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MEMORANDUM FOR: Distribution

FROM: M. Parsont, Environmental Standards Branch, SD

SUBJECT: MEETING WITH DR. D. KLEITMAN - January 7, 1977

Attached you will find notes on the January 7, 1977 meeting with Dr. Daniel Kleitman.

In addition, there are attached the following:

1. Dr. Kleitman's review of the Mancuso, Stewart, Kneale paper
2. Dr. Kleitman's review of the South Dakota Health Department paper
3. A list of attendees at the meeting.

A handwritten signature in cursive script, appearing to read "M. Parsont", is written above the typed name.

M. Parsont
Environmental Standards Branch
Office of Standards Development

Enclosure:
As stated

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See attached page

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MEETING WITH DR. D. KLEITMAN - January 7, 1977

On January 7, 1977, at NRC offices in Rockville, Md., Dr. Daniel Kleitman, an applied mathematician consultant from MIT, presented his analysis of 1) the paper on occupational mortality at Hanford by Mancuso, Stewart and Kneale and 2) the analysis by the South Dakota Department of Health of respiratory mortality in Falls River County, SD. Representatives of six NRC organizations and one representative from the National Cancer Institute were in attendance (see attached list of attendees).

The meeting began at 9:30 a.m. with introductory remarks by Drs. J. Kastner and M. Parsont of the Environmental Standards Branch.

Dr. Kleitman first discussed upon which documents his analyses were based. For the paper by Mancuso et al. he used the text of the October 13, 1976 HPS presentation. In addition he used the documents transmitted in a letter of December 13, 1976 to R. J. Mattson from Dr. Thomas F. Mancuso, M. D. Following this discussion, Dr. Kleitman reviewed his analysis of the SD Health Department paper.

Dr. Kleitman found that the conclusions given in the paper by Mancuso et al. were unsupportable by the data and analysis performed. He cited several specific areas where the techniques used in the paper were questionable. These were as follows:

1. Lack of age adjustment of mortality data.
2. Since lung cancer was one of the types where the authors found an apparent low radiation level response, the smoking history of the cases should have been determined. Differences in socioeconomic

- level and age difference between controls and exposed groups at death were other parameters that should have been investigated.
3. Dividing total number of mortalities into smaller groups, thus reducing the statistical sensitivity of the tests.
 4. Handling of the myeloma mortality by the authors. (the grouping of lymphatic cancer and myeloma)
 5. The author's analysis of breast cancer mortality was incorrect.

Dr. Kleitman showed that if the myeloma and pancreatic mortality data were removed from the analysis, there was no increase in total cancer mortality in the exposed group over the controls. These two groups contributed such a disproportionately large number of cases to the whole, that their removal led to a change in the result for the total cancer mortality experience. Dr. David Rubinstein, NRC, criticized this practice as being unjustified for the same reasons (grouping data into smaller units) as Mancuso et al. were at fault. He stated that the basic problem lay in the use of small number epidemiology. In addition, he called attention to the staff's own evaluation which suggested an increase in overall cancer mortality in the exposed individuals.

A discussion of Dr. Kleitman's presentation followed. This included a discussion of the staff's analysis of the paper by Mancuso et al. In addition, Dr. Allen Brodsky presented his thoughts about the proper use and handling of the data available for analysis. The use of limited information by Mancuso et al. was not proper and that they should have used all the data which were available as a result of the AEC Health and Mortality Study.

The South Dakota Department of Health (SDDH) analysis of respiratory cancer in Falls River County, SD was the next subject. Dr. Kleitman's analysis indicated that Falls River County respiratory cancer mortality has exceeded that of the State of South Dakota. This is in agreement with the SDDH analysis.

This SDDH analysis is subject to some of the same deficiencies as the paper by Mancuso et al. in that no age adjustment of the data or consideration of smoking habits were made. Occupational factors and the spatial distribution of the cases with respect to the mill tailings were also mentioned as being worthy of examination. A discussion followed in which staff and Kleitman's results were compared. Discussions ended at approximately 2:00 p.m.



M. Parsont
Environmental Standards Branch
Office of Standards Development

List of Attendees

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Craig Roberts	SD
John Hickey	SD
Sy Block	DOR/EEB
Wayne Britz	RAB
Allen Brodsky	OSD
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