ordinate to psychiatrists. They contend that the requirement for "physician supervision" adds another layer of costs and reduces the availability of psychotherapy. With the Medicare requirement for physician referral, said Cummings, "the patient is not likely to receive psychological services unless he or she is also billed for a medical problem of some kind." Psychologists, he said, are perfectly aware that many mental problems require drug treatment or are linked to physical problems, and they are as capable as any other professional of referring their patients to appropriate specialists.

A major forum of this conflict is in Community Mental Health Centers. Most CMHC's, except those that are hospital-based, are not recognized as health providers under Medicare. So patients do not even get the limited Medicare mental health benefits unless they are treated by a physician. Many psychiatrists are disillusioned with what Cavanaugh called the "general trend toward deprofessionalization" in CMHC's, and they believe the only remedy for the perceived low quality of care is to give them a lot more money so they can attract psychiatrists. The nonmedical professionals, however, contend that great savings could be made if benefits were made available not only to pay nonpsychiatrists but to cover costs of expanded outpatient therapy and "partial hospitalization" (spending the day in the hospital and going home at night). Witnesses from the National Council of CMHC's said that according to government data the average stay for elderly mental patients in state and county hospitals was 53 days, but for those supported by CMHC's it was only 14 days.

Although the senators present appeared willing to go along with the idea that expanded mental health services are desirable, their concepts about the difference between psychiatry and psychology, and the nature of mental illness itself, seemed foggy at best. Talmadge, for example, posed the following question: if a doctor prescribes tranquilizers for an anxious patient and the patient instead goes out and gets some "pep-up" pills—"is that mental illness?"

—CONSTANCE HOLDEN

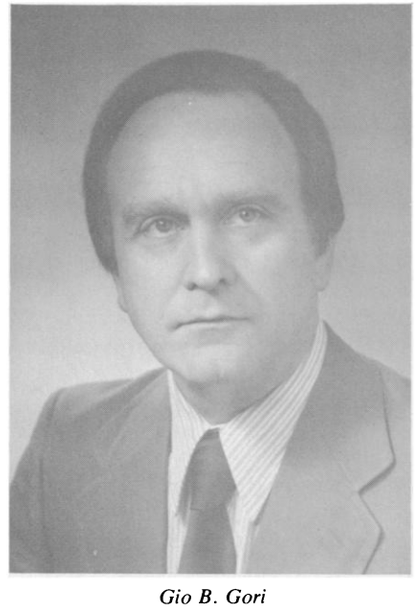
Health Officials Fired Up over "Tolerable" Cigarettes

In case anyone had any doubts before, they now know for sure. The Secretary of the Department of Health, Education, and Welfare (HEW), the Directors of the National Cancer Institute (NCI) and the National Heart, Lung, and Blood Institute (NHLBI), and the Surgeon General of the United States all agree, vehemently. Smoking cigarettes is hazardous to your health.

In fact, their pronouncements came so thick and fast and were so emphatic, an observer might think that someone, a government scientist, for example, had just asserted that some cigarettes were safe. That did not happen, however.

What did happen was this. A government scientist, Gio B. Gori, who is deputy director of the Division of Cancer Cause and Prevention at NCI, described to an Associated Press reporter the contents of a paper he coauthored with Cornelius J. Lynch of Enviro Control, Inc. In the paper, which is soon to be published in the *Journal of the American Medical Association* (JAMA), the two scientists conclude that the toxic substances in some brands of cigarettes, which they name, have been reduced to such a degree that an individual may be able to smoke limited numbers of the cigarettes without a *detectably* increased risk of dying as compared to the risk of nonsmokers. Gori, who is fond of saying "The only safe cigarette is an unlit cigarette," was careful to point out that smokers might still be at higher risk—as much as two times higher—than nonsmokers. He maintains, however, that even a risk twice that of nonsmokers might be difficult to detect in an epidemiological study and, as he wrote in the JAMA paper, "The inability to verify this risk might lead to it being considered socially tolerable."

But in Gori's interviews with reporters and the subsequent news accounts thereof, he translated a risk that might be socially tolerable into "tolerable cigarettes," as in the Washington *Post* headline "Some Cigarettes Now 'Tolerable,' Doctor Says." And "tolerable" suddenly became an intolerable word in the environs of the NIH and HEW.



