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File: Cancer

A scientist's viewpoint on the issue of environment and health

Interview with Dr. H.B. Demopoulos, of the New York University Medical Center and of the International Study Center for Environmental Health Sciences.

Professor Demopoulos' teachings and research works deal mostly with environmental hazards affecting human health and in particular with environmental factors as related to cancer. He was recently invited to communicate his toughts and findings on the main causes of cancer in industrialized countries at an International Communications Meeting of the asbestos industry. Following his presentation, Professor Demopoulos gave an interview to the Bulletin in which he recapitulates the content of his remarks.

• What do scientists today consider to be the main causes of cancer?

The main causes of cancer are environmental, there is no question about that. The estimate is quite reasonable that about 90% of cancers are caused by what we term environmental factors. It is important however to define the term environment. Up until this time, most of the federal regulatory agencies and most of the so-called public interest groups had assumed that what scientists mean by the term environment is the community environment: the air that we breathe and the water that we drink, for example. In actual fact, what most scientists mean, and what Dr. John Higginson, who is currently Director of the International Agency for Research on Cancer, meant when he coined the term several years ago, is the personal environment. We all live in two environments: the general environment over which we have no control, and the personal environment which we create through our choices: diet, habits and life style. It is this latter, the personal environment, that Dr. Higginson referred to and that most responsible university scientists refer to, when they talk about environmental cancer.

• Is it possible to identify more specifically these environmental factors?

A breakdown was arrived at by independent university scientists gathered at two symposia held in 1979 under the aegis of the New York Academy of Sciences and the American Health Foundation, with the cooperation of the American Cancer Society, as well as the World Health Organization's International Agency for research on Cancer.

I am talking here with reference to cancer in the United States, although the disease is a worldwide problem.



In the United States, there are 1 000 people a day who die of cancer. 350 of these people, or 35%, will die because of smoking high tar cigarettes and drinking excessive quantities of alcohol.

Another 45% of cancer deaths are due to what we call disordered nutrition, with the following subcategories: excessive calories, excessive consumption of dietary fats (unsaturated and saturated) as well as cholesterol, obesity of a magnitude of 40 pounds or more in overweight, and nutritional deficiencies such as low fibre diet, lack of fruit and vegetable ingestion and vitamin A deficiency, although in the case of vitamin A, excesses can also be dangerous.

Less than 5% of the present deaths are due to occupational exposures that occured in the past when the dangers were not known. An additional 3% of cancers are caused by exposure to ionizing radiation, two thirds of which is background or naturally occuring radiation, and the other third is medical X-rays. It should be noted that 0% of cancers are caused by nuclear power plants. Another 2% of cancers are caused by pre-existing medical disorders such as chronic fibrocystic disease of the breast, ulcerative colitis, chronic atrophic gastritis, etc. ▶

PLAINTIFF'S EXHIBIT

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A scientist's viewpoint...

A further 1% of cancers are due to the administration of prescribed pharmaceutical agents such as cancer chemotherapeutics, estrogens for the menopause and possibly some antihypertensive drugs. The balance of cancers result from the aging process or are willed by God.

These are the predominant causes of cancer, and it is important to note that most, with a few exceptions, are almost entirely avoidable for an educated public.

• You seem to play down the impact of occupational exposure which has often been stated as being one of the major causes of cancer?

That statement is totally fallacious. There is no question that industry, the asbestos industry, the chemical industry, the petroleum industry and others have the potential to kill us all, because the substances they deal with are very dangerous. But they are under control, and they have come under good control. And I don't think there is any need for the hysteria that we see. A lot of the hysteria is public relations, gimmickry, and the data simply does not support it.

For example, using the data from the National Cancer Institute's third national cancer survey, we examined three highly industrialized cities: Detroit, Pittsburg and Birmingham, where 40% of the workforce is engaged in dangerous "dirty" industries that cause tremendous pollution. We looked at the cancers that were reported for these three cities during the years 1969, 1970 and 1971. And if you keep in mind that there is a 20-year lag phase at least in cancer, the cancers that were diagnozed in 1970 started to develop back in the 1950's and 1940's when there were no such things as environmental controls. So if you look at Detroit, Pittsburg and Birmingham in the 40's, the 50's and even the early 60's, you have three of the most polluted cities imaginable, under worst case conditions.

Then we looked at four "clean" cities hat are not industrialized: San Francisco, Dallas, Minneapolis and Atlanta. What did we find? To our surprise, there was 8% less cancer in the three "dirty" cities than in the four "clean" cities. If the hypothesis that occupational exposures are responsible for 20 to 40% of cancers were correct, then we should have seen at least a 10% increase in all cancers in the three "dirty" cities. We actually saw 8% less, so that there is an 18% spread. The hypothesis just does not hold. And I should like to point out that the seven cities represent a total of 16 million people, studied for three years. That is a lot of people, so that we are not dealing with some kind of statistical freak. And all the data was from the third national cancer survey and was corrected by age, sex, race and anatomic locations.

