



Angular Momentum

By D. M. BRINK and G. R. SATCHLER. The quantum theory of angular momentum is here introduced to students unfamiliar with it, and developed to a stage useful for research. Part one contains the basic theory of rotations. Part two emphasizes its application to phenomena, states difficult theorems without proof, and presents a collection of results which will be helpful in solving problems. *Oxford Library of the Physical Sciences*. \$2.40

Eddington's Statistical Theory

By C. W. KILMISTER and B. O. J. TUPPER. The authors concentrate on the first five chapters of Eddington's posthumously published *Fundamental Theory*, a difficult book which has long defied efforts at understanding. To these chapters, in which Eddington relates certain numerical properties of scientific descriptive methods to fundamental constants of nature, they give a detailed, section-by-section examination and assessment, showing that correct theory of this type is possible. 4 text figures. \$3.40

Geodesy

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By BRIGADIER GUY BOMFORD. In line with progress in the field since publication of this book in 1952, much new material has been added to this edition. The volume emphasizes points usually omitted from elementary texts. Contents include: triangulation, bases and primary traverse, computation, heights above sea level, gravity and geophysical surveys, and the earth's figure and crustal structure. Fresh material is offered on artificial satellite use, geodetic computations, the reduction of gravity observations, and electronic distance measurement. 179 text figures. \$14.40

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By W. H. THORPE. A distinguished authority on animal physiology and psychology surveys our knowledge of the "creative" element in evolution: what would seem to be the progressive emergence of a sense of morality and value in the evolution of the mind. From a discussion of the similarities of man's thought and moral sense to certain activities of complex forms of animal life he leads into a consideration of various philosophical problems arising from these, including the possible nature of immortality. \$2.00

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contact between mother and young. Experiments with maternal (broody) hens (R. A. Majer, *J. Comp. Physiol. Psychol.*, in press) indicate that, if a broody hen is prevented from having physical contact with chicks while other cues are left intact, the hen's broody response quickly dissipates.

It is possible that the fear response hypothesized by Scott and the physical-contact variable interact to bring about a normal termination of the mother-young relationship in chickens. For example, as the chicks become relatively large the hen may show a fear response and avoid them as she does other large (adult) birds, thus terminating the period of physical contact. Lack of contact could reduce the maternal hormone level, bringing about a break-up of the maternal response.

The biological significance of such negative mechanisms is clear: without termination of one maternal relationship, other relationships, notably sexual relationships, may not commence.

RICHARD A. MAIER
Loyola University, Chicago, Illinois

Civil Defense

A potential enemy will surely perceive civil defense moves of the type advocated by A. W. Bellamy [*Science* 138, 958 (1962)] in their strategic context. Regardless of our intent, the principal strategic effect of civil defense will be not to increase the chance of preventing all-out war but to perpetuate the "policy-backing" role of our offensive forces as a mechanism for threatening the enemy. For without civil defense our threats of massive retaliation, or of similar reaction incommensurate with provocation, acquire the nature of an embarrassingly transparent bluff.

The latest form of threat, known as the "no-cities" policy, makes obsolete Bellamy's statement that "there is general agreement that such an attack would result in heavy damage to the nation's industrial plants. . . ." According to the no-cities mythology, we can safely threaten to strike first ("pre-emptively") by planning an antiseptic attack on the enemy's offensive military forces alone, leaving his cities untouched. Being rational and a good loser, our opponent will retaliate in an equally antiseptic manner. Our superior force will then "prevail," thus justifying our pre-emptive action and the posture and

policy of threats that lay behind it. This fairy tale would be amusing were it not the crucial substance of Defense Secretary McNamara's Michigan speech and the unspoken rationale behind the United States' current strategic stance and the composition of its armed forces for all-out war. On 22 October President Kennedy's Cuban-crisis threat of "full retaliatory response" to lesser provocation made explicit the pre-emptive-threat basis of U.S. strategy, in keeping with his advocacy the previous year of U.S. civil defense as the answer to the Berlin problem.

