plicit. *Investment in Innovation* is an admirable example of analysis, with reasonable inferences drawn from recent experience. It makes no attempt to construct a new system, nor does it incorporate any ingenious devices for bringing about increased outlay for innovation.

RICHARD L. MEIER
School of Natural Resources, University of Michigan

The Population of Japan. Irene B. Taeuber. Princeton University Press, Princeton, N.J., 1958. xx + 461 pp. Illus. $15.

If a nation the size of Japan had suddenly appeared on the earth on 31 December 1958, it would have been one of the great news stories of modern times. Actually, such a nation did move in on our planet during 1957 and 1958, for world population grew by some 90 million persons during those two years.

Nothing like that has ever happened before in the history of man. It took 200,000 years for the human species to multiply to a billion souls. Then the number doubled to 2 billion in only 2½ centuries. At the current rate of population increase, the present nearly 3 billion of us will grow to 6 billion by the year 2000. The United Nations was not fooling when, in a recent publication, it warned that this unprecedented multiplication of people is "at the very heart of the problem of our existence."

The complexities of the problem of too-rapid population growth surround the problem with an aura of futility. Yet, within just the last few decades, an Asian nation has reversed the upward trend of its birth rate to undergo the most remarkable demographic transition of all time. The *Population of Japan,* a monographic survey by Irene B. Taeuber, records this transition.

Irene Taeuber is the distinguished research associate of the Office of Population Research of Princeton University. She was for many years editor of the *Population Index.* She has traveled widely, thought profoundly, and written wisely on this compelling problem. Her survey of Japanese demography traces developments since the 12th century. The major part of her book is concerned with the fantastic century which intervened between the reluctant welcome given to Perry in 1854 and the end of World War II, when another visitor from the West dictated another agreement under the guns of warships.

The isolated island empire which Perry visited a century ago had a population stabilized, by a "managed" death rate, at about 30 million. A high death rate usually served to keep the high birth rate in balance. When for any reason natural causes failed to take the necessary toll, infanticide was used to redress the balance.

Perry's arrival initiated a social, political, and industrial revolution which upset this traditional system. In the succeeding century Japan's population tripled and she emerged as one of the world's most densely populated countries. In an incredibly short time she shifted from a feudal, Oriental, agrarian culture to an industrial, urban civilization patterned on an alien culture. The Japanese achieved levels of literacy and of living far superior to those of any other Asian country. Amazing advances in science and technology marked this century of change and progress as unique.

In the light of the current world population crisis, Taeuber's detailed account of what has happened in Japan to bring fertility into balance with modern low mortality is a story which deserves the consideration of all thinking persons.

The dramatic decline in the Japanese birth rate since 1945 tends to conceal the very important fact, emphasized by Taeuber, that the beginning of fertility control extended back more than 40 years to a time when national policy favored rapid population expansion:

"Planned limitation existed in the population of Japan in 1920. In the decades after 1920, practices of limitation were diffused over broader geographic areas and accepted by increasing numbers of people in ever-wider ranges of social groups.

"In the years before World War II a major portion of the increasing limitation of fertility among the Japanese was associated with the postponement of age at marriage and the separation of couples by the military service or migration of the husband. The process of fertility decline was continuous, but slow. In the middle 1930's the fertility of the Japanese was far below that of the peasant peoples of the East, but it remained high enough to produce a rather large population increase. . . .

"In the postwar years there has been a rapid spread of contraceptive practice and a nation-wide resort to abortions. There is increasing acceptance of sterilization. The decline in marital fertility has been rapid, and it has extended from Tokyo to the villages of Hokkaido in the northeast and Kyushu in the southwest. This is not the response of an agrarian society in the initial period of its social and economic modernization. It is the response of a literate people who have radios and electric lights, who live in a country with a network of transportation and communication facilities, and who work in major part in activities other than agriculture. The formal facts of changing levels of reproductive behavior, of contraceptive products manufactured and induced abortions performed, and of the diffusion of the various means of limitation singly or in combination contribute little enough to any real knowledge of the changing attitudes and values of the Japanese in the realm of fertility control. They offer even less basis for estimating under what circumstances or with what speed contraception or other types of birth restriction might develop in other Asian populations."

