

PLANNING OF UROLOGICAL DEPARTMENTS

At a meeting of the Section of Urology of the Royal Society of Medicine on January 24, which senior administrative medical officers were invited to attend, a symposium was held on the planning of urological departments.

Three of the opening speakers were urologists attached to established urological departments in main centres. It was clear from their description of these large departments that they had much in common and that certain facilities should be available to the urologist. Such a department should be part of a large hospital and not isolated from it, urological patients should be under one roof to allow proper medical and nursing care, and the wards, theatres, and diagnostic clinic should, where possible, be adjacent. As the diagnostic clinic was the hub of a urological department it should be equipped for full endoscopic and radiographic investigations. It should contain an anaesthetic room and provision for minor endoscopic surgery along with an adequate number of recovery beds. An extended use of the latter for diagnostic and operative procedures would reduce the occupancy of expensive in-patient beds.

Radiodiagnosis

Radiodiagnosis played a large part in the investigation and management of urological patients, and x-ray apparatus must be available in the clinic especially for instrumental examinations. This did not imply the exclusion of the radiologist, whose co-operation was desirable, but recognized the need for rapid diagnosis in out-patients and in-patients and reduced the demands on the main x-ray department. The operating suite should include "twin theatres," one of which was reserved mainly for endoscopic surgery. Where such an arrangement existed it had proved to be convenient, efficient, and economic, and there was no proof that this involved a higher rate of infection in urology. The in-patient requirements did not differ significantly from those of other branches, and the modern conception of rooms of different sizes and numbers of beds seemed particularly applicable. The total number of beds should be related to the urological service required in the hospital group or area, consideration being given to the Report of the Ministry of Health (1959, Part II, Cmnd. 1207): "In a large general hospital disease of the genito-urinary tract accounts for 20-25% of all surgical work."

The last opening speaker described the plans proposed for a urological clinic within the structure of a main surgical out-patient department. There was good provision for the reception of out-patients, consulting-rooms, and changing-rooms. Anaesthetic and recovery rooms were provided and full endoscopic facilities were available in two theatres. This plan envisaged the sharing of accommodation with other surgical disciplines when not in use for urological purposes. In the subsequent discussion the versatility of this plan appealed to certain of the administrative authorities who had to reconcile the demands of all specialists in new hospital building proposals. This design was also applicable to a number of hospitals which at present had inadequate provision for out-patient endoscopic examination and whose urological service might thus be limited. On the other hand a number of urologists pointed out that a compromise arrangement of sharing out-patient accommodation as well as theatres and beds was unlikely to fulfil the obligations of a large department offering a comprehensive service.

The rapid progress in renal vascular surgery and renal homotransplantation suggested that more official recognition should be given to this progressive and expanding speciality.

Book Reviews

CARCINOGENESIS

Carcinogenesis. By I. Hieger. (Pp. 138+xi. 35s.) London and New York: Academic Press. 1961.

The author of this book was a member of the famous Kennaway team, who were the first to isolate a chemically pure carcinogenic hydrocarbon and subsequently to isolate and identify many others. Their work gave and still provides enormous impetus to cancer research all over the world. They established experimental carcinogenesis as a basic laboratory procedure and their original observations and experimental methods were immeasurably broadened by the discovery that the carcinogenic hydrocarbons were not only capable of inducing skin cancer but were able to transform almost any normal tissue, including neuroglia, into malignant tumour tissue.

The main object of Dr. Hieger's book is "to describe the theories of carcinogenesis, to deal with the data and evidence on which they are based, and to come to some conclusion on their validity." He adopts the broad modern definition of carcinogenesis as "the process whereby normal tissue is transformed into cancer tissue."

As a result of his extensive literary research, for he deals with every cancer theory that has gained any support, he concludes that "cancer research has produced a vast accumulation of factual material . . ." that "there can hardly be any other field of scientific endeavour where can be found so much speculation and theorizing as in cancer research," and that "none of the theories so far advanced has been able to cope with the difficulties and contradictions which begin to appear when they are closely examined by logical, observational or experimental means." "Cancer," he says, has been termed "a problem in biology as well as a challenge to medical science," and "the difficulties of its solution are greater than can be overcome or even attacked by the best minds in biological science to-day."

It is instructive to follow the lines of Dr. Hieger's criticism. He finds that most cancer hypotheses which are open to criticism are either purely inductive or have inadequate experimental evidence to support them. Others are based on well-coordinated experimental studies, often producing facts of considerable scientific interest, but are directed to hypotheses which are either vaguely outlined or of doubtful validity. A weak hypothesis is sometimes related to difficulty in deciding which of a series of carefully controlled experimental facts are of significant importance, and the comparative ease of producing factual evidence compared with the difficulties of forming valid generalizations often leads to unnecessary repetition and publication of experimental or observational findings.

The author believes that the most hopeful approaches to the problem of carcinogenesis have not been from a theoretical direction but from a more modest and empirical approach. He regards cancer research as having two parallel master problems—cellular proliferation and cellular differentiation. He considers that the attack on differentiation has hardly begun, but that its solution is likely to be *via* the elucidation of the carcinogenic process.

