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Catalog No 090



# TechneColl™

Kit for preparation of  
Technetium 99m Sulfur Colloid

**CAUTION:** NEW DRUG - LIMITED BY  
Federal U.S.A. Law to Investigational Use

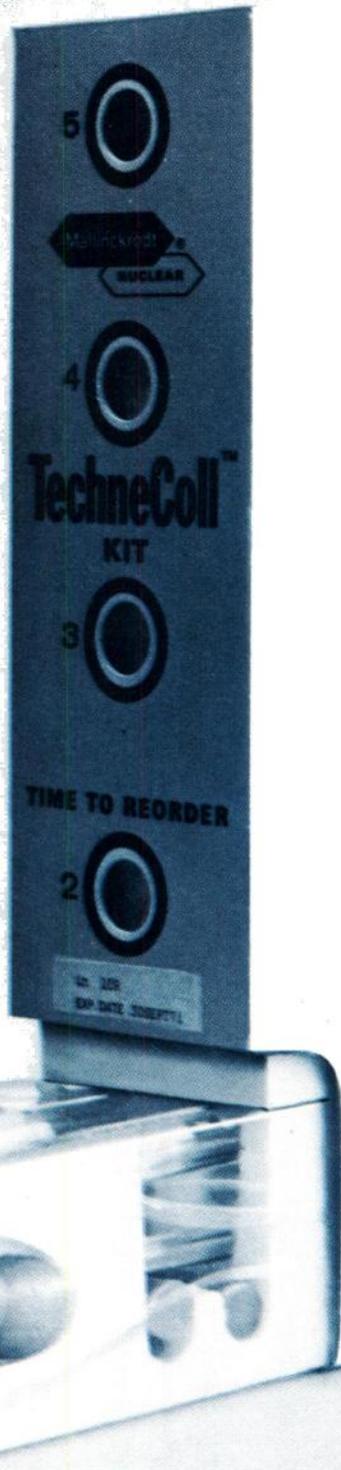
READ ENTIRE PROCEDURE BEFORE USE - SEE PACKAGE INSERT

Mallinckrodt Chemical Works  
St. Louis, Missouri 63160

**PACKAGE CONTAINS**

Five Technetium 99m Sulfur Colloid Preparation Kits  
Each one contains:

- 1. 100 µCi Technetium 99m Sodium Pertechnetate (Na<sup>99m</sup>TcO<sub>4</sub>)
- 2. 100 mg Sodium Sulfate
- 3. 100 mg Sodium Chloride
- 4. 100 mg Sodium Bicarbonate
- 5. 100 mg Sodium Phosphate



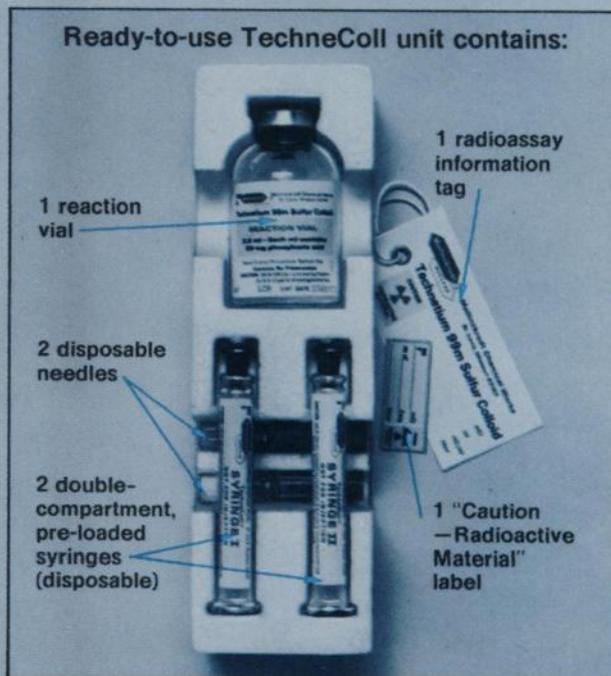
# from Mallinckrodt... new convenient kit for preparation of Technetium-99m Sulfur Colloid

Now you'll find it easy to prepare technetium-99m sulfur colloid in your own laboratory. This new kit was designed to help you—to make the procedure as reliable as possible—to provide you with a finished product having consistently high quality.

The Mallinckrodt/Nuclear TechneColl™ Kit offers exclusive convenience in use:

- Dispenser package makes the preparation units readily available.
- Viewing aperture shows when it's time to reorder.
- Each preparation unit is complete and self-contained, to eliminate possible mixing of components.
- Unique two-compartment syringes permit separate storage of reagents for maximum stability.
- Mallinckrodt/Nuclear's formulation allows use of the kit with any commercially available generator.

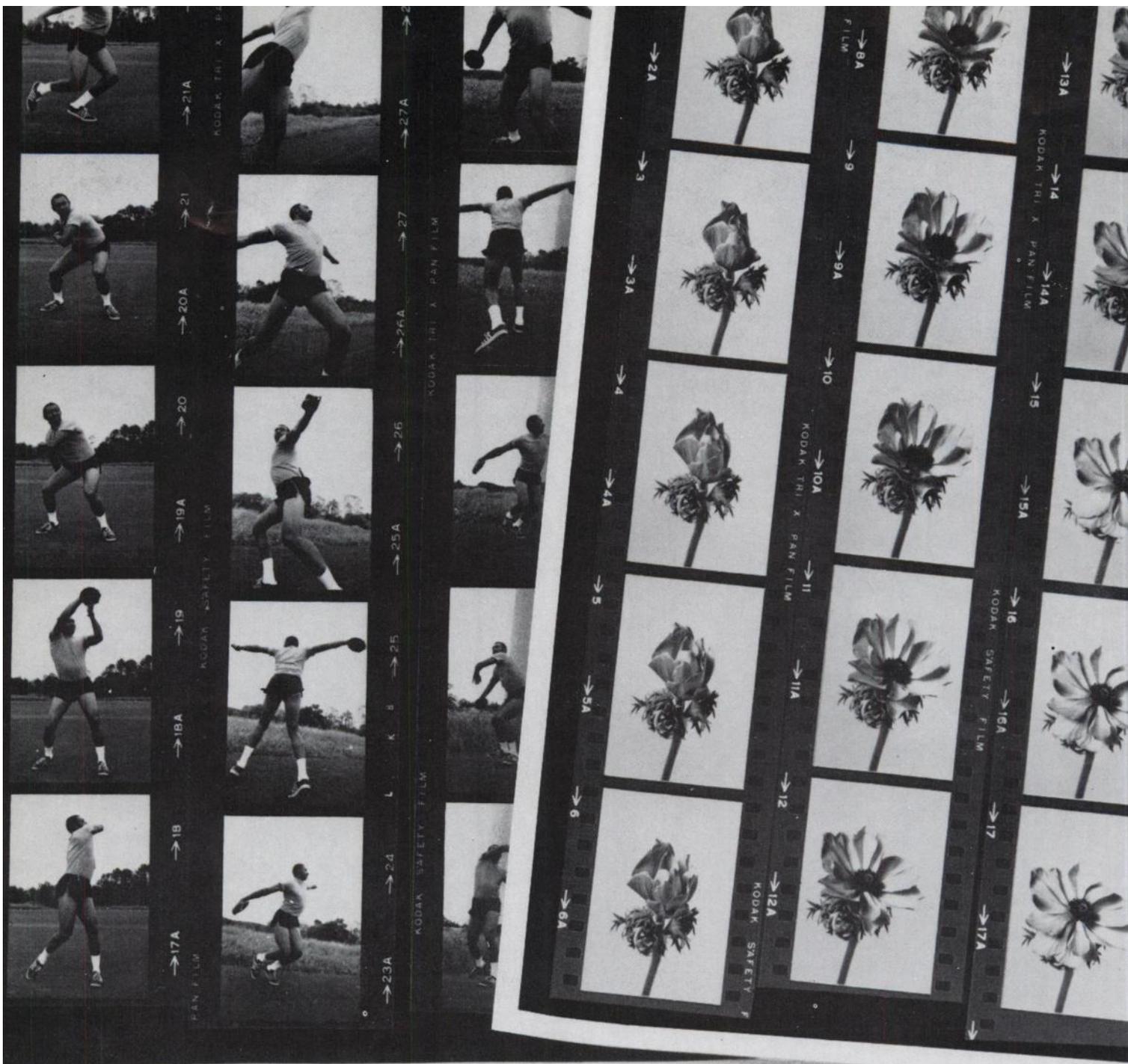
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## When you want more than just a piece of the action.



### Nikon Electric Motor Drive

Most photographers identify the motor-equipped Nikon F with rapid-sequence shots of news and sports events. To others, it is *the* equipment for automated monitoring of growth processes in science and industry, wildlife and bird study, observing excavation blast patterns, or for use in dangerous and inaccessible locations.

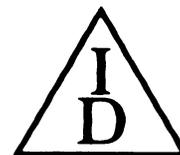
This preference for Nikon is no accident. The Nikon F was built around the motor drive. Its titanium

foil shutter, film and shutter transport and mirror are designed to function without complaining at rates up to 3 shots per second (4 per second with mirror locked in "up" position). Professionals pay this Nikon performance their ultimate compliment: They take it for granted.

The motorized Nikon F can be triggered at the camera or from hundreds of yards away — by wire or radio control, even by light or sound. Linked to an intervalometer, it performs time-lapse photography, taking up to 250 shots automatically

at pre-determined intervals, without reloading. (Nikon offers a special repeating electronic flash unit that provides up to 3 synchronized flashes per second.)

Two Nikon motor drives are available. F36 for standard film cartridges and F250, which uses special 250-exposure cassettes. Used as original equipment in scintillator applications. For details on this and other specialized applications, write Stuart Held, Photo-Technical Products Division, Ehrenreich Photo-Optical Industries, Inc., Garden City, N.Y. 11530. 



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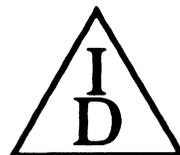
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3 safety factors with  
**Albumotope<sup>®</sup>-LS**

(Aggregated Radio-Iodinated [<sup>131</sup>I] Albumin [Human]) for lung scanning

Sterility testing is *safety factor #1* in the preparation and use of Albumotope-LS. A full two-week sterility test period must expire before the material is released for shipment. *Safety factor #2* is the low radiation dose. Quick clearance of Albumotope-LS from the lungs after scanning and its rapid excretion make for a radiation dose reported to be only 1.9

rads to the lungs and 0.008 rads to the body as a whole from an administered dose of 300 microcuries. *Safety factor #3*: aggregated radio albumin is virtually nontoxic. This together with the low radiation dose permits lung scanning to be repeated in 24 hours—a useful advantage in following the course of the disease or evaluating therapy.



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*For brief summary, see next page.*

14  
DAYS

# Albumotope®-LS

(Aggregated Radio-Iodinated [<sup>131</sup>I]  
Albumin [Human]) for lung scanning

**CONTRAINDICATIONS:** Radiopharmaceuticals should not be administered to pregnant women or to persons under the age of 18 years unless the indications are very exceptional. Because iodide is excreted in human milk, aggregated radioalbumin should not be administered to nursing mothers.

**ADVERSE REACTIONS:** Although the immunological properties of serum albumin are believed to be virtually unaltered by the iodination process, there is a possibility that hypersensitivity reactions may occur in patients receiving additional doses a number of weeks after an initial dose.

The hypothetical possibility that particles of large size might induce deleterious cardiovascular or cerebrovascular effects, postulated by some investigators, has not been borne out in extensive clinical use with Aggregated Radio-Iodinated (<sup>131</sup>I) Albumin (Human). For full prescribing information, see package insert.

**AVAILABLE:** As a sterile, nonpyrogenic, aqueous suspension. Each cc. contains approximately 0.5 mg. aggregated human serum albumin labeled with iodine-131. Not less than 90% of the aggregates are between 10 and 90 microns and none are more than 150 microns in size. The preparation also contains 0.9% (w/v) benzyl alcohol as a preservative. The potency ranges from 250 to 450 microcuries per cc. on date of standardization.



