is not used simply because a display system with a spatial resolving power at least an order better than that of the detecting system is required in order to keep the scalloping within acceptable limits.

Dr. Simons and Dr. Kereiakes complain that we offered no analysis to prove our statement that when unidirectional scanning is used instead of bidirectional scanning the information lost in the "fly-back" periods is more than offset by the increased statistical accuracy afforded by the longer space constants. The result of any such analysis is implicit in our quoted example in which we showed that of the 15 min taken in a typical unidirectional brain scan, 2½ min were lost due to "fly-back", whereas the time required for a bidirectional scan with equivalent display statistics was about 200 min if the displacement between successive scan lines was limited to 1 mm.

The time loss due to the silent "fly-back" periods in unidirectional scanning is generally relatively small as demonstrated in the foregoing example. In principle, bidirectional scanning can be retained and this small time loss avoided if the spatial lag on each scan line is offset by mechanical or electronic means. However, as long as a conventional ratemeter with an exponential response is used, distortions will still occur in opposite directions on successive scan lines which again restrict the length of the space constant that may be used. This difficulty can be overcome by the use of a digital ratemeter. Simmons, Hunkar, and Kereiakes found that such a device offered little practical advantage when using short space constants (*2*) but overlooked the benefit to be derived when long space constants were used. It was this omission that led to our original contribution to this correspondence (*3*).

When a digital ratemeter plus scan-line-offset system is not available, constant pulse-rate unidirectional scanning provides a simple and effective alternative means whereby a very large improvement in quality relative to that available by conventional bidirectional scanning may be achieved in the same total scan time.

R. SEAR
P. M. DEAN
The London Hospital
London, England

REFERENCES

1. SEAR R, DEAN PM: Unidirectional vs bidirectional scanning. *J Nucl Med* 12: 768–769, 1971

2. SIMMONS GH, HUNKAR DE, KEREIAKES JG: A digital ratemeter system for rectilinear scanning. *J Nucl Med* 11: 610–612, 1970

3. SEAR R, DEAN PM: A digital ratemeter system for rectilinear scanning *J Nucl Med* 12: 320, 1971

DATA RETRIEVAL SYSTEM FOR RECALLING INTERESTING SCANS

As a nuclear medicine department expands, the ability to recall that interesting brain scan with the "doughnut" lesion seen last week becomes more difficult. Do you, as we have, anticipate reviewing all lung perfusion scans exhibiting the "fissure sign" during the past three months? This becomes a tedious task. Our data retrieval system alleviates many of these problems.

Our system uses punch cards (Fig. 1). At the present time, we know of only two suppliers. These cards are available in standard index card sizes and therefore vary in the quantity of data storage. We

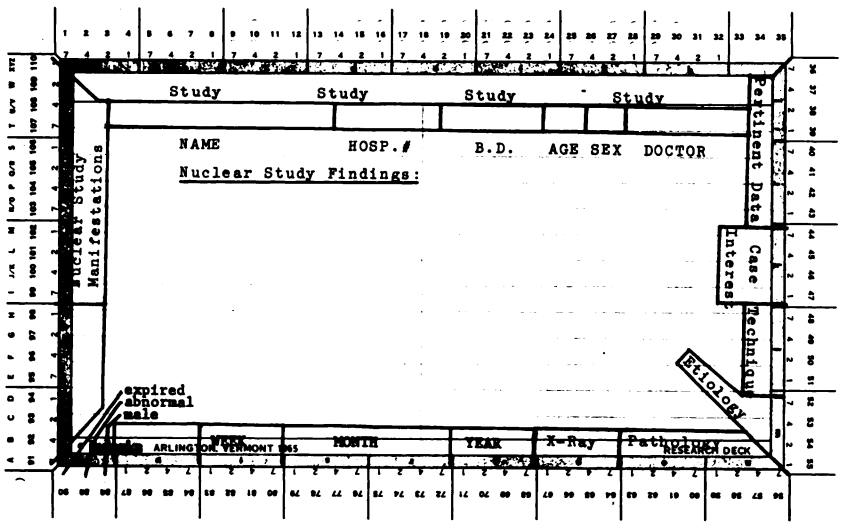

FIG. 1. Punch cards used are 5 × 8-in. and store up to 2 × 10^{20} bits of information.

chose the double-row 5 × 8-in. card which stores up to 2 × 10^{26} bits of information. Our print shop modified the card by adding information which aids in storage and retrieval.

