

Mr. VIVIAN. Excuse me. I have no objection to the use of water in papermaking processes. I do have objections to its use in the waste treatment process.

Mr. KNOWLTON. Yes, but the water has to go somewhere and this is in the river. Efforts have been somewhat successful in reducing the amount of water that we are using in making a ton of paper. In fact, it has been more than cut in half in the last 20 to 25 years.

Mr. VIVIAN. Has the amount of material dumped in the water gone down?

Mr. KNOWLTON. Yes. I think there has been a reduction of 60 percent in the waste load contributed to our streams in the last 22 or 23 years, the duration of the council's existence in the face of an increase of production of two and a half times. We are making two and a half times as much paper now as we made in 1943 and the waste load contributed to our streams has been reduced by a factor of some 60 to 65 percent.

So progress is being made. Now, insofar as the stuff that is brought to the surface as your motorboat goes by, we can't deny the fact but there has been accumulation over many, many years of these sludges which we are now attempting to stop putting in but those that are already there, are going to take a long time to get rid of. Another point that you make and I think this is true in Michigan.

Mr. VIVIAN. By the way, that river is dredged almost every year so you are physically removing the wastes.

Mr. KNOWLTON. But this becomes another part of the sludge disposal problem, where do you put it?

Mr. VIVIAN. Out in the lake obviously, where it is even more trouble.

Mr. KNOWLTON. This isn't right either, but you are also going to run out of holes to put it in. But as far as the paper industry in Michigan is concerned, I believe that the mills in the area that you talk about have all signed agreements with the State authorities—

Mr. VIVIAN. That is correct.

Mr. KNOWLTON. To undertake abatement procedures. Now, these take time. There is manpower, available equipment, planning, design, and so forth. But I think progress is being made. Does this answer some of your questions, Mr. Vivian?

Mr. VIVIAN. It answers some of my questions, but it does not soothe all of the irritations. I would like to comment further on this.

I would like to ask if the use of the rivers and streams as places to vent chemical and biological wastes may be inappropriate as compared to large areas of land. It was said that there are not acres of land next to some of the mills. I think in my own case, there are thousands of acres available only short pipeline distances away. The question I come back to is over the long run, is it not better to use the surface of the ground which is extremely active rather than the streams?

Dr. GEHM. I would like to answer that.

The paper industry has some 30 installations of this type, generally spray irrigation in operation at mills today.

However, you can get rid of as a rule, of about 10,000 to 20,000 gallons per acre per day. Some of the large mills use 60 million gallons of water a day, so you can imagine the acreage that would be involved