The apparent 'distribution space' was calculated as:

$$\frac{\text{Metabolic clearance rate (ml/min per kg body wt.)}}{K \text{ (min}^{-1}\text{)}}$$

where $K = 0.693/t_{1/2}$. These values were measured in 12 cases of liver disease and 12 cases of thyroid disease, and these were compared with values obtained in eight normal subjects.

The mean $t_{1/2}$ was prolonged in the groups with liver disease (31.8 min) and myxoedema (24 min) when compared with the normal group (18.75 min); P values were <0.001 and <0.025 respectively.

The difference in mean metabolic clearance rate was less marked between the groups (2.13, 2.55 and 3.13 ml/min per kg body wt.; P values <0.02 and $<0.01 > 0.05$ respectively).

There was no significant correlation between $t_{1/2}$ and metabolic clearance rate. This discrepancy between $t_{1/2}$ and metabolic clearance rate was due to variation in 'distribution space'. In the normal group the mean 'distribution space' was 80 (range 70–95) ml/kg body wt., and in the group with liver disease it was 106 (range 40–190) ml/kg body wt. In the liver patients there was a very close correlation between metabolic clearance rate and 'distribution space' ($r = 0.9430$; $P < 0.001$). A similar correlation existed in the other groups.

Thus $t_{1/2}$ does not give a meaningful estimate of the metabolism of human growth hormone. The apparent 'distribution space', which until now has been largely overlooked, is clearly of major importance in determining the rate of metabolism of growth hormone in man. The implications of these observations will be discussed.

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The Preparation and Characterization of Labelled Rat Growth Hormone

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If a protein can be made in which every residue is labelled with a radioactive isotope, techniques for determination of the amino acid sequence could be made more sensitive, since peptides, amino acids and their derivatives could be detected by virtue of their radioactivity. We have prepared internally ^{14}C -labelled rat growth hormone, by biosynthesis *in vitro*, that should be suitable for such sequence studies.

Male rat anterior pituitaries were incubated for 20 h in a simple bicarbonate-buffered medium (Gey & Gey, 1936) with the addition of 1 mg of glucose,

1 mg of bovine serum albumin, 1 μg of penicillin V, and 50 μg of streptomycin/ml. ^{14}C -labelled forms of all 20 amino acids normally found in proteins were added at a concentration of about 5 μCi of each amino acid per five anterior pituitaries. Growth hormone with a specific radioactivity of about 10 $\mu\text{Ci}/\mu\text{mol}$ was prepared by preparative polyacrylamide-gel electrophoresis of salt extracts of the anterior pituitaries.

Amino acid analyses of acid hydrolysates, and of Pronase and leucine aminopeptidase digests (to determine asparagine, glutamine and tryptophan), were carried out by paper electrophoresis and chromatography, followed by scintillation counting of the amino acid spots. Each type of residue contained label. The relative specific radioactivity of each type of residue was determined, from the published composition of rat growth hormone (Ellis, Grindeland, Nuenke & Callahan, 1968) with correction, where necessary, for ninhydrin decarboxylation. Peptide 'maps' of tryptic digests of performic acid-oxidized ^{14}C -labelled growth hormone were prepared by radioautography; they show a marked similarity to 'maps' of tryptic peptides of oxidized ox (Wallis, 1966) and sheep (Davies, 1971) growth hormones. Amino acid compositions of some of the tryptic peptides have been determined, again by detecting and estimating amino acids by virtue of their radioactivity.

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Breakdown of Indol-3-ylacetic Acid by *Corynebacterium fascians* (Tilford) Dowson

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Changes in the synthetic and degradative metabolism of indol-3-ylacetic acid may account for the characteristic symptoms that occur in plants infected with either *Corynebacterium fascians* (Lacey, 1936a,b, 1942, 1948, 1955, 1961) or *Agrobacterium tumefaciens* (Brown & Gardner, 1936).

Indol-3-ylacetaldehyde and tryptophol are formed during the synthesis of indol-3-ylacetic acid from L-tryptophan by the radicles of *Lens culinaris* (Hofinger & Gaspar, 1969). Indol-3-ylacetaldehyde