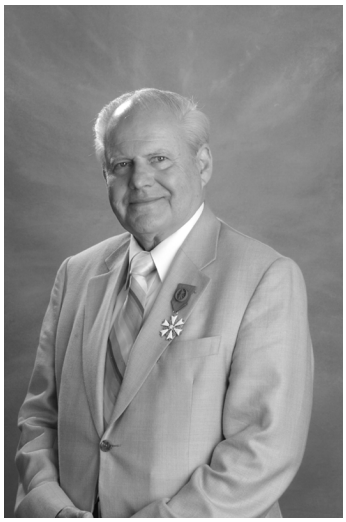
Oil Shale, 2010, Vol. 27, No. 3, pp. 191–193
doi: 10.3176/oil.2010.3.01
ISSN 0208-189X

EDITOR'S PAGE



This commentary comes from a novice member of the Editorial Board. While not an expert in the field, I have, nevertheless, been following the various developments regarding oil shale and its exploitation in Estonia, albeit from a distance. These days it is wise to put everything into a global context; yet, herewith some comments and suggestions which pertain particularly to the Estonian situation but do have a broader relevance.

The six papers in this issue offer an interesting mix of materials. Two from Estonia deal with oil shale mines, mining and their effects on groundwater. One from China offers an analytical assessment of shale deposits, with emphasis on rare earth elements. Use of microwave technology as both a means of energy-efficient heating and its effect on semi-coke structure is the topic for the other. The joint Estonian-Norwegian paper looks at possibilities to use ashes for agriculture. Finally, the U.S. paper considers various alternatives for pyrolysis/retorting for optimal performance, a subject which fits well with the last suggestion made in this commentary.

A century ago the Estonian 'burning stone' (direct translation) was not only utilized but also studied, in St. Petersburg, and subsequently in Estonia. Thus, an early scientific base was built for oil shale technology developments. I recall the name of Paul Kogerman as the most pre-eminent researcher of both the chemical composition and shale processing techniques. Also, a series of papers in "Industrial and Engineering Chemistry" was published in the early 1960-s which presumably summarized the status of that technology at the end of World War II as something new for the I&EC readership.

Both research activities and exploitation continued and expanded during the German and Soviet occupations of Estonia. The initial use of oil shale was as a fuel and a source of oil and gas, and for cement manufacturing. Subsequently, the main utilization shifted to electric power generation – something unique, done only in Estonia. Along with oil production also

a number of chemicals, e.g. phenolics, adhesives, etc. were extracted from the kukersite. Total utilization reached over 30 million tonnes per annum, in 1980, and has subsequently stabilized at about one half of that peak value.

Since Estonia regained its independence in 1991, changing economic conditions have, naturally, also influenced the various aspects of oil shale utilization. Both history, extensive research efforts and new developments in power production have recently been described by Prof. Arvo Ots in his book "Oil Shale Fuel Combustion" (reviewed in "Oil Shale" No. 1, 2005). Ots has also suggested a novel processing sequel for the integrated production of shale oil and power.

While the pre-eminence of Estonian technology in the power generation field has remained, it has been lost elsewhere. Indeed, only a small number of papers in "Oil Shale" emanate from Estonia, with major contributions from Australia, Brazil, China and several other countries ... not an unexpected development. Also, the production of high-value chemicals has suffered...all influenced by the greatly reduced research activity in this field in Estonia. What is worse, many capable researchers have retired or passed away, so the ranks of qualified personnel have been badly depleted. Hence, a couple of suggestions, re publication, education and new technology implementation.

My first suggestion is that "Oil Shale" publish a series of invited reviews about oil shale research, processing and technology developments, past and present, in Estonia, and that in a comparative global context. This would allow "Oil Shale" readers easier access to such information while highlighting important contributions.

It is important to build up a new cadre of experts and researchers in the important areas of oil shale properties, chemistry, processing and utilization, so as not to lose knowledge and with it the ability to act in utilizing the best globally available technology. This should become an important undertaking of the Tallinn University of Technology, with financial support from both government sources, Estonian Energy and other potentially interested parties. To attract good students, ample scholarship/ fellowship support must be made available. That is an urgent issue, to be implemented while there still are experts able to instruct the potential students.

Oil shale is too valuable a resource to be mainly used for power generation. Specialty chemicals should be extracted, good oil produced, and the high calcium content utilized more efficiently. For example, cheap high-sulphur coal or coke could be co-fired with the shale so that the excess calcium be used to trap sulphur, while leaving more shale for other applications and the future. This would also reduce CO_2 emissions.

Finally, as shale utilization to make both oil and generate power is likely to gain speed in many parts of the world, the Estonian experience with shale combustion will be valuable, but even more so if cogeneration be used. Suggestions made by the team of the Department of Thermal Engineering of Tallinn University of Technology would provide significantly better energy

utilization with oil pyrolysis residues used as fuel in a circulating fluidized bed boiler and the hot ashes preheating the incoming shale, with efficient heat transfer, in another fluidized bed. Such optimized fuel-efficient processes are likely to attract more attention and users, perhaps as clients, investors or collaborators with Estonian Energy.

Good luck and success with all your endeavours, to the whole "Oil Shale" readership!

Olev TRASS
Professor Emeritus
University of Toronto