A Life-Span Study Continued

Present and Past in Middle Life. DOROTHY H. EICHORN, JOHN A. CLAUSEN, NORMA HAAN, MARJORIE P. HONZIK, and PAUL H. MUSSEN, Eds. Academic Press, New York, 1981. xviii, 500 pp. $34.50.

For many developmental researchers, longitudinal study (that is, the repeated follow-up of the same individuals) is the royal road to knowledge about the course, mechanisms, and antecedents of development. Yet rarely do developmental researchers generate the type of personal investment, collegial commitment, and institutional support that is necessary to carry out such research, particularly over the whole life span of a group of subjects.

This volume is the outcome of a unique effort in that direction. Extending over more than 30 years in the lives of its subjects, it contributes information about adulthood, a period much neglected in developmental research. It moreover avoids the pitfall, common in longitudinal work, of being outdated in concept and method by the time of harvesting. Close to 50 years after the inception of the studies reported the contributions in this volume are relevant to the frontiers of developmental psychology.

The book reports on the adult development of subjects from three different longitudinal studies begun with different investigators and samples around 1930: the Guidance Study, J. W. Macfarlane, 1928; the Berkeley Growth Study, N. Bayley, 1928; and the Oakland Growth Study, H. E. Jones, M. C. Jones, and H. R. Stolz, 1931. The first two studies tracked infants from early life into adulthood, the third began with adolescence. The three studies were later merged as the "Intergenerational Studies" under the auspices of the University of California at Berkeley's Institute of Human Development. Reports in the present book center on the development of the subjects from adolescence to middle adulthood. Each of the subjects was observed many times (roughly from the early 1930's until the 1960's), although not always with the same degree of comprehensiveness. A wide range of psychological methods (interviews, personality and intelligence tests, ratings) were used, as well as some biological measures. As is true for most longitudinal studies in the human sciences, the subjects are volunteers and are above average in most characteristics (IQ, level of education, occupational status, and so on). Yet, in the instances (admittedly few) where control analyses were made, problems of selective sampling or dropout were relatively minor.

The dimensions of development covered in the book range from intelligence to personality to psychological health to various aspects of social, marital, and occupational functioning. Some attention is also given to medical-biological variables. Throughout, much effort is made to view human development holistically and to consider relationships among its facets.

The volume contains 16 chapters plus appendixes on methodology. The second chapter, by Eichorn, and the last, by Eichorn, Mussen, Clausen, Haan, and Honzik, present an overview of design and outcomes. The latter chapter summarizes the outcome by domain of functioning (intelligence, personality, political attitudes, psychological adjustment, marriage, health) and considers for each domain the essential questions of developmental research: age trends, individual consistency (stability in rankings of individuals across age), predictability from adolescence to adulthood, and sources of differences and change (primarily by sex, cohort, and socioeconomic status).

What are some of the conceptual and empirical highlights? A first concerns the role of historical context. The level and course of psychological development can vary markedly from one epoch to another. How can one know how much of a given aspect of development represents universal patterns, how much is history-specific, and how much reflects long-term sociocultural processes (such as trends toward modernization or post-industrial society)? Although the search for historical variation and influences was certainly not a part of the scientific scene when the project was initiated, several chapters consider this issue. For example, Elder gives a lucid overview of the historical conditions (1920's and 1930's) and the community contexts (Berkeley and Oakland, California) and how they may have shaped the lives of the subjects. His analysis indeed suggests that the historical context of the 1920's and 1930's has played an important role. The particular sequence of prosperity, economic depression, war, and postwar era created different packages of life conditions, varying for men and women, for middle and lower social classes, and for people born in the 1920's and those born in the 1930's. Such historical contexts interact with what one might call the average course of life-span development. Other chapters provide concrete illustrations. They use the cohort contrasts available in the project and perform control analyses in order to explore the robustness of the findings across historical epochs separated by a span of 10 years.

A second theme is the timely topic of constancy and change in human development. The findings reported indicate more predictability from childhood and adolescence to adulthood than a recent state-of-the-art volume suggests (*Constancy and Change in Human Development*, O. G. Brim, Jr., and J. Kagan Eds., Harvard University Press, 1981). In addition to the well-established finding of good predictability of intellectual functioning from childhood to adulthood, the evidence in this project is interpreted as support for fairly sizable predictability in personality and psychological adjustment as well.

Another finding is the existence of much variability among individuals in life-course trajectories, illustrating a principle of current concern to students of life-span development. Development is not a uniform process but reflects the joint operation of individual action plans and adjustments and of social-cultural constraints and opportunities. One example of systematic variability in development from adolescence to adulthood for different subgroups of people was obtained in the case of women's careers and their relationship to work, family, and personality (chapter 14, by J. G. Stroud). With respect to family and professional life four types of women (work-committed workers, double-track workers, full-time homemakers, unstable workers) were identified. These groups exhibited differential change patterns from adolescence to adulthood. For example, among college-educated women marked personality differences in midlife were found between the four types, but such differences were not found for

women who were not college-educated. Such findings are interpreted in terms of systematic differences between social classes in the degree of similarity (continuity) between adolescent and midlife socialization. Thus, for non–college-educated women, a double-track career was more consistent with their own and societal expectations than for college-educated women.

