This is a highly readable and informative evangelical book praising the success of immunisation and pointing the road to the control and eventual eradication of measles and rubella. Unlike smallpox, the elimination and eradication of these diseases require among other things the achievement and maintenance of very high acceptance rates of immunisation.

The elimination of measles has virtually been achieved in the USA, but there is a continual threat of importation of the virus. But there is another problem, for even with virtually complete immunisation of the population with a more than 90% effective vaccine there could be a residue of susceptibles of sufficient number to maintain transmission of measles in the community.

The success of the immunisation programme in the USA has been largely due to the “no shot–no school” policy and with the changing age incidence of measles the further requirement of immunising teenagers who had escaped immunisation as children. In the USA the programme has been pursued with energy and efficiency which has resulted in a decline in deaths of measles complications. The commonest CNS complication is encephalitis which is said to occur in about 1:1,000 cases, but this depends on the definition of “encephalitis” and the prevalence may be less. In referring to the review of the world literature in 1956 by H. Miller et al quoted by Bloch et al, chapter 1, an estimate of 4–7 days from onset of rash to onset of encephalitis is noted. In this estimate, while the great majority of cases (86%) had an onset in the first week, in a number of cases the latent period was much longer. These late onset cases represent post-infectious encephalitis with a pathology like allergic encephalitis while most cases are acute viral encephalitides with a pathology like that of any other acute viral encephalitis and indeed measles-like inclusions can be demonstrated in brain cells and measles virus isolated from the CSF of acute encephalitis cases by conventional culture and from brain tissue by co-cultivation. I therefore would not support the suggestion of Johnson and Griffin in chapter 2 that the pathology of measles encephalitis represents an auto-immune disease.

In general about one third of patients who develop measles encephalitis die and about one third have neurological sequelae the most common of which is mental retardation. The effect of the measles vaccination programme on the incidence of measles encephalitis in the USA is obvious as is also the virtual disappearance of subacute sclerosing panencephalitis. What about other countries? As Dr. Krugman points out in chapter 3, the acceptance of measles vaccines is low when the dangers of the disease are underestimated and when vaccination dangers are overestimated. This is the situation in the UK. While improved standards of living and smaller family size have been the main causes of the reduction in measles mortality since the beginning of this century, the neurological complications remain a serious problem; this does not seem to be appreciated by many doctors and parents. Unfortunately the memory of a few neurological complications associated with an early batch of measles vaccine overshadow the hundreds of serious complications associated with the disease. In most European countries, the immunisation rates are even worse than in the UK.

This book clearly presents the picture of what must be done to achieve high rates of immunisation and effective surveillance. In the UK we must “get our act together” and continue to educate parents, physicians, nurses and administrators; politicians will discover from chapter 10 the savings which can be made by an effective measles immunisation programme; thus in the USA in 3·5 million susceptible persons, the cost in 1981 was over 745 million dollars without an immunisation programme compared with about 51 million dollars with one.

The control of rubella presents a more difficult problem. The diagnosis and the reporting of this disease are probably not very accurate in most countries, but they do show trends and patterns of the disease. There is little information on the frequency of CNS complications of acquired rubella and although Orenstein et al (chapter 5) note that in one study the encephalitis-to-case ratio was 1:5,000, the underdiagnosis of rubella infection probably makes the true ratio very much less but furthermore there are no uniform case definitions nor commonly applied laboratory methods for confirmation of the disease. However, the major problem caused by rubella is the congenital rubella syndrome (CRS) on which there are reasonably good data from the National Congenital Rubella Registry (NCRSR) in the USA and the National Congenital Rubella Surveillance Pro-gramme (NCRSP) in the UK. This book lays down clear guidelines on the diagnosis of confirmed, compatible and possible cases of CRS and discusses the epidemiology and the associated central nervous system symptoms which include hearing impairment, microcephaly, mental retardation and cerebral dysfunction; the ages of onset of these conditions are very variable. Deafness, blindness and behavioural problems are the most common sequelae of CRS and many infected children are both deaf and blind. In one study half of the infants would have been considered normal at birth. Koplan and White have again calculated the effect of rubella vaccination on costs of disease and vaccine in 3·5 million susceptible persons for 1981 in the USA which shows that the cost of a vaccination programme is about 55 million dollars compared with 612 million dollars with no vaccination.

Acquired rubella and CRS can be prevented. The strategy in the USA depends on childhood immunisation in order to interfere with the transmission of the disease; in the UK vaccine is offered to prepubertal girls to protect a future foetus. Both programmes have their problems and both require reinforcement by the immunisation of susceptible non-pregnant young adult females. The various strategies and their implementation are discussed in detail and should help in determining future immunisation policies.

I used to think that compulsory immunisation was a “bad thing”, but I now believe that we should follow the lead of the USA and make evidence of completed immunisation a requirement for school, college, workshop and university entry. After all, we have legal requirements for seat belts, crash helmets, etc why not for immunisation? I can hear a voice saying “this is interfering with individual freedom”, but surely it gives greater freedom for individual and community health. Any such compulsory scheme would require escape clauses for conscientious objectors and could also contain a “no fault clause”, as in New Zealand, to cover any untoward vaccine accidents and if one did occur automatic acceptance in a scheme such as the war disability pension scheme as is done in Germany.

