HB

84

#2

(7)

COMMITTEE REPORT

HOUSE

FURTHER:

Date: 5-5-83

2/15/83

Mr. Speaker:

The Committee on JUDICIARY has had HB 84

An Act relating to smoking in public places and vehicles.

under consideration and reports it back as follows:

[ ] do pass [ ] do not pass

[ ] do pass with attached amendments(s)

[ ] replace with CS for HB 84 (new) [ ] same title [ ] new title

and recommends _____

[ ] AND attaches a "Letter of Intent" [ ] New Fiscal Note

[ ] Zero Fiscal Note Attached

[ ] reports it back without recommendation

[ ] referred to the _____ Committee

MEMBERS SIGNING
DO PASS

MEMBERS HAVING
OTHER RECOMMENDATIONS:

CHAIRMAN

H 60

FISCAL NOTE | Revision Date , 1983

I. REQUEST

Bill/Resolution No.: CS HB 84 (Judiciary)
Title: Smoking in public places & vehicles
Sponsor: Rep. Fritz, et al
Requestor: House Judiciary

II. FISCAL DETAIL

Agency Affected: Health & Soc. Services
Program Category Affected: Health
BRU, Program of Subprogram(s) Affected:

EXPENDITURES/REVENUES: (Thousands of Dollars)

	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88
OPERATING	0	0	0	0	0	0
100 PERSONAL SERVICES						
200 TRAVEL						
300 CONTRACTUAL						
400 COMMODITIES						
500 EQUIPMENT						
600 LANDS & STRUCTURES						
700 GRANTS, CLAIMS, ETC.						
TOTAL OPERATING	0	0	0	0	0	0
CAPITAL	0	0	0	0	0	0
REVENUE	0	0	0	0	0	0

FUNDING: (Thousands of Dollars)

GENERAL FUND	0	0	0	0	0	0
FEDERAL FUNDS	0	0	0	0	0	0
OTHER (Specify Source)						

POSITIONS:

FULL-TIME	0	0	0	0	0	0
PART-TIME	0	0	0	0	0	0
TEMPORARY	0	0	0	0	0	0

III. SOURCE OF FUNDS TO OFFSET FISCAL IMPACT OF BILL:

V. ANALYSIS: Attach a separate page for any Analysis

Prepared By: Dean Tirador Phone: 465-2113
Division: Public Health Date: 4-13-83

Approved by Commissioner: Robert London Smith, Ph.D. Date: 4/18/83
Department: Health and Social Services

Distribution:
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3/8/83

STATE OF ALASKA
FISCAL NOTE

Revision Date , 1983

I. REQUEST

Bill/Resolution No.: CSHB 84
Title: "...smoking in public places..."
Sponsor: Repr. Fritz
Requestor: House Judiciary Committee

II. FISCAL DETAIL

Agency Affected: Department of Law
Program Category Affected: General Govt.
BRU, Program of Subprogram(s) Affected: Legal Services

EXPENDITURES/REVENUES: (Thousands of Dollars)

	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88
OPERATING						
100 PERSONAL SERVICES		32.7	41.6	44.1	46.7	49.2
200 TRAVEL		2.5	3.2	3.4	3.6	3.8
300 CONTRACTUAL		4.5	4.8	5.1	5.4	5.7
400 COMMODITIES		3.6	1.5	1.6	1.7	1.8
500 EQUIPMENT		5.1				
600 LAND & STRUCTURES						
700 GRANTS, CLAIMS, ETC						
TOTAL OPERATING	-0-	48.4	51.1	54.2	57.4	60.5
CAPITAL						
REVENUE						

FUNDING: (Thousands of Dollars)

GENERAL FUND	-0-	48.4	51.1	54.2	57.4	60.5
FEDERAL FUNDS						
OTHER (Specify Source)						

POSITIONS:

FULL-TIME						
PART-TIME		2	2	2	2	2
TEMPORARY						

III. SOURCE OF FUNDS TO OFFSET FISCAL IMPACT OF BILL:

Not specified by sponsor.

IV. ANALYSIS: Attach a separate page for any Analysis

Prepared By: Richard L. Pegues Richard I. Pegues, Director Phone: 465-3672
Division: Administrative Services Division Date: April 13, 1983
Approved by Commissioner: Richard L. Pegues / FOR Norman C. Gorsuch, Attorney General Date: April 13, 1983
Department: Department of Law

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CSHB 84
Fiscal Note
Analysis

This bill extends the state's current mandatory prohibition of smoking in public places to include public meetings of municipalities and most places of business such as retail stores, restaurants, banks, offices, factories, warehouses, and other places of employment. Under existing statute, this extended prohibition is at the option of the person having control of such places of employment. The bill would also make the existing mandatory requirement to provide reasonable smoking areas, in most prohibited areas, optional. Because of the very broad changes to the existing law, requiring mandatory compliance by nearly every place of business in the state, except for cocktail lounges, taverns and tobacco shops, it is anticipated that the department will have to devote additional resources of one part-time attorney and a part-time secretary to provide the civil enforcement actions required by the bill in the Superior Court.

Consequently, the only costs shown are those that will occur in the department's civil division as result of filing and handling civil complaints on behalf of the Commissioner of the Department of Environmental Conservation. Work drafts of the committee substitute, dated 4/12/83, have added an entirely new section that provides criminal citations and penalties. So that there will be no misunderstanding, the department intends to handle these citations in the same manner as minor traffic offenses are handled. Traffic offenses are heard in magistrate court and only the arresting officer, civilian witnesses and the defendant appear before the magistrate. Prosecutors only attend these proceedings in those rare instances when defendants appear with counsel. If for any reason, it is expected that state prosecutors are to regularly prosecute violations of the proposed AS 18.35.300 or AS 18.35.330, then substantial additional funding will be required. A preliminary estimate is that 2 full-time and 1 part-time prosecutors and 1 legal secretary would be needed at an initial annual cost of $220.0.

Fiscal Analysis - HB 84

The impact of HB 84 is expected to result in the addition of one-half the time of an Attorney IV and one-quarter of the time of a Legal Secretary I on a statewide basis. Actual placement of cummulative positions and costs can only be determined after the Legislature has acted and we know what bills and fiscal notes have been approved. For purposes of the analysis, salary schedule A has been used.

The first year of the analysis is FY 84 and costs have been calculated on a 10 month basis to account for the time required to establish new positions and the time it takes to get a new program underway. The costs after FY 84 are on a 12 month basis and include a 6% annual inflation factor.

1st Year (10 months)

	Atty IV (PPT)	L/SI (½ equiv.)	Total
Personal Services	26.9	5.8	32.7
Travel	2.5	-	2.5
Contractual	4.0	.5	4.5
Commod. - ongoing	.8	.4	1.2
Commod. - single time	2.0	.4	2.4
Equipment - single time	1.5	3.6	5.1
			48.4

2nd Year (12 months + 6% annual inflation)

Personal Services	34.1	7.5	41.6
Travel	3.2	-	3.2
Contractual	4.3	.5	4.8
Commodities	1.0	.5	1.5
Equipment	-	-	-
			51.1

STATE OF ALASKA
FISCAL NOTE

Revision Date April 18 , 1983

I. REQUEST

Bill/Resolution No.: CS for HB 84
Title: An Act relating to Smoking in public places
Sponsor: Fritz, M.M. Miller et al
Requestor: Hein

II. FISCAL DETAIL

Agency Affected: ADEC
Program Category Affected: Public Info. Office
BRU, Program of Subprogram(s) Affected:
EQM - Environmental Sanitation

EXPENDITURES/REVENUES: (Thousands of Dollars)

	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88
OPERATING						
100 PERSONAL SERVICES	0	10.0	0	0		
200 TRAVEL		2.0				
300 CONTRACTUAL		3.0	7.0	7.0		
400 COMMODITIES		5.0	3.0	3.0		
500 EQUIPMENT						
600 LAND & STRUCTURES						
700 GRANTS, CLAIMS, ETC						
TOTAL OPERATING		20.0	10.0	10.0		
CAPITAL		-	-	-		
REVENUE		-	-	-		

FUNDING: (Thousands of Dollars)

GENERAL FUND		20.0	10.0	10.0		
FEDERAL FUNDS						
OTHER (Specify Source)						

POSITIONS:

FULL-TIME		.25	-	-		
PART-TIME		-	-	-		
TEMPORARY		-	-	-		

III. SOURCE OF FUNDS TO OFFSET FISCAL IMPACT OF BILL:

None identified in the legislation

IV. ANALYSIS: Attach a separate page for any Analysis

Prepared By: Joe Cladouhos
Division: Environmental Quality Mgmt.
Phone: 465-2640
Date: 4/18/83

Approved by Commissioner: Richard A. McGuire
Department: Environmental Conservation
Date: 4/22/83

Distribution:
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3/8/83

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

POSITION PAPER

CS for HB 84

April 22, 1983

The Department of Environmental Conservation supports this proposed legislation because it extends and clarifies the existing statute. If HB 84 is enacted, the Department would amend 18 AAC 55, Smoking In Public Places. We would also take appropriate measures to inform the public of the new law.

Richard A. Neve
Commissioner

THE LEGISLATURE OF THE STATE OF ALASKA
THIRTEENTH LEGISLATURE

FISCAL NOTE

I. REQUEST
Bill/Resolution No. HB 84
Title "An Act relating to smoking in public places and vehicles."
Requested by House State Affairs Committee Date 2/8/83

II. FISCAL DETAIL
Agency Affected Department of Law
Program Category Affected Legal Services
BRU, Program, Or Subprogram(s) Affected Legal Services
(Note: If more than one budget component is affected, separate line-item amounts and funding for each component in the analysis section.)

EXPENDITURES (Thousands of Dollars)

	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88
100 PERSONAL SERVICES						
200 TRAVEL						
300 CONTRACTUAL						
400 COMMODITIES						
500 EQUIPMENT						
600 LAND & STRUCTURES						
700 GRANTS,CLAIMS,ETC.						
TOTAL		48.4	51.1	54.2		

FUNDING (Thousands of Dollars)

GENERAL FUND		48.4	51.1	54.2		
FEDERAL FUNDS						
OTHER (Specify Source)						

POSITIONS

FULL TIME						
PART TIME						
TEMPORARY						

III. ANALYSIS (See Fiscal Note Preparation Instruction, Section III)
This bill extends the state's current mandatory prohibition of smoking in public places to include public meetings of municipalities and most places of business such as retail stores, restaurants, banks, offices, factories, warehouses, and other places of employment. Under existing statute, this extended prohibition is at the option of the person having control of such places of employment. The bill would also make the existing mandatory requirement to provide reasonable smoking areas, in most prohibited areas, optional. Because of the very broad changes to the existing law, requiring mandatory compliance by nearly every place of business in the state, except for cocktail lounges, taverns and tobacco shops, it is anticipated that the department will have to devote additional resources to provide the enforcement actions required by the bill such as seeking injunctions and the collection of fines and penalties.

Richard I. Pegues

IV. DATE February 9, 1983 PREPARED BY Richard I. Pegues, Dir. Adm. Svcs.
AGENCY Department of Law
PHONE 465-3672

Original: Legislative Finance
cc: Budget and Management
Prime Sponsor (First Legislator Named)

33-001 (Rev. 12/82)

STATE OF ALASKA
FINAL STATEMENT OF FISCAL IMPACT

Bill No: HB 84 Date on Bill: January 20, 1983
Title: "An Act relati to smoking in public places and vehicles."
Sponsor: Fritz et al
Requestor:

1. Estimated fiscal impacts on:

a. Expenditures:

(Thousands of Dollars)

			FY 83	FY 84	FY 85	FY 86		
Capital				-0-				
Operating				$10,000.00				
Total				$10,000.00				

b. Revenues:

Revenue				-0-				

2. Source of funds to offset fiscal impact of bill:

3. Assumptions:

18 AAC 55 "Smoking In Public Places" will be amended if this legislation passes. It would necessitate printing new regulations and public education to inform affected public facility operators and the general public of their rights and responsibilities under the new law.

4. This statement has been reviewed by the OMB in the Office of the Governor. It may be considered to represent the policy of the Sheffield Administration and the final estimate of fiscal impact.

Prepared By: Joe Cladouhos Phone: 465-2640
Division: Environmental Quality Management Date: 2-14-83
Approved by Commissioner: Lori Tasking for R. O. Sheffield Date: 2/14/83
Department: Environmental Conservation
Reviewed by OMB: Date:
Phone:

5. Distribution:
Original to Legislative Finance
Copy to Department
Copy to Sponsor
Copy to Requestor

2/8/83

STATE OF ALASKA
PRELIMINARY STATEMENT OF FISCAL IMPACT

Bill No: House Bill No. 84 Date on Bill: 1/20/83
Title: "An Act relating to smoking in public places and vehicles"
Sponsor: Rep. Fritz, et al.
Requestor: HESS

1. Estimated fiscal impacts on:

a. Expenditures:

(Thousands of Dollars)

			FY 83	FY 84	FY 85	FY 86		
Capital			0	0	0	0		
Operating			0	0	0	0		
Total			0	0	0	0		

b. Revenues:

Revenue								

2. Source of funds to offset fiscal impact of bill:

3. Assumptions:

4. Disclaimer:
This statement has not been reviewed by the OMB in the Office of the Governor. It does not represent the policy of the Sheffield Administration or the final estimate of fiscal impact.

Prepared By: Dean Tirador Phone: 465-3090
Division: Public Health Date: 2/10/83

Approved by Commissioner: Date: 2/17/83
Department: Health and Social Services

5. Distribution:
Original to Legislative Finance
Copy to OMB
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House Bill No. 84

"An Act Related to Smoking in Public Places and Vehicles"

BACKGROUND INFORMATION:

First, there is mounting evidence in the medical literature that passive smoking by children, particularly young children, and adults with heart or lung ailments cause them to suffer physiological and eventually anatomic consequences that adversely affect their health status. Second, there is a mounting public awareness of the annoyance caused by persons smoking indoors in public areas. Third, and this is the fact of greatest significance, in 1981, there were 92 deaths in Alaska due to cancer of the respiratory system and 145 premature deaths due to coronary disease. Smoking undoubtedly contributed heavily to these numbers.

WHAT THE BILL DOES:

This bill strengthens the rights of persons who choose not to damage their lungs and cardiovascular systems by smoking - either active or passive smoking. It recognizes several features of indoor air quality that are not adequately recognized by the present statute.

SUGGESTION FOR IMPROVEMENT:

On page 3 line 13: Due to the difficulty of defining a "smoker" this line could be more effectively stated; "(4) a place of employment if all the employees consent to the designation in entirety,".

On page 3, line 27: Addition of "per Alaska statute 18.35.300" would make the sign more effective.

On page 4, Section 6 would add a potential case load to already overcrowded district and superior courts. The personal injury sustained by a violation, or even a brief series of violations, of this statute would be minimal and difficult to prove. The remedies contained in Sections 7 and 8 of this bill set forth adequate avenues for correction of violations.

POSITION PAPER/Department of Health & Social Services

DEPARTMENT POSITION:

This bill is an enlightened public health policy statement and is strongly endorsed by this department.

RECOMMENDED BY: E. S. Rabeau, M.D.

E.S. Rabeau, M.D.
Director
Division of Public Health

DATE: Feb 10, 1983

APPROVED BY: Robert London Smith

Robert London Smith, Ph.D.
Commissioner
Department of Health and Social Services

DATE: 2/14/83

APPROVED BY: _____

Emil Notti
Legislative Assistant to the Governor

DATE: _____

2/15

(7)

COMMITTEE REPORT

HOUSE

FURTHER: RESOURCES JUDICIARY

1/20/83

Date: 2/14/83

Mr. Speaker:

The Committee on STATE AFFAIRS has had HB 84

An Act relating to smoking in public places and vehicles.

under consideration and reports it back as follows:

[X] do pass if amended [ ] do not pass

[ ] do pass with attached amendments(s)

[ ] replace with CS for _____ [ ] same title [ ] new title

and recommends _____

[ ] AND attaches a "Letter of Intent" [2] New Fiscal Notes Sup 9

[ ] Zero Fiscal Note Attached

[ ] reports it back without recommendation

[ ] referred to the ~~Resources~~ _____ Committee

MEMBERS SIGNING DO PASS

M. M. Miller - DO PASS

MEMBERS HAVING OTHER RECOMMENDATIONS:

Ronald J Larson - Pass if Amended.

Mike Hixon Pass if amended

Dick Shultz Pass if amended

Rep Mike Hixon
CHAIRMAN

H 60

HOUSE STATE AFFAIRS
STANDING COMMITTEE
February 14, 1983
1:00 p.m.

Members Present: Rep. Abood, Chairman
Rep. Cowdery, Vice-Chairman
Rep. Larson
Rep. Furnace
Rep. M. M. Miller
Rep. Shultz

Members Absent: Rep. Vaska

COMMITTEE CALENDAR

HB 85: "An Act relating to the use of the income of the Alaska permanent fund (AS 37.13); repealing the permanent fund dividend program (AS 43.23); and providing for an effective date."

HB 84: "An Act relating to smoking in public places and vehicles."

WITNESS REGISTER

Rep. Fritz
Pouch V
Juneau, Alaska 99811
465-4833
Position Statement: Original sponsor of the bill; urged passage of HB 84.

Rep. M. M. Miller
Pouch V
Juneau, Alaska 99811
465-4841
Position Statement: Co-sponsor of HB 84; urged passage of legislation.

Don Kubely
Cabaret Hotel and Restaurant Association
CHAR
6310 Glacier Hwy.
Juneau, Alaska 99801
789-4849
Position Statement: Representing CHAR; wanted Lines 6-7, Page 2 to be deleted from HB 84.

Donna Reeder
3713 Amalgo

Juneau, Alaska 99801
465-2176
Position Statement: Representing herself and other non-smoking state employees; urged passage of HB 84.

Beverly Bradon
P.O. Box 1424
Juneau, Alaska 99802
465-2176
Position Statement: Representing herself as a non-smoking state employee; supported passage of HB 84.

Cherie Shelley
Alaska Public Employees Association
340 N. Franklin St.
Juneau, Alaska 99801
586-2334
Position Statement: Representing APEA; did not indicate whether APEA supported HB 84 or not.

Rosalee T. Walker
7677 N. Douglas Hwy.
Juneau, Alaska 99801
586-2873
Position Statement: Representing herself; opposed HB 84.

Dove Kull
326 4th Street
Juneau, Alaska 99801
586-2670
Position Statement: Representing herself as an older Alaskan; urged passage of HB 84.

Leo Kaye
Director
Alaska Lung Association
P.O. Box 103056
Anchorage, Alaska 99510
Position Statement: On behalf of the Alaska Lung Association; urged passage of HB 84.

Richard Lauber
Tobacco Institute
120 W. 1st.
Juneau, Alaska 99801
586-1324
Position Statement: Representing the Tobacco Institute; opposed HB 84.

Tom Coyne
Box 5283
Ketchikan, Alaska 99901
225-4154
Position Statement: Representing himself; urged passage of HB

Alice Hovena
General Delivery
Auke Bay, Alaska 99821
789-2649
Position Statement: Representing herself as a former state employee; supported HB 84.

Don Hagmason
Retail Association
Juneau, Alaska 99801
Position Statement: Representing Retail Association; opposed HB 84.

Ken Richardson
1521 Sunrise Drive
Anchorage, Alaska 99504
277-5770
Position Statement: Representing himself and being an individual with breathing difficulties; urged passage of HB 84.

Joe Clodauis
Department of Environmental Conservation
Pouch O
Juneau, Alaska 99811
465-2640
Position Statement: Representing DEC; supported HB 84.

Susan Scott
Alaska Council on Health
217 E. 11th Ave.
Anchorage, Alaska 99504
276-0217
Position Statement: Representing herself and Alaska Council on Health; urged passage of HB 84.

Alice Richardson
1521 Sunrise Drive
Anchorage, Alaska 99504
277-5770
Position Statement: Retired Nurse and representing herself; urged passage of HB 84.

Debbie Sharpe
Box 7996
Ketchikan, Alaska 99901
225-5747
Position Statement: Representing herself; urged support of HB 84.

Jeff Sharpe
Box 7996

Ketchikan, Alaska 99901
225-5747
Position Statement: Representing himself; supports HB 84.

Gary Miller
P.O. Box 2436
Juneau, Alaska 99803
789-3757
Position Statement: Representing himself and numerous other individuals; supports HB 84.

Roberta Banko
P.O. Box 803
Juneau, Alaska 99802
586-9874
Position Statement: A state employee representing herself; urged passage of HB 84.

Ric Inannolino
426 East Street
Juneau, Alaska 99801
586-9850
Position Statement: Representing himself; supports HB 84.

PREVIOUS ACTION

None

ACTION NARRATIVE

TAPE#1

Recording Number 0001 — Chairman Abood called the meeting to order at 1:00 p.m., and indicated the members present at the hearing. He told committee members that the first bill to be heard would be HOUSE BILL NO. 85 and then following HOUSE BILL NO. 84.

Number 0036 — Chairman Abood told committee members that it was the intention of the Chairman to pass HB 85 out of committee to the next committee of referral.

Number 0050 — Rep. M. M. Miller moved that HB 85 be passed out of committee with individual recommendations. Hearing no objections, the motion carried with Representatives Abood, Cowdery and Furnace recommending a "do pass" and Representatives M. M. Miller, Shultz and Larson having no recommendation.

Number 0058

Chairman Abood called Rep. Fritz to the stand, the sponsor of HB 84; the bill relating to smoking in public places and vehicles. Rep. Fritz told committee members that if smoking affected only those who smoke, there would be little need for HB 84; but smoke is not confined to the smoker. He stated that smoking interferes with the rights of those who do not smoke, to work or carry on their business in a smoke-free environment. Therefore, it was his feeling that smoking should be banned in vehicles and indoor areas open to the public. He asked the committee to favorably consider HB 84 for passage.

Number 0136

Rep. M. M. Miller, co-sponsor of HB 84, testifies on behalf of the legislation. He told members of the committee that second hand smoke was a significant health hazard. He said a recent court decision ruled that employees had a right to work in a smoke-free environment. He said, "we're not prohibiting smoking." The intent is that smoking does not interfere with those who do not want to smoke.

Rep. M. M. Miller went over new sections of HB 84 that are different from current statutes. In Sec. 2. (2), Line 27 that indicates if privately owned such as, a library, (INDOOR) theater, museum, lecture or concert hall, gymnasium, or swimming pool or other indoor (PUBLICALLY OWNED AND OPERATED) place of entertainment or recreation. Rep. M. M. Miller stated that it was changed to include municipalities, retail store, restaurant or bank which was not in place in previous legislation. The reason being was because people with breathing difficulties and sensitivities to smoke have to go to these places. He urged support of HB 84.

Number 0270

Don Kubely, representing Cabaret Motel and Restaurant Association (CHAR) takes the stand. He told committee members that he had no problem with the main thrust of the bill. He was against the verbiage on Page 2, Lines 6-7 that referred to no smoking in a retail store, restaurant or bank. Mr. Kubely stated that it was contrary and establishments or businesses that are privately owned should not be subject. In

conclusion, Mr. Kubely stated that CHAR felt that sections on Page 2, Lines 6-7 should either be deleted, or left as they are in the present statutes.

Number 0309

Donna Reeder, representing herself and currently employed with the State Department of Administration, takes the stand. She said that she was in a corner with two other non-smoking employees and although the smokers are in another section, the non-smokers are still getting their smoke. She told committee members that dividing sections in offices does not help the problem. She said employees can't wear contacts and suffer irritations in their nose and throat, due to second hand smoke. She urged passage of HB 84.

Number 0339

Beverly Bradon, representing herself and currently employed with the State Department of Administration, Word Processing Unit takes the stand. She said she worked with machines that draw smoke to their section of the office. She told members of the committee that the smoke gave her frequent headaches, but that she had to work to support her child. She urged passage of HB 84.

Cherie Shelley, representing APEA takes the stand. Ms. Shelley referred to Page 4, Line 5 of the bill. She said that she wasn't for or against the bill per say. It was her intention to point out to committee members that if HB 84 passed APEA would be forced to file grievances or a court action, because of the change in working conditions for an employee.

Number 0385

Rosalee T. Walker takes the stand in opposition to HB 84. She said she was a law abiding citizen and that passage of HB 84 would make her a potential criminal, because she smoked. She said she didn't feel it was necessary to pass HB 84, because if merchants do not want you to smoke they can hang a sign and that was sufficient. She also said that there would be a great burden put on enforcement people if HB 84 passed. She opposed passage of HB 84.

Number 0422

Dove Kull, representing herself as an older

Alaskan takes the stand. She said older people have thin skin. She said that same thing happens in your nasal passages when you are around smokers. Ms. Kull said she and other older Alaskans have frequent nose bleeds when subjected to second hand smoke. She strongly recommends HB 84 for those people who have sensitivities such as older people encompass.

Number 0445 — Leo Kaye, the Director of the Alaska Lung Association gives his testimony via the teleconference network from Anchorage. He said that HB 84 was designed to improve the original law and provides safeguards for non-smokers. He told committee members it was a health hazard to receive second hand smoke. He urged passage of HB 84.

Number 0522 — Richard Lauber, with the Tobacco Institute takes the stand. He told members of the committee that there is no actual fact findings that indicate second hand smoke is harmful. He was opposed to HB 84.

Number 0658 — Tom Coyne of Ketchikan gives his testimony via teleconference network. He said that present laws pertaining to smoking were not being enforced. He supported HB 84.

Number 0700 — Alice Hovena takes the stand. She said that the current law was not effective on the part of businesses in controlling smoke. Ms. Hovena said she didn't wish to be subjected to second hand smoke, although she would like to have dinner at a restaurant with a smoke-free surrounding. She said that when someone has nose bleeds, headaches and difficulty breathing, how can it be stated that there is no fact finding evidence that second hand smoke is harmful. She urged support of HB 84.

Number 0840 — Don Hagmason representing the Alaska Retailers Association takes the stand. He was concerned with passage of HB 84, in that if a person was smoking in a grocery store and the knowledge of who the individual was uncertain, the action suit would be filed against the grocery store merchant. He opposed HB 84.

Number 0870 — Ken Richardson, representing himself gives his testimony via the teleconference

network. He said he must constantly wear masks to breathe when he is around smoke in federal meeting places, grocery stores and airplanes. He said the residual smoke gives you colds and other sensitivities and urged passage of HB 84.

Number 0916 — Joe Clodauis, with the Department of Environmental Conservation (DEC) takes the stand. He said that the current bill was more complete and extensive, addressing current needs. He added if the DEC is to enforce the law, support HB 84.

Number 0954 — Susan Scott, representing the Alaska Council on Health gives her testimony via teleconference in Anchorage. Her concern was mainly for small children, with breathing difficulties, who could not go into a store or restaurant because of second hand smoke. She said that breathing second hand smoke was a health hazard and urged passage of HB 84.

Tape 1, Side B
Recording
Number 0010 — Alice Richardson, a retired Public Health Nurse, representing herself gives her testimony via teleconference in Anchorage. She said over 3 million people suffer sensitivities to smoke. During her recent air travel, she indicated she was still recovering from bleeding sinuses. She urged passage of HB 84.

Number 0048 — Debbie Sharpe of Ketchikan gives her testimony via teleconference network. She told of the problem on the ferry system where the lounge is divided in half for smokers and non-smokers, but how the people blow their smoke as they go to their side of the lounge. She urged support of HB 84.

Number 0100 — Jeff Sharpe of Ketchikan gives his testimony via teleconference network. He was opposed to smoking in a grocery store near the fresh food section and was appalled at finding cigarette ashes on produce. He supported HB 84 and its passage.

Number 0119 — Gary Miller, a state employee representing himself, speaks on behalf of many state employees in favor of HB 84. He read a memo

from a department executive who found loopholes in the current statute and; therefore, permitted employees objecting to second hand smoke to be subjected to it just the same. It was the executive's belief that he set the rules and decide what is fair for all. Mr. Miller felt that passage of HB 84 would make the law for enforceable.

Number 0224 — Roberta Banko, representing herself takes the stand. She said that passage of HB 84 would give the non-smoker more leeway to go to a smoker and encourage him to put out his cigarette. She supported HB 84.

Number 0245 — Discussion continues on HB 84.

Number 0290 — Ric Inannolino representing himself takes the stand. He passed out an article from a San Francisco newspaper that told of a non-smoker, employed with the federal government, receiving a $20,000 suit because she was subjected to a smoke filled office. He supported passage of HB 84.

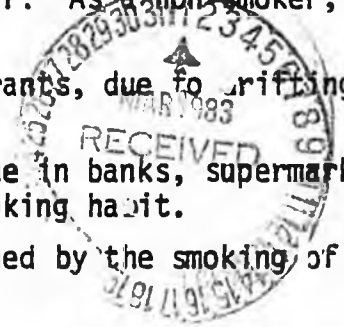
Tape 2, Side A
Recording
Number 0001 — Chairman Abood thanked everyone for taking the time to testify.

Number 0013 — Rep. Shultz moved that HB 84 be passed out of committee with individual recommendations. Motion passed with Rep. M M. Miller recommending a "do pass" and Representatives Larson, Abood and Shultz recommending do pass "if amended".

Number 0025 — No further business to come before the committee. Chairman Abood called the meeting adjourned at 2:35 p.m.

Dear Members of the Judiciary Committee:

I am writing to ask your support of House Bill 84, which provides long overdue health protection to non-smokers in Alaska. The present statute is inadequate in that it does not go nearly far enough to guarantee everyone's right to breathe clean air. As a non-smoker, I can attest to this fact because:



X I frequently have had meals ruined while eating in restaurants, due to drifting tobacco smoke.

X I have experienced extreme discomfort while waiting in line in banks, supermarkets, and other retail establishments, due to someone else's smoking habit.

X Where I work, I am constantly annoyed and sometimes sickened by the smoking of my fellow employees.

___ _____

How this bill is treated by your committee will show Alaskan voters whether their representatives really represent them or instead owe their allegiance to the tobacco lobby.

Signed: Rita Walker Date: 2/25/83

AMENDED TITLE:
AN ACT RELATING TO SMOKING IN PUBLIC PLACES AND VEHICLES

PRIME SPONSOR: FRITZ.

CO-SPONSORS: MILLER,M.M., BUSSELL, KOPONEN, LARSON, MALONE, MARTIN, MCBRIDE, SZYMANSKI, ZHAROFF, MILLER,M.W., LINDAUER, FURNACE, VASKA, DAVIS.

CURRENT STATUS: 2/15/83 IN (H) JUDICIARY

DATE	SEQ	PAGE	LEGISLATIVE ACTION
01/20/83	01	0067	FIRST READING -- COMMITTEE REPORTS
02/15/83	02	0259	S.A. -- DP01, OTHER03
02/15/83	03	0259	F/NOTES HSE SUPPL #9
02/15/83	04	0264	MOVED FROM RES TO JUD BY UNAN CONSENT
			JUDICIARY
			RULES
****	**	**	*** *** ***

2-WIRE

SPONSOR: H. Judiciary

SUBJECT: HB 84- Smoking in Public Places

MAILING ADDRESS: Invitational Hearing

zip

PHONE: 4990 CONTACT: Catherine Zalewski

TAKEN BY: Tim

T/C DATE/DAY: ~~Wed~~ Thurs, Feb 24

TIME: 1:30 Pacific
11:30 Alaska
10:30 Bering

T/C DURATION: 1 hr

SITES PARTICIPATING:

ALL ALASKAN	~~Anchorage~~	Dillingham	~~Juneau~~ *	Mat-Su	Sitka
	~~Barrow~~	Fairbanks	~~Ketchikan~~	Nome	Seward
WASHINGTON DC	Bethel	Haines	Kodiak	*Petersburg	Soldotna (Kenai)
	Delta Junction	Homer	Kotzebue	Sand Point	Valdez
					*Wrangell

Sen. Stevens
Sen. Murkowski
Congressman Young

SPECIAL OFF-NET* LOCATIONS/PHONE NUMBERS: _____

Chairing Site/Person * Rep. Bussell *

Catherine Zalewski
Signature of Sponsor/Contact Person

Date

-------- TELECONFERENCE OFFICE USE ONLY --------

MODERATOR NOTES

Special backup, publicty or technical considerations.

ANC- Leo Kaey
Exec. Director Alaska Lung Assoc.

POST TELECONFERENCE NOTES

SITE/LOCATION: _____

LOCAL MODERATOR: _____

T/C Started: _____

T/C Ended: _____

Was T/C Recorded? _____

Was T/C Broadcast on RADIO or TV?

(If yes, what stations?) _____

TESTIFIED/PARTICIPATED: _____

UNABLE TO TESTIFY: _____

OBSERVORS: _____

TOTAL #: _____

BILLING INFORMATION

Billing Address: _____

_____
zip

Phone
Charges To: _____
(area code) (phone number)

CATEGORY: Legislative ___ Non-Legislative ___

AMOUNT PAYABLE: _____

TO: ALL MEMBERS OF THE LEGISLATURE

FROM: LINDA BURKHART, 120 STEWART, A#2, ANCHORAGE, AK 99508
H- 338-2357 W- 333-1023

URGE YOU TO PASS HB 6 (DRIVING A MOTOR VEHICLE) TODAY.

QR

FROM: JOHNATHAN REYNOLDS
BOX 143
DOUGLAS, ALASKA 99824

PLEASE CONTINUE WORKING FOR SPEEDY PASSAGE OF HB 84-SMOKING/PUBLIC PLACES.
MANY THANKS.

EOM//

POSITION PAPER

CS FOR HOUSE BILL NO. 84 (Judiciary)

"An Act Relating to smoking in public places and vehicles."

BACKGROUND INFORMATION:

First, there is mounting evidence in the medical literature that passive smoking by children, particularly young children, and adults with heart or lung ailments cause them to suffer physiological and eventually anatomic consequences that adversely affect their health status. Second, there is a mounting public awareness of the annoyance caused by persons smoking indoors in public areas. Third, and this is the fact of greatest significance, in 1981, there were 92 deaths in Alaska due to cancer of the respiratory system and 145 premature deaths due to coronary disease. Smoking undoubtedly contributed heavily to these numbers.

WHAT THE BILL DOES:

This bill strengthens the rights of persons who choose not to damage their lungs and cardiovascular systems by smoking - either active or passive smoking. It recognizes several features of indoor air quality that are not adequately recognized by the present statute.

Starting on page 4 through the end of the bill there is considerable discussion adding and amending items regarding size of no smoking signs, civil complaints/penalties, citations/penalty, injunctions, enforcement authority, public education and definitions which delineate the context of the subject.

SUGGESTION FOR IMPROVEMENT:

On page 3, line 14: Due to the difficulty of defining a "smoker" this line could be more effectively stated; "(4) a place of employment if all the employees consent to the designatio in entirety,".

On page 3, line 27: Addition of "per Alask statute 18.35.300" would make the sign more effective.

DEPARTMENT POSITION:

This bill is an enlightened public health policy statement and is strongly endorsed by this department.

MSNG 15881 MARTIE/MATSU 5/9 ?:30 AM

TO: REPRESENTATIVES LACHER, LARSON, RUSSELL, Tischer LISKA, HAYES, BARNES, MALONE CLOCKSIN, WENDTE

FROM: JOE ORTNER
BOX 1178
PALMER 99645
745 3211

RE: HB 84, SMOKING IN PUBLIC PLACES

I AM STRONGLY IN FAVOR OF THE NO SMOKING BILL. A BILL OF THIS KIND IS LONG OVERDUE.

****

MSNG 15881 MARTIE/MATSU 5/9 9:30 AM

TO: REPRESENTATIVES LACHER, LARSON, TISCHER, LISKA, HAYES, BARNES, MALONE, CLOCKSIN, WENDTE

FROM: MICHELLE ORTNER
PO BOX 1178
PALMER 99645
745 3211

RE: HB 84, SMOKING IN PUBLIC PLACES

I AM STRONGLY IN FAVOR OF THE NO-SMOKING BILL. CONDITIONS IN ROOMS FILLED WITH SMOKERS FOR LONG PERIODS OF TIME CAN BECOME UNBEARABLE.

6

M. B. Boad, M.D.
Corporate Medical Director

AT&T
American Telephone and
Telegraph Company
295 North Maple Avenue
Basking Ridge, N. J. 07920
Phone (201) 221-2465

March 2, 1977

ALL MEDICAL DIRECTORS:

RE: EMPLOYEE SMOKING AT WORK

The number of complaints from employees who state they are seriously bothered by the smoking of others has increased somewhat and the strength of the complaints has increased a lot recently. A New Jersey Bell employee has recently gained much publicity on this topic and this has caused us to focus on the subject and consider just what the Company position should be to requests for banning all smoking on Company premises.

This issue is not solely a Medical one nor even a health issue alone but rather is a social matter. We don't know how many of our employees smoke but probably between 25 - 50%. We have not had any great problems in the Bell System and the issue has been handled on a local basis without the need for a Company policy or position. We would prefer to have it remain this way, with each complaint handled individually.

About a year ago I prepared the following statement for Mr. H. W. Clarke as a guide for consideration if it becomes necessary to have a definite Policy or Practice on smoking. This was distributed to the Personnel Vice Presidents February 18, 1977, at their annual meeting:

EMPLOYEE SMOKING AT WORK

Except in areas established as non-smoking such as switch-rooms, traffic operating rooms, etc., supervisors should make a reasonable attempt to separate in work areas those personnel who smoke from those who do not. This can usually be done by segregating the smokers (or non-smokers) in one area of the work space.

CONTROL DATA CORPORATION
Interoffice Memorandum

November 28, 1979

4

TO: Distribution A (Executives)

FROM: R.G. Wheeler HQS13A Ext. 4160

SUBJECT: New Policy on Designation of Smoking and Nonsmoking Areas

Effective January 1, 1980 the Corporation has approved a new domestic policy on the designation of smoking and nonsmoking areas.

Since both smokers and nonsmokers are employees, we're trying to find the most equitable way in which to assure the rights of both, given the rapidly moving public position on the question of smoking. Attached are the new policy and guidelines which are our best attempt to create a smoke-free atmosphere for those who desire it, and permit smoking by individuals who desire to do so. Where it gets tough, is in those areas regularly used by both smokers and nonsmokers. Here, the only way any semblance of equity can be achieved is by first establishing the basic assumption that those areas of our buildings in general use by employees will be nonsmoking, except where specific "smoking permitted" areas are designated.

At this time, Minnesota and Nebraska have legislation that is similar to this policy. Other states are currently holding hearings and working on legislation that will be similar to this policy. For both health and legal considerations, the Corporation has approved this policy to protect and preserve in the most reasonable manner we could find, the health and comfort of employees by creating both places that are free from smoking as well as those where smoking is permitted.

It is recognized that whenever there are potentially conflicting individual rights, a considerable amount of emotion surrounds those issues. We need to be as helpful as possible for our employees and our facilities people to implement this policy as equitably as possible.

Control Data is committed to protecting the rights of smoking and nonsmoking employees. As a consequence, we need to proceed as carefully as possible. If you have any questions, please do not hesitate to contact your personnel manager or myself.

Roger G. Wheeler
Vice President
Personnel & Public Affairs

/jzs

Attachments

3

Council Adopts A New Policy On Smoking

Few subjects stir up as much controversy as "smoking versus no smoking" in University buildings.

Nonsmokers often worry about the harmfulness of "passive smoking," i.e., inhaling the smoke of others. Smokers, on the other hand, often feel their own rights are being curtailed.

After a lengthy review and wide solicitation of faculty and staff opinions, the Personnel Policy Council has adopted the following policy:

"Harvard University recognizes the increasing weight of scientific evidence that smoking is harmful not only to the smoker but also to nearby nonsmokers who, in enclosed areas, become 'passive smokers,' without choice. It is hoped that such situations can be resolved among and between the staff members involved.

"If there remains a conflict between smokers and nonsmokers about when and where a staff member may smoke within University buildings, this policy calls for the smoker to respect the expressed wishes and needs of the nonsmoker."

Staff with questions and comments should contact their Personnel Officer or drop a note to Sunny Macmillan, Holyoke Center 661.

HARVARD UNIVERSITY GAZETTE 9/18/81

About the Hospital

In 1977, the New England Deaconess Hospital actively instituted an antismoking policy through a standing administrative and medical staff committee still active in the hospital today.

From the start, the Deaconess Smoking Policy Committee believed that slow, steady progress would produce more lasting results. Thus, smoking has not yet been banned throughout the hospital. However, the Deaconess has taken incremental steps to reduce the number of smoking areas and, in due course, hopes to eliminate smoking entirely within the hospital.

Although the most productive activity regarding the anti-smoking effort has taken place over the past few years, concern with this issue has been growing since the 1950's.

In 1959, a study found that doctors in Massachusetts had cut their smoking activity drastically. In 1962, Deaconess employees and visitors were asked to smoke only in designated areas. In 1964, with the issuance of the now famous Surgeon General's report on smoking and its destructive side effects, the antismoking effort increased at the hospital. In 1977, a New England Deaconess Smoking Policy Committee was established to complete the task of making the Deaconess a "smoke free" hospital. That goal is soon to be realized.

Policy on Smoking

Smoking Pc

The New England Deaconess Hospital is a health care institution committed to the prevention of disease as well as its treatment. Smoking, the major preventable cause of disease and death in this country, is, therefore, not permitted anywhere in the hospital by any patient, visitor or employee, except in specifically posted smoking areas. *All unposted areas are 'No Smoking' areas.*"

Where You May Not Smoke

Please refrain from smoking except in an area that is clearly marked to permit smoking.

Massachusetts General Laws, Chapter 270, S 21, (1975), require such a restriction in all hospitals in the Commonwealth, but permits *limited* smoking areas to be defined.

Where You May Smoke

Patients may not smoke unless their doctors write an order to permit them to do so. This should be discussed with individual physicians. Even with permission, patients may not smoke in most areas of the hospital.

Visitors are asked not to smoke at all in the hospital, if possible. However, an area located near the hospital cafeteria (Farr Building) is available for those for whom it is difficult to abstain.

Staff members may not smoke in patient areas, nor *any* area not marked to permit smoking.

The Reason

Smoking causes premature death for 300,000 Americans *each year.* Lung cancer, now the most common cancer in men and the second most common in women, is due almost entirely to smoking. With the steady rise in illnesses associated with cigarette smoking, such as emphysema, bronchitis and heart disease, the New England Deaconess Hospital has assumed an active, leadership role through its antismoking effort. The Deaconess policy sets an example for its employees, its patients and its visitors and for other hospitals and health care institutions. The Deaconess policy has been recognized by other health care institutions as one of the most progressive in the United States.

Patients

1) Patients are expected not to smoke while in the hospital, and are so informed prior to admission. This may be modified only on the written order of the patient's own physician.

2) No patient may smoke in a two-bed room unless both persons in the room have written permission from their respective physicians.

3) Smoking is never permitted, and may not be ordered on the intensive care units (Farr 6) or the special care units (Baker 5 and Farr 8).

Employees

1) No hospital employee may smoke while on duty. Employees may smoke only on their free time, and then only in the areas specifically set aside for them and clearly marked as "smoking" areas.

2) Employees may not smoke in patient or visitor areas.

3) Employees should not visibly carry cigarettes while on duty, as it might help to undermine a patient's effort to break the habit.

4) Employee lounges and locker rooms, provided for the use of all staff, are "no smoking" areas, unless specifically posted as "smoking" areas.

5) Prospective employees will be informed of these points at their first interviews.

Visitors

Visitors are requested not to smoke while in the hospital.

However, if visitors are on the premises for an extended period and they feel they must smoke, the vending area near the hospital cafeteria (Farr Building) has been designated as a visitors' smoking area. This is the only area where visitors may smoke, and medical and nursing staff are asked to help by informing any visitor who does not realize this.


Founded in 1896, the New England Deaconess Hospital began as a 14-bed home-hospital dedicated to serving the health care needs of the Boston community. Today, it is the third largest hospital in Boston, a 489-bed and [illegible] 14-building complex located in the famed Longwood medical area. The Deaconess is a specialty referral hospital [illegible] the medical and surgical needs of the patients as well as patients from the Joslin Diabetes Center and the Dana Farber Cancer Institute. The Deaconess is known internationally and [illegible] for its research and teaching [illegible] cardiac, pulmonary and chest [illegible] for diabetes, transplant and pediatric [illegible] cancer, diabetes, [illegible] and renal disease and [illegible]

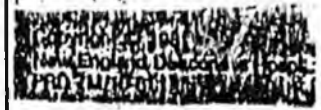
Com nce

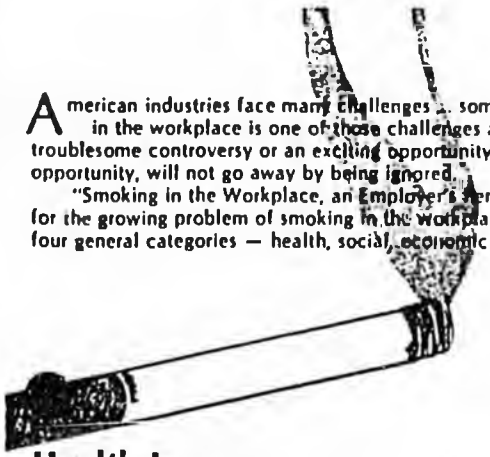
Supervisors and department heads are responsible for ensuring compliance with the letter and spirit of this policy, and violations of the policy should be referred to them.

1) Questions of interpretation, understanding or compliance may be referred to the coordinator of patient relations, ext. 2-8042 or to the personnel department, ext. 2-8146.

2) Suggestions regarding the policy, or its application, will be welcomed by the Smoking Policy Committee, ext. 2-8330. Members of the Committee are also available to speak to staff, patients or visitors who are reluctant to cooperate with this policy.

H4





American industries face many challenges ... some troublesome, some exciting. Smoking in the workplace is one of those challenges and, depending on who is speaking, it is either a troublesome controversy or an exciting opportunity. The smoking challenge, whether viewed as controversy or opportunity, will not go away by being ignored.

"Smoking in the Workplace, an Employer's Perspective" is an examination of facts and issues responsible for the growing problem of smoking in the workplace. The issues facing the employer are many, but fit into four general categories — health, social, economic and legal issues.

Health Issues

Health issues are of two types: risks to the smoker and to the non-smoker. Volumes of research verify that smokers are at increased risk of cancer, lung disease and heart disease. Research in the industrial setting has demonstrated that smoking increases risks to workers exposed to a wide variety of chemical and physical agents.[1] The risk may be that tobacco facilitates the inhalation, ingestion or skin absorption of toxic agents. In addition, workplace chemicals may be transformed into even more harmful agents by smoking. The synergism of smoking and asbestos is the most well known hazardous link. (Smoking asbestos workers are about five times more likely to develop lung cancer than are non-smoking asbestos workers.[1])

Health risks to non-smokers in the workplace are less well known. Recent research has demonstrated that exposure to tobacco smoke in the work environment is deleterious to the non-smoker and significantly reduces [redacted] airways function (a test of lung function.)[1] Prolonged second-hand smoke does more than cause demonstrable damage to healthy non-smokers. The effects on non-smokers with heart and lung disease can be devastating and life threatening. For the employee with emphysema or asthma, exposure to second-hand smoke at work will significantly impair the ability to breathe. By displacing oxygen with other gases it instantly (and in some cases drastically) alters symptoms. Most asthmatics and every employee with emphysema will incur long-term problems from systematic exposure to second-hand smoke.

Social Issues

Social issues of smoking are addressed less often, but are no less significant. Non-smokers frequently are offended by smoke. They express resentment that they cannot avoid air contaminated by second-hand and side stream smoke. More and more frequently conflicts are arising between smokers and non-smokers who demand what they feel are their rights.