The resort to legalized abortion would not be acceptable in a Western Christian culture. Yet recent surveys have revealed that the practice of abortion is widespread in this country and in Europe. In the light of this fact, it would seem that severe condemnation of Japan's solution would smack considerably of hypocrisy.

Japan, with this sharp application of the reproductive brakes, is today almost at the end of the period when growth of numbers is a problem. The prospect that population stabilization will come within a generation does not exist in any other Asian country. Because of Japan's heavy industrialization and her adoption of modern methods of food production, Taeuber believes that, given full access to world commerce, Japan will be able to care adequately—and at a rising level of living—for annual increases in population that become smaller year by year.

While much of Taeuber's book is highly technical, the lay reader will find kernels of summary and orientation which are fascinating—the chapters on "Marriage," "Fertility," and "The control of fertility" and the chapter on "The demography of war" are especially interesting. The concluding chapters—"Problems, projections and policies" and "The past and the future"—are definitely required reading for anyone who pretends to be really informed concerning the great problem of the world's unprecedented and accelerating multiplication of people.

ROBERT C. COOK
Population Reference Bureau, Washington, D.C.

The Archeology of Coastal North Carolina. William G. Haag. Louisiana State University Press, Baton Rouge, La., 1958. xi + 136 pp. Illus.

This study reports the results of an archeological program of investigation within the little-known area of the Outer Banks and the adjacent coastal mainland of northeastern North Caorlina. The purpose of the program, which was supported jointly by the National Park Service and the Office of Naval Research, was twofold—namely, to investigate the problem of aboriginal cultural

succession and to uncover any evidence bearing on the fate of a group of colonists (the "Lost Colony") who disappeared shortly after they founded Fort Raleigh (in 1587). Although the program was unsuccessful with respect to the latter aim, a considerable amount of useful data bearing on the former problem was obtained.

Since the area selected was too large for a complete survey, the field strategy was "to obtain representative sites throughout and, where circumstances suggested favorable results, to make test excavations in order to establish the chronological sequence of cultural events" (page 2). Consequently, most of the field work was in the nature of surface collecting, but stratigraphic test excavations were made at five sites, which were the most promising from the standpoint of depth of midden. Cultural materials, principally pottery sherds, were obtained from most of 81 "sites" located on Hatteras, Ocracoke, Bodie, Collington, and Roanoke islands, on the adjacent mainland in the vicinity of the Neuse River, and on Albemarle and Pamlico sounds.

As one might expect in a report of this nature, the bulk of the study is taken up by a description of the individual sites and a technical analysis and comparison of the pottery with that of adjacent regions in terms of temper, paste, surface finish and decoration, and form. However, in two final chapters Haag skillfully combines limited inferences from sparse archeological data with good regional historical data to produce a plausible reconstruction of aboriginal culture history. The latter is divided into an early period (hunter-fisher-gatherers), a middle period (introduction of agriculture), a protohistoric period (a time of numerous contacts with other areas, especially with the interior Piedmont and the Virginia coast and Chesapeake), a historic period (a period of considerable political adjustment), and a displacement of aboriginal culture period (post A.D. 1587).

BERT A. GEROW
Department of Anthropology,
Stanford University

The Second (1957) University of Utah Research Conference on the Identification of Creative Scientific Talent. Calvin W. Taylor, principal investigator. University of Utah Press, Salt Lake City, 1958. vii + 255 pp.

