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SUMMARY OF THE OSHA GENERIC CARCINOGEN
HEARING PROCEEDINGS ON JUNE 20, 1978

Witnesses: Panel of American Industrial Health Council

Mr. Paul Orefice, Chairman of the AIHC and
President, Dow Chemical Co.

Dr. Robert Olson, Professor, St. Louis
University Medical School

Dr. Richard Wilson, Professor, Harvard University

Dr. Colin Campbell, Professor, Cornell University

Dr. George Klaus, Rutgers Medical School

Dr. Bernard Oser, Toxicological Consultant

Dr. James Jandl, Professor, Harvard Medical
School

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Statement and Questioning of Mr. Orefice

Mr. Orefice stressed that AIHC's objective was, through dialogue and cooperation with OSHA, to develop a rational, practical and effective carcinogen policy. (Tr. 3192-3193, 3201). He said that the basic difference between OSHA's proposal and the AIHC alternative proposal is that the latter strives for an economically feasible protective program rather than an unachievable level of zero risk. (Tr. 3212-3213). Dr. Olson said that the latter objective can be inferred from OSHA's "vague" discussion of "lowest feasible level," (Tr. 3252), but

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that this objective is also clearly described with respect to less hazardous suitable substitutes. (Tr. 3254).

Statement and Questioning of Dr. Olson

Dr. Olson disagreed with the notion that "there is currently an epidemic of occupational cancer in this country." (Tr. 3220, 3293). He agreed with epidemiological data indicating that about 80% of human cancer is environmental, of which 50% may be due to cigarette smoking and 30% to eating and drinking. (Tr. 3221).

OSHA's proposal, Dr. Olson said, unreasonably ignores epidemiological data, which it deems unreliable. OSHA leans too heavily on data from mice and permits placement of a substance into Category I on the basis of the "very, very minimum data" derived from one set of mice coupled with a short-term test. (Tr. 3222, 3284-3285). The OSHA proposal was also criticized for its failure to consider quantitation of responses, dose-response curves, and potency evaluation of chemicals, and for its contention that the process of growth of benign and malignant tumors does not differ. (Tr. 3223, 3259-3260, 3279). In summary, the OSHA proposal is too rigid in that it does not permit "discretionary powers of informed scientists to look at the total data regarding a given chemical before coming to the conclusion that it is a so-called Category I substance." (Tr. 3225).

Dr. Olson feels that negative human results should supersede positive results in animal studies. (Id.). Saccharin and DDT were cited as examples of substances which have produced negative results in epidemiologic studies. (Tr. 3226-3230).

Positive animal test results must be juxtaposed with negative clinical information and the resulting body of data requires judgment by experts, not rote producers. (Tr. 3234, 3250). In judging the adequacy of an epidemiologic study, the lower the potency of the compound, the larger the population must be. (Tr. 3235-3236).

Dr. Olson also criticized OSHA's reliance on inadequate animal tests conducted by the NCI. Chemicals should not be administered above the maximum tolerated dose, nor should inbred strains of mice, with the potential for spontaneous tumor incidence, be used. (Tr. 3237-3239). The human incidence of spontaneous tumors, which is about 20%, is less than that of certain inbred strains. (Tr. 3261-3262). The mouse in general has a high and inconstant basal tumor incidence. (Tr. 3239). In addition, OSHA has failed to adequately consider either the effects of malnutrition on tumors or differences in metabolic profiles in different animals. (Tr. 3239-3241).

Dr. Olson described synergism as the event which "occurs when two agents have a proportionally greater effect together than they do separately." (Tr. 3255). Asbestos and smoking is a "classical example."

In the absence of any data in man, the prudent course must be taken and extrapolation from animal data must be made on a linear basis, according to Dr. Olson. (Tr. 3267). But there is no sure way for detecting a human carcinogen by using a non-human experimental animal. (Tr. 3268). What is objectionable about OSHA's proposal is its sole reliance on animal data even

when there is extensive human experience.. (Tr. 3269). Dr. Olson would be very cautious about regulating a compound below the ordinary conditions of use where there is human experience showing no evidence of tumorigenicity in man under conditions of exposure. (Tr. 3273). The "main danger" is burdening the population with unnecessary regulation for false alarms. (Tr. 3283). Significant human experience is exposure of thousands of people to a chemical for over 20 years. (Tr. 3274-3275). Although carcinogens are in general not species-specific among mammals, some become carcinogenic in one species and not in another. (Tr. 3280). Increasingly more weight should be placed on test data as the species gets closer to man. (Tr. 3286).

AIHC envisions that decisions about inferring human risk from animal experimentation be made by a body of experts independent of the regulatory agency. (Tr. 3281).

Statement and Questioning of Dr. Campbell

Dr. Campbell believes

"that carcinogen exposure in the workplace should be reduced to the lowest feasible levels which are consistent with maximum health protection, but which are also cognizant of acceptable risk and economic factors." (Tr. 3305).

He proposed the development of greater flexibility within OSHA's categories, "since chemical carcinogen potencies vary by several orders of magnitude, both within and between species." (Tr. 3305, 3320-3321).

The OSHA proposal may be counter-productive in its effect on basic laboratory research. The excessive costs

required to re-engineer and individually monitor all laboratories handling certain chemicals would prohibit all but a few selected institutions from conducting research. (Tr. 3306, 3317-18). Far fewer technical people could be accommodated in such limited facilities. (Tr. 3306). In addition, other equally hazardous chemicals or processes might be less attended. (Tr. 3307). Dr. Campbell outlined an alternative proposal for laboratory workplaces. (Tr. 3307-3308).

