welcomed the opportunity to "unload." (Consider in this connection the careful planning, the effort, and the time required to collect the data.) The Thematic Apperception Test was administered only to the 100 matched pairs in New Orleans and Boston.

The data are reported and analyzed in chapters 1 through 5; chapter 6 contains a summary and conclusions in the form of recommendations. Differences between dropouts and graduates are presented in small tables, and χ^2 tests are applied to the differences. The data are also reported in numerous case studies of varying length, which at times would seem repetitive and monotonous if the story they tell were not so important.

Possibly the best way to summarize the data presented is to summarize the general hypotheses introduced at the beginning of the book, since the data establish the truth of these hypotheses:

1) The dropout is reared in a family that has less solidarity, less primary relatedness, and less paternal influence than the family in which the graduate is reared.

2) The dropout is brought up in a family that has fewer close friends and fewer "problem-free" friends than the family in which the graduate is brought up.

3) The dropout's personal friends are typically not approved by his parents. The resulting "independent youth culture" of the dropout is in sharp contrast to the youth culture of the graduates, whose friends are approved by his parents and thus integrated with the adult culture.

4) The dropout was in trouble at school when he terminated his education and was but slightly involved in any school-related activities throughout his academic career.

5) The phantasy life of the dropout as manifested by the TAT is more characterized by unrestrained Id themes and that of the graduate more characterized by restrained superego themes. It is inferred from the TAT data that the dropout is typically "resentful of all authority (home, school, police, job, church)," has a weak "deferred gratification pattern," and a "weak self-image."

Other characteristics of dropouts not specifically identified above include retardation, irregular attendance at school, and frequent tardiness when in school. The dropout is especially deficient in the ability to read and to communicate. Teachers are seldom his confidants. Poverty is the milieu of the dropout, but lack of finances is seldom a reason for withdrawal. Especially worth noting in this research report are the contrasts between the families of the high school graduate and of the high school dropout—"the youth who continues in school has his origins in a family where personal acceptance, communication, and pleasure are staples." Numerous dropouts report that "there is not one person in their home in whom they can confide, with whom they enjoy being during leisure hours, and who they feel understands and accepts them."

Sociologists should read this book for the light that it sheds and the myths that it dispels with respect to family structure and youth culture. It should also be read by those who can bring action to bear on the dropout problem. Especially should it be read by social workers, high school principals, teachers, and counselors who may be able to compensate, in some measure, for the inadequate families of the dropouts or potential dropouts. On occasion, they may be able to transmit the message to the parents.

MAX D. ENGELHART
Division of Institutional Research and Evaluation,
Chicago City Junior College

Government-Sponsored Research and Exploration of Alaska

Exploration of Alaska, 1865–1900. Morgan B. Sherwood. Yale University Press, New Haven, Conn., 1965. xvi + 207 pp. Illus. $6.50.

As 1967, the centennial year of the purchase of Alaska, approaches we can look forward to the publication of many books about the state, its economy, environment, and people. It is hoped that at least one or two will be concerned with the history of Alaskan exploration, a most neglected field of study. If this excellent volume by Morgan B. Sherwood is an indication of things to come, then there is much fascinating and scholarly reading ahead for those interested in our 49th state.

Alaskan history has not always been a neglected field. In 1886 Bancroft's monumental *History of Alaska* was published, and in the 1920's there was the pioneering work of the late F. A. Golder. Bancroft's work, of necessity, deals primarily with the Russian period while Golder, during his abbreviated career, was concerned with specific problems and areas of Alaskan exploration and did not attempt a major overview of the subject. The only other historical surveys worth mentioning are Stuart R. Tompkins' brief but excellently written and well-documented study, *Alaska, Promyshlennik and Sourdough*, and A. H. Brooks's, *Blazing Alaska's Trails*, filled with valuable information on exploration during both the Russian and American periods, but published long after his death and poorly edited. It is perhaps significant that in spite of its age, errors, and poor documentation, Bancroft's *History* is still, in the words of Sherwood, "the single most important history of the northland" (p. 57).

The period covered by Sherwood's book is a justifiable unit because, as the author rightly points out, there was little scientific exploration of Russian America, while by 1900 all problems of gross geography in the territory had been solved. In his introduction the author provides a conceptual framework against which Alaskan exploration is examined; namely intellectual, political, and industrial attitudes in the United States toward the newly acquired territory.

The author deals succinctly and realistically with the significance, both scientific and political, of the Western Union Telegraph Expedition and then examines in detail the scientific career of William Healy Dall. Alaska specialists specifically concerned with ethnology and history are frequently exasperated by the errors and vague generalizations in Dall's writings, particularly in *Alaska and Its Resources*, but they tend to forget, or are ignorant of, his accomplishments in other fields and his accurate assessment of the future needs of the newly acquired territory.

Of particular interest to me is the chapter on Ivan Petroff, a major contributor to Bancroft's *History* and to the Tenth Census. Like most current workers in the field, Sherwood believes, perhaps somewhat intuitively, that Petroff's "translation" of Father Juvenal's "diary" is a fraud, but it was a disappointment to find that the author has little in the way of proof to back up this assertion.

