ence explains the difference in the cancer rates among the three states. Before it became politically popular to blame industry, the National Cancer Institute epidemiologists showed unequivocally that urban crowding was a predominate factor in cancer causation. It is clearly a surrogate for something else. New Jersey has a rather small land mass and over 80 percent of the people are crowded into a rather small area in the northeast part of the state. It is, therefore, like a large city and if you compare it to similar demographic areas, with equivalent land and population density, and look at it in a controlled way, it is shocking to see that many other cities and counties and regions that do not have any industry have higher cancer rates than New Jersey. For example, San Francisco; Washington, D.C.; Nassau County, which is an eastern suburb of New York City; Westchester County; these demographic areas have rates that are equal to or greater than New Jersey's, and those areas are devoid of heavy, polluting industry.

If you look at other questions beyond urbanization and ask what are the surrogate factors, the ecologists would say, well, it's urban air pollution, and it's still ultimately being derived from industry. Well, we tested that hypothesis. The hypothesis was that pollutants in the air and in the water are responsible for increasing the cancer rates by at least 25 to 30 percent. In order to test that hypothesis, we simply looked at the National Cancer Institutes own Third National Cancer Survey which surveyed 20 million people in this country, back in 1969, -70, and -71. Now, that was incidence data and as I said, it covered 20 million people. Our studies incidentally were conducted with the sole support of a grant from the National Cancer Institute when I served as the Director of the Cancer Institute of New Jersey in 1976.

The diagnoses were far more accurate than the death certificates in the N.C.I.'s mortality study because these were surgical pathology specimens. The slides were all read by Board Certified pathologists. In that Third Cancer Survey, there was a wealth of information and it was not originally designed to answer this hypothesis, but it came out that way. There were seven cities in that survey. Four of them were what we would call "clean" cities; San Francisco, Dallas, Minneapolis and Atlanta. They are urban centres without any kind of heavy industry. In that survey also were Detroit, Pittsburgh and Birmingham, the "Pittsburgh of the South". Those seven cities encompassed 16 million people. We did not massage the data; we simply lifted it out of the tables and put the data next to each other and if the hypothesis was correct that industrial air pollution or urban air pollution were a major factor in cancer causation, we would have expected to have seen that (the) four "clean" cities had lower cancer rates than the three "dirty" cities.

We looked at overall cancer rates for white males as well as for black males, age-corrected, and to our surprise, the three "dirty" cities had an overall 8 percent lower cancer rate than the four "clean" cities. I don't think the 8 percent is statistically significent, however, it invalidates the hypothesis. Furthermore, we looked at specific kinds of cancer that Blott, who is an N.C.I. epidemiologist, and others have said are industry-types of cancers, like lung, larnyx, nasopharnyx, stomach, lymphomas, leukemias, urinary bladder, liver and skin. These are all supposed to be industry-associated types of cancer. The Third National Cancer Survey gave us site specific cancer diagnosis, i.e., by atomic site. Those supposed industry-associated cancers were not higher or greater in incidence in the three "dirty" cities compared to the four "clean" cities. In Detroit, Pittsburgh and Birmingham, 45 percent of the occupational workforce is engaged, and has been engaged for several decades, in industry that most people would say is worrisome. Further, these decades of exposure were without controls. And yet, we did not see greater cancer rates in