, Berlin W.8)

Microwire and Resistance Measuring Instruments, 2nd scientific technical conf., Kishinev, Moldavian S.S.R. (Moldavian Acad., Kishinev, Moldavian S.S.R.)

October 1963 (no date)

Pure and Applied **Physics**, Intern. Union, 11th general assembly, Warsaw, Poland. (Polish Acad. of Sciences, Palace of Culture and Sciences, Dworkowa 3, Warsaw)

Workers in **Roentgenography**, cong., Kutna Hora, Czechoslovakia. (Inst. for Mineral Raw Materials, Hlousecka 279, Kutna Hora)

Radiological Defense, symp., Yugoslavia. (Inst. for Medical Research and Industrial Medicine, Yugoslav Acad. of Arts and Sciences, Zrinski trg. 11, Zagreb)

October–November 1963

Technical and Scientific Films, 3rd intern. festival, Budapest, Hungary. (Hungarian Soc. of Mechanical Engineers, Szabadság ter. 17, Budapest 5)

Autumn 1963

Radiation **Chemistry**, 3rd all-union conf., U.S.S.R. (Acad. of Sciences of the U.S.S.R., Lenin Prospekt 7, Moscow)

November 1963

7–9. East German **Chemical** Soc., annual, Leipzig, (East German Acad. of Sciences, Mohrenstrasse 39, Berlin W.8)

15–16. **Burns**, symp., Commission for Plastic Surgery of the Czechoslovak Medical Soc., Prague. (P. Pudlak, Czechoslovak Medical Soc., Sokolska 31, Prague 2)

21–23. **Forensic Physicians**, 10th conf., Prague, Czechoslovakia. (Czechoslovak Acad. of Sciences, Narodní Tr. 3, Prague 1)

November 1963 (no date)

Hematology, 2nd intern. conf., Pecs, Hungary. (I sz. Belgyogyaszati Klinika, Pecs I, Garau u 3 sz, Hungary)

December 1963

5–7. German Soc. of **Miners and Metallurgists**, 9th annual (Gesellschaft Deutscher Berg-und Huettenleute, Wallstrasse 68, Berlin C.2, East Germany)

December 1963 (no dates)

Rocket Technology and Astronautics, 2nd Czechoslovak conf., Liblice. (R. Pesek, Astronautic Commission, Czechoslovak Acad. of Sciences, Konviktska 22, Prague 1)

International Assoc. of **Dental Students**, congr., Zagreb, Yugoslavia. (Yugoslav Acad. of Sciences, Zrinski trg. 11, Zagreb 1)

Ionosphere conf., Kuehlungsborn, East Germany. (Heinrich-Hertz Inst. Adlershof, Geomagnetisches Inst., Potsdam, Telegraphenberg, East Germany)

Continuum Mechanics, applications of the theory of functions, symp., Tbilisi, U.S.S.R., (U.S.S.R. Natl. Committee on Theoretical and Applied Mechanics, Leningrad Ave. 7, Moscow A-40)

International **Medico-Athletic** Federation, 14th congr., Prague, Czechoslovakia. (Czechoslovak Acad. of Sciences, Narodní Tr. 3, Prague 1)

Society of **Obstetrics and Gynecology**, Craiva, Rumania. (Acad. of the Rumanian People's Republic, Calea Victoriei 125, Bucharest)

Roentgen Specialists and Radiologists, 2nd congr., Bulgaria. (Bulgarian Academy of Sciences, 7th November St. 1, Sofia)

Inquiries on the following meetings should be addressed to the Academy of Sciences of the U.S.S.R., Lenin Prospekt 7, Moscow:

Atomic Structure, Soviet Summer Inst., Trakia, U.S.S.R.

Young **Biologists**, 4th all-union scientific conf., Krasnoyarks, U.S.S.R.

Inorganic **Chemistry**, 5th Ukrainian Republic conf., Ukrainian S.S.R.

Crystallochemistry, 5th conf., U.S.S.R.

High Energy **Particle Accelerators** and Instrumentation, 3rd conf., Moscow.

Lithological conf., 6th all-union, U.S.S.R.

Manufacturing Methods: Physical properties and electron structure of refractory metals, compounds, and alloys, 5th all-union conf., U.S.S.R.

Medicinal Plant Resources, all-union conf., U.S.S.R.

Microminiaturization of radio and electronic equipment, 2nd conf., U.S.S.R.

Noble Metals, analysis, 6th all-union conf., Krasnoyarks, U.S.S.R.

Nuclear Fission, physics conf., U.S.S.R.

May 1964

6–10. East German **Geographic** Soc., 7th meeting, Leipzig. (East German Geographic Soc., Georgie Dimitroff Platz 1, Leipzig C.1)

May 1964 (no dates)

Geodetic Conf., natl., Czechoslovakia. (B. Volfik, Research Inst. of Geodesy, Topography and Cartography, Trida Politickych Veznu 12, Prague, Czechoslovakia)

Heat and Mass Transfer, conf., Minsk, U.S.S.R. (Acad. of Sciences of the U.S.S.R., Lenin Prospekt 7, Moscow)

June 1964

Balkan **Medical Week**, 7th, Sofia, Bulgaria. (M. Popescu-Buzeu, 10, rue Progresului, Bucharest, Rumania)

July 1964

15–19. **Biological Sciences**, intern. union, 15th general assembly, Prague, Czechoslovakia. (Czechoslovak Acad. of Sciences, Narodní Tr. 3, Prague 1)

July 1964 (no dates)

Materials and Structures, intern. union, Testing and Research Laboratories, 18th annual meeting of the permanent commission, Moscow, U.S.S.R. (Acad. of Sciences of the U.S.S.R., Lenin Prospekt 7, Moscow)

Anthropological and Ethnological Sciences, 7th intern. congr., Moscow. (Secretariat, Inst. of Ethnography, Acad. of