the numerical code to accommodate new entries will surely be necessary by the time of the next edition. It is to be hoped that revised editions will be forthcoming at frequent intervals.

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Modern Physics for Students

Atomic and Nuclear Physics. DEREK L. LIVESAY. Blaisdell (Ginn), Waltham, Mass., 1966. 539 pp., illus. $10.50.

A Collection of Problems in Atomic and Nuclear Physics. I. YE. IRODOV. Translated from the second Russian edition by Stevan Dedijer. S. Doniach, Translation Ed. Pergamon, New York, 1966. 249 pp., illus. $9.50.

The course in modern physics has been for some time a standard feature of the undergraduate physics curriculum. Compared to the texts of a decade or two ago many of those now available are considerably more sophisticated in their presentation. Much of the material that was once presented in graduate courses has now been inherited by a senior or even a junior course. This "hardening" is natural. After all, the subject has grown considerably. New concepts and principles have been developed, new areas of investigation even in relatively old and exploited fields have been opened up. Our understanding of older concepts has deepened, and much that was once difficult has with time become both clear and "obvious." In addition, our first-year students arrive with greater resources of knowledge and technique. They know quite a bit of modern physics and are very eager to learn more. It would be a pity, of course, if the increased sophistication of today's modern physics courses was achieved simply by introducing more complication. It is more desirable, but much more difficult, to deepen the content of the course and yet in some sense keep it simple.

Atomic and Nuclear Physics covers the standard set of topics. Perhaps there is more material than usual on the quantum theory of solids. In addition, being the latest book, this one treats, in the chapter on particle physics, the various mesons and hyperon properties. But quantum mechanics, relativity, the atom, the nucleus, and so on—the traditional topics—are all included as well. The level of difficulty is intermediate. The Schroedinger equation, for example, is solved for various bound state situations, but very little attention is paid to a quantitative theory of scattering. The treatment is straightforward, in some places almost to the point of bluntness, although on occasion comparatively subtle points are uncovered. The gain in this style is the comparatively fast pace of the discussion. The material is there. The presentation is clear. It is left to the instructor to refine it, to deepen and broaden it, to point up what is profound. The production of the volume cannot be faulted. The page size is large, the type clear and legible and uncrowded.

The volume by Irodov contains some 850 problems, together with answers and hints for solution. The problems are broken up into chapters covering the usual modern physics material. Each chapter is preceded by a short but by no means complete list of fundamental concepts and formulas needed for the solution of the problems.

The problems are more or less standard in type. One would find similar problems at the end of the chapters of most textbooks on modern physics. There are a few problems in each chapter which essentially verify that the definitions of the symbols in various formulas have been understood. There are some problems that can be used to review a given topic. Not many of the problems require a great extrapolation of concepts to new or novel situations. There are no problems on scattering or reactions besides Rutherford scattering and various kinematic calculations. The problems in nuclear physics are few and quite elementary. The answers for the more complex examples seem to be sufficiently detailed.

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Avian Population Dynamics

Population Studies of Birds. DAVID LACK. Oxford University Press, New York, 1966. 247 pp., illus. $10.10.

There is little doubt that bird populations are regulated by density-dependent factors. Not only does the availability of food appear to be the ultimate factor regulating population size in most birds, but at least in many species it appears to be the proximate factor. In *Population Studies of Birds*, David Lack examines in the light of recent studies the theme of his earlier book *The Natural Regulation of Animal Numbers* (Clarendon Press, 1954; now out of print). The present book considers in critical detail work on birds which has appeared since 1952 and which does not duplicate the 1954 effort. Whereas the 1954 book included material on invertebrates and on vertebrates other than birds, the new one deals entirely with population studies of birds. Lack presents the pertinent material from 13 major studies, each of at least four years' duration and consisting of substantially more than an annual census, and from 11 minor studies, each relevant to a major study. The species included are 13 passerine birds, representing insectivorous, graminivorous, and fungivorous forms, and bigamous, promiscuous, and colonial species in addition to the more commonly treated monogamous, solitary nesters; eight other land birds, nearly all territorial nesters, some vegetarians and some carnivores, with nidicolous and nidifugous forms represented; and four sea birds, all colonial, including both inshore and pelagic species.

Eleven of the 13 major studies were done by British workers—nine in Britain and two in the tropics. None of the major studies was American, although four of the five major studies included in the 1954 book were done in North America. This bias in coverage reflects a paucity of such work in the Americas since 1952, not the author's choice.

Lack's decision to restrict the book to birds has permitted him to write in greater depth. He has been successful in baring critical, often limiting, factors for inspection. In summary of his present views he states "(a) that the reproductive rates of birds have been evolved through natural selection and so are in general as rapid as the environment and the birds' capacities allow; (b) that mortality rates balance reproductive rates because bird populations are controlled by density-dependent mortality; (c) that starvation outside the breeding season is much the most important density-dependent factor in wild birds (but not necessarily in other animals); (d) that breeding birds are dispersed broadly in relation to food supplies, through various types of behaviour which are as yet little understood, but which are to be explained by natural selection."

It is apparent that Lack finds food