The cards are indexed by notching with a hand punch and sorted with knitting-like rods. We index under these categories: studies, pertinent data, case interest, technique, etiology, pathology, x-ray correlation, and nuclear manifestations. Such categories may be expanded and others may be initiated as needed.

With our rapidly increasing number of patients and examinations, we find that this mode of random filing and selective retrieval of specific data, diagnostic signs, diagnoses, technical data, etc., is ideal, short of using a computer. The system is simple, accurate, inexpensive, and affords the capability of a large amount of data storage.

MARTIN L. DAILY
MARIETTE R. JONES
St. Luke's Hospital Medical Center
Phoenix, Arizona

RADIOISOTOPE RED-CELL SURVIVAL STUDIES

An Expert Panel on the Application of Radioisotopes in Hematology of the International Committee for Standardization in Hematology has published recommended methods for red-cell survival studies using radioisotopes (*1,2*). These documents include standard techniques using ^{51}Cr and radioactive di-isopropylphosphorofluoridate (DFP). The recommendations include proposals for presentation and analysis of the data and a table of elution correction factors for use when the red-cell survival study has been carried out with ^{51}Cr. The panel has recommended that the use of a single index of $T_{50}Cr$ ($T_{1/2}Cr$) should be discontinued and in all cases the mean cell life should be deduced. The document also contains recommendations concerning the use of radioisotope-labeled red cells in compatibility testing.

H. I. GLASS
Hammersmith Hospital
London, England

REFERENCES

1. Expert Panel on the Application of Radioisotopes in Hematology: Recommended methods for radioisotope red cell survival studies. *Brit J Haemat* 21: 241, 1971

2. Expert Panel on the Application of Radioisotopes in Hematology: Recommended methods for radioisotope red cell survival studies. *Blood* 38: 378–386, 1971

DOT COUNTING IN SCINTIGRAPHY

In their letter on dot counting in scintigraphy, Lying-Tunell and Söderborg (*1*) rightly comment that if a low dot factor is chosen, information will be lost because of the deadtime of the dot printer. With high dot factors, the pulses from the detector tend to become derandomized, and less information is lost.

Although a calibration procedure may be carried out as suggested by Lying-Tunnell and Söderborg, it should not be necessary if the dot printer is preceded by a queueing circuit or digital derandomizer as described by Kemplay and Vernon (*2*) and Smith and Love (*3*). In this instance, the object of the circuit would be to accept the random or partially derandomized pulses from the dot factor unit and convert them to a fixed but discontinuous repetition frequency f where 1/f is greater than t, the resolution time of the dot printer. A circuit of this type has been used with an experimental scanner at the Royal Postgraduate Medical School of London when it was necessary during quantitative radioisotope studies to ensure that for any dot factor, every dot was recorded and similarly the position of each dot recorded for data analysis purposes (*4*).

J. R. KEMPLAY
Westminster Hospital
London, England

REFERENCES

1. LYING-TUNELL U, SÖDERBORG B: Dot counting in scintigraphy. *J Nucl Med* 12: 269–270, 1971

2. KEMPLAY JR, VERNON P: An efficient method of using an audio magnetic tape recorder for storing random pulses. *J Sci Instru* 44: 566–568, 1967

3. SMITH RO, LOVE WD: A buffer storage interface for use in recording individual scintillation pulses on magnetic tape. *J Nucl Med* 8: 607–610, 1967

4. KEMPLAY JR: A digital data logging technique for medical radioisotope scanners. *Phys Med Biol* 13: 413–420, 1968