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ACTUAL SIZE

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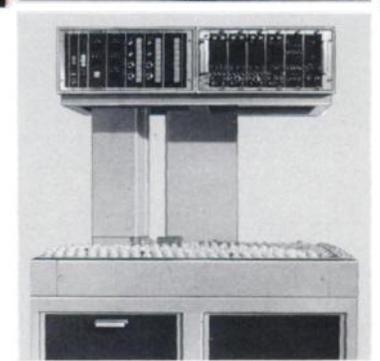
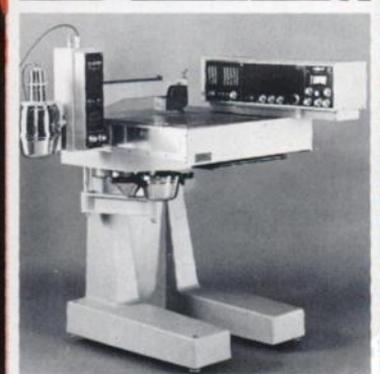
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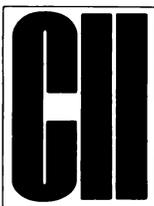
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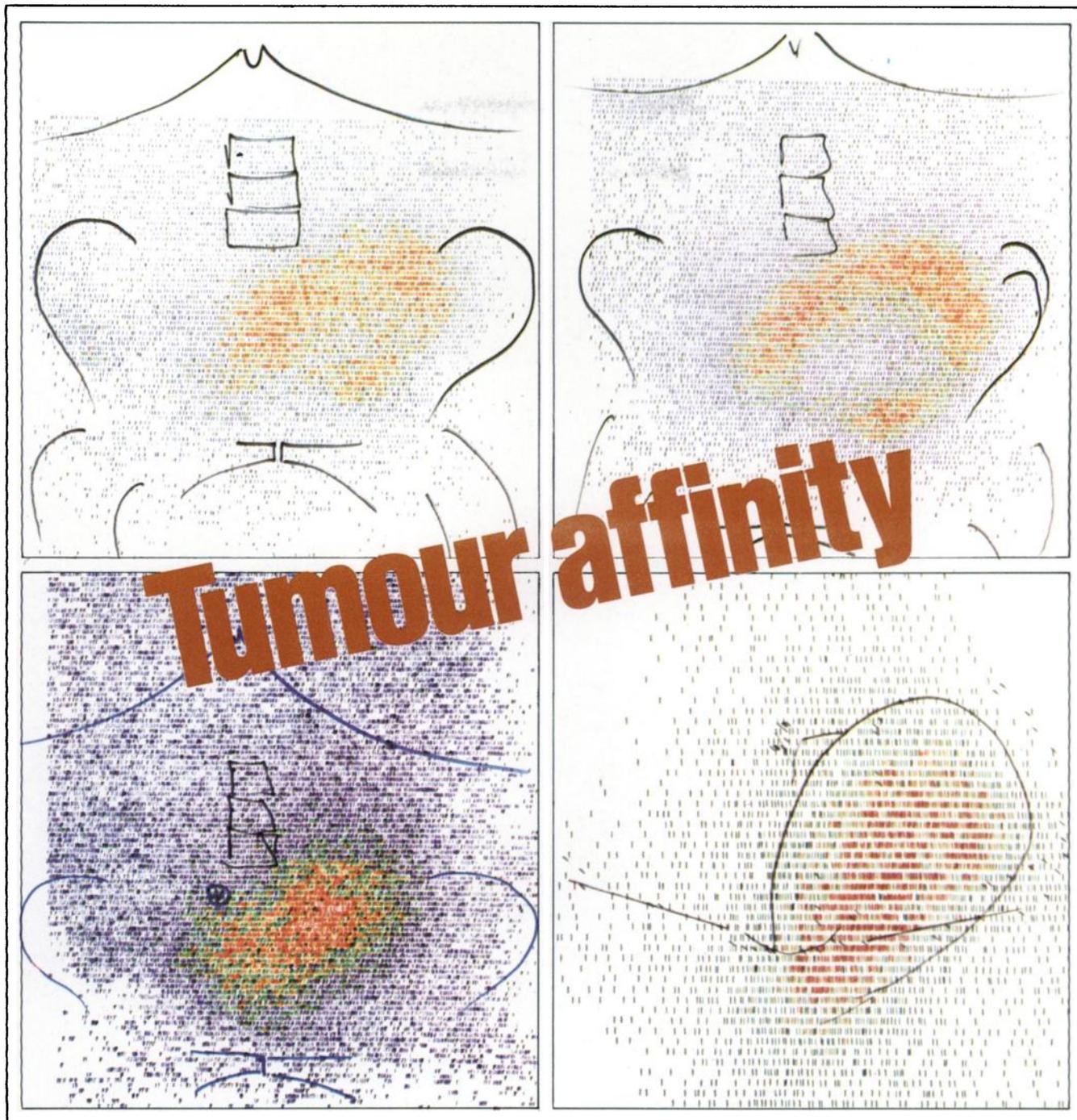
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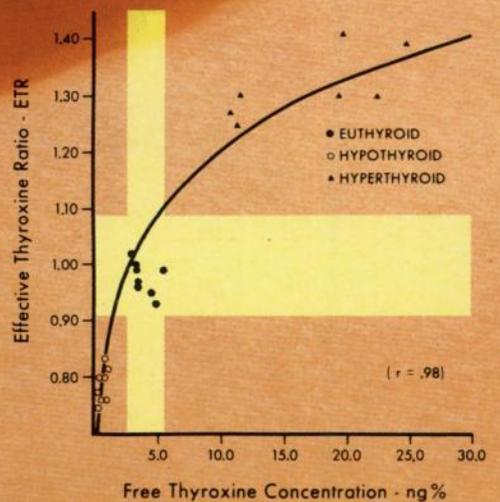
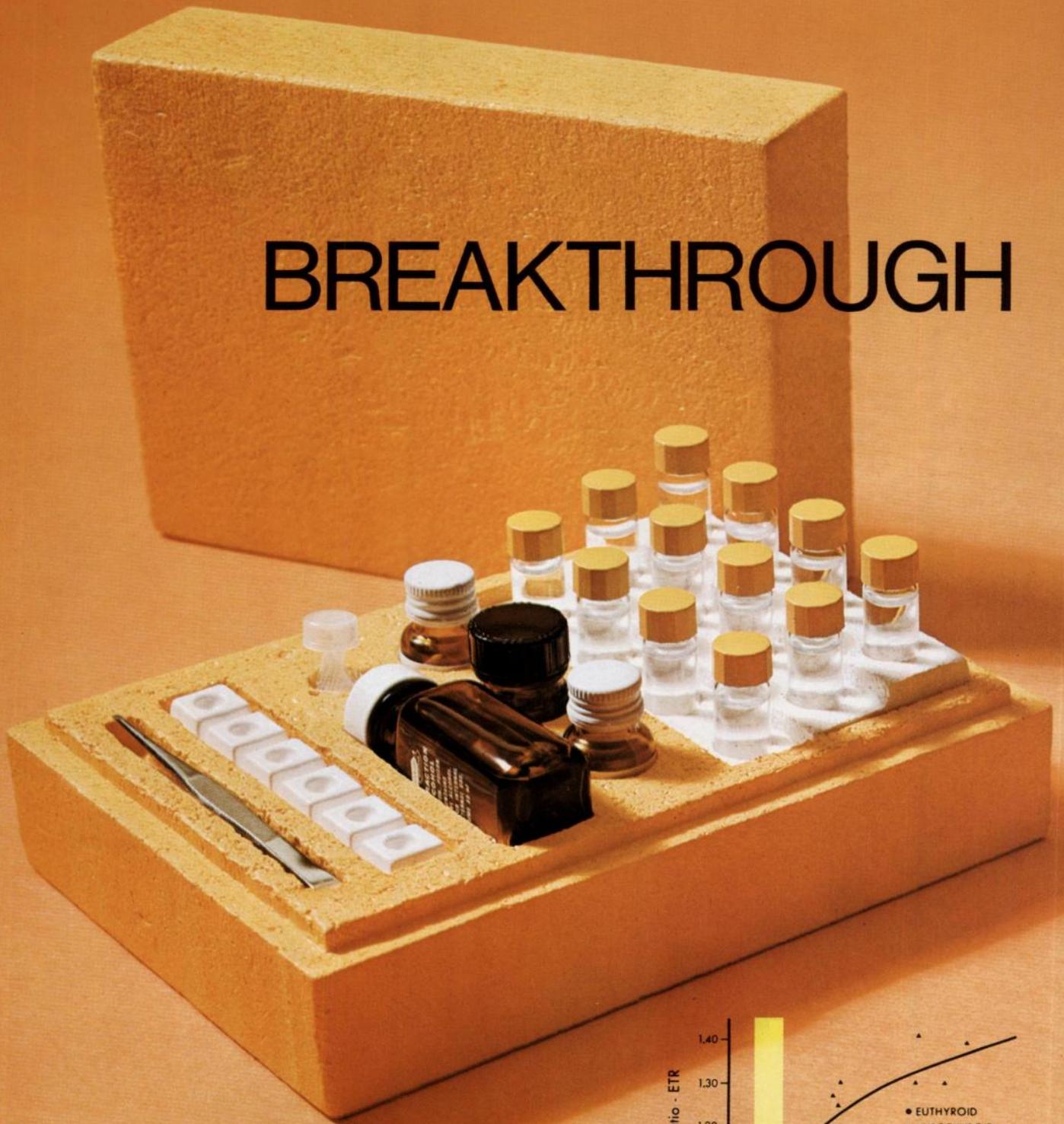
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# BREAKTHROUGH



Graph showing (1) distinct separation between hypothyroid, euthyroid, and hyperthyroid states, and (2) correlation between effective thyroxine ratio and free thyroxine concentration. Shaded horizontal area shows euthyroid range for effective thyroxine ratio. Vertical shaded area shows euthyroid range for free thyroxine concentration. S. C. Thorson, M.D., private communication.

Mallinckrodt announces ...

# Res-O-Mat<sup>®</sup> ETR<sup>™</sup> Test

indicates metabolically active thyroxine  
IN A SINGLE PROCEDURE\*

With the **Res-O-Mat ETR** test you can now assess the level of metabolically active thyroxine in a single test. Separate determinations of serum T3 uptake and T4 are no longer necessary.

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Effective Thyroxine Ratio is the first direct, single-test measurement having a clinically proven<sup>2</sup> correlation with the level of metabolically active ("free") thyroxine. Send in the coupon for detailed

supporting information about the new test of choice for determination of thyroid function.

#### Availability

**Res-O-Mat ETR** Test Kits are available in 12- and 60-test sizes.

1 Mincey, E. K. and Brown, J. L., Thyroid Function Testing: a New Approach. Submitted for publication.

2 Mincey, E. K. and Thorson, S. C., et al.: A New Parameter of Thyroid Function—the Effective Thyroxine Ratio. Submitted for publication.

\*Patent applied for.



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St. Louis, Missouri 63160

Send me full information on the Effective Thyroxine Ratio method.

Have your representative call to arrange a **Res-O-Mat ETR** test evaluation.

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Laboratory or Hospital \_\_\_\_\_

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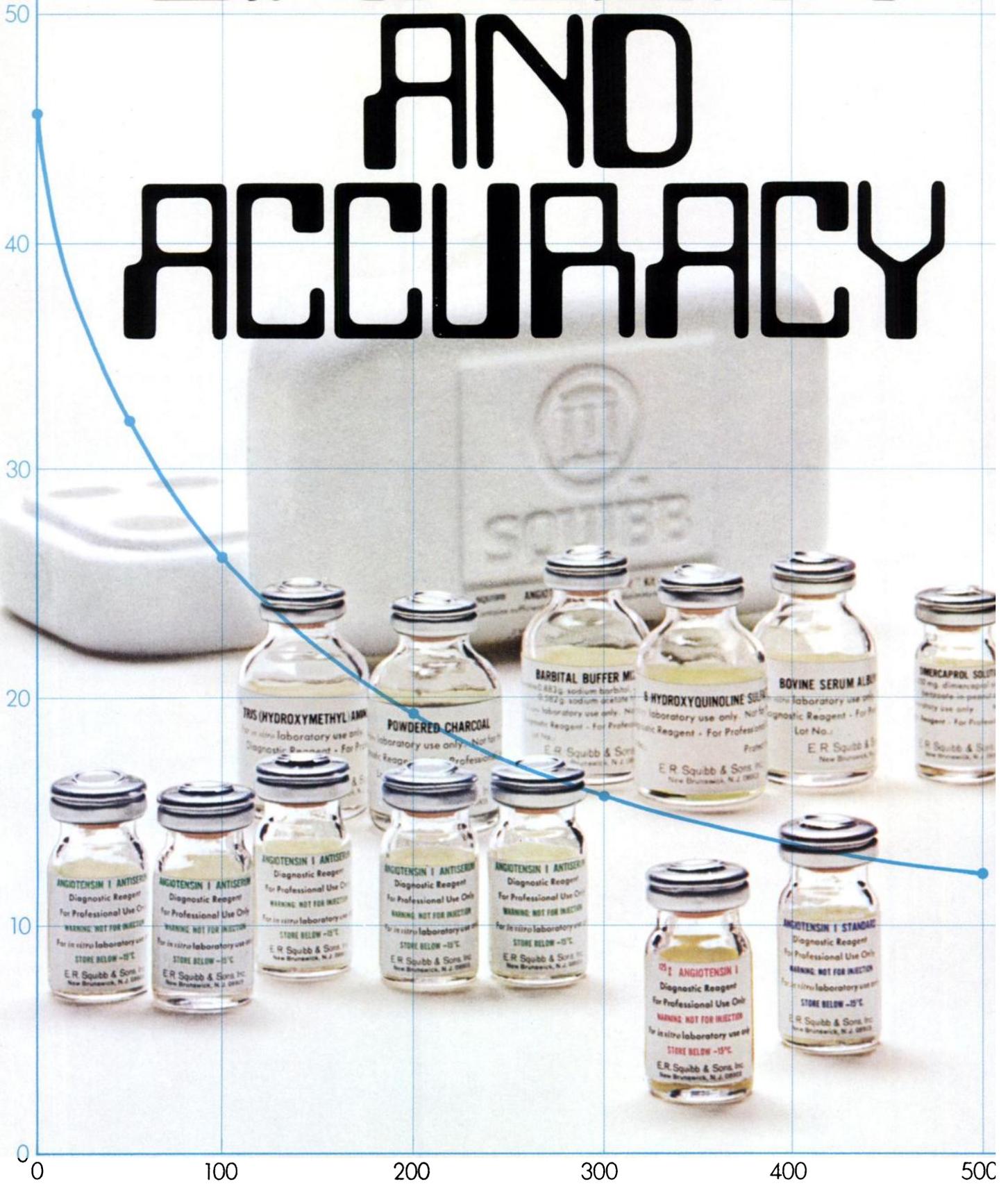
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Now doing radioactive thyroid tests.

Not now doing radioactive thyroid tests.

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Isn't that what  
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when you measure  
plasma renin  
activity?

## Designed for precision and accuracy

Three important features of the Immutope Kit assure reliable, reproducible results in determination after determination. First, a special formulation makes the Angiotensin I Standard stable. Second, standardization is protected by a built-in iodine scavenger. Third, *all* the reagents in the Immutope Kit are stable (when properly stored) and all are matched — specifically formulated and tested to assure compatibility.

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for determination of plasma renin  
activity by radioimmunoassay

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# ANGIOTENSIN I IMMUTOPE™ KIT

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combines the extreme sensitivity  
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the extreme specificity of  
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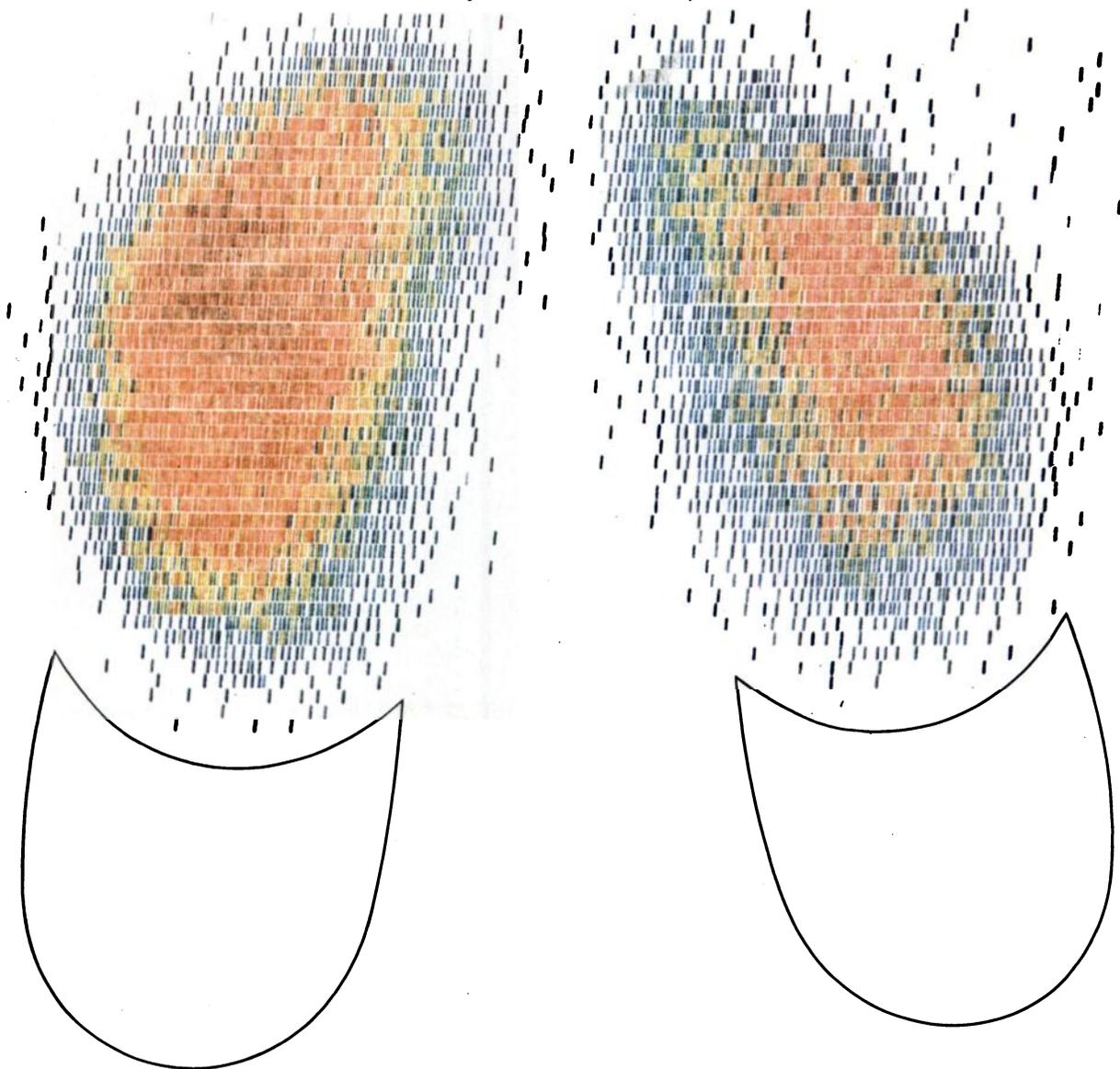
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Ferrous ascorbate can now be  
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Ideal for efficient kidney imaging.