Gio B. Gori

Reaction was swift as Julius Richmond, the Surgeon General and assistant secretary for health at HEW, and Robert Levy and Arthur Upton, directors of NHLBI and NCI, respectively, issued statements disavowing the possibility that any level of smoking might be safe. Everyone agrees Gori never actually said that. But they were concerned about an uncritical public being misled by the word "tolerable" to equate a risk too small to be measured with no risk at all, especially since they are far from convinced that Gori's conclusions were justified in the first place.

Virtually everything that happens in Washington has political ramifications and the smoking issue is no exception. Gori's boss HEW secretary Joseph Califano has been waging a well-publicized, although not particularly well-financed, campaign against smoking. Exact figures on just how much HEW is spending to educate the public about the health hazards of smoking are somewhat hard to come by. The Office of Smoking and Health estimates the amount to be under $2 million in FY 1978 and projects spending of about $6 million for FY 1979. These are miniscule figures by Washington standards, but additional programs funded by NCI or NHLBI are sometimes cited as having an antismoking component.

In any event, health officials, who are finally coming to grips with the idea that prevention is a cost-effective way to reduce the human and economic toll of ill-

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ness, are already sensitive to criticisms from Congress and consumer groups that they give too little attention to preventive medicine. In this atmosphere, the suggestion by a government scientist that smoking might be "tolerable" was not well received by health officials who were afraid it would undermine their antismoking efforts.

In addition, the suggestion that people might smoke small quantities of cigarettes without apparent harm touches on the threshold issue, which is both highly controversial and loaded with regulatory implications. You could even call it a burning issue. The essence of the controversy is whether or not there is some low concentration—the threshold—below which a cancer-causing agent has no effect. If there is such a threshold, then low concentrations of the agent might be permitted in food, for example. If there is no threshold, as many cancer researchers now think, then no concentration, however low, would be "tolerable." Thus, the threshold controversy gives health officials another reason to be

Briefing

Clash in Congress over the Honourable Schoolboy

Reacting to disclosures of unseemly behavior by agents of the Central Intelligence Agency (CIA) and the Federal Bureau of Investigation (FBI), the Senate Select Committee on Intelligence last February introduced a 263-page national intelligence act, S. 2525, establishing FBI and CIA charters that expressly outline the agencies' permitted activities. As the result of disclosures that academic instructors and researchers had been used by the CIA, both wittingly and unwittingly, in the conduct of covert operations, the bill contains provisions that would limit contacts between the CIA and the academic community beyond the spy agency's preference.

At a recent hearing of the subcommittee, however, three representatives of the academic community attacked the provisions from the opposite direction—they feel the bill does not go far enough. All agreed with the testimony of the first witness, Morton Baratz, general secretary of the American Association of University Professors (AAUP), that "S. 2525, if enacted as presently drafted, will leave the door open to unacceptable intrusion by the intelligence agencies in colleges and universities throughout America."

As now structured, the bill would prevent the purchase of information from U.S. citizens who travel to foreign countries with U.S. support or sponsorship as part of an effort to promote education, arts, humanities, or cultural activities; it would not, however, prevent a citizen from providing information gathered on such a trip without being remunerated. The bill would prevent the use of U.S. citizens for covert operational assistance in foreign countries if their travel is supported by an academic institution; exceptions would be made, however, if "appropriate senior officials" of the institution are informed. It would prevent the use of anyone without his or her knowledge and prevent the agency from covertly placing its employees in academic institutions, the U.S. news media, U.S. religious organizations, or international government programs. But the agency would not be constrained from recruiting operatives covertly from among foreign and American students at U.S. universities, perhaps the most frequent reason for contact between the agency and academic instructors. At a recent AAUP convention, CIA Director Stansfield Turner acknowledged that the CIA continues to recruit foreign students on campuses here.

One reason the bill does not go any further is the concern expressed in an earlier Senate intelligence report that restrictive legislation would itself be an intrusion into academic affairs. Another of the witnesses, Harvard President Derek Bok, suggested, however, that more constraints on the CIA may be necessary because the agency has refused to abide by the guidelines for contacts drawn up independently by Harvard. "[Letters], as well as direct discussions with the CIA, make it clear that the CIA plans to ignore . . . central elements of our guidelines," Bok said. Specifically, Harvard wants Turner to agree to make all contracts with the university public, to provide notification to administrators of ties to any individual professor, to engage in recruiting investigations only after notifying the student targeted, and to stop using academic employees in covert intelligence activities. In such instances, Bok said, "put most simply, the academic enterprise provides a cover for intelligence work. This . . . should not, in our opinion, continue."

