

hydrostatics; speed paradox resolved; inertial experiment and trajectory."

Perhaps the most important result of Drake's examination is his proof that virtually all of Galileo's work in kinematics, published in 1638 in Days III and IV of *Two New Sciences*, had been completed by 1609, when his telescopic discoveries got him involved in astronomy, and that most of that part of the book had been written by the time the *Dialogue* of 1632 was published. The significance of this is that the latter book is thus shown to be Galileo's synthesis of physics and astronomy, and a defense of Copernicanism grounded on the second of his "two new sciences," rather than an incompletely thought-out espousal of Copernicanism. With respect to methodology, Drake documents at least two important qualities that augment the traditional view of Galileo as a keen observer, ingenious experimenter, and mathematical interpreter of nature: one is interest in and success with predictions, and the other is an engineer mentality. Galileo's predictive prowess showed itself primarily in connection with positions of Jupiter's satellites and the appearance and disappearance of Saturn's rings, predictions concerning which were sent by letter to acquaintances and were usually confirmed. His engineering frame of mind becomes evident from Drake's discussion of Galileo's construction of such instruments as the calculating "sector," the microscope, and the thermoscope (besides, of course, the telescope) and of the reports he frequently was asked to make to his employer (the Grand Duke of Tuscany) concerning various projects and problems of civil engineering.

The most controversial issue the book is likely to raise concerns what I shall call the philosophical question. Drake explicitly asserts in the preface that he wants to avoid discussion of the "philosophical implications" of Galileo's scientific work. This he does partly for temperamental reasons and partly for what I cannot refrain from calling philosophical reasons. He justifies his approach by reference to Galileo's view (with which he expresses agreement) that science and philosophy are distinct, and that hence one may engage in the former without engaging in the latter. The case, of course, depends on what is meant by the terms.

By "science" Drake usually means the study of questions that can be decided by "sense experiences and necessary demonstrations," and by "philosophy" the study of those questions that cannot be so decided. This view provides Drake's rationale for avoiding the

philosophical question in favor of staying as close as possible to the texts, documents, and evidence of Galileo's scientific work and developing the theme of "Galileo at work" to which the book's title calls attention. Other times in Drake's usage "science" refers to the investigation of physical problems and "philosophy" to speculation on metaphysical topics. Here I think Drake is completely right when he emphasizes that Galileo did not engage in metaphysics.

A qualification is in order concerning the type of "philosophy" that is most likely to come to mind in a scientific context, namely philosophy of science, meaning considerations about the nature, aims, and methods of scientific knowledge. Drake's book documents that Galileo frequently engaged in such considerations, mostly in the process of explaining and justifying his scientific ideas in the face of opposition. Thus we have Galileo portrayed as both a scientist and a philosopher in this sense.

In summary, this is a timely book for scientists interested in their roots, an epoch-making book for the quality and thoroughness of the documentation, and a provocative one concerning the "philosophical implications" which Drake refrains from discussing but which others inevitably will.

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Sex Roles in the Kibbutz

Gender and Culture. Kibbutz Women Revisited. MELFORD E. SPIRO. Duke University Press, Durham, N.C., 1979. xx, 116 pp. \$9.75.

This book originated as the Howard Eikenberry Jensen Lectures presented at Duke University. The published version provides a concise and readable account of the changes that have occurred among women of the kibbutz since Spiro conducted his well-known research of the '50's (see his *Kibbutz: Venture in Utopia and Children of the Kibbutz*, Harvard University Press, 1956 and 1958). He describes the erosion of the early ideals of sexual equality and notes that the hard-won actuality had given way, in 1975, to a division of labor in which most women are engaged in service jobs such as laundry and child care. Men hold the prestigious farm labor jobs. Today few women are engaged in kibbutz governance. Marriage and the family have increased in importance, although both institutions

had been regarded by the "pioneers" as obstacles to the collectivist spirit and to the emancipation of women. There has been a "return from radical feminism to femininity" (p. 44). A beauty parlor now operates within the kibbutz studied by Spiro. Spiro describes these changes in some detail, using data from his fieldwork of 1950 and 1975. Has this sexual counter-revolution been imposed on the young "sabrá" women of today? Quite the contrary, according to Spiro. Not only has the definition of equality been changed from one of "identity" to one of "equivalence," the women themselves are content to view their present condition as more "natural." The problem of female discontent, which Spiro identified in 1950, remains not because women are denied equal access to all jobs within the collective but because of the restricted opportunities available to both sexes in any small, rural community.

Unlike similar reports by Talmon-Garber (*Family and Community in the Kibbutz*, Harvard University Press, 1972) and Tiger and Shepherd (*Women in the Kibbutz*, Harcourt Brace Jovanovich, 1975), Spiro's report examines the roots of this counter-revolution with reference to his own longitudinal data. Many of the individuals he observed and interviewed in 1975 were the children he and his wife studied in 1950. We learn that, although socialized so as to minimize all sex differences except those in dress and personal names, these preschoolers (now grown to adulthood) demonstrated significant sex differences in their behavior, particularly their play behavior.

