through 1959, published by the Stanford University Press and still in print) had appeared. Entitled *Mental and Physical Traits of a Thousand Gifted Children*, it laid a firm base for his continuing efforts to show that extremely bright children are not small, unhealthy, unpleasant brats artificially goaded by pushy parents into becoming unwilling scholars. They do not tend to regress toward mediocrity, die early, be psychotic, or become routine adults educationally or vocationally. Over the years Terman hammered home these and related points to the extent that denigrators of intellectual talent can readily be countered with strong evidence. Findings of that important study to 1960 were summarized succinctly and extended by Melita H. Oden in her 90-page *Genetic Psychology Monographs* article (vol. 77, 1968).

It is the story of Lewis Terman as person, Stanford University professor of education and then of psychology, and researching advocate of the gifted that his former doctoral student May Seagoe tells, interestingly and with excellent balance. Terman was a complex, many-faceted individual who did far more than develop tests and use them to find high-IQ'ers, but clearly that was the central theme of his long, productive lifetime. Terman never showed much interest in slow learners. Paradoxically, however, of the 27 dissertations for the Ph.D. degree that he supervised from 1916 through 1937 only four were concerned with the gifted, and all those were written between 1924 and 1928. More were about some aspect of atypicality in the other direction, such as delinquency, mental retardation, and neuroticism. There were only eight that did not deal with one or more aspects of intelligence.

Terman wanted to learn what high-IQ children were like and how they progressed during their lifetimes. He did not intend to intervene in their lives, though being called a "genius" or a "Termite" may have affected a number of them in one way or another. Terman and others such as Paul A. Witty and Leta S. Hollingworth described characteristics of the intellectually gifted well, but few persons have been concerned much with actually helping them educationally and otherwise. Most attention, especially since the mid-1950's, has been directed toward those members of minority groups who score low on intelligence tests and toward the mentally retarded. Funding agencies which pass over the gifted usually rationalize—quite incorrectly, the evidence shows—that they will get along about as well without special provisions as with them.

A revival of interest in the intellectual highly able seems in the offing, aided by books such as Seagoe's biography and *Intellectual Talent: Research and Development,* edited by Daniel P. Keating (Johns Hopkins University Press, 1976). By force of his greatness as a psychologist Terman gave impetus to the scientific study of gifted children. After his retirement in 1942 the field lost leadership, perhaps to a considerable extent because he had not produced protégés to keep it going. The following up of his gifted group continues, however, under the auspices of Robert R. Sears and Lee J. Cronbach at Stanford University. They are preparing reports concerning the 1972 survey, when the average member of the group was 61 years old. Pauline S. Sears's study of the personal and vocational satisfaction of the women in the group as of 1972 will appear in *The Gifted and the Creative: Fifty-Year Perspective* (Julian C. Stanley, Ed., Johns Hopkins University Press, in press).

Besides providing a perceptive, tasteful 189-page biography Seagoe lists Terman's 270 publications, 26 unpublished items, and details about the 69 M.A. and Ph.D. degree theses that he supervised. She also reproduces six of his unpublished papers.

It is easy for this reviewer to agree with Terman's longtime close friend Ernest R. Hilgard in his introduction to the volume: "The Terman story stands on its own merits, and it is told here clearly, honestly, and competently . . . we have a reflection of the history of psychology in the history of one of its prominent figures. . . . Dr. Seagoe has been thorough, objective, and sensitive throughout; she gives the story of the man I knew. I believe this will be his definitive biography."

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Valued Behaviors

Origins of Intelligence. Infancy and Early Childhood. MICHAEL LEWIS, Ed. Plenum, New York, 1976. x, 414 pp. $17.50.

In the introduction to this collection of 13 papers the editor warns, "There is no summary statement to be found in this volume." He might have added that a reader who tried to formulate one would be hard pressed to do so since there are only a few threads that link the contributions. The major one is simply the authors' common interest in infants, who are no longer seen as mere passive recipients of stimuli but rather as active, self-motivated explorers and participants in their environments. Another link is the widespread agreement that a unitary conception of intelligence as a single general trait is no longer, if it ever was, tenable. Human beings exhibit a variety of symbolic and overt behaviors which show a shifting pattern and range of intercorrelations. Some of these behaviors are valued and individuals who show them to a high degree are called "intelligent." The particular behaviors that singly or in combination elicit that designation vary across cultures and, within cultures, over the life-span. This book deals primarily with the valued behaviors of infants in Western industrialized societies.

While a number of papers deal with specialized topics, there are several distinguishable groups. One focuses on the traditional infant intelligence scales. The history of the infant testing movement is described and a fairly complete rundown of available tests and their technical characteristics is given. Collectively, although the authors don't say so, these papers show that the tests have proved practically and theoretically disappointing. For most infants they simply provide a standardized technique for normatively assessing current level of functioning in a set of sensory, motor, and simple social skills that emerge in the first few years of life. Retest reliabilities are so low that few normal infants retain their relative standing in a group over any but the shortest intervals. This plus the fact that the behaviors sampled are very different from those sampled by later IQ tests makes it understandable that predictability of later IQ from early infancy test scores is almost nil. Certainly the hope, once held, that prospective adoptive parents and children could be intellectually matched never came close to realization. The only exception to this picture of poor predictability is in the case of grossly retarded children. For them the tests do predict later cognitive functioning and are useful diagnostic adjuncts to pediatric examination. Finally, with reference to these traditional psychometric instruments, it is noteworthy that they do not relate to socioeconomic level or to race in the same way as do later IQ tests. Poor infants and black infants do not earn lower scores than white middle-class infants. In some cases they earn higher scores. This clearly reduces the impact of Lewis's blanket assertion that "IQ scores have come to replace the class systems or feudal systems that pre-

viously had the function of stratifying society and distributing the goods and wealth of that society."