He advocates further and more critical evaluation of the multicentric origin of tumours, which regards a malignant growth as arising, not in a single cell or in small sharply localized cell groups, but over relatively large "fields" of tissue within which hundreds or thousands of normal cells become cancerous simultaneously. It would certainly strengthen the multicentre hypothesis if experimental carcinogenesis could provide further and possibly more conclusive evidence in its favour.

He considers that the published results of various experimentalists who are investigating the multi-stage hypothesis of carcinogenesis (that is, "initiation and promotion" or "co-carcinogenesis") are in good agreement, and that the following conclusions are valid. First, the initiator may be a carcinogen which can be effective at threshold intensity. Secondly, the promoter must be capable of producing hyperplasia but need not be a carcinogen. Thirdly, that initiation is irreversible while promotion is reversible. For these reasons he regards further research into this approach as hopeful.

The genetic concept of the origin of cancer, first formulated in 1926, became the theory of somatic mutation, and the site of mutation was thought to be the nuclear genes. The author vigorously criticizes this theory and exposes its fallacies. It was then concluded that the site of mutation must be extrachromosomal and was possibly located in self-propagating particles living in the cytoplasm. This modified genic conception was rather more difficult to criticize and all it appeared to need was experimental support.

Meanwhile, with many setbacks and few successes, research into the virus theory of cancer, which started with the observations of Rous in 1911, was making slow progress. The extrachromosomal theory collected relatively little supporting evidence. The virus theory was strengthened by the observations of Shope in 1933 and Bittner in 1942, but its protagonists were still unable to meet the weighty criticism that their theory carried the implication that there would need to be thousands of viruses to account for the many varieties of cancer. Both theories postulated the existence of self-propagating cytoplasmic particles, and there were clear indications that the apparent conflict between them was breaking down.

A new chapter was opened by Gross in 1951, who, investigating mouse leukaemia, found that this disease could be easily transmitted to newborn animals; that, following preliminary cultivation of the virus *in vitro*, it produced a wide spectrum of tumours in many organs and tissues—for example, kidney, mammary gland, parotid gland, connective tissues, mesothelia, etc. The virus was renamed the "polyoma virus." It was found to be contagious and to be transmitted by contact with saliva, urine, and faeces, and it proved to produce tumours when injected into rats, rabbits, guinea-pigs, and hamsters. It has been shown to be a single virus independent of the mouse leukaemia virus. Clones of the polyoma virus grown from single virus particles produced the same wide spectrum of tumours on injection into mice.

It is quite clear that the establishment of the true role of viruses in the causation of cancer urgently calls for very much more experimental research, and though Dr. Hieger briefly refers to the polyoma virus in his book he offers no criticism of it. It will be agreed that this is the correct attitude to take about research work which is progressing so rapidly.

Dr. Hieger strongly advocates the verification and extension of Earle's experiments (1942 to 1954), during which it was found that in some strains of mouse fibroblasts grown in tissue culture there was a gradual change in the rate and mechanism of division, culminating in plentiful multipolar mitoses, and that such cultures produced cellular sarcomata on injection into mice. These results have been confirmed by Firor and Gey (1945, 1949).

One instructive chapter in this book contains the protocols of 13 experiments of simple design on the induction of skin cancer by carcinogenic hydrocarbons. They were planned to answer a series of fundamental questions on carcinogenesis, and though of some historical interest they are of considerable scientific value as they formed part of the experimental evidence which led to the original discovery by the Kennaway school of the carcinogenic property of chemically pure hydrocarbons.

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PAEDIATRIC SURGERY

Surgery of Childhood. Edited by James J. Mason Brown. (Pp. 1,302+xii; illustrated. £10.) London: Edward Arnold Ltd. 1962.

In the last decade three large books on paediatric surgery have been published in the United States, two in Germany, and one in France. Apart from some excellent small publications designed for nurses and undergraduate medical students there has been no major paediatric surgical publication in this country since long before the last war. The appearance of a British textbook on paediatric surgery of some 1,300 pages is therefore an event of considerable importance.

Paediatric surgery has been recognized and practised as a separate specialty much longer in Scotland than it has in England and it is therefore appropriate that the editor of this book is a Scottish paediatric surgeon, the President of the Royal College of Surgeons of Edinburgh, and that nearly half of the 27 contributors practise surgery north of the border.

No other branch of surgery has made more rapid progress during the last ten years than that of infancy and childhood, and everyone who wants to familiarize himself with new developments will welcome an authoritative textbook on this subject. Unfortunately so rapidly has the subject advanced that the writing of such a textbook is extraordinarily difficult. It takes time to write a large book, it takes more time to edit and print it, and the chances are that the book will be out of date by the time it is published. It seems to be impossible at present to overcome this difficulty, and while some of the contributors to this volume have made strenuous efforts to be as up to date as possible, some of the chapters appear to be somewhat out of date.

For whom has this book been written? The editor in the preface hopes that it will be read by undergraduates, general practitioners, and junior staff in hospitals, but the book appears too voluminous (and too expensive) for these groups of doctors. He also hopes that it will be of use to postgraduates and paediatricians, and a large number of the chapters will undoubtedly be very valuable for paediatricians and surgeons alike; in a few of the chapters, however, the information is hardly sufficient for postgraduate studies.

As in all books written by a number of authors the quality of the chapters varies, and though it is difficult to single out some for special praise the chapters written