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Mr. Shakespeare was obviously not thinking of our new ICON 380 Scintillation Camera when he wrote those words. But compared to other Cameras, the ICON 380 is a very deep well and a very wide church-door indeed. (We agree that wells and church-doors are hardly accurate units of measure, but we like the quotation). For those who insist on more exact terms, here is what the new ICON 380 offers:

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Delay line arithmetic.

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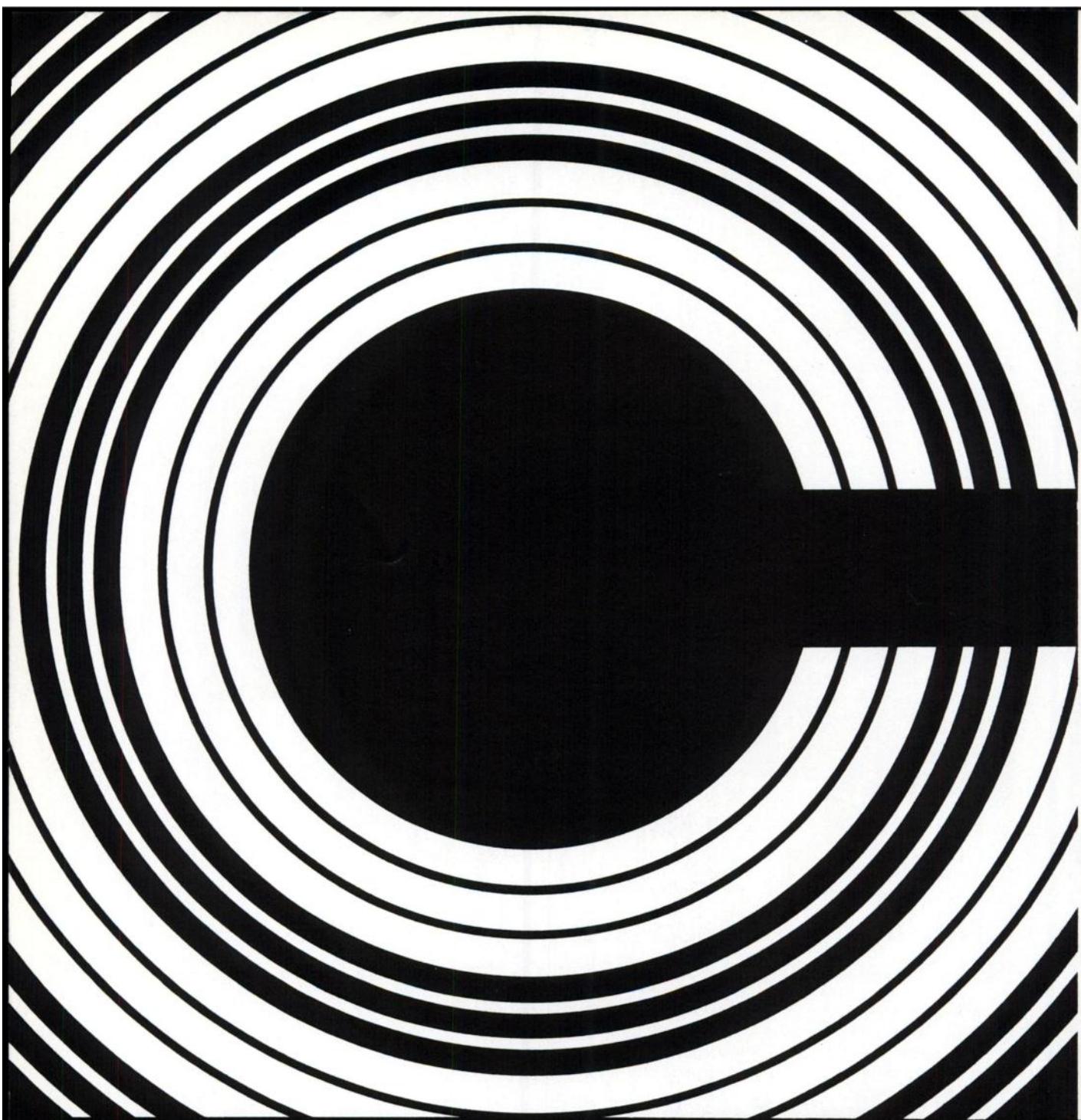
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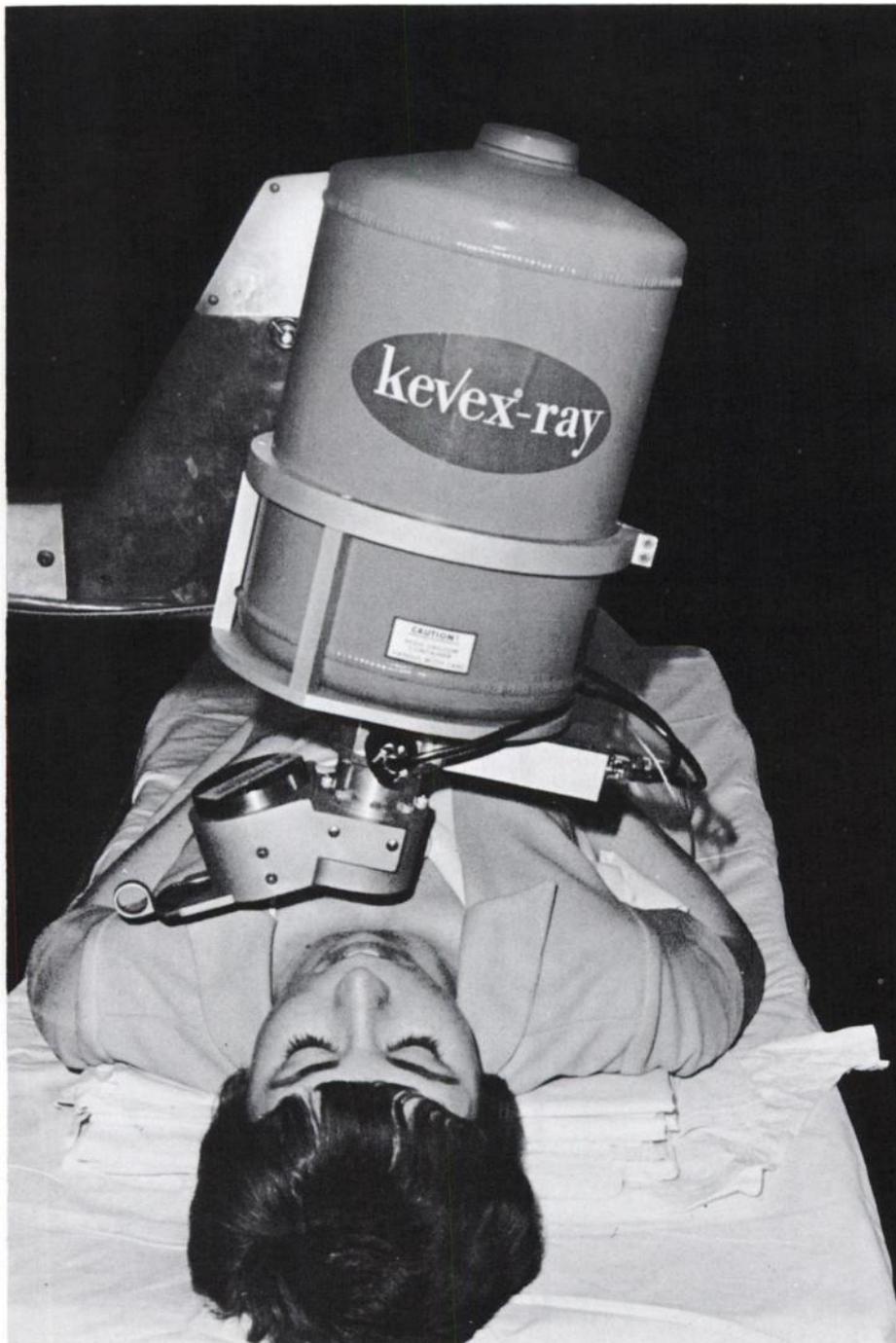


Radiopharmaceuticals

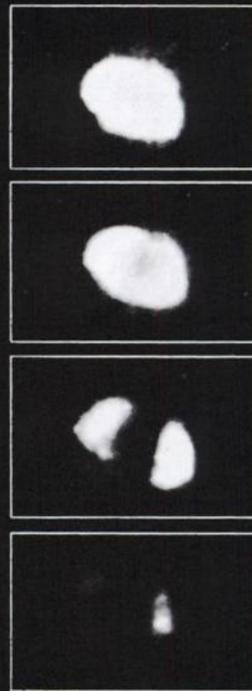


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# Thyroid scanning without injection.



Successive enhancement ranges of thyroid scan pictures show iodine concentration contours

The Thyroid Analyzer shown here was developed by the Kevex Corporation, specialists in X-ray energy spectroscopy (XES). It measures the latent iodine distribution by scanning the gland region with a focused fluorescing source. The method has generated considerable interest because it eliminates the need for injecting radioactive iodine into the patient. Total radiation exposure from the Kevex system amounts to less than 1/100 of that produced by conventional methods.

The Kevex Thyroid Analyzer allows mapping of quantitative profiles of iodine distribution. It also provides a visual rendition of the scanned data. The visual is significantly improved by the Kevex X-ray Image Enhancer, as the photos show.

Write or call Dr. Rolf Woldseth for more details.

Reference:  
Hoffer, P B., "Fluorescent thyroid scanning," *Amer. J. Roentgenology* CV (4), (April 1969).

Photograph courtesy of University of Alabama School of Medicine.



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# three books, excellent and new

## RADIONUCLIDES IN NEPHROLOGY

Proceedings of an International Symposium  
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Jean-Louis Funck-Brentano, M.D.

Collating the work of specialists from more than twenty countries, *Radionuclides in Nephrology* is an in-depth review of the wide range of applications of radioactive materials to the study of renal physiology and disease.

Oriented toward clinical investigation and basic research, the contributors present many different approaches to the various problems in the field, together with critiques of the procedures.

New techniques for measuring renal blood flow and distribution using radioactive gas techniques and microsphere injections as well as discussions of methodology are emphasized. Focusing on the disease entities and the types of information derivable, the techniques of radioimmunoassay, autoradiography, clearance methods, renal imaging methods, and radiorenography are covered in great depth.

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illustrated

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314 illustrations

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Progress in Atomic Medicine, Volume 3  
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In this most recent *Progress* volume, chapters include: Potential Early Diagnosis of Cancer with Radioactive Compounds; Present Status of Radioiodine Therapy of Thyroid Disease; The Cyclotron: Source of Short-lived Radionuclides and Positron Emitters for Medicine; Trace Elements in Biology and Medicine; The Safe Tracer Dose in Medical Investigation; Some Considerations of Physical and Biological Factors in Radiotherapy with High-LET Radiations Including Heavy Particles, Pi Mesons, and Fast Neutrons; Heavy Particle Therapy, for Acromegaly, Cushing's Disease, Nelson's Syndrome, and Nonfunctioning Pituitary Adenomas.

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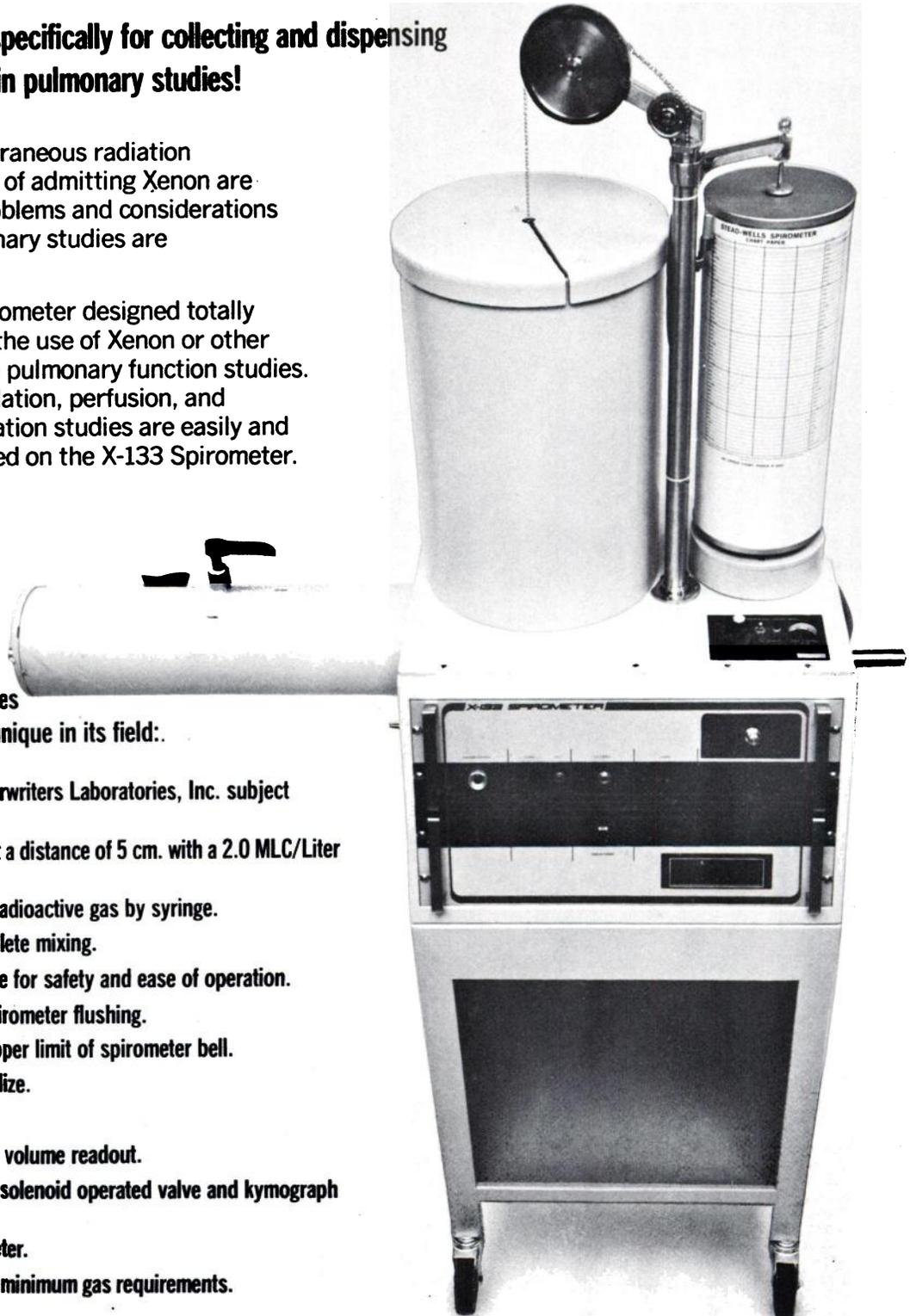
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Ultimately, it had to happen . . . a table that matches the high diagnostic aims of Nuclear Medicine. When you consider the high cost and sophistication of imaging equipment, partially adequate tables seem slightly incongruous. Long needed was a stable platform with movement capabilities that maximized patient comfort, facilitated patient handling and access, and was easy to operate. Above all, the table would have to allow a precise control of the patient's position so that the entire organ of interest

could be encompassed within the limited field of view of the detector. Result: The DI 800 Triaxial Table.