One of the stumbling blocks in achieving high rates of acceptance of vaccines in the UK and elsewhere, is the uncertainty of physicians, nurses and parents about vaccine complications. It is unfortunate that space was not given to providing assurance of the relative safety of measles and rubella vaccines, particularly in children with neurological problems.

This is an excellent book which is brief,
but comprehensive and is written by world experts. It is provided with a wealth of appropriate and readily understood graphs, tables and references. It has four chapters on measles, five on rubella and five on general immunisation policy issues with a foreword by Gruenberg who has been a very good editor of a multi-author book; but I wondered who wrote chapter 1 on the Epidemiology of Measles and its Complications which has 20 pages one quarter of which are taken up by diagrams and tables but has eight authors!

I can heartily recommend this book to all health workers and to administrators and politicians who will be given a clear exposition of the problems relating to the control of measles and rubella and of the interaction between clinicians, laboratory workers, epidemiologists, other health workers and the politicians which is necessary to make immunisation for all children in the world at least an aim, if not a reality, by the year 1990.

GEORGE DICK


Regeneration and plasticity of the nervous system is not a generally recognised phenomenon particularly within the brain. Neuronal membranes contain high concentrations of nerve growth factors known as gangliosides but these are not thought to act once maturation of the nervous system has occurred. However, the Neurobiology of Gangliosides contains a series of papers detailing the ability of these substances to stimulate neuronal growth and sprouting and to be of use in the regeneration of damaged brain areas.

Initial chapters deal with the biosynthesis, isolation and characterisation of gangliosides. Subsequent contributions show the ability of ganglioside preparations to stimulate neuronal growth and repair in a variety of cell lines. This is followed by details of the biophysical interaction between gangliosides and membranes. All of these parts of the volume are highly specialised and serve to introduce the applications of gangliosides to central nervous system repair.

One component of the ganglioside mixture extracted from neuronal membranes namely, the monosialoganglioside GM-1 appears particularly useful in brain regeneration. GM-1 applied exogenously may be incorporated into neuronal membranes and induce neurite growth. This material features in later chapters as capable on peripheral administration of inducing neurochemical and behavioural restoration of deficits induced by experimental lesions of the brain. Indeed, a double blind study of the effects of GM-1 in stroke are contained in a later chapter suggesting beneficial effects.

It seems evident at first sight to accept that the peripheral administration of gangliosides can induce a regeneration of the adult central nervous system. However, the evidence is compelling, but readers must judge for themselves. Overall, an interesting and specialised volume to be recommended to those involved in this field.

P JENNER


In the six years since the first Magnetic Resonance Imaging (MRI) studies of the head there have been dramatic improvements in the technique for imaging the body in general and the CNS in particular. The number of MRI facilities continues to grow and as it does so this will alter the practice of clinical investigations as well as remaining a research instrument.

This book provides a useful introduction to clinical MRI and covers the fundamental principles of Nuclear Magnetic Resonance (NMR) and the constituent parts of the MRI system. The format of the book is straightforward and the order logical with each chapter following on from the one before, beginning with the physical principles, covering the machinery and instrumentation and finally the clinical imaging and its application. More than half the text is concerned with general principles and the second half addresses more specific aspects of imaging in various parts of the body.

Although the theory of NMR is not difficult to grasp at a basic level the principles involved in the manipulation of the NMR signal for image production are complex for those untrained in physics. In particular two dimensional Fourier transformation, frequency encoding and phase encoding of a sample may be new areas for the clinician and these are explained usefully and clearly by means of text and diagram.

Some of the most difficult aspects of MRI for the uninitiated are the mechanisms of generation signal and contrast in the image. Contrast and relative signal intensity from the various parts of the image are difficult to predict because there are several parameters which determine the signal intensity: most notably the proton density and the relaxation times T1 and T2 of the protons in any given area. Furthermore, there are several possible imaging sequences, the most widely used being saturation recovery, inversion recovery and spin echo. The appearance of the image (relative signal intensity from the various areas within the image) is different for each of these as they have different dependence on the three main imaging parameters. The inversion recovery sequence is usually made T1 dependent and the spin echo is usually more T2 dependent although all of the imaging parameters will contribute to the signal intensity in each of the three sequences. The relative signal intensity from a given area with any one of these sequences can be markedly altered by altering the timing intervals within a given pulse sequence. This book goes some of the way to explain these concepts and enabling some predictions to be made about the optimal pulse timing intervals for imaging various tissues. The issue is, however, complicated further in that the optimal pulse timing intervals will vary between systems operating at different magnetic field strengths.

The book partly explains these problems of clinical imaging but unlike many of the other aspects the book covers this particular angle would benefit by further examples of clinical images.

Although most of the introductory text on MRI include sections on the equipment and the magnets this is often superficial to the needs of the clinician and of much less interest than the images themselves and this point is certainly not laboured in this book which is very much to its advantage. Similarly, only the clinically relevant aspects of site planning and of the MRI environment are discussed with particular reference to imaging artefact and the safety of patients and personal effects.

Clinical imaging of the nervous system is discussed as this was one of the first areas in which MRI was found to be useful. MRI possess certain technical advantages over CT x-ray scanning, in particular the absence of known bio-hazard, the ability to obtain direct coronal and sagittal images and the absence of bone artefact make it particularly suitable for imaging the CNS. It is in the areas in which CT scanning has had the most difficulty that MRI is the most useful. In demyelinating disease, lesions in the poste-