Dr. Campbell criticized OSHA's categorization scheme. He said that chemicals which possess carcinogenicity and other forms of toxicity do not lend themselves to easy categorization. (Tr. 3308). Factors such as differing rates of metabolism and tissue distribution patterns between various species may exert independent actions on the quantity of carcinogen to which the animal has been exposed. There may also be differing rates and ability for recovery. (Tr. 3309). The interplay of these and other external factors should not be ignored in the regulatory process. (Tr. 3310).

Regulatory action by OSHA would be more efficient and economical if coordinated with actions of other agencies. Better coordination is needed, for example, in studying the role of nutrition and diet in carcinogenesis. (Tr. 3313-3314). Dr. Campbell deemed the philosophy of the Delaney clause to be inappropriate for the workplace.

Statement and Questioning of Dr. Jandl

Dr. Jandl, as did Dr. Oslen, disagreed with OSHA's allegation that there has been an "increase in cancer." (Tr.

3326-3327). Referring to charts included in his prepared statement, Dr. Jandl stated that there is no new trend in terms of cancer mortality since 1947. (Tr. 3329-3331). He criticized OSHA's assertions to the contrary as unsubstantiated. (Tr. 3333-3337). There is no fundamental basis for the position that "a massive crusade of testing," particularly in the manner recommended by OSHA, is required. (Tr. 3338).

Dr. Jandl explained his view that tests conducted in rodents constitute an inadequate screening mechanism. They are "bad seed animals," and "inbred in the most obscene way," which passes on defective DNA repair and produces spontaneous tumors. (Tr. 3342-3343). The animals also have nephritis and pneumonitis. The doses administered are too high. (Tr. 3344, 3348).

The closer the species tested is to man, the more pertinent the results. (Tr. 3345). However, "human data is the only data that is valid for man." (Tr. 3345). Such evidence should be considered the highest-rated and best information. (Tr. 3346).

The shortest latency period of which Dr. Jandl is aware is one month, for reticulum cell sarcoma in people that are on immunosuppression for renal transplants. There are latencies for leukemia of the order of 1-2 years. (Tr. 3351-3352).

Dr. Jandl understands that there are about two dozen substances which have been shown to have a reasonable evidence of cause and effect of cancer in humans. If a level of valid

statistical significance is reached concerning such a substance, testing should stop and efforts should be made to eliminate it, unless it is "essential to the survival of mankind." (Tr. 3356). Among the substances which have reached that level are radiation, asbestos, cigarette smoking, and perhaps beta-naphthylamine and vinyl chloride. (Tr. 3357).

Statement and Questioning of Dr. Wilson

Dr. Wilson criticized the OSHA proposal for its failure to define the "lowest feasible" permissible exposure limits. If what OSHA means is technical feasibility,

"the whole generic carcinogen proposal is unworkable, for scientifically one can reduce it to almost any exposure without limit." (Tr. 3363).

The term "feasible" must be numerically defined, in light of common sense. Absent such a definition, OSHA's aim of having a coherent policy for all carcinogens will vanish. (Id.).

Dr. Wilson proposed that an acceptable definition "is that the exposure levels should be such that the cancer risk to the worker should be comparable to other risks that the worker is willing to accept." (Tr. 3364). Some estimate must be made of how much one can afford to pay to reduce the risk of exposure. (Tr. 3372). It is prudent to insist on a very much lower level of exposure when the general population is exposed to a chemical, rather than just those in the workplace. (Tr. 3382-3383).

Chemicals vary in their potency by factors of 100,000. "Potency" was defined by Dr. Wilson as "the slope of the linear dose-response relationship". (Tr. 3428). Potency in any species can be factored very roughly into an in-human potency

multiplied by a species factor. It is possible to calculate carcinogenic risk to man for any chemical where there is animal data. (Tr. 3364-3365).

Dr. Wilson advocates comparing the risk of different actions to cause the same benefits. One method by which this can be done is substitution in the workplace of one chemical for another, if the substituted chemical has a lower risk. (Tr. 3379-3380).

Dr. Wilson stated that the concept of "acceptable risk" is widely accepted among the academic community. (Tr. 3387-3388). An "acceptable cost" for reducing a risk of exposure of ten to the minus four per year is \$100 per year for every person exposed. (Tr. 3402-3403). If a potential risk of a chemical exceeds 10 to the minus 5, OSHA should consider regulating it. (Tr. 3432). The question of how much money industry or society is willing to spend to reduce a risk "should be faced for all risks together and not for cancer risks separately from others, and certainly not for cancer risks very much more than others." (Tr. 3404). There are a number of uncertainties in risk analysis of carcinogen exposure, including the unreliability of both epidemiological and animal data, and, to a lesser extent, methods of absorption. (Tr. 3413). Dr. Wilson admitted that his method of risk calculation had a "large element of uncertainty" in it, but said it was "probably an uncertainty on the high side." (Tr. 3440).

In estimating risks, one can use three different numbers: the number you believe is the best number, the number

you believe is a reasonable upper limit, and the number you believe is a reasonable lower limit. (Tr. 3423). A different number may be chosen, depending upon the purpose. For regulatory purposes, Dr. Wilson feels it is proper to take an upper 95% confidence limit. (Tr. 3424). The distinction between "carcinogens" and "non-carcinogens" should be "muddied" slightly in order to provide proper incentives for industry to institute proper controls. (Tr. 3433).

Social benefits should be considered in weighing the total costs and total benefits of a regulatory decision. There is not yet a good procedure for considering social costs and benefits in making decisions. (Tr. 3446).