The DI 800 offers continuous height adjustment. Hence, easy patient transfer (whatever the height of the conveyance vehicle) onto either side of our table because of its flush edges. All four wheels lock from two controls. For final precise positioning the DI 800 has long axis adjustment of 18 inches in the horizontal plane. Most important, the top is tiltable, head up or head down. This means

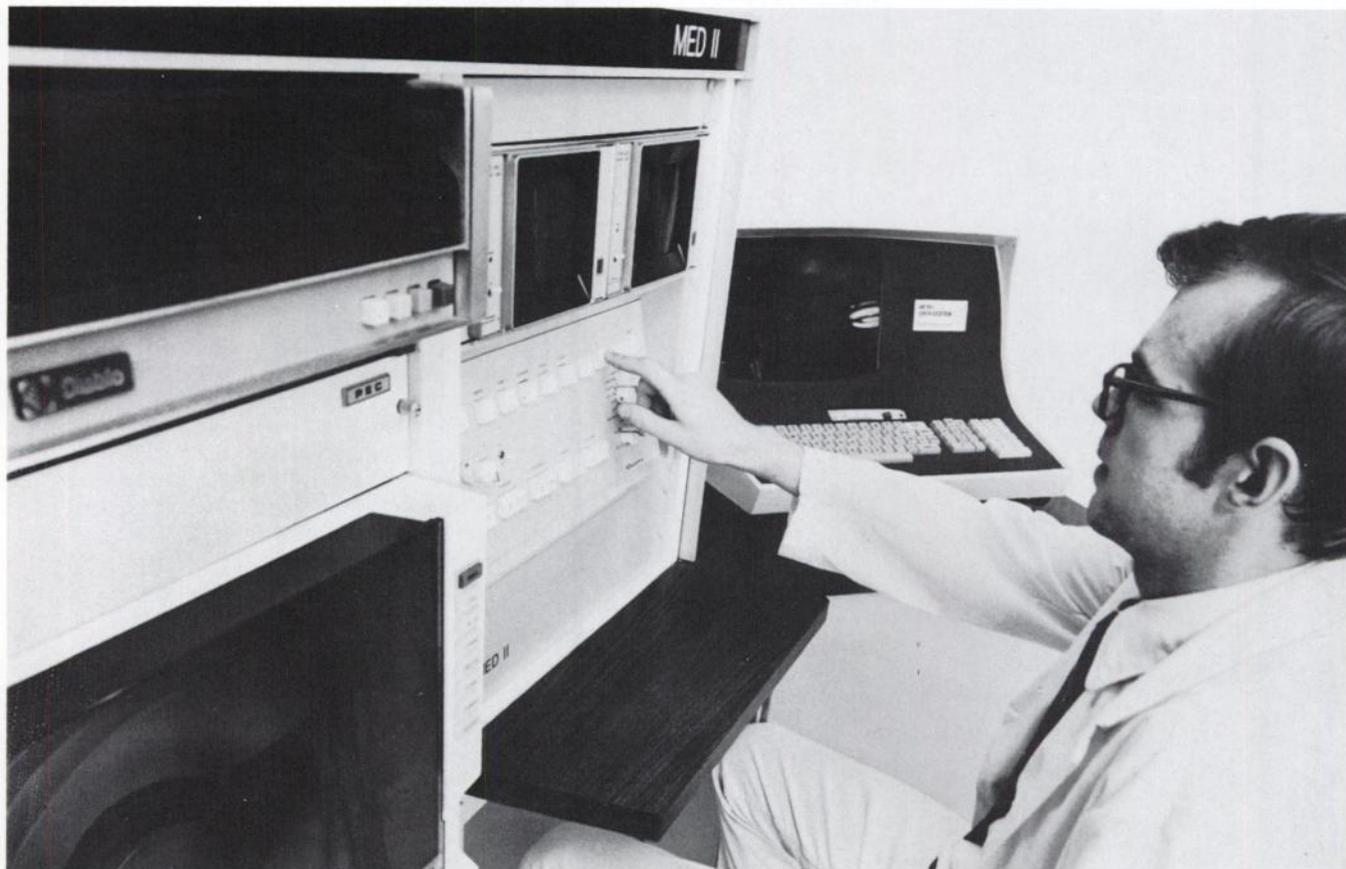
greater patient comfort. More, it will permit oblique imaging. Example: tilting will permit cephalad displacement of the liver for improved pancreas imaging. With its open under carriage, overhanging adjustable head rest and  $\frac{1}{4}$  inch lucite top, the DI 800 offers an unobstructed view of the patient—above, below, either side and vertex. That's total performance.

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# MED II has all the clinical capabilities you expect from a computerized image processing system.



## But you don't have to be a computer man to use it.

### **MED II: what it is**

MED II is a data acquisition, storage and playback system. But it is also much more. MED II is a diagnostic image enhancer, a clinical data processor, plus a curve analyzer and a fully programmable 16k computer.

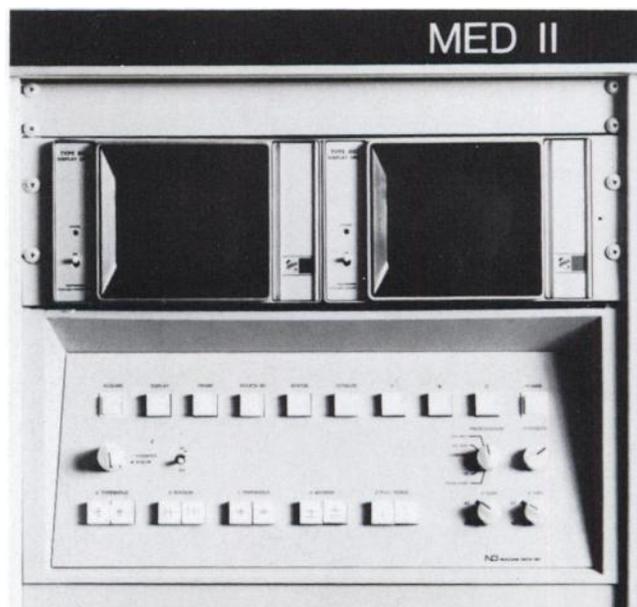
### **MED II and you**

With the MED II, you can record dynamic and static gamma camera images. You can enhance these images in accordance with several clinically tested protocols. You can generate time/activity histograms, and derive data, which cannot otherwise be visualized, from the resultant curves. In addition, you can correct for camera response non-uniformities, add and subtract either sequential or non-sequential images from each other; and perform several additional image manipulation routines which yield improved visualization and higher confidence levels.

### **MED II: its different**

First, the MED II is pre-programmed. To execute a complex clinical protocol, the operator has only to type in the appropriate two letter command.

Second, image enhancement has been vastly simplified. For example, contrast manipulation is now achieved with continuous action pushbuttons.



Third, the image data are now recorded on a high-speed disc. After a given frame or frame sequence is specified, it can be displayed within milliseconds. And magnetic tape continues to be available for bulk storage.

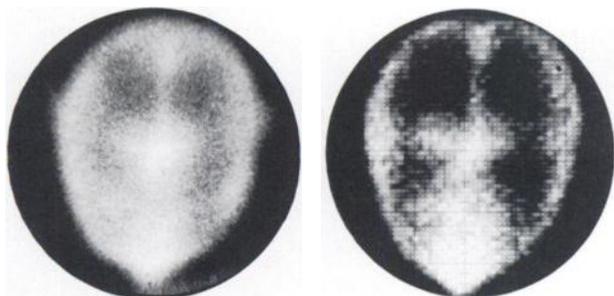
Fourth, the comprehensive image data analysis capability available in Nuclear Data's earlier systems has been extended still further with the MED II. Extraction of exponentials, normalization, curve smoothing and the many additional data analysis routines available with MED II are more refined than ever. And they are easier to execute.

#### **MED II as a storage retrieval system**

As a storage device, the MED II records complete studies on a rapid access disc. While acquiring data, frame rates of up to 8 frames-per-second may be specified. If desired, the frame rate may be more rapid during some intervals of the study than others. For example, in a renal function study, it may be desirable to have a rapid frame rate during the first few minutes, and a slower rate during the more gradually changing excretory phase. Another important feature: with the MED II, a recorded frame or frame sequence can be accessed for replay in a matter of milliseconds.

#### **MED II as a static image processor**

MED II can be considered a "perception extender." Image enhancement, for instance, allows one to elaborate subtle differences in displayed activity to the point where they can be discerned. Improved delineation of organ contours, lesion boundaries, and other abnormalities are prominent advantages to be gained with the MED II.



Initial analog scintigraph

Same data processed by MED II

#### **MED II as a dynamic image data processor**

As a dynamic processor, the MED II brings a wide range of data quantification and enhancement into the clinician's repertoire.

Renograms, cerebral blood transit, cardiac and pulmonary function studies are all included among the major dynamic study applications of the MED II. For example, separate areas-of-interest within a recorded renal excretion study may be specified by the clinician. These areas-of-interest may be assigned to correspond only to the right and left renal contours, or to regions within the kidneys. Then, after appropriate brief instructions, complete right and left renograms appear on the MED II oscilloscope. Since the renograms represent activity only within the defined areas-of-interest, distorting background data, as well as activity within the ureters and bladder, do not mask renal activity. And in pulmonary function analyses, the ability of the MED II to generate dynamic function curves for up to twelve areas-of-interest means that right versus left lung activity comparisons can be made for six different regions simultaneously. Dynamic activity curves for comparing comparable regions within the cerebral hemispheres and right versus left carotid blood transit can also be available for your evaluation within seconds.



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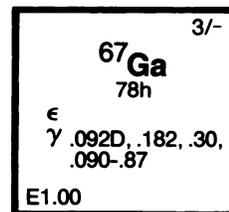
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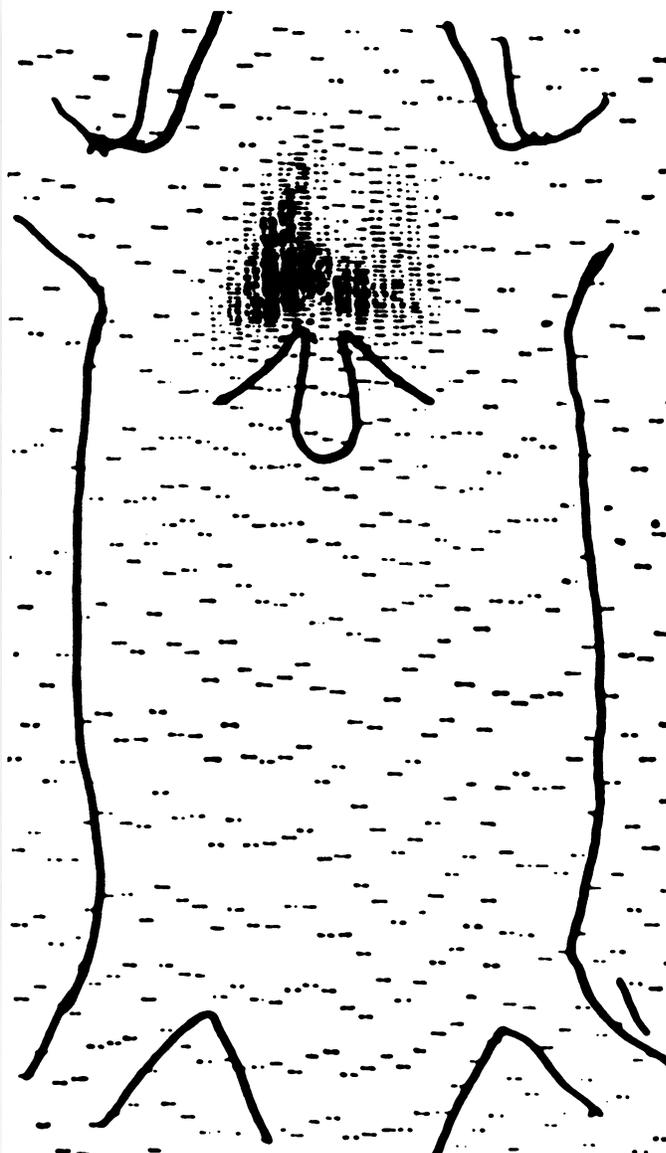
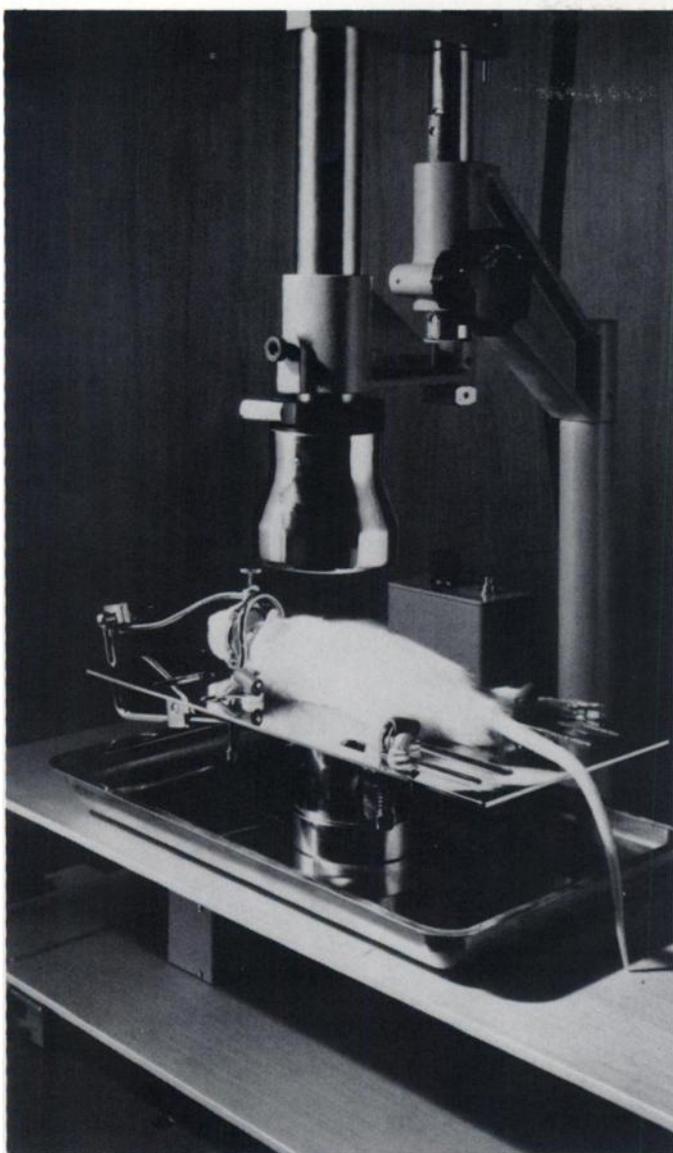
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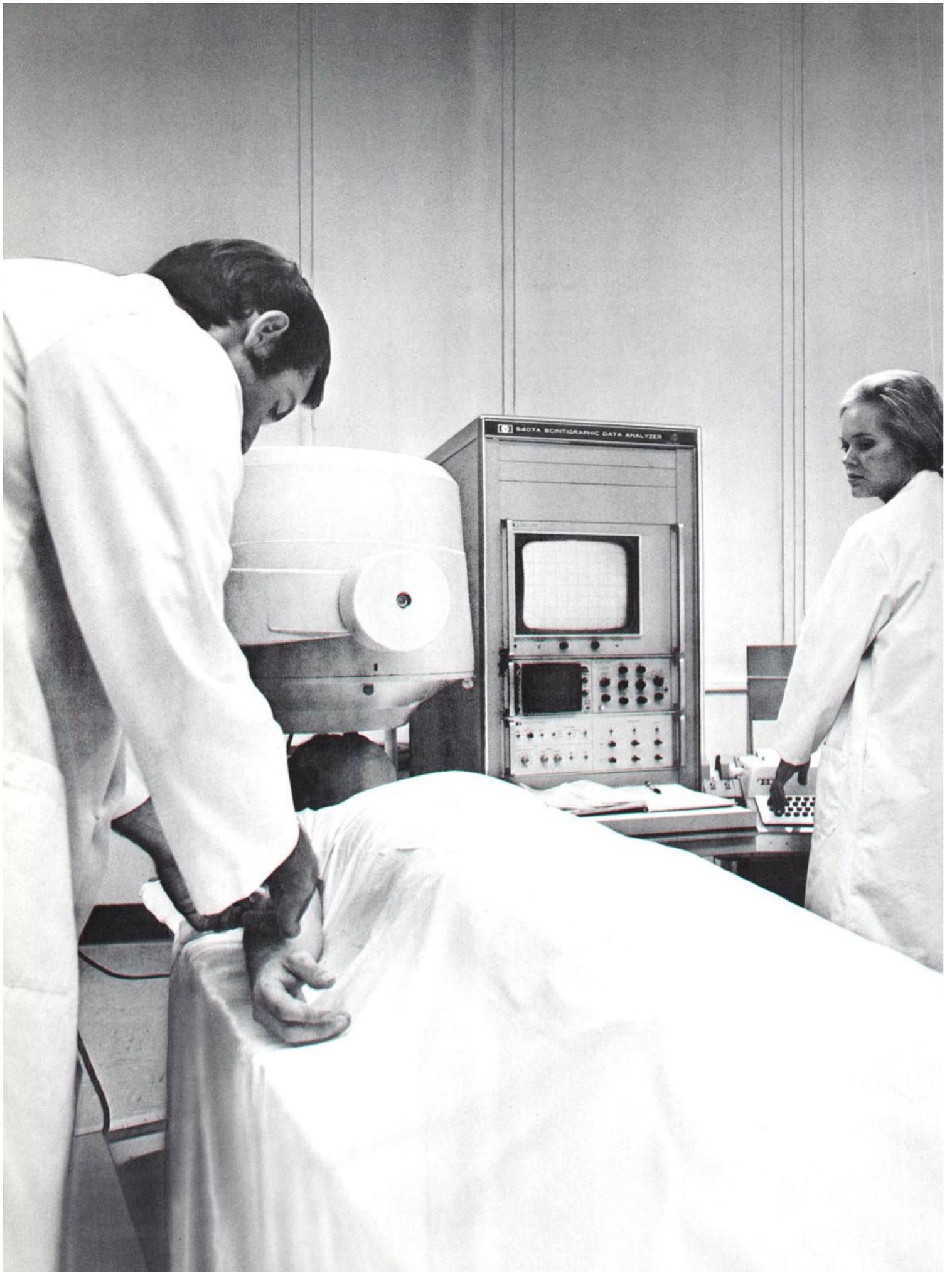
Typical isotopes that can be used include  $^{125}\text{I}$ ,  $^{131}\text{I}$ ,  $^{197}\text{Hg}$ ,  $^{203}\text{Hg}$ ,  $^{75}\text{Se}$ , and  $^{241}\text{Am}$ .