• These conclusions do not seem to coincide with the ideas that the general public has about the causes of cancer, how do you explain it?

The answer is that most people have a misconception about the causes of cancer. If you took a public opinion survey, you would find that most people believe that the major causes of cancer are air pollution, cigarette smoking, nuclear power plants, saccharine, cyclamates, asbestos in hair dryers, asbestos in the office, asbestos in schoolrooms. In actual fact, if you put up that list against what university scientists say the causes of cancer are, there is only one factor that shows up on the public's list and that is cigarette smoking. The public is misinformed about at least 80% of the causes of cancer.

This has come about because the federal regulatory agencies all have a public relations department, and to put it bluntly, they have a propaganda machine. Similarly, the so-called public interest groups, which really do not represent the public but themselves, have public relations firms working for them. So they all grind out the propaganda. The only group that does not have a propaganda machine is the one that has the data, namely the university scientists. We do our research, we publish our papers, we put them in scientific journals and they get buried there. Nobody reads them except other scientists. I think that this is really an irresponsible way to act. Scientists who have developed the data and understand it actually have a societal obligation to get the data out, to get the truth out into acceptable public consciousness.

• There are scientists who hold a different opinion than yours. And there are epidemiological studies that prove exactly the opposite of what you are saying about occupational exposure, at least as far as asbestos is concerned. How do you explain this?

The only group that contends that asbestos is dangerous is really one major group in New York City. And they did not use proper epidemiology. Dr. Selikof and his group studied 18 000 insulation workers for a period of ten years and noted that these developed 485 cancers of the lung, of the bronchogenic variety. They also noted 160 mesotheliomas that were asbestos induced from high exposures, and there is no question that high dosages of asbestos will cause mesotheliomas, there is no argument about that. The argument comes when you try to demonstrate that the tracheobronchial tract is at an increased risk from asbestos exposure.

I do not quarrel with Dr. Selikof's observations and I thouroughly believe that the 485 cancers of the lung developed in the asbestos exposed workers. But what I question are the controls that Dr. Selikof and his group used. The wrong control was made insofar as Dr. Selikof took the national expected average, looked at the age distribution of his patient and took a similar group of people from the tables, not actual people, and came up with an expected average of 106 cancers of the lung for the same age distribution. He therefore concluded that there is a 400% increase in tracheobronchial lung cancers as a result of asbestos exposure. Such an extrapolation is probably the most damning bit of evidence against asbestos.

A group of scientists who have had a lot of experience in controls undertook to correct Dr. Selikof's data, taking into account such factors as cigarette/alcohol consumption, urban density,

socio-economic status and nutritional habits, all of which can raise the risks for most of the common cancers by 50 to 800%, depending on the sites considered. We came up with an expected rate of 410 lung cancers for construction workers who are not asbestos exposed. The difference between 410 and 485 is not statistically significant.

This is a long winded answer to your question: how come other scientists do not agree with your theory. The answer lies in the use of proper controls. Dr. Selikof's group did not use case control studies, and whether they have done this purposely or not, I do not know and I do not care. The fact of the matter is that as a scientist, I label those studies as non-scientific, uncontrolled, and therefore they should never have seen the light of day.

What is critically needed is a case control. A well-developed epidemiological study has to be done, where you take your asbestos workers and you match them. Joe Blow is 45 years old, he weights 175 pounds, he eats this much meat, he smokes this many cigarettes, he lives at such an address. I want to compare him with four people like him, who match him but are not asbestos exposed. This is the way you do it. You use four controls for every one experimental subject. This is classical science and we never had the benefit of that in the asbestos story.

• Is there evidence to support your own theory that the predominant causes of cancer are cigarette smoking, excessive consumption of alcohol and disordered nutrition?

One proof can be found in the data about a religious group called the Seventh Day Adventists. Many of them live in highly polluted areas, such as Los Angeles County for example which is located at the eastern end of Los Angeles where the winds blowing from west to east bring in all the automotive exhaust and other types of pollution. By virtue of their religion, these people do not smoke, do not drink, and many of them are vegetarians. They still consume milk and milk products and they still eat eggs so that they have not cut down as much as they should on their fat intake, and some of them are obese since they are adult converts. Even so, the Seventh Day Adventists, looking at males and females, have a rate of cancer deaths that is one half of the rate of the rest of the Americans. So, instead of having 1 000 cancer deaths a day, if we all lived the way the Seventh Day Adventists do, we would have only 500 cancer deaths a day. And if we took pain to take low fat milk products and did something else with eggs besides eating them, and if we took care of obesity, it would still be better.



Animal studies have also been definitive. If you administer a very tiny dose of a chemical carcinogen to animals, they will not develop cancer. If however you put them on a high fat diet, increasing their fat intake from their normal 5% to 20%, they develop cancers as if they had gotten a tremendous dose of that carcinogen. So, fat is extremely toxic in the development of cancer.

• Do you have data specifically related to asbestos exposure?