Similarly, Baratz suggested that the committee place a prohibition on covert operational assistance by academics as well as a complete ban on covert recruiting. Richard Abrams, chairman of the University of California's Committee on Academic Freedom, went even further, urging that all CIA-academic contacts—with schools, employees, and students—be required to be publicly disclosed. The comments will be considered when the entire hearing record is reviewed later this fall.

We Wanted to Cut and, Well, um, There It Was

As expected, the 1979 budget of the National Science Foundation (NSF) fell prey on 7 August to the desire of the U.S. Senate to heed the overwhelming victory of California's austerity-forcing Proposition 13.

Following some complex parliamentary maneuvers with several proposals to trim the mammoth Housing and Urban Development bill that contains the NSF money, the Senate approved an amendment that would fix the science agency's budget at a level $17 million below President Carter's request. Instead of an 8.4 percent increase over the current fiscal year, NSF will have to get by with an increase of between 6.4 and 3.7 percent, the levels now passed by the Senate and House, respectively.

Earlier, the appropriation had survived more drastic cutback attempts, emerging from subcommittee with only $7 million taken from research and overseas activities. After seeing a survey that showed 8 percent of all academic scientists to be receiving higher salaries—with the help of NSF funds—than the maximum civil service rate given to government scientists ($47,500), the subcommittee also tacked on a provision preventing the use of NSF funds for salaries in such cases. Cogitatively, the members noted in their report the "questionable propriety of decreasing the relative attractiveness of scientific positions in the Government and the questionable need to further aug-

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concerned about public understanding—or misunderstanding—of Gori's work. The scientist, incidentally, says he never implied there is a threshold. At least in his scientific papers, he is quite clear about the possibility of those few cigarettes increasing a smoker's risk by as much as 100 percent.

Whether you consider the kinds of increases Gori is talking about as "tolerable" depends on your point of view, however. On the one hand, Levy and Upton justifiably say they "cannot find an activity that increases the actual risk of death from cancer or from heart disease by 100 percent or more to be tolerable." On the other hand, and with equal justification, Gori points out that the average smoker's risk of dying of lung cancer is now ten times greater than that of the nonsmoker. Reducing the relative risk from ten to two would mean fewer than 20,000 new cases of lung cancer every year, not the current 100,000. Such a reduction could even be hailed as an advance in the "War on Cancer," if anyone is still using that phrase.

Briefing

ment the powerful nonmonetary incentives for academic scientists to obtain NSF research grants."

When the bill reached the Senate floor, a proposal by Senators William Proxmire (D–Wis.) and Charles Mathias (R–Md.) to impose widespread cuts averaging 1.2 percent was narrowly defeated. The intent of the proposal, Proxmire said, was "to show the American taxpayer that we have gotten the message loud and clear. It will serve as an acid test of whether Congress is willing to take Proposition 13 seriously and cut this budget, or whether it will be more spending as usual in fiscal 1979." Included in the cuts was $10 million allocated for basic and applied research at NSF, for no more reason, according to a Proxmire aide, than the fact that "it was one of the biggest line items in that part of the bill." The vote against was 44 to 43.

Subsequently, two senators departed from the chamber.Then the bill survived by a wider margin (55 to 30) a motion by Senator William Roth (R–Del.) to impose a larger, 2 percent across-the-board cut. Three more senators arrived on the scene, and a motion to reconsider the Proxmire-Mathias amendment passed by a vote of 47 to 41. As the amendment came up once again, six senators decided to switch from their earlier positions, two members who had been what the Senate calls "necessarily absent" suddenly showed up, and two members who had voted before suddenly decided not to. When the dust settled, the Proxmire amendment had passed, 45 to 42. Estimates from Senate aides on the proportion of senators who had no idea what they were voting on range from one-quarter to one-half. "It was terribly intricate," said one.

As a result of all this, the agency will either have to curtail its operations—yielding to the pressures of an inflation rate in basic research that has varied in recent years from 6 to 9 percent—or maintain the status quo. The next move will be in the House-Senate conference.

Waiting for the Other Plate to Drop in California

Rather unscientifically, people have speculated that one reason Californians so frenetically pursue pleasure and wealth is the knowledge that any day now an earthquake could sever portions of the state from the mainland and sink them in the Pacific. Although these fears are undoubtedly exaggerated, on 13 August, a sunny Sunday afternoon, the state had a tremor of what may be ahead. A quake, measuring between 5 and 6 on the Richter scale, occurred 6 miles offshore of Santa Barbara.