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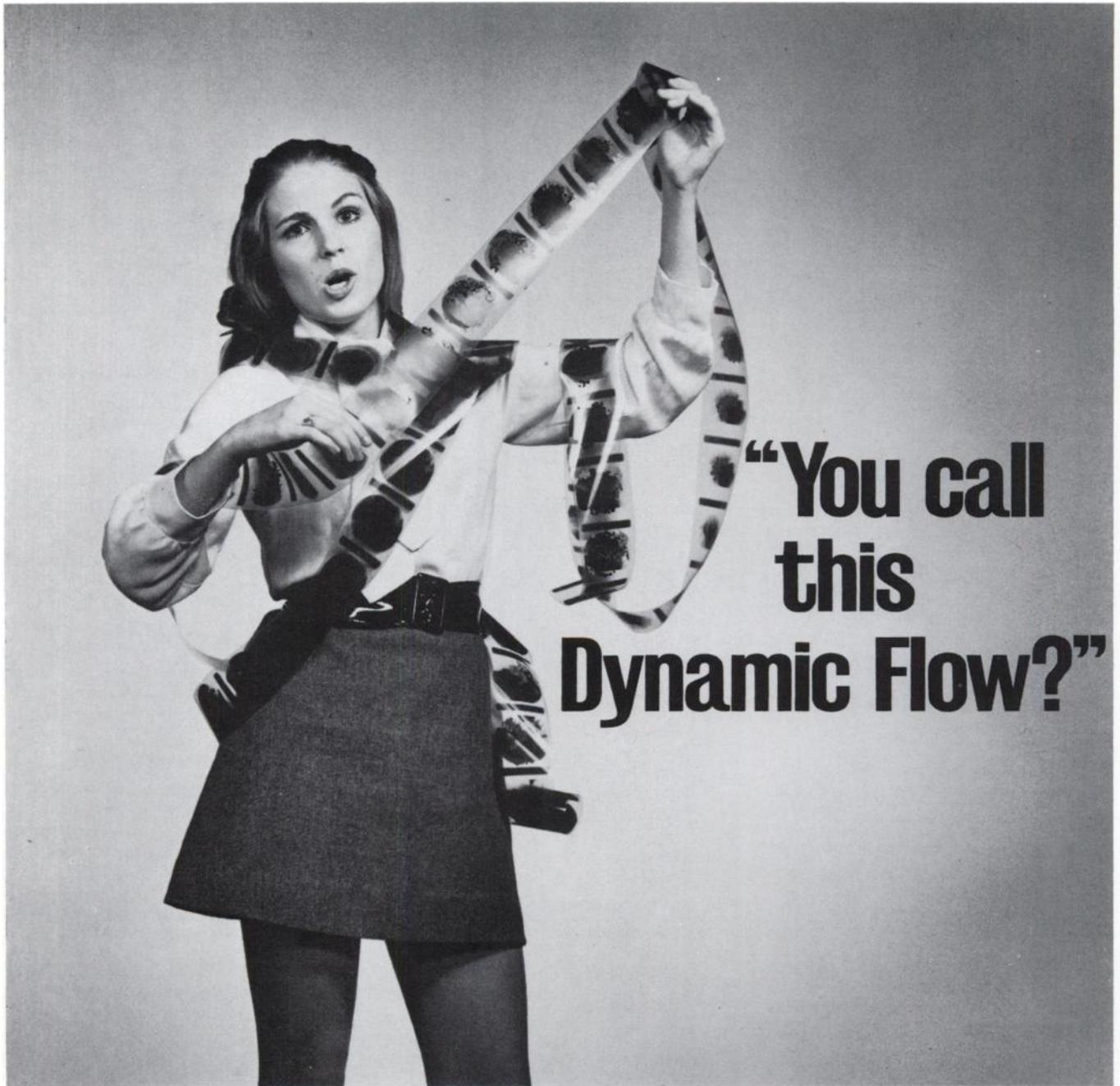
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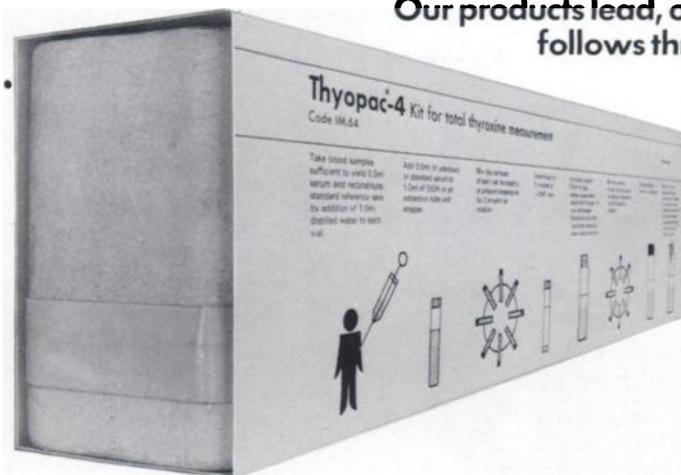
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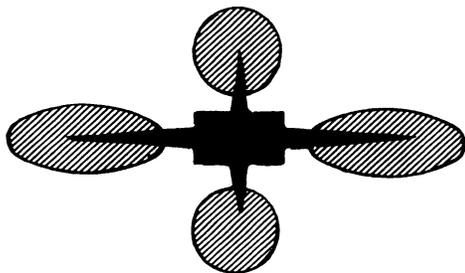
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Take-up cassette	light-tight . . . accepts 1-600 frames	light-tight . . . accepts 1-100 frames
Oscilloscope control	yes	no
Pre-set count	yes	no
Automatic film cut-off	yes	yes
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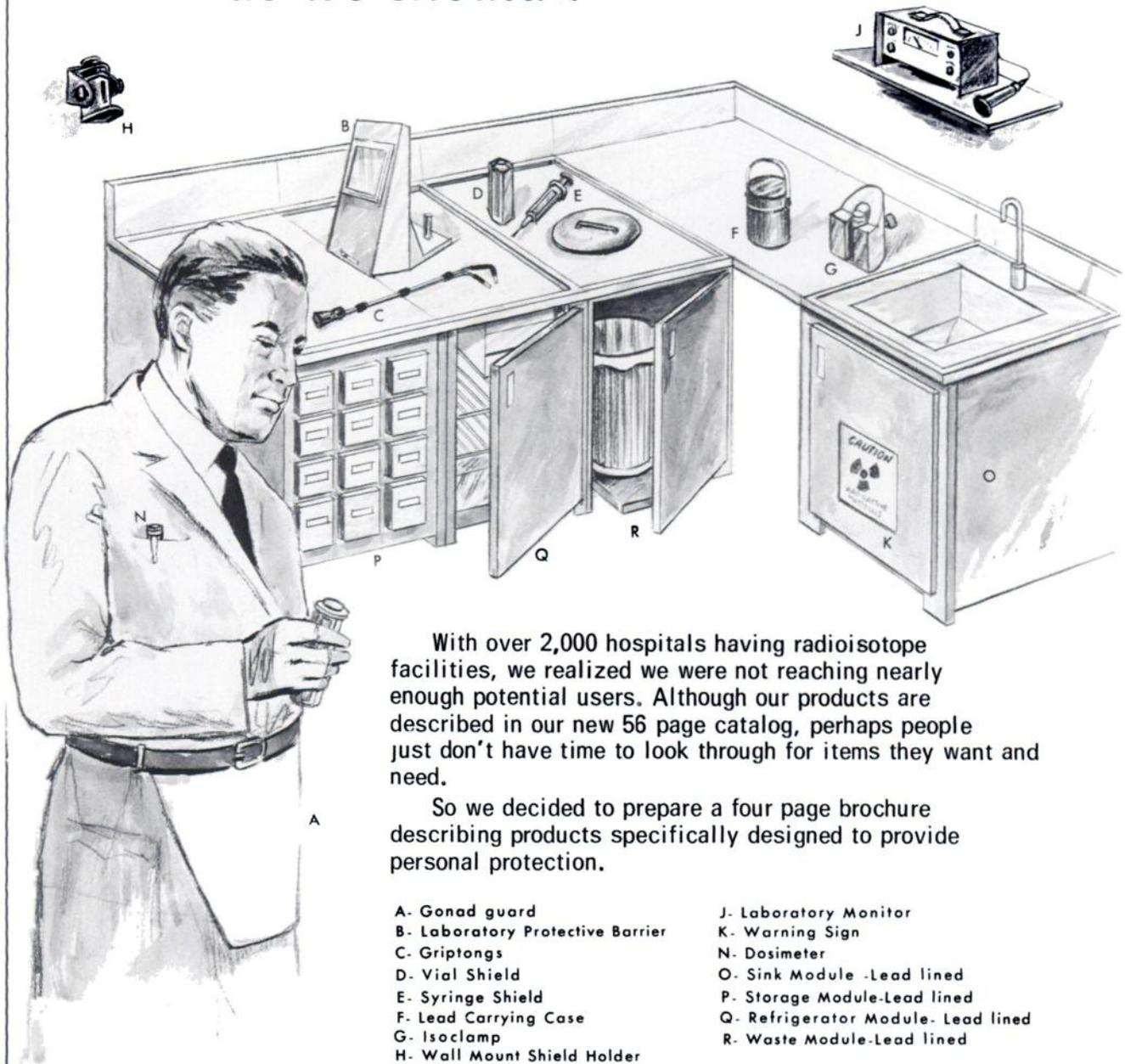
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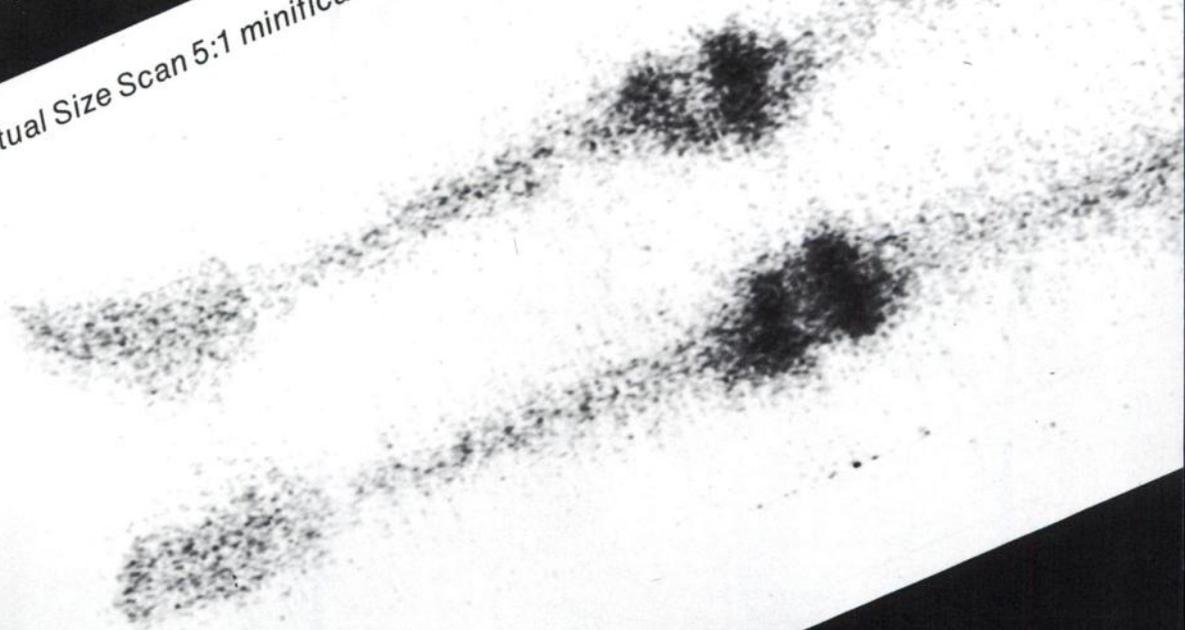
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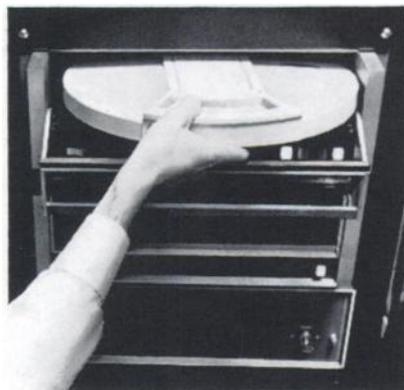
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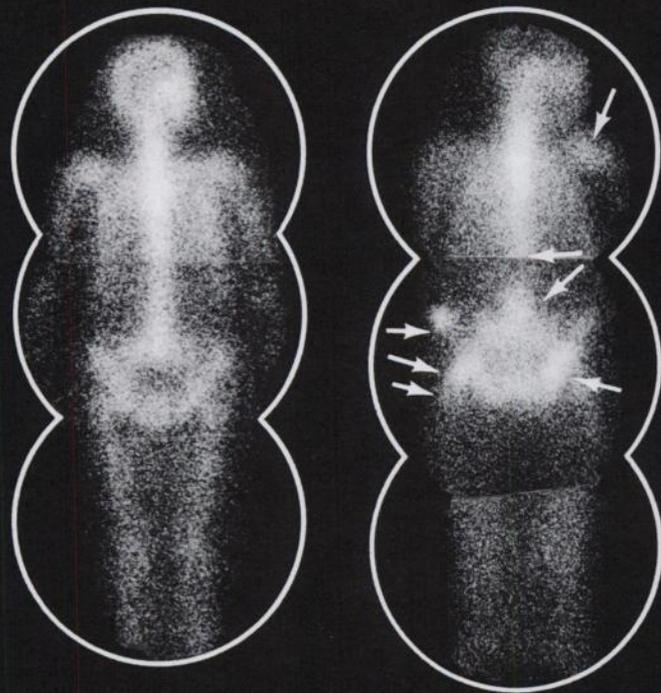
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# Bone Scintigraphy Using Fluorine-18

