

ment of the coal process for sewage treatment? Where did the money come from?

Answer: The development of the coal-based waste water treatment process is sponsored by the Office of Coal Research, U.S. Department of the Interior. All funds have been provided by that Office. The first effort was funded at about \$200,000, and the present 2-year pilot program is funded at about \$667,000.

Question 9: What percentage of total funds expended by your organization on pollution abatement research comes from Government? From industry?

Answer: While the funds for the pollution abatement research my company is doing at present come from Government, I should add that industry in general has been cooperative in supplying samples of their effluents at their expense, and in other ways. We would be glad to work directly for industry in this area of research and development.

RESPONSES TO QUESTIONS OF THE SUBCOMMITTEE ON SCIENCE, RESEARCH, AND DEVELOPMENT BY DAVID C. KNOWLTON, KNOWLTON BROS., INC.

Question 1a: What has been the estimated savings to the industry through making these improvements in papermaking processes?

Answer: If the question relates to the recovery of usable values by waste treatment processes of any kind, such values are usually nonexistent or negligible. The references in the statement to improvements in the water economy and the fiber economy within our pulping and papermaking processes refer primarily to in-process changes which were economically justified by the resulting savings. However, it should be noted that such in-process changes have had significant collateral benefits in reducing the industry's waste discharges. There are a few exceptions where heat, water, or material savings are possible but only to a very limited degree.

Question 1b: Does the industry tend to make the changes in process to eliminate pollution only when there is an economic savings in the cost of producing paper?

Answer: With respect to the industry's attitude toward process changes or the installation of waste treatment processes to avoid pollution, such changes are made as needed to the extent it is practicable to do so in order to conform with applicable receiving water quality regulations.

Question 2: Can you develop figures on how much the industry itself is expending in its own laboratories on pollution abatement?

Answer: The current budget for the National Council is \$428,000. In addition to the National Council expenditures for research and development directed at the abatement of air and water pollution—as well as those of the North West Pulp & Paper Association, the Sulphite Pulp Manufacturers' Research League, and the Institute of Paper Chemistry—individual companies of the industry are currently spending in their own laboratories in excess of \$2,500,000 per year on air and water pollution abatement investigations. This amount does not include capital or operating expenses connected with waste treatment installations.

Question 3a: Can you give more quantitative estimates of the re-