About three-quarters of the damage, which was estimated at around $15 million, was sustained at the University of California campus at Santa Barbara, much of it in laboratories. There is a small irony here, because last June, a respected geophysicist at the university's Berkeley campus challenged a recent prediction by the National Aeronautics and Space Administration (NASA) that a California quake was likely to occur sooner than had been expected.

The prediction came from NASA's Goddard Space Flight Center in Greenbelt, Maryland, where several scientists computed shifts in the distance between a site on Otay Mountain, near San Diego, and Quincy, north of Sacramento, with laser beams bounced off of a Beacon Explorer satellite. The model for their computation is complex and subject to error, according to one of the Goddard scientists, David Smith. Nevertheless, the measurements they took in 1972, 1974, and 1976 indicate that the distance between the two sites—which straddle the San Andreas fault—has been decreasing at an average rate of 9 centimeters per year, with a standard deviation of 3 centimeters.

If precise, such a rate is significant because movement across the fault—the result of relative shifts in the North American and Pacific tectonic plates—was thought to have been occurring at a rate of 6 centimeters per year. On the basis of that rate, geophysicists had predicted that a major quake is due in California sometime before 2025, because the last big quake, near San Francisco in 1906, occurred after 20 feet of strain had built up in the fault. If the rate of movement has been 6 centimeters per year, 20 feet of strain will once again have accumulated by 2025; if it has been 9 centimeters per year, the big one is due any day now.

Smith stresses that no one really knows whether or not extrapolation of the present rate into the past is valid. But, he says, "The increased strain, at 9 centimeters per year instead of 6, could imply that an earthquake of the same magnitude [as in 1906] will occur sooner. It could also imply increased overall seismicity for the region—more quakes."

Bruce Bolt, director of the University of California's seismographic research station, challenged this conclusion last June, noting that his own research with sites much nearer the San Andreas fault than Goddard's had shown the rate of movement to be 6 centimeters per year. Smith states, however, that he is not necessarily at odds with Bolt, because the additional 3 centimeters could be manifested in any of the faults in the region, and the total movement across the San Andreas will eventually equal the total movement between the two Goddard sites. The quake on 13 August, he said, is an indication of overall tension in the region.

Bolt described this as "so broad-brush as not to be very helpful. Readjustment of movement between points distant from the San Andreas could occur in faults parallel to it.

Meanwhile, Californians continue to react to each shaking of the earth as did Jim Braly, a resident of Santa Barbara, during the last one: "My God," he said, jumping off the couch in his home. "This is the Big One."

R. Jeffrey Smith

Moreover, there is general agreement that development of a less hazardous cigarette is a good idea. It is, after all, one of the goals of the Smoking and Health Program of NCI, which was directed by Gori until a few weeks ago. The Institute has spent about $18 million to develop such a cigarette over the past 5 or 6 years.

The justification for the program is simple. Despite antismoking campaigns, about 60 million people in this country still smoke and many of them are not going to quit. Thus, a less hazardous cigarette could save lives. Epidemiological studies performed under the auspices of the American Health Foundation and the American Cancer Society have already shown a reduction in the death rates from cancer and heart disease in individuals who smoke low-tar, low-nicotine cigarettes compared to the death rates of smokers of the high-tar, high-nicotine variety. Individuals who did not smoke at all had the lowest death rates of all, however.

While no one questions that development of a less hazardous cigarette could pay off in improved health, officials at NCI and NHLBI doubt whether Gori's conclusions about current brands are justified. To reach these conclusions, Gori performed statistical analyses of data collected by other investigators in four large epidemiological studies that have linked cigarette smoking to an increased risk of dying from all causes. These studies found that the risk of dying from all causes increases with the number of cigarettes smoked daily.

Conversely, as the number of cigarettes smoked decreases the risk decreases. Gori reasoned that the risk might eventually decline to a point at which it is not detectably different from that of a nonsmoker. Using the data from those four studies, he then set out to determine by standard statistical methods the number of cigarettes an individual could smoke each day without apparently increasing his expected mortality above that of a nonsmoker. He called this number the critical value.

