DYNAMIC STUDIES WITH RADIOISOTOPES IN MEDICINE. International Atomic Energy Agency, Vienna, 901 pp., 1971, $24.00.

Time-dependent observations have been the hallmark of many of the advances in the application of radionuclides to human disease. Although most now recognize the significance of organ imaging and in vitro assay methods, these have in part a time-dependent basis. The sagacity of the International Atomic Energy Commission is well appreciated in this document which represents the proceedings of a major international symposium dedicated to appraising the current status of time-dependent studies. The materials and the discussion reveal a phenomenal latitude which is well worked into the central theme involving the tracer method and its application to understanding pathophysiology and to the improved diagnosis of human disease. The variety of papers is too broad to recount in any detail in a brief review, but specific contributions warrant acknowledgment.

Dr. Veall leads off with a theoretical paper presenting a nice review of the basic concepts of time-dependent observations with tracers. This is followed by two other theoretical papers, and specific note should be given to the contribution of J. G. Llaurado who presents a clear example of the strength of the tracer method in appraising a specific metabolic problem, i.e. the effects of aldosterone on sodium distribution in the arterial wall.

There are many papers using variations on the newer techniques and instruments, and particular note should be made of the contribution of H. K. Awwad who has developed a unique way to appraise serum albumin synthesis. This should be a considerable improvement over the more complicated, albeit elegant, McFarland technique. Dr. Awwad uses the relationship between hepatic albumin and sulfate synthesis in his endeavor.

The application of computers to data-processing techniques is well brought out in the section on instrumentation. Here there are brief discussions of the problems of gamma cameras and computers which foretell continued application in both research and clinical nuclear medicine.

After these introductory sessions, there are a series of clinically relevant discussions related to specific organ properties beginning with thyroid function studies and continuing through renal function, hepatic and splenic function, mineral metabolism, cardiac function, and pulmonary function studies. The review paper by W. D. Alexander, et al on the Radioisotopic Studies of Thyroid Function and Thyroid Hormone Metabolism is a most welcome addition toward an elementary understanding of a subject that has been a burden to many students of nuclear medicine. The continued controversy is nicely documented in the printed discussions following the paper. By reading the paper one obtains a rather unbiased introduction into the problems of the iodide pool.

The kidney session is initiated by Dr. Zum Winkel's review paper on renal function with radioisotopes. This nicely sets the tone for subsequent presentations, although here, I am discouraged by many of the international efforts in this field which reflect persistent confusion and a continued use of inappropriate quantitation in an effort to extract information which is not intuitively available. Some of these controversies are nicely brought out in the discussion. In particular, problems dealing with varying radiopharmaceutical quality are emphasized by Norman Veall in discussing the paper by K. Sliz, et al. There is obviously need for some internationally acceptable standards in investigatory methods if reproducible phenomenon are to be obtained between various laboratories throughout the world.

The session on hepatic and splenic function studies is characterized by heterogeneity in the quality of the presentations and variations on some well-worn themes. Particular note can be directed toward the contribution of D. L. Fontein, et al who had somewhat different data on methods to test for the effectiveness of splenectomy and it warrants reading by those interested in this area. The Mineral Metabolism section is also quite heterogeneous, but it does

contain an excellent paper by J. L. Bullamore, et al on radiocalcium measurement and bone turnover.

The blood-flow session begins with an excellent review paper of the subject by Dr. H. N. Wagner. This paper should be read by all interested in the problem of regional blood flow, a subject much to the liking of this reviewer. Here too, unfortunately, the quality of the material presented is very variable but overall this section provides a useful contribution, although it is not as comprehensive as other recent publications. Similar problems prevail in the section dealing with cardiac function. Most of this material is available elsewhere, although again, the review paper by L. Donato is well worth reading.

Finally, we come to the Pulmonary Function Studies, an area of time-dependent observations which is of increasing importance to those practicing clinical nuclear medicine. Here too, the review paper by Dr. D. V. Bates is excellent and will provide people who are unfamiliar with the field an excellent introduction into the subject. Dr. Bates' book, however, contains considerably more information and perhaps could be better appreciated by those beginning the subject*. The overall quality of the pulmonary-function study papers is excellent, particularly the paper by H. Kazemi, et al from the Massachusetts General Hospital.

In summary, the book represents a very wide spectrum with a central theme of time-dependen. studies. It is of somewhat better quality than seen in other international documents although it is characterized by a wide variation between meaningful scientific contributions and reiterations of well worn themes. I would recommend it for selected papers to any practitioner of nuclear medicine. It may be required reading for those involved in research into the problems of time-dependent observations developed either to appraise pathophysiology or contribute to diagnostic problems in patient care.

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* Bates D, Christie R: *Respiratory Function in Disease*, Philadelphia, WB Saunders Co, 1965.