The bulk of Sherwood's *Exploration* deals with government-sponsored research, the major purpose of which was to open up new land. The explorations of Raymond, Allen, Abercrombie, Cantwell, Stoney, and others are discussed in detail as are the more specifically scientific contributions of Nelson, Turner, the Krause brothers, and Jacobsen. The role of prospectors and missionaries is also examined, and in the last chapter there is emphasis on the work of the United States Geological Survey and the important contributions made by A. H. Brooks. The author concludes, as he began, by noting that the "progress of discovery was consistent with social attitudes in the United States, the remoteness of the territory, the economic interest expressed in the country, and the popular interest as evidenced by the population of the region" (p. 187).

The very excellence of Sherwood's book, which will surely be a basic source for many years to come, serves to call attention to the fact that there is nothing comparable on the exploration of Russian America. A really thorough, well-documented history of Russian exploration in Alaska is badly needed. Although the scientific contributions of Russian explorers were less notable than those of their American counterparts, important and significant observations were nevertheless made on the native peoples, the geography, and the resources of the country. Much of the archival material for such a study is available in this country, and Soviet historians are increasingly turning their attention to Alaska and have published useful material in recent years. Perhaps the approaching centennial year will provide the impetus for a history of Russian exploration. If it does, and if the resulting volume is as carefully researched and well written as the one reviewed here, the cause of Alaskan history will be very well served indeed.

JAMES W. VANSTONE
Department of Anthropology, University of Toronto

A History of Mathematical Approaches

Ways of Thought of Great Mathematicians. An approach to the history of mathematics. Herbert Meschkowski. Translated from the German edition (Berlin, 1961) by John Dyer-Bennett. Holden-Day, San Francisco, Calif, 1964. x + 110 pp. Illus. Paper, $3.95; cloth, $5.95.

Meschkowski selected nine men whom he felt illustrated "the ways of thought of mathematicians of earlier centuries"—the Pythagoreans, Archimedes, Nicholas of Cusa, Blaise Pascal, Gottfried Leibniz, Carl Gauss, George Boole, Karl Weierstrass, and Georg Cantor.

As the author indicated in the preface, most of the choices were somewhat arbitrary, but some were selected to support the thesis that earlier mathematicians were willing to investigate problems that could not be resolved solely by mathematical methods.

In the first chapters of the volume, the "way of thought" is identified and mathematical examples are used to illustrate it. For example, Archimedes is used to demonstrate that mathematicians could be both "pure" and "applied" in their thinking. Two examples from the work of Archimedes are used to support this observation: the first is a rigorous, geometrical proof of a theorem concerned with the area of a spherical surface, and the second is a heuristic argument that involves the determination of the equilibrium state of a lever in order to find the volume of a sphere. In the chapters that follow, the examples speak for themselves in illuminating the particular "way of thought."

The chapter on Gauss illustrates the principle of *pauca sed matura*, and the major portion of the chapter contains an analytic proof of the fundamental theorem of algebra published by Gauss in 1816. This proof demonstrates the Gaussian ability to compress a mathematical discussion into its most simple and elegant form. Some historians may feel that the works of Gauss better illustrate other avenues of thought of a great mathematician, but it is doubtful that any would quarrel with the claim that Gauss was truly a master of elegance in mathematical proof.

This brief volume is an excellent complement to the many comprehensive histories of mathematics.

DONALD J. DESSART
Department of Mathematics, University of Tennessee

Solar Energy: Future Research

Direct Use of the Sun's Energy. Farrington Daniels. Yale University Press, New Haven, Conn., 1964. xviii + 374 pp. Illus. Paper, $2.45; cloth, $7.50.

The enormous amount of solar energy falling on large areas of the earth's surface is impressive and frustrating, for man feels that he should utilize this energy with reasonable efficiency. Indeed, by planting and harvesting crops, man does utilize it, but at low efficiency and in relatively short time. Or man burns rapidly fossil fuels that have required eons to accumulate. But what one really wants is a large amount of energy, spontaneously regenerated as rapidly as it is utilized and converted to power at a reasonable efficiency.

Farrington Daniels is an authority who writes lucidly and logically on the utilization of solar energy. He recognizes clearly the challenge, the limitations, and the practicalities. To anyone who desires a concise and readable review of the subject, with complete references, this book is highly recommended.

Daniels, professor emeritus of physical chemistry at the University of Wisconsin, clearly demonstrates his years of wisdom, knowledge, and versatility to write a thoroughly stimulating and informative book on solar energy. Naturally, the author is at his very best in the chapter on the photochemical conversion of solar energy. In order to utilize photochemical reactions for the use of sunlight, the chemical reaction must be endothermic with high quantum yield and reversible. For conversion to electrical energy, electrons must be transferred photochemically from a low energy to a high energy level. The author points out a number of promising avenues of research on the photochemistry of solar energy conversion.

Although the total amount of solar energy incident on the earth is impressive, it will not be utilized, except in special cases, because of the high cost of collecting it and the high investment required for solar devices. Daniels expects that, as fossil fuels are depleted and as mass production of solar equipment reduces costs, solar energy will compete favorably with fossil fuels. He honestly recognizes that this utilization will come slowly at first and primarily in economically