the topics of chapter eight. Chapter nine consists of a discussion of Minkowski's convex body theorem and its applications; here, a particularly notable feature is the author's derivation of the elegant Siegel formula. Characters, L-functions and Dirichlet series are introduced in the tenth chapter, and Dirichlet's celebrated theorem of 1837 is proved on the existence of primes in an arithmetical progression; this pioneering work is usually regarded as the genesis of analytic number theory. The final chapter is devoted to a proof of the prime number theorem using the Wiener–Ikehara argument.

There are full references to associated literature in the notes on the chapters at the end of the book and there is also a brief bibliography; but many other works might appropriately be listed here and, in particular, Davenport's *The Higher Arithmetic* and Prachar's *Primzahlverteilung*. The references serve to guide the reader to newer pastures beyond the essentially traditional terrain of the main body of the narrative. A. BAKER

LOCAL THERMODYNAMICS

Introduction to the Thermodynamics of Charged and Polarized Layers

By A. Sanfeld. (Monographs in Statistical Physics and Thermodynamics, Vol. 10.) Pp. xxiv+258. (Wiley: London and New York, December 1968.) 90*s*.

THIS book deals with two main topics: the development of the local thermodynamic method to deal with systems where there is a high electric field, and the application of this method to the problem of the diffuse double layer originally worked out on a much simplified model by Gouy and Chapman.

The advantage of the local thermodynamic method, as of more conventional thermodynamics, is that general, formal relations between observable properties can be derived. In the application to microscopic regions where there is a high field, this method has the great disadvantage that to obtain useful results experimental data are necessary for the effect of field or of ionic strength on the permittivity, and the like. These data must be obtained from experiments on bulk phases and extrapolated to the conditions of the charged layer. This extrapolation is often quite uncertain, as can be seen from the discussion on pages 93–94, for example. It can be argued that this approach is the best available until a rigorous statistical mechanical treatment of a realistic model is possible. The answer to this must be in a comparison of the predictions with experiment. Sanfeld claims (page 244) that his purpose has been to see what a purely thermodynamic study can achieve with the minimum number of hypotheses and "by making a direct comparison between the calculated and observed phenomena". A major criticism of this book is that this comparison is far too limited, especially in view of the quite large amount of experimental data now available. The only quantitative comparison is given on pages 118–119, and this makes use of experimental results of a type in which variation of the diffuse layer properties have the minimum effect on the measured properties. Brief mention of experimental results is made on pages 121 and 149, but here there is no attempt at any quantitative use of the theories proposed here.

A particularly interesting and novel approach concerns the discussion of orientation of molecules at the interface, but again there is no attempt to relate this to experimental work even though several systems have now been thoroughly studied where there is clear evidence for orientation dependence on double-layer field; for example, pyridine, p-toluene sulphonate.

The style in which the book is written is at times irritating in that cryptic references are made to work which is not sufficiently described for the reader to know what it contains; for example, page 177, "Using equation (15.21) Joos[35] obtains interesting results about the Gibbs' formula". Equation (15.21) is an expression for the chemical potential in an ideal uncharged monolayer, and reference 35 is a private communication! This, together with the odd "remarks" which are interposed and the totally irrelevant chapter 18, suggests that the structure of the book has been insufficiently thought out.

Professor Prigogine suggests in his preface that this is a book to last. As an exposition of the theoretical method of local thermodynamics this book may stand the test of time, but it does not provide a convincing practical justification of these methods. ROGER PARSONS

MEMORIAL TO A PHYSICIST

Spectroscopic and Group Theoretical Methods in Physics

Racah Memorial Volume. Edited by F. Bloch, S. G. Cohen, A. De-Shalit, S. Sambursky and I. Talmi. Pp. x+462. (North-Holland: Amsterdam, 1968.) 168*s*.

THIS is a collection of papers by Racah's colleagues, friends and pupils, published as a tribute to his memory. (He died in 1965, at the early age of 56.) I am usually not very enthusiastic about the publication of volumes such as this; it seems to me that the usefulness of such a book is apt to be in inverse proportion to the range of interest of the man who inspired it, for as the range of subjects increases, so the proportion which is useful to any one reader decreases. One understands the authors' wish to honour the memory of their friend and teacher, but in my view the scientific value of the material is diminished if it is presented in this way.

This said, it must be admitted that the present volume is not as much of a hotch-potch as I had feared. The twenty-five papers do range from an essay on the relation between magic squares and 3-j and 6-j symbols, through various topics in nuclear physics, to atomic spectroscopy and a study of Yb^{3+} in a cubic crystal field; but they are held together very firmly by their common theme, which is the study of the properties and applications of Racah coefficients and related group theoretical techniques. Rather more than half the papers are more or less directly concerned with nuclear and elementary particle physics, and several more deal with related group theoretical and quantum mechanical problems. When one adds that the list of contributors includes names like Wigner, Fano and Regge, it will be apparent that this is a book which most theoretical physicists will want to have in their libraries, if not on their own shelves. I still regard eight guineas as a lot to pay for a book, but unfortunately it is not out of line with current prices for books of this type.

Of the fringe topics, it is worth mentioning an article on the atomic photoeffect, by Rakavy and Ron, and an account by Goldschmidt of the very difficult problem of interpretation of rare-earth atomic spectra. In a book which is predominantly concerned with nuclear physics, such papers are likely to be overlooked.

I am not impressed with the index, which is very brief. Finally, I think it would have been appropriate to include a short biography of Racah, and a bibliography.

A. J. STONE

SELECTIVE ELECTRONICS

Solid State Electronics

By G. Fournet. Translated by Scripta Technica. English edition edited by S. Chomet. Pp. 311. (Iliffe: London, 1968.) 70*s* boards; 38*s* paper.

IT takes some courage these days to publish a book on solid state electronics, because the available literature is plentiful. This is a translation from the French of a book