Planning from the Beginning

Alaska, A Challenge in Conservation. RICHARD A. COOLEY. University of Wisconsin Press, Madison, 1966. 186 pp., illus. $5.50.

Almost one-third of the federal domain in Alaska is to be donated to the new state over a period of 25 years. This extremely liberal donation will amount to some 104 million acres, to be selected by the state. The state has taken significant steps to insure the wise use of this great natural resource. Its constitution, adopted in 1956, prior to statehood, contains an article stating a policy "to encourage the settlement of its lands and the development of its resources by making them available for maximum use consistent with the public interest." In 1959 the legislature passed a Land Act which provides for classification of the selected federal lands according to their best use, limits the state's disposal of certain classes of lands such as mineral and renewable-resource lands, requires advertised, competitive lease and sale bids, includes provisions for multiple use, and, by providing for public hearings on rule-making and land classification or reclassification, insures that the state's land programs will be responsive to the public will. The program has been made flexible so that it will be able to meet changing situations.

Richard A. Cooley, a research economist and former director of the Alaska Research Center, knows the state, its people, their problems, and their new government. His book is a refreshing revelation of Alaska's entirely new concept of statewide land classification and use. Cooley has brought into sharp focus the contrast between the exciting new Alaska land-management policy guidelines and past policies in the American West, which were steeped in fraud, speculation, and waste. The old "economic determinism" of laissez faire that prevailed during the settlement of the western states led to needless errors which today can be rectified only at tremendous cost. The Alaska program may point the way to belated land-management reforms in other states.

Cooley does not accept the dogma that man's progress is measurable solely in terms of economic factors. He is convinced that land use should be planned to effect a desired total environment so that the selection, classification, and management of wilderness, scenic parks, recreation areas, historic sites, beaches, parkways, and highway waysides will contribute to the fulfillment of social and economic goals. He stresses the need for "a broader and more comprehensive knowledge of intricate ecological interrelationships in the natural and human environments" and cites problems in land management which arise from "the antiquated governmental machinery for decision-making." As a remedy he recommends "a new approach to the education of public officials in the resource fields" and points out the great need for federal-state coordination in research and planning. Strides in this direction are hoped for from the new federal-state Alaska Field Committee and the President's Review Committee for Development Planning in Alaska.

Problems in Alaska are numerous and difficult. The state's income is limited, its administrative responsibilities are extensive and expensive. Its population is only 255,000, and one-quarter of these are military personnel and their dependents. There are conflicts of interest, problems of "aboriginal rights," absentee ownership, lack of risk capital, and a present inability to compete fully in world markets because of high labor and transportation costs and seasonal unemployment. But in spite of its problems, the future of this fabulous land is a bright one if its government, responsive to the will of the people, can avoid the mistakes of the West. The political structure that can enable the state to realize its great potential has been provided, but, more importantly, the determination and wisdom of Alaskans will be needed to recognize and implement the long-term planning to meet the challenge in conservation of all its resources.

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Sequential Decision Problem

Algebraic Structure Theory of Sequential Machines. J. HARTMANIS and R. E. STEARNS. Prentice-Hall, Englewood Cliffs, N.J., 1966. 221 pp., illus. $12.

In the analysis of discrete systems two of the most fundamental considerations are the combinatorial and the sequential decision processes. The study of combinatorial (time-independent) decision processes has an ancient heritage in propositional logic, with recent extensions being directed toward achieving optimum algorithmic implementations (the synthesis problem) and theoretical (analysis) work in Boolean algebra. The sequential problem, treating transitions from one logical state to another, has no such long history: E. F. Moore presented the first definitive work in this area in 1956. The decade following has been very active, much of the research being sponsored with a view toward achieving optimum implementation of computing machines (the general use of the word "machine" rather than "system" is a tacit acknowledgment of this).

More recently the sequential decision problem has been viewed as an essential ingredient in many other discrete systems: biological, linguistic, econometric, and general learning models. The emphasis in this broader area is less on implementation algorithms (synthesis of such systems) than on analysis and understanding of general behavior patterns.

The synthesis problem is commonly restricted to what is called the "state assignment problem"—finding an optimum implementation for the states of the system—that is, coding at minimum cost. Initially, "minimum cost" was construed to mean the implementation which afforded the least number of components. Recent technological developments have rendered this objective questionable.

Of the earlier researchers in the area, Hartmanis and Stearns were among the most active in utilizing results based upon algebraic decompositions on the set of machine states. While the work was largely directed at the solution of the state assignment problem, they have provided some of the definitive abstractions for sequential systems. *Algebraic Structure Theory of Sequential Machines* is a monograph covering primarily the work and contributions of the authors in this area. The book begins with a review of algebra and sequential machine models. The key concept of the state set partition with the substitution property (state homomorphism or the partition congruence property) is then developed for series-parallel machine decompositions. This is then extended with partition pairs and arbitrary loop-free decompositions. Implementations using overlapping or shared partitions are then discussed, together with feedback partitions. The final chapter cov-