A Social Security Administration poll of 14,110 SSA employees revealed that 76% of the non-smoking employees were bothered by second-hand smoke. A majority reported developing sore throats, burning eyes and coughing spells, and half reported occasional difficulty in concentrating. Since two-thirds of most work forces are non-smokers, the indicated rate of dissatisfaction among all employees translates to half the work force. They reported dissatisfaction and disrupted work caused by others' smoke.[4]

As management approaches the smoking issue, it is treading in a sensitive area. The positive aspects must be emphasized to smokers (promotion of quit-smoking programs) and non-smokers (protection from others' smoke). The second-hand smoking issue will continue to snowball during the 1980's. Research has shown that 78% of the work force feel employers have the right to prohibit smoking.[4]

Economic Issues

Economic issues related to smoking include:

- The absentee rate among smokers is twice that for non-smokers.
- The accident rate is twice that of non-smokers (due in part to loss of attention, hand occupation, eye irritation and cough.)[6,7]
- Increased health insurance costs ($204 additional cost per smoking employee, in 1980 dollars)[1]
- Additional fire insurance, workers compensation, life and disability insurance costs.[1]
- Down time spent doing smoking-related activity (estimated at 30 minutes per day at $4 per hour for a yearly cost of $500, $900 for a pipe smoker.)[8]
- Increased maintenance costs (Merle Norman Cosmetics returned $40 to each employee in unused maintenance funds after they banned smoking in their facilities). It is estimated each smoker causes $120 damage per year to carpeting, etc.

A less obvious economic price for smoking is the increased cost of heating and cooling outside air. Recommended outdoor air ventilation rates for areas of buildings where smoking is permitted is *25 cubic feet per minute per person.* Compare this to only *one-fifth* that for areas where smoking is not permitted. The expense of heating and cooling such a large amount of outside air is staggering and increasing as energy costs rise.[10]

Legal Issues

Legal responsibilities for smoking are still evolving. In Minnesota, however, the guidelines are clear. The Minnesota Clean Indoor Air Act (MCIAA) defines places of employment as public places. The right of non-smokers to breathe clean air is primary. All areas, except private offices, must have signs designating smoking/no-smoking areas. Non-smoking employees must be allowed, under the MCIAA, to carry out their duties in a smoke-free area.

Employers who fail to comply with the law are at risk to suits by employees who wish to force compliance. They are additionally at risk in cases where workers compensation or personal injury are issues.[11] By mid-1981, several successful litigations, as well as numerous workers compensation claims, have been settled on behalf of the non-smoker. Punitive damages have been awarded to non-smokers.

Solutions

Resolving the four categories of issues normally takes a two-pronged approach. The combination of restricting smoking to a limited number of designated areas, combined with a company-supported smoking cessation program, seems to be most common.

Smoking restrictions take a variety of forms. Probably the most effective method is to restrict smoking to a portion of the cafeteria or certain rest areas. An alternate method is to separate smokers from non-smokers at work stations and allow smoking in the smokers' area. This plan often leads to complications with work flow, reshuffling people who quit smoking, and problems with air flow pulling smoke into non-smoking areas. This solution also fails to address the problems of energy consumption, reduced productivity and the increased accident rate of smokers.

Some companies have banned smoking in all company facilities. The transition period for older employees is somewhat difficult, but new employees readily accept the restrictions.

Smoking cessation programs can be educational, supportive, or added incentive. An extensive listing of smoking cessation programs is available through the American Lung Association.

Incentive programs attempt to use the economic system to motivate people to quit. There are numerous examples. G.W. Dahl Co., Inc., Bristol, Rhode Island, allows employees to sign a pledge stating "To qualify for a bonus of $3 per week, I promise to quit smoking entirely. I promise to report myself immediately in writing to the payroll department in the event I break this pledge..."

Intermatic Company employees bet against the house on their ability to quit smoking. Bets range from $1 to $100 with double-or-nothing for anyone with 12 month's abstinence.

Texas Division of Dow Chemical Company quitters earned a raffle ticket for a fishing-boat for each month they didn't smoke. Non-smokers could participate in a second raffle by recruiting smokers to join the smokers' raffle.[11]

Incentive programs often achieve a success rate well over 30%, with some as high as 70%. (Unless there is a provision for them to participate, non-smokers may build resentments over incentive programs.)

Smoking in a work environment poses a unique set of problems for management. There are tools and techniques which, when properly applied, provide for positive intervention. It is possible for management to (1) provide a beneficial smoking and health package for workers, (2) simultaneously improve productivity and profits, and (3) head off an issue of growing concern among employees and between management and labor.

About ANSR

The Association for Non-Smokers' Rights (ANSR pronounced answer) is a concerned citizens' group for smokers and non-smokers alike, interested in protecting everyone's right to a clean indoor environment.

ANSR promotes and protects the right to clean indoor air through many activities including:

- Working for enforcement of the Minnesota Clean Indoor Air Act (MCIAA-1975), a law protecting "the public health, comfort and environment by prohibiting smoking in public places and at public meetings EXCEPT in designated smoking areas."
- Informing Minnesotans as to their rights and responsibilities under this law.
- Educating the public about the health and safety hazards of SECOND HAND SMOKE, particularly in an enclosed environment.
- Encouraging implementation of the MCIAA in the workplace and other public places such as restaurants, retail stores, public transportation, educational facilities, health care facilities, auditoriums and arenas and public meetings.

ANSR is sponsored by the American Lung Association of Minnesota and the American Lung Association of Ramsey County. Its activities are governed by a board of directors who are elected by the general membership.

REFERENCES

1. "Interaction between Smoking and Occupational Exposure," U.S. Surgeon General Report on Smoking and Health. The Office on Smoking and Health, Park Building, Room 1-68 12420 Park Lawn Drive, Rockville, MD 20857.
2. "How Much can Business Expect to Earn from Smoking Cessation," Marvin M. Kristein, Ph.D., Available from Interagency Council on Smoking and Health, 291 Broadway, New York, NY 10007.
3. "Small Airways Dysfunction in NonSmokers Chronically Exposed to Tobacco Smoke," New England Journal of Medicine, March 27, 1980, 13 No. 302, P. 720. James R. White, Ph.D. and Herman F. Froeb, M.D.
4. Social Security Administration, 6401 Security Blvd., Baltimore, MD 21235.
5. Health, Education and Welfare Survey, Adult Use of Tobacco. U.S. Health and Welfare Administration, 200 Independent Avenue, S.W., Washington, D.C. 20201.
6. "Work Injuries and Smoking," Industrial Medicine and Surgery, October 1966, pp 211-15.
7. Med. Y Seguridad Del Trabajo, October/December 1973.
8. Toronto Globe and Mail, April 2, 1978.
9. Wall Street Journal, May 8, 1979.
10. Energy Use Related to Smoking in Buildings, Bruce Nelson, energy technical analyst. Report available through ANSR office.
11. Minnesota Clean Indoor Air Act, 1975. Available through ANSR office.
12. Smoking in the Workplace, Richard Cesario, attorney. Available through ANSR office.
13. "Structural Support and Reinforcement of Maintained Risk Reduction," Edwin B. Fisher, Ph.D. Available from Interagency Council on Smoking and Health, 291 Broadway, New York, NY 10007.

ANSR
Association for Non-Smokers' Rights
614 Portland Ave.
St. Paul, MN 55102
(612) 227-8014

A program of:
American Lung Association of Minnesota
American Lung Association of Ramsey County

Smoking in the Workplace

An Employer's Perspective

ACTION ON SMOKING AND HEALTH
2000 H Street, N.W. Washington, D.C. 20006 (202) 659-4310

ASH SPECIAL REPORT:
THE ECONOMICS OF EMPLOYEE SMOKING

Action on Smoking and Health (ASH) has prepared this presentation to help employers appreciate both the immediate and long-range economic benefits of implementing "quit smoking" programs for smoking employees, and of establishing policies to protect nonsmoking employees from exposure to tobacco in the workplace. Today private business firms are expressing more interest than ever before in smoking cessation programs for their employees. In one month ASH has received in excess of 60 separate company requests for assistance and/or information on how to reduce smoking among employees.

These companies writing for our suggestions have already realized the fact that smoking is bad business. One fifth of all lost work days in the U.S. is attributable to the effects of cigarette smoking;[1] a 2-pack-a-day smoker is absent from work 150% more often than a nonsmoker.[2] Cigarettes are a major cause of damage to furniture[3] and carpets, the leading ignition source for small fires,[4] and a prime cause of damage to inventory and expensive office equipment.[5] Medical and disability payments are greatly increased due to the smoking habit,[6] as are insurance costs.[7] Add to this increased costs for cleanup and equipment to accommodate smoking employees,[8] lost production time fiddling with smoking paraphernalia, the problems of smoking in hazardous areas, etc., and the reduction of smoking becomes a significant source for savings and increased efficiency for almost any business operation. This reduction can be accomplished both by helping smokers cut down on (or quit) smoking and by restricting smoking in the work area. Of course, hiring, salary and promotion policies can also influence the amount of smoking cutting into work hours.

In addition to the economic aspects of smoking in the workplace, large employers are increasingly sensitive to the health problems, counterproductive discomfort, and offense smoking causes nonsmoking employees and customers alike. Not only does unrestricted smoking contribute to discontent, conflict and ill will on the job, but it is now the subject of a mounting body of legal and regulatory action.[9]

Employees in many states have been awarded unemployment and job disability payments after having left their jobs due to significant tobacco smoke in their workplace. In one case which has received national attention, a court in New Jersey has banned all smoking in the office of a worker whom the judge found to be allergic to tobacco smoke.[10] The court determined: "There can be no doubt that the by-products of burning tobacco are toxic and dangerous to the health of smokers and nonsmokers generally and to this plaintiff in particular."[11] The judge also held as a matter of law that "an employee has a right to work in a safe environment," and that to the extent necessary to protect this right, a court may prohibit smoking in the workplace.[12]

We at ASH strongly believe that the problems of smoking in the workplace should be taken to the courts, or before regulatory agencies, only as a last resort. With the cooperation of companies concerned with the welfare of their employees and the public interest, the health and comfort of nonsmoking employees can be protected with little or no inconvenience to employees who smoke during working hours.

We are therefore providing these materials to major business organizations in an effort to secure their cooperation with regard to this problem. For our part, we do not seek a total ban on smoking in the workplace. Rather, we ask only that certain minimal -- and we believe reasonable -- steps be taken to protect the health and comfort of the majority of workers who are nonsmokers.

Attached is a list of proposals. These are steps which we feel would provide minimal protection for nonsmoking employees. Many employers have gone beyond these proposed measures after determining it is in their best interests to do so.

Although at least 30% of businesses in America already have restrictions on smoking at the workplace, ASH attaches only a sample list of employers who have already acted to reduce or eliminate smoking among their employees. As you can see, the approaches taken by different companies vary considerably.

In considering this matter you may find the following information of particular interest:

1. An idling cigarette generates as much as four times the amount of toxic agents given off by a cigarette being puffed by the smoker.[13] These toxic agents go directly into the air, and are not filtered by the cigarette filter or by the filtration through the cigarette tobacco.

2. Studies have shown that nonsmokers in a smoke-filled room may be forced to breathe in the equivalent of several cigarettes a day.[14]

3. The American Medical Association estimates that at least 34 million Americans are tobacco smoke sensitive in one way or another.[15]

4. Seventy-eight per cent of all adults -- including 70% of all adult smokers -- believe management should have the right to prohibit smoking in their places of business. The clear majority feels management should have this right even if there is no safety hazard.[16]

5. The majority of adults are nonsmokers. Specifically, less than 40% of adult males, and less than 30% of adult females, are cigarette smokers.[17]

6. Almost 65% of all adults -- including 77% of nonsmokers, and 34.8% of smokers -- find it annoying to be near a person smoking cigarettes.[18]

7. A very substantial body of evidence now clearly indicates that ambient tobacco smoke can create a serious health problem, especially for the estimated 34 million Americans who have particular susceptibilities. Moreover, in significant concentrations, tobacco smoke causes measurable physical symptoms of irritation in the majority of all nonsmokers.[19]

8. The majority of smokers -- and the overwhelming majority of nonsmokers -- believe smoking should be allowed in fewer places.[20]

9. In response to increasing pressures from nonsmokers, the majority of states -- and literally hundreds of counties, cities, towns, etc. -- have passed laws to protect the rights of nonsmokers to breathe air unpolluted by tobacco smoke.[21] Restrictions on smoking aboard airplanes, trains, buses, and in a growing number of federal office buildings are other indications of the strong desires of many nonsmokers, and of the growing public acceptance of reasonable restrictions on smoking in enclosed public places.

Action on Smoking & Health would be happy to provide further documentation for any of the statements made above. To obtain information relating to this general problem, or to discuss any particular aspect of the economic disadvantages of smoking in the workplace, please feel free to write or call at your convenience.

Action on Smoking & Health is a national, nonprofit tax-exempt scientific and educational organization concerned with the problems of smoking and with the rights of the nonsmoker. It serves as the legal action arm of the anti-smoking community, initiating, participating in, and assisting legal actions designed to reduce the toll of smoking in the U.S. and to protect the rights of the nonsmoker. In this regard, the issue of smoking in the workplace is of great concern to us.

NONSMOKERS MAKE GOOD RISKS, SAY INSURANCE COMPANIES

Now, those bastions of cautious economics are rewarding nonsmokers with discounts—and not just for life insurance.

By Diana Shaman

In 1979, 15 years after the Surgeon General issued the first report on smoking and health, a Worcester, Mass., insurance company, State Mutual Life Assurance Company of America, issued a landmark study of its own. Entitled "Mortality Differences Between Smokers and Nonsmokers," the report is still causing ripples within the insurance industry.

The study, which was conducted over a 15-year period, examined the causes of death of policyholders and revealed, for example, that for lung cancer, pneumonia and influenza, the mortality rates among smokers were 15 times higher than among nonsmokers.

For heart disease, cardiovascular disease, and other respiratory diseases, the death rate for smokers was two to three times higher. In general, a higher death rate for smokers, usually two and one half times that of nonsmokers, showed up at all ages, particularly among younger people.

The insurance company's president, W. Douglas Bell, emphasizing that he was not taking a moral stance on cigarette smoking, issued this statement at the time the report was released: "State Mutual's position has been simply that nonsmokers are better life insurance risks than cigarette smokers, and that as a mutual life insurance company, we have a responsibility to our nonsmoking policyholders to recognize their improved mortality rate in the form of lower insurance costs."

As the most comprehensive insurance study to date, the report continues to have an impact on insurance underwriting. "Immediately before our study, no more than 50 companies offered nonsmoker discounts on life insurance," says Peter Marion, associate actuary at State Mutual. "Less than three years later, there are 400 companies offering them."

Nonsmoker discounts are reduced premiums on insurance policies offered by some companies to policyholders who have not smoked cigarettes—in some cases also pipes and cigars are included—for at least 12 months.

The idea for a nonsmoker discount became a reality at State Mutual in 1964, a month following the Surgeon General's report. "The idea was prompted by the report," says William Moisuk, associate actuary for individual health insurance at State Mutual, "but at the time there was no such thing as an insurance study on the subject, so we were pioneering the ground."

Initially, State Mutual offered nonsmokers discounts of from 5 to 10 percent, but as the company grew more confident that mortality rates were indeed substantially affected by smoking, it increased discounts and dividends so that nonsmokers now save an average of 20 percent. Mr. Marion says that more than 100,000 nonsmoker policies, representing 70 percent of life insurance sales, have been issued since the discounts began.

State Mutual's success has been closely monitored by other insurers who are anxious to achieve the same competitive edge. "Nonsmoker discounts are a vital selling tool for us," says Theodore Topalian, chief underwriter at Mutual of New York, the 15th-largest life insurance company in the country. "Sometimes it makes the difference between a sale and a nonsale."

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Some companies have stepped in with discounts on health, homeowner, and other insurance

In addition to life insurance discounts, several companies have begun offering nonsmoker discounts on disability income policies, which are paid when a policyholder can't work because of being sick or disabled. One company, Provident Indemnity Life Insurance, in Norristown, Pa., offers a one-third discount for nonsmokers in its small group comprehensive medical insurance plans. And, on the theory that smokers cause more fires and often have accidents when lighting up a cigarette while driving a car, casualty companies—companies that insure property—have stepped in with discounts on homeowner, fire and automobile insurance.

Because the cost of premiums is usually based on a company's claim experience, many insurance companies say that, by taking new directions, they are treading on shaky ground from an underwriting point of view.

"There is an abundantly clear correlation between smoking and less than good mortality, but on the disability side we are frankly winging it," says William Boyd, vice president of health insurance at the Indianapolis Life Insurance Company. The company has been offering nonsmoker discounts on life insurance for 10 years and is about to offer a three percent discount for disability insurance.

Collective savings on nonsmoker discounts by policyholders could be substantial

Insurance premium receipts amount to billions of dollars annually. During 1981, companies collected $33.8 billion in individual automobile insurance premiums, and $11.4 billion in individual homeowner insurance premiums. Life insurance companies collected $36 billion in individual life insurance premiums, and $31.8 billion in group and individual health insurance premiums. If the nonsmoker discount trend accelerates, collective savings by policyholders could be substantial.

John M. Bragg, an actuarial consultant with offices in Atlanta, Ga., and Toronto, Canada, has researched the effects of smoking and nonsmoking both on mortality and morbidity (disease) and has come up with some startling conclusions, based on studies of data on about 250,000 persons insured by life insurance companies over the period 1968 to 1978.

At age 45, male smokers die at an 80 percent higher rate than nonsmokers, Mr. Bragg concluded. At age 55, male smokers die at a 110 percent higher rate. Though somewhat less affected, women are also hit by smoking. Women smokers at age 45 have a 49 percent higher death rate than nonsmokers. At age 55, their death rate is 71 percent higher. For both sexes, the situation tends to get worse with advancing age. Mr. Bragg's definition of a nonsmoker is someone who has not smoked cigarettes for 12 months at the time the policy was issued.

"We also have reason to believe that medical and surgical expenses for smokers, both male and female, are generally 70 percent higher than for nonsmokers," Mr. Bragg says. He arrived at that figure, he says, by studying available data. "Smokers have far more deaths related to pulmonary illness, for example. We also talked to knowledgeable doctors. When you put everything together, you can come up with an educated professional opinion."

Mr. Bragg points out that his conclusions will probably cause some controversy, but he is in the business of advising insurance companies on product development, and many companies appear to agree that the nonsmoking discounts are justified. More important, companies feel they have the evidence to present to state insurance commissioners, who also have to rule that discounts are not arbitrary and unfair.

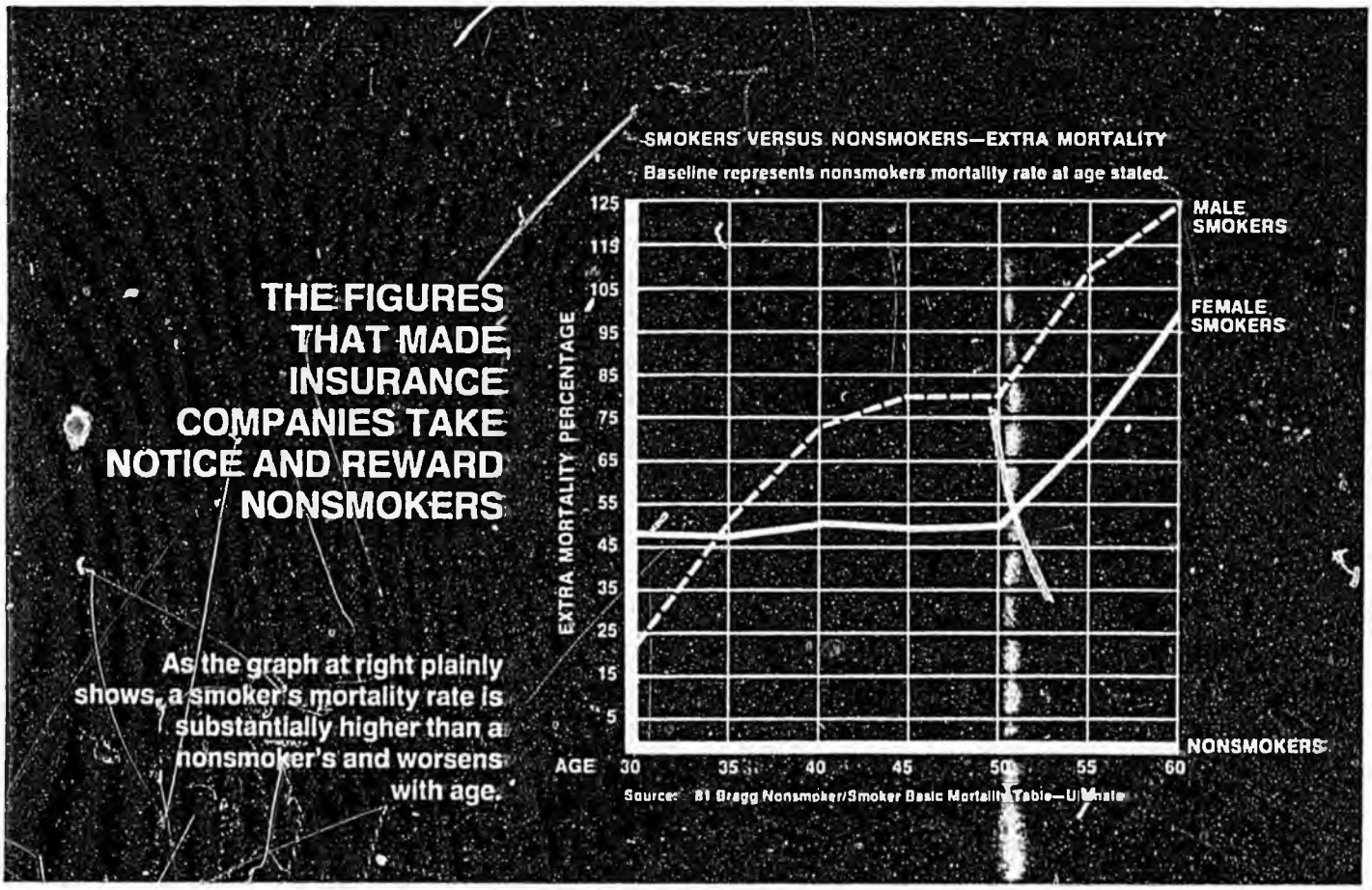
"Nonsmokers live longer. Our rates prove it!" proclaims one insurance company's billboard ad

Allnation Life Insurance Company in Wilmington, Del., rented a billboard last June to advertise a new 30 percent discount on life insurance premiums for nonsmokers. The message read, "Nonsmokers live longer. Our rates prove it!" Said their company president, Douglas Ietter, "We thought we should reward people who don't smoke."

Industry spokesmen say that nonsmoker discounts are good for business. "Everyone is looking to save money," says Marshall Hendrian, an agent for The Travelers Insurance Companies in New York. He is able to offer nonsmoking customers who take out a minimum of $75,000 in life insurance a substantial discount. A male smoker, aged 45, for example, pays an annual premium of $2,107 compared with a nonsmoker's premium of $1,936.

Discounts on life insurance premiums are now relatively common, but nonsmoker discounts on disability income insurance are also increasing. Reflecting the current trend, Kansas Farmers Life Insurance Company in Manhattan, Kans., began offering about a 10 percent discount on this type of insurance, effective August 1, 1982, according to John Cooper, the claims manager. The company also offers nonsmoker discounts on life insurance.

A company that already has been making discounts available on disability is Pacific Mutual Life Insurance Company in Newport Beach, Calif., which began to offer such plans in July 1980. The discounts average five percent of the premium, and 70 percent of the company's disability policies are sold on a nonsmoker basis. "Smokers are less concerned about their general body condition and are generally more careless than nonsmokers," says William Hezzelwood, assistant vice president, explaining why the company felt justified in offering the discounts. "The Surgeon General's report also indicates that nonsmokers get sick less often than smokers."



Another trend: Raise the discounts

Pan American Life Insurance Company in New Orleans, La., was another company in the forefront, offering three percent nonsmoker discounts on disability as of July 1981. The company is now considering raising the amount of the discount, according to Paul Wisnewski, second vice president and disability income director.

The company started with the smaller discount, he says, because "there was no empirical study we could transfer into claims costs of occupational groups that we sell to. We figured that in a year or two we would get more empirical data." Two thirds of the company's sales are to nonsmokers. And Pan American is now working on developing new health insurance policies, including hospitalization. "I suspect that whatever we work on will have a nonsmoker discount," Mr. Wisnewski says.

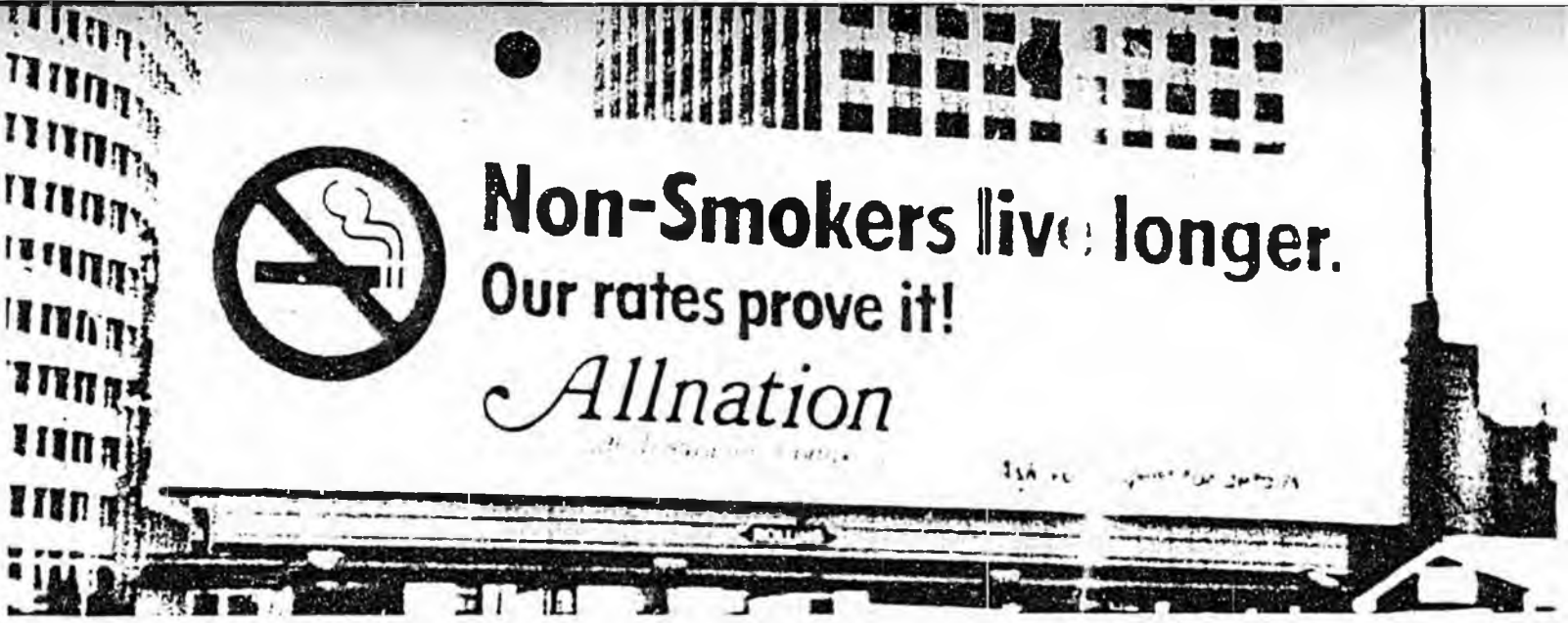
Like others in the industry, Mr. Wisnewski considers discounts the coming trend. Paul Barnhart, a consulting actuary in St. Louis, Mo., predicts that within two years, 90 percent of the insurance companies carrying disability plans will be offering some kind of nonsmoker discount on disability income policies. What percentage the discount will be of the premium amount depends on how conservative or aggressive the individual company wants to be, Barzhart says. He has worked on discounts ranging from 3 to 10 percent and feels the higher figure is justified. "Nonsmoker policyholders ought to experience at least 10 percent lower disability claims," he says.

Less prevalent are nonsmoker discounts being offered by casualty companies, but they are available. Farmers Insurance Group, headquartered in Los Angeles, Calif., has been offering discounts on homeowner and automobile insurance since the late '70s. The present discount on homeowners policies is 10 percent. The discount on automobile insurance is 12 percent.

The company's decision to offer the discounts was prompted in part by a Columbia University study that showed smokers to have significantly more accidents than nonsmokers. Among one of the groups studied by researchers, 54 percent of those who had a high rate of accidents were smokers, compared with 18.6 percent of those who had no accidents or violations.

Farmers also conducted its own study of policyholders, and it showed that 6.59 percent of smokers had accidents compared with 3.75 percent of nonsmokers. Robert Hitchcock, sales manager of the company's regional office in Merced, calls the discounts "our number one calling card."

Citizens Insurance Group in Howell, Mich., has been offering a 10 percent nonsmoker discount on homeowner policies since October 1, 1980. No member of a house-



The billboard in Wilmington, Del., rented by a life insurance company offering a discount to nonsmokers.

hold can have smoked over a 12 month period. The Michigan Insurance Bureau regulations have allowed insurance companies to use smoking as a rating criterion since January 1981. "That was one of the reasons we started to offer the discounts," says Jim McLogan, personal lines unit manager.

A study has shown that 17.7% of the fires in one- and two-family homes are smoking-related

The Hanover Insurance Company in Worcester, Mass., introduced nonsmoker discounts on homeowners insurance in 1973, says James Richardson, the vice president of the company. Discounts on automobile insurance were offered a year later. "Initially, we offered a five percent discount on both plans," Mr. Richardson says. "We were so pleased with the results that we felt we could increase the discounts and did so in the late '70s." The discounts now average 10 percent.

Studies by the National Fire Protection Association have shown that 17.7 percent of fires in one- and two-family homes are smoking-related, Mr. Richardson says. Children playing with matches caused an additional 9.7 percent of fires.

Several companies are now studying the possibility of offering nonsmoker discounts on comprehensive medical insurance coverage, but Provident Indemnity Life Insurance took the step two years ago. With that company, nonsmokers pay one third less for small group comprehensive medical insurance, life insurance and short-term disability insurance.

"We felt that if nonsmoker discounts make sense for life insurance, why not for health insurance," says Samuel Corey Jr., Provident's senior vice president of marketing. "Everyone knows there is a relationship between smoking and health. The problem was how to price the product. We took an educated stab." Because the field is so new, other insurers will probably be watching Provident's experience in order to develop their own products.

In a broader sense, nonsmoker discounts go beyond mere savings on premiums, and they may, in fact, already be shaping social policies. Mr. Corey, for example, noted that employers must pay at least 50 percent of small group insurance premiums, which average about $5,000 a year. Hiring nonsmokers saves them money, and many are already indicating that they make that choice when they can.

"I think that newer policies down the road will take into consideration things even beyond smoking," says William Boyd of Indianapolis Life. "Whether or not you are exercising, for example, or whether or not you are dieting. Insurance companies could be rewarding lifestyles that have been proven effective in promoting longevity and lower rates of morbidity. In a way, I think we have a social responsibility to do that."

A. Judson Wells, Ph.D., a former director of the specialty products division at E.I. De Nemours Du Pont & Company, has been working, since his retirement, as a volunteer for the American Lung Association. His special concern are the issues of passive smoking, smoking in the workplace, and nonsmoker discounts in the insurance industry. "We are always looking for ways to convince people that smoking isn't good for them," Dr. Wells says. "If they start getting the same message from the insurance industry, maybe it will help."

Most insurers appear convinced that nonsmokers live longer and are healthier. As good business practice, they are putting that conviction to use. "Nonsmokers discounts are not a gimmick," says William Moisuk of State Mutual, where nonsmoking discounts started. "We feel they are something we should offer our policyholders in order to be equitable and fair." «

Dian Shaman is a freelance writer based in New York.

SMOKING AND HEALTH DON'T COMPUTE

At IBM, educating employees to attain and maintain a healthy lifestyle is considered good business. The giant corporation gives its managers guidance on smoking practices in the workplace—and it also has ordered 27,000 copies of ALA's self-help Freedom From Smoking manual

A conversation with Cole Mandelblit, IBM senior advisor for Health and Care Planning.

Q. *IBM, which is one of the leading corporations in this country, has offered ALA's* FREEDOM FROM SMOKING *self-help manuals as part of its health education program to its 200,000 employees. Tell us something about that health education program.*

A. Back in 1978, we at IBM took an intensive look at what we were doing in our preventive health efforts. We concluded that although we had a number of good programs in place, and some of them had been in place for many years, we had not done enough in the way of health education and health promotion.

Q. *Did you have a special reason for that review?*

A. Yes, we did. In recent years, medical research has found increasing evidence that lifestyles have a major influence on health. Lifestyles that include cigarette smoking, insufficient exercise or poor diet affect people's health over a period of time. It follows, then, that lifestyle also affects corporate costs in relation to medical benefits and absenteeism as well as productivity. And it also impacts life insurance and total disability costs.

Q. *Is money the bottom line?*

A. No. The larger picture is that if employees learn how to improve or maintain their health, they will lead more productive, more satisfying lives.

Q. *Leading a more satisfying life is really what people want these days, isn't it?*

A. They do. In contrast, if you develop a serious ailment, such as emphysema, chronic bronchitis or lung cancer, you are limited in your activities, often for years on end. This impacts your whole life, as well as your ability to perform work effectively.

"Smoking cessation is a key area of concern in terms of preventive health programs."

Q. *Can you identify an important area of lifestyle that people should modify to protect their health?*

A. Well, if you look at the available data, smoking cessation is a key area of concern in terms of preventive health programs. Smoking cessation should be the first on the list.

Q. *Have you offered smoking cessation clinics to IBM employees?*

A. Yes, IBM will provide tuition assistance for any smoking employee or a member of the family to attend smoking cessation clinics run by the Lung Association or other organizations in the community. This is in addition to clinics specifically scheduled by IBM for employees and their families. However, only a small percentage of smokers have tried cessation clinics.

Q. *The National Cancer Institute reports that 95 percent of smokers who successfully quit do so on their own, not through a group.*

A. The data seems to indicate that a lot of people quit smoking only after a number of efforts, maybe of different types. You never know what it was that helped the person to succeed—whether it was the last thing that did it or all of the things that preceded the decision to quit.

Q. *Well, preliminary data show that people who use the American Lung Association's "Freedom From Smoking in 20 Days" manual and the followup manual keep returning to the manuals for help. The rate of nonsmoking does not drop off as the months pass but, instead, increases with users of these manuals.*

A. Yes, and IBM was the first corporation to offer the manuals to its employees. In our opinion, the FREEDOM FROM SMOKING self-help program—which includes ways to change eating habits, reduce stress, and start exercising—is a well-thought-out piece of work. It's also a low-cost approach to smoking cessation. The research data indicated that there was sufficient expectation of success to justify making it available to our employees and members of their families free of charge.

Q. *Did IBM employees order a large number of copies?*

A. Yes, 27,000 requests were received.

Q. *Besides smoking cessation, what else does IBM offer in its preventive health program?*

A. We offer exercise classes, weight reduction programs, nutrition courses, and a number of other programs that

Photos: Penny Gentieu

IBMer Rose Fletcher has a company-supplied desk sign proclaiming her workspace to be a nonsmoking area.

help to improve lifestyle patterns. The subjects vary somewhat according to local interest.

Q. *Are many corporations other than IBM taking a hard look at the effect of lifestyle on health?*

A. Although a lot of companies are doing things and there has been considerable publicity and attention to this subject, it is my impression that the trend toward providing health education in the workplace is just beginning to develop.

It seems to me that employers have been presented with a very high-cost model of preventive health. It includes not only building new exercise facilities but also hiring staff members to maintain them and to conduct the programs. More than this, the model includes detailed needs and interest surveys, as well as evaluation studies to assure that the programs result in changes in people's health practices.

Q. *You are saying that IBM has another approach.*

A. Yes. IBM decided to turn to community organizations that have an established track record in health promotion and fitness—organizations such as YMCAs, hospitals, voluntary health organizations—such as Lung Associations—and commercial organizations. We offer approved courses at IBM offices or at local community facilities at no cost to employees, retirees and their families.

Q. *Using community organizations and local facilities as part of your health program looks like a practical approach for a corporation like IBM, which has so many employees spread throughout the nation.*

A. That's true. We have some 200,000 employees in about 300 locations.

Q. *Returning to IBM's concern about smoking, surveys today show that two-thirds of employees are nonsmokers. Does management have a responsibility to them, as well as to the smokers?*

A. We recognize the responsibility. In addition to assisting smokers to quit, IBM has established guidelines concerning smoking in the workplace.

Q. *Does IBM have written policies on smoking at work?*

IBM managers are responsible for banning smoking from meeting rooms without good air-clearing ventilation

A. We don't call them policies, but we have provided managers with guidance over a period of eight years concerning smoking in the workplace. We have modified that guidance from time to time with the goal of increasing the sensitivity to the needs of the nonsmoker.

Q. *People in other organizations would be interested in the way smoking-nonsmoking guidelines work at IBM. What is management's overall approach?*

A. Briefly, the guidance involves setting aside areas in cafeterias, libraries and other general areas for the smoker and the nonsmoker. It involves identifying certain common areas, such as elevators and copier rooms and small shuttle buses, as nonsmoking areas. It also indicates that managers are responsible for assuring that meeting rooms have adequate ventilation. If the ventilation is not adequate, the conference room is to be designated as a nonsmoking area.

"We make a reasonable effort to accommodate the person who may be irritated by smoke."

Q. *What do you do about private offices? Can the person who occupies an office designate it as either a smoking or nonsmoking area?*

A. We've made nonsmoking signs available to people who want to place them on a desk and make that office a nonsmoking area. The problem is, of course, what to do if there are three or four desks in an area where some people are smokers and some are not. We try to deal with

that the best we can. We make a reasonable effort to accommodate the person who may be irritated by smoke. We certainly don't have 100 percent success, but we work pretty hard at it.

Q. *Beyond the guidelines IBM has worked out, is there any one thing that you can recommend from your experience that will make the workplace more agreeable for both smokers and nonsmokers?*

A. In the past, we have obtained opinion survey data and reviewed the written complaints we have received from nonsmokers. A few people have said they want smoking banned entirely in the workplace. We have not been able to accommodate people with that view.

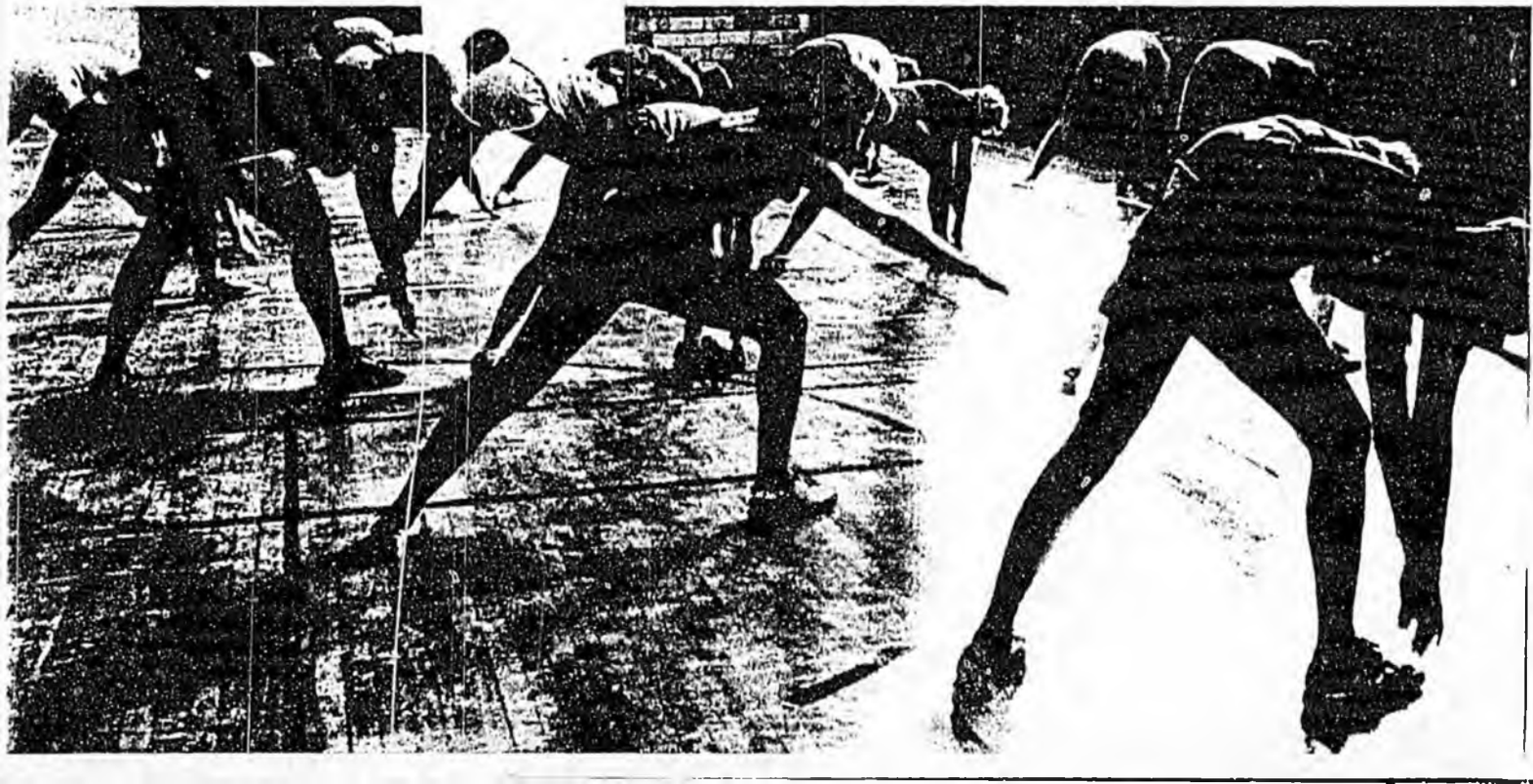
The vast majority of people are not saying "ban smoking." They are saying something else—"be more sensitive." If you conduct a meeting and six of ten people are heavy smokers, some of the nonsmokers will get a headache or an irritated throat and be very uncomfortable.

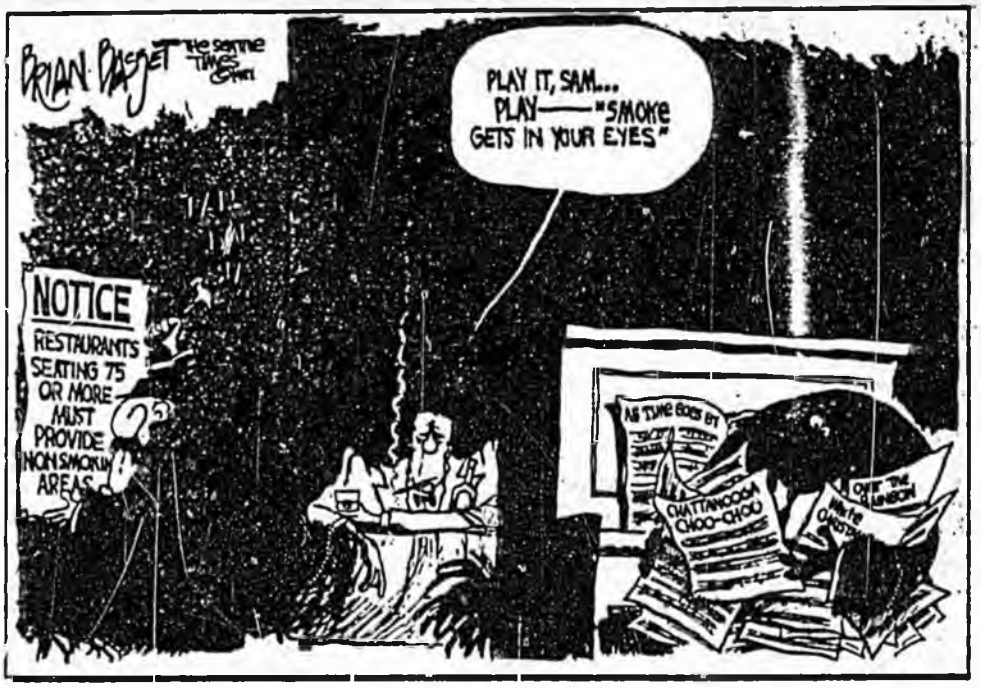
Q. *Are you saying that it's only fair for the smokers to curb their smoking at such a meeting?*

A. If you're conducting a meeting in a conference room, you have to manage it in a rational way so you're not affecting people negatively. By the same terms, if someone whom you know is affected by smoke in your office, you don't smoke. I think that a lot of smoking complaints in places of work and in public places would disappear if people were basically more sensitive to each other. A lot of the friction would be reduced if smokers were thoroughly informed about the effect that smoking may have on other people. «

COLE MANDELBLIT was a speaker at a session on Smoking at the Workplace at the ALA Annual Meeting held in Los Angeles in May 1982. The ALA has since sent "Smoking at the Workplace, A Program Guide" to all Lung Associations to help them work with companies in establishing programs to curb smoking at work.

Above: Lisa Andrews p[illegible]uses one of the 27,000 ALA Freedom From Smoking [illegible]anuals requested by IBM employees. Below: IBMers [illegible]ercise together at a YMCA.





ASH Assists Appeal of Nonsmoking Employee

Action on Smoking and Health has agreed to assist in appealing a court decision holding that an employee in the District of Columbia is entitled to no protection from the health hazards and risks of drifting tobacco smoke on the job.

The case involved Adele Gorden, a young woman who was hired by a contractor for the Environmental Protection Agency (EPA). Because she was sensitive to tobacco smoke and because she was pregnant at the time, she asked that she not be required to be seated near smokers. At first her request was granted, but subsequently she was given the choice of being seated in the midst of smokers or of being dismissed from her job.

When Ms. Gorden's action was first filed, the defendant argued that it should be dismissed because she was entitled to no legal protection against smoke on the job. ASH filed an *amicus curiae* (friend of the court) brief on her behalf, and ASH Executive Director John Banzhaf joined in the oral argument on the motion. The defendant's request was denied because the original judge determined that Ms. Gorden was entitled to legal protection.

When the case finally went to trial, a different judge ruled, after presentation of all the evidence, that the law provided no protection for a smoke-sensitive worker in Gorden's situation, regardless of whether the smoke had in fact proven harmful to her health. At this point ASH agreed to help finance the appeal and to provide additional legal assistance.

The case is an important one because the precedent will affect all nonsmoking employees in the District of Columbia. The rule also contradicts the well-known Donna Shimp case in which a smoke-sensitive office worker in New Jersey was granted an injunction preventing any smoking in her office, and provides legal support for other employers who wish to disregard the health and needs of nonsmoking employees. The proceeding is expected to be a difficult and expensive one: the transcript alone cost almost $1,000. But, as ASH general counsel Paul Pfeiffer put it, "This is one case that nonsmokers simply can't afford to lose."

Every employee who smokes a pack of cigarettes a day costs his or her employer $624 a year because of illness and absenteeism, according to Dr. Marvin Kristein, professor of economics at the State University of New York at Stony Brook.

A smoking ban in your workplace?

A smoking ban in the workplace can result in savings of up to 75% in personnel costs, insurance premiums, maintenance charges, and other expenses. An article in **Personnel Journal** quotes extensively from the 1979 **Surgeon General's Report**, which indicates that more than 81-Million days of work are lost each year in the US because of smoking; that the lung cancer mortality rate for those who smoke 25 or more cigarettes per day is 2,500% higher than for nonsmokers; and that male employees who smoke more than 40 cigarettes per day are absent from work 84% more often than their nonsmoking peers. In addition, the mortality rate for smokers is 300% higher than that of nonsmokers during their peak employment years.

The following costs can be reduced by enforcing a smoking ban:

- Interior cleaning costs can be cut by up to 50%.
- Health and fire insurance premiums can be 25 to 35% lower for smoke-free businesses, and morbidity and fire statistics suggest that premium discounts should be as high as 70%.
- Disability and early retirement payments can be slashed by as much as 75%. Smokers are almost 6 times as likely to become disabled and retire early as nonsmokers.

It was also reported that a recent study in the **Wall Street Journal** found particulate contamination in office buildings that permit smoking to be 10 to 100 times higher than allowable limits for the quality of outside air.

— **Management World, August 1981.**

No-Smoking Airline Gets Support

Muse Air, a Dallas-based airline that bans all smoking on its flights, is operating successfully on its present Dallas-Houston route with a 40 percent load factor, quite high for a carrier that began operations on July 15. In support of its decision to fly smokeless, the airline cited studies showing that for every passenger who requests a smoking seat, five request seats in the no-smoking section. A recent survey conducted by the airline showed that passengers support the idea of a smoke-free flight by a margin of 100 to 1. Muse Air is hoping to expand its routes to other cities in the future—friendly letters from nonsmokers would help. Write to Muse Air, 3300 Mockingbird Lane, Dallas, TX 75235.

