Partigen¹ plates. It is possible a normal α_1 -antitrypsin level by these methods may be without antitryptic activity, so biological assay should be considered in such patients with diminished lower lobe perfusion.

References

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¹Partigen α_1 -antitrypsin plates and a standard serum can be purchased from Hoechst Pharmaceuticals, Hoechst House, 50, Salisbury Road, Hounslow, Middlesex.

The Correlation of Structure and Function in Chronic Obstructive Lung Disease

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The anatomical changes seen in lungs which have been the seat of airways obstruction range from widespread destruction of the greater part of the lung parenchyma (panacinar emphysema), destruction of a small volume of lung parenchyma located at a functionally strategic part (centriacinar emphysema), no destruction at all (bronchitis), and lastly complete obstruction of a proportion of very small airways (bronchial asthma).

The functional consequences of each of these disease processes are similar and include airways obstruction, hyperinflation, and poor mixing of inspired gas. Bronchitis and asthma have an additional feature in that the latter may be completely reversible and the former partially so.

Explanation of the airways obstruction is possible in each disease though the mechanism is not similar, the first two having the site of obstruction in the large airways and the latter two in the small airways, with some contribution from the larger ones. Hyperinflation may be a consequence of airways obstruction and of changes in elasticity.

The gas mixing defect produced by centriacinar emphysema may be readily explained, as may that seen in panacinar. In the absence of anatomical changes impairment of gas mixing is less readily explained but a general hypothesis explaining this functional defect will be described.

Radioimmuno- and Related Assays: Applicability to All Branches of Pathology

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During the last decade a large number of

radioimmunoassays have been developed, based on the progressive saturation of specific antisera by the compound to be assayed. This technique owes its success to the large number of samples that can be assayed; its specificity, which is a feature of all antigen-antibody reactions; and its sensitivity, often in the femtogram or low picogram range, which results from the use of an isotopically labelled tracer.

Introduced for insulin by Yalow and Berson, radioimmunoassay was applied initially to the larger peptide hormones such as growth hormone. More recently the technique has been extended to the smaller peptides, including angiotensin and vasopressin; to non-hormonal proteins such as the lipoproteins; and, of especial importance, to the detection of tumour specific antigens. Conjugation to synthetic or natural proteins of all types of molecule, as haptens, has enabled the development of radioimmunoassay for aldosterone, oestradiol, and other steroids. A similar approach to the assay of digoxin and cyclic AMP indicates the wide applicability of this technique in pharmacology and biochemistry. Concomitantly, a variety of procedures have been introduced which employ specific circulating or tissue-binding proteins instead of antibodies. Vitamin B₁₂, folic acid, thyroxine, and cortisol are among the compounds that can be assayed by such techniques.

It seems likely that the next decade will witness a still more explosive increase in the use of radioimmuno- and related assays, and their incursion into many different and, as yet, unexplored fields such as virology and bacteriology.

Book reviews

The Nucleus and Cytoplasm 2nd ed. By Henry Harris (Pp. xviii + 181; illustrated. £1.90 board, 90p paper.) London: Oxford University Press. 1970.

This book is based on a series of lectures given by the author at the University of Oxford setting out his views on the control of mammalian cells. He builds up lucid arguments on the nature of cytoplasmic nuclear relationships drawing on the results coming from the rapidly expanding fields of molecular biology, nucleic acid chemistry, and cell science. His approach is critical, first reviewing the classical experiments on the giant unicellular algae, acetabularia that have given many important clues. The Jacob Monod theory is then discussed and its wider implication considered. The history of the search for messenger RNA is followed by a chapter on the transcription of genetic information. The author's own study of the formation and function of hybrid eukaryotic cells (heterokaryons) produced by the action of the Sendai virus has been a most enlightening line of research that has had considerable impact on our present-day knowledge of nuclear activation and inactivation and the flow of genetic information from the nucleus to the cytoplasm. Finally, he considers the problems of cell differentiation in the light of observations from a wide range of experimental systems.

The printing of a second edition of this book is a mark of its previous success; it can be recommended to pathologists as excellent reading if they desire to learn more of the fundamental basis of cell behaviour and given them an insight into the way biological science is making inroads into topics that eventually may give us a new understanding of pathology. For experimentalists there are many points of real interest and value. The frequent use of the personal pronoun leaves the reader in no doubt that the author is prepared to accept responsibility for his statements and not hide behind the vague anonymity of a less personal style. Moreover, you can get all this for a moderate price.

EDWARD H. COOPER