## Pinhole Collimator- Scintillation Camera Images

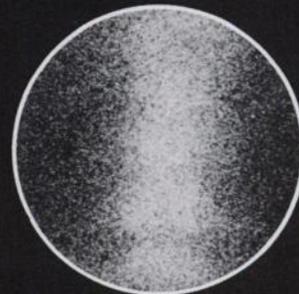
### Whole Body Survey Anterior View



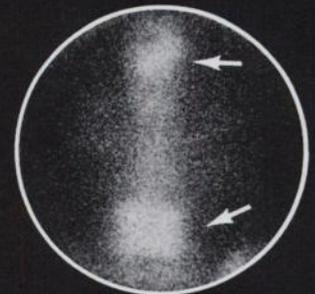
Normal

Metastatic  
Breast Ca.

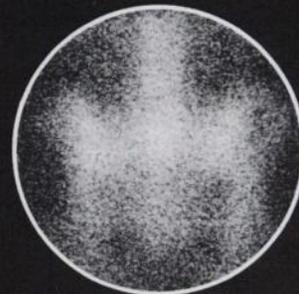
### Close Up Images



Lumbar Spine (Posterior)  
Normal



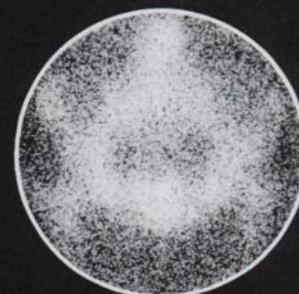
Lumbar Spine (Posterior)  
Ca. Breast



Pelvis (Posterior)  
Normal



Pelvis (Posterior)  
Ca. Breast



Pelvis (Anterior)  
Normal

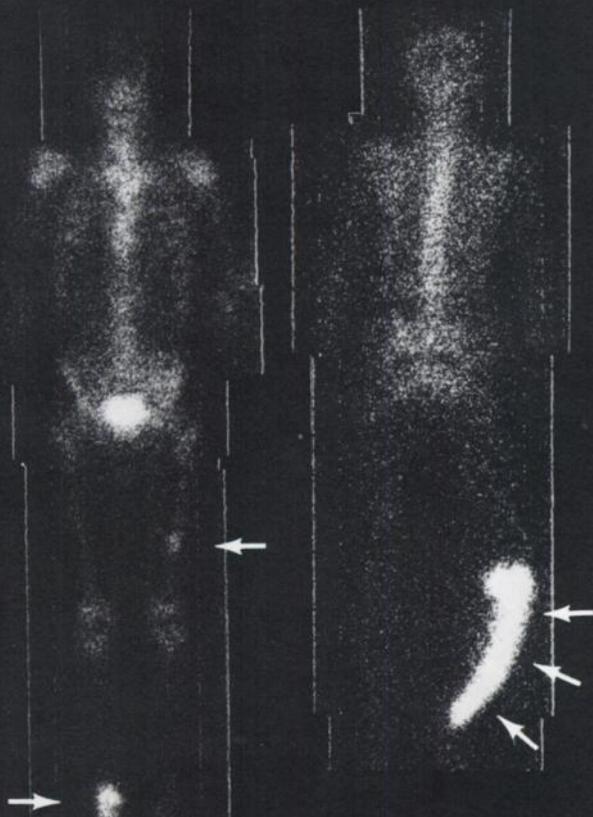


Pelvis (Anterior)  
Ca. Prostate

Lesions are commonly found in the axial skeleton and a complete skeletal survey should include imaging of limbs as well as trunk.<sup>5</sup>

Scintillation camera images 2 to 4 hours after I.V. administration of 2 to 4 mCi of  $^{18}\text{F}$  required 3 to 10 min. exposures each.

## Rectilinear Scanner Images (5 inch crystal)



Metastatic Renal  
Cell Ca. (Anterior)

Paget's Disease  
(Posterior)

Dual probe rectilinear whole body imaging 2 hours after I.V. administration of 1 to 2 mCi of  $^{18}\text{F}$  required 30 min. exposure. (Negative image of original shown to compare with camera images.)

### References

1. Bachman & Sproul, Bull. N.Y. Acad. Med. 31:146 (1955)
2. Edelstyn et al. Clin. Radiol. 18:158 (1967)
3. Sklaroff & Charkes, J. A. M. A. 188:1 (1964)
4. Spencer et al. Brit. J. Radiol. 40, 641 (1967)
5. Ronai et al. J. Nucl. Med. 9, 517 (1968)
6. Harmer et al. Clin. Radiol. 20, 204 (1969)
7. Blau et al. Medical Radioisotope Scintigraphy 11:341, (1969)
8. Harbert & Ashburn. Cancer 22, 58 (1968)

## Radioisotopic Imaging of Bone in Clinical Medicine

### Review

Various radioisotopes are known to preferentially accumulate in both malignant and benign lesions of bone. When such radioisotope accumulation is detected and imaged, using suitable instrumentation, clinically useful information is frequently obtained which cannot be readily acquired using other methods. Examples of this are the detection of primary and metastatic tumors in bone. Tumors metastatic to bone most commonly spread to spongy (trabecular) bone. Such lesions can be visualized by X-ray examination only when they are greater than 1.5 cm in diameter and 50% to 75% of the local calcium is lost.<sup>1,2</sup> Localization of radioisotopes in the region of metastases has been shown to be an earlier and more sensitive indicator of the presence of bony metastases than that provided by conventional radiographic techniques.<sup>3</sup> While Strontium-85 was the radioisotope most commonly used in initial studies, subsequent evaluations have shown fluorine-18 to be a superior radioisotope since its use results in both improved image quality and markedly lower radiation dose to the patient.<sup>4,5,6,7</sup>

### Indications

The suspicion of malignant neoplastic involvement of bone, either primary or metastatic, is the principal indication for performance of a radioisotopic study of bone. Such a possibility should be considered in the primary evaluation of patients with a diagnosis of malignant tumors of the breast, lung, stomach, prostate gland, thyroid gland, and other carcinomas which commonly spread to bone, and in evaluating the extent of involvement of primary bone tumors, multiple myeloma, etc. Such studies should be particularly useful in patients in whom extensive surgery is proposed for the possibility of total extirpation of neoplastic tissue, since demonstration of a previously unrecognized metastasis may influence the proposed therapy. Lymphomas, such as Hodgkin's disease, frequently involve bone, and it has been recommended that patients with these disorders have radioisotopic skeletal surveys as a part of their initial staging.<sup>8</sup> Subsequent to initial evaluation of patients with various carcinomas and sarcomas, periodic radioisotopic skeletal surveys may be useful in demonstrating presence and extent of bone lesions. A large number of nonmalignant conditions can result in abnormal deposition of radioisotopes in bone (arthritis, fractures, osteomyelitis, Paget's disease, etc.). Whether sufficient beneficial information can be obtained from the performance of a radioisotopic bone study in patients with these non-neoplastic diseases to warrant the performance of such a study remains to be established.

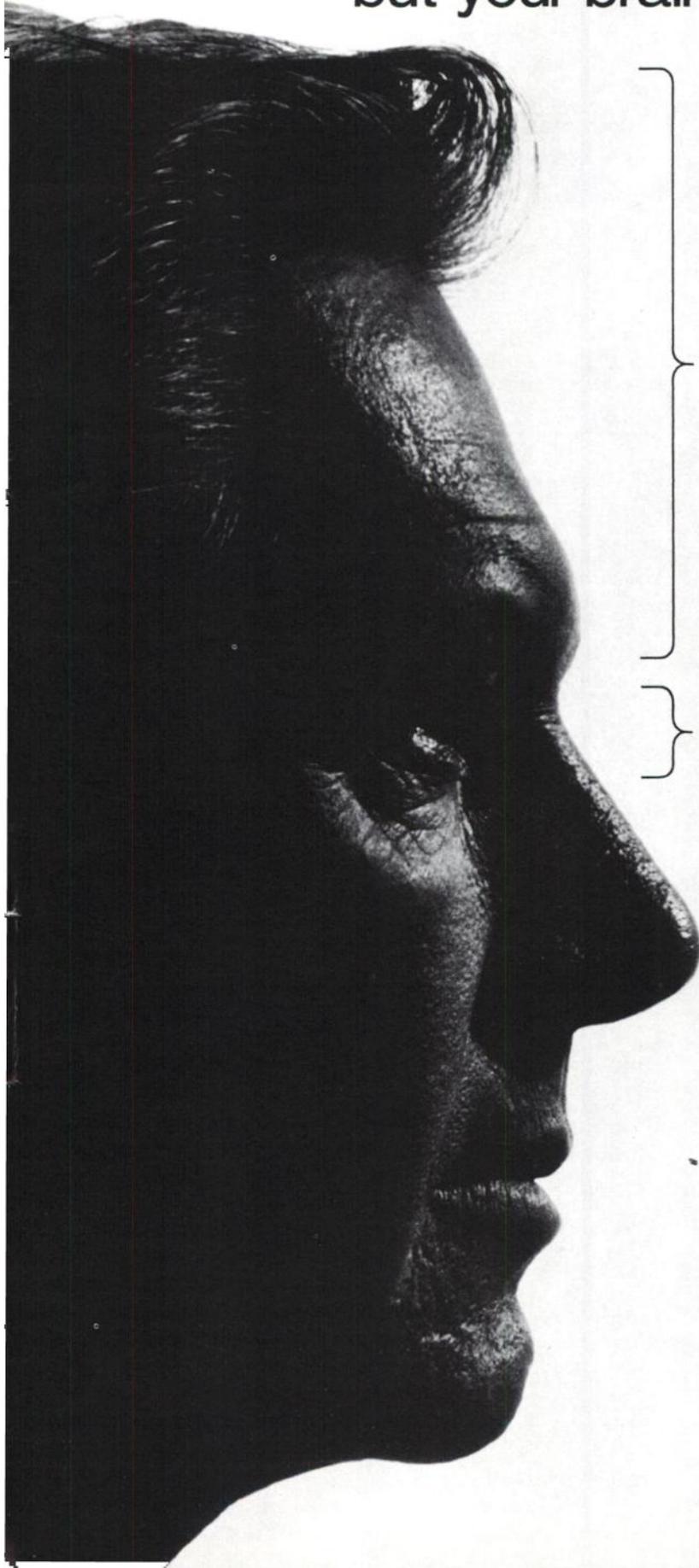
### Hazards

There are no reported cases of adverse reaction to the administration of carrier-free fluorine-18 in isotonic saline solution. The radiation dose received by the patient in association with a typical fluorine-18 bone study is considered comparable to that which he would receive from similar X-ray studies.

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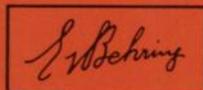
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These images are of a liver/pancreas dual isotope scan. Each is a manipulation, displayed on the face of a color TV screen.

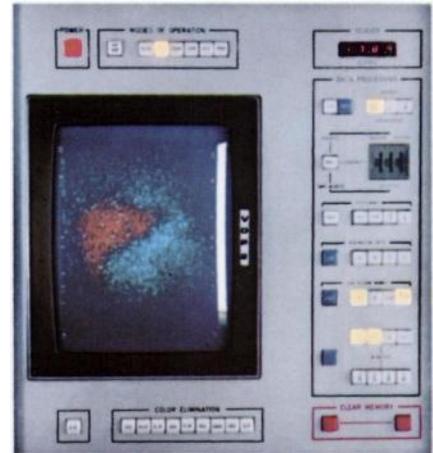
GE's Videodisplay color change is instant, reproducible and can be manipulated even after the patient has left the room.



The gold isotope, only, is displayed here, with intensity manipulated to  $\frac{1}{8}$  scale (4 counts per cell instead of 32). Makes more colors discernible; aids interpretation and diagnosis.



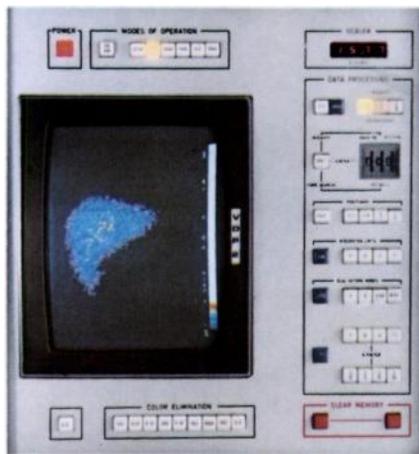
The selenium isotope, selected here, is displayed at  $\frac{1}{4}$  scale and with more background subtracted because it displays at least twice as many counts as gold. Note the pancreas appearing beneath the liver.