DEPARTMENT OF ADMINISTRATION
DIVISION OF RETIREMENT & BENEFITS
POUCH CR
JUNEAU, ALASKA 99811

(907) 465-4461

February 7, 1983

Mr. Leo C. Kaye
Executive Director
Alaska Lung Association
P.O. Box 3056 DT
Anchorage, AK 99510

Dear Mr. Kaye:

I am writing at the request of Mr. Don Allen to provide you with some statistics regarding costs associated with employees who smoke as opposed to those who do not smoke.

Our health insurance consultant did research the subject and reported that health insurance claims for non-smokers could possibly warrant an approximately 2% reduction of standard premium rates over the long run. Further figures indicate a more significant employer savings when absentee rates are examined. These statistics point to a greater absentee rate for smokers than for non-smokers. This might be explained by a smoker's greater susceptibility to minor throat ailments and colds of relatively short duration that do not require the services of a physician. These statistics are still quite tentative since such studies are as yet ongoing and should not be considered conclusive.

As I discussed with Mr. Allen, I do not believe that the State of Alaska is able to financially reward a specific group of employees due to the obvious claims of discrimination and a negotiated pay schedule for all employees. We further discussed that if our experience rated group health plan felt the effects of fewer claims because of more non-smokers, our savings as an employer would eventually result from lower health insurance premiums. A even greater economy would presumably be realized if the absentee rate decreased as suggested. We are considering these types of programs generally and this reasoning may lead to an employee program to assist employees in their efforts to stop smoking.

I did recommend to Mr. Allen that efforts in establishing such a program also be discussed with agencies such as the Division of Labor Relations

Rep. Aboud

and the Department of Health and Social Services since they might be in a position to research this subject further and/or implement non-smoking programs or even other avenues that might be indicated.

The idea of health insurance cost containment is an issue affecting all of us. This division, in dealing with group health insurance, is particularly interested in efforts that could result in lower medical costs. Please feel free to contact me if there is additional health insurance information that this office might furnish.

Sincerely,

Michael B. Coughlin

Michael B. Coughlin
Deputy Director - Dept of Administration

Dept of retirement + Benefits

Sophicar
Fisher
Clarkin
Helling

MBC/jb

20% reduction of standard premium rates for non-smoker

Screening for Adult Respiratory Disease

tant to emphasize that the common denominator underlying the asthmatic diathesis is a nonspecific hyperirritability of the tracheobronchial tree. Thus, the distinction between various types of asthma may often be artificial and the response of a given subclassification may be initiated by more than one type of stimulus" (22). The natural history of adult asthma has not been well documented. There is no evidence that early detection of asthma is feasible, and no documentation that therapy for asymptomatic asthmatics is beneficial. Therefore, no justification exists at present for asthma screening in the general population.

B. *Clinical Case Finding*

It is important to establish the diagnosis of asthma (reversible airway obstruction) in all patients with one or more symptoms of the classic triad (cough, wheezing, or dyspnea), particularly when these symptoms are episodic and nocturnal. Although pulmonary function studies alone are nondiagnostic, when performed on patients with these symptoms spirometry can document the airways hyperirritability that is characteristic of asthma.

Ideally, all patients with wheezing, dyspnea, or chronic cough should have spirometry. If airways obstruction is demonstrated, the spirometry should be repeated after bronchodilators to document reversibility of the airways obstruction. In the presence of normal spirometry, symptomatic patients who suffer paroxysmal breathlessness or unexplained cough should have a provocational challenge with methacholine. A positive challenge can document airways hyperirritability between symptomatic attacks.

It is important to obtain repeated spirometric measurements throughout the treatment of asthmatic patients to evaluate objectively the therapeutic response. ". . . signs and symptoms of asthma imperfectly reflect the physiologic alterations that are present, so much so that if one relies upon the loss of subjective complaints, or even the sign of wheezing, as being the end point at which therapy for an acute attack should be terminated, an enormous reservoir of residual disease is missed" (22).

III. Lung Cancer

A. *Population Screening*

Lung cancer mortality has increased continuously over the last half century even though the major causal factor is a well-known controllable exposure. Eighty-seven percent of bronchogenic carcinoma in the adult male is attributable to cigarette smoking (23), and it has been noted that "For every preventable death from highway accidents, there were approximately two deaths from lung cancer which could have been prevented if the individual had not smoked cigarettes" (24). The risks for developing lung cancer are directly related to the amount and duration of smoking, the age of starting to smoke, the degree of inhalation, the tar and nicotine content of cigarettes, and inversely related to smoking cessation. Other etiologic factors, such as occupational exposures to asbestos, nickel, chromium, and radioactive ores have contributed, but far less than cigarette smoking, to the mortality risk from lung cancer. Males 45 years and over who have had a chronic, daily cigarette consumption of one or more packs seem to be the high risk group for this disease (24).

The treatment of lung cancer after it has become symptomatic remains unsatisfactory. Symptomatic bronchogenic carcinoma is usually advanced and incurable. Presymptomatic bronchogenic carcinoma is not necessarily early-stage disease, but resectability rates and survival rates tend to be considerably better among those with presymptomatic cancer. The National Cancer Institute's program of Surveillance, Epidemiology and End Results Reporting (SEER) in lung cancer (25) indicates that only 18 percent of newly detected lung cancers were found to be "localized" (confined to the site of origin) at the time of detection. However, individuals with localized lung cancer who were subsequently treated by surgical resection experienced a 50 percent five-year survival.

Of various methods considered for the early detection of lung cancer, only examination of sputum cytology and chest radiography have been found by population studies to be sufficiently practical and acceptable to be considered for a clinical trial of the efficacy of screening (26, 27). Previous clinical trials of early lung cancer detection using chest radiography alone (28-30) and those using exfoliative sputum cytology in addition to chest radiography (26, 27) failed to demonstrate a reduction in lung cancer mortality associated with screening. However, none of these studies was a randomized clinical trial using full size (36 cm x 43 cm) chest radiographs with or without sputum cytology testing in which screening was compared to no screening. Until recently, such a trial might have been considered ethically inappropriate.

There have been only three completely randomized clinical trials of screening (exclusively) for early-stage bronchogenic cancer. These clinical trials are now being conducted under auspices of the National Cancer Institute (31). These studies have enrolled more than 30,000 men, age 45 years and older, who smoked 20 or more cigarettes per day. The three clinical centers of the NCI Cooperative Early Lung Cancer Study follow two separate study designs. One study design (Mayo Clinic) tests whether screening by chest radiography plus sputum cytology at four-month intervals is more efficacious than a traditional recommendation that the two tests be performed annually (32). The other design (Johns Hopkins and Memorial-Sloan Kettering) tests whether the efficacy of lung cancer screening by annual chest radiography is enhanced by the addition of exfoliative sputum cytology screening at four-month intervals (33, 34).

The three clinical trials are incomplete, thus only interim results are available. These studies have demonstrated that chest radiography and sputum cytology can detect presymptomatic, earlier stage carcinoma, particularly carcinoma of the squamous cell type. Resectability and survival rates have been higher in the study groups than in the control groups. However at this time, only one of the three centers (Johns Hopkins) reports a statistically significant reduction in lung cancer mortality associated with screening (35). "With equal rates of lung cancer occurrence in the two arms of the JHLP population, the observation of a reduced lung cancer mortality in the Study group seems likely to be due to the effect of cytologic screening. However it must still be realized that the entire benefit of cytologic screening seems to be confined to only one (squamous) cell type (35). These optimistic results remain to be corroborated.

In the fall of 1978 a Consensus Conference of Screening for Lung Cancer was held under the sponsorship of the Division of Cancer Control and Rehabilitation, National Cancer Institute, in collaboration with the National Institute for Occupational Safety and Health. This conference sought to develop guidelines for lung cancer screening programs in the general population. Recommendations were developed in conformity with the criteria developed by Wilson and Junger for the World Health Organization (3).

Included among these recommendations are the following (36):

1. Current prospective studies of asymptomatic persons who have been screened for lung cancer by chest roentgenograms and cytological examination do not at present show any evidence of a definite reduction in mortality from the disease. These studies must be continued for several more years before the accumulated information will be sufficient to allow a relationship between screening and mortality to be established. Re-

of Washington is working with Weyerhauser in Tacoma and Seattle, Intalco in Bellingham, General Telephone in Everett, Eddie Bauer Clothing, Northern Pacific Insurance and Sea-First National Bank.

ALA of Washington does not charge a fee to the company for any of these services.

The ALA of Middlesex County (Mass.) has been actively promoting the FFS self-help manuals in industry since 1981. Health or personnel departments are contacted and a date is arranged for a "Smoking/Health Awareness Day," an inservice introduction to the association's services and resources. Films, FFS slide/tapes, and ecolyzers are used, and a question-and-answer period ensues. "Miss Massachusetts" for 1981-82, who quit smoking using the FFS self-help manuals, frequently participates in the session, answers questions, and signs autographs.

The company always promotes the event with a notice either in pay envelopes, newsletters, or announcements posted throughout the building. The association presented its awareness day to 1,000 employees at Digital Equipment Corporation.

After the event, the FFS program begins centered on the manuals. The association staff meets six times with participants for one hour, twice a week during lunch hour. Progress with the manuals is reviewed. The following week participants meet to focus on the second manual and maintenance.

The association reports much more interest from employees in this approach with the manuals rather than the seven-session FFS clinic.

COST/BENEFIT ANALYSIS

The issue of the costs of smoking to individual businesses is controversial. There is no question that costs are involved. But determining exactly what those costs are is extremely complex.

In spite of well-known literature on the subject it is still open to question as to just how much money a company will save if it institutes smoking cessation programs. Such financial analyses, or so called cost benefit analyses, are very complex, involving as they do mortality and morbidity estimates, actuarial life tables, discounting of future benefits to present values, productivity impact studies, and other similarly complex components.

The marketing strategy plan (see Appendix B), suggests that associations emphasize the health benefits of curbing smoking at the workplace rather than put major stress on cost benefits.

ALA does not recommend using the figures widely cited by Professor William L. Weis, a C.P.A., who teaches at Seattle University. His calculations have been examined and questioned by one of the experts on this topic: Marvin Kristein, Ph.D., associate professor of economics at the State University of New York at Stony Brook. Dr. Weis' figures are not as widely accepted and are more than 6 times greater than Dr. Kristein's.

The total economic cost of cigarette smoking per year to American industry is estimated at $47.5 billion, according to Dr. Kristein, who believes his calculations represent underestimates of the real financial cost of smoking workers.

The average pack-or-more-a-day smoker, he says, costs the employer $624 for every year of his or her working life. These calculations are based on an average salary of $10,000.

These are totally wasted dollars that could otherwise be given to the employees as compensation or improved health benefits, shared with stockholders, or otherwise allocated to business development for a stronger national economy. Dr. Kristein is now in the process of refining his analysis.

At the National Conference on Smoking OR Health (see below) a special workshop addressed how to conduct a cost-benefit analysis on smoking control and cessation in industry. The assembled group of experts agreed that relatively good data exist on the extra costs of smoker absenteeism, disability insurance, health insurance and life insurance, but the impact on accident rates, productivity, pension accruals, maintenance costs and the impact of smoking on the health of nonsmokers need much more work.

The American literature on the cost benefit analyses for smoking cessation programs suffers from several weaknesses. The higher pension accruals that will result if smokers quit smoking and therefore live longer are not considered. This number is substantial and could be as high as the total "savings" calculated in some papers.

Other areas where better basic data are needed involve: accident rates for smokers versus nonsmokers; productivity of nonsmokers versus smokers; and costs of the health effects of passive smoking at the workplace. A third area of concern is the length of time that will elapse between the time the smoker quits and the time a given benefit will materialize (such as increased productivity or improved health of nonsmokers).

It is ALA's experience from contacts with national companies that officers--including medical directors--are extremely interested in both the health and financial costs of smoking at the workplaces. As more definitive studies become available these will be sent to associations.

NATIONAL CONFERENCE ON SMOKING OR HEALTH

Smoking at the workplace was one of the major topics at a November 1981 conference, Smoking OR Health, underwritten by the American Cancer Society and cosponsored in cooperation with a host of other organizations, including ALA.

Under discussion are ways to produce models to help companies calculate their own costs as a result of smoking at the workplace. During 1982 and the years ahead, more materials on these subjects will be published as a result of the conference, which called for ongoing cooperation among agencies to develop programs to curb smoking at work.

Appendix BB from the proceedings includes: action strategies and suggested elements of corporate guidelines for smoking control programs; ways to calculate cost benefits; experiences of selected companies to date; labor-managment relations. Further updates from the Conference will be published later in the summer of 1982 and will be sent to associations.

Until this cost benefit area becomes much better defined, lung associations would be well-advised to avoid using explicit economics as the major basis for selling smoking control and cessation programs to industry. Nevertheless, nearly all experts feel that in the long run a given workplace will be healthier, and more productive, if smoking among the workplace is eliminated or reduced to an absolute minimum.

A vice president of Boeing summed it up: "We tried to calculate the costs and benefits but finally gave up. We just decided that we would rather pay pension benefits than hospital bills."

SMOKERS AND NONSMOKERS AT WORK

An investigation by C.B. Barad (reported in the journal, Occupational Health Safety, 48:1979) studied symptomatic effects of passive smoking in a population of more than 10,000 nonsmoking office workers:

- more than 50% of the nonsmokers reported difficulty working near a smoker.
- another 36% said that they were forced to move away from their desks or work stations because of passive smoking.
- about one nonsmoker in three reported being "bothered" either continuously or very frequently by tobacco smoke at work. In terms of specific symptoms, 48% of the nonsmokers reported conjunctival irritation, 35% nasal irritation, and 30% coughing, sore throat, or sneezing. Nearly 25% reported exacerbation of a preexisting

pulmonary condition, 3% aggravation of a cardiovascular disorder, and 10% stated they were "allergic" to tobacco smoke.

The study also found:

- nearly one fourth of the nonsmokers very frequently or always reacted to tobacco smoke with frustration, and a similar proportion felt hostile toward smokers or management.
- 7% of the nonsmokers stated that they had used sick leave during the preceding 12 months because of the tobacco smoke around them at work.

White and Froeb in a study of the long-term effects of both voluntary and involuntary smoking in more than 5,000 persons (New England Journal of Medicine, 302:720-23, 1980) found that chronic exposure to tobacco smoke in the work environment harms nonsmokers and significantly reduces small airway function. Small airway function in nonsmokers exposed to smoke on the job was reduced to the equivalent of smokers who consumed from one to ten cigarettes daily.

The studies suggesting a link between lung cancer and passive smoking (the chapter on involuntary smoking and lung cancer from the 1982 Surgeon General's report has been sent to all associations, see DETAILS, March 12, 1982) present alarming possibilities of concern to all employers and nonsmoking employees.

In an article by W.L. Weis (Supervisory Management, 26(9):31-35, September 3, 1981) the possibility that smokers may be experiencing a growing negative bias in the job interview process and on the job itself is investigated.

The survey of 223 Seattle-area managers found:

- 119 would choose nonsmokers over smokers if they were equally qualified.
- 103 had no definite preference.
- 1 preferred smokers.

The managers were then asked to make two assumptions, that smokers have about a 50 percent higher absenteeism rate than nonsmokers, and that the health of nonsmokers who work around smokers is measurably impaired. The number choosing nonsmokers increased to 198, 23 were undecided, 1 had no response, and 1 still preferred smokers.

CLEARING THE SMOKE FROM THE WORKPLACE

By Kay Amicone

Few companies have calculated what employee smoking actually costs them in employee health, in benefit programs, and in the cost of doing business

NONSMOKERS HAVE A RIGHT TO BREATHE air not fouled by cigarette smokers practicing their addiction—and a growing segment of American industry has come to believe that dictum. Business is finding it both altruistic and economical to protect employees' health, so a number of firms are examining policies regarding smoking in the workplace—and some companies have sharply restricted smoking at work.

Because a widening body of medical evidence suggests that the potential health problems caused by "side-stream" or "secondhand" smoke can be very serious, managements are looking hard at the fact that a nonsmoking employee can spend 40 hours a week in a confined area breathing co-workers' sidestream smoke. Sidestream smoke has even higher concentrations of noxious compounds than the mainstream smoke inhaled by the smoker, the secondhand variety containing *twice* the tar and nicotine and *five* times the carbon monoxide of mainstream smoke. Before the nonsmoker inhales secondhand smoke, however, some of these concentrations are diluted in the ambient air. The smoker, on the other hand, inhales more toxic compounds directly into the lungs.

A 1980 study by James White and Herman Froeb published in the *New England Journal of Medicine* concluded that chronic exposure to tobacco smoke in the workplace may be deleterious to the nonsmoker. In their study, the nonsmokers who were chronically exposed to tobacco smoke showed dysfunction of the small airways of the lungs comparable to that of light smokers. It is also a fact that tobacco smoke can combine with other toxic agents, such as asbestos, in ways that compound the harm caused by either agent alone. Add to this not-pretty picture that many nonsmokers suffer allergic or irritative reactions when exposed to tobacco smoke, and it is not difficult to understand why the health cost of on-the-job smoking can be high indeed. The economic costs are equally overwhelming.

Health economist Marvin Kristein of the State University of New York at Stony Brook has estimated that the average one-pack-or-more-per-day smoker may, over his or her lifetime, be costing his or her employer about $624 per year in lost productivity and excess insurance costs. He puts the total economic cost of cigarette smoking per year to American industry at $47.5 billion.

Smokers raise the cost of doing business

Smokers cost industry billions of dollars a year in lost productivity: Smokers waste time lighting and puffing on cigarettes, they are absent more often than nonsmokers, they get sick more, they have twice the number of on-the-job accidents as nonsmokers, they also retire more often on early disability—and they may die sooner from smoking-related diseases.

And smokers raise the cost of doing business: Employers pay more for maintenance, ventilation and fire insurance if their employees smoke. Increased fire-accident costs alone have been estimated to be $10 per year per smoker.

Few companies, however, have calculated what smoking actually costs them or what management has saved in those firms that do have no-smoking policies. Such figures are difficult to pin down for several reasons. Cigarette smoking is not the only risk factor to consider when evaluating employee health, and there has not been sufficient time to measure the long-term gains from smoking cessation efforts or reduced incidence of disease. The question of employee turnover further complicates the calculations.

New York Telephone has tried to add it all up. The company determined that 57 percent of the employees who participated in their smoking-cessation program actually quit smoking. Using this figure, the company esti-

adults, too) to find a useful, self-fulfilling societal niche. By that I mean a place where a young man or woman can be a self-supporting, contributing citizen engaged in a worthwhile, healthful life. As a Ph.D. scientist trained in chemistry, I understand perhaps better than most what can happen to the human mind and body when it is abused. I count the habitual inhalation of tobacco smoke as serious abuse.

What then does all this say to me? For one thing, that there is plenty to accomplish in educating youth about pitfalls, shortfalls, wrong turns. If you choose to regard life as a highway, then consider that just off the shoulder of the road is quicksand. People who tend to romanticize life's fast track seldom see that quicksand—until they are waist-deep in it.

"The new volunteer load must be spread evenly"

Additionally, with the federal government in retreat along the social service front and with more women working, the new volunteer load must be spread more evenly among young and old, male and female. It is imperative that each does his or her appropriate share.

Still, the skeptic may say, "Why worry about all this? Leave people alone. If they got hooked on drugs, that's their problem. If they become sick and die after smoking cigarettes for a long time, well, they knew what they were doing. Why bother?"

As I see it, there are two reasons for us all "to be concerned." One is simply the social costs reflected through what I'll label public burdens. Consider the escalating health, accident and life insurance rates; add on higher taxes to pay widows' benefits; and figure in the costs of building, equipping and maintaining hospitals, clinics, rehabilitative centers and jails.

The second reason is more personal. It has to do with a basic view of life here on earth. Stated simply, it says that each of us should do what he or she can to leave the world a slightly better place than he found it. I find support for this in recent explorations of the solar system. I was fascinated to learn that all our space scientists found were barren rock and gaseous clouds. This discovery merely emphasizes the uniqueness of planet earth, with its broad oceans and verdant valleys teeming with life.

I don't mean to pontificate, but doesn't this fact point to an object lesson, one that argues compellingly to society to maintain, to nurture, to improve our precious and oftentimes precarious existence?

President Derek Bok of Harvard University, in charging this year's seniors, commanded my attention when he stated: "Most of us will never achieve a lasting happiness unless we engross ourselves in some serious effort to improve the condition of others. Sooner or later we have to find a convincing way to justify our privileges and opportunities in a world in which so many others remain in much less fortunate circumstances. If you fail to make these efforts, every success and satisfaction is likely to become, sooner or later, hollow . . . illegitimate . . . and unfulfilling."

"Most of us have some time or talent to promote good causes"

Not all of us have the good fortune to find careers that directly benefit others or improve the long-term prospects of life. But most of us have some funds we can spare and time or talent to promote good causes in our home communities. So, gathering everything together, I would much rather miss a few games of golf, or even some time sitting on the warm sands of a Caribbean island. I prefer to get back into the thick of some action, in a setting where it's easy to tell the white hats from the other guys. I enjoy getting in a few more licks for a cause I truly believe in; and I can't think of a better, more aggressive group to work with than the American Lung Association.

Two areas are of particular interest to me, and both deal with smoking and health: 1) passive smoking and 2) smoking cessation in the workplace. I feel safe in predicting that we are on the cutting edge of developments in these obviously interrelated arenas.

Finally, when I become tired or discouraged trying to break into a field which is somewhat new to me, I reach back for an authority. The best one I know is that of Isaiah, one of the original volunteers. When the Lord had a particularly sticky job and asked, "Whom shall I send? Who will go for us?" Isaiah had a ready answer. This biblical stalwart said, "Here am I, send me." «

Campbell's Carol Ritchie, supervisor of personnel services, makes sure prospective employees know that smoking is banned except in designated areas.

areas. "I guess the general idea was not to get any cigarette butts in the soup," says Dr. Wear.

Now Campbell can't find enough employees for the kind of smoking-cessation programs it ran in the past. The reason for this is not a lack of interest—it's a lack of smokers. According to Dr. Wear, "We can't find enough people to make up a group anymore. We cleaned up all those [smokers] who were ripe for picking a long time ago, and we just don't have that many left." The company now deals with smokers on a one-to-one basis as part of a periodic health examination program.

• The Austad Company sells mail-order golf equipment and has a showroom and retail store in Sioux Falls, S.D. Oscar Austad, who started the company in 1963, has never permitted smoking. At Austad no one is allowed to smoke—not workers or customers or sales people—not even at break time. "If Ronald Reagan walked in here and lit up," says Mr. Austad, "we'd kick him out."

A nonsmoker himself, Mr. Austad cites fire protection and aesthetics among his reasons for the ban. But his main motivation, he says, is to protect the rights of his nonsmoking employees.

• Johns-Manville, an asbestos manufacturer, bans smoking in plants where asbestos and asbestos products are made. The company instituted the ban in 1976 after medical evidence showed that asbestos workers who smoke have a 92 times greater chance of contracting lung cancer than workers who do not smoke. In some Johns-Manville facilities the ban is total; in others, where unions saw the ban as an issue in contract negotiations, the company has had to set up break areas where smoking is permitted.

When the smoking ban was imposed at each plant, Johns-Manville also offered smoking-cessation classes to help its employees make the nonsmoking transition. As a further safeguard, the company no longer hires smokers in asbestos-using plants.

• Intermatic, Inc., of Illinois, which manufactures small electrical appliances, offers its smoking employees incentives to quit and has run three separate programs. In one program, employees could bet the company up to $100 that they would quit smoking for one year. In the most recent campaign, 18 successful quitters were eligible for a lottery. The winner of the lottery received a trip for two to Las Vegas. The "losers" were treated to a day at the race track.

Smoking is viewed as New York Telephone's principal health hazard

• Employee smoking is given top priority at New York Telephone: "We view smoking as the principal health hazard of this company," says Dr. Loring Wood, medical director for research and development. "We consider that smoking cessation will alleviate a whole variety of chronic diseases and productivity problems."

About 1,000 New York Telephone employees have completed various company-sponsored cessation programs. The company's medical staff also refers smoking employees to community organizations, such as lung associations, as part of their health-strategy planning for each employee.

Because total prohibition is considered a last resort, the company's on-the-job policy provides for separate smoking and nonsmoking sections in areas of common use, such as cafeterias and conference rooms; and employees having private offices can decide for themselves whether to smoke or not. In areas with two or more workers, accommodation is urged, with a series of steps to be followed if someone objects to smoking for medical reasons.

• Riviera Motors, a Volkswagen/Porsche/Audi dealership in Hillsboro, Ore., restricts on-the-job smoking to specified areas. Since 1978, the company has run annual smoking-cessation classes and has maintained a support system for those who were trying to quit. The company stocked a refrigerator with yogurt, fruit and fresh vegetables to serve as low-calorie substitutes for smoking; it compiled a collection of books on smoking, jogging and health; and it encouraged nonsmokers to give moral support to their fellow workers. The support was sometimes expressed in novel ways, such as placing a flower with an encouraging note on a smoker's desk.

Smoking also plays a role when Riviera interviews prospective employees: "We still hire some people who smoke," says Marcus Sassaman, "but we try to be very much up front with them and tell them this is not what

mated that their smoking-cessation program produced an annual savings in health costs of $645,000 for reduced coronary disease and $1,400,000 for reduced lung disease.

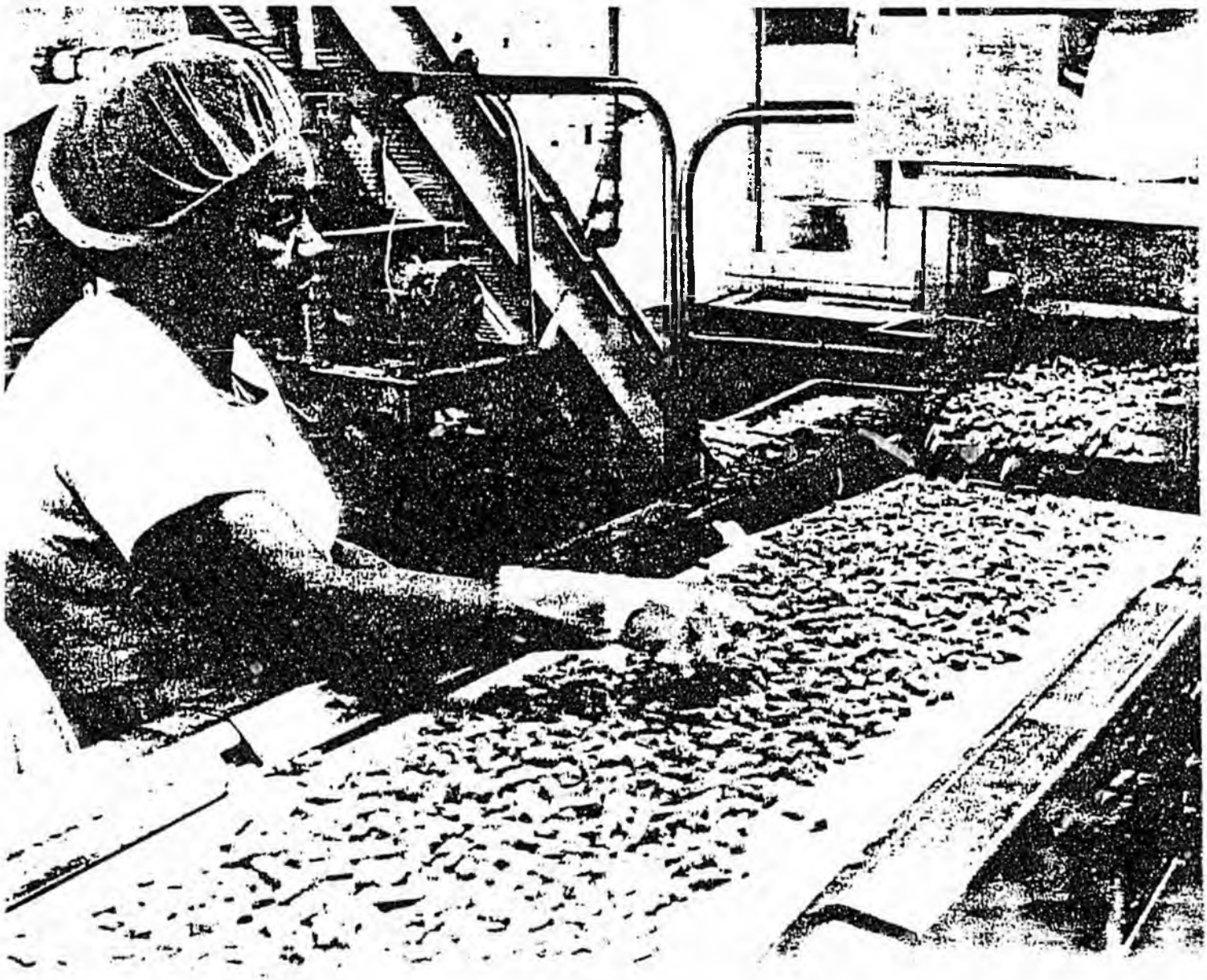
The Campbell Soup Company also has been willing to work up estimates on the effects of their past smoking-cessation programs. The company figured that it cost them $500 for every employee who quit smoking (about 70 employees participated, with a 20 percent quit rate), mainly for time off the job to attend the sessions. It is difficult to measure the long-term savings for such a small group, but Campbell's corporate medical director, Dr. Roland Wear, has worked out estimates of probable savings, and his figures indicate a substantial return on the company's investment. Dr. Wear is convinced of the value of this type of economic evaluation: "I'm a doctor, not an economist," he says. "But at the same time I think this is the kind of thing we're going to have to get into we hope to get businessmen to spend upfront money i this area." Such savings analyses make the kind of bo tom-line presentation that can impress businesses wit how reduced-smoking policies can combine concern f employee health with good economics.

A number of approaches to smoke-free workplaces

Once a company has opted for a smoke-free workplace it can choose a number of approaches to this goal. Som employers concentrate on smoking-cessation program and incentives, others prefer promulgating on-the-jo smoking policies, and combining techniques is also pop ular. Some examples:

- At the Campbell Soup Company, which has banne smoking on the job since the company was founded i 1869, smoking is permitted only in designated breal

Founded in 1869, Campbell Soup may have modernized its technology but one original policy remains: No Smoking.



Because sponsoring smoking-cessation programs has proved to be a relatively noncontroversial way for companies to approach the smoking-in-the-workplace problem, much of industry's effort to reduce on-the-job smoking is centered upon such programs. "The nonsmokers at this point," says Donna Shimp, an activist for nonsmokers' rights, "are benefiting from the fallout of the pitch to smokers."

Some employers won't go as far as instituting hard and fast no-smoking rules because they fear employees' resistance. Their fears could well be groundless: In a 1975 government survey, 78 percent of all adults, including 70 percent of all adult smokers, felt employers had the right to prohibit smoking in the workplace.

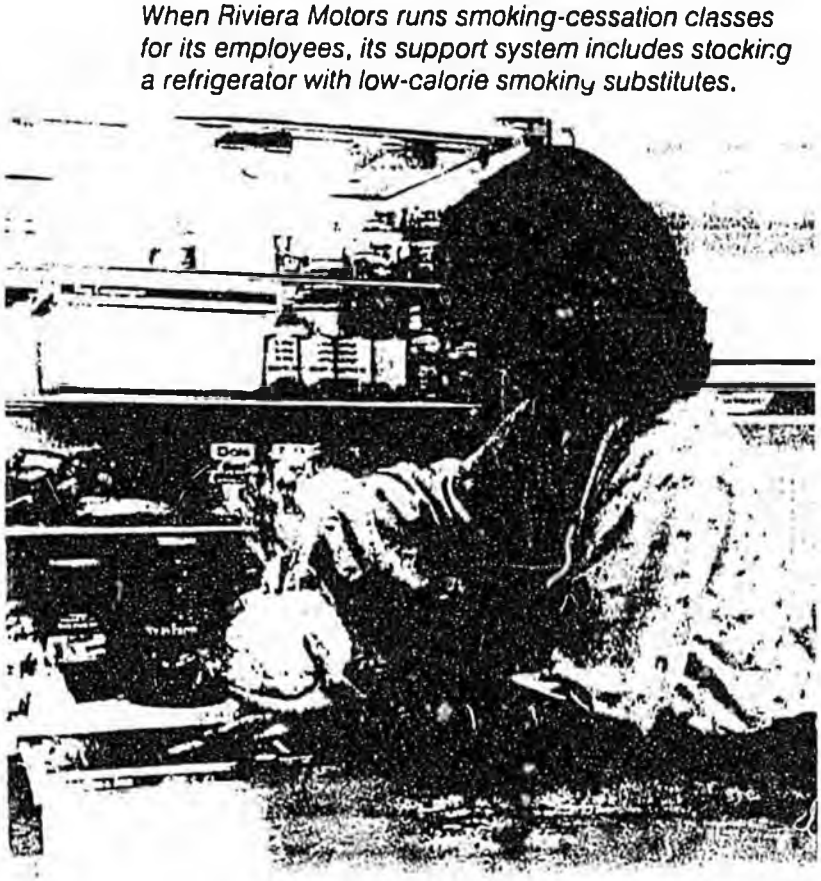
And evidence from companies already restricting on-the-job smoking supports the survey results. Johns-Manville reports that the employee who resists is the exception. According to Marcus Sassaman at Riviera Motors, the nonsmokers support their fellow workers' attempts to quit.

Anticipating union resistance also discourages some employers from pushing nonsmoking programs. The union question is complicated. At Johns-Manville it was the union's insistence that the right to smoke was negotiable under their contract that compelled the company to set up smoking areas in some facilities.

But, says Donna Shimp, this is the case only where a contract contains a specific right-to-smoke provision. Yet even when smoking is not a matter of direct contract negotiation, management often will consider union reaction while formulating a no-smoking policy. "Organized labor is in the middle," says Shimp, because it represents both smokers and nonsmokers. In 1976 Shimp, who suffers severe allergic reactions to tobacco smoke, sued her employer, the New Jersey Bell Telephone Co., for the right to a smoke-free workplace. She won. At that time, her union told her it would represent her right to work but not at the expense of other, smoking employees.

But now some unions have found a way out of this dilemma. Today a union might represent both the nonsmoker's right to a healthy, smoke-free work area and the smokers's right to a smoking lounge. "Comparing six years ago with today," says Mrs. Shimp, "it's a whole new ball game."

When Riviera Motors runs smoking-cessation classes for its employees, its support system includes stocking a refrigerator with low-calorie smoking substitutes.



Court decisions are enunciating nonsmokers' rights

Some employers worry about the possibility of a smoking ban violating smokers' legal rights. Not so, says Shimp: There is no constitutional right to smoke. The judge in her precedent-setting case cited her common law right to a safe working environment and termed tobacco smoke a "non-necessary toxic substance."

"The right of an individual to risk his or her own health," the judge's decision states, "does not include the right to jeopardize the health of those who must remain around him or her in order to properly perform the duties of their jobs."

In other court cases, employees adversely affected by tobacco smoke on the job have been awarded compensation and disability by the courts. And three states—Minnesota, Utah and Nebraska—have legislation controlling smoking in the workplace. The Nebraska law, passed in 1979, illustrates the shift in emphasis from a smoking to a no-smoking norm. It states: "No person shall smoke in a public place or at a public meeting except in designated smoking areas." Most office settings are included under the law.

Those who work in the smoking and health field feel there is an increasing awareness of the hazards of secondhand smoke and the rights of nonsmokers. "I was in industry for quite a while, and I can't even remember anybody talking about this five years ago," says Judson Wells, a retired Du Pont executive who is working with Edwin Fisher on the ALA program for industry.

In the 1979 NICSH survey cited earlier, 33 percent of the responding companies expressed an interest in developing or expanding a program to help their employees quit smoking. This number represents both the progress that has already been made and the work left to be done. The momentum is there; someday America may be a land of smoke-free workplaces. «

Kay Amicone is a freelance writer based in New York.

.Kimberly-Clark sees health promotion as part of the total health-care containment efforts by the company. The program shows management's concern and respect for the health needs of the employees. "Effectively helping people achieve their normal life expectancy as healthy, motivated and productive citizens is really the bottom line," says the company's medical director.

.Smokers have twice the deaths due to coronary heart disease and 10 times the risk of developing lung cancer. They also have longer convalescent periods from respiratory infections. If surgery is required, they are more likely to develop post-operative infections.

.Smoking in certain occupations greatly increases the threats to lung health because of synergistic effects of tobacco smoke and other airborne hazards. Controlling smoking at the workplace—as well as exposure to other airborne hazards—is critically important in these industries.

.As a result of its smoking cessation programs, New York Telephone estimates an annual savings in absence and treatment costs for smoking-related diseases of $1.4 billion for lung disease and $645,000 for cardiovascular diseases. This does not take into account the impact on employees' well-being, productivity and approximately 15 lives saved annually.

.Protecting workers from airborne hazards—asbestos, silicosis, cotton dust, and thousands more substances—is critically important in specific industries. Lung associations are eager to assist these industries in establishing programs to prevent occupational lung disease.

.The facts urge a new definition of employee benefits, one which stipulates that no-smoking policy is a labor-management accomplishment of which both sides can be proud. Unions as well as management are now beginning to see programs to help smokers quit as an employee health benefit.

.Of the $245 billion spent by Americans on health care in 1980, estimates are that employers paid nearly half the cost.

.Smokers who consume one pack of cigarettes daily have a 50% greater rate of hospitalization than those who do not smoke. If they smoke two packs per day, smokers have twice the absenteeism rate of nonsmokers.

.Cigarette smoking causes the premature death of 340,000 Americans each year and disables millions more.

.Although costs and savings are the language of business, a main driving force for most companies is improvement of health. Overall, "Companies would rather have healthy employees and pay pension benefits instead of hospital bills," says the medical director of Boeing.

.Smokers, on the average, have 35-45% higher absenteeism rates compared to nonsmokers.

.The total economic cost of cigarette smoking per year to American industry runs as high as $47 billion, according to Marvin Kristein, Ph.D., Associate Professor of Economics at the State University of New York at Stony Brook. Each smoker costs the employer approximately $624 for every year of his or her working life. These costs are based on an average one-pack-a-day smoker.

.Smoking is related to 90% of all lung cancer cases; 80% of emphysema and bronchitis.

."We view smoking as the principal health hazard of this company," says Dr. Loring Wood, Medical Director for Research and Development at New York Telephone Company. "We consider that smoking cessation will alleviate a whole variety of chronic disease and productivity problems."

SACRAMENTO REPORT

CALIFORNIANS FOR
NON-SMOKERS' RIGHTS
909 12th Street
Sacramento, CA. 95814

VOLUME 1 NO.2 SEPTEMBER 1982

CNR

News Briefs

Famed attorney Melvin Belli has filed a $100 million lawsuit against two major tobacco companies on behalf of a terminally ill former smoker. The patient suffers from cancer, lung disease, and heart failure, all attributed to cigarette smoking.

If the suit is successful it will pave the way to shifting the cost of providing cigarette victims' medical care from nonsmokers (in the form of higher taxes and insurance premiums) to the tobacco industry and its customers.

ASH, Smoking and Health Review, July 1982

San Francisco station KRON-TV sent anchorman Evan White to interview the six cowboys in Wyoming seen in the film "Death in the West" who were suffering from smoking-caused lung cancer. Five had already died!

Herb Caen's column
San Francisco Chronicle, May, 1982

Speaking of "Death in the West", Senator Diane Watson sponsored the showing of the film to legislators, legislative staff members, and public representatives in the Capitol on June 23. She says she hopes it can be shown in schools throughout the state.

Sacramento Union
June 24, 1982

Yet another smoking-caused fire which claimed the lives of a north area of Sacramento couple and their pet dog. Firefighters found that a smoldering cigarette in the living room was the culprit.

Sacramento Bee
May 31, 198[illegible]

Published in the New England Journal of Medicine recently a report that radioactive particles in cigarette smoke can cause tumors throughout the body. Smokers are exposed to these particles just in smoke more than all the other sources combined.

NBC News
July 29, 1982

A recent study of the American Association of Family Physicians found that only 18% of teachers smoke. Yet the non-smokers don't have officially mandated protection in teachers' lounges.

Wind Pipeline
San Fernando, CA
June 1982

ASH Review, July '82

NEXT MEETING: September 21, Tues. 7 PM

..at the home of Chuck & Cathy Mawson [illegible] Lake Glen Way, Sacramento

NEW JERSEY
GASP INC.
Group Against Smoking Pollution

NEWSLETTER

October 1982

Volume 9 Number 2

"THANK YOU FOR SMOKING."

GASP GETS FILM SUPPRESSED BY PHILLIP MORRIS

Death in the West is now in GASP's hands. The 25-minute film made by Britain's Thames TV shows old Marlboro man commercials along with footage of real cowboys dying of smoking--for instance, a rancher riding along with an oxygen mask for his emphysema, his oxygen tank on his saddlebags. The victims' doctors testify smoking caused their patients' diseases. And Philip Morris representatives are interviewed, making asinine comments like "Applesauce can be hazardous to your health if you eat too much."

The showing in Britain produced such outrage against

(See FILM, page 2)

Two Nonsmoking Workers Win

A Missouri Appellate Court has ruled unanimously that Western Electric Co. must provide a safe workplace, free from tobacco smoke, for employee Paul Smith. The Sept. decision, as a unanimous ruling by a higher court, can be expected to have much greater impact than Shimp vs. N. J. Bell.

Jesse Rivera, an employee of N. J. State Division of Youth and Family Services, has won a grievance asking for the Governor's policy on smoking for state employees to be implemented in his office. The arbitrator directed that an enclosed area be set up for smoking and the majority of the office be smoke-free.

GASP has copies of both decisions.

Current workplace cases now number in the tens, if not in the hundreds, as nonsmoking workers seek protection or compensation. In Washington State a federal judge has ruled tobacco intolerance is a legal handicap. GASP will follow these cases and report them.

PLEASE DON'T DROP YOUR CIGARETTES ON THE FLOOR. THE COCKROACHES ARE DYING OF CANCER.

SMOKING AND HEALTH REVIEW

Volume XI, Number 5 September-October 1981

ASH Sues CAB Over Smoking Rules

Action on Smoking and Health has taken the Civil Aeronautics Board (CAB) to court in a challenge to the CAB's new rules, which significantly reduce the protections provided for nonsmoking passengers and open the door to seating smokers next to nonsmokers. In a related matter, ASH is asking the CAB to reconsider a staff decision to do nothing about ASH's complaint about allowing smoking on airplanes despite cutbacks in airplane ventilation, particularly cutbacks that occurred when they clearly violated existing CAB rules.

Under the old rules, passengers seated in the no-smoking section were entitled to protection against drifting tobacco smoke by a rule that provided that they not be "unreasonably burdened" by such smoke. This rule was used by ASH to force Pan Am to abandon its practice of seating smokers directly across the aisle from nonsmokers (longitudinal separation), and TWA to stop sandwiching small no-smoking sections between smoking sections. ASH attorneys argued that the new rule provides no protection for passengers seated in the no-smoking section because it does not consider how thick or how harmful the drifting tobacco smoke is. Moreover, under the new rule, passengers could not complain about new longitudinal or sandwiching configurations, or even about the seating of smokers next to nonsmokers as long as the latter were technically in a no-smoking section.

Continued on page 2

Smoker's Brown Lung Compensation Limited

Court Decision

In a decision that could have important ramifications in many other industrial compensation fields and to government entitlement programs generally, the North Carolina Supreme Court has ruled that a textile worker need not be compensated for that portion of her disabling lung condition caused by her own smoking.

Mrs. Elsie Morrison, now 54 years old, had worked in the textile trades for more than 20 years, where she was exposed to cotton dust. For at least 20 years, she also smoked half a pack of cigarettes per day even though she had been treated many times for respiratory infections, bronchitis, and coughing. In recent years she reportedly smoked less, but she was still regularly smoking when she became totally disabled and sought workers' compensation.

Mrs. Morrison claimed that her condition, diagnosed as byssinosis (also known as brown lung), was caused by her exposure to cotton dust during her employment. If her claim proved true, she would have been entitled to an award of approximately $36,000. However, the industrial commission that considered her case found on the basis of medical testimony that almost half of her condition was caused by other factors, including primarily smoking, and accordingly slashed her award by almost one half. This decision was affirmed by North Carolina's highest court; thus it becomes binding in that state.

Many authorities have begun to question what proportion of various

Continued on page 2

In This Issue

Smoker's Brown Lung Compensation Limited

(Continued from page 1)

compensable medical conditions are in fact caused by the employee's own smoking, and whether employees who smoke should continue to be fully compensated for these disabilities. For example, in a commentary in the *Journal of the American Medical Association*, Drs. Heyden and Pratt stated that "it is difficult to conceive the legislative need for compensation of a disease that rarely reaches irreversible disabling degrees among exsmokers or nonsmokers who continue to work under the same cotton dust exposure." (Vol. 244, No. 16, Oct. 17, 1980 at 1797-8) They cited a study, reported in 1972, that indicated that only smokers seemed to suffer from serious byssinosis and that "workers with typical byssinosis who stopped smoking cigarettes without changing their work area ... observed that their byssinosis symptoms disappeared." Another study showed similarly high rates of emphysema in smokers regardless of whether they worked around cotton dust or not, and virtually no emphysema among nonsmokers even if they worked with cotton.

The Morrison decision could have a major impact in North Carolina, where awards for brown lung totaled $4 million in 1980, particularly if the compensation commissions reduce awards to heavier smokers by a proportionally higher amount. The decision is also of particular importance since it comes from a state with a strong sympathy for the tobacco industry; thus it might serve as a precedent in other southern, as well as northern, states.

The rationale of the decision--that workers are not entitled to full compensation for conditions that they cause by their own smoking—also has potential application in many other areas. As indicated elsewhere in the *Review*, respiratory diseases among coal miners, lumber workers, employees in the construction industry, and workers exposed to asbestos are believed to occur largely in workers who smoke, and in many cases the disability is moderated if they quit smoking. Various studies also indicate that a significant portion of the medical expenses paid by the government under Medicare, Medicaid, veterans' benefits, and welfare are for conditions caused primarily by the smoking of the recipients.

While it may be illogical to require nonsmokers to pay the vast medical costs of conditions caused by smoking, either through unnecessarily high insurance premiums, taxes, or through the added costs of products from cotton goods to coal, many feel that it is unfair to deny compensation to workers who suffer from conditions aggravated by exposure to industrial pollutants. ASH attorneys are therefore considering two alternatives: (1) requiring the tobacco companies to pay for these costs, or (2) requiring workers or those seeking government-supported health benefits who smoke to pay an additional amount in health insurance premiums to compensate for the added health costs or risks associated with their smoking.

ASH Testifies Before Congress on Black Lung

The tobacco industry should pay its fair share of the costs of black lung disease, and coal mining companies should be given financial incentive to reduce smoking among their employees, ASH recently testified before the House Ways and Means Committee's Subcommittee on Oversight.

The problem the subcommittee was investigating was what to do about the insolvency of the Black Lung Trust Fund, which is used to compensate coal miners who suffer disabling lung disease. At present, coal mining companies are required to make payments into the fund based upon the number of tons of coal mined, and the federal government has been financing the deficit of almost half a billion dollars a year out of general tax revenues.

ASH staff counsel Athena Mueller cited medical evidence that black lung is much more likely to occur among coal miners who are also smokers, and that only smoking miners seem to come down with the most serious form of the disease, which requires compensation. Therefore, she said, payments for allocation to the black lung fund should be made by both the coal and tobacco companies in proportion to the role each product plays in causing the disease. Failure to require the tobacco industry to pay its fair share not only burdens nonsmoking taxpayers who are forced to pay more for products that use coal, but it also inter-

Continued on page 4

The Wizard of Id

A PRECEDENT-SETTING CASE: NONSMOKERS' RIGHTS UPHELD IN COURT

A legal precedent was set when Donna Shimp obtained a court ruling granting her the right to work in an environment free from tobacco smoke. Mrs. Shimp, who is with the New Jersey Bell Telephone Company, found that she had a serious allergy to cigarette smoke. The following interview relates the incidents in Mrs. Shimp's long search for a way to keep on working. Many people gave their time to help her, including medical experts, the lung association, and a team of lawyers.