Unfortunately this important portion of the book is a frustrating mixture of interpretation and data. A lecture format does not allow for digression, but the published version should have included an appendix giving the definition of a "play sequence," telling how many were recorded for each child and for each age group, and giving some information on how the behavior was transcribed and the reliability of the data. No actual frequencies of behavior are recorded in any of the tables; only percentages are given. For example, we are told the girls pretended to be animals in 23 percent of their fantasy play. But how many acts were scored? Is this percentage unique to girls in 1950, reared communally in a setting that minimizes sex differences? No data for any other group but the boys are provided for comparison. In short, the material is not presented with the clarity needed to understand what the scores for each sex mean.

Spiro provides a simplistic five-part division into which "determinants of hu-

man social behavior" (p. 64) can be classified. A variety of possible reasons for the sexual counter-revolution are eliminated on rhetorical rather than empirical grounds, as if the causes of human behavior are indeed finite in number. As Holmes remarked to Dr. Watson long ago, once you have eliminated the impossible, the remaining explanation, no matter how improbable, is indeed your solution. The solution is contained in the play behavior of 41 preschool kibbutz children in 1950, who in spite of an up-bringing that minimized such differences showed persistent sex differences in their play. The latter presaged the current sexual counter-revolution and are an expression of "precultural motivational dispositions" (p. 89). A sexually egalitarian socialization was not able to counteract these powerful motivational forces. But are such dispositions carried on the already overburdened X and Y chromosomes, or are they acquired by learning? Spiro says either is possible (p. 101).

A further example of "the triumph of human nature over culture" (p. 100) is provided by the sexual modesty that appeared among the sabra pubescent girls in spite of all the efforts to make the sexes feel unselfconscious with each other. One wonders if peer teasing could have been more influential than the sleeping and showering arrangements imposed by the kibbutz elders.

Sex differences in nonplay behavior among the children are also reported, and these bear a remarkable similarity to the cross-cultural findings of Whiting and Edwards (*J. Soc. Psychol.* 91, 171 [1973]). But their study is not cited. On the other hand, the excellent review of the Tiger and Shepherd volume by Kanter (*Science* 192, 662 [1976]) is cited, but the variety of plausible alternative explanations that Kanter suggests for the sexual counter-revolution are ignored.

Spiro states at the outset that the phenomenon of the kibbutz is important "for any theory of human nature and its social and cultural vicissitudes" (p. 4). Further, he suggests that his earlier data were collected at the moment in "the early fifties [that] represents the watershed between revolutionary and counter-revolutionary periods in kibbutz history" (p. 72). Such an auspicious conjunction of time and place should help us out of the mire of the nature-nurture controversy concerning sex roles. Alas, labeling the motivation for certain sex-typed behaviors as "precultural" does not provide a way out. A label is not an explanation.

In spite of shortcomings, this book is a

refreshingly brief, clear description and analysis of some of the changes that have taken place in the kibbutz. Spiro is uniquely qualified to have provided a work of this nature.

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Books Received

Adhesion of Solids. B. V. Deryagin, N. A. Krotova, and V. P. Smilga. Translated from the Russian edition (Moscow, 1973) by Robert K. Johnston. Consultants Bureau (Plenum), New York, 1978. xvi, 458 pp., illus. \$49.50. Studies in Soviet Science.

Advances in Heat Transfer. Vol. 14. Thomas F. Irvine, Jr., and James P. Hartnett, Eds. Academic Press, New York, 1978. xvi, 364 pp., illus. \$34.50.

Advances in Oceanography. Papers from a meeting, Edinburgh, Sept. 1976. Henry Charnock and George Deacon, Eds. Plenum, New York, 1978. viii, 356 pp., illus. \$39.50.

Advances in Parasitology. Vol. 16. W. H. R. Lumsden, R. Muller, and J. R. Baker, Eds. Academic Press, New York, 1978. xii, 376 pp., illus. \$38.75.

Albert Einstein. The Human Side. New Glimpses from His Archives. Helen Dukas and Banesh Hoffmann, Eds. Princeton University Press, Princeton, N.J., 1979. viii, 168 pp. \$8.95.

Animal Learning. Survey and Analysis. Proceedings of a NATO Advanced Study Institute, Reimsburg, Germany, Nov. 1976. M. E. Bitterman, V. M. LoLordo, J. Bruce Overmier, and Michael E. Rashotte. Plenum, New York, 1979. xii, 510 pp., illus. \$42.50. NATO Advanced Study Institutes Series A, vol. 19.

Anti-Inflammatory Drugs. J. R. Vane and S. H. Ferreira, Eds. Springer-Verlag, New York, 1979. xxx, 954 pp., illus. \$176. Handbook of Experimental Pharmacology, vol. 50/II.

Antiviral Mechanisms in the Control of Neoplasia. Proceedings of a NATO Advanced Study Institute, Corfu Island, Greece, Mar. 1978. P. Chandra, Ed. Plenum, New York, 1979. xiv, 758 pp., illus. \$57.50. NATO Advanced Study Institutes Series A, vol. 20.

