

Foreword

When I first planned this book my idea was to produce an update of the book we published in 1978 on *Protein Turnover in Mammalian Tissues and the Whole Body* (Waterlow *et al.* 1978). It soon became clear that such a vast amount of work has been done in this field in the last 25 years that a new book was needed rather than a revision. But is there a need, since several books have already been produced, such as those of Wolfe (1984, 1992) and Welle (1999), together with numerous reviews and reports of conferences? None of these is entirely comprehensive, giving a conspectus of the whole field. There is, however, another and to me more compelling reason for embarking on this enterprise. Twenty-five years ago, with the increasing availability of stable isotopes and mass spectrometers, a huge new field was opening up for human studies. It extended also to experimental work on animals, since I have been told that it costs less to use stable isotopes than to provide all the facilities needed for working safely with radioisotopes. Good use has been made of these new developments, but I believe we are coming to the end of an era. Even a cursory look at the physiological and clinical journals shows that simple measurement of synthesis and breakdown rates is being overtaken by studies to unravel the molecular biology of these processes. The change of emphasis is part of scientific advance, and is to be welcomed, although many have expressed fears of excessive reductionism; but the pieces, after being taken apart, must be put together again to see how they work as a whole. Here kinetic studies may perhaps play a role. There may be an analogy with the contribution of metabolic control theory to our understanding of the rates of reaction through a sequence of enzymes. An interesting question that has not to my knowledge been tackled is whether the 'use' of an enzyme affects its rates of synthesis and breakdown.

This is looking forward, in the hope that protein kinetics at the molecular level may still have something to contribute. However, I have another aim in this book: to look back at the past and pay tribute to all who have contributed to our present knowledge, with studies that may be completely forgotten in the future. An example is the work on the turnover of plasma proteins labelled with radioactive iodine isotopes. This dominated two decades, from 1960 to 1980, and produced huge numbers of papers and reports on conferences. One of these, named Protein Turnover (Wolstenholme, 1970) was entirely devoted to plasma proteins, as if no others existed. Has all this work, and the mathematics that went with it, anything to offer us now? I believe that it has, though it would be hard to define exactly what.

It is possible that work on whole body protein turnover will meet the same fate as that on iodine-labelled plasma proteins, and disappear into a forgotten limbo. However, I hope that this will not happen, because if it is accepted that protein turnover is a biological process of great importance,

equivalent to oxygen turnover, then we need to know more about it in different groups of people under different circumstances; we need to bring our knowledge to equal that of oxygen turnover or metabolic rate.

In citing references I have used the Harvard system because a name in the text not only refers to a particular paper but recalls a person or a group with whose work I am familiar. Some of these authors I know personally; others I do not, but I feel as if I did. The Harvard system has a human factor which the other systems lack. I apologize to authors whose relevant papers I have missed. Since readers may feel that too many references are cited, to them also I apologize: it is not easy to get the right balance.

This book is dedicated to Vernon R. Young, in recognition of his great contribution to the field, his stimulus and comradeship.

References

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