

LOST EMPIRE:

The Fall of R.J. Reynolds Tobacco Company

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Chapter 20, Part 2

One-Fanged Rattler

Conceding that there will always be some smokers, the search for a 'safer' cigarette doesn't turn up anything new

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No less an authority than [Dr. Ernst Wynder](#) had reached the same conclusion by the mid-1960s. Since his pioneering mouse-painting experiment in 1953, he had published more than 400 papers on the health effects of smoking. Working in cramped quarters at the Sloan-Kettering Institute in New York, Wynder and the indispensable Dietrich Hoffmann, the world's leading authority on the chemistry of tobacco, turned out a series of studies that firmly established the link between smoking and cancer in many parts of the body, including the lungs, esophagus, kidneys, pancreas and bladder.

Wynder approached the task as if it were a crusade, declaring to anyone who would listen that smoking was a scourge that the medical establishment had ignored for too long. Though driven to make his mark, Wynder was a pragmatist. He, for instance, agreed with RJR researchers that extracting tobacco to reduce benzopyrene wasn't commercially feasible, and he began to abandon the idea that specific carcinogens needed to be removed from tobacco smoke in 1957 when he suggested at a congressional hearing that the tobacco companies should instead investigate ways to lower the tar content of their cigarette smoke by 40 percent to make their product less



The R.J. Reynolds Tobacco Co. was once the largest cigarette company in the United States with a powerhouse of best-selling brands: Winston, Salem and Camel. But times changed, and as the case against smoking became more pronounced in the 1960s, RJR failed to adapt to the marketplace. Its rivals would eventually rush past it, and RJR's efforts to catch up would have a profound impact on the company and the cigarette industry.

hazardous.

Wynder was also among the first scientists in public health to publicly declare that some smokers would never give up their habit, regardless of the medical evidence, and government would never, as a practical matter, ban cigarettes. Instead of pursuing a utopian dream of a smokeless society, scientists from academia and government should join with the industry, Wynder said, to develop a less hazardous smoke.

Mindful of the commercial failures of various cigarette designs, such as carbon filters, that had a demonstrated effectiveness in greatly reducing certain harmful compounds in tobacco smoke, Wynder noted that this less hazardous cigarette had to be one that smokers were willing to smoke. "As a practical matter, it is important to appreciate that a virtually harmless cigarette smoked by only one percent of the population will have a lesser impact on the reduction of tobacco-related diseases than a somewhat more harmful cigarette smoked by 80 percent of the total smoking population," Wynder wrote in a magazine article in 1979. "Research on the less harmful cigarette should therefore be directed toward developing a cigarette containing the lowest possible amount of harmful elements for all tobacco-related diseases, but one that has sufficient acceptability for the largest segment of smokers."

This whole idea of a "safer," or less hazardous, cigarette struck many public-health scientists as being like a rattlesnake with one fang. To them, no cigarette was safe. Wynder wasn't claiming that a totally safe cigarette could be produced, but his research told him that some cigarettes -- primarily those that produced smoke lower in tar -- may be safer than others. The Federal Trade Commission also contributed to the public belief that low-tar cigarettes were somehow less hazardous. It reported in 1970 that "responsible medical opinion indicates that the reduction of tar and nicotine content in cigarette smoke decreases the hazard to the health of that element of the population which persists in smoking cigarettes."

Wynder had a proposition for Kenneth M. Endicott, the director of the National Cancer Institute. In view of the rising death toll from lung cancer, the agency should lead an effort to develop a cigarette that could save lives, he argued. A serious smoker himself, Endicott agreed with Wynder's assessment that many people like him would never be able to kick the habit. Endicott appointed the Lung Cancer Task Force in 1967 to start a formal research program to deal with the smoking issue. A subcommittee of the task force, formally called the Less Hazardous Cigarette Working Group, was formed in March the following year and embarked on the most expensive government effort yet: a 10-year search to find a cigarette for those unwilling to quit that would reduce their risk of dying.

(Kluger footnote; account of the formation and workings of the Tobacco Working Group.)

Coordinated by the cancer institute's Smoking and Health Program, under Italian-born Gio Batta Gori, some of the best public-health and industry scientists in the country, including Wynder and Hoffmann, served on the committee. Murray Senkus and then Alan Rodgman were the RJR employees on the committee. The companies' scientists served as private consultants, Rodgman explained, because their employers didn't want it to appear that the scientists agreed with the group's conclusion. Neither did the companies like the implication of the term "less hazardous cigarette" in the group's name. The committee then became known as the Tobacco Working Group.