The need for identification and support of individuals gifted with creative scientific talent has been increasingly recognized in the United States since the fall of 1957. It is to the credit of the National Science Foundation that since its inception, and particularly since 1954, it has effectively encouraged investigation aimed at discovering and nurturing potentially creative scientists, and it has supported two summer research conferences on this topic, in 1955 and 1957. This report of the second conference, held in Brighton, Utah, 17–20 Aug. 1957, has the same form as that of the earlier conference [reviewed in *Science* **125**, 813 (1957)]; it is prepared from a complete transcript of proceedings and presents 15 original papers, discussion of each paper, and two committee reports. Restrained and judicious editing by the participants has served to retain the liveliness of the discussions; the enthusiasm of the participants is apparent and contributes to the readability of the product.

A reader in search of hypotheses concerning characteristics of the creative scientist and methods for identifying him will find that almost every contribution to the conference offers stimulating suggestions. Of particular interest is the view of a criterion committee, which reported to conferees, "The measure of a creative product should be the extent to which it restructures our universe of understanding." The committee report continues by suggesting means for estimating degree of creativity for established scientists and proposes a series of testable hypotheses which specify promising relations between this estimate and other variables (for example, the diversity of a scientist's contributions).

To one hoping to discover proven methods for the successful selection of promising scientific talent, the report will be provocative but disappointing. In the empirical studies cited, attempts to distinguish creative scientific achievements or to discriminate between creative and noncreative scientists on the basis of academic grades or standard aptitude measures were not remarkably successful. While in two or three studies certain aptitude measures showed some promise, the more typical finding was one of no relationship between this class of variables and creative scientific achievement. In explanation, the report does not rule out inadequate criteria of creativity, unsatisfactory predictor variables, or inappropriate experimental design and analysis. Nevertheless, there remains the tenable conclusion that conventional measures of intelligence and academic achievement are not good measures of creativity. Participants emphasize the probably greater value, as indicators of creativity, of certain special aptitudes (such as the aptitude for divergent thinking), of certain qualities of temperament (for example, independence versus conformity), and of certain kinds of motivation (for instance, inquisitiveness of mind); it is suggested that new tests be developed where none now exist for measuring such variables.

Not the only challenge contained in the report is directed toward research on identification of creative scientific talent. Repeatedly participants emphasize the danger that academic training procedures or environmental working conditions may inhibit rather than excite the creative impulse. In the words of one, "More good people are spoiled scientifically and in their creative thinking by being frightened than [by] anything else." While this report will affect most directly the research area which it represents, its relevance to the training of scientists should not be overlooked.

LYLE V. JONES
Psychometric Laboratory,
University of North Carolina

Symposium on Sociological Theory. Llewellyn Gross, Ed. Row, Peterson, Evanston, Ill., 1959. ix + 642 pp. $7.25.

This book of 19 essays covering theory in sociology is as good as anything available. Happily, one advantage—not more than three of the essays are long-winded or dull—will assure recognition of the book's merit. The essays range from a confessional "how-to-do-it" piece, by C. Wright Mills, through an artfully complex but not difficult "axiomatization" of linguistics, by Joseph H. Greenberg, to Anatole Rapoport's "Uses and Limitations of mathematical models in social sciences."

Unfortunately, however, a prejudiced outsider will probably leave the book with his prejudices intact. The difficulty is stated forthrightly in Robert Bierstedt's article: "The important lacuna . . . is that between metasociological theory on the one hand and sociological theory on the other or, stated differently, between methodological theory and substantive theory. Metasociological theory is now a highly developed discipline; sociological theory, on the contrary, is still a weak and pallid thing whose pursuit receives no special encouragement within the profession and whose major achievements frequently come not from academicians, but from novelists, journalists, publicists, and those relatively few sociologists who are not afraid of epithets like 'unscientific'." Even Greenberg says of linguistics, which vies with economics for being the most thoroughly "scientific" of the behavioral sciences, that it "does not at present have a general theory as this term is employed, e.g., in physics. What can be axiomatized is rather the descriptive methodology of the science."

There is a lot of "metasociological theory" in this book. Sociologists must, apparently more than other scientists, recognize that all "facts" are perceived phenomena and that the statement of a