Applications of Early Astronomical Records. R. Richard Stephenson and David H. Clark. Oxford University Press, New York, 1979. x, 114 pp., illus. \$12. Monographs on Astronomical Subjects, 4.

Biology of Microorganisms. Thomas D. Brock. Prentice-Hall, Englewood Cliffs, N.J., ed. 3, 1979. xiv, 802 pp., illus. + plates. \$21.95.

Colloid Chemistry. S. Voyutsky. Translated from the Russian edition (Moscow, 1975) by Nicholas Bobrov. Mir Publishers, Moscow, 1978 (U.S. distributor, Imported Publications, Chicago). 560 pp., illus. \$8.50.

Color Atlas and Textbook of Hematology. William R. Platt. Lippincott, Philadelphia, ed. 2, 1979. xvi, 644 pp. + plates. \$49.

Communications Satellite Systems. James Martin. Prentice-Hall, Englewood Cliffs, N.J., 1978. xviii, 398 pp., illus. \$35. Prentice-Hall Series in Automatic Computation.

Compatible Fortran. A. Colin Day. Cambridge University Press, New York, 1979. viii, 108 pp., illus. \$13.95.

Computer Techniques in Cardiology. Lee D. Cady, Jr., Ed. Dekker, New York, 1979. x, 466 pp., illus. \$45. Biomedical Engineering and Instrumentation Series, vol. 4.

Computers and Intractability. A Guide to the Theory of NP-Completeness. Michael R. Garey and David S. Johnson. Freeman, San Francisco, 1979. xii, 338 pp., illus. Cloth, \$18.50; paper, \$10. A Series of Books in the Mathematical Sciences.

A Concrete Introduction to Higher Algebra. Lindsay Childs. Springer-Verlag, New York, 1979. xiv, 338 pp., illus. \$14.80. Undergraduate Texts in Mathematics.

Contemporary Topics in Polymer Science. Vol. 1, Macromolecular Science: Retrospect and Prospect. Proceedings of a meeting, 1976. R. D. Ulrich, Ed. Plenum, New York, 1978. x, 284 pp., illus. \$29.50.

Controlled Therapeutic Trials in Cancer. R. Flamant and C. Fohanno, Eds. International Union Against Cancer, Geneva, 1978. xxviii, 684 pp. Paper, Sw.Fr. 28. UICC Technical Report Series, vol. 32.

Cosmic Rays in the Stratosphere and in Near Space. N. G. Basov, Ed. Translated from the Russian edition (Moscow, 1976) by James S. Wood. Consultants Bureau (Plenum), New York, 1978. viii, 180 pp., illus. Paper, \$39.50. The Lebedev Physics Institute Series, vol. 88.

Cosmology and Geophysics. Paul S. Wesson. Oxford University Press, New York, 1979. viii, 240 pp. \$24.95. Monographs on Astronomical Subjects, 3.

The Cytoskeleton in Normal and Pathologic Processes. G. Gabbiani, Ed. Karger, Basel, 1979. Two volumes. Cell Biology. xvi, 192 pp., illus. \$64. Cell Physiopathology. xiv, 264 pp., illus. \$97.25. Methods and Achievements in Experimental Pathology, vols. 8 and 9.

The Dancing Wu Li Masters. An Overview of the New Physics. Gary Zukav. Morrow, New York, 1979. 354 pp., illus. Cloth, \$12.95; paper, \$5.95.

Densitometry in Thin Layer Chromatography. Practice and Applications. Joseph C. Touchstone and Joseph Sherma, Eds. Wiley-Interscience, New York, 1979. xvi, 748 pp., illus. \$29.95.

Electronic Games. Design, Programming, and Troubleshooting. Walter H. Buchsbaum and Robert Mauro. McGraw-Hill, New York, 1979. xii, 336 pp., illus. \$17.50.

Energy Dictionary. V. Daniel Hunt. Van Nostrand Reinhold, New York, 1979. x, 518 pp., illus. \$22.50.

Experimental Rock Deformation. The Brittle Field. Mervyn S. Paterson. Springer-Verlag, New York, 1978. xii, 254 pp., illus. \$24. Minerals and Rocks, 13.

Faces in a Cloud. Subjectivity in Personality Theory. Robert D. Stolorow and George E. Atwood. Aronson, New York, 1979. 218 pp. \$15.

Few Body Systems and Nuclear Forces II. Papers from a conference, Graz, Austria, Aug. 1978. H. Zingl, M. Haftel, and H. Zankel, Eds. Springer-Verlag, New York, 1978. x, 546 pp., illus. Paper, \$25.30. Lecture Notes in Physics, vol. 87.

Field Matter Interactions in Thermoelastic Solids. A Unification of Existing Theories of Electro-Magneto-Mechanical Interactions. Kolumban Huuter and Alphons A. F. van de Ven. Springer-Verlag, New York, 1978. viii, 232 pp., illus. \$12.50. Lecture Notes in Physics, vol. 88.

(Continued on page 488)