The scientists were given three objectives: produce a less-hazardous cigarette, identify people at increased risk of tobacco-related diseases and develop drugs to help people quit. The committee gave the highest priority to the first objective. Such a cigarette, according to the committee's definition, had to produce fewer tumors in mouse-painting experiments than did the control cigarettes and the cancer-causing compounds in the smoke had to be reduced.{{pr}}{pr}}

Meeting two or three times a year starting in 1969, the committee authorized hundreds of experiments that were aimed at trying to understand how cigarette design might reduce the risks of smoking. Scientists working under contract with the committee tried to extract from tobacco the precursors of what were considered cancer-causing chemicals. The committee also tested various parameters in tobacco growing and cigarette production: nicotine content, fertilizer application, artificial substitutes, paper porosity, pesticides and such additives as sugar and cocoa. They tried homogenizing tobacco, removing nitrates and adding nitrates. From all that came more than 100 experimental cigarettes that were tested on mice against two control cigarettes, a standard experimental cigarette and one developed at the University of Kentucky.

The mouse experiments broke no new ground, proving nothing that the industry didn't already know. They showed, for instance, that cigarettes with very porous paper or blends made only from tobacco stems produced fewer tumors than the standard blends. Low-nicotine blends and those made from puffed tobacco also produced significantly fewer tumors. Tests also showed that other techniques already in use, such as faster-burning cigarette paper and tobacco reconstituted from stems and scraps, effectively reduced tumors on the backs of mice.

In fact, about the only tangible result of the committee's work was a theory by Gio Gori that a "socially tolerable" smoking limit was possible. As early as 1971,

he cited epidemiological studies that he said showed low-tar cigarettes were less harmful than regular cigarettes. He even went as far as to suggest a legal limit: 20 milligrams of tar and 1 milligram of nicotine.

He published his theory in December 1976 in *Science* magazine and again in the *Journal of the American Medical Association* in September 1978 in which he advocated "tolerable" levels on smoking. The public responded by buying more low-tar cigarettes. Sales of American Tobacco Co.'s Carlton brand, which Gori identified as the safest cigarette, doubled within a week.

The reaction among doctors and anti-smoking groups was immediate and vociferous. They said that all cigarettes, no matter their tar and nicotine level, posed some risk, and they accused Gori of putting the anti-smoking movement back years. Anti-smoking groups started pressuring Joseph A. Califano Jr., the secretary of the Department of Health, Education and Welfare, to discipline or fire Gori.

Califano, a Harvard-educated lawyer, was known to be a compassionate political activist. As a powerful aide to President Lyndon Johnson, he had helped formulate and ramrod through Congress many of Johnson's Great Society programs. As a former smoker, Califano was no friend to tobacco. He had proposed on Jan. 11, 1978 -- the 14th anniversary of the first surgeon general's report on smoking -- the most strident anti-cigarette program that ever came out of a Cabinet-level office. Calling cigarettes "public enemy No. 1," Califano wanted every school in America to teach kids about the consequences of smoking. He wanted a higher federal excise tax on cigarettes and called on the Civil Aeronautics Board to ban smoking on all commercial flights.

The tobacco barons and their defenders were left reeling at the breadth of the proposal. Sen. Jesse Helms chided Califano for "demonstrating callous disregard for economic realities, particularly for the economy of North Carolina." Gov. Jim Hunt urged Califano to visit so he could learn what tobacco meant to North Carolinians. Rep. Charlie Rose, a Democrat who represented tobacco farmers in the eastern part of the state, elevated the whole discussion when he promised, "We're going to have to educate Mr. Califano with a two-by-four, not a trip."

For Gori and the Tobacco Working Group, the end was near. On Aug. 28, 1978, HEW said that Gori was taking a leave of absence to get a master's degree in public health at Johns Hopkins University. He would never return to the National Cancer Institute. The working group, after spending more than \$32 million, was dissolved in 1979 after HEW refused to continue paying for it.

"The government took on the policy that the only acceptable outcome was no smoking and walked away from the concept that reduced risk is possible or desirable, which I think is outrageous," said David E. Townsend, RJR's vice president for product development and assessment. "Practically speaking, some people will continue to smoke. No matter how hard you push cessation, some people will continue to smoke. If it's possible at all to reduce the risks of smoking, we ought to be doing it. So when the government walked away from that as a possible alternative, that just left industry out here on our own trying to design cigarettes that may have reduced risks without any government participation or involvement or any government concern."

