

the Zapp Theory has not yet been put in its grave and that any given amount of investments will result in a predictable quantity of energy. This certainly must be subject to question.

One of the frequently referred to authors, whose material does not appear in the text, is Dr. M. King Hubbert. Some authors have utilized Dr. Hubbert's curves as an estimate for future reserves and refer to the curve indicating world potential of 2100×10^9 barrels. It was the writer's own impression the 1350×10^9 barrels, is a more realistic possibility and Dr. Hubbert's thesis is that the 80 per cent consumption time span only covers from 58 to 64 years in the two cases. This, indicating that consumption would expand to utilize whatever world crude oil resources may exist in essentially the same time frame. The serious student of Dr. Hubbert is referred to the paper entitled "Researcher Defends Reserve Estimate" appearing in *The Oil and Gas Journal*, October 11, 1976.

The Annual Review on Energy is a "must" reading for any serious student of the subject. The one criticism which might be raised for future reference is that many of the papers spend much of the text setting out the argument that an energy problem does, in fact, exist. With this frequently restated by many of the authors, it tends to make the book unnecessarily lengthy.

MS received November 25, 1976

Oil Under the Ice

By Douglas Pimlott, Dougald Brown and Kenneth Sam
Canadian Arctic Resources Committee,
178 Pages, 1976.
\$6.95

Reviewed by C. J. Yorath
Geological Survey of Canada
100 West Pender Street
Vancouver, B.C.

As a potential libretto for a turgid four act opera, *Oil Under the Ice* presents a scenario of collusion, deception and potential tragedy. The villains of the piece are the petroleum companies and the Department of Indian Affairs and Northern Development (DIAND),

together in an orchestrated conspiracy to defraud and destroy our heros, the environment and native peoples of the Canadian Arctic. The frustrated and emasculated fool is the Department of the Environment (DOE). Three of the acts take place in the Beaufort Sea, the offshore regions of the Arctic Archipelago and the Hudsons Bay where petroleum companies are greedily hunting for liquid gold. The music creates an aura of a mysterious, cold, dark and hostile environment within which the "savage innocents" live and die in a timeless pageant of survival and unity with nature.

Enter the men from the "South", their mouths salivating in anticipation of wealth and power. The tools they bring, designed to rape the land and thus wrench the souls from the natives, are inadequate to cope with a vengeful earth which will vomit forth black oil upon and beneath the pristine and ever shifting Arctic ice pack. Meanwhile, in the Nation's capital, a power struggle continues between two jealous government departments. One is DIAND, the sinister Mafiosi partner of the oil companies; the other is DOE, vainly trying to establish its protective mandate while being led by men who are weak and powerless. Although the fourth act is excluded from the libretto, the climax is certain and to be awaited with sorrow. The two villains will be successful in their rape and slink silently away, the fool will vanish in whimpering despair and the once proud native peoples, driven from a new Tower of Babel, will vanish into history, victims of the Tragedy of the Commons. Such is what the authors of *Oil Under the Ice* would have us believe.

The book is about offshore drilling in the Arctic. On the positive side it is well written and researched, given the limited official sources of information available to the authors. They describe in considerable detail the degree of infighting between DIAND and DOE, the prize being the ultimate authority in matters affecting the Arctic offshore. DIAND is a regulatory agency, charged with the responsibility to ensure that marine drilling systems are adequately engineered and operated so as to reduce the risk of an oilspill to an "acceptable minimum", whatever that is. DOE, through its mandate under the Arctic Waters Pollution Prevention Act, must ensure that adequate (whatever that means) environmental assessment

and impact studies are undertaken prior to the granting of drilling licences. The authors describe how DOE has been relegated to an advisory role and how DIAND achieved its prominent position with regard to all development issues affecting the Arctic. The characteristics of proposed drilling systems are discussed to the extent of the limited engineering and geological knowledge of the authors. They illustrate the dangers to the environment of potential blowouts, for which they claim adequate preventative measures for all anticipated circumstances have not been taken. The authors provide a reasonably realistic assessment of what the dangers are and how industry plans to cope with them.

On the negative side, if the reader is looking for a balanced treatment of a complex issue, he will be disappointed. Although they make no apology for the biased perspective of the book, and state as much, this does not excuse their apparent lack of interest in the reasons for which such great risks are being taken. The kind of emotionalism and bogie-man-under-every-bed attitude expressed in parts of the book lends a certain lack of credibility to their efforts.

In an era threatened with global energy shortages and during a time when petroleum diplomacy will alter the structure of international economics, much will be said and written on the value of risk taking. Books such as *Oil Under the Ice* may encourage people to search collectively for realistic solutions, but as the authors say in their opening statement of the Preface: "it has been said that where men are involved there is no absolute truth".

MS received November 3, 1976