takes a worldwide perspective, the papers are almost exclusively concerned with Asian Russia. They are typically brief, almost abstract in form. Their heavy emphasis on pure zoonoses contributes to the fields of comparative medicine and veterinary parasitology. For those interested in diseases important to man outside of Russia there is little meat, and the collection of papers is important chiefly from the standpoint of medical intelligence; that is, it provides a miscellany of minor factual information and illustrates the scope of interest of, and approaches taken by, a segment of Russian epidemiologists as of 1959. This volume probably should be available in university biomedical libraries, but only readers with highly specialized interests will wish to add it to their personal collections.

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Physics Summer School

Fundamental Problems in Statistical Mechanics II. Proceedings of the second NUFFIC International Summer Course, Noordwijk, the Netherlands, 1967. E. G. D. COHEN, Ed. North-Holland, Amsterdam, 1968 (U.S. distributor, Interscience [Wiley], New York). ix + 338 pp., illus. $11.

This book records the proceedings of a summer school on statistical mechanics held in 1967. It is a successor to a volume containing the proceedings of a summer school held five years earlier. The contrast is interesting: whereas the first school was largely backward-looking, reviewing progress made chiefly in the previous 10 to 15 years, the recent school was far more "up-to-date" and forward-looking. In particular this volume will be valued because of the introductory accounts by Hugenholtz and Ruelle of the so-called C* operator algebra approach to the treatment of statistical systems of infinite extent. This rigorous approach, developed with much fanfare in the last few years, avoids all consideration of the "thermodynamic limit," in which finite but ever larger systems must be discussed. For physicists not versed in modern mathematical terminology the original papers have been hard going. The lectures by Hugenholtz and Ruelle will ease the way, although one regrets that a more extended expository review of all this work was not presented so that nonexperts could more easily assess its significance.

Another new and fundamental area concerns the "divergencies" which have been found in the theory of the transport coefficients of a fluid. Extensive efforts by many research schools had finally led to agreed-upon formal expressions for the density corrections to the thermal conductivity, viscosity, and other properties of a dilute gas. Unfortunately, once a serious effort was made to actually evaluate these higher-order terms (mainly by Cohen and his collaborators) it was discovered that some of the integrals involved were logarithmically divergent. As is explained by Cohen in his lectures, the origin of these divergencies—essentially in multiple collisions in which one or more of the collisions occurs indefinitely far from and later than the earlier ones—is now understood. It is believed that, in contrast to the equilibrium properties of a gas, for which a Taylor series in powers of the density ρ exists (the virial expansion), the correct expressions for *non*equilibrium properties must include terms such as $\rho^2 \ln \rho$, which are not analytic at $\rho = 0$.

The subject of phase transitions and critical phenomena, which has been under increasingly active investigation, is the topic of the lectures by Kasteleyn and Kac (and a shorter note by Jancovici on theories of freezing). Kasteleyn presents a clear and succinct review of many of the recent developments, but in the proceedings as a whole one misses accounts of some of the beautiful work of Griffiths, Dobrushin, Minlos and Sinai, and others on the rigorous proof of the existence of phase transitions, and of the deep thermodynamic analyses of Griffiths, based on convexity properties, which concern the equation of state of a system near a critical point. This, however, is a carping point: one should indeed be grateful for this excellent and well-produced collection (although typographic errors are rather abundant). Potential readers or browsers should note, in addition to the topics singled out above, the general introduction by Uhlenbeck and the contributions by Glauber on photon statistics, by Casimir on Bose-Einstein condensation, by Waldmann on gases with internal dynamics, and by van Kampen on classical plasmas.

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Tooth Decay

Art and Science of Dental Caries Research. ROBERT S. HARRIS, Ed. Academic Press, New York, 1968. xx + 428 pp., illus. $17.50.

This book gives a picture of the present state of dental caries research and of the activity of a number of highly productive workers in this field. It will be an essential part of the library of persons doing dental research and should be read by any dentist who wants to follow advances in science which touch on his art.

During the last decade quantitative bacteriological studies on animal caries, begun at Harvard by Shaw and Keyes, and similar quantitative studies on man, by Stralfors and by Krasse in Sweden, have converged, notably in the work of Gibbons, to give a great increase in the understanding of the bacteria producing dental caries in man. This work is described in Harris' book by the bacteriologists involved in it. The description of the progress of the research and the techniques used is excellent. Because of the specific nature of the polysaccharide-producing microorganisms concerned there is a real prospect of very much improved prophylaxis if the discoveries are exploited. Moreover, the new bacteriology of caries appears relevant to the other important dental condition, periodontal disease.

The bacteria causing caries establish themselves in a "plaque" adhering to the enamel surface and leach out the enamel salts by altering the surface concentration of hydrogen, phosphate, carbonate, and possibly calcium ions. There results a very specific change in the enamel which can be duplicated by exposing enamel in vitro to sterile inorganic solutions. The highly characteristic change can be observed in sectioned enamel with the polarizing microscope and correlates very well with the nature of the penetration of the enamel, the pathways by which the enamel was originally mineralized, and the known activities of the microorganisms involved. The information essential to the understanding of the biochemistry of this aspect of caries is more readily available in the English, Swedish, and German literature than in publications in the U.S. and U.S.S.R. The coverage in the present book tends to be American in approach.

The clearly written articles on the design of conclusive experiments are particularly valuable because, with the understanding of mechanisms now