A final example that illustrates the fertility of this project involves the identification of two personality dimensions that appear to act like central control mechanisms for later development: emotional control and cognitive investment. Emotional control in adolescence proved to be a strong predictor of adult health, marital and occupational career, and IQ. For the dimension cognitive investment, an index category measuring cognitive competence and commitment, a similar pattern is identified. Investment in oneself and one's growth during adolescence appears to be a major driving force in achieving "healthy and effective" adult functioning.

The present volume, like any long-term longitudinal research on human development, has its limitations. The adequacy of design and statistical controls and analyses varies. Despite much effort to avoid it, several authors succumb to the temptation to speak about causal mechanisms and linkages where it would have been more appropriate to limit themselves to reporting correlations. Similarly, one wonders whether the high degree of stability in personality functioning found may in part be a methodological artifact. If a few items in the pool used for rating of personality are stable over time and these items function as "trend setters" (prototypes), they could produce a halo effect based on belief systems about people rather than on people's behavior, with resulting overstatement of the case for developmental continuity. The reader would be aided also if the editors had presented a table summarizing the timing, format, subject composition, measurement battery, and other such features of the various longitudinal studies.

In sum, despite its shortcomings this volume will, in our view, become a classic of the literature on human development. It is a testament to the rewards of cooperation, and the harvest is rich enough to encourage our interest in the next season of the subjects' lives.

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A History of Platinum and Its Allied Metals. DONALD MCDONALD and LESLIE B. HUNT. Johnson Matthey, London, 1982 (distributor, Europa Publications, London). xii, 450 pp., illus. $37.50.

Platinum entered the purview of science in 1750, when recent studies of the "new semi-metal" were made known to the Royal Society of London. But this was rather an identification than a discovery. As is related in this book, platinum was known to visitors to South America in the 16th century and has been found among the objects of pre-Columbian archeology. The metal was virtually unworkable, and the successful resolution of this problem, accomplished by 1782, was a remarkable exemplification of the powers of applied science, involving several scientists and several techniques, including powder metallurgy. The growing sophistication of the chemist was further shown in the discovery of other elements in crude platinum, iridium, osmium, palladium, and rhodium (1802–1804). By 1805 W. H. Wollaston was able to supply small articles of malleable platinum for uses where corrosion resistance was important enough (his price was £16 an ounce). The predominant early uses were for touchholes and pans of flintlock guns and for boilers for concentrating sulfuric acid, of which the first was made in 1805. Other uses of the metal were obvious enough to outrun supply, but its suitability for what was to be its most important use, in catalysis, was not unveiled until 1822, by J. W. Döbreiner. A worldwide search for sources of platinum has since been continuous, and largely successful, the most recent source described here being South Africa.

This is an excellent book, to be recommended not only to scientists and historians interested in the topic (which is, as the book shows, wider than most of us realize) but especially to anyone involved in the history of a science-oriented business. The publisher is a principal producer of platinum and the authors are long-time associates of the firm. Together they have virtually set a new standard for this genre of publication.

In 1960 the senior author published *A History of Platinum*, "from the earliest times to the 1880's," which was well received, being criticized mainly for its early cut-off date and for neglecting the scientific aspects of the subject. The present book is responsive to these criticisms. The former book had 18 chapters in 254 pages; this one has 24 chapters in 450 pages. Chapters on catalysis, the chemical history of the platinum metals, their place in the periodic table, and platinum in the measurement of high temperatures have been added. And the subject is brought up to the 1960's—still not quite the last word; we are told in the preface that the scale of production of the platinum metals has increased fivefold since 1960.

Revision appears to have been principally the work of the junior author, for the understandable reason of McDonald's advanced age—he died at 92 while the book was in press. The writing is straightforward, descriptive rather than analytical; but historical analysis depends on the prior existence of books such as this.

The 1960 volume was praised for its elegance. This one improves on it, the illustrations being even more numerous and some of them in color. The sponsoring firm, and its members who are the authors, have exercised a restraint and modesty that are, to say the least, unusual in historical publications emanating from commercial firms. It is to be hoped that others may take this as a model for how to expend a small fraction of their substantial expenditures for public relations, or "understanding."

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Particle Physics

Proceedings of the Seventeenth Rencontre de Moriond. Les Arcs, Savoie, France, March 1982. J. TRAN THANH VAN, Ed. Editions Frontières, Gif sur Yvette, France, 1982. In two volumes. Vol. 1, Quarks, Leptons and Supersymmetry. 650 pp., illus. $60. Vol. 2, Elementary Hadronic Processes and Heavy Ion Interactions. 702 pp., illus. $65.

It is useful to view the present volumes from the perspective of the past ten or 15 years in particle physics. Tremendous progress has been made, both theoretically and experimentally, in understanding particles and their interactions. A real unified theory of weak and electromagnetic interactions was written and experimentally tested in many ways. A possibly fundamental theory of strong interactions (called quantum chromodynamics) was found; many of its predictions are, so far, only qualitatively tested, but agreement between theory and experiment is good, and the circumstantial evidence is highly favorable. There exist theories that describe all known