The Big 8

In its final report released in 1980, the Tobacco Working Group credited eight methods used by the industry that have lowered tar and nicotine in cigarettes and, presumably, made them less hazardous to smokers. RJR developed or perfected all but one: air dilution.

Aside from puffed tobacco, here's a rundown:

- **Blend:** Introduced by RJR in Camels in 1913, it became known as the "American blend" and was eventually used throughout the world. The goal was to make a cigarette that tasted better than those then on the market, which were made from either all flue-cured or oriental tobaccos. No one at the time knew that the American blend also produced less tar and nicotine and less tumors on the backs of mice.
- **Reconstituted tobacco:** Sam Jones, an RJR scientist, invented the reconstituted sheet in the 1940s as a way to use tobacco stems and leaf scraps, which were discarded. "I can remember when I first came here (in 1954) they weren't using all the stems," Rodgman said. "You could get a little truck and they'd fill the truck for you for 75 cents." People used the stems, he said, to fertilize their yards.

Called G-7, reconstituted tobacco was first used in the original Winston blend in 1954. RJR eventually used it in Camel and Cavalier. By 1960 all U.S. companies were using it. It was originally designed to save money, Townsend explained. "What we learned after the fact was that because the reconstituted tobacco is made the way it is, with a fair amount of stems, it generates less tar and nicotine when it's burned," he said. Tests also showed that tar from G-7 produced less tumors on mice.

- **Filter tips:** Though filters had been on the market since the 1930s, Winston was the first filter-tip to command a significant market share. The goal was to reduce tar and prevent smokers from getting tobacco fragments in their mouths. As filters got better -- longer filters were added to Winston in 1957 and more-efficient filters two years later -- the tar and nicotine content of smoke decreased.
- **Filter additives:** Adding such plasticizers as triacetin made the fibers inside the filter stick together better, but they also selectively removed phenols, nitrosamine and decreased the amount of nicotine. Adding carbon to filters selectively removed acrolein, acetone and other compounds thought to affect cilia, the small hairs that cleanse the lungs. Smokers, though, didn't like the taste, and the carbon filters never commanded any great market share. Liggett & Myers introduced Lark, the first cigarette with a charcoal filter in 1963. RJR introduced its version, Tempo, the following year.
- **Paper additives:** RJR worked with its supplier to ensure that the paper burned slightly faster than the tobacco to keep the cigarette from going out. Adding citrate solved the problem and also decreased the amount of tar and slightly cut the nicotine because it reduced the number of puffs required to finish the cigarette.
- **Porous paper:** Introduced by RJR in 1959, the paper allows more air to be drawn into the tobacco, increasing the burn rate and diluting the tar.
- **Air dilution:** Small holes in the filter draw in fresh air when the smoker inhales and reduce the air that comes through the fire cone, thus cutting the tar. Air dilution also slows the velocity of smoke coming down the tobacco rod. As the smoke moves slower through the filter, the filter becomes more efficient in removing compounds. Developed by American Tobacco Co., air dilution was added to RJR cigarettes in 1980.

All the methods were gradually incorporated into cigarettes by RJR and the other tobacco companies, usually without smokers' knowledge.

"One by one, we did things -- all of which lowered and lowered and lowered different things in proportion," Rodgman said. "What else could you do? There was only one alternative: Close the place down."

The 1979 surgeon general's report noted that reconstituted and puffed tobacco were the most significant advances in reducing tar and nicotine. Puffed tobacco cut tar and nicotine content in half, the report said, while reconstituted cut tar

another 50 percent. Puffed also cut benzopyrene in half and had "significant" effect on carbon monoxide.

The changes made in cigarette design gradually reduced the tar content in the smoke of an average cigarette from 38 to 40 milligrams in the early 1950s to about 12 milligrams today. The nicotine content dropped from about 2.8 milligrams to less than 1. But did all those things produce a "safer" cigarette? Murray Senkus, RJR's former director of research, has his doubts.

"Looking at it in retrospect, we tried everything possible, but I'd have to say, now talking as a scientist, that tobacco is tobacco," Senkus said. "Whatever changes you made are not likely to change the risk at all. . . . If a risk is associated with smoking there is nothing you can do to a cigarette that would make it any different. That's kind of an over-generalization, but that's my opinion. A cigarette today is the same as it always was. It will continue to be the same as it always was. People who smoke it should know the risk, and that's all there is to it. Intuitively, I knew from the very start."

• **Coming Wednesday: *Tortes and Torts***

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