Editor: A judge in a New Jersey Superior Court recently granted you the right to work in an environment free from tobacco smoke.

Mrs. Shimp: Yes, the Honorable Philip A. Gruccio, J.S.C. made the ruling that in the office where I work there would be no burning of tobacco products at any time by anyone and that I would have the full protection of the court against any disciplinary action, harrassment, or anything else directly or indirectly related to the ruling.

Editor: Is this the first court decision of its kind?

Mrs. Shimp: As far as I know, it is.

Editor: What was behind it all? Were you campaigning to get your rights as a nonsmoker, or did tobacco smoke bother you physically?

Mrs. Shimp: I had a serious medical problem. Tobacco smoke made me nauseous, gave me big red blotches on my face, and probably caused three episodes of corneal erosion.

Editor: Where do you work?

Mrs. Shimp: I work for the New Jersey Bell Telephone Company as a service representative in the Millville Business Office.

Editor: Do customers who smoke come in to see you?

Mrs. Shimp: Yes, they do.

Editor: Sounds like a tough problem, if smoking makes you sick. Did you think of quitting your job and doing something else?

Mrs. Shimp: Yes, my husband wanted me to quit, but I needed to keep my job. One reason, to be honest, is that I knew that in March of this year I would have 15 years of service with the company. At 15 years they vest your pension—they give you a permanent right to it. I felt that if I were to leave, I would be throwing 14 years down the drain. All I thought at first was, "Let me just make it until March."

Editor: Then what happened?

Mrs. Shimp: I read a lot about the health effects of smoking. As I learned how harmful tobacco smoke is to everyone, I began to feel it was unfair to be forced to leave a job I really liked just because other people were smoking.

Editor: Why did you go to the courts?

Mrs. Shimp: I finally got to that point after I had tried everything else. I had tried asking my co-workers not to smoke. I tried going to the company medical department with my problem. I asked the help of the union. I also tried to locate a local or state health or environmental regulation that would apply.

Editor: What was the general response?

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ON THE COVER: 1976 Christmas Seal Chairman Dick Cavett (right) with former chairman Jack Lemmon. Lemmon recently sent this mailgram: BEST WISHES FOR SUCCESS WITH YOUR UPCOMING CHRISTMAS SEAL CAMPAIGN. JACK LEMMON, AN ACTOR WHO APPRECIATES CLEAN AIR."

NOVEMBER 1976

AMERICAN LUNG ASSOCIATION
BULLETIN

DICK CAVETT, 1976 National Christmas Seal Chairman, with former chairman Jack Lemmon—see page 11

A PRECEDENT-SETTING CASE: NONSMOKERS' RIGHTS UPHELD IN COURT

Mrs. Shimp: Many officials of different organizations acknowledged the health hazard created by tobacco smoke and the justice of my request, but they would finally say, "Sorry, we can't do anything. There's no regulation that covers tobacco smoking in your circumstances."

Editor: When did the whole problem start?

Mrs. Shimp: About five years ago, but the correct diagnosis as to what was causing it wasn't made until this year. I finally got to the diagnosis through my eye problem. Something was causing the cornea of my eyes to erode.

Editor: Corneal erosion sounds serious. I suppose you went to an eye doctor.

Mrs. Shimp: Yes, I did. First my regular doctor and then three ophthalmologists tried to find out what was happening. The first eye doctor said, "Ask the Man upstairs. I don't know what's causing it." The second said that the corneal erosion was probably the result of an allergic condition, perhaps hay fever, but he made no effort or suggestion to explore further. Neither my private physician nor the ophthalmologists suggested that I go to an allergist at that time.

Editor: Then how did you begin to identify tobacco smoke as the probable cause?

Mrs. Shimp: One evening, I got acutely ill at a dinner party. About 40 people were in a room that wasn't well ventilated, and many people were smoking. I got so actively sick that I thought I had food poisoning.

Editor: So what did you do?

Mrs. Shimp: From this experience, I began to suspect

Mrs. Shimp is holding one of the "No Smoking" signs which are displayed in her company's medical departments. She says, "I was only asking them to spread this protection to other departments."

tobacco smoke as the cause of the problem. For days after that dinner party, even the smell of a burning cigarette at work would make me feel sick all over again.

Editor: Did you discuss the problem with your physician at that point?

Mrs. Shimp: Yes. He said, "You undoubtedly have a toxic reaction to tobacco smoke. The only thing I can tell you is stay away from it."

I said to him, "Do you really mean I ought to quit my job?" and he replied, "I can't be involved in changing your vocation. I'm telling you what the problem is, and you work it out."

Editor: Did you ever get a definitive diagnosis concerning your reaction to tobacco smoke?

Mrs. Shimp: Yes, I did. Allergist Richard F. Brams, M.D., of Wilmington, Delaware did a thorough evaluation for clinical allergies, including a study of my home and work environments. The diagnosis was respiratory allergies exacerbated by tobacco smoke, especially in poorly ventilated rooms. Apparently, I had lived for years with a few allergies with just a mild antihistamine for relief. Then somewhere along the line, I developed an allergy to tobacco smoke.

Editor: Did you ever smoke yourself?

Mrs. Shimp: Oh, yes. I used to be a heavy smoker. I smoked about three packs a day when I was in the brokerage business. Black coffee and cigarettes were my mainstays in that business.

But when I got married, my husband said, "It's me or the cigarettes." And, I must say, he almost lost. When people tell me cigarette smoking is not a drug addiction, I tell

them they are all wet. Some people are truly addicted to nicotine. I went through a terrible withdrawal period.

Editor: How long did it take you to quit?

Mrs. Shimp: I couldn't admit this for a long time, but I admit it now because I think it helps people to understand the hold that cigarettes can have on you. It took me almost two years to completely quit. Every now and then, I would buy a pack and sneak one smoke privately, just to try it again. It took me 12 years or more before I didn't desperately want a cigarette once in a while.

Editor: So you understand the problems other people have when you ask them not to smoke.

Mrs. Shimp: I've also seen women I've worked with—women who are really in very poor health with respiratory conditions and circulatory problems—try to quit smoking, and they just can't make it. I can empathize with the smoker who feels threatened. I think I can understand it better than someone who has never smoked.

Editor: Let's go back to your immediate problem when you discovered you were allergic to tobacco smoke: How did you handle the situation? You said you had to work.

Mrs. Shimp: At first, I was able to get around the problem by putting up a "No Smoking" sign in the office. It was a small office which had individual ventilating systems. I could use the exhaust mechanism, even in the winter, if I wanted to.

Editor: And then what happened?

Mrs. Shimp: I found that our business office was going to close. I had a choice of going to one or two other offices where a good percentage of the employees smoked. The man I ultimately went to work for said, "If you can't take the smoking, you'd better not come to my office."

So I said to him, "What do you suggest I do?"

He replied, "You'll have to decide. I'm letting you know now that the other people in the office are not going to quit smoking and I'm not going to ask them to."

Editor: So what was your decision?

Mrs. Shimp: I elected to keep on working. A couple of days before I was to go to the new office, my husband called my physician and said, "Can't you give her something to combat the nausea?" My physician reluctantly prescribed an anti-emetic.

Editor: Did that work?

Mrs. Shimp: When I felt terribly nauseated from the smoking in the office, I took the medicine, and it would enable me to last the day somehow, even though I still felt sick to my stomach.

Editor: Wasn't there any ventilation there?

Mrs. Shimp: None! There were no individual exhaust fans, and the central unit was not used because it created cold drafts. However, I came up with something that could help me. A friend of mine who is an industrial physician in the Delaware Valley suggested a respirator. I talked to the people at a mine safety appliance company and got an industrial mask.

Editor: Is this a mask that fits over your nose and mouth?

Mrs. Shimp: Yes, it does. Of course, my job is talking over the telephone, so the mask made that rather difficult.

Editor: Sounds like a scene from a novel.

Mrs. Shimp: I would say that was probably the worst two months I ever spent in my life, because I was sick every day. About the second week in the new office I had to go to an ophthalmologist because my eyes were so irritated.

"When I felt terribly nauseated from the smoking in the office, I took the medicine, and it would enable me to last the day somehow. That was probably the worst two months I ever spent in my life."

"I first went to the company representative responsible for formulating policy and explained my problem. They agreed that the problem was a very real one, but they said there was no law requiring them to do anything about it."

Fortunately, he had the good sense to send me to an allergist. As I said earlier, the allergist identified my problem as allergies aggravated by tobacco smoke.

Editor: What did the allergist tell you to do?

Mrs. Shimp: After another corneal episode, he told me not to go back to work. The Bell medical department's consultant concurred with his findings and also found an allergy to tobacco smoke, itself. At that point, the company put me on disability with full pay for three months.

Editor: Did your nausea, eye problems, and skin problems subside when you were off the job on disability?

Mrs. Shimp: In about a week, I was just fine. I had no problem at all.

Editor: Then what happened?

Mrs. Shimp: I kept thinking, "There must be somebody who can help me." I contacted any group I could think of who might have some information. The American Lung Association of Southern New Jersey was most helpful. I wanted to understand the situation as best I could. I even contacted the U.S. Surgeon General's office. I found that

there was excellent evidence about the health hazards of cigarette smoke, but there was nothing on what to do about it in the work environment.

Editor: Did your physician also give you some help at this point?

Mrs. Shimp: My allergist, Dr. Brams, was neither too busy nor afraid to get involved. He helped me by writing to my employer, and by filing a claim with the regional office of the Occupational Safety and Health Administration on my behalf, citing some of the medical reports I had accumulated. The very fact that he was willing to go to bat for my right to a healthy work environment—one that was smoke-free and also ventilated—gave me the strength to pursue this goal.

Dr. Brams did all these things without fee—and so did all the other doctors who later on came to my aid and supported his position.

Editor: Was it at that point that you went to the union?

Mrs. Shimp: Actually, I've always been a corporation-minded person, so I first went to the company representative responsible for formulating policy and explained my problem. They were all very receptive and agreed that the problem was a very real one, but they said there was no law requiring them to do anything about it.

Editor: So what was your next move?

Mrs. Shimp: I then went to the union with the same request and got the same answer. The union said it would represent my right to work but not at the expense of the other employees.

It was at that time that I first considered legal action as a very remote possibility. I honestly couldn't believe, until I finally went into the courtroom, that you would have to legislate or litigate common decency.

Editor: Did you talk to the other employees in the office?

Mrs. Shimp: I had talked to them, and they were sympathetic—as long as they didn't have to stop smoking. As union members, they knew they had the backing of the union in any right-to-smoke issue. The awareness of the safety and health people at the top hasn't filtered down to the field yet. At any state level, I did get good representation for improved ventilation but without any smoking restrictions.

Editor: Have people at New Jersey Bell had this privilege for many years?

Mrs. Shimp: There was no smoking on the job when I was hired 15 years ago. It was a condition of employment. Smoking on the job came into union contracts in many businesses about 10 or 12 years ago, and our company went along with the trend.

Editor: You said that at that point you were on disability.

Mrs. Shimp: Yes. The company was paying me to stay at home, without working, in a smoke-free environment. After three months, I went to half-pay and was told that I could be fired "to protect my health" if I didn't take a demotion.

Editor: What was a demotion supposed to accomplish?

Mrs. Shimp: It offered a convenient solution to the problem. According to company rules, telephone employees may not smoke at the switchboards or where there is switching equipment. If I had been demoted to telephone operator, I'd be working where no smoking is allowed as a matter of company policy.

Editor: Is there any special reason for a no-smoking rule near the equipment?

Mrs. Shimp: It's to protect the machinery from contamination and also from fire.

Editor: Did you accept the demotion?

Mrs. Shimp: No, I didn't. First of all, I had worked for many years as a service representative. I didn't think that a demotion and substantial pay loss was a fair solution to th problem. But equally important, I had come to understand that tobacco smoke is harmful to nonsmokers, especially to those of us who are sensitive to it. I said to myself, if this is true, why should the company allow smoking on the job? Why was the union continuing to go along with smoking on the job?

Editor: So, despite the obvious roadblocks, you were still looking for a way to continue at your regular job.

Mrs. Shimp: All along, I had a basic belief that there must be a way, somehow, to keep on working. Especially if smoking is injurious to your health. Justice is part of the great American dream.

Editor: Did you try some other routes before you got into legal action?

Mrs. Shimp: I kept thinking that there was some answer other than the courts. I went to the Clean Air Council, I went to the Environmental Protection Agency, I even went to the Occupational Safety and Health Administration (OSHA) in Washington. Almost everybody whom I pleaded my case to said, "Yes, you are right, but there's no law to say you are right." I finally concluded that the question would have to be brought to the courts. I didn't know how to do it, but I decided to give it a try.

Editor: Very quickly, tell us the end before we discuss the details: Just exactly what was the court decision?

Mrs. Shimp: I received a temporary restraining order stating that I was to be provided an atmosphere free of toxic and harmful substances.

Editor: What was the basis of the court decision?

Mrs. Shimp: The judge said he was weighing the right of the person who accepted the medical evidence on the hazards of tobacco smoking and chose not to smoke—versus the right of the person who chose to disregard the evidence and continued to smoke.

The judge said that, on the basis of the evidence he had before him, there was no question that he had to protect my health in the work environment.

Editor: What's next? Will the order stand?

Mrs. Shimp: No opposing affidavits have been filed, and my employer asked for a settlement conference, so the order will probably become a permanent injunction very soon.

Editor: How did you proceed with the development of the case? Did you employ a lawyer, or did one volunteer to help you?

Mrs. Shimp: At first, a friend who is a lawyer agreed to represent me in my right to work. I could sense the company attitude and the union attitude at the time and saw that I might need some help. The lawyer, Edward N. Adourian, Jr., wrote a letter of representation to both the company and the union, saying that he was interested in helping provide me with a healthy work environment and would be glad to cooperate in any way he could.

Editor: What happened then?

Mrs. Shimp: Mr. Adourian made some preliminary investigations and found that there were no precedents for the case. He felt I definitely had a case but pointed out that it would take a couple of years of research to prepare what he called a "landmark case." He equated it with the desegregation question in U.S. schools a few years ago.

Editor: So you hit another roadblock.

Mrs. Shimp: The lawyer said that the expense of the research would be tremendous, even though some other lawyers might be willing to cooperate with us as a matter of public interest.

Editor: By now, I've learned to ask you this: What did you do then?

Mrs. Shimp: I kept asking people about ways to help. One person would refer me to somebody else.

Finally, I located a professor of labor law at Rutgers University, Alfred W. Blumrosen. I found out later from

others that he is eminent in his field and very well respected nationally. He had done all the research for a case such as mine as a matter of academic interest. He said the premise he had developed could be applied very well to my particular case.

Editor: What was his premise?

Mrs. Shimp: That an employee has access to the courts for injunctive relief if his or her health is being harmed and if there are no clear laws to protect the employee. Professor Blumrosen said he would help me if I could get a team of lawyers together.

Editor: And did you get a team of lawyers to help you?

Mrs. Shimp: Yes, there were five altogether.

Editor: Did they work on the case on a volunteer basis?

Mrs. Shimp: Yes, they did it as lawyers interested in the precedent. Not one of them charged a fee or indicated in any way that he wanted payment.

Editor: Were they nonsmokers?

Mrs. Shimp: Only one was a nonsmokers' rights person. The other lawyers felt, as one of them said, that a human need was not being met and that if they had the knowledge to meet it, they would help me.

Editor: What kind of documentation did you have to come up with for the case?

Mrs. Shimp: Well, first of all, I obtained an affidavit from Dr. Brams concerning my medical susceptibility to cigarette smoke. I then obtained supporting affidavits from allergists Frank Rosen, M.D.—who had already written to Bell on my behalf—and Michael Diamond, M.D.

Those affidavits also included statements from experts concerning studies of persons exposed to tobacco smoke involuntarily and the effect of such exposure on those people, especially on those with allergies.

Editor: What other evidence did you need?

Mrs. Shimp: There were affidavits from experts in environmental health, such as Dr. Wilbert S. Aronow of the University of California and Dr. Susan M. Daum of the Mt. Sinai School of Medicine, New York City. There were also affidavits from experts in the field of smoking and health—people such as Dr. Luther Terry, who was U.S. Surgeon General when the first report, "Smoking and Health," was published, and also former U.S. Surgeon General Jesse L. Steinfeld. One important affidavit was from Dr. D. C. Bews, an occupational health expert and former medical director of Bell Canada.

Editor: Let's come up to the present. In your new office, do you still work as a service representative?

Mrs. Shimp with Professor Alfred W. Blumrosen of Rutgers University. Prof. Blumrosen had done the research for a case such as hers.

Mrs. Shimp: The job is the same. The telephone company policy states that employees should be flexible enough and the jobs standardized enough that they may be assigned to any office, as the work demands. We are often loaned to another office.

Editor: What happens when you are loaned to another office? Does the no-smoking order go with you?

Mrs. Shimp: The judge granted me the right to a smoke-free environment wherever I am assigned. This brought up some problems a short time ago. The company wanted to loan me to another office. They were going to put me in a little room where they said I'd be protected from smoke. I'd been there before, and it worked out all right, except when I went out into the main office or when someone came in with a cigarette.

Editor: Did you accept this temporary move?

Mrs. Shimp: I said I would work there if I had the same protection I had in my assigned office—but so far I have not been loaned.

Editor: Did the court decision also cover demotion to a lesser job? Can the company change your job status to

Mrs. Shimp worked for over a year digging up facts on matters such as the health hazards of smoking and also locating experts who could help her.

solve smoking conditions at work?

Mrs. Shimp: My job status cannot be changed. And my rate of pay can't be changed, either.

Editor: How is the matter working out for you now at work?

Mrs. Shimp: There's no smoking in the office. This means a 20-cent "No Smoking" sign, when you get right down to it. When my trial lawyer, Stuart B. Finifter of Atlantic City, N.J., asked the court to grant me the same protection that Bell gives to its equipment, I really got that protection.

Editor: Can the other employees smoke anywhere in the building where you work now?

Mrs. Shimp: The company has set up a smoking lounge in the basement, which can be used by smokers and any nonsmoking workers who choose to share it. Even though this may be in violation of the court order, I haven't complained as I do have the use of a separate lounge which is adjacent to the work area and rest room facilities . . . all within the "no smoking" part of the building.

Editor: How do you feel about smokers at work after your experience of getting ill from smoke and getting little cooperation from them?

Mrs. Shimp: I look upon them as people who happen to smoke. They don't have three heads. If I could have worked up a nice, healthy hatred for the people in my office who continued to smoke on the job, even though it was making me ill, my fight would have been easier. But I didn't feel that way then. Disappointed in them, maybe, but I didn't hate them.

Editor: How does the smoking lounge work out practically at work? Are the people in the office happy with the arrangement?

Mrs. Shimp: Because the company also grants extra "smoke breaks," this does create an extra burden for the nonsmoking workers, but things are working out fairly well. In some other offices, where there is a more impersonal relationship between employees, I could see this situation causing friction. Personally, I am so thankful to be able to work without being sick that I'm not going to complain at this point!

"There's now no smoking in the office where I work. The company grants extra 'smoke breaks', and this does cause an extra burden for nonsmoking workers. In some other offices, where there is a more impersonal relationship between employees, I could see this situation causing friction."

Editor: I understand that there are a number of people throughout the United States who, like you, get ill from tobacco smoke. The percentage is not high, but those people have a real problem. What would they have to do to win a court decision like yours, creating smoke-free working conditions for them?

Mrs. Shimp: I would recommend that they try talking with fellow employees, with the officials of the company, the union, and any local body that might assist them before they attempt to go the legal route. Sometimes you can solve the problem quite simply by turning up a fire regulation that stipulates no smoking in certain areas.

Editor: But suppose they fail, as you did, to get a regulation set up in their work place that prohibits smoking on the job. What then?

Mrs. Shimp: I suppose they would have to go essentially the same legal route that I did. They could benefit by my experience and save some steps.

Editor: Could they use the documents that you presented in court?

Mrs. Shimp: Yes, but they couldn't simply take the

documents, put a ribbon around them, and present them in court. However, I am advised that a lawyer could take the pleadings and rework them to fit his client and the laws of his state. Hundreds of letters have come in to me and to my lawyers requesting copies of these documents. We are putting all the material together in a handbook that will be available through the National Interagency Council on Smoking and Health in New York.

Editor: Could a lawyer cite your case as a precedent?

Mrs. Shimp: Yes. However, in order to cite that precedent, a lawyer would have to prove that his client had a medically proved allergy to cigarette smoke. A lawyer would have to obtain his own affidavits from the client's own doctor and specialists.

Editor: Would a lawyer have to obtain his own testimony from experts on smoking and health and from environmental experts as well?

"I agree that smoking is something that has been accepted, but times are changing. Before I learned the scientific facts about the matter, I used to be apologetic about asking people to stop smoking. But now, I think it's foolish to be apologetic about protecting your health."

Mrs. Shimp: That's a question for a lawyer, but as I understand it, that is true. However, the affidavits in my case could be used in several ways without obligating my expert witnesses to participate directly.

Editor: Looking back at the long and tortuous route that you trod, would you go through the same process again to obtain working conditions free from tobacco smoke?

Mrs. Shimp: Many people ask me that. I think I would because the matter is an important one. Time has dimmed some of the agony of the struggle, and I have learned how universal the problem is. I'm anything but alone in this situation. The volume of mail I receive attests to that!

Editor: Do you think that a person has much chance today of convincing people at work to quit smoking? Some people argue that smoking is such an entrenched social custom that it's difficult to change this habit in groups of people.

Mrs. Shimp: I agree that smoking is something that has been accepted, but times are changing. Before I learned scientific facts about the matter, I used to be apologetic about asking people to stop smoking. But now I think that it's foolish to be apologetic about protecting your health.

Editor: What about making people mad when you ask them to quit smoking?

Mrs. Shimp: You can ask them in a nice way to stop. You don't have to go around chopping people's heads off. However, I do think you have an obligation to be firm about it if you truly believe that cigarette smoking is harmful to your health.

Editor: Do you think that employees will comply if companies set up no-smoking regulations?

Mrs. Shimp: They will comply if the company rule is explained fairly and if it is enforced. A vigorous educational program is essential. I do think that some companies will have to provide smoking lounges for their employees if a good percentage of the employees smoke.

You have to remember that in retail merchandising, in heavy industry, and in places where people work on assembly lines, there almost invariably is a company rule against smoking, and people just accept it. Many millions of people don't smoke at work . . . and the number is growing. Every day I learn of small businesses and large companies that are taking measures to protect their nonsmoking employees.

Editor: Let me ask you this: If you had no specific allergy to tobacco smoke, would you go through the same battle to win your right to a smoke-free work place?

Mrs. Shimp: Knowing what I know now, I think I would. I have read most of the important scientific research on the effects of tobacco smoke on nonsmokers. In my opinion, and in many experts' opinion, there is good scientific evidence that smoking is harmful to nonsmokers.

Editor: What is your basic scientific concern about no smoking in the work place?

Mrs. Shimp: I am really concerned about the unexplored synergistic effect of the many toxic agents on our body systems in today's polluted environment. When "safe" levels have not been established, the only acceptable standard should be zero—especially when dealing with a nonessential toxic substance like tobacco smoke.

I won my battle because the harm to my system was immediate and could be documented. But I think all nonsmokers and agencies, such as the American Lung Association, that are working for environmental improvement should have the wholehearted support of the medical community in trying every means of attaining a smoke-free environment, especially at work.

DONNA M. SHIMP has been a service representative with the New Jersey Bell Company for 15 years. Before that, she was an assistant account executive with the investment firm, Merrill Lynch, Pierce, Fenner and Smith. Much of Mrs. Shimp's free time is now taken up in writing and consulting with unions and management concerning smoke-free work areas. She continues to receive letters about the court case.

LUCILLE FISHER is the editor of the ALA Bulletin.

SMITH v. WESTERN ELECTRIC COMPANY

Missouri Court of Appeals
Eastern Division

Decision reversing circuit court order which dismissed employee petition seeking injunction to prevent employer from exposing employee to tobacco smoke in workplace.

PAUL SMITH, Plaintiff-Appellant v. WESTERN ELECTRIC COMPANY, Defendant-Respondent, No. 44286, Sept. 14, 1982.

Morley Swingle, Cape Firardeau, Mo., for plaintiff-appellant.

Willam G. Ohlahausen, St. Louis, Mo., for defendant-respondent.

Before Dowd, Gunn, and Crandall, Judges.

PRIVATE SUIT

1. Working Conditions — Exposure to Tobacco Smoke — Employee's Allergic Reaction — Duty of Employer under State Law ►80.30

Employee's petition seeking to enjoin employer from exposing him to tobacco smoke in workplace and from altering his pay or employment conditions because of employee's allergic reaction to smoke states claim upon which relief can be granted under applicable state law, since it is well-settled in Missouri that employer owes duty to employee to use all reasonable care to provide reasonably safe workplace and to protect employee from avoidable perils; accordingly, order dismissing petition is reversed and case is remanded for further proceedings.

2. Employee Exposure to Tobacco Smoke — Allergic Reaction — State Court Jurisdiction over Claim ►80.30

Employee is not precluded by Occupational Safety and Health Act from seeking relief in state court in order to prevent employer from maintaining working conditions which expose employee to tobacco smoke and thus trigger his allergic reaction to smoke, because Act does not affect common law duty of employers regarding injuries, diseases or death of employees arising out of employment, and does not prevent state court from asserting jurisdiction over occupational safety and health issue for which no OSH Administration standards is in effect.

Full Text of Decision

DOWD, Judge:

Plaintiff appeals from an order dismissing his petition on the ground that it fails to state a claim upon which relief can be granted.

The petition seeks an injunction to prevent plaintiff's employer from exposing him to tobacco smoke in the workplace and from affecting his pay or employment conditions because of his medical reaction to tobacco smoke. The petition alleges that by allowing smoking in the work area, defendant permits its employees to be exposed to a health hazard and thereby breaches its duty to provide a safe place in which to work.

Plaintiff contends the trial court erred in dismissing his petition in that it invokes legal principles entitling him to relief and shows that injunctive relief is appropriate. Plaintiff further contends that federal law does not preempt state common law in this case.

In reviewing the dismissal of this petition for failure to state a claim, we grant the petition its broadest intendment and liberally construe its averments. *Paddock Forest Residents Ass'n v. Ladue Service Corp.*, 613 S.W.2d 474, 476 (Mo.App. 1981). We accept as true all factual allegations and their favorable inferences. *Nelson v. Wheeler Enterprises, Inc.*, 593 S.W.2d 646, 647 (Mo.App. 1980). If the averments thus viewed invoke principles of substantive law upon which relief can be granted to plaintiff, the petition is not subject to dismissal. *Paddock Forest Residents Ass'n*, 613 S.W.2d at 476. Any reasonable doubt with regard to the petition's sufficiency is resolved in favor of plaintiff. *Nelson*, 593 S.W.2d at 647.

The petition includes the following allegations. Plaintiff has been employed by defendant since 1950 and has worked in defendant's Missouri branch since 1967. He is a nonsmoker sharing an open office area with other employees, many of whom smoke tobacco products as they work. In 1975 plaintiff began to experience serious respiratory tract discomfort as a result of inhuling tobacco smoke in the workplace. A subsequent medical evaluation determined that plaintiff suffers a severe adverse reaction to tobacco smoke. His symptoms include sore throat, nausea, dizziness, headache, blackouts, loss of memory, difficulty in concentration, aches and pains in joints, sensitivity to noise and light, cold sweat, gagging, choking sensations, and lightheadedness. After a sufficient period

have become increasingly severe over the years, however. Doctors evaluating and treating plaintiff have advised him to avoid contact with tobacco smoke whenever possible.

The petition further alleges that plaintiff first complained to defendant about the tobacco smoke in the workplace in 1975. Defendant thereafter moved plaintiff to different locations within the plant, but no improvement resulted because each location contained significant amounts of tobacco smoke. In 1978 plaintiff was informed that he should no longer sumbit complaints about the smoke through defendant's anonymous complaint procedure since defendant would not process them. In response to recommendations of the National Institute for Occupational Safety and Health,[1] defendant adopted a smoking policy in April 1980. The declared policy was to protect the rights of both smokers and nonsmokers by providing accommodations for both groups and by making a reasonable effort to separate the groups in work areas. Because defendant has failed to implement its policy by making such a reasonable effort, improvement of the air in the workplace has not resulted.

According to the petition, in August 1980 plaintiff filed with defendant a Handicapped Declaration Statement that he was handicapped by his susceptibility to tobacco smoke. Refusing to segregate smokers or to limit smoking to non-work areas, defendant informed plaintiff he could either continue to work in the same location and wear a respirator or apply for a job in the computer room (where smoking is prohibited). The latter option would entail a pay decrease of about $500 per month. Defendant thereafter provided plaintiff with a respirator that has proven ineffective in protecting plaintiff from tobacco smoke.

The petition states that plaintiff has exhausted all avenues of relief through defendant; he has no adequate remedy at law; he is suffering and will continue to suffer irreparable physical injuries and financial losses unless defendant improves working conditions. The petition alleges that defendant is breaching its common law duty as an employer to provide plaintiff a safe place to work, and that defendant has available defendant's ability to protect its computer equipment from tobacco smoke. The petition further states that, although "second-hand smoke" is harmful to the health of all employees, defendant is permitting them to be exposed in the workplace to this health hazard which is neither related to nor a necessary by-product of defendant's business.

Construing these allegations favorably to plaintiff, we must determine whether they invoke principles of law entitling him to relief.

[1] It is well-settled in Missouri that an employer owes a duty to the employee to use all reasonable care to provide a reasonably safe workplace, *e.g., Todd v. Watson,* 501 S.W.2d 48, 50 (Mo. 1973); *Hightower v. Edwards,* 445 S.W.2d 273, 275 (Mo. banc 1969), and to protect the employee from avoidable perils. *Moles v. Kansas City Stock Yards Co. of Maine,* 434 S.W.2d 752, 755 (Mo.App. 1968). Whether the employer has fulfilled its duty depends upon the facts of each case. *Lathrop v. Rippee,* 432 S.W.2d 227, 231 (Mo. 1968). For example, in *McDaniel v. Kerr,* 258 S.W.2d 629 (Mo. banc 1953), the employer had failed to provide a safe workplace where the employee's inhalation of dust on the job caused damage requiring removal of his lung. In *DeMarco v. United States,* 204 F.Supp. 290 (E.D.N.Y. 1962), the court found a negligent failure to provide a safe working environment where the plaintiff was injured when he fainted and fell after complaining about gasoline fumes in an unventilated work area.

The allegations of the instant case, taken as true, show that the tobacco smoke of coworkers smoking in the work area is hazardous to the health of employees in general and plaintiff in particular. The allegations also show that defendant knows the tobacco smoke is harmful to plaintiff's health and that defendant has the authority, ability, and reasonable means to control smoking in areas requiring a smoke-free environment. Therefore, by failing to exercise its control and assume its responsibility to eliminate the hazardous condition caused by tobacco smoke, defendant has breached and is breaching its duty to provide a reasonably safe workplace. *See Shimp v. New Jersey Bell Telephone Co.,* 145 N.J. Super. 516, 368 A.2d 408(1976). As stated in *Thompson v. Kroeger,* 380 S.W.2d 339, 343-44 (Mo. 1964) (quoting *Gatzke v. Terminal Railroad Ass'n of St. Louis,* 321 S.W.2d 462, 466 (Mo. 1959)).

tions which a reasonably prudent employer would have taken in given circumstances, even though other employers may not have taken such commensurate precautions. What usually is done may be evidence of what ought to be done, but what ought to be done is fixed by a standard of reasonable prudence, whether it usually is complied with or not.

If plaintiff's petition establishes defendant's failure to provide a safe place for plaintiff to work, we must next consider whether injunctive relief would be an appropriate remedy. An injunction may issue "to prevent the doing of any legal wrong whatever, whenever in the opinion of the court an adequate remedy cannot be afforded by an action for damages." §526.030 RSMo 1978. Injunctive relief is unavailable unless irreparable harm is otherwise likely to result, *see City of Grandview v. Moore,* 481 S.W.2d 555, 558 (Mo.App. 1972), and plaintiff has no adequate remedy at law. *See State ex rel. Taylor v. Anderson,* 242 S.W.2d 66, 72 (Mo. 1951).

The petition alleges that plaintiff's continuing exposure to smoke in the workplace is increasingly deleterious to his health and is causing irreparable harm. Assuming the allegations and reasonable inferences therefrom to be true, we think it is fair to characterize deterioration of plaintiff's health as "irreparable" and as a harm for which money damages cannot adequately compensate. This is particularly true where the harm has not yet resulted in full-blown disease or injury. Money damages, even though inadequate, are the best possible remedy once physical damage is done, but they are certainly inadequate to compensate permanent injury which could have been prevented. Plaintiff should not be required to await the harm's fruition before he is entitled to seek an inadequate remedy. Moreover, the nature of plaintiff's unsafe work environment represents a recurrent risk of harm that would necessitate a multiplicity of lawsuits. Finally, the petition states that plaintiff has no adequate remedy at law and alleges facts indicating that prior to this action plaintiff unsuccessfully pursued relief, both through his employer's in-house channels and through administrative agencies. Viewing the petition favorably, as we must to determine its sufficiency, we find that injunction would be an appropriate remedy.

[2] Defendant contends the trial court lacks jurisdiction to provide relief, and therefore the petition fails to state a claim the subject matter of this case is p by the Occupational Safety and H (OSHA), 29 U.S.C. §§651-678 (1 Act specifically states, however, th not affect the common law regar juries, diseases, or death of emplo ing out of . . . employment." § The Act also declares that it does vent a state court from asserting tion over an occupational safety issue for which no OSHA standa fect. §667(a). We are unperso defendant's argument that §653(b only to the common law pert workers' compensation laws. In defendant has not directed our at any OSHA standard which would cover tobacco smoke. No such figured in the opinions of other co sidering OSHA and tobacco *Federal Employees for Non-S Rights v. United States,* 446 F.Sup OSHC 1407] (D.D.C. 1978), *aff* F.2d 310 [7 OSHC 1634] (D.C. Ci *denied,* 444 U.S. 926 (1979); *Shi* N.J. Super. 516, 368 A.2d 408. more, defendant conceded in oral a that a court may retain jurisdictio absence of an OSHA standard.

We conclude that plaintiff has claim upon which relief can be gra that the trial court therefore erro missing the petition. Plaintiff shou lowed the opportunity to pr allegations.

The judgment is reversed and r remanded.

BECHTEL POWER CORP TION

Review Commission Decisio

SECRETARY OF LABOR, Com v. BECHTEL POWER CORPOR Respondent, OSAHRC Docke 77-3222, Aug. 31, 1982.

Marshall H. Harris, U.S. Depart Labor, Philadelphia, Pa., for comp

Michael A. Floyd and James H San Francisco, Calif., for respondent

Review Commission Judge He Osterman.

Before Rowland, Chairman; Cle Cottine, Commissioners.

[1] The Occupational Safety and Health Act of 1970, 29 U.S.C. §§651-678, established the National Institute for Occupational Safety and Health, §671, to develop safety standards and implement sections 669 and 670 of the Act.

406 "G" Street P.O. Box 3056 DT Anchorage, Alaska 99510 (907) 272-2332

ALASKA LUNG ASSOCIATION, *Inc.*

Leo C. Kaye, *Executive Director*

Representative Charlie Bussell, Chairperson
House Judiciary Committee
Alaska State Legislature
Pouch V
Juneau, AK 99811

Dear Representative Bussell,

The Alaska Lung Association is indeed pleased to submit the enclosed portfolio containing documentation in support of House Bill 84.

I was impressed to find that the Anchorage Times published a report on the public hearings. A copy is enclosed.

Please contact Don Allan (564-1094) or my office, should you desire additional information or assistance.

Sincerely,

Leo C. Kaye
Executive Director
Alaska Lung Association

LCK/vk

Enclosures

cc: Don Allan, CLU

THE SMOKENDER®

Volume 1, Number 1 — Spring/Summer 1981

Wives Risk Lung Cancer From Husbands' Smoking

A recent 14-year study, performed at Tokyo's National Cancer Center Research Institute, found that nonsmoking wives of smoking husbands die of lung cancer at a rate double or more that of nonsmoking wives with nonsmoking husbands. The landmark study, published January 17, in the British Medical Journal, reports that the risk to nonsmoking wives was directly related to the amount of their husbands' smoking. These findings support mounting evidence that links "passive" or "second-hand" smoking with a variety of respiratory ailments.

The Japanese study, which followed 142,857 women and 122,261 men between 1965 and 1979, found that nonsmoking women who were regularly exposed to their husbands' smoking, showed risk levels ranging from ⅓ to ½ that of direct smoking. A total of 346 lung cancer deaths among women were reported during the 14 year survey, and 174 of these deaths were nonsmoking women married to smoking husbands.

Dr. Takeshi Hirayama, author of the study and chief epidemiologist at the National Cancer Research Institute in Tokyo, suggests the findings "appear to explain the long-standing riddle of why many women develop lung cancer although they themselves are nonsmokers".

The study found that the increased risk to women varied according to the amount of cigarettes smoked by the husband, and the living environment, urban or rural, also was a big factor.

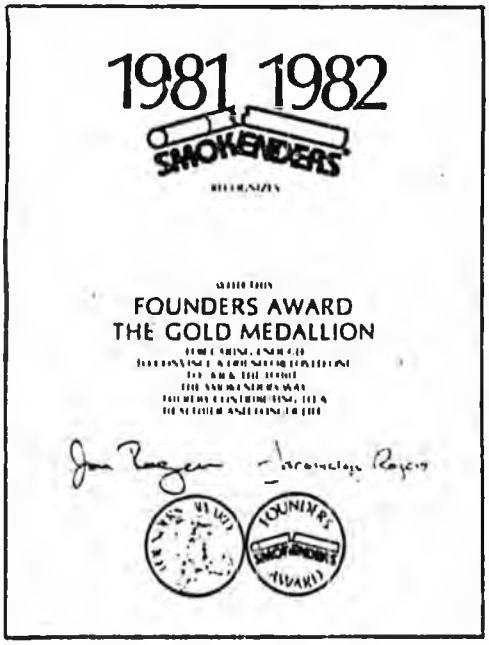
Women whose husbands smoked 20 or more cigarettes a day were 2.08 times more likely to develop lung cancer. If the husbands smoked 20 or less cigarettes a day, the risk was still 1.61 times higher than for wives of nonsmokers.

In agricultural areas where air pollution was not influencing the study's findings, a risk level 4.6 times higher was observed among nonsmoking wives of farm workers 40 to 59 years of age who smoked two or more packs of cigarettes each day.

The study was originally undertaken to determine the effects on health of a large number of factors, including drinking, occupation and marital status. Results indicate, however, that smok-

Continued on page 2

New Smokenders Founders Medals to be Awarded Yearly



Each year hundreds of Smokenders graduates recommend the Program to their friends and loved ones. And happily enough, most of these referrals sign-up, complete the course and join the growing ranks of nonsmokers.

We feel that graduates deserve official recognition for helping their friends quit smoking, so we've established a series of yearly awards to be given to the sponsors of new Smokenders graduates.

If, in the course of a year, you refer just one new person, and he or she completes the program, we'll award you a Bronze Smokenders Founders Medal and a special certificate highlighting your achievement. If you recommend as many as five new graduates, you'll receive a beautiful, sterling silver plated Founders Medal and certificate. And for referring ten new graduates, you'll receive a stunning 14K gold plated Founders Medal and a framed certificate of merit commemorating your truly outstanding contribution to good health.

SURGEON GENERAL REPORTS DANGERS OF LOW-TAR CIGARETTES

In *The Changing Cigarette*, a 237-page report issued by Surgeon General Dr. Julius B. Richmond, federal health officials summarize recent scientific findings on low-tar, low-nicotine cigarettes. In brief, the report states that milder brands may offer "limited" reduction in lung cancer risks, but there is little evidence to indicate that they reduce the risks of heart disease, bronchitis, emphysema, complications of pregnancy and other disorders related to smoking.

The report warns of new health hazards from chemical additives used in cigarettes to enhance lost flavor due to reduced levels of tar and nicotine. Additives currently in use include substances such as shellac, caramel, eugenal and chemicals which can produce carcinogens when burned.

Last year the tobacco industry supplied the surgeon general with a list of about 1,500 cigarette additives but no specific brand-levels or formulas have been released to date. Dr. Richmond is continuing negotiations with the industry to obtain precise additive formulations for each brand. However, under current law, cigarette companies do not have to release this information, and until then, adequate testing is not possible.

In a compromise move, the Surgeon General has proposed that a government guarantee could preserve the confidentiality of such information. This approach has worked successfully in Great Britain, and American companies doing business there have conformed. However, Secretary of Health and Human Services, Patricia Roberts, stated that new legislation may be required to secure the necessary information.

When asked to comment, a Tobacco Institute spokesman called the report "markedly candid and more moderate in tone" than prior

Continued on page 3

IN THIS ISSUE:

An Invitation To All Our Friends

Dear Graduate:

Saying "hello" to you that first meeting was a pleasure. You came to us to quit smoking, and we were anxious to get to know you and help you.

During the weeks that followed, we all grew closer. We talked together, laughed together, and worked together. Together we shared the same goals and the same attitudes towards smoking. We helped you develop the motivation and gave you the tools you needed to stop smoking, and you did.

With **The Smokender**, a free newsletter, we have a way to stay in touch with you and share ideas, personal experiences, current events, and other items of general interest.

We invite you to read it, respond to it, and help us make it as interesting as we can together. This is our way of saying hello again and we would love to hear from you.

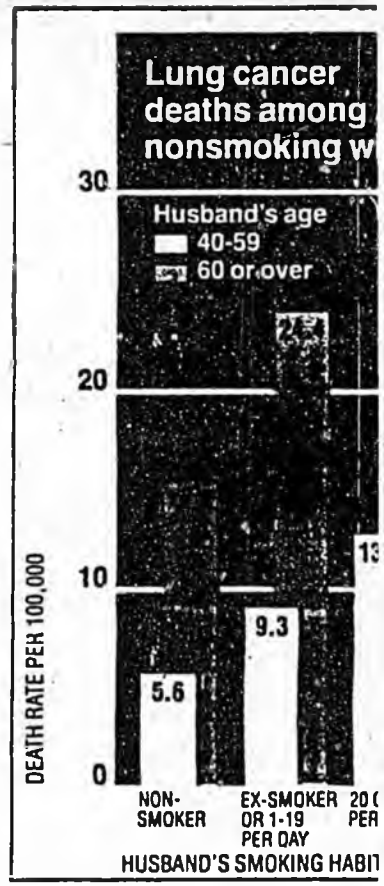
What would you like to see included in **The Smokender?** With your comments and contributions, we can make this the beginning of a long and lively new relationship.

Enjoy.

Sincerely,
THE SMOKENDERS STAFF

The Smokender is published by Smokenders World. Please address all submissions and inquiries to:

Managing Editor
The Smokender
50 Washington Street
Norwalk, CT 06856



Source: National Car Research Inst

Airlines must seat non-smokers

Non-smokers travelling on U.S. airlines are now protected by a special regulation of the Civil Aeronautics Board. The rule requires airlines to provide a seat in the non-smoking section for any passenger who requests it. This holds true even if the section must be enlarged to accommodate everyone.

Foreign airlines also have non-smoking sections, but they are under no obligation to expand their non-smoking section.

Wives Risk *Continued from page 1*

ing is the only habit of husbands to affect the deaths of wives. The findings are so statistically significant that it "was not the result of chance", Dr. Hirayama said.

Surprisingly, the husbands smoking *did not* affect the risk of death from other types of cancer or heart attacks.

A noted British physician, who did pioneering work linking cigarette smoking and lung cancer, described Dr. Hirayama's study as "scientifically sound." He also stated that the correlation between smoking husbands and deaths from lung cancer in nonsmoking wives was higher than he had expected.

"The implication", he said, "is that cigarette smoking poses a hazard to anybody in public rooms if they are not well ventilated."

GRADUATES WELCOME

Just a reminder that as a S enders graduate, you are a welcome to attend any of ou venient seminars if you wou to reinforce your non-sm habit. Whether you would l offer a personal testimonial, a friend, or just visit, we a ways glad to see you.

By the way, if you have back to smoking again (it ca pen), you can enroll anytin an additional eight-week se for just ½ the regular rate.

If you prefer, take advant our Summer Rejoin Sale. T will be only $125.00 if you before Labor Day. To get and locations of seminars you, please refer to the en schedule.

FACTS ABOUT NONSMOKERS

More than 30 million Americans have kicked the cigarette habit. Millions more are trying. Among adults, only one in three still smokes. In the population as a whole, it's one in four. Even counting cigar and pipe smokers, nonsmokers are a clear majority.

Nonsmokers are no longer a silent majority, though. They mind if you smoke. And they're speaking up. They see tobacco smoke as a pollutant that defiles their air. And new research gives them ammunition to defend themselves. It shows that second-hand smoke can have harmful effects on nonsmokers.

OPEN BURNING

Tobacco smoke is a very complex mixture. There are hundreds of chemical compounds in burning tobacco.

Some of the most hazardous compounds are tar, nicotine, carbon monoxide, cadmium, nitrogen dioxide, ammonia, benzene, formaldehyde, and hydrogen sulphide. And dozens of others. Any one alone can assault the body and cause trouble. Together, they make smoking the menace it is.

Even when a smoker inhales, researchers have calculated that two-thirds of the smoke from the burning cigarette goes into the environment. The percentage of pollution from cigar and pipe smoke is even higher.

SIDESTREAM SMOKE

Every time anyone lights a cigarette or cigar or pipe, tobacco smoke enters the atmosphere from two sources. Most important for nonsmokers, there is *sidestream* smoke, which goes directly into the air from the burning end. Then, there is *mainstream* smoke, which the smoker pulls through the mouthpiece when he or she inhales or puffs. Nonsmokers are also exposed to mainstream smoke after the smoker exhales it.

A cigarette smoker inhales—and exhales—mainstream smoke eight or nine times with each cigarette for a total of about 24 seconds. But the cigarette burns for 12 minutes and pollutes the air continuously with sidestream smoke. Smokers can keep cigars and pipes burning for a much longer time. The pollution lingers long after.

Sidestream smoke—the smoke from the burning end—has higher concentrations of noxious compounds than the mainstream smoke inhaled by the smoker. Some studies show there is *twice* as much tar and nicotine in sidestream smoke compared to mainstream. And *three* times as much of a compound called 3-4 benzpyrene, which is suspected as a cancer-causing agent. *Five* times as much carbon monoxide, which robs the blood of oxygen. And 50 times as much ammonia.

There is also evidence that there is even more cadmium in sidestream smoke than in mainstream. Cadmium is now under investigation as one of the compounds in cigarette smoke that damages the air sacs of the lungs and causes emphysema.

Before the nonsmoker inhales secondhand smoke, however, some of the high concentrations of hazardous substances are diluted in the ambient air. The smoker, on the other hand, inhales both firsthand and secondhand smoke.

CARBON MONOXIDE

Carbon monoxide is a colorless, odorless gas created by incomplete combustion. Car exhaust puts it in the air. So does tobacco smoke.

While it is difficult to measure the amount of tar or cadmium in someone's lungs or body, it is relatively easy to measure the levels of carbon monoxide in the blood.

When you inhale carbon monoxide, the gas bumps oxygen molecules out of your red blood cells and forms a new compound called carboxyhemoglobin. As the amount of this compound increases in your blood, the body becomes starved for oxygen.

One study shows that after only thirty minutes in a smoke-filled room the carbon monoxide level in the nonsmoker's blood increases as well as the blood pressure and heart beat.

HAZARDOUS LEVELS

What levels of carbon monoxide are hazardous? In industry, the maximum concentrations of carbon monoxide in the air cannot average out to more than 50 p.p.m. (parts per million); and efforts are now underway to reduce the maximum. The Federal Air Quality Standards for the *outside air* limit concentrations to an average of 9 p.p.m.

Given this as a baseline, how much carbon monoxide do cigarettes send into the air?

Researchers have found that smoking seven cigarettes in one hour—even in a ventilated room—created carbon monoxide levels of 20 p.p.m. In the seat next to the smoker, the level shot up to 90 p.p.m., almost twice the maximum set for industry. Smoking ten cigarettes in an enclosed car also produced carbon monoxide levels up to 90 p.p.m. The carbon monoxide level in the blood of nonsmokers and smokers in the car *doubled*.