According to the results of this analysis, which were published in *Science* (17 December 1976), the critical number of cigarettes of the kind manufactured at the time the epidemiological data were collected (before 1960) was two. Cigarettes produced before 1960 delivered much higher quantities of toxic substances in their smoke than do most cigarettes today.

Prodded by concerns about the hazardous nature of cigarette smoke, manufacturers have over the years developed several brands of cigarettes specifically designed to reduce the quantities of tar and nicotine in their smoke. What Gori has done in the current work, which is an extension of that published in *Science*, is to compare the amounts of six toxic substances (tar, nicotine, carbon monoxide, nitrogen oxides, acrolein, and hydrogen cyanide) in the smoke of 27 brands of these low-tar, low-nicotine cigarettes with their concentrations in the smoke of the average pre-1960 cigarette. He then estimated the critical values for the 27 brands by determining how many cigarettes would deliver the same concentrations of each of the six toxic substances as two average pre-1960 cigarettes. For example, ten cigarettes, each delivering 10 milligrams of tar, would be equivalent to two pre-1960 cigarettes that delivered 50 milligrams of tar each. The critical values he found ranged from 3 to 23 for the modern low-tar, low-nicotine cigarettes.

Gori's Conclusions Criticized

Both Gori's earlier paper and the new one have been criticized on scientific gounds, however. After the *Science* article appeared, statisticians John Gart and Marvin Schneiderman of NCI submitted a letter to the editor of *Science* (the letter was never published) in which they described the statistical methods used as "so seriously in error that we find the conclusions based on the statistical analysis and the concept of 'critical values' to be invalid."

They asserted that Gori's handling of the data led to serious underestimation of the risks associated with a given number of cigarettes. Gart and Schneiderman suggested an alternative way of handling the data which, in their example, leads to a "tolerable" number of cigarettes of only 0.2 per day. Gori says he redid the analysis in accordance with the suggestions of Gart and Schneiderman and did not find enough difference in the results to warrant changing his conclusions.

According to Upton, Gori's more recent calculation of the critical values for the low-tar, low-nicotine cigarettes is suspect because it rests on the assumption that the risk of dying will decrease in exact proportion to the decreases in the concentrations of those six toxic agents. He maintains there is no evidence to support this assumption. Gori rejects this criticism on the grounds that the critical values in the original analysis were obtained from data relating the risk of dying to the number of cigarettes smoked and thus to the amounts of toxic substances delivered.

This issue is complicated by uncertainties regarding the manner in which the cigarettes may be smoked. Some observers think that smokers who switch to low-tar, low-nicotine brands may inhale more deeply or smoke more cigarettes than they did before the switch in order to get the same amount of satisfaction. Daniel Horn of the Office of Smoking and Health says there is little reliable data on this point. His own data indicate that the smoker who switches may smoke fewer cigarettes provided the concentrations of tar and nicotine in the new brand are less than 25 percent lower than in the old brand; but if the decrease is larger than 25 percent the smoker may smoke more cigarettes. For this reason, Horn recommends that smokers who wish to cut back their tar and nicotine consumption do so gradually.

Upton also points out that cigarettes contain additional substances which were not considered by Gori and which may contribute to the development of disease. Gori concedes this point but suggests that filters designed to produce a low-tar, low-nicotine cigarette should remove many of these other agents too.

Another frequently heard criticism of the JAMA article revolves around the assignment of critical numbers to specific brands of cigarettes. Several observers have objected to the precision implied by the assignments and do not think it is justified by the data. In reply, Gori says many of these same critics do not hesitate to extrapolate the results of animal studies to humans. He thinks his own approach, involving the extrapolation of human data to humans, is more justified.

In summary, it would be safe to say that Gori thinks his analysis is correct, whereas many of his colleagues and supervisors suspect that it is not. And however controversial the JAMA paper is now, it passed the internal review system at NCI and was cleared for publication in June 1977 (before the arrival of Upton, as Upton notes).

At one time there were rumors that Gori would be fired, as a result of the smoking flap. The rumors were fostered by Gori's own statements to the press to the effect that Califano was pressuring NCI to discipline or fire Gori. Upton says there are absolutely no plans to discipline Gori. And Gori, who now says he was misquoted, retains his position as Deputy Director of the Division of Cancer Cause and Prevention. Although he is no longer in charge of the Smoking and Health Program, that change was made as part of a reorganization going on the division before the current furor broke out. All in all, the smoke seems to be clearing.—JEAN L. MARX