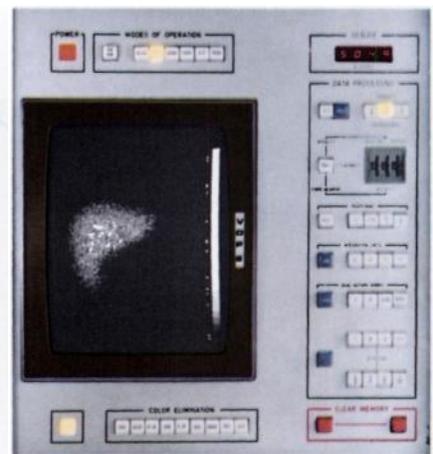
This isotope subtraction manipulation reveals the pancreas; displays only two colors with various intensities. Gold is subtracted to the point where the isotope counts have been normalized (equal).



A single isotope scan display, with several colors eliminated, has an area of interest enclosed within X, Y cursor lines. Area size and shape are adjustable and moveable. Scaler displays only the count of the colors within the box.



Lower counts may not be of clinical interest. The color scale can start at any count level, by turning the thumbwheel. Thus it is possible to show a dynamic range of 64 shades. Here the image starts at 12 counts (shown at indicator).



View any scan in shades of gray, instead of color, by pressing the B & W button. Each shade represents a specific number of counts in each cell; can be manipulated just like color display.

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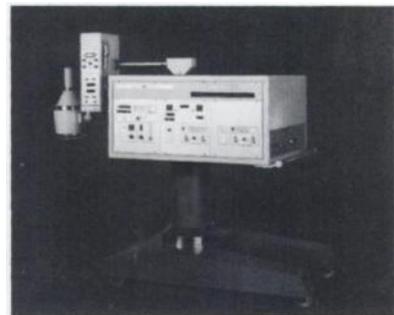
ready for instant display on a video monitor. The result is true electronic visualization of the accurate count data at every point of the scan.

The series of scan manipulations, shown and briefly explained at left, demonstrates the Videodisplay unit's broad range of data versatility. For each image or area of interest displayed, a continuous digital readout of counts is shown at the scaler.

And, as you consider each scan display, remember: the scanner was set up only once. The patient was scanned only once. Yet the manipulation capability of the patient data from that one scan is virtually unlimited. And, can be performed any time. As long as the information remains in the unit's memory, it's always fully and immediately recoverable.

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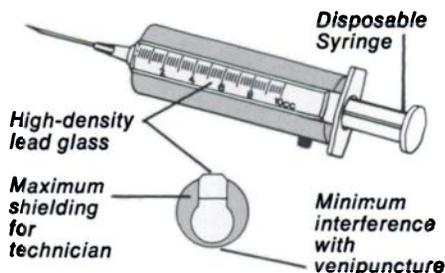
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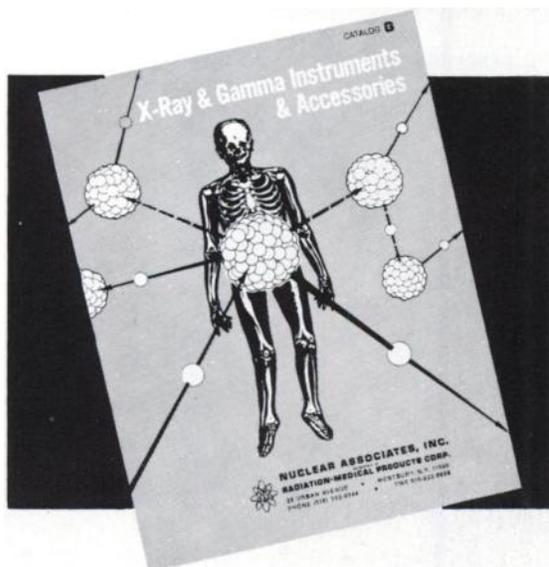
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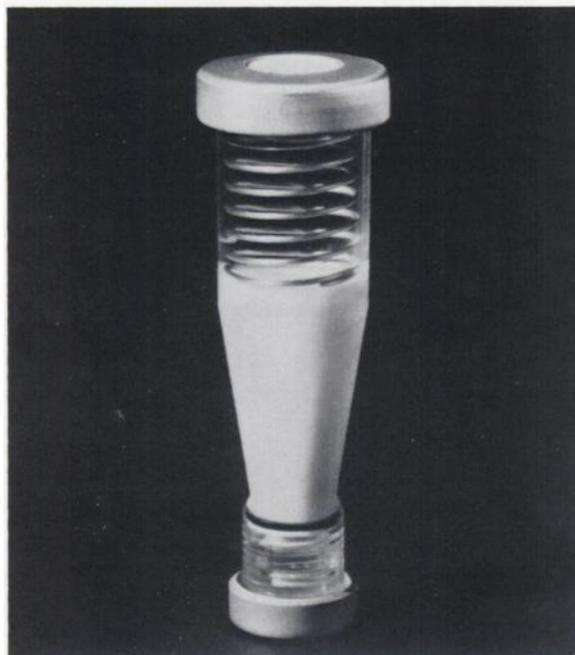
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## ANNOUNCEMENT

The Nuclear Medicine Institute is presenting a comprehensive course to aid physicians in their preparation for certification in nuclear medicine. The subject material covered will include:

Physics	In vivo & in vitro procedures
Instrumentation	Dynamic and static imaging procedures
Radiochemistry	Interpretative sessions

A unique interrupted schedule format has been chosen so that maximum duration away from home will be five days at a time. Classes will be held the weeks of:

November 6, 1972	January 15, 1973
December 4, 1972	February 12, 1973

Sessions will be five days each, Monday through Friday. Subject materials will be intermixed and cumulative.

For further information and registration forms, contact:

D. BRUCE SODEE, M.D., Director  
Nuclear Medicine Institute  
6760 Mayfield Road  
Cleveland, Ohio 44124

# Here are four ways to handle your in-vitro and in-vivo testing requirements.

## IN-VITRO

### LOGIC™ scintillation well counter

LOGIC™ is a simplified integrated spectrometer and well counter that's easy to operate. Most important is the LOGIC™ unique service commitment. When problems arise, a unique service program goes into action and your unit is back in operation fast. Every LOGIC is built with solid state and integrated circuitry to give greater reliability and less downtime.

The LOGIC™ symptom describing manual allows you to pinpoint most service problems in minutes. A call to our technical representative confirms or corrects your diagnosis immediately. The cor-

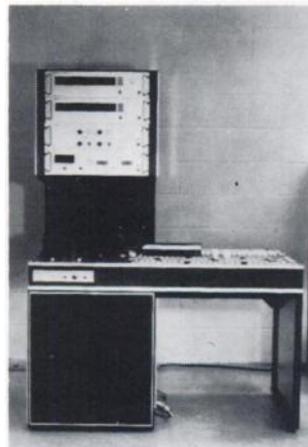


rect plug-in circuit board or a replacement LOGIC™ is air shipped to you the same day. You're back in operation within 24 hours. In short, if you have trouble with a LOGIC™, we'll repair or replace it with a service loaner in 24 hours or less.

### Wallac automatic gamma sample changer

The Wallac LKB 80000 automatic sample changer handles a large capacity of samples to free your skilled staff for other duties. It allows long uninterrupted automatic runs with either uniform or intermixed samples.

The sample conveyer operates as an endless belt giving you fast, safe and secure pneumatic handling of samples. There are two methods for positive sample identification before measurement, its position on the conveyer belt, and a binary coded cap. And, samples are changed in only 10 short seconds. Data read-



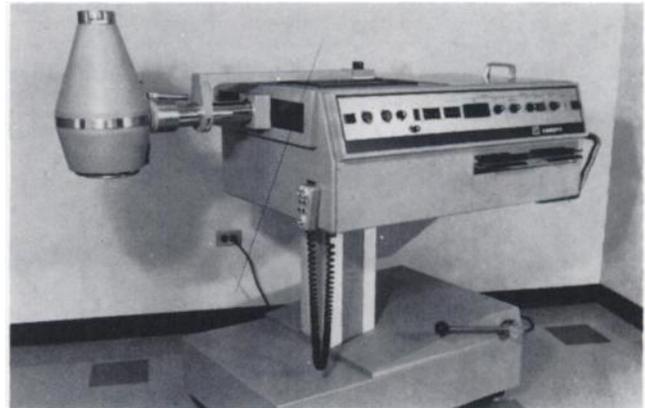
out is supplied in printed form or on punched tape. The Wallac automatic sample changers simple foolproof controls allow you to handle your needs efficiently and accurately.

## IN-VIVO

### GRAPHIC™ Rectilinear scanner

GRAPHIC™ operation is simple. The control panel is designed for a logical left to right set-up procedure. Start at the left with Power On and work your way in a logical sequence to the right of the panel to Scan On. GRAPHIC™ two-position film cassette allows you to scan

14" x 17" in either direction, across the chest or lengthwise along the body. GRAPHIC™ will accommodate a variety of large scan field requirements with uniform ease. And, GRAPHIC™ is built to last requiring a minimum of service attention. It's so rugged that we warranty it for mobile operation. You have to be tough to work under these conditions.

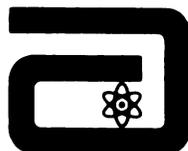


### LOGIC™ with uptake module

By simply adding a medical stand and probe with collimator to either of two LOGIC™ models, the 111 or 121, you're ready for thyroid uptake studies. The LOGIC™ modular concept provides add-on capabilities for you. Buy what you need when you need it. And, you still get the unique service commitment provided only by LOGIC™ . . . when problems arise, we'll repair or replace your instrument with a service loaner in 24 hours or less.



*And, these instruments come from a full-line supplier who assures you of a continuing service commitment to train and assist your personnel in all their needs. It's our privilege to keep your Abbott instruments operational.*



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# To check the performance of your Scintillation Camera or Scanner, you need...

## HINE REFERENCE PHANTOM

Offers the simplest, most efficient means of securing optimum camera or scanner performance with respect to depth resolution, uniformity of response, and sensitivity. Changes in instrument output can be delineated quickly, and the best operating conditions can be established readily. The spectrometer window, the display system, the collimator performance, and the total counts can be optimized for a particular application.

Has a 9" diameter and simulates the physical conditions prevalent for large-organ scanning. With a volume of about 730 ml, it approximates the scattering which has a great effect on the performance of cameras and scanners.

The Phantom can be filled with a solution of a radionuclide chosen according to the application for which the camera or scanner should be tested. Typically, 300  $\mu$ Cl of I-131 or 1 mCi of Tc-99m are used most frequently.

**76-800** Hine Reference Phantom ..... \$150.00

## FLOOD PHANTOM

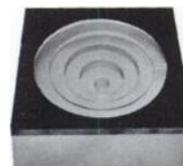
For obtaining optimum scintillation camera performance with respect to uniformity of response over the entire crystal area. Consists of a square plastic form, 15" x 15" x 1" thick that has a circular cavity 13.5"D. x 0.5" deep. A solution containing approximately 1 mCi of Technetium-99m, or any other suitable radioisotope, may be placed in the cavity via a filling port.

**76-805** Flood Phantom ..... \$90.00

## BAR PHANTOM

Provides a simple and effective means of checking a scintillation camera's intrinsic resolution, collimator spatial resolution, field size and linearity. Consists of four sets of lead bars, 1/2", 3/8", 1/4" and 3/16" wide respectively, embedded in a 16" x 16" x 1/2" lucite holder.

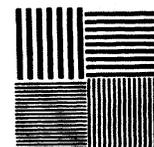
**76-808** Bar Phantom ..... \$195.00



Hine Phantom



Flood Phantom



Bar Phantom

Write for free copy of "HOW TO CHECK YOUR SCINTILLATION CAMERA & SCANNER"

For more details, ask for Bulletin 88-B



**NUCLEAR ASSOCIATES, INC.**

35 URBAN AVENUE, WESTBURY, N. Y. 11590, PHONE (516) 333-9344

## FOURTH ANNUAL SEMINAR IN NUCLEAR MEDICINE

August 20-26, 1972

COLBY COLLEGE

Waterville, Maine

This course will be concerned with the basic principles and practical aspects of nuclear medicine presented through lectures, panel discussions and illustrative cases. The material will be of value to physicians preparing for certification examinations in nuclear medicine, as well as for those now devoting their full time to nuclear medicine. Basic scientists will find the course a useful orientation to the clinical uses of radioactive tracers.

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Professor of Radiology, School of Medicine, Professor of Radiological Science, School of Hygiene and Public Health, The Johns Hopkins Medical Institutions.

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Pathologist, Thayer Hospital, Waterville, Maine; President (1966-1967) New England Chapter of Society of Nuclear Medicine.

### FACULTY

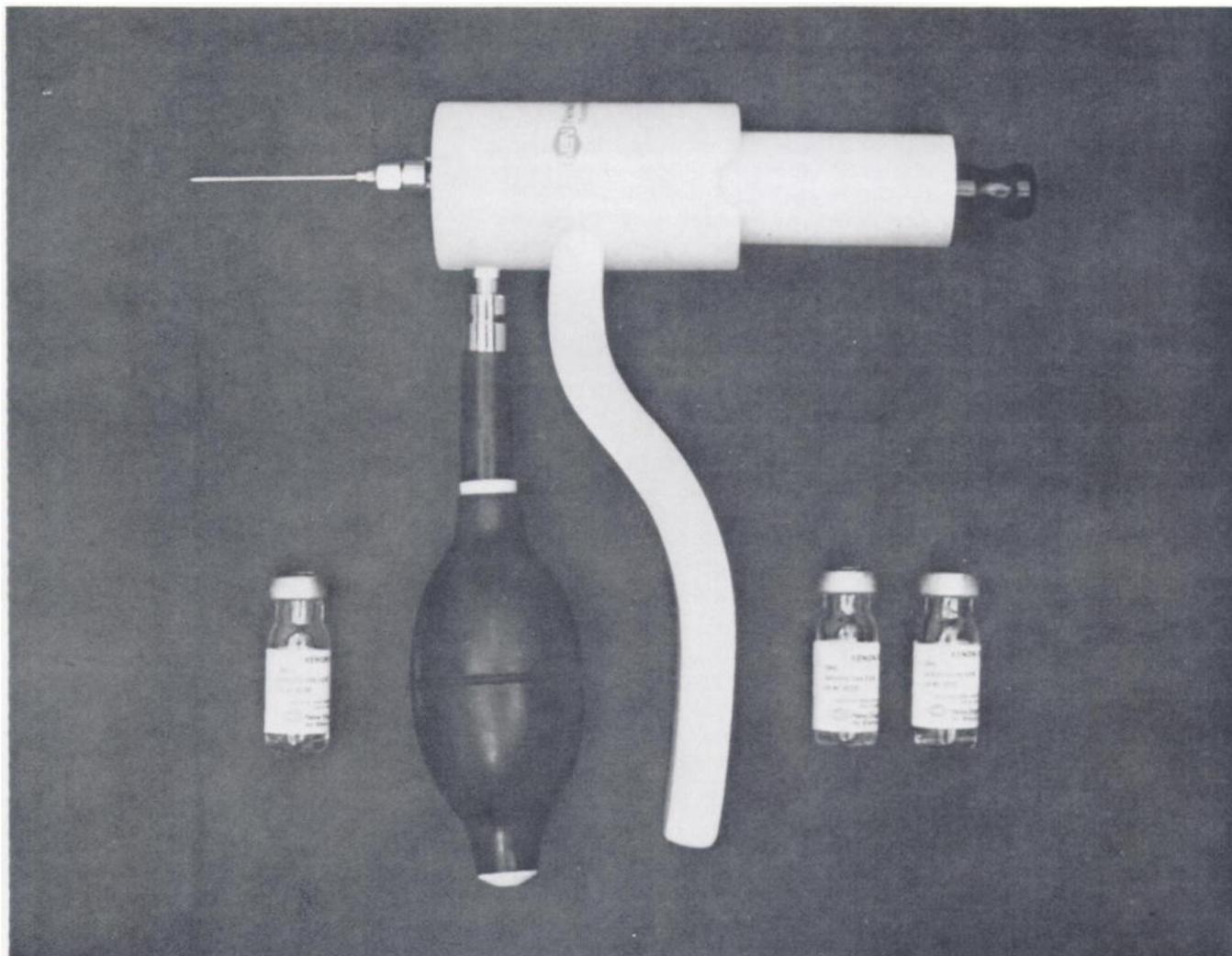
**FRANK N. DeLAND, M.D.**  
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**ALEXANDER GOTTSCHALK, M.D.**  
**JAMES L. QUINN III, M.D.**

Fee: \$300 covering tuition, room, board, and recreational facilities. A limited number of wives and children can be accommodated at a small additional cost.