When nonsmokers were exposed to these levels, the carbon monoxide level in their blood not only doubled within the first hour, *but doubled again during the second hour.*

When nonsmokers leave a smoky environment, it takes hours for the carbon monoxide to leave the body. Unlike oxygen which is breathed in and then out again in minutes, carbon monoxide in the blood lasts for hours. After three or four hours, half of the excess carbon monoxide is still in the bloodstream.

EFFECTS OF THE GAS

Some studies indicate that with these levels of carbon monoxide in the blood, people—including drivers—cannot distinguish relative brightness, lose some ability to judge time intervals, and take longer to respond to taillights. They also show impaired performance on some psychomotor tests. These levels of carbon monoxide in the blood create physiologic stress in heart disease patients. The resultant lack of oxygen can also add distress for people who already have lung disease.

Animals exposed to carbon monoxide (levels from 50 to 100 p.p.m.) continuously for weeks showed damage to heart and brain.

OTHER COMPOUNDS

Not enough research has been done on effects of other compounds in tobacco smoke. For example, hydrogen cyanide is a poison that attacks respiratory enzymes. It is not found in ordinary air pollution. But the concentration in cigarette smoke itself is 1600 p.p.m. Long-term exposure to levels above 10 p.p.m. is considered dangerous.

Nitrogen dioxide is an acutely irritating gas that can damage the lungs. Levels of 5 p.p.m. in the air are considered dangerous. Cigarette smoke contains 250 p.p.m.

ANIMAL RESEARCH

Some researchers have exposed mice to second-hand smoke over a period of one or two years. A significant number of mice developed severe bronchitis. Rabbits exposed to smoke from 20 cigarettes per day for two to five years developed emphysema.

Dogs exposed to cigarette smoke ten times per week for one year suffered a breakdown in lung tissues. Rats exposed to second-hand smoke for 45 minutes a day for two to six months showed twice as many lung tumors as did a control group.

The exact parallel between animal and human exposure in smoke-filled rooms is hard to determine at this stage of research. But some implications are serious indeed.

SMOKE AT THE WORKPLACE

A study of nonsmokers exposed to tobacco smoke at work for many years showed a dysfunction in the small airways of the lungs of the nonsmokers. It is not yet clear whether abnormalities in the small airways precede the kind of changes that characterize chronic lung disease like emphysema. But very frequently the beginning changes of chronic lung diseases start in the small airways.

EFFECTS ON CHILDREN

Babies and young children breathe more rapidly than adults. Because of this higher breathing rate, they inhale more air—and more pollution—in comparison to their total

body weight. Some studies show youngsters inhale two to three times as much of a pollutant per unit of body weight compared to adults. And this assault happens when young lungs are growing and developing.

One major study discovered that in their first year, babies of parents who smoke at home have a much higher incidence of lung disease, specifically bronchitis and pneumonia, than babies with nonsmoking parents.

A study of the lung function of children—aged five to nine—showed an adverse reaction in the small airways of children who had smoking parents compared with those whose parents were nonsmokers.

Parents who smoke at home can aggravate symptoms in some children with asthma and even trigger asthma episodes. Millions of people, adults as well as children, are sensitive to tobacco smoke and suffer smoke-caused asthma episodes. Parents should limit their smoking to separate rooms away from these children or, better yet, should quit smoking altogether.

Even among nonasthmatic children, a team of researchers found that respiratory illnesses happened twice as often to young children whose parents smoked at home compared to those with nonsmoking parents.

In a study of 441 nonsmokers divided into two groups—those with a history of allergies and those without—70 percent of *both* groups suffered from eye irritations caused by smoke. Even among the nonallergic groups, 30 percent developed headaches and nasal discomfort, while 25 percent experienced cough.

SECONDHAND SMOKE AND LUNG CANCER

Some studies have found an increased risk of lung cancer in nonsmoking wives married to men who smoke. Although the studies are too few as yet to conclude a definite association between secondhand smoke and lung cancer, the findings have raised concern. Since there are cancer-causing agents in cigarette smoke, it is not unreasonable to expect that inhaling these agents firsthand or secondhand could cause disease. Exposure to tobacco smoke may be similar to exposure to radiation: there are no safe levels.

TOBACCO SMELLS

Contamination and odors are immediately created by such elements in tobacco smoke as ammonia and pyridine. Pyridine is a strong irritant that is produced when nicotine burns. The presence of a minute amount in the air produces distinctly unpleasant odors.

The contamination is so intense that when someone smokes in an air-conditioned environment, the air-conditioning demands can jump as much as 600 percent to control odor.

Another intriguing finding from air-conditioning research is that the human body attracts tobacco smoke. Burning tobacco smoke creates a high electrical potential, whereas the water-filled human body has a low one. The smoke in a room gravitates and clings to people in much the same way as iron filings are drawn to a magnet.

And the odors linger on. Chemicals in tobacco smoke called aldehydes and ketones supply the penetrating smell, while the tars hold them to your skin and your clothes. But the smoker is not sensitive to the smell because of the destructive effects of smoke on the inner lining of his or her nose.

THE RIGHT TO BREATHE CLEAN AIR

Nonsmokers have the right to breathe clean air, free from harmful and irritating tobacco smoke. This right supersedes the right to smoke when the two conflict.

THE RIGHT TO SPEAK OUT

Nonsmokers have the right to express—firmly but politely—their adverse reactions to tobacco smoke. They have the right to voice their objections when smokers light up.

Nonsmokers have the right to act through legislative channels, social pressures or any other legitimate means—as individuals, or in groups—to prevent or discourage smokers from polluting the atmosphere and to seek the restriction of smoking in public places.

- Let family, friends, co-workers and strangers know you mind if they smoke.
- Put stickers, buttons, and signs in your home, car, and office. Request seating in nonsmoking sections when you travel.
- Support legislation to restrict smoking or set up smoke-free areas in public places.
- Ask your doctor and dentist to restrict smoking in their waiting rooms and to establish no-smoking regulations in all health care facilities, including hospitals.
- Propose no-smoking resolutions at organization meetings. Encourage hotels and restaurants to establish no-smoking areas.
- Contact your lung association to discuss ways to protect nonsmokers at work.

AMERICAN LUNG ASSOCIATION
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#0008 Published by AMERICAN LUNG ASSOCIATION 8/82

Second-Hand Smoke

Are you a nonsmoker who is shy about defending yourself against inconsiderate smokers?

Or are you a smoker who doesn't realize the distress you inflict on nonsmokers?

Find out the effects of tobacco smoke on nonsmokers.

Take A Look At The Facts

asbestos exposure. Case histories were studied for smoking and drinking habits and occupation. In 14 of 156 available chest X-rays typical PP were found; a significantly higher incidence than expected in the region ($p < 0.001$), but in agreement with earlier studies, which are reviewed. It is suggested that all patients with laryngeal carcinoma should be questioned about exposure to asbestos, and that in patients occupationally exposed to asbestos, the occurrence of laryngeal carcinoma should be considered an occupational disease. It is concluded that exposure to asbestos in association with smoking gives rise to a higher incidence of laryngeal carcinoma. (Auth. Abs. Mod.)

81-1088. Hirayama, T. Non-Smoking Wives of Heavy Smokers Have a Higher Risk of Lung Cancer: A Study From Japan. *British Medical Journal* 282: 183-185, January 17, 1981.

A Japanese study of 91,540 nonsmoking wives aged 40 and above who were followed up for 14 years (1966-79) is described. Standardized mortality rates for lung cancer were assessed according to the smoking habits of their husbands. Wives of heavy smokers were found to have a higher risk of developing lung cancer and a dose-response relationship was observed. The relationship between the husband's smoking and the wife's risk of developing lung cancer showed a similar pattern when analyzed by age and occupation of the husband. The risk was particularly great in agricultural families when the husbands were aged 40-59 at enrollment. The husbands' smoking habit did not affect their wives' risk of dying from other diseases such as stomach cancer, cervical cancer, and ischemic heart disease. The risk of developing emphysema and asthma seemed to be higher in nonsmoking wives of heavy smokers, but the effect was not statistically significant. The husbands' drinking habit seemed to have no effect on any causes of death in their wives, including lung cancer. These results indicate the possible importance of passive or indirect smoking as one of the causal factors of lung cancer. They also appear to explain the longstanding riddle of why many women develop lung cancer although they themselves are nonsmokers. These results also cast doubt on the practice of assessing the relative risk of developing lung cancer in smokers by comparing them with nonsmokers. (Auth. Abs.)

81-1089. Kunze, M.; Vutuc, C. Threshold of Tar Exposure: Analysis of Smoking History of Male Lung Cancer Cases and Controls. In: Gori, G. B.; Bock, F. G. (Editors). *Banbury Report 3. A Safe Cigarette?* New York, Cold Spring Harbor Laboratory, March 12, 1980, pp. 29-36.

In the study described, individual tar exposure was quantified for a lifetime of smoking to determine a threshold below which the smoker is at a "tolerable risk" for lung cancer. The exposure figure would represent the sum of all the tar yields of all the cigarettes ever smoked by an individual. Over 700 male lung cancer patients and over 1,500 controls, in three subject samples, were evaluated in terms of neoplasm incidence, smoking history, and total tar exposure. It was found that the average tar exposure in tumor patients is significantly higher than that of the controls. In general, higher tar exposures correlated with higher risks of various types of cancer. The threshold for tolerable risk was determined to be around 500 exposure units (based on the calculation method used). This would roughly equate to consumption of one pack per day of a low-tar brand (less than 15 mg) for 20 years.

81-1090. Langenbach, R.; Malick, L.; Nesnow, S. Rat Bladder Cell-Mediated Mutagenesis of Chinese Hamster V79 Cells and Metabolism of Benzo(*a*)pyrene. *Journal of the National Cancer Institute* 66(5): 913-917, May 1981.

Primary rat bladder epithelial cells were cocultivated with Chinese hamster V79 cells in the presence of carcinogens, and the induction of 6-thioguanine resistance in the V79 cells was used as a marker of cell-mediated mutagenesis. The carcinogens dimethylnitrosamine, 7,12-dimethylbenz(*a*)anthracene, and benzo(*a*)pyrene (BP) were mutagenic to V79 cells in the presence of bladder cells but not in their absence. Analysis of BP metabolites formed by bladder cells indicated that 7,8-dihydro 7,8-dihydroxybenzo(*a*)pyrene, 9,10-dihydro-9,10-dihydroxybenzo(*a*)pyrene, benzo(*a*)pyrene-3,6-quinone, and 9-hydroxybenzo(*a*)pyrene were the major organic-soluble metabolites formed. Glucuronide and sulfate conjugates of BP metabolites were also produced by bladder cells. Mutagenesis data from the rat bladder system and previous data from rat liver and lung cell-mediated mutagenesis systems indicate that the cell-mediated mutagenesis approach may provide a useful approach for studying the organotropic effect of chemical carcinogens. Furthermore, the finding that rat bladder epithelium can metabolize some carcinogens offers new possibilities for the mechanism of initiation of bladder cancer. (Auth. Abs.)

81-1091. Miller, A. B. Epidemiology and Etiology of Lung Cancer. In: Hansen, H. H.; Rorth, M. (Editors). *Lung Cancer 1980.* Amsterdam, Excerpta Medica, International Congress Series 525, 1980, pp. 9-26.

Epidemiologic evidence compiled by the International Union Against Cancer and the International Agency For Research on Cancer, from a number of cancer registries throughout the world, clearly identifies the carcinogenic risk factors associated with cigarette smoking. Incidence of lung cancer data in males and females, derived from these studies and standardized to world population, shows that the highest and lowest incidence for men in Liverpool, United Kingdom, and Ibadan, Nigeria, respectively. For females, Maori, New Zealand, and Ibadan, Nigeria, present the highest and lowest figures. These risks are compounded by other environmental factors, such as asbestos, radiation, and other forms of air pollution, which frequently confuse the smoking issue. One of the more recent studies sponsored by the Tobacco Research Council in the United Kingdom, involving a comparison of mortality between different areas in the north of England while taking into account differences in smoking incidence, confirmed the overwhelming importance of cigarette smoking as a risk factor. Therefore, a

major reduction of lung cancer incidence and mortality will occur only when there is a substantial shift in population exposure to smoking. In Canada, a reduction in smoking in males gives rise to cautious optimism; however, in females this trend is not yet apparent. Smoking bans in public places along with a gradual change in the public's tolerance to cigarette smoke forecast a major impact in most technologically advanced countries with a resultant reduction in both incidence and mortality from lung cancer in both sexes.

81–1092. Milti, L.; Massei, V.; Sanguinetti, C. M.; Forastieri, L.; Pomifazi, F.; Frascione, P.; Vennarucci, L. S. I Tumori Broncopolmonari. [Bronchiopulmonary Tumors.] *Minerva Medica* 70(3):.217-230, January 21, 1979, Italian.

An examination was made of 259 subjects, 242 males and 17 females, with primitive pulmonary carcinoma. Of the male group, 75 percent were smokers—most smoking between 11-30 cigarettes per day—and 19 were former smokers (11 of whom had quit for more than 5 years). Among the items taken into consideration were the symptoms, age of the subjects, year of diagnosis, clinical prognosis, and TNMP models. It is noted that bronchiopulmonary cancer rates have been on the rise during the past 10 years, and that this is probably connected to the increase in cigarette consumption.

81–1093. Ohmori, T.; Mori, H.; Rivenson, A. A Study of Tobacco Carcinogenesis XX. Mastocytoma Induction in Mice by Cigarette Smoke Particulates ("Cigarette Tar"). *American Journal of Pathology* 102(3): 381-387, March 1981.

A significant incidence of cutaneous mastocytomas was observed in female mice of CAF/J and ARS-HA (ICR) strains upon long-term application of cigarette smoke condensate suspensions ("tar"). The mastocytomas were not detected in control groups treated with acetone, benzo(*a*)pyrene (BaP), tetradecanoyl pherbol acetate (TPA), nor in mice treated once with an initiator dose of 75 mg 7, 12-dimethylbenz(*a*)anthracene (DMBA). The skin mastocytomas were constantly accompanied by diffuse dermal mast cell infiltration (DDMI), which was also seen in the tumor-free skin of the "tar"-treated mice. These results indicate that mastocytomas were induced by agents present in the cigarette smoke condensate. DDMI might be a precursor of mastocytomas. (Auth. Abs.)

81–1094. Reif, A. E. Effect of Cigarette Smoking on Susceptibility to Lung Cancer. *Oncology* 38: 76-85, 1981.

It has been suggested that genetic predisposition to lung cancer is a more important factor than cigarette smoking, and that, therefore, one may smoke. Recently, this thesis has been defended strongly, but this literature survey indicates that the genetic susceptibility for development of lung cancer varies between individuals. Therefore, to conclude from this that one may smoke would be valid only if there was a close relationship between the genetic tendency to smoke cigarettes and the genetic tendency to develop lung cancer. The evidence that such a relationship does not exist is overwhelming. It is, therefore, valid to conclude that the large excess of deaths from lung cancer in cigarette smokers as compared to nonsmokers is a direct consequence of smoking cigarettes. To illustrate the effect of cigarette smoking on susceptibility to lung cancer, the distribution of susceptibilities to lung cancer in cigarette smokers and in nonsmokers has been derived. The shape of the susceptibility distribution is determined by the effects of all environmental carcinogens (both known and unknown) to which the population has been exposed, as well as by differences in genetic susceptibility between members of the population. The method described has general application. (Auth. Abs.)

81–1095. Rivedal, E.; Sanner, T. Potentiating Effect of Cigarette Smoke Extract on Morphological Transformation of Hamster Embryo Cells by Benzo[*a*]pyrene. *Cancer Letters* 10(3): 191-198, September 1980.

Morphological transformation in the hamster embryo cell bioassay was used to study the possibility that carcinogenicity of benzo(*a*)pyrene (BP) is affected by cigarette smoke extract and whether smoke extract would promote transformations initiated by BP. The transformation frequency increases with increasing concentrations of BP and smoke extract. In experiments with a combined treatment of BP and smoke extract, the transformation rates were higher than expected for all concentrations from experiments with the compounds tested separately. The greatest potentiating effect was found using 0.01 µg/ml BP and 1 µg/ml smoke extract. The transformation frequency obtained with this combination was 4.3 percent compared to 1.4 percent and zero, respectively, for the individual substances. In experiments where cells were treated sequentially with BP (0.05 µg/ml) for 4 days, followed by smoke extract (1 or 5 µg/ml) for the next 4 days, the transformation frequency was significantly higher than expected on the basis of the compounds tested separately. The demonstration of a synergistic effect between BP and cigarette smoke and the promotion-like effect of smoke extract on BP-initiated transformations of hamster embryo cells are of interest in relation to the higher frequency of lung cancer found in areas with high air pollution compared to rural areas. (Auth. Abs.)

81–1096. Ruffie, P.; Hirsch, A.; Marteau, D.; Dignon, J.; Chretien, J. Etude Etiologique et Histologique de 448 Cancers du Poumon. [Etiological and Histological Study of 448 Cases of Lung Cancer.] *Annales de Medecine Interne* 132(1): 12-15, 1981, French.

Distribution of histological types of lung cancer and correlation of cell types with sex, smoking habit, and asbestos exposure were studied over an 8-year period in 425 male and 23 female patients in a French hospital. The mean age of the patients was 63.2 years. The epidermoid cancer type was the most frequent both in the male (77.6 percent of all lung

7

RODALE PRESS

MEMORANDUM

TO: All Rodale Press Employees

FROM: Bob Rodale

SUBJECT: A uniform no-smoking policy

For a number of years, smoking has not been permitted in some Rodale Press buildings, and in certain office areas. Yet smoking has been allowed in the majority of our work areas.

Because of this policy confusion and recent rise in complaints about smoking, I feel that it's time we work toward a uniform no-smoking policy. Here are the reasons. Most important, the non-smokers among us feel very strongly that they have a right not to breathe second-hand smoke, which can be as dangerous to health as first-hand smoke, if you get enough of it. There are complaints not only about possible harm to health, but about inability to concentrate as well. Also very important to us are the many questions asked by visitors, who often include customers. They ask why a health-oriented company like Rodale Press permits smoking in its offices.

After considerable discussion, we have decided that January 1, 1983 will be the time when a no-smoking policy will become uniform throughout all our buildings, including not only work areas but rest rooms and eating areas as well.

Between now and then, we will offer a variety of programs to help those people who want to quit smoking. This will include additional Smokenders programs, special classes to help ex-smokers prevent weight gain and get started on a fitness plan, and booklets, posters, and meetings designed to help smokers break their habit. Information about these activities will appear regularly in What's Going on Here.

I feel that this is one of the most important steps that can be taken to improve the environment that we all live a large part of our lives in. I have never smoked, so I can't see this issue from the vantage point of someone who does. I do know this action will cause inconvenience for some people. But I hope we can work together to solve any problems and create a climate that will make it possible for smokers who wish to stop to do so.

RR:mls
March 1, 1982

Rodale Press, Inc., 33 East Minor Street, Emmaus, PA 18049
215-967-5171 Telex 484231

GENERAL SERVICES ADMINISTRATION

Public Buildings Service

[41 CFR Part 101-20]

MANAGEMENT OF BUILDINGS AND GROUNDS

Smoking in GSA-Controlled Buildings and Facilities

AGENCY: Public Buildings Service, General Services Administration.

ACTION: Proposed rule.

SUMMARY: This regulation prohibits smoking in certain areas of buildings controlled by GSA. It has become necessary to regulate smoking in certain areas of Federal buildings because smoke in a confined area may be irritating and annoying to nonsmokers and may create a potential hazard to those suffering from heart and respiratory diseases or allergies. The intent of this regulation is to provide a reasonably smoke-free environment in certain areas for those working and visiting in GAS-controlled buildings.

DATE: Comments must be received on or before October 11, 1978.

ADDRESS: Comments should be addressed to the General Services Administration (PBOP), Washington, D.C. 20405.

FOR FURTHER INFORMATION CONTACT:

Mr. Donald Winegarden, Director, Operations Division, Office of Buildings Management, General Services Administration, Washington, D.C. 20405, 202-566-1563.

Subpart 101-20.1 Building Operations, Maintenance, Protection, and Alterations

Section 101-20.109-10 is revised to read as follows:

§ 101-20.109-10 Regulations of smoking.

Regulation for controlling smoking in GSA-controlled buildings and facilities are set forth below. Agencies are encouraged to develop additional guidelines for internal use and for taking appropriate administrative action when violations of these regulations occur.

(a) Smoking is prohibited in the following areas:

(1) *Auditoriums, classrooms, and conference rooms.* Buildings managers shall insure that signs and adequate receptacles for smoking refuse are placed outside the entrances to auditoriums, classrooms, and conference rooms.

(2) *Elevators.* "No smoking" signs shall be posted in elevators, and adequate receptacles shall be placed outside the entrances.

(3) *Shuttle vehicles.*

(4) *Hazardous areas.* Each agency shall post and enforce "no smoking" rules in any location under its jurisdiction which involves flammable liquids, flammable gases, or flammable vapors, or in all other locations where there is a collection of readily ignitible, combustible materials.

(b) Smoking is not permitted in libraries, except in those non-stack areas that are designated as "smoking" areas. These areas shall be established by the buildings manager in collaboration with the heads of the occupant agencies.

(c) An employee who occupies a private office is authorized to declare that office a "no smoking" area.

(d) "No smoking" areas shall be established in cafeterias. These areas shall be designated as "no smoking" areas by each building manager, in collaboration with the heads of the occupant agencies. The areas designated shall be based upon an estimate of the number of smoking and nonsmoking patrons served. This may be adjusted on the basis of local experience. The "no smoking" areas shall be identified by appropriate signs.

(e) The establishment of "no smoking" work areas in open space should be thoroughly investigated. Supervisors should plan work space in a manner so that employees who desire a "no smoking" area can be accommodated: *Provided,* That: (1) Efficiency of work units will not be impaired, (2) additional space will not be required, and (3) costly alterations to the space or procurement of additional office equipment will not be necessary. Agencies are responsible for insuring that "no smoking" areas are identified by appropriate signs. In establishing and continuing a smoking policy in work areas under their jurisdiction, supervisors should strive to maintain an equitable balance between the rights of nonsmokers and those of smokers.

(f) In medical care facilities such as medical clinics and health units, smoking is restricted to visitor waiting areas, staff lounges, private offices, and specially designated areas. Waiting areas shall be divided into areas designated as "smoking" and "no smoking" whenever possible.

(g) Agencies are responsible for providing adequate noncombustible ash trays or receptacles in locations where smoking is permitted.

(Sec. 205(c), 63 Stat. 390 (40 U.S.C. 486(c))

Dated: August 25, 1978.

JAMES B. SHEA, Jr.,
Commissioner,
Public Buildings Service.

(FR Doc. 78-25407 Filed 9-6-78; 11 03 am)

COPY

P.O. Box 803
Juneau, AK 99802
Feb. 10, 1983

TO: State Affairs, Resources & Judiciary Committees

Dear Committee Members:

We are both state office workers in the Department of Labor Building. The Air conditioning doesn't work and our superiors have repeatedly failed to address the problem of smoke in the air with reasonable accomodations to protect us from the effects of ambiant smoke inhalation. In the light of recent court decisions on the subject and in behalf of the approximately two thirds of state workers who don't smoke please consider your duty to your constituents and to the state workers and give your full support to passage of House Bill #84 "An Act Relating to Smoking in Public Places and Vehicles".

Thank you,
Roberta S Banko.
Dennis G. Andison
Roberta S. Banko
Dennis G. Andison

P.O. box 206
Douglas, Ak. 99824

2 - 8 - 83

State Affairs

C.C. Resources and Judiciary

I wish to convey my suport for House Bill No. 84. Tobacco smoke irritates my eyes, nose and throat. I resent having to restrict my activites to protect my health from others smoking

Sincerely,

Mark J. Miller

APPLECART

Feb. 14, 1983

TO: State affairs, Resources + Judiciary Committees

Dear Committee members,

I would appreciate your consideration of House Bill # 84 "an act Relating to Smoking in Public Places + Vehicles.

I am now in private business + do not allow smoking on the premises due to the fact that I quit working at the museum (Dept. of Ed.) to get away from smoke as I have a real allergy to cigarette smoke.

Sincerely,

Martha Stevens

Larry and Martha Stevens
515 N. Franklin Street
Juneau, Alaska 99801

(907) 586-3689

February 23, 1983

Thank you for permitting me to make this presentation in favor of the passage of HB-84.

The Judiciary Committee will be interested in learning of two recent court decisions relating to one aspect of the proposed law as contained in HB-84, that of protecting the non-smoking employee in the workplace:

1. In the first decision (Vickers v. Veteran's Administration, U.S. District Court, Seattle, WA, August 31, 1982), the plaintiff was found by the Court to be protected as a "handicapped person" by provisions of the Rehabilitation Act of 1973 (29 U.S.C. §794). The plaintiff, Mr. Vickers, is an employee hypersensitive to tobacco smoke who brought suit for relief from the smokey office atmosphere in which he worked.

   The importance of this decision is the formal declaration by the court of the inclusion of persons hypersensitive to ambient tobacco smoke under the federal law assisting handicapped persons in the workplace.

2. In the second case (Parodi v. Merit Systems Protection Board, 690 F. 2d 731 (1982)), another employee, also hypersensitive to the tobacco smoke in her place of work, had been advised by her physician to retire, since her allergy made it impossible to work in the smokey office to which she had been assigned. The Ninth Circuit Court of Appeals declared that the employee suffers from an "environmental limitation" and has the right to disability retirement benefits, unless her employer can place her in a "safe," "smoke-free" environment in which she can perform her duties.

   One important fact about this case is that it was decided by the second highest court in our country. Another is the declaration of the plaintiff as having "environmental limitations;" the law has previously only spoken to assisting workers having physical limitations, such as vision problems, those confined to wheelchairs, and so forth.

   To me, the most interesting possible effect of this court decision is as follows: I believe it was the 1964 U.S. Surgeon General's report on smoking which provided the statistic that approximately six percent of the American public is allergic to tobacco smoke. Assuming that the Alaska population follows this norm, it may be that, among employees working for the State of Alaska alone, six hundred (6% of approximately 10,000 state employees) may now be eligible for disability retirement benefits if they cannot be placed into work environments free of smoke. The economics behind such a statistic are very interesting.

Numerous corporations in the United States, taking the above judicial decisions into consideration, have solved the problem by simply taking a poll of employees, and based upon statements of employees regarding their desire to work in or out of a smokey area, have revised floorplans

and work areas, installed improved air circulation systems, smoke-eaters, and so forth.

I strongly urge this Judiciary Committee to recommend passage of HB-84 which will assist in a voluntary implementation of provision of safe working conditions for workers in Alaska. To assist you, copies of the above-referenced decisions are attached for your review.

Thank you.

Marilyn Norton

court adjudicate," *id.*, he or she is not identified, nor is he or she shown to have authorized the Foundation to represent him or her in making such a showing. They simply are not here.

B. *The Legislator Plaintiffs.*

[2] As we have seen, these plaintiffs sue only in their official capacities as members of the Legislature. They do not assert independent claims as individuals. Thus, their specific claims are confined to those under Article IV, Section 4, and the Fifth and Tenth Amendments. But those are claims of the State of California, and there is no allegation that the legislator plaintiffs represent, much less that they have been authorized to represent the house of the legislature of which they are members, the legislature itself, or the State.

For all that appears, the State may not desire to assert the constitutional claims that they make, either because it does not believe that the claims have merit, or for other reasons. In California, the Attorney General is, "[s]ubject to the powers and duties of the Governor, ... the chief law officer of the State." Cal.Const., Art. 5, § 13. He "has charge, as attorney, of all legal matters in which the State is interested ..." (Cal. Government Code § 12511), and "... shall ... prosecute or defend all causes to which the State ... is a party...." (*Id.*, § 12512). For whatever reason, he is not here.

In *Mountain States Legal Foundation, supra*, the state was before the court, arguing against the petitioners' claims. Here, it is not present at all. That fact, however, does not, by some alchemy, transfer the state's claims to the plaintiffs, just because the plaintiffs want to assert them. Here again, *Mountain States* is directly in point. *See* 630 F.2d at 769-771.

If we assume that the allegation that "plaintiffs" are injured by the ban on construction of major sources of pollution is intended to include the plaintiff legislators, it is still insufficient to give them standing. The injury involved, "economic stagnation," or "severe economic dislocation," may or may not in fact affect any of them, or any of the Foundation's members, supporters, or contributors. It is just the kind of claimed injury the assertion of which is an attempt at having the court adjudicate "'abstract questions of wide public significance' which amount to 'generalized grievances, pervasively shared and most appropriately addressed in the representative branches.'" *Valley Forge College, supra*, —— U.S. at ——, 102 S.Ct. at 760, *quoting Warth v. Seldin*, 1974, 422 U.S. 490, 499-500, 95 S.Ct. 2197, 2205, 45 L.Ed.2d 343.

In No. 81-4442, the judgment is affirmed. In No. 81-7060, the petition is dismissed.

Irene C. PARODI, Petitioner,

v.

MERIT SYSTEMS PROTECTION BOARD and Office of Personnel Management, Respondents.

No. 80-7671.

United States Court of Appeals, Ninth Circuit.

Argued Feb. 10, 1982.

Submitted April 13, 1982.

Decided Oct. 21, 1982.

Federal employee was denied disability retirement benefits by the Merit Systems Protection Board, and she appealed. The Court of Appeals, Pregerson, Circuit Judge, held that: (1) the Court of Appeals had appellate jurisdiction to review decision, and (2) employee established prima facie case for entitlement to benefits; however, proceeding would be remanded since record was unclear as to whether suitable employment in a safe environment was available.

Reversed and remanded.

1. United States ⇐39(15)

Judicial review of voluntary disability determinations is available where there has been a substantial departure from important procedural rights, misconstruction of governing legislation, or some like error going to heart of administrative determination. 5 U.S.C.A. § 8347(c).

2. United States ⇐39(15)

Disability benefits proceeding in which federal employee claimed that Merit Systems Protection Board misconstrued governing legislation by not finding her "totally disabled" despite her inability to perform her work in her assigned work site was subject to judicial review. 5 U.S.C.A. § 8347(c).

3. United States ⇐39(15)

Party seeking to prove disability meets initial burden of proof by showing that employee is unable, due to disease or injury to perform useful and efficient service in specific position occupied at time proceedings for voluntary or involuntary retirement are instituted by either federal employer or government. 5 U.S.C. (1976 Ed.) § 8331(6).

4. United States ⇐39(15)

Under statute pertaining to disability of federal employees, it is not required that person have serious or permanent physical problem to qualify for disability benefits; law only requires person be unable to perform useful and efficient service because of disease or injury on job last occupied. 5 U.S.C. (1976 Ed.) § 8331(6).

5. United States ⇐39(15)

Statute governing disability of federal employees does not require applicant to prove inability to perform useful service under all circumstances. 5 U.S.C. (1976 Ed.) § 8331(6).

6. United States ⇐39(15)

Once applicant for voluntary disability retirement benefits demonstrates inability to perform useful and efficient service in last job occupied, burden shifts to government to show that appropriate substitute position is available and if government satisfies that burden and offers claimant suitable position, claimant is no longer disabled within meaning of statute but if government cannot find suitable position or refuses to offer one, claimant is then entitled to disability benefits. 5 U.S.C. (1976 Ed.) § 8331(6).

7. United States ⇐39(15)

Federal employee established prima facie case of entitlement to disability retirement benefits due to her inability to continue working in a smoke-filled environment; however, record was unclear as to whether suitable employment in a safe environment was available necessitating remand for further proceedings. 5 U.S.C. (1976 Ed.) § 8331(6).

Paul M. Dubrasich, Browne & Kahn, San Francisco, Cal., for petitioner.

William Kanter, argued, Russell L. Caplan, William Kanter, Washington, D. C., on brief, for respondents.

Appeal from the Merit Systems Protection Board.

Before CHOY, PREGERSON, and POOLE, Circuit Judges.

PREGERSON, Circuit Judge:

Appellant Irene C. Parodi, a federal employee, was transferred to an office in which many other employees smoked. She began experiencing pulmonary difficulties. On her doctor's advice, she took a leave of absence from work. She then applied for employment disability benefits, claiming her reaction to cigarette smoke rendered her disabled. Doctors who examined her on behalf of the government found that she had not suffered physical damage. They did conclude, however, that her hypersensitivity to cigarette smoke prevented her from working in a smoke-filled environment. Appellee Office of Personnel Management (OPM) ruled that her medical condition did not render Parodi disabled within the meaning of the governing statute and denied disability benefits. Appellee Merit

Systems Protection Board (MSPB) affirmed the denial.

Parodi appeals, claiming that appellees, in denying her disability benefits, misconstrued the statutory meaning of "disability." Appellees answer that this court has no jurisdiction to review this case, or, if this court has jurisdiction, that Parodi was not disabled under the applicable statute.

We conclude that this court has appellate jurisdiction to review appellees' decision and that Parodi was disabled. Accordingly, we reverse and remand for further proceedings.

BACKGROUND

Parodi worked for the Defense Logistics Agency for nearly twelve years. In July 1977, the agency transferred her to a new workplace, located in a room occupied by sixty to seventy people, many of whom smoked.

Immediately after the transfer, Parodi began missing work due to pulmonary complications which included continual phlegm production, chest pains, congestion, and difficulty breathing and speaking. A pulmonary specialist, Dr. Donald Ho, diagnosed her as suffering from "asthmatic bronchitis with hyper-irritable airways," and concluded her condition stemmed from her reaction to cigarette smoke. Dr. Ho recommended she take leave from work. She did so and her symptoms subsided. Dr. Ho then recommended she not return to work in a smoke-filled environment. Parodi continued her absence from work and, shortly thereafter, on June 26, 1979, she filed for disability retirement benefits.

Two doctors examined Parodi on behalf of the OPM. Dr. Charles Bass did not perform any objective tests but reported that Parodi did not suffer any short or long term adverse physical effects. Dr. Bass acknowledged that his opinion could change if he saw Parodi's chest x-rays and that Parodi's problem could require "personnel and environmental control." Dr. Robert Fallat, in examining Parodi, exposed her to cigarette smoke and within four minutes she suffered acute pulmonary problems including airway irritation, an increase in airway resistance, and a reduction in peak-flow rates. Dr. Fallat concluded that Parodi was hypersensitive to cigarette smoke, and recommended she "not return to employment in the same office where she previously experienced significant symptomatology." Dr. Fallat also stated that requiring Parodi to work in her previous job would endanger her health.

The OPM reviewed the medical evidence and, on September 27, 1979, concluded that Parodi was not totally disabled "within the meaning and intent of the Civil Service Retirement Regulations." Parodi appealed to the MSPB.

In its decision, the MSPB acknowledged the doctors' recommendation that Parodi not return to work in a smoke-filled environment and that her superior officer believed that she could not do her job due to pulmonary problems. The MSPB also recognized that Parodi "might reasonably be concerned with the probable risk to her future health from working in an environment where exposure to cigarette smoke presents a hazard to all employees, and particularly to herself because of her peculiar physical sensitivity." Despite these findings, the MSPB concluded that Parodi was not totally disabled and affirmed the OPM decision.

JURISDICTION

Parodi requests that this court review the MSPB's denial of her disability retirement claim. Our review of this denial is governed by several statutes. At the time Parodi filed her claim, the employee retirement statute provided that "[a]n administrative action or order affecting the rights or interests of an individual or of the United States under this subchapter [5 U.S.C. §§ 8331 et seq.] may be appealed to the Merit Systems Protection Board." 5 U.S.C. § 8347(d). Another statute provided that persons could appeal decisions of the MSPB to the United States Court of Claims or the United States Court of Appeals. 5 U.S.C. §§ 7703(a)(1) and (b)(1). Under section 7703, courts must set aside agency actions found to be "(1) arbitrary, capricious, an

abuse of discretion, or otherwise not in accordance with law; (2) obtained without procedures required by law, rule or regulation having been followed; or (3) unsupported by substantial evidence." 5 U.S.C. 7703(c). The retirement statute, 5 U.S.C. §§ 8331–48, also provided, however, that "[t]he Office [of Personnel Management] shall determine questions of disability and dependency arising under this subchapter. The decisions of the Office concerning these matters are final and conclusive and not subject to review." 5 U.S.C. § 8347(c).[1]

The question before us is whether this court may review the MSPB's denial of Parodi's claim, and if so, what standard of review should be applied. Parodi argues that this court should review the MSPB decision pursuant to the standard of review set forth in section 7703(c). Appellees contend that section 8347(c), in mandating that OPM decisions concerning disability and dependency "are final and conclusive and not subject to review," bars any judicial review of Parodi's claim.

With one exception, discussed below, courts have rejected both these positions. Courts have recognized that the "conventional 'substantial evidence'" standard of review—which Parodi seeks to apply—does not apply to disability determinations because section 8347(c) places a "special and unusual restriction on judicial examination," *Scroggins v. United States*, 397 F.2d 295, 297, 298 (Ct.Cl.), *cert. denied*, 393 U.S. 952, 89 S.Ct. 37[illegible], 21 L.Ed.2d 363 (1968).[2]

Courts, have also rejected the contention that section 8347(c) bars all judicial review of OPM disability determinations. That section specifically limits its effect to questions of "disability and dependency." Thus, courts have interpreted section 8347(c) as barring judicial review only of the evidentiary basis of determinations concerning disability and dependency. *See Scroggins*, 397 F.2d at 298, 299. Courts, however, have allowed judicial review in disability cases "where there has been a substantial departure from important procedural rights, a misconstruction of the governing legislation, or some like error 'going to the heart of the administrative determination.'" *Scroggins*, 397 F.2d at 297, *quoting Gaines v. United States*, 158 Ct.Cl. 497, 502, *cert. denied*, 371 U.S. 936, 83 S.Ct. 309, 9 L.Ed.2d 271 (1962). *See also Polos v. United States*, 621 F.2d 385, 391 n.9 (Ct.Cl.1980); *Fancher v. United States*, 588 F.2d 803, 806 (Ct.Cl. 1978); *Allen v. United States*, 571 F.2d 14, 17 (Ct.Cl.1978); *McFarland v. United States*, 517 F.2d 938, 942–43 (Ct.Cl.1975), *cert. denied*, 423 U.S. 1049, 96 S.Ct. 776, 46 L.Ed.2d 638 (1976); *McGlasson v. United States*, 397 F.2d 303, 307 (Ct.Cl.1968); *Smith v. Dulles*, 236 F.2d 739, 742 (D.C.Cir.), *cert. denied*, 352 U.S. 955, 77 S.Ct. 329, 1 L.Ed.2d 244 (1956); *Matricciana v. Hampton*, 416 F.Supp. 288, 289 (D.Md.1976); *Cantrell v. United States*, 240 F.Supp. 851, 853 (W.D.S.C.1965), *aff'd*, 356 F.2d 915 (4th Cir. 1966).[3]

Thus, under this so-called *Scroggins* rule, courts treat section 8347(c) as limiting, rather than barring, judicial review otherwise provided by section 7703(c). While the *Scroggins* standard of judicial review and the standard of review provided by section 7703(c) are similar—both allow courts to

1. Congress amended section 8347(c) in 1980 to provide for judicial review under 5 U.S.C. § 7703(c) in involuntary disability retirement cases where the employee was found disabled on the basis of his or her mental condition. Pub.L.No.96-500, 94 Stat. 2696 (1980), (codified at 5 U.S.C. 8347(d) (1981)). As the statute went into effect January 1, 1981 and Parodi's claim did not involve an involuntary claim on the basis of her mental condition, the amendment does not control her case. The significance of the amendment is discussed *infra*.

2. The statute was amended since *Scroggins*. The change—substituting the OPM for the Civil Service Commission in subsection 8347(c) and the MSPB for the Civil Service Commission in subsection 8[illegible](d)—was a technical amendment and does not affect the *Scroggins* doctrine. *See Ch[illegible] v. Office of Personnel Management*, MSPB No. DA 831609003 (May 28, 1981), slip op. [illegible]

3. Congress did not explain the purpose of section 8347(c). *See Matricciana v. Hampton*, 416 F.Supp. 288, 289 n.1 (D.Md.1976). (After an exhaustive search, counsel was unable to come up with an explanation of the purpose of section 8347(c) in the legislative history.)

overturn decisions based upon improper procedures or misconstruction of the law—the *Scroggins* standard of review is narrower. Courts reviewing agency decisions under section 7703(c) overturn decisions not supported by substantial evidence whereas, courts reviewing decisions controlled by section 8347(c), as construed by *Scroggins*, may not reexamine the evidentiary basis for an agency's disability determination.

This construction of section 8347(c), which limits rather than bars judicial review, is consistent with the presumption favoring judicial review of agency actions. "Only upon a showing of 'clear and convincing evidence' of a contrary legislative intent should the courts restrict access to judicial review." *Abbott Laboratories v. Gardner*, 387 U.S. 136, 141, 87 S.Ct. 1507, 1511, 18 L.Ed.2d 681 (1967), cited in *Dunlop v. Bachowski*, 421 U.S. 560, 567, 95 S.Ct. 1851, 1857–58, 44 L.Ed.2d 377 (1975). The language of section 8347(c) does not provide clear and convincing evidence of a congressional intent to bar all judicial review of disability determinations. The statute only evinces a congressional intent to bar judicial review of factual questions concerning disability and dependency.[4]

The Eighth Circuit recently became the first court to reject the Court of Claims' *Scroggins* rule by holding that courts lack jurisdiction to review voluntary—i.e., employee-initiated—disability retirement decisions. *Morgan v. Office of Personnel Management*, 675 F.2d 196 (8th Cir. 1982). The *Morgan* court asserted that the 1980 amendment to the disability statute, Pub. L.No. 96–500, 94 Stat. 2696 (December 1980), indicates that Congress recognized that section 8347(c) mandates a total bar on judicial review of voluntary disability decisions. The 1980 amendment, however, made involuntary—i.e., agency-initiated—disability retirement determinations based on an employee's mental condition subject to judicial review pursuant to the provisions of 5 U.S.C. § 7703, rather than the narrower provisions of section 8347(c).

According to *Morgan:*

> this amendment expressly providing for judicial review under § 7703 would have been redundant if § 8347(c) had already provided for judicial review under § 7703. The 1980 amendments are specific. Had Congress intended to provide for judicial review of *all* disability determinations and not just agency-initiated involuntary disability retirement determinations based in whole or in part upon mental condition, Congress could have so provided.

Morgan, 675 F.2d at 200 (emphasis original).

We disagree with the *Morgan* analysis. The argument that the 1980 amendment would have been redundant if section 8347(c) had provided for judicial review under section 7703 is irrelevant for the simple reason that section 8347(c), as construed by *Scroggins*, does not provide for review under section 7703. Rather, as noted above, *Scroggins* teaches that section 8347(c) limits the review provided by section 7703(c). The 1980 amendment gave courts power to review the facts underlying an MSPB decision involving an involuntary disability determination based on mental condition—a power courts do not possess, under *Scroggins*, when reviewing a MSPB decision involving a voluntary disability application. Thus, there is no conflict or redundancy between *Scroggins'* interpretation of section 8347(c) and the 1980 amendment. The amendment, rather than duplicating *Scroggins*, expands judicial review beyond that provided for by *Scroggins* for involuntary disability retirement determinations based on mental condition.

The *Morgan* court also misread the legislative reports accompanying the 1980 amendment. *Morgan* contends that the re-

4. Had Congress wished to preclude judicial review of both factual and legal questions, Congress could have so provided. *See* 38 U.S.C. § 211(a) as it read prior to its 1970 amendment. ("[D]ecisions of the Administrator on any question of law or fact concerning a claim for benefits or payments under any law administered by the Veterans' Administration shall be final and conclusive and no other official or any court of the United States shall have power or jurisdiction to review any such decision.")

ports refer to a bar on *all* judicial review. The House Report, however, in discussing the problem Congress intended the amendment to remedy, pointed to three cases that did not allow "judicial review" to show that the amendment was necessary. H.Rep.No. 1080, 96th Cong., 2d Sess. 4 (1980). All three cases—*Scroggins v. United States*, 397 F.2d 295 (Ct.Cl.), *cert. denied*, 393 U.S. 952, 89 S.Ct. 376, 21 L.Ed.2d 263 (1968), *McGlasson v. United States*, 397 F.2d 303 (Ct.Cl.1968), and *McFarland v. United States*, 517 F.2d 938 (Ct.Cl.1975)—held that under section 8347(c), courts could not review the factual findings that underlie an agency's disability and dependency determinations, but that limited judicial review, i.e., review under the *Scroggins* rule, is appropriate. Thus, the bar on judicial review referred to by the reports precludes only judicial review of factual findings.

The legislative history of the 1980 amendment also indicates that Congress amended the statute based, in part, on the OPM's representation that section 8347(c) already allowed limited judicial review of all disability proceedings. As *Morgan* notes, Congress passed the 1980 amendment to prevent involuntary disability retirement proceedings from being misused to force employees out of active service for reasons of mental competency. *Morgan*, 675 F.2d at 200. *See also* S.Rep.No.1004, 96th Cong., 2d Sess. 2, *reprinted in* 1980 Code Cong. & Ad.News 5986, 5987. At the time the initial House version of the amendment was passed, the OPM objected that the proposed standard of judicial review—*de novo* review of the evidence—was too broad. *See* letter of Alan K. Campbell, Director, OPM, May 14, 1980, H.R. 96-1080, at 8. The OPM, however, did not argue that judicial review was not otherwise available. In fact, the OPM took a position opposed to that which it now takes before this court by admitting that judicial review exists for all disability retirement decisions and that the *Scroggins* rule was appropriate for reviewing voluntary disability determinations. The Director of the OPM wrote Congress:

> We believe it is reasonable and proper to restrict *expanded* judicial review to involuntary disability retirements. An employee who voluntarily applies for disability retirement seeks to establish title to a benefit granted by law; the Office of Personnel Management is the administrative agency charged under the law with the managerial function of adjudicating disability retirement claims. *It is appropriate, therefore, that OPM decisions on voluntary applications be conclusive, reviewable only to determine whether there has been a substantial procedural error, a misconstruction of governing legislation, or some like error going to the heart of the administrative determination.*

H.R. 96-1080 at 8 (emphasis added).[5]

Thus, we disagree with the Eighth Circuit's conclusion that the 1980 amendment indicates that section 8347(c) forecloses all judicial review.[6] Rather, the history and language of the 1980 amendment indicate Congress merely wished to expand judicial review for involuntary disability retirement determinations based on an employee's mental condition, not that Congress believed the law barred all judicial review of disability determinations.

[1] Therefore, we decline to follow the *Morgan* decision and agree with the prior consistent judicial opinions that section 8347(c) does not bar all judicial review.[7]

5. A similar letter accompanies S.R. 96-1004, but is not reprinted in the Congressional & Administrative News. The letter may be found in the 1980 Senate Reports, on microfilm in the Library of the United States Court of Appeals for the Ninth Circuit.

6. "Although we look to the reasoning of other circuits and district courts for guidance, we are bound only by decisions rendered in this circuit." *Gunther v. County of Washington*, 623 F.2d 1303, 1319 (9th Cir. 1979), *aff'd*, 452 U.S. 161, 101 S.Ct. 2242, 68 L.Ed.2d 751 (1981).

7. Appellees also assert that the Supreme Court's decision in *United States v. Erika, Inc.*, —— U.S. ——, 102 S.Ct. 1650, 72 L.Ed.2d 12 (1982), precludes judicial review of voluntary disability decisions.

Erika addressed the question whether the Court of Claims has jurisdiction to review determinations by private insurance carriers of

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We adopt the *Scroggins* rule and hold that judicial review of voluntary disability determinations is available where there has been a substantial departure from important procedural rights, a misconstruction of the governing legislation, or some like error going to the heart of the administrative determination.

[2] Here, Parodi claims the agency misconstrued the governing legislation by not finding her "totally disabled" despite her inability to perform her work in her assigned worksite. This case, therefore, falls squarely within the *Scroggins* doctrine and is subject to judicial review.

