

Mr. CARPENTER. That takes care of that question as far as I was concerned.

Dr. WEINBERGER. Dick, may I comment for your record on this phosphate problem?

Mr. CARPENTER. Please do.

Dr. WEINBERGER. The question is frequently asked is eutrophication caused primarily by phosphates. Eutrophication means enrichment and enrichment in the biological sense means the providing of food materials. One of the foods or nutrients that organisms require at the algae level is phosphates, but they also require a whole host of other elements including the same elements which we would need in our nutrition. They would be such things as carbon, nitrogen, sulphur, potassium, and so forth.

If one wants to go to starving of the organisms—and this is what we mean by nutrient control—and again the implication here is the same thing in dealing with human nutrition—we need control but one element. In other words, any one of the elements is essential to life and if we can control any one of these we should be able to, and we can, control the growth of these organisms.

Now in taking a look at the elements which might be controlled, we first take a look at the macro, that is the larger scale, requirements. One of the macro nutrients would be phosphorous. Of all of the nutrients, it seems that phosphorous is the one most likely to be controlled. And this is the reason for the emphasis on phosphorous control in most bodies of water.

There are some situations where there is sufficient phosphorous in natural waters so that this is apparently not the controlling element and in those cases one might control the process by reducing nitrogen.

From a long point of view there have been many suggestions made, all of which have scientific validity, and that is, if one could find a micro nutrient, such as cobalt, and if we could reduce its concentration below the critical level, we would likewise stop the growth of these organisms.

This is the reason why you find in the literature suggestions that we might try to control a vitamin. And again relating back to human nutrition you can actually starve a person by them not having a particular vitamin, even though their caloric intake is quite adequate.

Mr. CARPENTER. Is there any possibility of a specific herbicide as an approach to algae control?

Dr. WEINBERGER. This is always a possibility, of trying to find a very specific chemical control. This must be approached with a good deal of caution, because this is very seldom that specific. There have been chemicals added.

Mr. CARPENTER. Copper sulphate?

Dr. WEINBERGER. Copper sulphate to control algae and in limited cases it can be effective. I would say its most effective application is in terms of a swimming pool, but in terms of any continual application we would much prefer to not resort to chemicals which now add another impurity into the environment.

Mr. CARPENTER. One question remained from the prior hearing and that is that I have noticed the Department's releases, when the State standards are approved, do not give the numerical standards, that is the temperature rise or the salinity and so on.