contains. It should obviously be on the shelves of every biological library, since no biologist can escape from genetics today. Dipping into it makes one aware how thinly genetic knowledge is spread over the living world, and leaves one convinced that the total genes yet named or identified (surely less than 10000), and the 3–4 million nucleotides sequenced add up to only a bucketful in the lake – and this is good news for those who can still lay their hands on money for research. The book is also of value in enabling one to find out quickly what the boys and girls in the other back rooms have been doing.

I hope we can look forward to the next volume in 1986, though it will need even more of the Seville spirit than this one. If it goes into production, may I offer a few suggestions to the editors and contributors; (i) it would be very helpful for page shufflers to have the name of the organism given on each page. (ii) there are a number of organisms with developing (or complete) gene maps which might find a place: phage Mu (which I sadly missed), phage T7 (with its complete genome already sequenced), perhaps P22, a few more Enterobacteria such as *Klebsiella* (an early map badly needs up-dating before it is published) and possibly *Erwinia* (interest in growing on certain species), *Physarum polycephalum* to set against *Dictyostelium discoideum* (the Physarians claim *Dictyostelium* is not a true slime mould), and even other species of Drosophila. (iii) I would have found a little more text with each organism helpful, particularly if it gave some information on related organisms not included and where one could look for genetic data on them. This would help those who wanted a wider view of, say, bacteriophage genes. For example, the complete nucleic acid sequences of f1, fd, g4, m13 and ms2, and t7, as well as the listed lambda and phiX174, are available. As a footnote, I met a few puzzles when looking through the Genbank Database list. Where is influenza virus? Ah, of course, it is coded under 'fl' for flu! Under bacteria, I found sau (clearly *staphylococcus aureus*), sdy (*Shygella dysenteriae*) and sma (*Serratia marcescens*), but I was stumped by *S. pneumoniae* and *S. fradiae*. Perhaps if you ask the computer it will tell you what these organisms are. Or perhaps everyone else knows.

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Modern Approaches to Vaccines. Edited by ROBERT CHANOCK and RICHARD LERNER. Cold Spring Harbor Laboratory. 1984. 500 pages (approx.). $52.00 U.S.A. $62.40 elsewhere. ISBN 0 87969 165 4

This book is the product of a meeting held in Cold Spring Harbor in 1983, which was to be the first in a series of meetings discussing modern approaches to vaccines. This first meeting aimed to cover the topics of the molecular and chemical basis of virus virulence and immunogenicity. The sixty-six papers presented at the symposium are reproduced in the book, thus bringing together in a single volume a timely commentary on the evolving concepts of viral immunogenicity and on the applications of recent advances in biotechnology to the production of viral vaccines. A rapid leaf through the pages encourages the reader to a sense of great optimism for a future in which safe and effective control of viral infection will be based at last on scientifically proven principles of virus virulence and immunogenicity.

The headings of the five sections into which the presentations are divided indicate the attempted plan of the conference proceedings, but there is overlap and repetition between sections and three papers on bacterial vaccines have been included. As might be expected the largest number of papers are presented in Section 3 which covers the topics of Cloning and Expression of Viral Genes. Papers on picornaviruses (poliovirus and foot and mouth disease virus, FMDV) Hepatitis B virus and influenza virus appear regularly throughout the book, but other important virus infections for which effective vaccines are also desperately needed are given less prominence although there are four papers each on rabies virus and herpes simplex virus.

Nine papers in the first section aim to illustrate current approaches to the study of 'Virus Structure and Function'. Not surprisingly, the first paper presents the three dimensional structure of the influenza virus which must now be accepted as the classic work relating alteration in virus structure to virus antigenicity. The sequence relationships among the genes of the three reovirus subtypes which is the topic of another paper in this section demonstrates that although the sequences have diverged greatly between the three serotypes the tertiary structure as determined by computer analysis is remarkably similar so that function, particularly that of tissue tropism, is conserved. Studies on the molecular basis for the antigenicity of poliovirus and the immunogenicity of purified measles virus peplomer components are also included in this first section. Gene cloning techniques applied to respiratory syncytial virus and to rotaviruses should very soon lead to the identification of antigenically significant regions of these medically important viruses. The study of the genome of hepatitis A (HAV) virus has been slow because of the limited host range of the virus, nevertheless HAV RNA for molecular cloning has been purified from livers of experimentally infected marmosets, a tremendous achievement which is described in the last paper of this section.

Section 2 is headed 'Chemistry of Virus Neutralization'. Papers in this section describe how the amino acid sequences of important neutralising antigens have been deduced. This has been achieved by a combination of methods such as the comparison of amino acid sequences of viral antigens that had undergone antigenic change in nature (influenza A, FMDV) or on sequence analysis of viral mutants selected to resist neutralisation by monoclonal antibodies (influenza A and poliovirus). The work described progressed from amino acid sequencing to the production of synthetic peptides which were used as vaccines.The success of the early FMDV synthetic vaccines is familiar but other papers present the varying degrees of success achieved by synthetic vaccines prepared against poliovirus, hepatitis B virus (HBV), Herpes simplex virus, influenza virus, rabies virus and cholera toxin.

In the third section of the book the expression of protective antigens of a wide range of viruses both in prokaryotic and in eukaryotic cells is described. The eighteen papers are written in the jargon of the enthusiastic super specialist so that it is difficult for the motivated amateur to unravel the truth. However, similar conclusions are reached following identical manipulations with different viruses so that even the uninitiated emerge from this section clutching several impressions. Firstly, that antigen expression in prokaryotic hosts does not look very promising at this time since some proteins are produced but rapidly degraded, or show toxicity to the host, or are not immunologically active. More success has been achieved by the use of eukaryotic hosts such as yeast cells or a continuous line of mammalian cells. The detail of genetic manipulation that is described in this context is quite fascinating to the non-geneticist who can resist being totally 'switched off' by the jargon.

In the next section there is much more variation of subject matter under the heading 'Alteration of Virulence'. Alteration by deletion mutation, by gene reassortment and by selection of avirulent mutants selected with neutralizing monoclonal antibodies are some of the techniques described. The controversial use of vaccine virus recombinants expressing foreign genes as immunization agents is the topic of three papers. The surface antigen of HBV (HB_sAg), Influenza HA and HSV antigens have been expressed in vaccine virus and are immunogenic in animals following vaccination. Not one of the three papers refer to the complications which were associated with vaccination in the past and none asked whether this procedure would be useful for only one vaccine regimen since thereafter the vaccinee would be immune to vaccinia and a second foreign antigen would not be amplified by replication of the carrier virus.

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