DISABILITY

The parties do not dispute the essential facts of this case: Parodi worked in an environment containing cigarette smoke; due to her hypersensitivity to cigarette smoke, she could not work at her assigned worksite; further employment at her worksite would subject her to risk of permanent lung impairment; but she could work in an environment containing less cigarette smoke. Given these facts, the issue here is whether the OPM and MSPB erred in finding that Parodi was not "totally disabled."

[3] Under the governing legislation a person is totally disabled if unable to perform "useful and efficient service in the grade or class of position last occupied by the employee or Member because of disease or injury not due to vicious habits, intemperance, or willful misconduct on his part within five years before becoming so disabled." 5 U.S.C. § 8331(6).[8] Under this statute, the party seeking to prove disability meets its initial burden of proof by showing that the employee is unable, due to disease or injury, to perform useful and efficient service in the specific position occupied at the time proceedings for voluntary or involuntary retirement are instituted by either the employee or the government. *See Cerrano v. Fleishman*, 339 F.2d 929, 931 (2nd Cir. 1964), *cert. denied*, 382 U.S. 855, 86 S.Ct. 106, 15 L.Ed.2d 93 (1965).

Appellees do not dispute that Parodi, because of her disease,[9] is unable to perform the specific position she last occupied. Rather, appellees contend that Parodi is not disabled because she does not suffer any permanent or serious impairment, and because she would be able to work in an area with less cigarette smoke.[10]

the amounts of benefits payable under Part B of the Medicare Statute. Part A of the Medicare statute covers institutional health care costs such as hospital expenses. Part B provides supplemental benefits for certain medical expenses excluded from the Part A program. The Court held that the Court of Claims has no jurisdiction over Part B determinations.
Erika is not applicable to the instant case. While *Erika* dealt with the question of judicial review, the Court did not provide any general guidelines for determining whether a statute precludes judicial review. In fact, the Court specifically noted that judicial review was only foreclosed "[i]n the context of the [Medicare] statute's precisely drawn provisions." *Id.* 102 S.Ct. at 1654. The Medicare provisions are different from the retirement disability provisions at issue in this case. Further the Court noted that the Medicare statute's legislative history provides clear evidence of Congress' intent to limit judicial review of Part B decisions. *Id.* 102 S.Ct. at 1654–55. Appellees cannot point to any similar history for section 8347(c).

8. This definition was replaced in 1980. Act of Dec. 5, 1980, Pub.L.No.96–499, Title IV, § 403(b), 94 Stat. 2606. The new definition of disability provides in part:

> Any employee shall be considered to be disabled only if the employee is found by the Office of Personnel Management to be unable, because of disease or injury, to render useful and efficient service in the employee's position and is not qualified for reassignment, under procedures prescribed by the Office, to a vacant position which is in the agency at the same grade or level and in which the employee would be able to render useful and efficient service.

Id. § 403(a) (codified at 5 U.S.C. § 8337(a) (1981)). The new definition of "disabled" is not applicable to the present case because the amendments were not effective until 90 days after the effective date of the act, December 5, 1980. *Id.* § 403(c).

9. Parodi's disease is asthmatic bronchitis with hyper-irritable airways disease. Appellees do not assert her disease was caused by vicious habits, intemperance, or willful misconduct.

10. Parodi contends she would be unable to work in a location containing *any* cigarette

[4] Both contentions suffer the same flaw—they impose on claimants seeking disability benefits certain requirements beyond those imposed by section 8331(6). As to appellees' first contention, section 8331(6) does not require that a person have a serious or permanent physical problem to qualify for disability benefits.[11] The law only requires the person be unable to perform useful and efficient service, because of a disease or injury, in the job last occupied.

[5] Appellees' second contention—that Parodi is physically able to perform her job—is also irrelevant. Section 8331(6) does not require an applicant to prove an inability to perform useful service under all circumstances. While Parodi could perform her previously assigned job in an area with less smoke, as stated above, all she must show under section 8331(6) is an inability, due to an injury or disease, to perform the job she occupied at the time she applied for disability benefits. *Cerrano*, 339 F.2d at 931. She has done so.[12]

While Parodi's condition presents a prima facie case for disability benefits, we recognize that her claim is unusual. Most disability claims involve a physical or mental limitation that prevents a claimant from performing his or her job. Parodi has an environmental limitation. Unlike a person with a physical limitation, a person with an environmental limitation can physically perform the assigned work in a proper environment. Here, Parodi could perform the work assigned to her if she were placed in a smoke-free environment. Parodi cannot, however, perform her job due to its location in a smoke-filled office. She is as disabled for her job at her assigned worksite as she would be had she actually suffered permanent and severe chronic bronchitis or another physically disabling disease. She cannot perform her job, not due to choice or bad habits, but due to a disease which limits the environment in which she can work.

Section 8331(6) does not exclude environmental limitations from forming the basis of an employee's disability. Appellees have not cited any authority or justification for precluding victims of environmental limita-

smoke. The question whether she could work in a location containing less cigarette smoke or whether she requires total isolation from cigarette smoke is not relevant here as the government did not offer Parodi employment in any location containing less smoke than at her previous place of employment.

11. Section 8331(6) makes no reference to "severity" or "seriousness" of the injury or disease. Had Congress intended "seriousness" to be a prerequisite to recovering benefits, it could have explicitly required a showing of seriousness. The federal disability insurance benefits statute, for example, defines disability as:

> (i)nability to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment which can be expected to result in death or which has lasted or can be expected to last for a continuous period of not less than twelve months.

42 U.S.C. § 423(d)(1)(A). This definition requires the claimant to prove a serious medical problem before receiving benefits. No such requirement exists under section 8331(6). Further, disability does not always involve a physical impairment. For example, in *Globe Union, Inc. v. Baker*, 310 A.2d 883 (Del.Super. 1973), *aff'd*, 317 A.2d 26 (Del.1974), the claimants worked in an environment of high lead concentration. When the lead level in their blood reached a certain point, they were transferred to less remunerative jobs in lead-free environments. They applied for and received partial disability benefits. The employer appealed claiming that disability requires physical incapacity as well as loss of wages. The court rejected this argument and affirmed the award. While this case involved the Delaware workers' compensation statute, the principle that a finding of disability does not require a physical impairment applies to this case.

12. Under similar disability statutes, courts have held that one's ability physically to perform a job does not necessarily render the person ineligible to receive disability benefits. For example, in *Diamond M. Drilling Co. v. Marshall*, 577 F.2d 1003 (5th Cir. 1978), the claimant suffered a heart attack on the job and filed for benefits under the Longshoreman's Compensation Act. The Benefits Review Board found him totally disabled. The employer appealed. The court, in affirming the award, noted that one can be disabled "when physically capable of performing certain work but otherwise unable to secure that particular kind of work." 577 F.2d at 1006.

tions from receiving disability benefits.[13] As noted above, to qualify for disability benefits applicants must demonstrate an inability, due to a disease or injury, to perform useful and efficient service at the last job occupied. The nature of the disease or injury, unless it involves vicious habits, intemperance, or willful misconduct, is irrelevant.

In sum, Parodi's lack of a serious or permanent medical incapacity and her ability to perform her job in another location are immaterial to the primary question concerning disability—whether she could perform the job she last occupied. She could not.

The finding that she could not perform the job she last occupied, however, does not conclusively decide this case. Under the facts presented here, Parodi would not be disabled if the government offered her suitable employment—employment at the same grade or position in a location appropriate for Parodi's physical condition—because if such employment were offered, Parodi would be able to perform useful and efficient service. We must decide who carries the burden of proving whether suitable employment is available to Parodi.

The only case discussing this issue is *Cerrano v. Fleishman*, 339 F.2d at 926. There, the Bureau of Customs involuntarily retired Cerrano. The administrative board found Cerrano disabled for "useful and efficient service" in his position. He claimed he was not disabled for service in other positions in the same grade or class. The Second Circuit held that the Civil Service Commission, before involuntarily retiring someone, need not "search the entire galaxy of Civil Service jobs, either in the same grade or the same class, to determine whether or not there was some such position between Alaska and Florida or Hawaii and Maine, which the appellant, in spite of his disability, could fill." *Id.* at 931. The court also suggested that an *employee* applying for voluntary disability benefits would not have to prove "he was unable to perform any of the jobs which for administrative convenience are put in the same grade or class and in which, at the time, there might be an opening." *Id.*

[6, 7] We agree that an employee should not have to prove the availability of an appropriate job. The government is in a better position than the claimant to provide evidence of the availability of suitable employment, particularly the availability of employment in a safe environment. Therefore, we hold that once an applicant for voluntary disability retirement benefits demonstrates an inability to perform useful and efficient service in the last job occupied, the burden shifts to the government to show that an appropriate substitute position is available.[14] If the government satisfies this burden and offers the claimant a suitable position, the claimant is no longer disabled within the meaning of section 8331(6). If, however, the government cannot find a suitable position or refuses to offer one, the claimant is then entitled to disability benefits. In the instant case, Parodi is willing and able to work if a position in the same grade or class located

13. Analogous areas of law provide that persons suffering from environmental limitations (generally referred to as non-exertional limitations) may be considered disabled. Social Security, for example, provides disability benefits where environmental restrictions result in an "inability to tolerate some physical feature(s) of work settings that occur in certain industries or types of work." 20 C.F.R. Subpart P, App. 2, Rule 2000.00(e). *See also Gagnon v. Secretary of Health, Education, and Welfare*, 666 F.2d 662 (1st Cir. 1981). Workers' Compensation cases have also recognized environmental limitations as disabling. *See generally* 2 A. Larson, *The Law of Workmen's Compensation*, § 57.61, (1981).

14. This test is similar to that employed in determining Social Security disability. When applying for Social Security disability, a claimant carries the initial burden of establishing that he is unable to perform his previous work. Once the claimant has made such a showing, the burden shifts to the Secretary of HEW to establish that there is other substantial gainful employment which the claimant can perform. *Hall v. Secretary of HEW*, 602 F.2d 1372, 1375 (9th Cir. 1979). The test we adopt is also similar to the test employed in connection with the Longshoremen's Compensation Act. *See Bumble Bee Seafoods v. Director, Office of Workers' Compensation Programs*, 629 F.2d 1327 (9th Cir. 1980).

in a safe environment is available. Therefore, unless Parodi's environmental limitation is accommodated within 60 days by an offer of suitable employment in a safe environment,[15] Parodi is eligible for disability benefits. For good cause shown to the district court, this period could be extended.

The record is not clear whether suitable employment in a safe environment is available. If it is, and if the government does not offer Parodi such employment, she is eligible for disability retirement benefits in an amount to be determined through regular proceedings.

This panel will retain jurisdiction over further proceedings in this appeal if any are necessary subsequent to remand.

REVERSED and REMANDED for further proceedings in accordance with the foregoing opinion.

Milton VENTURA, Plaintiff-Appellant,

v.

Hoyt C. CUPP, Superintendent, Oregon State Penitentiary, Defendant-Appellee.

No. 81-3598.

United States Court of Appeals, Ninth Circuit.

Argued and Submitted Aug. 5, 1982.

Decided Oct. 21, 1982.

Petitioner appealed from an order of the United States District Court for the District of Oregon, Robert C. Belloni, J., denying a petition for habeas corpus. The Court of Appeals held that although the failure to exhaust state remedies was suggested by the record, it was not possible to determine whether the failure to exhaust was properly excused in whole or in part or whether any state remedy still existed, and therefore, appeal from denial of petition for habeas corpus would be dismissed and cause would be remanded for determination of whether any state remedies remained available to petitioner, whether any previously available state remedies were not exhausted, and whether failure to have employed available state remedies was either a deliberate bypass or a situation in which there was no cause of the failure to have employed state remedies.

Dismissed and remanded.

1. Habeas Corpus ⇐45.3(1)

Requirement of exhaustion of state remedies may not be waived by state unless the interest of justice so requires.

2. Habeas Corpus ⇐113(13)

Although the failure to exhaust state remedies was suggested by the record, it was not possible to determine whether the failure to exhaust was properly excused in whole or in part or whether any state remedy still existed, and therefore, appeal from denial of petition for habeas corpus would be dismissed and the cause would be remanded for a determination of whether any state remedies remained available to petitioner, whether any previously available state remedies were not exhausted, and whether failure to have employed available state remedies was either a deliberate bypass or a situation in which there was no cause of the failure to have employed state remedies.

Hollis K. McMilan, Eugene, Or., for plaintiff-appellant.

Virginia L. Linder, Asst. Atty. Gen., Salem, Or., for defendant-appellee.

Appeal from the United States District Court for the District of Oregon.

15. In this case, the government could simply remove the environmental barriers or offer Parodi a job in an area containing less smoke.

Feb. 14, 1983

To: The Honorable Sponsors of HB No. 84

I would like to see passage of the above---especially as related to the "close work area". Many workers are exposed, to "smokers," who have allergy/respiratory problems and should be allowed to have a smoke-free work place.

Thank you.

Pat Ellsworth RN
Health Unit, Fed. Bldg.
Bx 378
Juneau, Alaska 99802

February 14, 1983

Dear Hearing Officer,

I support House Bill No. 84, which if enacted would prohibit smoking in public places and work area. As a nonsmoker, I am concerned about the injurious effects of secondary smoke to my health.

I believe my desire for a smoke free environment can be achieved, and that smokers may continue to smoke, by providing for designated smoking areas and segregating work areas into smoking and nonsmoking areas.

I am also concerned that the tobacco industry, by spending large amounts of money, may sway the apparent consensus of the group presenting testimony.

I hope that you will seek information from the interested public beyond the short sighted profit motive of the tobacco companies.

Sincerely,

Eugene E. Miller

Eugene E. Miller
17040 Glacier Highway
Juneau, AK 99801

cc: Representative Mike Miller
Representative Jum Duncan
Senator Bill Ray

BARTLETT MEMORIAL HOSPITAL

P. O. BOX 3-3000 • JUNEAU, ALASKA 99801 • TELEPHONE (907) 586-2611
MILE 3 — GLACIER HIGHWAY

February 11, 1983

HOUSE BILL 84 "SMOKING IN PUBLIC PLACES"

Traditionally, smokers have enjoyed the freedom to smoke when and where they choose. In recent years, research has shown that second hand smoke can have harmful effects on non-smokers. Non-smokers are no longer a silent majority, they mind if you smoke and are speaking up.

Tobacco smoke contains hazardous compounds; tar, nicotine, carbon monoxide, cadmium, nitrogen dioxide, ammonia, benzene, formaldehyde and hydrogen sulfide. Two-thirds of the smoke from the burning cigarette goes into the environment. The smoke from the burning end of the cigarette has the highest concentration of these pollutents.

Being in a room with smokers can significantly increase the carbon-monoxide levels in non-smokers. The half-life of carbon-monoxide is over 5 hours and with prolonged repeated exposure a non-smoker may have a carbon-monoxide level as high as someone that smokes. This carbon-monoxide has a higher affinity for hemoglobin in the blood than does oxygen and causes a decrease in the ability of the blood to transport oxygen thru out the body. This can lead to impaired performance and physiological stress to vital organs.

Persons exposed to second hand smoke experience an increase in the likelyhood of developing; broncitis, emphysema, lung cancer and persons with existing lung disease such as asthma who are sensitive to tobacco smoke are compromised.

Nonsmokers have the right to breath clean air, free from harmful and irritating tobacco smoke. I support House Bill 84 and encourage the legislature to take action on their behalf.

Sincerely,

Gary Dunne RRT

Gary Dunne RRT

COPY

To: All Members of the State Affairs, Resources & Judiciary Committee

From: Anna von Reitz, State Employee, Alaska Voter

Dear Committee Members,

I urge you to support and pass the proposed House Bill 84, "An Act Relating to Smoking in Public Places and Vehicles." The health hazards of smoking and of ambient smoke inhalation are well documented; the correlation between exposure to tobacco smoke and incidence of heart and lung diseases is too strong to ignore. In the best interests of public health, it is your responsibility to take action against this ubiquitous menace.

There are some special areas of concern that I urge you to consider with exceptional care -- those being the provisions to protect young children, the elderly and non-smoking members of the work force.

As you are probably well aware, the elderly and young children are especially susceptible to lung damage and impaired vascular performance, which is further complicated by exposure to ambient smoke. Non-smoking members of the work force deserve spicial consideration because their abstinence from smoking is a contributing factor toward greater productivity, lower insurance rates and lower work site maintenance costs.

A final urgent concern is for the establishment of an effective and comprehensive educational program for the general population concerning the dangers to public and personal health, and the very real social costs, that are associated with smoking and inhalation of ambient smoke.

Support House Bill 84!

Box 981
Juneau, Alaska 99802
February 9, 1983

The Honorable Mitchell F. Abood, Jr.
Chair. State Affairs Committee
Alaska State House of Representatives
Pouch V State Capitol B uilding
Juneau, Alaska 99811

Dear Mr. Abood:

Re: HB #84 SMOKING IN PUBLIC PLACES

I encourage you to work toward passing HB #84 out of your committee with a unanimous "Do Pass."

Medical studies show that exposure to tobacco smoking among healthy non-smokers significantly reduces small airway function. In people who are allergic to smoke, it can cause headaches, elevated blood pressure and heart rate, coughing and even asthma attacks. Prevent discrimination agains non smokers, by providing public places where they can do their grocery shopping etc, without being subjected to the passive act of smoking agains their own choosing.

I think people in general are considerate of others, when it is pointed out that their actions can harm others. This is demonstrated by the way people obey the no smoking signs in hospital rooms and in elevators.

HB # 84 can be used to let smokers know that non smokers have the right not to be subjected to their side smoke.

Sincerely,

Nina L. Brown R.N.

Nina L. Brown, R.N.

CC: MIlo Fritz
Mike Miller

Juneau, Alaska
February 10, 1983

The Honorable Mitchell E. Abood, Jr.
Alaska State House of Representatives
Pouch "V" State Capitol Building
Juneau, Alaska 99811

Dear Sir:
RE: HB 84 Smoking in Public Places

As a respiratory Therapist in an acute care facility I see the ravages of smoking every day. Men and women who were once active and healthy now are reduced to no better than cripples by the self destructive act of smoking.

As Chairman of the State Affairs Committee, I encourage you to work toward passing this bill out of your committee with a unanimous "Do Pass." It will protect the non-smokers from the exposure to smoke in the air from smokers. Cigarette, cigar and pipe smoke does not heed "No Smoking Signs" it drifts as it pleases. Smoke assaults the lungs, sometimes only as unseen particles of all people, smokers and non smoker alike.

Smoking is an active habit done by conscious choosing, unfortunately non-smokers are subjected to the passive act of smoking against their own choosing. Passive smoking by non-smokers causes some people great distress, in the form of headache, nausea, itchy eyes and sore throats. In some cases it can trigger shortness of breath, elevated blood pressure and heart rate, coughing and even asthma attacks in some individuals. The worst result of passive smoking is the effect on infants and little children and the elderly who have minimal reserves to combat the ill effects.

Non Smokers deserve equal rights, provide them with public places where they will be free from passive smoking.

PLEASE SUPPORT H.B. #84 SMOKING IN PUBLIC PLACES.

Sincerely,

Sandra N. Gast

Sandra N. Gast, R.T.
6310-22 Glacier Hwy
Juneau, Alaska 99801

(Bartlett Memorial Hospital)

CC: Milo Fritz
Mike Miller

SOHIO ALASKA PETROLEUM COMPANY

3111 "C" STREET
ANCHORAGE, ALASKA

TELEPHONE (907) 276-5111

MAIL: POUCH 6-612
ANCHORAGE, ALASKA 99502

February 14, 1983

Representative Milo Fritz
Alaska State Legislature
Pouch V
Juneau, Alaska 99811

Dear Milo:

As the Alaska Medical Director for Sohio Alaska Petroleum Company, I am personally committed to the preservation and maintenance of good health and safe working conditions.

The most serious preventable hazard to an individual's health is the danger from cigarette smoking and/or inhalation of second hand smoke.

I strongly encourage you to co-sponsor and support passage of House Bill 84.

It is indeed a matter of life and health versus sickness and infirmity.

Sincerely,

Robert W. Rigg, M.D.
Alaska Medical Director

RWR:jsr

Will see you next week -
Regards.

VI. LITIGATION

A. Private Actions to Prohibit or Restrict Smoking in Private Places of Work

1. Shimp v. N. J. Bell Telephone Co., 368 A 2d 408 (N.J. Sup. Ct. 1976):

In the single case in which a court has found an employee has a right to a smoke-free work environment, a New Jersey court prohibited smoking in all work areas of a company office. Alleging a severe allergic reaction to cigarette smoke, the plaintiff Shimp sued her employer to compel it to provide her a no-smoking work area. This case was not actively defended by N.J. Bell Telephone.

2. Mitchell v. Bell Telephone Co., C-4159-76 (N.J. Sup. Ct. 1978):

This was another case in which the plaintiff, an employee of the defendant and allegedly allergic to tobacco smoke, sought an injunction compelling the defendant to provide him with a smoke-free place of work. The court dismissed the case, in response to the defendant's motion which was based on preemption grounds. Mitchell, which was actively defended, was brought by the same attorney who represented Shimp and the dismissal was entered by the same judge.

3. Gordon v. Raven Systems and Research, Inc., 14092-79 (D.C. Sup. Ct. 1981):

Plaintiff sought reinstatement and damages from her former employer, alleging that she was fired when she insisted that she be provided with a smoke-free environment because of her allergy to tobacco smoke. The court dismissed the case, finding that defendant had no contractual or legal obligation to accede to plaintiff's demands. The court expressly declined to follow Shimp, discussed above, and observed that "neither statute, regulation, nor principles of common law required the Raven Corporation to furnish the plaintiff with the kind of smoke-free workplace she demanded."

4. Kensell v. State of Oklahoma et al., Civ. No. 81-786-T (W.D. Okla. 1982):

The plaintiff, an employee of the Oklahoma Department of Human Services, filed suit in U.S. District Court against his employer, the State of Oklahoma and numerous state officials and employees, contending, inter alia, that their refusal to provide him with a smoke-free workplace violated his rights under the First, Fifth, Ninth and Fourteenth Amendments. Citing FENSR and Gasper, discussed below, the court dismissed the plaintiff's suit, concluding that "[f]or the Constitution to be read to protect non-smokers from inhaling tobacco smoke would be to broaden the rights of the Constitution to limits heretofore unheard of." Like the court in Gasper, the Kensell court noted that the results sought by the plaintiff might better be accomplished through the legislative process.

5. Vickers v. Veterans Administration, No. (81-85V) (W.D. Wash., August 31, 1982):

A U.S. District Court in Washington State ruled that a federal employee who is hypersensitive to tobacco smoke is "handicapped" within the meaning of the Rehabilitation Act, 29 U.S.C.§794. The court, however, found that the supervisor's reasonable efforts in this case to accomodate the employee's handicap satisfied the Act's requirement that federal agencies not discriminate against handicapped persons. No damages were awarded to the plaintiff.

6. Smith v. Western Electric Company, No. 44286 (Mo. Ct. of Appeals, Sept. 14, 1982):

The Missouri Court of Appeals held that an employer's common law duty to provide a reasonably safe workplace might include an obligation to ensure a smoke-free environment for employees sensitive to burning tobacco. The court did not base its decision on any statute but rather on the "well-settled" law that employers must protect employees from avoidable perils. Western Electric had contended that the federal Occupational Safety & Health Act preempted any state action on this issue. This decision will allow plaintiff the opportunity to prove his allegation at a trial.

7. Parodi v. Merit Systems Protection Board, 80-7671 (9th Cir., Oct. 21, 1982):

The U.S. Court of Appeals for the 9th Circuit ruled a government employee with a hypersensitivity to cigarette smoke must be given a smoke-free office within 60 days or be granted disability payments. While acknowledging that most disability claims involve a physical or mental limitation, the court stated that an "environmental limitation",such as Parodi's hypersensitivity to smoke, may form the basis for an employee's disability.

8. Hentzel v. The Singer Co., (Calif. Ct. of Appeals, Dec. 20, 1982):

The California Court of Appeals found that an employee allegedly fired for insisting on a smoke-free workplace has the right to sue his former employer for damages. The decision, reversing a trial court's dismissal of the Henztel complaint, emphasized the need to protect employees who voiced dissatisfaction with allegedly hazardous working conditions.

B. Private Actions to Prohibit or Restrict Smoking in Public Places

1. Gasper v. Louisiana Stadium and Exposition District 418 F. Supp. 716 (E.D. La. 1976), aff'd, F.2d 897 (5th Cir. 1978), cert. denied, 439 U.S. 1079 (1979):

Plaintiffs sued to compel the authorities who manage the Louisiana Superdome to prohibit smoking in the Superdome during sporting and other public events. In support of this request, the plaintiffs claimed a constitutional right to a smoke-free environment, relying on the First Amendment (freedom of speech), Fifth and Fourth Amendments (due process right to life and liberty) and Ninth Amendment (which protects so-called unspecific but "fundamental" rights). The district court unequivocally rejected each of these claims. The court of appeals affirmed this decision in all respects, while noting that the legislature, as opposed to a court, would have broad power to regulate smoking in public places. The Supreme Court denied the plaintiff's petition for review of the lower courts' decisions.

2. Federal Employees for Non-Smokers Rights (FENSR) v. United States, 446 F. Supp. 181 (D.D.C. 1978), aff'd, 598 F. 2d 310 (D.C. Cir.), cert. denied, 444 U.S. 926 (1979).

Several anti-smoking organizations, whose members included federal employees, sought to compel the federal government to prohibit smoking in federal facilities except in designated smoking areas. Plaintiffs asserted a private right of action under the Occupational Safety and Health Act (OSHA), a deprivation of their First and Fifth Amendments rights (freedom of speech and right to due process) and a common law right to a smoke-free workplace. The district court, relying on the decision in Gasper, rejected the constitutional claims, held that OSHA implies no private cause of action and found that it had no jurisdiction to consider the common law claim advanced by the plaintiffs in support of their demands. The court of appeals affirmed the district court decision and the Supreme Court refused to review the case.

3. Church v. Brown, et. al., Civ. No.78-4073 (S.D. Ill. 1979):

The plaintiff, an employee of Scott Air Force Base, brought this action in U.S. District Court alleging that the commander of the base and the United States had a duty, under both the common law and OSHA, to provide him with a smoke-free working environment. Accepting "wholeheartedly" the analysis of the court in FENSR, the Church court found that it had no jurisdiction to consider the common law claim propounded by the plaintiff and rejected his OSHA claim, finding "that no private implied cause of action exists under OSHA..."

4. GASP v. Mecklenburg County, 256 S.E. 2d 477 (N.C. 1979):

An anti-smoking group sought an injunction forcing county authorities to prohibit smoking in all county public buildings and places of work, relying, like the plaintiffs in FENSR and Gasper, on an alleged constitutional right to a smoke-free environment. The North Carolina Court of Appeals, citing FENSR and Gasper, held that no such constitutional right exists and dismissed the plaintiff's suit.

VI. LITIGATION

C. Other Decisions

1. Stevens v. Employment Security Commission (Iowa, Nov. 1976):

An Iowa state court ruled eligible for unemployment benefits a woman whose health required that she accept a job only in a smoke-and-dust free environment. Suffering from asthma, the plaintiff quit her job because the cigarette smoke in her office allegedly aggravated her illness. Unable to find a job that met the conditions required by her health, she applied for unemployment benefits. The Employment Security Commission said her restrictions on possible employment had made her unavailable for work and ineligible for benefits. But a District Court in Iowa disagreed, saying her limitation was not so great as to to remove any possibility of employment. The court compared her situation to the cases where benefits were granted to persons limited to "light work".

2. Ellen L. Meyer v. C.P. Clare & Co., (Idaho Industrial Comm., Nov 1978):

Unemployment benefits were also granted to an Idaho worker who had quit because two cigar smokers were transferred into her work area. She could have been given a leave of absence until a suitable position opened, but no one told her of this option. According to the state industrial commission, her limited choice "would compel a reasonable person to leave her employment." Thus she had good cause for quitting and was eligible for benefits.

3. Alexandria Volunteer Fire Dept. v. City of Alexandria, (E.D. VA, Dec. 13, 1982):

A federal district court rejected a lawsuit by Alexandria volunteer firefighters which challenged a regulation requiring volunteer firefighters to meet city fire department standards, including no smoking. No violations of the due process or equal protection clauses were found in the requirement that the volunteers meet the same physical, mental and training standards that the professional firefighters must meet.

4. San Mateo County Fire Fighters, Local 2400 v. City of San Mateo, No. 268890 (Calif. Sup. Ct. Dec. 16, 1982):

Stating the city may have violated a state law that requires local officials to negotiate working conditions, a superior court temporarily barred the city of San Mateo from enforcing a no-smoking policy for rookie firefighters. Under the court order, the city may continue to require fire department applicants to sign the no-smoking pledge, however, it would be unenforceable unless the temporary injunction is overturned at trial.

STATE of ALASKA

MEMORANDUM

TO: [redacted]
Director

DATE: June 2, 1982

FILE NO:

Thru: [redacted]

TELEPHONE NO: [redacted]

FROM: Roberta Banko
[redacted]

SUBJECT: Cigarette Smoke

For some time we have noticed a severe problem with the amount of cigarette smoke in the air of [redacted]. As you know, the Surgeon General of the United States as well as many studies on the subject are linking the effects of passive smoking with lung cancer and other related diseases. Fellow workers have expressed concern about the health hazards, discomforts and inconvenience experienced as a result of the smoke in the air. Although some efforts have been made to improve the situation by moving workers' work stations around, installing large "smoke-eaters" and providing fans to recirculate the smoke, these efforts are not effective. As stated in the APEA contract (Article 3, Section 1 b, pp. 8-9) one of the purposes of our contract is "to promote fair and reasonable working conditions." These conditions should apply equally to all members.

We are confident that all reasonable efforts can be made to promote the welfare and champion the rights of non-smokers as well as those of smokers. [redacted] to move to a new building, we feel that now is the best time to address the problem and, if necessary, institute some regulations correcting the situation. The following are suggestions for dealing with the situation:

1. "NO SMOKING" in all areas except those designated and agreed upon by all workers as smoking areas.

2. All smokers who wish to smoke at their desks should provide, at their expense, desk-type "smoke-eaters".

3. Smokers should refrain from walking around others' work areas with lighted cigarettes.

4. Install more large, room-size "smoke-eaters" so that a modicum of efficiency might be achieved or otherwise provide for an air exchange or proper ventilation (this should be undertaken in addition to the above regulations.)

Additional information can be provided on the subject of the harmful effects of passive or "side-stream" smoking on health if you find it necessary in order to address this problem. We are looking forward to your reply and to working with you in solving this problem.

cc: [redacted]
Leo Kay, Alaska Lung Association
Joe Cladouhos, Environmental Health/Environmental Conservation
Raymond Jorgenson, OSHA
Dr. Erwin Rabeau, Director Public Health/Health & Social Services
Dr. Helen Byrne, Commissioner, Health & Social Services
John Cenoweth, Ombudsman, Governor's Office
Dianne Corso, APEA

MEMORANDUM [redacted]

State of Alaska [redacted]

TO: Roberta Banko

DATE: June 8, 1982

FILE NO: [redacted]

TELEPHONE NO: [redacted]

FROM: [redacted] Director

SUBJECT: Smoking Prohibitions

This will acknowledge your memo of June 2, 1982, concerning "Cigarette Smoke" and set forth the policy of this Division with regard to restricting smoking.

It is the policy of this Division to adhere strictly to Alaska Statute 18.35.300 and Chapter 55 Alaska Administrative Code Section 18 AAC 55.010-AAC 55.060.

AS 18.35.300(3) states, "smoking is prohibited in a public school; or in a room, chamber, place of meeting or public assembly under the control of the state, or a department or agency of the state, while a public meeting held under auspices of the state, or a department of the state, is in progress". This section will be adhered to and all rooms accommodating public meetings will be posted as a no smoking area while the meeting is in progress.
AS 18.35.300(6) states, "smoking is prohibited in a place of business in which the owner, manager, proprietor, or other person who has control of the premises posts a sign conveying the message that smoking is prohibited by law". Although this section refers specifically to businesses it may be interpreted to mean state office buildings serving the public. In any case it is my decision to not exercise this questionable perogative and restrict smoking in all or any portion of office space housing the [redacted] Division. Chapter 55 Alaska Administrative Code Section 18 AAC 55.900(c)(3) states in part ". . . in a state office building "other person who has control" means a division director who has authority over the office or his designee". This places the responsibility and authority to restrict or not restrict smoking, for those areas not specifically restricted by the law, in this office. Therefore, no areas housing [redacted] staff will be restricted to smoking without my expressed approval.

Although this policy may seem harsh to those of you who wish to limit smoking, it is my belief that if we are to promote fair and reasonable working conditions for all employees, our policy concerning this subject should be no more or no less restrictive than the law.

The new office building to which we are moving does have an air cirulating system. Hopefully, this will help provide a work environment in which we can all achieve our goals in pleasant and comfortable surroundings. If specific problems with ventilation do occur, please inform this office through your supervisor.

Attached is a copy of the pertinent statute and Administrative Code for your perusal.

cc: Central Office Supervisors
Regional Managers

Attachment

[redacted]

CHAPTER AND VERSE:

Public Smoking

I. THE ISSUE

Does other people's smoke cause disease in nonsmokers?

Is the presence of tobacco smoke in the atmosphere cause for alarm?

In the continuing national dialogue on the various issues raised by cigarette smoking, these questions have now come to the forefront.

It has been called the issue of "second hand smoke," "public" or "involuntary" smoking.

Unfortunately, as with most controversial scientific issues, there has been a great deal of misinformation and unsubstantiated allegations made about the effect of other people's smoke on nonsmokers.

Because of this misinformation, a majority of both smokers and nonsmokers have come to believe erroneously that second hand smoke has been shown to be harmful to the normal nonsmoker. This perception is apparently the underlying basis for widespread efforts to prohibit smoking in public places.

The fact is: other people's smoke has not been shown to cause disease in nonsmokers.

Because we believe that public policy should be debated and determined on the basis of proven facts, rather than false

perceptions, we have prepared this document summarizing what is known at this time on the question of second hand smoke.

II. WHAT ARE THE FACTS?

Numerous scientists, physicians, government officials and health experts have studied the effect of environmental smoke on nonsmokers. None of these studies has been able to prove that other people's smoke causes disease in nonsmokers.

- A joint study conducted in 1971 by the Federal Aviation Administration (FAA), the U. S. Department of Health, Education and Welfare (HEW) and the National Institute of Occupational Safety and Health (NIOSH) examined the health aspects of smoking on passenger aircraft. The report of this study stated: "...it is concluded that inhalation of the by-products from tobacco smoke generated as a result of passengers smoking aboard commercial aircraft does not represent a significant health hazard to non-smoking passengers." (1)

- In 1977, after studying a proposed rule on prohibiting airline pilots from smoking in the cockpit of commercial planes, the FAA stated: "...with respect to the alleged deleterious effects of carbon monoxide upon the performance of the smoking pilot, the FAA believes that the information presented is too inconclusive to warrant the issuance of the requested rule at this time." (2)

- The U.S. Interstate Commerce Commission (ICC), in a 1971 decision upholding the right to smoke on interstate buses, stated "We agree with the examiner's conclusions that petitioner has failed adequately to demonstrate the deleterious effects of

second-hand smoke upon the health of motorbus passengers." (3)

• In 1974, Dr. R. Rylander, the Swedish medical researcher, and other leading medical experts organized an international workshop, attended by scientists from all over the world, to consider the health consequences of atmospheric tobacco smoke. They concluded: "For the majority of the population the average exposure burden due to environmental tobacco smoke is probably much lower than that due to industrial air pollutants and in many cases also environmental air pollution or the lung burden due to dust clouds or other indoor air pollutants." (4)

• The Bavarian Academy of Industrial and Social Medicine sponsored a symposium on smoking in the workplace in 1977 in Munich, attended by eminent German scientists, lawyers and government leaders. In a closing statement, the symposium's chairman, Professor Doctor H. Valentin of the University of Erlangen-Nuremburg, said: "In conclusion, with regard to medical and legal facts of passive smoking at the work place, the following must be considered. Under our present day work place conditions, no clear and significant untoward health effects from passive smoking have been shown." (5)

• R.S.F. Schilling and a group of co-researchers, thinking that children of smoking parents might contract respiratory symptoms or disease due to their close proximity to smoking family members, determined exactly the opposite after a study.

In 1977, they reported in the American Journal of Epidemiology: "We have found no significant relation between parents' smoking and respiratory symptoms or lung function in their children." They added: "We conclude that exposure to low levels of smoke produced by cigarette smokers does not result in chronic respiratory symptoms or loss of lung function among children nor among adults." (6)

III. SUPPORTING OPINIONS

Others who have studied the effects of smoking on nonsmokers have confirmed these findings.

- Dr. D.M. Aviado, a Professor of Pharmacology at the University of Pennsylvania for almost 30 years, said in a statement before the Council of the District of Columbia Committee on Transportation and Environmental Affairs in 1976: "On the basis of existing scientific evidence, tobacco smoke constitutes no health hazard to nonsmokers in public places." (7)

- In a statement in 1977 before the New Jersey Public Health Council, Dr. Walter M. Booker, Emeritus Professor of Pharmacology of Howard University, said: "As a scientist, I am interested in actual data which demonstrate whether a nonsmoker absorbs tobacco smoke and, if so, whether the amount is sufficient to cause adverse physiological effects. The literature simply does not support the theory that a nonsmoker absorbs amounts which can cause harm." (8)

- Pathology Professor Dr. Edwin R. Fisher of the University of Pittsburgh, appearing before the same New Jersey group in 1977 said: "My careful review of the literature, confirming the conclusions based upon my own experimental data and the related work discussed above, reveals a lack of scientific information which would allow me to conclude that atmospheric tobacco smoke or its constituents represent a health hazard in nonsmokers." (9)

• Writing in the San Francisco Examiner in 1977, medical researcher Dr. C. H. Hine said: "The medical literature to date does not indicate any significant health risk to the nonsmoker from environmental tobacco smoke normally encountered in day-to-day situations." (10)

• Appearing before the New Jersey Public Health Council in 1977, Dr. Charles L. Waite, Retired Rear Admiral of the U. S. Navy Medical Service, Medical Director of The Tobacco Institute, and Fellow of the American College of Physicians, made the following statement: "In my opinion, there is no convincing evidence to support the hazards claimed by some to the effect that cigarette smoke threatens the health of the average well nonsmoker. On the basis of existing scientific evidence, I can only conclude that tobacco smoke constitutes no health hazard to nonsmokers in public places." (11)

• And, in 1977 Dr. W. Klosterkotter, of the Hospital of the University of Essen, W. Germany, said: "So far passive smoking has not proven to be health-hazardous in healthy adults. Thus an important condition for a legal smoking ban, e.g. at places of work, remains unfilled." (12)

Opponents Of Smoking Agree

Even the most avowed critics of smoking acknowledge that smoking has not been established as a cause of disease in nonsmokers.

Some of them include:

• The then U.S. Surgeon General, Jesse Steinfeld, who stated after issuing the 1972 Public Health Service Report on Smoking: "We cannot say with certainty that exposure to tobacco smoke is causing serious illness in nonsmokers..." (13)

• Dr. Jonathan Rhoads, Chairman of the National Cancer Advisory Board, said in 1975 that to his knowledge "it is not, in fact, actually harmful." (14)

• Dr. E. Cuyler Hammond of the American Cancer Society was reported to have said in 1974 that there "was no shred of evidence" that a nonsmoker can get cancer from "second hand" smoke and that there is a lot of evidence that he cannot... He added that to suggest passive smoking could cause cancer is dishonest, and that he would be prepared to testify as much in a court. (15)

• The "Expert Group" appointed by the British organization, Action on Smoking and Health (ASH), headed by Dr. Charles Fletcher of the British Royal College of Physicians, concluded in 1973 that: "There is no evidence that other people's smoke is dangerous to healthy nonsmokers..." (16)

• American Cancer Society official Lawrence Garfinkel said in 1976: "...(T)here is no evidence, however, that nonsmokers who are constantly exposed to cigarette smoke have a higher incidence of bronchial carcinoma." (17)

• Great Britain's Foreign Minister Dr. David Owen, while serving as Minister of Health in 1975 said: "No clear

evidence has yet been published to show that tobacco smoke is harmful to normally healthy nonsmokers or that a heavily tobacco-smoke laden atmosphere has other than a transient effect." (18)

- In a 1977 television appearance in Washington, D.C., on WTOP-TV (CBS) Dr. Gio Gori stated: "I would say that the evidence that we have today, scientific evidence, something that we can prove, or normal smoking conditions that you may have a couple of people smoking in a regular size room, the health effects connected with that are probably going to be minimal." (19)

- Three spokesmen for the Naylor Dana Institute for Disease Prevention of the American Health Foundation, including Dr. Ernst L. Wynder, concluded that: "Specifically, we know of no data suggesting that passive inhalation of cigarette smoke increases the risk of developing lung cancer." In addition, they reported: "On the basis of available epidemiological evidence, it appears that passive inhalation of tobacco smoke by nonsmokers or smokers does not increase their risk for chronic illnesses such as cancer of the respiratory tract, emphysema, or cardiovascular disease." (20)

IV. REFUTING FALSE CLAIMS

Although there is no convincing evidence to date to show that other people's cigarette smoke causes disease in nonsmokers, a number of false allegations bearing on this subject have been widely published. Some of the more common claims are listed below accompanied by the facts:

Claim: Smoking causes chronic degenerative diseases in nonsmokers.

Fact : There is no scientific basis for such claims. An American Cancer Society epidemiological study in 1976 found no evidence that nonsmokers constantly exposed to tobacco smoke have increased risk of lung cancer. (21)

Claim: Atmospheric tobacco smoke causes or contributes to the development of atherosclerosis (a disease characterized by inelasticity and thickening of arterial vessel walls) in nonsmokers, as a result of carbon monoxide.

Fact : Early studies conducted on animals chronically exposed to carbon monoxide and fed a high cholesterol diet compared with animals not so exposed showed that these animals had arterial changes which duplicated early atherosclerosis. (22)

However, the experimenter, P. Astrup, has recently admitted that he and others have been unable to reproduce his previous experiment and that his "present study suggests that applying the generally accepted criteria for intimal (membrane or lining of an organ) damage, no

direct toxic effect of CO can be demonstrated." Dr. Astrup added that "CO exposure is probably a very weak stimulus on the aortic wall, compared with hypercholesterolemia induced by cholesterol feeding." (23) In addition, the CO claim ignores observations in bridge and tunnel workers which showed that those persons, also chronically exposed to carbon monoxide, did not have any increased incidence of atherosclerosis. (24)

Claim: Parental smoking causes respiratory illness in children.

Fact : A group of researchers studied respiratory symptoms, diseases and lung function in 37. families with 816 children in three towns and "found no signficiant relation between parents' smoking and respiratory symptoms or lung function in their children." They concluded that "exposure to low levels of smoke produced by cigarette smokers does not result in chronic respiratory symptoms or loss of lung function among children nor among adults." (25)

Another recent clinical study confirms the same findings. The study determined that: "Smoking and nonsmoking parents have about the same proportion of children with respiratory symptoms. The number of cigarettes smoked by the parents has no influence on respiratory symptoms in their children..." (26)

Claim: Cigarette smoke causes respiratory allergies.

Fact : Claims about tobacco allergy stem primarily from the many studies in which extract from tobacco leaf has been tested and found to cause allergic response in people who are otherwise allergic. (27) However, these tobacco leaf extract studies do not resolve the issue, and despite the claims of one researcher, the work of others to date has not found any allergens in tobacco smoke. (28) Work is still being done in this area.

Claim: Asthmatics are believed to be particularly vulnerable to tobacco smoke.

Fact : A recent study failed to find any significant changes in the lung function of asthmatics who had been exposed to cigarette smoke for two hours in a small test chamber. (29)

VI. CARBON MONOXIDE AND OTHER ENVIRONMENTAL FACTORS

Some nonsmokers have expressed concern over the presence of tobacco smoke in the atmosphere.

Studies measuring tobacco smoke constituents in the atmosphere under realistic conditions have not found levels of carbon monoxide sufficiently high to justify such concern. The level set by the U.S. Occupational Safety and Health Administration (OSHA) as the limit for industrial exposure over an eight-hour period is 50 parts per million (ppm). The combined results of studies on the amount of carbon monoxide in the atmosphere from smoking indicate that, under realistic conditions, carbon monoxide in the atmosphere from smoking will rarely exceed 10 ppm. (30)

One exception was reported in a study of a sports arena which permitted smoking but was not air conditioned, causing the carbon monoxide level to reach 25 ppm, a level which was not considered to be hazardous. (31) Other exceptions were studies performed in taverns and nightclubs where carbon monoxide levels as high as 42 ppm were recorded. (32) However, these studies were conducted with an instrument that is known to exaggerate the level of carbon monoxide in the presence of alcohol vapors. (33)

Combined results of studies of COHb* levels in smokers and in nonsmokers exposed to tobacco smoke indicate that, under realistic smoking conditions, smokers will rarely experience COHb levels greater than ten percent and the levels in nonsmokers

* Carboxyhemoglobin, the combination formed by carbon monoxide and red blood pigment

usually will not exceed two to three percent. And, even these relatively low levels of COHb will drop within a few hours after the cessation of exposure to smoke. (34)

Some nonsmokers also complain about the alleged buildup of carbon monoxide in offices and other places where smoking is allowed. Yet, one recent study showed that the COHb levels of office workers were higher when they came to work than when they left at the end of the day, even though they were exposed to cigarette smoke throughout the day. (35) Clearly, the real concern should be for the outdoor levels of carbon monoxide from car exhaust and other sources to which nonsmokers are exposed on their way to work.

No one has ever established that the health of normal nonsmokers is adversely affected by even the small amount of carbon monoxide that might be in the atmosphere due to cigarette smoke. CO is a natural body constituent which is present in the blood without any exposure to CO in the atmosphere, and the body can and does eliminate CO by various means. Persons with COHb levels of 15 percent or less rarely even suffer any of the first symptoms of CO difficulties such as headaches and nausea. (36)

A claim frequently made about exposure to low levels of CO is that it affects certain performances, such as the ability to distinguish between short intervals of time or to solve mathematical problems. But there is still scientific disagreement about whether such performances are affected by COHb measurements in the neighborhood of ten percent or less. Some studies indicate that these levels of CO will affect such performance (37), while

other studies do not so indicate. (38) This area requires additional research.

It also has been alleged that persons with severely compromised cardiovascular systems are adversely affected by environmental tobacco smoke, especially carbon monoxide.

This belief stems largely from Aronow's studies of angina patients in which he used "pure" carbon monoxide, as well as tobacco smoke, to elevate their COHb levels. He found that a certain COHb level obtained by exposure to "pure" carbon monoxide caused certain changes in cardiac function, but that the same COHb level obtained from tobacco smoking did not result in such changes. (39) The reason for these differences in cardiovascular function are as yet unknown. Whatever the reasons for these findings, this study raises a substantial question about the relevancy of "pure" carbon monoxide type studies to the nonsmokers' situation. This is another area where further research is needed.

Studies of other tobacco smoke constituents indicate that smoke's contribution to atmospheric levels of these compounds is minimal. (40) Such studies are usually conducted as the result of a claim about the danger of exposure to some compound attributable to tobacco smoke. One such study of "volatile" organic compounds recently concluded that the amount of such compounds added to the atmosphere as a result of cigarette smoking is "insignificant." (41)

As to nicotine, research shows that low atmospheric levels result from cigarette smoke. (42) No scientist has suggested that

the minuscule amount of nicotine that might be absorbed by a nonsmoker has anything to do with the production of human disease. In fact, a recent study monitoring heart rates of nonsmokers exposed to cigarette smoke under laboratory conditions concluded that the amount of nicotine inhaled by nonsmokers under their rigorous test conditions was too small to alter heart rate. (43)

VI. THE ANNOYANCE FACTOR

All of the foregoing establishes, in our judgment, that there is no physiological basis for claiming that other people's smoke causes disease in the nonsmoker.

Despite that fact, it is clear that cigarette smoke does annoy some people. Tobacco smoke may "drift" into the eyes or nose of the nonsmoker who may be annoyed by the smell. In places that are poorly ventilated, high concentrations with other environmental impingements may cause eye or nasal irritation.