What advocates of the "defended posture" habitually forget is the technological versatility of the offense in reshaping its policy. Preparedness is met by counterpreparedness. If the U.S. seriously prepares itself for the Office of Civil Defense Mobilization's 2 weeks of shelter occupancy, apparently endorsed by Bellamy, the obvious enemy response is to prepare for a long war (for example, by insuring relative invulnerability of his striking forces through designing them for mobility and concealment). If food and petroleum are to be stockpiled above ground, they become targets for high-yield thermal weapons. If crops are, as Bellamy believes, not seriously threatened by fallout, they can be attacked by specific anticrop agents. If neutral nations are to be called on for assistance in post-attack recovery, they can be subjected to nuclear blackmail. And so on; offense readjusts to meet defense. It remains true that there is no place to hide.

In view of the possible penalties to a policy of deterrence—the forcing of the arms race that would result from our opponent's inevitable search for measures with which to counter our disaster "insurance"—it seems unprofitable to make even the first moves in this game, unless possibly it can be demonstrated that those moves would exert strong economic leverage such that a small investment in defense on our part would necessitate a large compensatory outlay on the part of the opponent. Bellamy has attempted no such demonstration. Nor has he attempted an analysis of the relative time scales for developing defensive measures and offensive counter-measures. He has failed to recognize the strategic implications of his recommendations, which are based, apparently, on behavioral considerations.

Both the aggressively threatening humanitarianism of the no-cities policy and the curatively threatening humani-

tarianism of the "defended posture" should receive short shrift from scientists or laymen oriented toward genuine humanitarianism. To love people and to respect their values is to think in terms of prevention, not of cure. As Bellamy's article and the rest that has been written on civil defense confirm, the belief that one can think both ways is subtly delusive.

T. E. PHIPPS, JR.

*Research Department,
U.S. Naval Ordnance Test Station,
China Lake, California*

Phipps illustrates well the controversial muddles that have beset nonmilitary defense policy-making and planning from the beginning. In making assumptions about enemy intentions and an enemy's reactions to our several security measures, he seems to miss the main point and purpose of my article.

In accepting the federal intent to create a civil defense system I attempted to outline a neglected and necessary part of that system and noted that "systematic study, by experts, is required to advance these proposals to the implementation stages." A main point of the article is that as long as there is federal determination to create a civilian defense system with survival potential, the system should be complete in both its short- and long-term aspects. I did not attempt to instruct the State or Defense Department on how it should respond to possible Russian reactions.

Phipps notes that "regardless of our intent, the principal strategic effect of civil defense will be not to increase the chance of preventing all-out war but to perpetuate the 'policy-backing' role of our offensive forces as a mechanism for threatening the enemy." Historians may one day record the extent to which an adequate civilian defense or the lack of it does or does not act as a deterrent or as a "mechanism for threatening the enemy." In my opinion the time is past when hypothetical enemy reactions to our postures and actions should be permitted seriously to affect our national interests, security measures, and countermeasures. I have no doubt that an "enemy will surely perceive civil defense moves of the type advocated. . . ." So what?

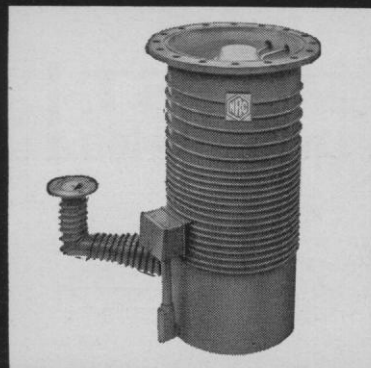
I am gratified that Phipps has taken time to read the article but disappointed that he neglected the main point and made no constructive criticism.

ALBERT W. BELLAMY
University of California, Los Angeles

15 FEBRUARY 1963

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