We made a study here at the New York University Medical Center on trends in mesotheliomas for Manhattan. The island of Manhattan has the highest air pollution rate, as far as asbestos is concerned, compared to any other city in the country. Because of its location in mid-Manhattan and the fact that it is a general medical center, our institution admits more than the national average of high-rise construction workers, bridge and tunnel toll-takers and street traffic-controllers who are exposed to asbestos from automobile brake drums, former shipyard workers, and general population that has above average asbestos exposure. Our investigative tumor registry has a good cross section of Manhattan patients. We looked at our mesothelioma rates and compared them with those of the third national cancer survey.

The survey shows a ratio of approximately one mesothelioma per 1 000 new cases of cancer. At NYU Medical Center, we see approximately 3 000 new cases per year and averaged 2.6 mesotheliomas each year, for 10 years, or 0.86 mesotheliomas per 1 000 cases per year. So we have somewhat less cancers due to specific asbestos exposure than the nation as a whole.

Furthermore, we did a time trend analysis, because if asbestos is supposed to stick in your lungs and keep causing cancer, then as the years go by trends should develop. We looked at the past 12 years, from 1967 to now, and there is no trend; mesothelioma is at absolute plateau.

So our question is: where is the data that supports the fear of asbestos? We have looked for it and we have not fount it.

• Are there other studies that support your findings?

There have been studies about the Québec mine workers showing that there is no increase in the cancer risk for Québec asbestos miners, and that is mining asbestos. There are whole towns in Québec that have been built on asbestos tailings, and they have been there for 90 years, and there is no increase in cancer rates. There are whole communities that drink asbestos-rich water, and they do not get increased lung cancer rates. Those studies have all been published, but everybody chooses to ignore them, and I don't know why.

• Would you go so far as to say that asbestos is no more dangerous than most natural or man-made substances?

see page 7

Mechanized wrapping at LAQ

The wrapping of bags of asbestos at Lac d'amiante du Québec, Limitée (LAQ) is now entirely mechanized thanks to the use of a Canadian-made "Spider" wrapping machine.

This operation, which consists in covering under pressure bundles of bags with a polyethylene film, was done up till recently with a manually-operated machine capable of handling 10 to 15 tons per hour. Within the same period of time, the new "Spider" wrapping machine can handle 60 tons.

Completely Automatic

This conveyor crossing through the 14x14x14 metal structure takes charge of the 36-bag palets as soon as they are deposited by the lift truck. The conveyor starts automatically upon the arrival of a load and carries it to the middle of the structure. There, a roll of plastic film automatically unwinds around the bundle of bags until the desired thickness is obtained, in accordance with the customer's order. The machine may also be ordered to place a plastic covering on top of the unit. Once the wrapping is completed, the load is automatically sent to the other end of the conveyor where a lift truck removes and carries it to containers, trucks or freight cars.

Programmed wrapping

Besides rapid work, the machine has several advantages; in particular it can adapt to different-size palets and can provide an infinite variety of types of wrapping without changing the grade of the plastic film. This represents a savings compared with the old process.

In addition, the oblique unwinding arrangement of the film further decreases the quantity of film used while increasing the strength of the wrapping. Lastly, because the machine can be programmed at the beginning of each shift, it can operate without supervision thereby enabling continuous loading and unloading, assuring a rythm four times greater to that of the old machine while making the employees' work easier.

This type of wrapping, now coming into general use, lowers the risk of breakage and loss and facilitates handling, transport and storing, while at the same time eliminating risk of dust emission.



Automatic wrapping, an efficient, safe and economical operation.

Interview...

continued from page 3

I think that chrysotile asbestos, in the usual doses that civilized society is now getting and the usual doses that asbestos workers are getting nowadays, poses absolutely no hazards, not for fibrosis, not for cancer.

I think that the amounts found in hair dryers are absolutely inconsequential, that the amounts found in schoolrooms are absolutely inconsequential. I find it total hypocrisy to see school administrators worry about a couple of asbestos fibres, when in fact they build smoking lounges for the kids, actually encouraging them to smoke.

In my opinion, asbestos presents no danger to the general public, and no danger to the workers if we simply maintain the controls that are now in place.

Harry B. Demopoulos, M.D.

Dr. Harry B. Demopoulos is currently Associate Professor of Pathology at the New York University Medical Center after having been Director of the University's Comprehensive Cancer Center Planning as well as Director of Graduate Studies in Experimental and Molecular Pathology.

Dr. Demopoulos, who is a member of the American College of Toxicology, of the Advisory Council, Environmental Improvement Associates and of the National Research Advisory Committee of the Kent Waldrep International Spinal Cord Research Foundation, is also a life-mamber of the New York Academy of Sciences. He is the author or co-author of numerous scientific and medical papers published in prominent medical journals such as the American Journal of Pathology and the Journal of the National Cancer Institute.

He is a Director of the International Study Center for Environmental Health Sciences which is devoted to education, service and research concerning environmental hazards affecting human health.