At least one scientist, Dr. Gary Huber, suggests that the odor of smoke components "may trigger emotional responses not yet well understood." (44) Support for this theory was found in a recent study in which college students were first characterized as to their attitudes concerning tobacco smoke and then were exposed to such smoke. (45) The heart rates of those who "disliked" smoke were much higher than those who were "indifferent" to smoke. There was no way to determine from the data whether initially the "dislike" group had a higher heart rate or whether the anticipation of sitting and inhaling the "disliked" cigarette smoke caused an increased heart rate.

Yet some studies suggest that the vast majority of smokers and nonsmokers are not usually annoyed by public smoking. For example, a recent U.S. survey conducted by Response Analysis in Princeton, N.J., found that when people were asked about the kinds of things that annoyed or irritated them in their everyday lives,

only about two percent of the annoyances mentioned were related to smoking. (46)

The American Express Company found little interest in nonsmoking travel tours (47), and a Seattle, Washington, restaurant reported that there were only seven requests for seating in the nonsmoking section during a three-month period when they served 30,000 customers. (48)

All of this suggests that the issue of other people's smoking really falls into the category of annoyances -- akin to other everyday annoyances, such as barking dogs, loud music, personal eating habits, etc.

Smoking is like any other habit or practice with the potential of annoying others. In our society, such annoyances are alleviated through the traditional rules of common courtesy. The "second hand" smoking problem addressed in this paper would surely begin to disappear if smokers were more sensitive to the feelings of nonsmokers and practiced simple rules of courtesy in dealing with the problem.

One fact is clear: Although atmospheric tobacco smoke may be annoying to some people, it has not been proven to cause disease in nonsmokers.

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MEMORANDUM

TO; Rep. Bussell, Chairman, House Judiciary Comm.

TOPIC: Suggested Amendments, Deletions to HB 84 as per Committee Discussions at prior hearing, Feb. 23, 1983

FROM: Joe Brewer

Date: March 28, 1983

1st suggested amendment:

Page 3, line 19--

(d) A smoking section may not be designated under (a) of this section in an area or vehicle unless the area or vehicle [meets the minimum ventilation and air quality standards adopted by the Department of Enviromental Conservation.] is sufficiently well ventilated by natural or mechanical means.

2nd suggested amendment: (add authority)

Page 3, line 27--

"Smoking Prohibited by law"[.], per AS 18.35.300.

3rd suggested amendment: (deletion)

p. 4, delete entire Section 6, lines 4 through 10.

4th suggested amendment: (delete words) (Dist. Ct. has no injunctive powers; unless this Committee gives it such by this language in this limited area).

p. 4, line 12:

Sec. 18.35.346. INJUNCTIONS. The commissioner of environmental conservation or any affected party may institute an action in the [district court or the] superior court to enjoin repeated violations of AS 18.35.300- 18.35.360.

p. 2, memo on changes suggested for HB 84.

5th suggested change, or addition. (Statutory authority needed so act would not wind up in temporary acts and fail to be in permanent statutes

p. 4, line 21--

Sec. 9. AS 18.35 is amended by adding a new section to read:

Sec. 18.35.360. PUBLIC EDUCATION. The Commissioner of environmental conservation shall take appropriate measures to inform the public of their rights under this Act.

- -

(Note:

Then, the last section in the statute, as it exists now, AS 18.35.360, would have to be renumbered, as shown. I don't know if this should be included as an amendment or leave it up to the Revisor of Statutes. (?)

[Sec. 18.35.360] Sec. 18.35.365. Regulations. The Department of Environmental Conservation may adopt regulations to implement the provisions of AS 18.35.300 -- [18.35.350] 18.35.360.

Alaska Public
Employees Association APEA
State Headquarters: 340 N. Franklin, Juneau, AK 99801 (907) 586-2334

epresentative Bussell, Chairman
douse Judiciary Committee

FROM. Cherie Shelley
APEA Executive Director

SUBJECT: Smoking Survey

DATE: March 25, 1983

APEA recently mailed a smoking survey to our membership. Forty-four percent or 3,628 of the members responded

QUESTIONS	PERCENT OF AFFIRMATIVE RESPONSES	PERCENT OF NEGATIVE RESPONSES	PERCENT OF NO RESPONSES
Do you smoke?	26	70	4
Do you have a medical condition which is affected by smoke?	24	74	2
Is there adequate ventilation in your office?	40	58	2
Is your worksite enclosed by walls?	61	38	1
Is your worksite open-concept with dividers?	36	61	3
Has the issue of "smoking" interfered with your office operations?	36	61	3
Do you believe it would be possible to reach a mutually agreeable solution within your office regarding "smoking"?	68	26	6
Have any arrangements been made in your office to separate smokers from non-smokers or to provide proper ventilation?	29	61	10

Fairbanks Field Office
825-D College Road
Fairbanks, AK 99701
Telephone: (907) 456-5412

Anchorage Field Office
833 Gambell Street, Suite A
Anchorage, AK 99501
Telephone: (907) 274-1688

Juneau Field Office
227 4th Street
Juneau, AK 99801
Telephone: (907) 586-6305

AMENDMENT

OFFERED IN THE HOUSE: BY: Rep. John Lindauer

To: House Judiciary Committee HOUSE BILL No. 84

SENATE BILL No. _____

PAGE: _____ LINE: _____

To be added on line 26 of page 1:

elevator, or intra-state commercial airline flights of duration of two hours or less.

To be added on line 4 of page 4:

hire, or intra-state commercial airline flights of duration of two hours or less.

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF WASHINGTON

LANNY L. VICKERS, Plaintiff, vs. THE VETERANS ADMINISTRATION, et al., Defendants.	No. C81-85V MEMORANDUM DECISION

From the credible evidence presented at the trial of this cause, the Court now renders the following decision:

1. The issues before this Court are these:

(a) Does the plaintiff have a cause of action against his superior, David Radke, Chief of Supply Service at the Veterans Administration Medical Center in Seattle, Washington?

(b) Does the plaintiff have a cause of action against the Veterans Administration under the Rehabilitation Act of 1973, as amended, 29 U.S.C. § 794, for money damages or for equitable relief?

2. This is not an action to determine whether all government employees have a right to work in offices which are free from tobacco smoke. It is an action solely to determine whether this one plaintiff has the right to work in an

Copy to Clerk

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environment wholly free from tobacco smoke.

3. Plaintiff is entitled to recover damages of and from David Radke only if plaintiff established by a preponderance of the evidence that David Radke, in his actions relative to plaintiff, violated a clearly-established statutory or constitutional right of plaintiff. Harlow v. Fitzgerald, 50 U.S.Law Week 4815, June 22, 1982.

4. From the evidence in this cause the Court is unable to find that David Radke did in fact at any time violate any clearly-established right of plaintiff. The complaint of plaintiff against David Radke must in consequence be dismissed with prejudice.

5. The question then remains as to whether plaintiff is entitled to any kind of relief against the Veterans Administration as a handicapped person under the Rehabilitation Act of 1973, as amended, 29 U.S.C. § 794. The Court ruled prior to trial that § 794 does permit a private right of action for damages or for equitable relief.

6. The Court finds that plaintiff is a handicapped person within the meaning of the term "handicapped person" as defined in 29 U.S.C. § 706(7)(B). That subsection provides that any person is a "handicapped" person within the contemplation of 29 U.S.C. § 794 if that person has a physical impairment which substantially limits one or more of his or her major life activities. It appears from the evidence in this cause that plaintiff is unusually sensitive to tobacco smoke and that this hypersensitivity does in fact limit at least one of his major life activities, that is, his capacity to work in an environment which is not completely smoke free.

7. The finding by the Court that plaintiff is a handicapped person within the meaning of the Act does not, however,

dispose of this matter. In order for the Court to find that plaintiff is entitled to recover money damages from the Veterans Administration or that plaintiff is entitled to some kind of equitable relief, the Court must find that the Veterans Administration discriminated against plaintiff by reason of his handicap.

8. 29 U.S.C. § 794 provides as follows:

> "No otherwise qualified handicapped individual in the United States, as defined in Section 706(7) of this title, shall, solely by reason of his handicap, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination...under any program or activity conducted by any Executive agency or by the United States Postal Service."

9. In his trial brief plaintiff asserts that because of plaintiff's complaints and this lawsuit, Mr. Radke has indicated resentment and anger toward plaintiff by means of non-verbal expressions of animosity towards plaintiff, by statements made to other employees about plaintiff and the smoking issue, and by efforts to limit work assignments to plaintiff and to prevent his promotion. The Court found no credible evidence in the record to sustain any one of these contentions.

10. The Court finds further no evidence in the record that plaintiff has in any way been discriminated against in terms of work assignments, pay or promotions by reason of his hypersensitivity to tobacco smoke, by reason of his complaining to his superiors about the presence of tobacco smoke in his work environment, or by the commencement of this action. Plaintiff has regularly received high performance ratings for his work and has been awarded at least three incentive awards, which have resulted in higher pay for him.

11. The Court is unable to find in the words of § 794 that

plaintiff has been, solely by reason of his handicap excluded from the participation in or denied the benefits of any program or activity conducted by the Veterans Administration.

12. Plaintiff asserts, however, that he has been discriminated against because of the failure of the Veterans Administration "to make reasonable accommodations to his physical handicap by providing a work environment that is free of tobacco smoke."

13. Plaintiff has failed to cite any authority from the decided cases to the effect that the Veterans Administration was under a duty to make "reasonable accommodations" to plaintiff's sensitivity to tobacco smoke. Assuming, but not deciding, that the Veterans Administration was under such a duty, the Court finds from the evidence that the Veterans Administration did make reasonable efforts to accommodate to plaintiff's handicap.

14. Plaintiff is employed in the Purchasing and Contracts Section of the Supply Service Department at the Veterans Administration Medical Center. The employees in that section have their desks in Room 105-C in Building 15. This building is a temporary one. It is contemplated that within two years all of the Supply Service employees will be moved out of that building and into new quarters in a building now under construction. Ten employees have their desks in Room 105-C. Some of them smoke; some do not. Room 105-C is relatively quite crowded as there are more desks and more employees in that room than the available space can comfortably accommodate. In that room are seven windows, which can be opened and closed, and one double door. This double door may be opened or "cracked" to admit fresh air. Two rather large circulating fans are located in this room.

15. Immediately adjacent to Room 105-C is Room 105-D in which are located those employees who are in the Personal Property Management Section of the Supply Service Department. There are eight employees in this section. Some of these employees smoke; some do not.

16. In February, 1979 the Deputy Administrator of the Veterans Administration at the direction of the Administrator promulgated a nationwide policy relative to smoking at the facilities of the Veterans Administration. One of the provisions of that policy was as follows:

> "In establishing and continuing a smoking policy in work areas under their jurisdiction, supervisors should strive to maintain an equitable balance between the rights of smokers and nonsmokers."

17. In February, 1980 the Director of the Veterans Administration Medical Center in Seattle promulgated a policy relative to smoking in the facility. That policy provided that smoking was to be permitted in office areas. By virtue of that promulgated policy employees were permitted to smoke in Rooms 105-C and 105-D.

18. From time to time plaintiff has made known to his superiors his sensitivity to tobacco smoke and has urged that action be taken by them to make it possible for him to work in a smoke-free environment.

19. In an effort to accommodate to plaintiff's handicap the following has been done by the Veterans Administration:

(a) After plaintiff's initial complaint the desks of smokers were physically separated in the office from the desks of the nonsmokers.

(b) Thereafter Mr. Radke sought and was able to secure a voluntary agreement by those who work in the same office as plaintiff (Room

105-C) not to smoke at any time in that room.

(c) Later, Mr. Radke sought and was able to secure a voluntary agreement by those who work in Room 105-D, the office adjacent to Room 105-C, that they would not smoke at any time in that room.

(d) Mr. Radke submitted a requisition for an exhaust system to be installed in Room 105-C in the hope that this system would remove whatever tobacco smoke might drift into Room 105-C from rooms where smoking was still permitted. This request was, however, turned down by the Engineering Department because its cost was considered to be excessive in light of the fact that Building 15 was only a temporary building and the employees in Supply Service were to be transferred from that building to a new building.

(e) Mr. Radke was able to have two vents installed in the ceiling of Room 105-C in an effort to withdraw from that room any tobacco smoke that might drift into it from other areas.

(f) Mr. Radke purchased at his own expense an air purifier in an effort to alleviate the effects of his smoking in his own private office, Room 105-B.

(g) Mr. Radke offered to have a partition constructed around plaintiff's desk. This partition would have extended from floor to ceiling and have a door.

(h) Plaintiff was given the opportunity to move

his desk farther away from the door leading from Room 105-C to 105-D and closer to a window.

(i) Plaintiff has been offered an outside maintenance job by defendant Veterans Administration.

20. The voluntary action by the smokers in Rooms 105-C and 105-D has significantly reduced the presence of tobacco smoke in plaintiff's work space in Room 105-C.

21. At the time plaintiff complained to his supervisor about the adverse effects of tobacco smoke upon his health, Mr. Radke was faced with the problem of trying to accommodate the desires of plaintiff with the desires of the smokers whose desks were in Rooms 105-C and 105-D. It appears from the testimony of plaintiff that some of those individuals were "heavy" or "very heavy" smokers. Under the national policy of the Veterans Administration he was under a duty to "strive to maintain an equitable balance between the rights of smokers and nonsmokers." In light of the policy promulgated by the Director of the Veterans Administration Medical Center in Seattle that smoking was to be permitted in offices, Mr. Radke could not have ordered that there be no smoking in Rooms 105-C and 105-D without running into the objection by the smokers in those rooms that they were permitted by the Director's policy to smoke at their desks and that Mr. Radke did not have the authority to override that policy. He was faced, too, with the problem that some of the employees in Room 105-C wanted to have the windows open; some insisted that they be closed. Some wanted the temperature of the room relatively high; some wanted it relatively low. These opposing attitudes made it, of course, difficult to arrive at a mutually satisfactory arrangement with respect to whether the windows would be open or closed.

22. The only tobacco smoke to which plaintiff is now

exposed is that which may at times drift into Room 105-C from Room 105-A or 105-B. This drifting in of smoke is not a constant phenomenon and, when it does occur, the smoke is normally not heavy in concentration. At the time of the voluntary commitments by the smokers in Rooms 105-C or 105-D, and as an accommodation to them in exchange for their agreeing not to smoke at their desks, Mr. Radke gave them permission to smoke in Room 105-A, the office of the Assistant Chief of Supply Service, or, when on business, to smoke in his own office, Room 105-B.

23. In light of all of the foregoing the Court finds that the Veterans Administration did make a reasonable effort to accommodate to plaintiff's handicap while at the same time attempting to accommodate to those who felt the need to smoke during working hours.

24. Plaintiff would like to have everyone in Supply Service be forbidden to smoke in order that he would not be exposed at any time to tobacco smoke. The Director of the Medical Center has not, however, banned smoking in any of the office spaces of the Center. The Veterans Administration has not adopted a policy against smoking in any of its offices. Congress has not enacted any legislation which forbids smoking in office working spaces in any of the office buildings owned by the United States.

25. Had Congress enacted legislation or the Veterans Administration adopted a policy or the Director of the Medical Center promulgated a directive forbidding the smoking of tobacco in any office space, this Court would readily enforce that ban. In the absence, however, of a statute or regulation forbidding the smoking of tobacco in government office spaces those Supply Service employees who smoke have certain rights

which must be balanced against the desire of plaintiff that his working environment be completely free of tobacco smoke. Until and unless Congress enacts a statute banning the smoking of tobacco in government offices or the Veterans Administration promulgates a policy against smoking in its offices, the desires of those employees who wish to smoke cannot be disregarded.

26. In order to minimize the effect of tobacco smoke upon himself, plaintiff must himself take action to avoid his exposure to tobacco smoke. It appears that plaintiff can at any time close the door which separates Room 105-C from 105-D and that this would have the effect of preventing the entrance into Room 105-C of any smoke which might drift out of Rooms 105-A or 105-B. Although it is somewhat of an inconvenience and perhaps a nuisance to close that door, it appears to the Court that plaintiff would choose to do that rather than to have himself exposed to the tobacco smoke to which he is sensitive. There is no prohibition against the closing of that door, and the Chief of the Purchasing and Contracts Section testified that it was immaterial to him whether that door was kept in a closed or an open position.

27. In addition the desk of plaintiff is located but one desk away from the door which separates Rooms 105-C and 105-D. Plaintiff was advised that he could move his desk farther away from that door and closer to a window if he desired to do so, but he has chosen to have his desk remain in its present position. The Court is of the opinion that moving his desk would undoubtedly reduce his exposure to smoke.

28. By reason of the foregoing the Court finds that plaintiff is not entitled to injunctive relief nor to damages as against defendant Veterans Administration.

29. This Memorandum Decision will be in lieu of formal findings of fact and conclusions of law.

The Clerk of this Court is instructed to send uncertified copies of this Memorandum Decision to all counsel of record and to prepare and enter a judgment reflecting this decision.

DATED this 31st day of August, 1982.

United States District Judge

62-73

ANSI B 194.1-1977

ASHRAE STANDARD

Standards for NATURAL AND MECHANICAL VENTILATION

Approved by the American Society of Heating, Refrigerating and Air-Conditioning Engineers Inc. Standards Committee January 28, 1973, and Board of Directors by Letter Ballot February 16, 1973.

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FOREWORD

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CONTENTS

STANDARDS FOR NATURAL AND MECHANICAL VENTILATION

SECTION 1.0 PURPOSE AND SCOPE

This standard* defines ventilation requirements for spaces intended for human occupancy and specifies minimum and recommended ventilation air quantities for the preservation of the occupants' health, safety, and well-being.

Good ventilation practice exists when clean ventilation air is provided in sufficient quantities to maintain the required oxygen, carbon dioxide, and other air quality levels in the space under consideration.

The standard does not specify the air quantities required for the control of temperature and humidity or the exhaust quantities required for source control of domestic or industrial wastes. The specifications are based on the current state of knowledge and acceptable practice related to air filtration, odor control and environmental physiology.

*Replaces the ventilation section of ASA Standard A53.1 dated May 23, 1946.

SECTION 2.0 DEFINITIONS (SEE FIG. 1)

2.1 AIR CLEANER: a device capable of removing airborne impurities such as dusts, gases, vapors, fumes and smokes.

2.2 AIR CONDITIONING: the process of treating air to meet the requirements of the conditioned space by controlling simultaneously its temperature, humidity, cleanliness, and distribution.

2.3 AIR, EXHAUST: air removed from a space and not reused.

2.4 AIR, OUTDOOR: air taken from outdoors and therefore not previously circulated through the system.

2.5 AIR, RECIRCULATED: return air again supplied to a space.

2.6 AIR, RETURN: air removed from a space and recirculated or exhausted.

2.7 AIR, SUPPLY: that air delivered to each or any space in the system, or the total delivered to all spaces in the system, which is used for ventilation, heating, cooling, humidification, dehumidification, distribution, etc.

2.8 AIR, VENTILATION: that portion of supply air which comes from outside (outdoors) plus any recirculated air that has been treated to maintain the desired quality of air within a designated space. (See Section 3.0).

2.9 EXFILTRATION: air flow outward through cracks and interstices, around windows and doors, and through floors and walls of a space or building.

2.10 INFILTRATION: the inward air leakage through cracks and interstices, around windows and doors, and through floors and walls of a space or building.

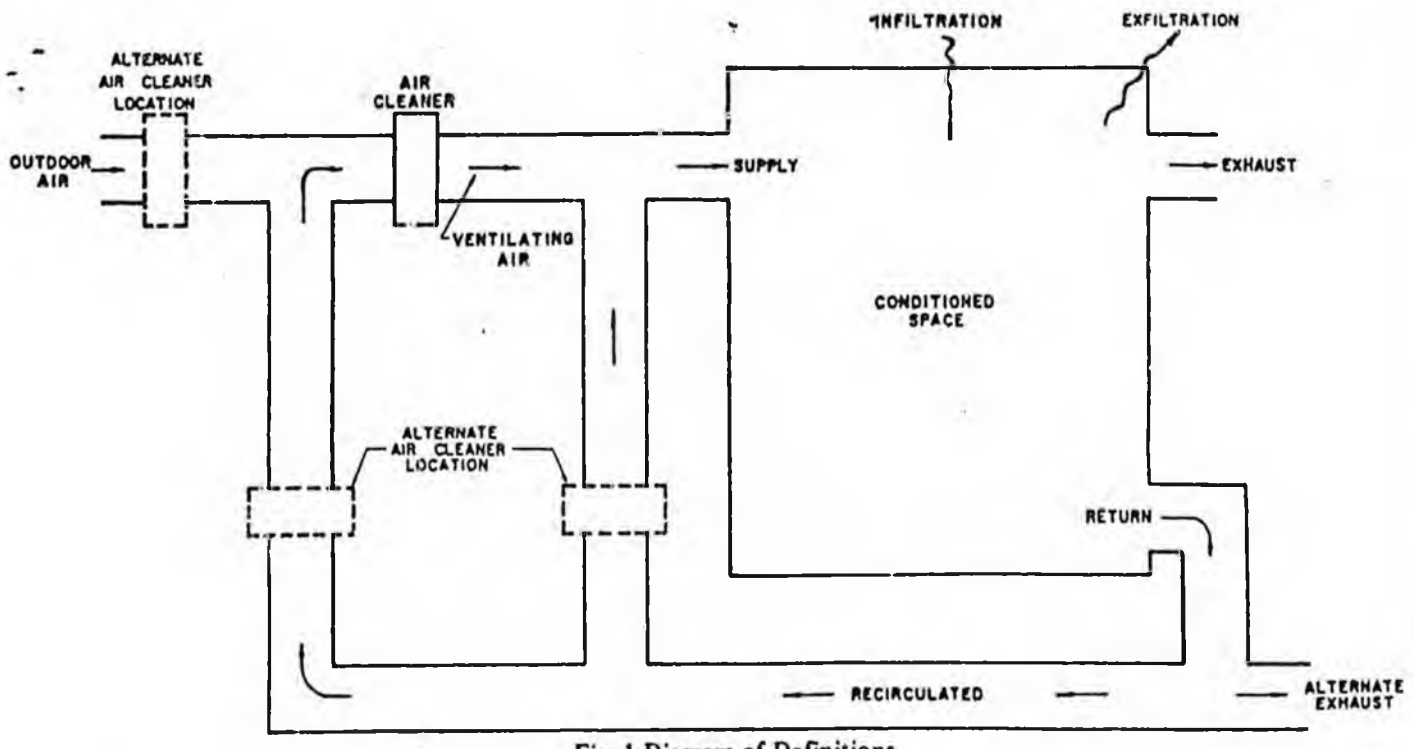

Fig. 1 Diagram of Definitions

2.11 MECHANICAL EXHAUST SYSTEM: a system for removing air from a room or space by mechanical means.

2.12 MECHANICAL SUPPLY SYSTEM: a system for forcing air into a room or space by mechanical means.

2.13 NATURAL VENTILATION: the movement of air into and out of a space through intentionally provided openings, such as windows and doors, or through non-powered ventilators.

2.14 VENTILATION: the process of supplying ventilation air to any space by natural or mechanical means. (Provision must be made for simultaneous removal of air from the space.)

SECTION 3.0. ACCEPTABLE VENTILATION AIR QUALITY (SEE BIBLIOGRAPHY)

3.1 TABLE I lists the maximum allowable pollutant concentrations in ventilation air commensurate with the ventilation requirements set forth in Section 6.0 of this Standard. In addition ventilation air shall conform to the limiting conditions given in Section 3.3.

3.2 OUTDOOR AIR shall be considered of that quality which meets or exceeds the criteria of Table I if one of the following conditions is met:

3.2.1 Monitoring Data of governmental pollution-control agencies such as the National Air Pollution Control Administration show that the air quality of the community in which the ventilation system is located meets the requirements of Table I;

3.2.2 The Community in which the ventilation system is located is similar in population, geographic and meteorological setting and industrial pattern to a community having acceptable air quality as determined in paragraph 3.2.1;

3.2.3 The Community in which the ventilation system is located has a population of less than 20,000 people, and no nearby substantial contamination source;

3.2.4 Air Monitoring, for three consecutive months, as required for inclusion in the NAPCA-SORAD System, shows that the air quality meets the requirements of Table I.

3.3 AIR shall be considered unacceptable for ventilation use in accordance with this standard if it contains any contaminant in a concentration greater than one-tenth the Threshold Limit Value (TLV) currently accepted by the American Conference of Governmental Industrial Hygienists. Where there is reasonable expectation that the air is unacceptable, as indicated above, sampling and analysis shall be carried out by qualified personnel in accordance with procedures and equipment acceptable to the American Conference of

Table I
Maximum Allowable Contaminant Concentrations
for Ventilation Air

Contaminant	Annual Average (Arithmetic Mean) $\mu g/m^3$	Short-Term Level (Not to be exceeded More than once a Year) $\mu g/m^3$	Averaging Period (hr)
Particulates	60*	150*	24
Sulfur Oxides	80	400	24
Carbon Monoxide	20,000	30,000	8
Photochemical Oxidant	100	500	1
Hydrocarbons (not including methane)	1,800	4,000	3
Nitrogen Oxides	200	500	24
Odor		Essentially Unobjectionable**	

*Federal criteria for U.S. by 1975.
**Judged unobjectionable by 60% of a panel of 10 untrained subjects.

The levels listed are met by ambient outdoor air in many major cities, or will be met by such outdoor air when passed through minimal air treatment systems (containing suitable combinations of heaters, coolers, humidifiers, etc., and including roughing particulate filters). Conformity of users' local air to these concentrations may be determined by reference to the Storage and Retrieval of Aerometric Data System (SORAD) of the National Air Pollution Control Administration, and by other means, as listed in Section 3.2.

Governmental Industrial Hygienists, the American Industrial Hygiene Association or the Occupational Health Section of the U.S. Public Health Service.

3.4 IF OUTDOOR AIR of the quality specified by Sections 3.1 and 3.3 is not available, filtration or other treatment devices shall be used to bring its quality to or above the minimum level defined by Sections 3.1 and 3.3.

3.5 ACCEPTABLE VENTILATION AIR may contain a mixture of suitably treated recirculated air and outdoor air such that the mixture meets or exceeds the quality limits stated in 3.1 and 3.3 (See Section 5.0).

SECTION 4.0. VENTILATING SYSTEMS– GENERAL REQUIREMENTS

4.1 VENTILATING SYSTEMS shall be provided with adequate openings for supply, return and exhaust air to obtain the required circulation.

4.2 OUTDOOR AIR INLETS shall be located to minimize or eliminate possible contamination.

4.3 EXHAUST DISCHARGES shall be located so that the air exhausted to the outside does not create a nuisance or contaminate outdoor air near outdoor air inlets.

4.4 VENTILATING SYSTEMS shall be designed and installed so that the air coming in contact with occupants is at a temperature, velocity and quality not to constitute a health hazard or discomfort.

4.5 VENTILATING DUCTS shall be constructed entirely of incombustible, nonporous materials. Their construction shall comply with the standards of air conditioning and ventilating systems of the National Fire Protective Association (Pamphlets NFPA No. 90A and NFPA No. 90B).

4.6 OCCUPIED SPACES shall be provided with means of supplying sufficient ventilation air for the maximum number of persons for which such spaces are designed.

4.7 THIS STANDARD assumes that contaminants from concentrated sources which can be a potential hazard or nuisance (heat, smoke, fumes, etc.) are collected as close as possible to the source by exhaust systems separate from the space ventilating system.

4.8 WHEN SPECIAL EXHAUSTS are used (as in the kitchen), consideration must be given to provide adequate supply air to the space to replace the exhaust air.

SECTION 5.0. RECIRCULATION

The requirements for ventilation quantities given in Section 6.0 are for 100% outdoor air when the outdoor air meets the specifications for air quality given in Section 3.0. Except for areas where recirculation is prohibited by other codes or standards having precedence, the outdoor air requirements may be reduced to 33% of the specified required ventilation air quantity if adequate temperature control is provided, in addition to filtering equipment, so that the maximum allowable concentration of particulates entering the space is less than that specified in Table I. If, in addition, high efficient adsorption or other odor and gas removal equipment is employed, so that the air entering the space has been purified to meet the requirements of Sections 3.1 and 3.3, the outdoor air requirement may be reduced to 15% of the specified required ventilation air quantity. *In no case shall the outdoor air quantity be less than 5 cfm per person.*

SECTION 6.0. VENTILATION REQUIREMENTS

The required air quantities are for outdoor air meeting the requirements of Section 3.0 or for a combination of acceptable outdoor air and recirculated air in accordance with Section 5.0. Minimum and recommended values are given to provide different quality levels in recognition of the need to provide choices of environmental performance for different classes of projects. In either case the designer is encouraged to use his experience and judgment in the application of this Standard as long as the minimum requirements are satisfied.

In many cases the required ventilation air quantities for spaces with positive exhaust systems, such as toilets, baths, lobbies, corridors, and kitchens, may be supplied from adjacent spaces. The sum of the ventilation requirements for the space and the adjacent space shall be provided.

	Estimated persons/ 1000 sq ft floor area. Use only when design occupancy is not known	Required ventilation air, cubic feet per minute per human occupant, (when the number is bracketed, refer to the notes).		Comments
		Minimum	Recommended	
6.1. RESIDENTIAL (Private dwelling places, single or multiple units)				
Single Unit Dwellings				
General Living Areas, Bedrooms	5	5	7-10	
Kitchens	–	20	30-50	*
Baths, Toilet Rooms	–	20	30-50	*
Basements, Utility Rooms	–	5	5	
Multiple Unit Dwellings				
General Living Areas, Bedrooms	7	5	7-10	
Kitchens	–	20	30-50	*
Baths, Toilet Rooms	–	20	30-50	*
Basements, Utility Rooms	–	5	7-10	
Garages	–	(1.5)	(2.0)-(3.0)	**
Mobile Homes	7	5	7-10	
6.2. COMMERCIAL				
General Requirements–Merchandising (Apply to all forms unless specially noted)				
Sales Floors and Showrooms (Basement and Street Floors)	30	7	10-15	
Sales Floor and Showrooms (Upper Floors)	20	7	10-15	
Storage Areas (Serving Sales Floors and Storerooms)	5	5	7-10	
Dressing Rooms	–	7	10-15	
Malls and Arcades	40	7	10-15	
Shipping and Receiving Areas	10	15	15-20	
Warehouses	5	7	10-15	
Elevators	–	7	10-15	
Food Markets, Supermarkets, etc.				
Meat Processing Rooms	10	5	5	*
Drug Stores				
Pharmacists' Work Rooms	10	20	25-30	
Specialty Shops				
Pet Shops	–	(1.0)	(1.5)-(2.0)	*
Florists	10	5	7	**
Greenhouses	1	5	7-10	**, ***

*Installed capacity for intermittent use.
**cfm per sq ft of floor area.

*Spaces maintained at low temperatures (–10 to 50 F) are not covered by these requirements unless the occupancy is continuous. Ventilation from adjoining spaces is permissible. When the occupancy is intermittent, infiltration will normally exceed the ventilation requirement. (See Chapter 23, Refrigeration Load, ASHRAE Handbook of Fundamentals, 1972).

*cfm per sq ft of floor area
**Maximum allowable concentration (MAC) for sulfur dioxide = 30 μg/cu m
***Ventilation to optimize plant growth, temperature, humidity, etc., will almost always be greater than shown.

	Estimated persons/ 1000 sq ft floor area. Use only when design occupancy is not known	Required ventilation air, cubic feet per minute per human occupant, (when the number is bracketed, refer to the notes).		Comments
		Minimum	Recommended	
Banks (see sales floors and offices				
Vaults	–	5	5	
Food Services				
Dining Rooms	70	10	15-20	
Kitchens	20	30	35-35	•
Cafeterias, Short Order, Drive-Ins, Seating Areas, and Queuing Areas	100	30	35-35	
Bars (Predominantly Stand-up)	150	30	40-50	
Cocktail Lounges	100	30	35-40	
•Exhaust to outside; source control as required.				
Hotels, Motels, Resorts				
Bedrooms (Single, Double)	5	7	10-15	
Living Rooms (Suites)	20	10	15-20	
Baths, Toilets (attached to bedrooms)	–	20	30-50	•
Corridors	5	5	7-10	
Lobbies	30	7	10-15	
Conference Rooms (Small)	70	20	25-30	
Assembly Rooms (Large)	140	15	20-25	
Public Rest Rooms	100	15	20-25	
Cottages (treat as single-unit dwellings)	–	–	– –	
(See also Food Services, Industrial, Merchandising, Barber and Beauty Shops, Garages for associated Hotel/Motel Services)				
•Installed capacity for intermittent use.				
Dry Cleaners and Laundries				
Commercial	10	20	25-30	•, ••
Storage/Pickup Areas	30	7	10-15	
Coin-operated	20	15	15-20	••
•Exhaust to outside; source control as required. ••Installed equipment must incorporate positive exhaust and control (as required) of undesirable contaminants (toxic or otherwise).				
Barber, Beauty and Health Services				
Beauty Shops (Hair dressers)	50	25	30-35	
Reducing Salons (Exercise Rooms)	20	25	30-35	
Sauna Baths and Steam Rooms	–	5	5	
Barber Shops	25	7	10-15	
Photo Studios				
Camera Rooms, Stages	10	5	7-10	•
Darkrooms	10	10	15-20	
•Thermal effects probably determine requirements.				
Shoe Repair Shops (Combined Workrooms/ Trade Areas)	10	10	15-20	

	Estimated persons/ 1000 sq ft floor area. Use only when design occupancy is not known	Required ventilation air, cubic feet per minute per human occupant, (when the number is bracketed, refer to the notes).		Comments
		Minimum	Recommended	
Garages, Auto Repair Shops, Service Stations				
Parking Garages (enclosed)	–	(1.5)	(2.0)-(3.0)	*
Auto Repair Workrooms (general)	–	(1.5)	(2.0)-(3.0)	*, **
Service Station Offices	20	7	10-15	

*cfm per sq ft of floor area

**Stands where engines are run must incorporate systems for positive engine exhaust withdrawal

Theatres				
Ticket Booths	–	5	7-10	
Lobbies, (Foyers and Lounges)	150	20	25-30	
Auditoriums (in Motion Picture Theatres, Legitimate Theatres, Lecture, Concert and Opera Halls—no smoking)	150	5	5-10	
Auditoriums (smoking permitted)	150	10	10-20	
Stages (with proscenium and curtains)	70	10	12-15	*, **
Green Rooms and Workrooms	20	10	12-15	
Public Rest Rooms	100	15	20-25	

*Thermal effects probably determine requirements

**Special ventilation will be needed to eliminate stage effect contaminants

Ballrooms				
Public	100	15	20-25	
Bowling Alleys (Seating Area)	70	15	20-25	
Gymnasiums and Arenas				
Playing Floors—minimal or no seating	70	20	25-30	
Locker Rooms	20	(30)	(40)-(50)	*
Spectator Areas	150	20	25-30	
Ramps, Foyers, and Lobbies	150	10	15-20	

*cfm/locker

Pool Rooms	25	20	25-30	
Amusement Parlors	25	20	25-30	
Tennis, Squash, Handball Courts (indoor)	–	20	25-30	
Swimming Pools (indoor)	25	15	20-25	*

*The same for air-supported structures

Ice-skating and Curling Rinks	70	10	15-20	*

*The same for air-supported structures

Roller Rinks	70	10	15-20	*

*The same for air-supported structures

	Estimated persons/ 1000 sq ft floor area. Use only when design occupancy is not known	Required ventilation air, cubic feet per minute per human occupant, (when the number is bracketed, refer to the notes).		Comments
		Minimum	Recommended	
Transportation				
Waiting Rooms	50	15	20-25	
Garages	–	(1.5)	(2.0)-(3.0)	*
Ticket and Baggage Areas, Corridors and Gate Areas	50	15	20-25	
Control Towers	50	25	30-35	
Hangers	2	10	15-20	**
Publi Rest Rooms	100	15	20-25	
Platform	150	10	15-20	
Concourses	150	10	15-20	
Repair Shops	–	10	15-20	
Offices				
General Office Space	10	15	15-25	
Conference Rooms	60	25	30-40	
Drafting Rooms, Art Rooms	20	7	10-15	
Doctor's Consultation Rooms	–	10	15-20	
Waiting Rooms (Doctors, Employment Agencies, etc.)	30	10	15-20	*
Lithographing Rooms	20	7	10-15	*
Diazo Printing Rooms	20	7	10-15	
Computer Rooms	20	5	7-10	
Keypunching Rooms	30	7	10-15	
Public Rest Rooms	100	15	20-25	
Communication				
TV/Radio Broadcasting Booths, Radio Studios	20	30	35-40	*
Motion Picture and TV Stages	20	30	35-40	
Pressrooms	100	15	20-25	
Composing Rooms	30	7	10-15	
Engraving Shops	30	7	10-15	
Telephone Switchboard Rooms (Manual)	50	7	10-15	
Telephone Switchgear Rooms (Automatic)	–	7	10-15	
Teletypewriter/Facsimile Rooms	–	5	7-10	

*cfm per sq ft of floor area

**Special solvent and exhaust problems handled separately

*Installed equipment must incorporate positive exhaust and control (as required) of undesirable contaminants (toxic or otherwise).

*Thermal effects probably determine requirements

6.3. INDUSTRIAL

Occupational safety laws in the various states usually regulate the ventilation requirements. Almost always, these are far in excess of the ventilation requirements for the occupants. The following list gives the requirements for the occupants only, assuming that the ventilation air is of a quality equal to or exceeding the limits listed in Section 3.0.

	Estimated persons/ 1000 sq ft floor area. Use only when design occupancy is not known	Required ventilation air, cubic feet per minute per human occupant, (when the number is bracketed, refer to the notes).		Comments
		Minimum	Recommended	
Mining and Rock Products*				
Underground Mine Shafts	–	20	25-30	
Underground Mine Faces (non-Toxic Materials)	–	35	40-45	
Underground Mine Faces (Toxic Materials: Beryl, Uranium and other radioactive rocks; radon emanators)		35	40-45	
Underwater Tunneling	–	35	40-45	
Control Cabs for Rock-Handling Machinery	–	20	25-30	
Control Rooms (for Lime and Cement Kilns, Crushers, Tipples, Weighing stations, etc.)		15	20-25	
Stonecutting Rooms	–	36	40-45	
Areas Serving Cement Kilns, Crushers, etc.	–	35	40-45	
*Special contaminant control systems may be required				
Metallurgy*				
Control Rooms	–	15	20-25	
Crane Cabs	–	20	25-30	
Halls Containing Cupolas, Melting Furnaces, Oxygen Furnaces, Pot Lines, etc.	–	35	40-45	
*Special contaminant control systems may be required				
Metalworking and Metal Finishing*				
Foundry Mold, Core Making and Shakeout Areas	–	35	40-45	
Halls Housing Heavy Metalworking, such as Foundry Pouring Rooms, Drop Forges, Scarfing and Rolling Stands, Cast Iron Machining	–	35	40-45	
Halls Housing Medium Metalworking, such as Finish and non-Ferrous Machining, Punch Press and Brake Operations, Spot-welding, Extruding	–	35	40-45	
Gas- and Arc-Welding Booths	–	35	40-45	
Halls Housing Light Metalworking: Appliance, Aircraft, Automotive and Machine Assembly (Excluding 3.3.7)	–	20	25-30	
Automotive Engine Test, Drive-Away Areas in Automotive Assembly Plants	–	–	– –	**
Paint Spray Booths	–	–	– –	**
Pickling, Etching, and Plating Lines	–	–	– –	**

	Estimated persons/ 1000 sq ft floor area. Use only when design occupancy is not known	Required ventilation air, cubic feet per minute per human occupant, (when the number is bracketed, refer to the notes).		Comments
		Minimum	Recommended	
Degreasing Booths, Steam Cleaning Booths	–	–	– –	••
Sandblasting Booths, Frit Spraying Booths	–	–	–	••
Rooms Serving Porcelain Enamel and Heat-Treating Furnaces	–	–	– –	••
Grinding and Polishing Rooms	–	30	35-40	••
*Special contaminant control systems may be required **Special exhaust systems required				
Chemicals and Pharmaceuticals				
Rooms Containing Grinders, Mullers, Blenders, Pulverizers, Pelletizers Sieving and Other Dusty Operations	–	30	35-40	•
Rooms Containing Reaction Vessels, Stills, Contactors, Extractors, Evaporators and Other Potential Gas Emitters	–	20	25-30	•
Rooms Containing Drying Ovens	–	15	20-25	•
Fermentation Rooms	–	15	20-25	•
Pillmaking and Capsule Filling Booths	–	10	15-20	•
Packaging Areas	–	10	15-20	•
Utility Rooms (Refrigeration Plants, Heating Plants)	–	7	10-15	
Control and Computer Rooms	–	7	10-15	
*Special contaminant control systems may be required				
Textiles, Clothing Manufacture				
Carding Rooms; Nonwoven Fabric Production and Pile Fabric Shearing Areas	–	15	20-25	
Spinning Rooms (Natural and Staple Fibers)	–	15	20-25	
Spinning Rooms (Synthetic Continuous Fiber Production)		15	20-25	
Yarn Rewinding, Warping Rooms	–	15	20-25	
Yarn and Cloth Dyeing and Coating; Cloth Printing Rooms	–	15	20-25	
Weaving and Knitting Rooms	–	15	20-25	
Cutting and Sewing Lofts	–	15	20-25	
Plastics and Rubber Processing*				
Rooms Containing Mixing and Compounding Operations (dry or liquid)	–	15	20-25	
Rooms Housing Thermoplastic Thermosetting Froming Operations (Extrusion, Injection Molding, Bead Molding, Vacuum Forming, etc.)	–	15	20-25	

	Estimated persons/ 1000 sq ft floor area. Use only when design occupancy is not known	Required ventilation air, cubic feet per minute per human occupant, (when the number is bracketed, refer to the notes).		Comments
		Minimum	Recommended	
Foam-moulding Rooms (especially Urethane)	–	15	20-25	
Glassfiber Reinforced Plastic Layup Rooms	–	15	20-25	
Trimming, Grinding and Polishing Rooms	–	25	30-35	
Vacuum-Coating Rooms	–	15	20-25	
Painting, Printing and Adhesive Assembly Operations	–	15	20-25	
Rubber Calendering Rooms	–	15	20-25	
Moulding, Vulcanizing, Lamination Rooms	–	15	20-25	
*Special contaminant control systems may be required				
Electrical Electronics and Aerospace				
Semiconductor Processing Rooms	–	10	15-20	
Circuit Board Etching, Soldering Rooms	–	20	25-30	
Magnetic Tape Production Areas	–	10	15-20	
Clean Rooms (Class 100)	–	10	15-20	
Clean Rooms (Class 10,000)	–	10	15-20	
Clean Rooms (Class 100,000)	–	10	15-20	
Encapsulation Operations (Plastic, Glass and Ceramics)	–	10	15-20	
Coil Winding Capacitor, Relay and Transformer Manufacturing Areas	–	10	15-20	
Lamp and Tube Manufacture	–	10	15-20	
TV Picture and Image Tube Manufacturing Areas	–	10	15-20	
Magnet, Magnetic Core Manufacturing Areas	–	10	15-20	
Wood Products, Papermaking				
Sawmills, Lumber Planing and Sanding, Wood Turning, Shaping, Drilling and Routing Operations, Veneer Making Areas	–	20	25-30	•
Glueing and Plywood Manufacturing Areas	–	20	25-30	•
Chipboard, Bagasseboard and Hardboard Manufacturing Areas	–	20	25-30	•
Rubbing, Staining, Varnishing and Painting Rooms	–	20	25-30	••
Crate and Pallet Making, Building Prefabrication (Nailing Operations) Areas	–	20	25-30	
Lumber and Panel Warehouses	–	20	25-30	
Chipping, Barking and Grinding Operations Areas	–	20	25-30	•
Pulping Operations, Digesters, Bleachers	–	10	15-20	•

	Estimated persons/ 1000 sq ft floor area. Use only when design occupancy is not known	Required ventilation air, cubic feet per minute per human occupant, (when the number is bracketed, refer to the notes).		Comments
		Minimum	Recommended	
Papermaking Operations (Beaters, Fourdrinier machiners, dryers, creped wadding machines, calenders)	–	10	15-20	•
Winding, Slitting, Curring, Envelope Making Rooms	–	10	15-20	
Paper Warehouses	–	20	25-30	
Corrugated Board Honeycomb Manufacture, Boxmaking room	–	20	25-30	••
Coating Rooms	–	20	25-30	••
*Special contaminant control systems may be required **Special solvent and exhaust problems handled separately				
Brewing, Distilling, Wineries, Bottling**				
Grain Mixing and Handling Areas	–	20	25-30	•
Yeast Production Areas	–	20	25-30	•
Fermentation Areas	–	20	25-30	•
Distillation Rooms	–	20	25-30	•
Fruit Handling, Crushing Areas	–	20	25-30	•
Caves	–	20	25-30	
Warehouses	–	20	25-30	
Filtration Rooms, Blending Rooms	–	20	25-30	
Bottling Areas	–	20	25-30	
Soft-Drink compounding Areas	–	20	25-30	
Carbonation Areas	–	20	25-30	
*Special solvent and exhaust problems handled separately **Spaces maintained at low temperatures (–10 to 50 F) are not covered by these requirements unless the occupancy is continuous. Ventilation from adjoining spaces is permissible. When the occupancy is intermittent, infiltration will normally exceed the ventilation requirement. (See Chapter 23, Refrigeration Load, ASHRAE Handbook of Fundamentals, 1972).				
Food Processing****				
Fruit and Vegetable Sorting and Cleaning Areas	–	20	25-30	
Cutting, Chopping, Shredding, Crushing, Squeezing Areas	–	20	25-30	•
Canning Operations	–	20	25-30	•
Bakeries, Cereal Processing, Candymaking	–	20	25-30	•
Fish Processing	–	20	25-30	••
Meat Curring, Canning	–	20	25-30	•
Dairies (Fluid Milk Operations)	–	20	25-30	
Cheesemaking, Yogurt	–	20	25-30	
Flour Milling, Bagging, etc.	–	30	35-40	•••
Sugar Purification and Salt Purification	–	20	25-30	
Control Rooms for Coffee Roasting, Grinding	–	10	15-20	
Vacuum Drying Operations	–	10	15-20	

	Estimated persons/ 1000 sq ft floor area. Use only when design occupancy is not known	Required ventilation air, cubic feet per minute per human occupant, (when the number is bracketed, refer to the notes).		Comments
		Minimum	Recommended	
Tea and Spice Handling, Packaging	–	20	25-30	
Packaging	–	20	25-30	
Refrigeration Plants, Steam Plants	–	20	25-30	•

*Thermal effects probably determine requirements
**Special solvent and exhaust problems handled separately
***Special contaminant control systems may be required
****Spaces maintained at low temperatures (−10 to 50 F) are not covered by these requirements unless the occupancy is continuous. Ventilation from adjoining spaces is permissible. When the occupancy is intermittent, infiltration will normally exceed the ventilation requirement. (See Chapter 23, Refrigeration Load, ASHRAE Handbook of Fundamentals, 1972).

Tobacco Processing				
Blending and Shredding	–	20	25-30	
Redrying, Reconstituting	–	20	25-30	
Cigar Manufacturers	–	20	25-30	
Cigarette Manufacturers, Pipe Tobacco Packaging	–	20	25-30	
Power Plants				
Control Rooms	–	10	15-20	
Boiler Rooms	–	35	40-45	
Generator Rooms	–	20	25-30	
Sewage Treatment Plants				
Control Rooms	–	10	15-20	
Compressor/Blower Motor Rooms	–	20	25-30	
Glass and Ceramic Manufacture				
Sand Handling and Mixing Areas	–	20	25-30	
Melting Furnace Support Areas	–	20	25-30	•
Platemaking, Pouring Areas	–	20	25-30	•
Bottlemaking, Blowing Machinery Areas	–	20	25-30	•
Fiber Spinning Areas	–	20	25-30	•
Grinding Rooms	–	20	25-30	••
Ceramics (Powder) Pressing and Molding Areas	–	20	25-30	
Potters Workrooms (wet)	–	20	25-30	
Kiln and Sintering Furnace Service Areas	–	20	25-30	•
Frit and Glaze Sprayrooms	–	20	25-30	••

*Thermal effects probably determine requirements
**Special contaminant control systems may be required

6.4. AGRICULTURAL
(Includes installations on farms, farmers' markets, grain elevators, etc.; for processing operations)

Fodder, Seed and Grain Handling, Storage	–	20	25-30	•

	Estimated persons/ 1000 sq ft floor area. Use only when design occupancy is not known	Required ventilation air, cubic feet per minute per human occupant, (when the number is bracketed, refer to the notes).		Comments
		Minimum	Recommended	
Animal Husbandry	–	20	25-30	•
Vegetable and Fruit Handling, Storage	–	20	25-30	••
Dairy Products	–	20	25-30	••
Natural Fiber Handling	–	20	25-30	
Tobacco Handling, Warehousing	–	20	25-30	
Mushroom Growing	–	10	15-20	

•Special contaminant control systems may be required
••Spaces maintained at low temperatures (−10 to 50 F) are not covered by these requirements unless the occupancy is continuous. Ventilation from adjoining infiltration will normally exceed the ventilation requirement. (See Chapter 23, Refrigeration Load, ASHRAE Handbook of Fundamentals, 1972).