For information: **PAUL D. WALKER, Director**  
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# New convenience in Xenon-133 dispensing.



Just slide a pre-calibrated vial of Xenon-133 gas from the lead storage tube into the shielded gun, push the plunger to break the seal, and squeeze.

Fast, trouble-free handling. Precise dose, pre-calibrated at rated strength (10-100mCi) as of Wednesday noon in your facility. And we let you have the dispenser free for as long as you use our new Xenon-133 system. Call us.



**New England Nuclear  
Radiopharmaceutical Division**

Atomlight Place, North Billerica, Mass. 01862  
Telephone (617) 667-9531

# The new Picker Isotope Calibrator: It's as if you had studied the others... and then designed your own.

Which is, of course, precisely what happened. As expected, many of the existing instruments have desirable features. Why not then combine these features into a single instrument? Why not provide an instrument that emphasizes simplicity of use, dependability (dependability in the broadest sense: dependable data, dependable operation), and maximum flexibility? These are, after all, the characteristics that users care most about.

Herewith, the list of prime specifications that will in fact give users an instrument that meets the general design goals described. Now check *any* isotope calibrator against this listing. Not unexpectedly, this new Picker product adheres to all of these requirements. Your requirements, remember.

1. Simple to operate—just position sample, select calibration factor, push a button and read. Read activity directly in milli- or microcuries without calculations. (Digital readout, of course.)
2. Rapid measurements—less than one second in most instances.
3. Wide energy range—25 KeV to 3 MeV (encompasses all clinically used isotopes).
4. Maximum flexibility—easily optimized calibration for any dose volume or geometry.
5. Wide activity range—1 $\mu$ Ci to 999mCi (accommodates any diagnostic dose).
6. Accuracy—don't settle for less than  $\pm 5.0\%$ .
7. Repeatability (short term)—at least  $\pm 3\%$ .
8. Stability (long term)— $\pm 1.0\%$  will eliminate annoying drift.
9. 110V AC operated—batteries fail; batteries need replacement.
10. Avoid plug-in modules—not sufficiently flexible; no provision for different geometries or volumes; involve extra costs.
11. Self-zeroing—eliminates manual adjustments.
12. Minimal size—space is always scarce.
13. Competitive price—money is *always* tight.

What else might you check? The existence of adequate field service, for one. Some companies don't have any which can become a major aggravation. The availability of a molybdenum-99 breakthrough kit, for another. Finally, will you be locked into a generator purchase arrangement that diminishes your overall flexibility? *First* choose the best generator, *then* the best calibrator.

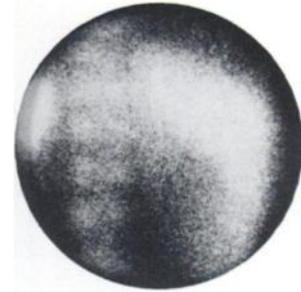
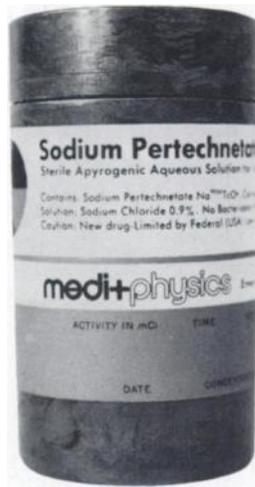
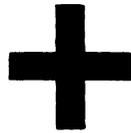
Is there any other information you'd like? Please speak to your local Picker representative, or write Picker, 333 State Street, North Haven, Connecticut 06473.



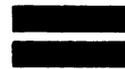
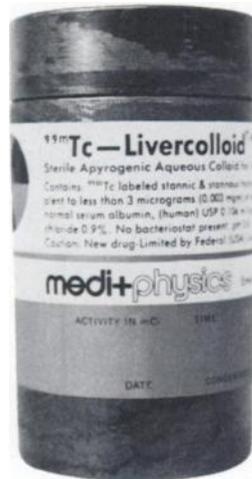
**PICKER**

# Do it Yourself or Ready-made

## Scintigraphic Imaging of Liver, Spleen and Bone Marrow



**Posterior View**  
Thoracic-Lumbar Vertebral  
Bone Marrow in  
Patient with Cirrhosis



**Anterior View**  
Multiple Space Occupying Lesions  
in Liver  
Normal Spleen

**Do-it-yourself** Instant Livercolloid™ Reagent (not a kit but a Reagent) is an aqueous solution of hydrolyzed stannous chloride. Mix with <sup>99m</sup>Tc-Pertechnetate in syringe, wait 7-10 minutes and the efficiently labeled <sup>99m</sup>Tc colloid is ready to use. No heating, buffering or other procedures to follow. Supplied in 2.2 ml single dose ampoules, sterile and pyrogen free.

**Ready-made** <sup>99m</sup>Tc-Livercolloid™ contains <sup>99m</sup>Tc-hydrolyzed stannous chloride colloid, human serum albumin stabilized in 0.9% saline solution. Ready-to-use for reticuloendothelial organ studies. 5 mCi in 2.5 ml (2mCi/ml) Technetium-99m calibrated for 12 noon PCT (+10% overfill). Stable, contains no gelatin or dextran. Sterile and pyrogen free.

# medi+physics

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# Introducing...

## the **nms** MODULAR 1000

# ...the most revolutionary new camera for nuclear medicine!

Now . . . for the first time a photographic system that can accept any size film you require — 35 mm, 70 mm, or Polaroid! Can even be adapted for 90 mm and 105 mm.

This is in addition to the superiority that made NMS's reputation in the field — the best picture quality and definition available!

On the opposite page you will find a detailed, feature-by-feature comparison of the new NMS Modular 1000 with its closest competitor.

In the important field of nuclear medicine, superior equipment can make an enormous difference in diagnosis and scientific investigation.

SEE US AT THE NUCLEAR  
MEDICINE CONVENTION  
We'll have booths 7 & 8  
and we'll be there for  
demonstration and information.



**Compare the revolutionary NMS MODULAR 1000  
with currently available systems.**

<b>Features</b>	<b>NMS Modular 1000</b>	<b>Current competitive systems</b>
Film acceptance 70mm 35mm Polaroid	yes yes yes	yes no no
Adaptability to large film 90mm 105mm	yes yes	no no
Image size	variable	fixed
Threading of film	automatic self-threading	automatic self-threading
Take-up cassette	light-tight . . . accepts 1-600 frames	light-tight . . . accepts 1-100 frames
Oscilloscope control	yes	no
Pre-set count	yes	no
Automatic film cut-off	yes	yes
Oscilloscope viewing	direct	direct
Remote control	yes	yes
Installation	manufacturer installed, calibrated and tested in each laboratory	user installed
Display of operating modes	full display	ready light only
Dead time	4/100 sec.	3-4/100 sec.
Frames per second	10 plus	10
Film Identification	Electronic & automatic	manual

**For more information, call or write:**

# New Head Rest attachment simplifies brain-scan positioning on Ohio-Nuclear Dual-Probe systems



## Provides maximum comfort during lateral, anterior and Townes-view scans

The positioning of brain-scan patients on the Ohio-Nuclear Dual-Probe system can now be simplified significantly by adding the *Adjust-O-Scan™* Head Rest.\* This easy-to-install device adjusts to varying angles and distances from the table top. It can position the patient comfortably during anterior and lateral scans (and a Townes view) without any other supports or props. Allows complete freedom of movement.

With this unique head rest, the plastic riser on the Ohio-Nuclear table can be removed, allowing the lower probe to extend through the table and come

very close to the patient's head. This eliminates table-top attenuation and assures correct dual-probe/collimator geometry correlation.

Made of sturdy aluminum with a Velcro sling. Do-it-yourself installation takes about 20 minutes. The only tool required is a drill. Kit includes mounting brackets and full instructions.

17-240 *Adjust-O-Scan* Head Rest Kit.....\$275.00

### IMMEDIATE DELIVERY

TM Nuclear Associates Inc. \*Patent Pending



## NUCLEAR ASSOCIATES, INC.

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For details on other patient-positioning devices, scanning and imaging tables, ask for Bulletin 931-B

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# Iodinated <sup>(125I)</sup> human fibrinogen

- 90% of iodinated fibrinogen is available for coagulation.
- prepared from a restricted pool of donors, screened to minimize the possibility of transmission of serum hepatitis.
- can be used for monitoring treatment of thrombus as well as detection.
- more convenient than phlebography—can be used for routine screening by ward staff.
- available from stock.

Post-operative deep vein thrombosis of the leg can give rise to many serious sequelae, including fatal pulmonary embolism, yet in many cases there are no clinical signs of the thrombus, itself. Labelled fibrinogen, administered by intravenous injection, becomes incorporated in the thrombus, and can be followed by daily scanning of each leg (using a hand held Isotope Localization Monitor). The area of maximum radiation intensity indicates the size and site of the thrombus. This simple daily procedure can be easily carried out at the patient's bedside.

*Full information on the material and the technique is available from The Radiochemical Centre.*

*Availability of this product may be subject to national regulations.*

## For early detection of post-operative deep vein thrombosis



The Radiochemical Centre Amersham England





# 10,000 counts per second. Impressive? Try 200,000.

Here's a scanning gamma camera that's designed around a minicomputer and a front end, to deliver 200,000 observed counts per second, at any energy, with no intrinsic components of spatial resolution.

After three years of clinical evaluation and thirty man-years of engineering development, our Baird-Atomic nuclear medical teams have eliminated the clinical constraints of 10,000 counts per second and 1.5 centimeters resolution.

You might call it a result of our decade of concerned commitment to the nuclear medical community.

We've produced a scanning gamma camera system that has been human engineered to reduce set-up time to the absolute minimum. It lets your technician give you clinical data in seconds . . . with the best spatial resolution available, at count rates virtually impossible today.

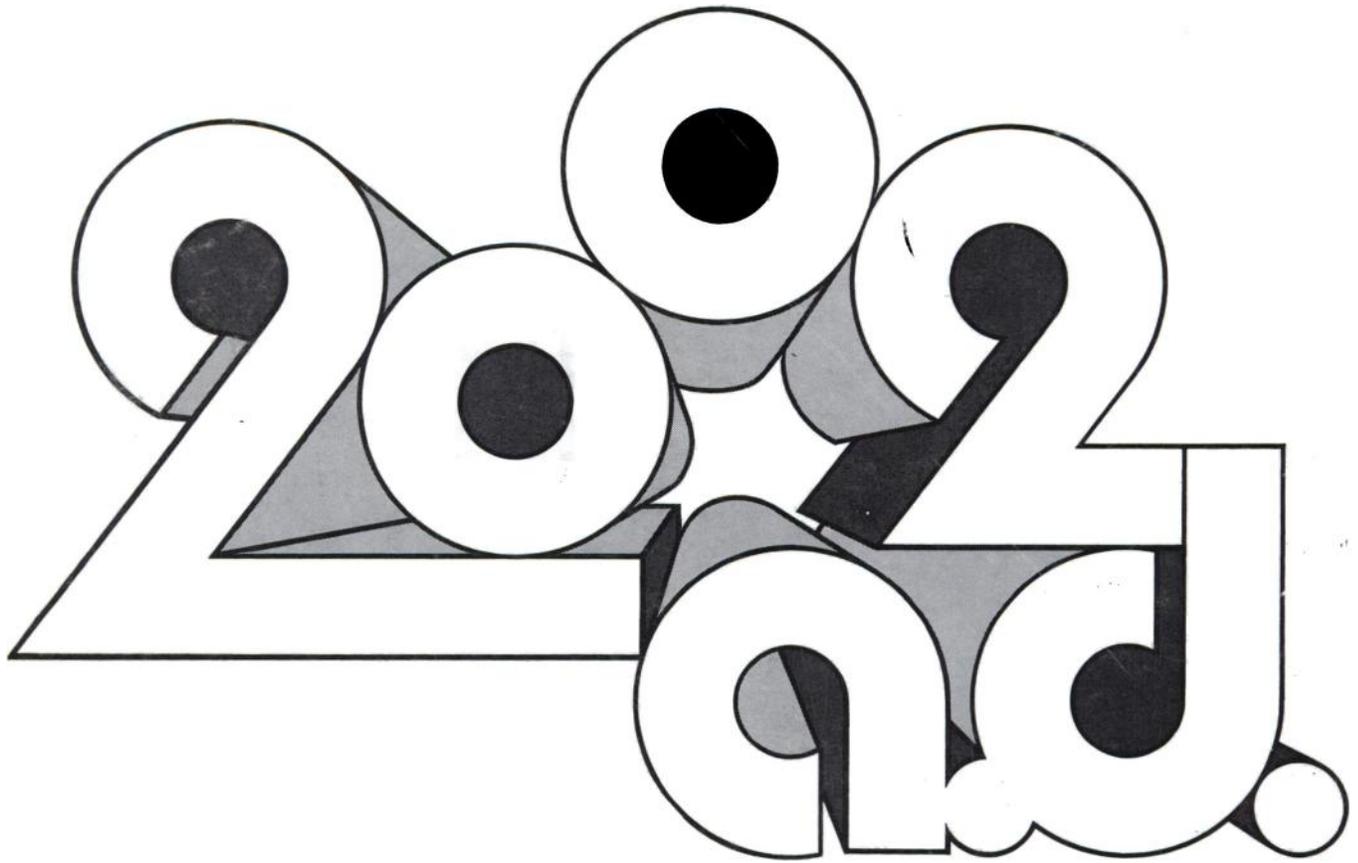
Through comprehensive software packages, the camera's minicomputer is programmed to provide direct and immediate count conversion for clinical interpretation. By letting this special programming do the tedious work of reducing count information into clinical formats, the computer will continue to allow the physician to practice his science at the highest level of nuclear medicine.

We're proud of our accomplishment. But be sure you get the complete picture, next month.

See this system in operation at the  
Boston exhibition, Society of Nuclear  
Medicine, Booths 187-190, 239-241.



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