There seems to have been a research shift (some would call it a sensible, perhaps temporary, retreat) in recent years. Few investigators are concentrating on the goal of predicting later functioning from infant test scores. Many are simply trying to describe and conceptualize infant functioning per se. The papers that illustrate this trend reveal the pervasive influence of Piaget, who labels infancy the period of "sensorimotor intelligence." Within this framework infancy is seen as a period when sensory, perceptual, and motor patterns (schemas) emerge, are practiced, and, ultimately, are coordinated with each other. The infant gradually constructs a world which includes notions of object permanence and simple spatial and causal relationships and the concept that available means can be mobilized in the service of more and more complex and remote goals.

Various papers discuss the components of Piagetian sensorimotor intelligence and describe the recently developed tests that purport to assess them. One paper describes a factor analysis of responses on the traditional Gesell scale which yields clusters consistent with Piagetian developmental hypotheses, and another describes a new four-level characterization of sensorimotor intelligence. It is hoped that this characterization will aid in the evaluation of various Piagetian tests and in the definition of component domains whose interrelations could then be explored. Still another paper elaborates the view that human sensorimotor intelligence, unlike the abstract, verbal cognitive activities of adulthood, is strikingly similar to that of other primates. It shares an evolutionary history and is similarly "canalized," that is, based on genetic predisposition. Environment is not unimportant in the emergence of sensorimotor intelligence, but, it is contended, almost all naturally occurring primate and human environments provide sufficient support and stimulation that there are relatively few individual differences in attaining criterion performance. This last assertion, however, requires far more empirical support than is yet available.

In general, the description of infancy in Piagetian terms is more conceptually satisfying than the traditional normative catalog of behaviors. Nevertheless, at this point in time, performance on available Piagetian instruments is no more consistent than performance on traditional tests. Moreover, although sensorimotor intelligence is conceived of as a sort of concrete model of later abstract reasoning, no one has yet demonstrated a predictive relationship between the two.

Individuals labeled "intelligent" in Western industrialized societies are often those with outstanding verbal skills. While infants, of course, are only in the beginning stages of language development, the sense of the potential importance of linguistic skills is reflected in this volume, where several papers suggest they are important precursors of later cognitive skills. It is reported, for instance, that, for girls, early vocalization substantially predicts adult cognitive functioning. Other authors contend that it is in the early precursors of language that we find the roots of socioeconomic class differences in intellectual functioning, and it is suggested that early intervention programs should be heavily aimed at language development. Finally, an entire paper is devoted to a detailed analysis of one infant's progression toward comprehension and production of the concept "why." This type of analysis is considered useful because "the linguistic mastery of terms that lack portrayable correlates ultimately gives the child access to types of information and information processing that is inaccessible through sensorimotor learning."

It has been traditional in American psychology to view cognitive and emotional development as separate. At several places in this book that distinction is questioned. One paper, for example, presents a convincing argument that affective responses, that is, "looking smart," "showing interest," actually figure importantly in the scoring of both traditional and Piagetian test items, although the affective component has not been explicitly acknowledged. Another paper reports that an analysis of the Bayley scales led to the identification of three clusters of items that "measured cognitive abilities but that had a strong underlying motivational component."

The general picture that emerges in this volume is of a vigorous but fragmented field of research. Infant behavior is seen as complex and interesting in its own right, but there is not yet general agreement about which are the most useful dimensions in which to conceptualize it. Also, as the title suggests, there is a tacit belief that the activities of infancy relate to adult cognitive functioning. However, the direct or circuitous routes by which an infant's search for a hidden object leads to an adult's solution of an abstract problem have certainly not yet even been sketched. This book will prove disappointing to a layman seeking answers. It should be of considerable interest to any social scientist interested in the process whereby alternative points of view and alternative research strategies focus in on a complex problem of human development.

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Continuing in the MacArthur Tradition

Ecology and Evolution of Communities. Papers from a symposium, Princeton, N.J., Nov. 1973. MARTIN L. CODY and JARED M. DIAMOND, Eds. Belknap (Harvard University Press), Cambridge, Mass., 1975. xiv, 544 pp., illus. $29.50.

Comparative tables of the number of species of plants, insects, and birds of different regions were compiled by Alfred Russel Wallace in his last book, *The World of Life*. He wrote, "This distribution constitutes the primary and fundamental fact in the relation of species to the whole environment—it is, in fact, the broadest and most simple expression of that relation." Over the next half century little progress was made in the expression and interpretation of this relationship, although Charles Elton and G. Evelyn Hutchinson's development of the niche concept and C. B. Williams's and F. W. Preston's studies on diversity provided useful tools. It was for the late Robert MacArthur in a brilliant, but tragically short, working life to lay open the whole subject of the structure and evolution of natural communities, viewed as evolving assemblages of species. The insights he brought from the combination of his real knowledge of birds with his mathematical skills spawned a whole new area of ecology to take its place beside studies of the dynamics of populations and of the trophic structure of communities expressed in terms of the circulation of energy or chemical components. At last the relationship between