6.5. INSTITUTIONAL

Schools				
Classrooms	50	10	10-15	
Multiple Use Rooms	70	10	10-15	
Laboratories	30	10	10-15	•
Craft Shops, Vocational Training Shops	30	10	10-15	•
Music, Rehearsal Rooms	70	10	15-20	
Auditoriums	150	5	5-7½	
Gymnasiums	70	20	25-30	
Libraries	20	7	10-12	
Common Rooms, Lounges	70	10	10-15	
Offices	10	7	10-15	
Lavatories	100	15	20-25	
Locker Rooms	20	(30)	(40)-(50)	••
Lunchrooms, Dining Halls	100	10	15-20	
Corridors	50	15	20-25	
Utility Rooms	3	5	7-10	
Dormitory Bedrooms	20	7	10-15	

•Special contaminant control systems may be required
••cfm/locker

Hospitals, Nursing and Convalescent Homes				
Foyers	50	20	25-30	
Hallways	50	20	25-30	
Single, Dual Bedrooms	15	10	15-20	
Wards	20	10	15-20	
Food Service Centers	20	35	35	
Operating Rooms, Delivery Rooms	–	20	– –	•
Ready Rooms, Recovery Rooms	–	15	– –	•
Amphitheatres	100	10	15-20	
Physical Therapy Areas	20	15	20-25	
Autopsy Rooms	10	30	40-50	
Incinerator Service Areas	–	5	7-10	••

For Shops, Restaurants, Utility Rooms, Kitchens, Bathrooms and other service items see Hotels.

•Special requirements or codes may determine requirements
••Special exhaust systems required

	Estimated persons/ 1000 sq ft floor area. Use only when design occupancy is not known	Required ventilation air, cubic feet per minute per human occupant, (when the number is bracketed, refer to the notes).		Comments
		Minimum	Recommended	
Research Institutes				
Laboratories (Light-duty, nonchemical)	50	15	20-25	*
Laboratories (Chemical)	50	15	20-25	*
Laboratories (Heavy-duty)	50	15	20-25	*
Laboratories (Radioisotope, Chemically and Biologically Toxic)	50	15	20-25	*
Machine Shops	50	15	20-25	
Darkrooms, Spectroscopy Rooms	50	10	15-20	
Animal Rooms	20	40	45-50	**
*Special contaminant control systems may be required **Special requirements or codes may determine requirements				
Military and Naval Installations				
Barracks	20	7	10-15	
Toilets/Washrooms	100	15	20-25	
Shower Rooms	100	10	15-20	
Drill Halls	70	15	20-25	
Ready Rooms, MP Stations	40	7	10-15	
Indoor Target Ranges	70	20	25-30	*
*Floor area behind firing line only				
Museums				
Exhibit Halls	70	7	10-15	
Workrooms	10	10	15-20	
Warehouses	5	5	7-10	
Prisons (See also Gymnasiums, Libraries, Applicable Industrial Areas)				
Cell Blocks	20	7	10-15	
Eating Halls	70	15	20-25	
Guard Stations	40	7	10-15	
Veterinary Hospitals				
Kennels, Stalls	20	25	30-35	*
Operating Rooms	20	25	30-35	*
Reception Rooms	30	10	15-20	
*Special requirements or codes may determine requirements				

6.6. ORGANIZATIONAL

Churches, Temples (See theaters, schools and offices)	–	–	–	
Legislative Halls				
Legislative Chambers	70	20	25-30	
Committee Rooms and Conference Rooms	70	20	25-30	

	Estimated persons/ 1000 sq ft floor area. Use only when design occupancy is not known	Required ventilation air, cubic feet per minute per human occupant, (when the number is bracketed, refer to the notes).		Comments
		Minimum	Recommended	
Foyers, Corridors	50	20	25-30	
Offices	10	10	15-20	
Press Lounges	20	20	25-30	
Press/Radio/TV Booths	20	20	25-30	
Public Rest Rooms	20	15	20-25	
Private Rest Rooms	–	20	30-50	
(For Food Service, Utilities, etc. see Hotels)				
Police and Fire Stations (See Prisons and Military Installations)	–	–	–	
Survival Shelters	–	5	–	•

•Special requirements or codes may determine requirements

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Public smoking under fire

by Bill White 2-21-83
Times Juneau Bureau

Juneau — Anti-smokers lined up this week behind a bill that would ban cigarette, pipe, and cigar smoking in public places.

"Your bill can be a terrific benefit for the people of Alaska," said Dr. John Middaugh, state immunologist and official with the Alaska Public Health Association. "It endorses the concepts of health prevention and deterrence."

Middaugh's comments came from Anchorage during a statewide teleconference on the proposal, on which the House Judiciary Committee held two days of hearings.

Susan Scott, a state employee in Anchorage, asked, "Is it unreasonable to request not to have ashes in my cauliflower at the grocery store or to stand in a long line at Long's Drug store with a man puffing on a 6-inch-long cigar or to eat a tasty meal without smoking my neighbor's pipe?"

Current law says smoking in public places "may constitute" a nuisance. The public places listed include trains, buses, ferries, elevators, libraries, museums, lecture or concert halls, gymnasiums, public schools, state meeting rooms, restrooms and hospital hallways. Portions of those areas may be designated as smoking sections.

The proposed bill would declare smoking in those areas a nuisance and a public health hazard.

It also would expand the list of areas in which smoking would be banned. On the list would be taxicabs (unless the driver agrees), all indoor dens of recreation, mu-

See Smoke, page A-4

Smoke

(Continued from page A-1)

nicipal meeting halls, businesses (including retail stores), restaurants, banks, offices, factories and warehouses.

The bill would allow civil lawsuits "to recover for personal injuries sustained as a result of the violation." But committee members discussed deleting that language to prevent harassment suits.

Rep. Hugh Malone, D-Kenai, said one of the biggest problems with the current law is no one enforces it. "I'm inclined to focus on enforcement or forget the bill."

State regulations set fines at $10 to $25 for smokers violating the law and $50 to $100 for those who fail to display no-smoking signs. State Department of Environmental Conservation officials testified they could not recall anyone ever being fined.

Rep. Don Clocksin, D-Anchorage, agreed that enforcement seems to be the problem. Narrowing the law to make sure it is enforced is more important than broadening it if there is no enforcement, he said.

Leo Kaye, executive director of the Alaska Lung Association, said studies have shown second-hand smoke is a health hazard. He added that recent court decisions recognize the rights of employees to work in smoke-free environments.

And employers pay higher health insurance and sick pay costs because of workers who smoke, Kaye said.

Rep. Charlie Bussell, R-Anchorage, pegged the cost per 50 smokers at his electric company at $300,000 a year.

Representatives of the tobacco and retailing industries spoke against the proposal.

Rick Lauber, representing the tobacco industry, argued against testimony that second-hand smoke is harmful. "A vast majority of [illegible] show there's no health hazard from second-hand smoke."

State employees who have complained are covered under the current law, he added.

But one state worker, Roberta Banko, said non-smokers are "treated as troublemakers" if they complain about the "noxious fumes."

"There are a lot of things I can choose to do, but I cannot choose not to work," she said.

Banko, who works for the Department of Labor, said Friday she planned to file a complaint against Rep. Ramona Barnes, R-Anchorage, who smoked in apparent violation of the law, through one of the hearings on the bill.

Barnes said she was in the smoking section of the room. But there are no signs posted in the hearing room.

3-2-83
CB

Richard B. Lauber

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JUNEAU, ALASKA 99801

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March 2, 1983

The Honorable Charlie Bussell
Chairman House Judiciary Committee
State Capitol
Pouch V
Juneau, Alaska 99811

Dear Mr. Chairman:

During the testimony last week on HB 84 there was mention of the White-Froeb Study. The conclusion of that report appeared to conflict with the vast array of eminent scientists who agree that no conclusive scientific evidence exists to support the claim that smoking affects the health of nonsmokers.

I am enclosing a reprint of the Congressional Record, "White-Froeb Study Discredited By Scientists", for your information.

Sincerely,

Rick Lauber

Richard B. Lauber

RBL:ml

United States of America

Congressional Record

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House of Representatives

WHITE-FROEB STUDY DISCREDITED BY SCIENTISTS

HON. L. H. FOUNTAIN
OF NORTH CAROLINA
IN THE HOUSE OF REPRESENTATIVES

Thursday, December 16, 1982

Mr. FOUNTAIN. Mr. Speaker, after 30 years of service to the people of the Second District of North Carolina, I am about to retire from the U.S. House of Representatives. Before leaving I would like to submit, for the RECORD, an item dealing with an issue with which I and many others have long been interested; namely, the alleged effect of smoking on the health of the nonsmoker.

Mr. Speaker, let me briefly place the issue into its proper context. In 1978, the Subcommittee on Tobacco of the House Committee on Agriculture heard testimony from a vast array of eminent scientists and physicians on the issue of the effect of tobacco smoke on nonsmokers. Those individuals who testified generally agreed that no conclusive scientific evidence exists to support the claim that smoking affects the health of nonsmokers. In 1980, however, an article appeared in the New England Journal of Medicine by Drs. White and Feoeb entitled "Small Airways Dysfunction in Nonsmokers Chroncially Exposed to Tobacco Smoke," in which the authors concluded that smoking in the workplace adversely affects the lung function of nonsmokers. This conclusion appeared to conflict with the testimony presented to the Subcommittee on Tobacco.

Since its publication, the White-Froeb study has been used to support both regulatory and legislative activities in the United States. For example, the study was referred to in testimony before the Civil Aeronautics Board during its recent consideration of rules regarding smoking aboard commercial aircraft. The National Research Council report entitled "Indoor Pollutants" which was issued in 1981 under an EPA contract also relies on the study. Finally, the White-Froeb study has received widespread attention in both State and local legislative and policymaking bodies.

The White-Froeb study continues to play an important role in legislative considerations, despite the fact that the study itself has been heavily criticized by scientists and health practitioners. Most recently, at the 1982 joint meeting of the American Lung Association-American Thoracic Society, Dr. Michael D. Lebowitz, professor of internal medicine, college of medicine, University of Arizona and special consultant to the Subcommittee on Tobacco, presented reasons why, in his own words, "the results of this study cannot be used to demonstrate an effect of passive smoking on forced expiratory flows in adults exposed in the workplace." Dr. Lebowitz, a noted specialist in epidemiology and respiratory diseases, said that the basic problem with the White-Froeb study is that it is "improperly designed" and that "there are problems with the whole data set and with the conclusion." Dr. Lebowitz also expressed concern that the significance of the White-Froeb data appeared to depend upon their unexplained omission of data from 3,000 subjects originally included in the study.

Mr. Speaker, Dr. Lebowitz wrote a letter, dated July 10, 1981, to our colleague, Congressman CHARLES ROSE, Chairman of the Tobacco and Peanuts Subcommittee of the House Agriculture Committee, as a result of a personal interview which Chairman ROSE and Dr. Lebowitz had with Dr. White. With the personal consent of Chairman ROSE, I am inserting herewith Dr. Lebowitz's letter. It more fully explains the author's views regarding the White-Froeb study.

I also want to mention another evaluation of the White-Froeb study, one which was made by Dr. J. G. Gostomzyk, director of the department of health of the city of Augsburg, West Germany. After an extensive, detailed review of the White-Froeb study, Dr. Gostomzyk has concluded that the White-Froeb data were incompletely presented and did not satisfy the prerequisites for scientific credibility. In addition, Dr. Gostomzyk remarked that "Dr. White's methodology is not scientific but that of a lay person with convictions," and concluded that "we assume that Dr. White's study is an attempt at scientific validation of his credo and that he possibly is unaware of the inadequacy of this methodology." It is obvious that Dr. Gostomzyk is referring to Dr. White's outspoken antismoking activities in California, including Dr. White's endorsement of public smoking referendums which were, incidentally, twice rejected by the California voters.

Given these and other criticisms of the White-Froeb study, it would appear that the New England Journal of Medicine has, perhaps unwittingly, performed a disservice to its readership. It is extremely unfortunate that a study so fraught with methodological problems, as indicated through numerous criticisms by scientists in the United States and elsewhere, should have been published in such a reputable journal of medicine. The White-Froeb study should, therefore, not be relied upon by the Congress, Federal agencies, or other legislative or policymaking bodies when considering restrictions on smoking in public places.

THE UNIVERSITY OF ARIZONA,
COLLEGE OF MEDICINE,
Tucson, Ariz., July 10, 1981

Congressman CHARLES ROSE,
Chairman, Subcommittee on Tobacco and Peanuts, House of Representatives, Rayburn Building, Washington, D.C.

DEAR CONGRESSMAN ROSE: The following is a summary of my notes on our visit to Dr. James White at UC San Diego, as per our discussion. Unfortunately, despite the statement in the editorial of the New England Journal of Medicine (27 March 1980), Dr. White and his co-author did not "faultlessly demonstrate a reduction in measures of small airways of healthy non-smokers exposed to cigarette smoke in the work place". It is apparent from our visit and the article that there were various faults in the present study, which shall be discussed.

The problems with the research design are as follows:

The participants were not only volunteers, but generally had to pay for the physical fitness course; this is the reason most were white-collar. Employees in specific factories invited White to run the physical fitness course in their factories as well, which would also bias the population sample. Blue-collar workers were not distributed randomly. [It has to be assumed that volunteers in the physical fitness courses fall into unrepresentative categories: the highly motivated, with an interest in health and usually healthier, those who are worried about health and generally less healthy; the first group would include fewer smokers and the second group would include more smokers.]

The questionnaire utilized was not a vali-

dated one per se; test-retest comparisons were made only on the smoking questions and very small groups of subjects. The smoking information was not validated. There were no test-retest or validations on symptoms asked in the questionnaire. The questionnaire itself was derived by the investigator, and included some questions from standard questionnaires; this did not appear to include standard respiratory questions, and in fact various typical respiratory questions (such as phlegm) were not asked. The questionnaire did not include questions on attitude, but did include questions on activity levels and jobs (duration, type). The questionnaire did ask how many smokers were in their work area, room size, and nature of the air conditioning. It also included questions about residences in the last 20 years (zip codes), so that exposures away from work were assessed by residential location. A question was asked about smokers in the home. [Thus, the smoking information is not validated, but is probably relatively accurate. The information about exposure to passive smoking is only approximate, as is the information on other occupational exposures. Exposures to air pollutants or to unknown toxic gases in the working place is only approximate, and their effects underestimated.]

Dr. White presented a paper to the American College of Sports Medicine, the abstract for which in 1977 indicated there were 7,122 subjects enrolled between 1969 and 1977. However, in the New England Journal of Medicine article, he states that the base population analyzed is only 5,210 smokers and non-smokers enrolled between 1969 and 1979. Although he excluded all the ex-smokers, some whose zip codes were missing, his answers as to why the rest of the subjects were excluded were entirely unclear and tend to indicate potential bias in selection of subjects for consideration for analyses. It might be added that the 2,100 subjects analyzed in the NEJM article and those analyzed and presented in the Sports Medicine abstract appear to be the same as they yield exactly the same table of results (as determined from comparison of the table in the Sports Medicine manuscript and the NEJM table).

In addition to the sources of bias mentioned above, it is apparent that the non-smokers in clean work environments and those in smoking work environments have not only chosen not to smoke, but it is likely that those non-smokers working in smoking environments may be different for a variety of reasons from non-smokers working in clean environments. Furthermore, it is apparent that the non-smokers in non-smoking environments are quite different in that their lung function is "super normal" in comparison even with the Seventh Day Adventists (the source of the Morris prediction equations).

Dr. White did state that from the questionnaire and from the baseline tests that there were no significant differences in the three non-smoking/non-inhaling groups in terms of the amount of previous exercise or oxygen consumption, but he was unsure of the difference in percent of body fat. Smokers did have less body fat, were less in terms of having lower oxygen consumption, and had less activity. He says further that there were no differences between the groups in terms of childhood respiratory history (lower respiratory tract illnesses) from his submitted questionnaire information, but he did not ask about family history. He did not ask sufficiently about respiratory questionnaires to appropriately exclude groups on the bases of productive cough ("cough bronchitis"). He states that there were no differences in prevalence rates of questionnaire responses by zip codes; if so, this contradicts other evidence vis-a-vis the effects of air pollution in these areas. He was not able to assess other exposures such as those from hobbies, exposures to gas stoves, or transportation. In terms of passive smoking in the home, he excluded such passive smokers from the non-smoking and passive smoking groups, but not from any smoking groups. He was not able to provide any information about the distribution of characteristics in those eliminated from the original 7,000 or the 2,208 that qualified because of other questionnaire results.

With regards to the pulmonary function testing done by Dr. White, it must be first noted that the instrument used is not considered a satisfactory instrument in that it is non-linear (highly biased) at both high volumes and low volumes. [This has the effect of maximizing differences in that anyone with minor aberrations of total vital capacity or of flows at the end of the flow volume curve would have very different, that is, low, flows.] The comparisons that Dr. White did and reported on in his response letter in the NEJM (14 August 1980) would not in any way modify this opinion. Furthermore, Dr. White has the only pulmonary function technician and reader. Even though he was trained at the VA hospital and his techniques were evaluated by test—retest and by comparison to other readers, any biases inherent in Dr. White's thinking (see below) would affect the way he read the tests. Furthermore, he took the FEV$_1$ and flows off the same spirogram using an approximation technique published by Morris, et al., which is not an adequate or accurate representation of those measures. All of his tests were baseline tests done after two and a half hours in the classroom in the evening on those without acute respiratory illnesses (usually on a Monday or Tuesday evening); thus, there is probably little diurnal variation or pretest biases other than those experienced by the workers during their work day and in their activities prior to the classroom. Although it is difficult to judge the effects of these factors, they may have influenced the test results, especially in those with any significant exposures during the day.

The major problem with the pulmonary function test results as reported is that they are not age- and height-adjusted, since lung volumes and flow rates are associated with both of these factors. In other words, Dr. White used raw values of flows and volumes to do comparisons. He did this on the assumption that the mean age and height were similar for the different groups. This is a mistake, since the distributions for those ages and heights could have differed. Furthermore, his quoted figures for percent predicted are strictly for the average person, age 49, with an average height, and does not represent the group for which they are provided. In terms of these statistical analysis, he just chose the SNK package among many. There is no correlation coefficient per se. "Normality" was not an objective of this study, so he cannot state anything about the normality of the subjects studied, including those he considered to have significantly different results from the non-exposed non-smokers. He does not understand the difference between clinical meaningfulness and statistical significance. It is quite obvious that the majority of those in the passive smoking and in the non-inhaling group are quite normal and that very few would be consdered abnormal by any criteria.

In his reported results, he quotes as incorrect significance level of $p.<.005$, whereas the level provided by the technique is $p.<.05$. This is very different, given the number of comparisons made, and indicates that some of the results would not be significant if corrections were made for the number of comparisons. Furthermore, the data presented in Table 1 was used to recompute the SNK analysis by Mary C. Townsend, MPH (Department of Epidemiology, University of Pittsburgh). Those results differ from those published by Dr. White and are provided in the attachment. The most important of the differences is the finding that the passive smokers and light smokers differ for the male FEV 75-85 percent. Thus, the effect of passive smoking on non-smokers is still unconfirmed, despite Dr. White's unfailing conviction that it is confirmed.

Other minor points: In terms of the carbon monoxide sampling, although it is stated that it was randomized, it was really on only 40 smoking and 40 non-smoking situations chosen by chance but not by random selection. Dr. Froeb, the co-author with Dr. White, is a private practitioner in La Jolla and helped Dr. White in drafting the NEJM manuscript from the manuscript presented at the American College of Sport Medicine. It might be pointed out that San Diego is not strictly low in air pollution concentrations, nor uniformed throughout the area; this may bias some results. Dr. White performed the pulmonary function tests until "reproducible curves were obtained", but they do not necessarily follow the Intermountain, Snowbird, or ATS recommendations.

In reviewing Dr. White's response to the letter to the Editor in the NEJM (14 August 1980), it is quite clear that Dr. White did not satisfactorily answer all the questions raised, many of which are similar to those raised in this letter. It is questionable, from the discussion, whether Dr. White would pursue any further re-analysis of the data, nor necessarily could it be pursued. It is questionable, given the basic underlying problems in the research design, that re-analysis of the data would be worthwhile. On the other hand, given other results that contradict Dr. White's, including those now in press (such as Comstock et al., Johns Hopkins, presented at the Society for Epidemiological Research in June of 1981), it would be likely that a panel discussion of passive smoking might be valuable. I will be glad to furnish further discussion or help in that matter.

Sincerely,

MICHAEL D. LEBOWITZ, Ph. D.,
F.C.C.P.,
Professor of Internal Medicine

development programs are under way through sponsorship of the U.S. Department of Agriculture, National Science Foundation, Southwest Border Regional Commission, Four-Corners Regional Commission, and the state of California.

Germ plasm collections have been made from wild guayule plants in Mexico and Texas. Plantings have been established to test yields, to increase seed supplies, and to conduct plant breeding work. Test plots have been established to determine desirable planting and cultivation practices. Research is being conducted on the possibility of increasing rubber yield by treating guayule plants with plant growth regulators.

The recent development of a seed coating process to promote germination, and the development of selective herbicides, will make direct seeding in field plantations a possibility. Eliminating nursery or greenhouse propagation could produce considerable savings in production costs.

The only guayule yield figures now available are estimates developed during the ERP. During the life of the ERP the [illegible] per hectare, approximately 480 kg of guayule rubber per year. Kelly (*15*) obtained yields of approximately 860 kg per hectare per year from one test plot in California. Foster *et al.* (*16*) have outlined the state of the art of guayule technology and described present and projected world rubber market conditions and areas of the United States where conditions favor guayule cultivation.

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17. The Diamond Shamrock Corporation, Cleveland, Ohio, is sponsoring the hydrocarbon research program at the University of Arizona.

M. Dunn

Indoor Air Pollution, Tobacco Smoke, and Public Health

James L. Repace and Alfred H. Lowrey

Serious health effects from air pollution have led to federal standards for the regulation of outdoor exposure levels. However, Americans spend about 90 percent of their time indoors (*1*). Thus the levels of indoor air pollution are important in determining total exposure to air pollutants (*2–6*). Indeed, in a recent review article (*4*) it was concluded that indoor air pollution in public office buildings is of greater potential harm than the outdoor variety, and that these exposures may constitute a real threat to the health of many urban people. The U.S. Surgeon General asserted in his report on *Smoking and Health* that tobacco smoke can be a significant source of atmospheric pollution in enclosed areas (*7*). Some 53 million U.S. smokers consumed 615 billion cigarettes in 1978 (*8*). Thus it is apparent that indoor air pollution from tobacco smoke is pandemic.

In the presence of cigarette smoke, many normal nonsmokers experience eye and throat irritation, headache, rhinitis, and coughing; allergic persons report wheezing, sneezing, and nausea as well. Particularly acute symptoms may be found in infants, children, persons with cardiovascular or respiratory disease, and wearers of contact lenses (*7, 9*). Determining the extent of the exposure of nonsmokers to cigarette smoke is important because smoking is a cause of chronic obstructive pulmonary disease, cardiovascular disease, and lung cancer, and is associated with cancers in other parts of the body (*7*); because these diseases also occur in nonsmokers; and because the products of tobacco combustion have been detected in nonsmokers (*10*).

Although measurements of indoor carbon monoxide pollution from smoking are abundant (*7*), published reports of the exposure of the population to the particulate phase of ambient tobacco smoke are rare (*7, 11–13*). Furthermore, a comprehensive theory of the generation and removal mechanisms for tobacco particulates in naturally or mechanically ventilated habitable spaces has not been presented.

We therefore undertook a systematic study of the levels of respirable suspended particulates (RSP) in several common indoor environments in an attempt (i) to determine the relation of these levels to the aerosol from tobacco smoking, (ii) to understand the effect of ventilation on tobacco smoke concentra-

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tions, and (iii) to develop a general model for estimating the range of the public's exposure. Our goal was to provide a quantitative basis for assessing the health hazards to nonsmokers posed by repeated exposure to tobacco combustion products.

Model Development

To relate the contribution of smoking to indoor RSP requires a model describing the behavior of the tobacco aerosol in indoor spaces. Bridge and Corn (*6*) found that a reduced form of an equation by Turk (*14*) reliably predicts carbon monoxide (CO) concentrations from tobacco smoke in ventilated spaces and so is of major value in assessing the possible hazards in occupied spaces (*11*). The equation is not valid, however, for a pollutant that is affected by physical decay due to adsorption on room surfaces. Penkala and DeOliviera (*15*) showed that decay of the tobacco aerosol in a well-mixed unventilated chamber is exponential.

We modify the Turk equation in differential form by adding a decay term to the removal rate and equating the rate of change of pollutant mass to the algebraic sum of the generation and removal rates.

Table 1. Recommended values of the mixing factor m. After Corn (*11*).

Configuration of air supply system	m
Perforated ceiling*	1/2
Trunk system with anemostats	1/3
Trunk system with diffusers	1/4
Natural draft and ceiling exhaust fans	1/6
Infiltration and natural draft	1/10

*This is the best standard condition.

The mixing factor is an empirical number that accounts for room-specific effects on pollutant transport. Pollutant removal is more rapid in a well-mixed atmosphere (where m is large) than in a poorly mixed, stable one (where m is small). Factors that affect m include type and placement of ventilation grills, ventilation flow rates, inhomogeneous pollutant distribution, barriers, circulation fans, and room traffic.

decay time, a time constant associated with the removal of a pollutant from a room through adsorption on surfaces and filtration; and m is the mixing factor, an empirically determined number (*16*) that modifies the ventilation time as τ_v/m, where $m \leq 1$ ($m = 1$ implies ideal mixing). Corn (*11*) suggested values of m for various ventilation systems (Table 1). We postulate that m also modifies the ideal decay time as τ_a/m. The pollution generation rate, in micrograms per minute, is given as $G = nC_0/t_b$, where n is the number of cigarettes being smoked at time t; C_0 is the total particulate matter (TPM) from both sidestream and exhaled mainstream smoke; and t_b is the duration of cigarette smoking.

Summary. An experimental and theoretical investigation is made into the range and nature of the exposure of the nonsmoking public to respirable suspended particulates from cigarette smoke. A model incorporating both physical and sociological parameters is shown to be useful in understanding particulate levels from cigarette smoke in indoor environments. Observed levels of particulates correlate with the predictions of the model. It is shown that nonsmokers are exposed to significant air pollution burdens from indoor smoking. An assessment of the public health policy implications of these burdens is presented.

The solution yields the density $A(t)$, in micrograms per cubic meter, of smoke in the room as a function of time:

$$A(t) = A_{eq}(1 - e^{-t/\tau}) \qquad (1)$$

where $A_{eq} = G\tau/V$ is the equilibrium concentration of the pollutant in the room, and where the time constant

$$\tau = \frac{\tau_a\tau_v}{m(\tau_a + \tau_v)} \qquad (2)$$

is the mean ventilation time, or the time for the smoke concentration to decrease to $1/e$ of its value (where e is the base of natural logarithms); V is the room volume in cubic meters; $\tau_v = V/Q$ is the ideal ventilation time, or the time required to replace a volume of air equal to the volume of the room by ventilation and infiltration; Q is the volume rate of ventilation and infiltration; τ_a is the ideal

If $\tau = \tau_v/m$) it becomes the reduced Turk equation of Bridge and Corn (*6*), with $m = 1$; and (ii) in the case of adsorption only (the unventilated room), $\tau = \tau_a/m$. Then, if the generation of smoke ceases at time t_b, prior to equilibrium, A will decay according to

$$A(t) = A_0 e^{-m(t-t_b)/\tau_a} \qquad (3)$$

where A_0 is a constant related to the equilibrium concentration by

$$A_0 = A_{eq}[e^{m t_b/\tau_a} - 1]$$

Equation 3 becomes the decay equation described by Penkala and DeOliviera ($t > t_b$, $m = 1$).

The modified Turk equation (Eq. 1) contains only measurable quantities, and thus in principle can be used to estimate the concentration of TPM or CO from tobacco smoke (or other indoor air pollutants), as a function of time, for any room for which the pollutant generation rate, volume, and mean ventilation time are known.

Controlled Experiments

Equation 2 shows that the mixing factor affects the time constant for decay as well as ventilation. Experiments under conditions of known ventilation were therefore necessary to assess the influence of mixing factors, decay time constants, and generation rates on the growth and decay of tobacco smoke particulates. To increase the usefulness of the experimental values determined for the mean ventilation time for the removal of tobacco smoke, we conducted these experiments in actual occupied spaces rather than in experimental chambers.

A piezobalance (TSI model 3500) (*17–19*) was used in sampling the aerosol. It collects respirable particulates (*20*) between 0.01 and 3.0 micrometers in diameter with near 100 percent efficiency (decreasing to 50 percent at 3.5 μm and to 10 percent at 4 μm). The sampling rate is 1 liter/min (*18*); the sampling time is variable. Factory-calibrated with welding smoke, the detecting crystal in the instrument used has a sensitivity of 5.74 $\mu g/min\text{-}m^3$ per hertz. The instrument underestimates the mass concentration of tobacco aerosol by about 15 percent compared to measurements made with low-volume filter sampling techniques. Readings can be affected by changes in humidity; the maximum expected error due to changes in relative humidity when sampling a hygroscopic aerosol (such as tobacco smoke) is given as $\pm$ 10 $\mu g/m^3$. The overall instrument error is about $\pm$ 10 percent compared with low-volume filter measurements of welding smoke (*19*). The aerosol from sidestream cigarette smoke (that portion emitted by the burning tip), an important component of many indoor aerosols, is lognormal, with 99 percent of the mass < 1 μm in aerodynamic diameter and with an initial mass median diameter (MMD) from 0.2 to 1.5 μm depending on dilution (*20, 21*). The relative particle sizes of fresh sidestream and mainstream smoke (the latter being that portion inhaled by the smoker) are about the same; for ex-

Table 2. Parameters for Eq. 1, as determined with experiments 1 to 3 (unventilated rooms).

Experiment	A_{eq} ($\mu g/m^3$)	A_u ($\mu g/m^3$)	τ_a/m (min)	m	r^{2*}	C_0† (mg of TPM)	Cigarette condition
1‡	530	503	10	1	.98	12.3	Smoldered
2‡	5178	551	89	1/9	.42	16.0	Smoldered
3§	1773	681	16.4	< 1	.81	23.0	Smoked

*Coefficient of determination for the decay curve. †The estimated amount of TPM liberated if the entire cigarette had been consumed, according to FTC protocol. The FTC mainstream TPM level for this cigarette is 18 mg (*24*). ‡V = 21.9 m³. §V = 29 m³.

haled mainstream smoke, particle size is estimated to be ~ 0.8 μm (MMD). Since the ambient cigarette smoke aerosol is reproducible and coagulates very slowly, it has been used as a test aerosol (*21*) and in evaluation of heating, air-conditioning, and ventilating systems (*22*). [The bulk of the ambient tobacco aerosol is probably due to cigarettes, since less than 15 percent of smokers smoke cigars or pipes (*23*).]

Unventilated Growth and Decay of Tobacco Smoke

Experiments were carried out to determine the usefulness of Eq. 3, which predicts a rapid decay for good mixing and a slow decay for poor mixing; and also to discover the limits of τ_a/m.

Experiments 1 and 2 were conducted in a wood-panelled den in a private residence. In the geometric center of the room (volume, 21.9 m³), a popular filter cigarette [containing 65 millimeters of tobacco and ranking 94th on the Federal Trade Commission (FTC) scale of tar and nicotine content (17 milligrams of tar and 1 milligram of nicotine) (*24*)] was ignited and allowed to smolder until 89 percent of its tobacco was consumed. During the first experiment, two box fans (51 centimeters in diameter) with antiparallel exhausts were used to ensure ideal mixing; each fan's exhaust, measured with a Velometer, was 55 m³/min. The growth and decay of the RSP were measured with the piezobalance. Experiment 2 was similar to experiment 1, except that the cigarette was extinguished after 75 percent of its tobacco was consumed and the circulating fans were not used, so that mixing was natural. The results of both experiments are plotted in Fig. 1, with the background levels of RSP subtracted. The data points generally represent 1-minute average values. The differences in mixing dramatically affect the slopes of the decay curves.

The theoretical curves shown in Fig. 1 were generated by fitting the data points from the decay curves to Eq. 3 with a regression analysis; A_0 and τ_a/m were determined and used to calculate the growth curves from Eq. 1, case (ii). The ratio of the slopes of the decay curves for ideal and natural mixing yields the mixing factor for the room. Table 2 gives the values obtained for the various parameters. The value of the mixing factor obtained is in good agreement with the expected value given in Table 1 for the case of infiltration and natural draft. The growth curve for the case of natural mixing (experiment 2) shows a poor fit initially because of the effect of the warm smoke rising to the ceiling and remaining

Table 3. Field survey of indoor RSP in the absence of smoking.

Locale	Room volume (m³)	Persons per room	Persons per 100 m³	Indoor RSP level* ($\mu g/m^3$)	Average time per RSP sample (min)	Outdoor RSP level† ($\mu g/m^3$)	Comment
Crepes restaurant (Washington, D.C.)	124	43	35	29	20	44	No smoking section; aroma of frying crepes evident
Sandwich restaurant (Laurel, Md.)	326	40	12	55	21	40	No smoking section; near kitchen; three smokers in smoking section
Sandwich restaurant (Laurel, Md.)	326	55	17	51	21	55	No smoking section; near kitchen; one smoker in smoking section
Fast-food restaurant (Bowie, Md.)	1,400	22	1.6	38	7		Aroma of hamburgers frying
Private residence (Seabrook, Md.)	120	11	9	24	20		Cocktail party; one candle burning 6 m from RSP detector
Private residence (Bowie, Md.)	124	1	0.8	44	15		One hour after sweeping basement floor
Private residence (Greenbelt, Md.)	22	2	9	24	6		Natural mixing‡
	22	2	9	55	1		Two fans moving 110 m³ of air per minute§
Private residence (Glenn Dale, Md.)	29	7	24	57	5		One fan moving 55 m³ of air per minute‖
Conference room (Greenbelt, Md.)	113	10	9	53	10		Two fans moving 50 m³ of air per minute¶
Public library meeting room (Bowie, Md.)	1,415	30	2.1	29	30		During piano recital
Library of Congress (Washington, D.C.)	27,000	130	0.48	30	10		Main reading room
Church (Bowie, Md.)	4,224	300	7	30	42		During Sunday service
Bagel bakery (Yonkers, N.Y.)	510	30	6	25	10	8	Aroma of baking bagels evident
Private residence (Hawthorne, N.Y.)	150	17	11	26	16		During dinner party

*Mean ± standard deviation for the Washington area samples, 40 ± 13 $\mu g/m^3$. †Duration of sampling, 5 minutes. ‡Experiment 2 background. §Experiment 1 background. ‖Experiment 3 background. ¶Experiment 4 background.

out of the detector's range for about 3 minutes. Experiment 3 demonstrated that Eq. 3 is valid under more general conditions, that is, when a cigarette is actually smoked.

We conclude that these experiments show that for the unventilated room, Eq. 3, the reduced form of Eq. 1, is useful in describing the growth and decay of cigarette smoke particulates.

Ventilated Growth and Equilibrium of Tobacco Smoke

An experiment was conducted in a ventilated conference room of a modern office building to test Eq. 1 in the case of removal of uniformly generated tobacco smoke by both decay and ventilation. The experiment involved measuring the growth of cigarette-generated RSP from background levels to near equilibrium. Analysis of the RSP-versus-time curve determines τ, the mean ventilation time, and C_T, the total RSP liberated from the combined sidestream and exhaled mainstream smoke.

The RSP detector was located in the geometric center of the 113-m³ room. Two fans with antiparallel exhausts were used to establish a vigorous circulation of 100 m³/min. The ideal ventilation time τ_a, calculated from the volumetric flow rates of the ventilation system, was 49.2 minutes for a complete change of air. Thirty-two cigarettes were smoked in 40 minutes by a relay of seven smokers, with an average of four persons smoking at any given time. When smoking their own brands, they averaged 9.8 minutes per cigarette; when smoking cigarettes supplied to them, they averaged 5.8 minutes per cigarette. All butts were collected and the amount of tobacco consumed was measured for each cigarette. The estimated mainstream TPM (M) (tar plus nicotine) generated by the 32 cigarettes was determined by weighting the TPM values for each cigarette (*24*) by the fraction of tobacco consumed, and adding the results to obtain M = 418 mg [TPM is emitted from cigarettes at a linear rate after the fourth puff (*25*)].

Figure 2 shows the growth against time of RSP from the cigarette smoke. The data points are corrected for background RSP levels and are 2-minute averages. A regression analysis using Eq. 1 yields A_{eq} = 1947 μg/m³ and τ = 14 minutes, with a coefficient of determination = .964 (from Eq. 2, τ_a = 19.5 minutes). Finally, C_T, or the total amount of RSP liberated in the room during the entire smoking period, 772 mg, is calculated by using Eq. 1; C_T/M = 1.85. This ratio represents a weighted average for six different brands of filter cigarettes that together commanded a 23 percent share of the market in 1976 (*26*).

From the goodness of fit of the theory to the data and from the observation of predicted interactive behavior among mixing, growth, and decay processes for RSP from cigarette smoke, it appears that all the room-specific factors affecting the removal of tobacco smoke (ventilation, decay, and mixing) can be combined into a single time constant τ, which can be determined for any room by regression analysis of the decay or growth-equilibrium curves, or by calculation from the equilibrium concentration if the smoke generation rate and room volume are known. The ratio of the slopes of the decay curves for ideal and natural mixing yields the mixing factor. We conclude that Eq. 1 is a useful tool for predicting the levels of tobacco smoke in both ventilated and unventilated occupied space.

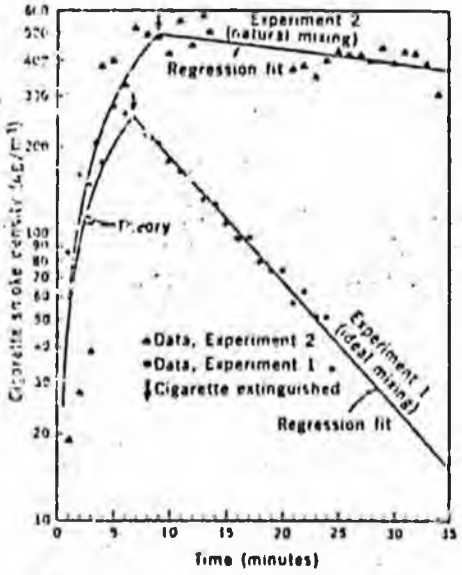

Fig. 1. Theoretical predictions versus experimental results for the growth and decay of RSP from a smoldering, average-tar cigarette in a 22-m³ unventilated room. The dramatic difference in the slopes of the decay curves reflects the difference in room air turbulence (mixing) for the otherwise similar experiments.

Field Survey of RSP

We now address the complex problem of surveying the levels of RSP indoors and determining what portion of this aerosol may be attributed to cigarette smoke by means of Eq. 1. The problem is complicated by differences in smoking rates, numbers of smokers, room volumes, effective ventilation rates, and the TPM values of various brands of cigarettes. The problem may be simplified by assuming that smoking is a random process when it occurs among large groups of people. It follows that cigarette smoke RSP values may be treated as equilibrium values; that all of the smokers may be treated as habitual smokers who smoke identical average-tar cigarettes in the same way at the same average rate, uniformly distributed over a 16-hour day. An average smoking rate r of two cigarettes per hour is calculated from the 1975 figures for the number of U.S. smokers and the U.S. domestic cigarette consumption (*8*). In 1978, the sales-weighted average mainstream TPM value M_a was 17.6 mg for all the cigarettes sold in the United States (*7*). The estimated emission rate C_0 (combined sidestream plus exhaled mainstream TPM) from a habitual smoker is given by $E = 1.85\,rM_a$ = 65 mg/hour, where 1.85, used for the ratio C_0/M_a, is taken from the conference room experiment. Physically observable in any field survey of smoking is n_s, the number of burning cigarettes (the number of "active" smokers); n_s can be related to the number of habitual smokers n_{hs} by considering that the average time for smoking a cigarette is 10 minutes (*2, 6*). This number and the previously calculated average smoking rate indicate that $n_{hs} = 3n_s$.

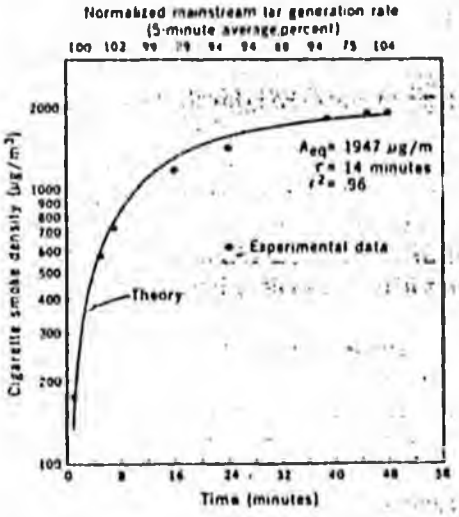

Fig. 2. Theoretical predictions versus experimental results for the attainment of equilibrium A_{eq} for the combined emission of sidestream and exhaled mainstream cigarette smoke from four chain smokers in a 113-m³ conference room with well-mixed ($n \sim 1$) ventilation in a modern office building. Under natural mixing conditions, about 11 habitual smokers would generate an equivalent equilibrated concentration of smoke. This many smokers would be expected in a group of 33 adults (well within the capacity of this 50-person conference room).

From the equilibrated form of E[illegible], we determine that

$$R = A_{eq} = 650 \frac{D_s}{C_a} \quad (4)$$

where R is the smoker-generated equilibrium RSP level in micrograms per cubic meter, D_s is the density of active smokers (number per 100 m³), and C_a is the effective rate for the removal of cigarette aerosol (air changes per hour), with $C_a = 60/\tau$.

The aerosol sampling described in this article was performed from late March through early June 1978 in the Washington, D.C., metropolitan area. The MMD (seasonal average) of the outdoor urban aerosol for Washington in 1970 was 0.5 μm, with 90 percent of the aerosol mass less than 3 μm in aerodynamic diameter and lognormally distributed (*27*).

It is important to note that all of the RSP measurements we report represent time-averaged values.

Factors other than tobacco smoke may contribute to indoor RSP. These include infiltration of outdoor RSP, cooking, dust raised by indoor traffic, and industry. By restricting the sampling to nonindustrial indoor locations where tobacco smoking is absent, the effect of the remaining variables may be assessed. Table 3 gives the RSP levels for several indoor spaces in which smoking did not take place: three restaurants, four private residences, an office building conference room, two libraries, and a church during services. The mean of these measurements is 40 μg/m³. In three instances, fans were mixing the air at a high rate and RSP levels were elevated, apparently because of dust entrainment. No correlation between the volumetric density of people (occupancy) and RSP is evident. Hemperly (*28*), in sampling RSP in Houston, found similar RSP levels in two schools, a library, and a museum—all nonsmoking areas.

Table 4 gives the results of RSP sampling in nonsmokers' automobiles traveling along two major commuter highways (Route 50 in Maryland and U.S. I-295 in Washington) during the rush hour. The samples were taken on different days and were measured in different vehicles. In all cases, the windows were slightly open and the ventilation fans were running. The mean of the data, 38 μg/m³, is not very different from the mean of the indoor readings, 40 μg/m³ (Table 3).

The impact of actual ventilation practice on ambient RSP levels from smoking was investigated at eight restaurants, three cocktail lounges, two bingo games, a dinner-dance, a bowling alley, a sports arena, and a hospital emergency waiting room. For contrast, one unventilated private residence was sampled during a cocktail party. With the exception of the hospital waiting room and the hotel bar, each space sampled represented the major part of the building and was subject to ventilation requirements specified by building codes. Sampling was generally performed well after opening time to ensure that an approximately steady-state level of smoking had been reached.

Table 4. Levels of RSP in nonsmokers' [illegible] during rush-hour traffic on a busy commuter highway in Washington, D.C., measured with the vehicles' windows slightly open and the ventilation fans running. Each car carried four persons and had a volume of 2 m³, so that the occupancy was equal to 200 persons per 100 m³.

Date	Time	Sampling time (min)	RSP level (μg/m³)
23 March	a.m.	10	40
23 March	p.m.	35	20
24 March	a.m.	20	54
28 March	a.m.	26	49
31 March	a.m.	8	25
Mean ± standard error			38 ± 15

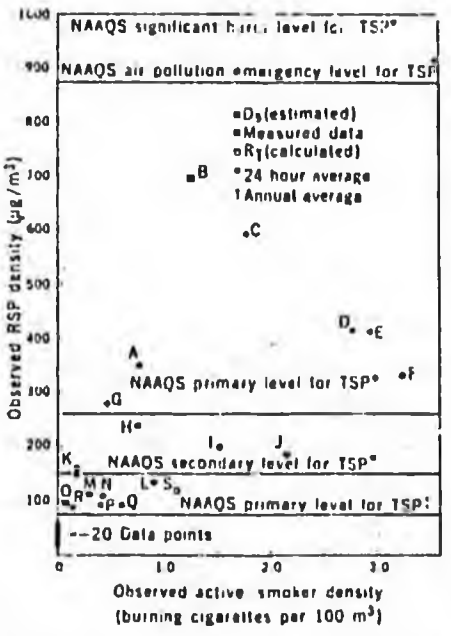

Fig. 3. Results of a field survey of short-term time-averaged levels of RSP in 38 enclosed spaces (see Tables 3, 4 and 5). Levels corresponding to federal standards for TSP are indicated for comparison only. The microenvironments include ten restaurants, three cocktail lounges, two bingo games, a dinner-dance hall, a bowling alley, a sports arena, two libraries, a church, a hospital waiting room, five vehicles, and five residences. The letters A through S correspond to those given in Table 5. The effective air change rates for microenvironments A and S are known from experiments to be C_a = 1.5 and 9.2, respectively.

The piezobalance and a stopwatch were used to take tabletop-level RSP samples for periods ranging from 10 to 50 minutes (mean, 20 minutes). The piezobalance was equilibrated in advance to avoid errors due to changes in temperature or humidity.

The room dimensions were estimated and the number of active smokers was sampled periodically throughout the measurement period and averaged. It was usually not possible to sample the premises when there was no smoking; in most cases, the RSP outside the premises was sampled for comparison. Table 5 gives the results of the measurements. Figure 3 shows the average density of active smokers (defined as the number of burning cigarettes per 100 m³) plotted against the total indoor RSP sampled. As a guide to whether a given datum is "high" or "low," the National Ambient Air Quality Standards (NAAQS) for total suspended particulates (TSP) are also shown. Since a specific averaging time is incorporated into these standards, violation of the standard is not demonstrated here. However, repeated exposure to such elevated levels can lead to "violations" of the annual standards, as will be shown later. Note that all the data for nonzero smoker density exceeded the level of the annual primary (health-related) NAAQS, whereas none of the data for zero smoker density exceeded this level. Further, the background RSP measured outside the smoking premises suggests that the source of these elevated levels was not the outdoor air. The mean and the standard deviation for the outdoor RSP are 46 ± 13 μg/m³, and in every case the outdoor level is less than the indoor. In certain cases, indoor controls are available. In bingo game 2, held in the nave of a church, the active smoker density was 0.47 per 100 m³, the occupancy was 3.6 persons per 100 m³, and the RSP density was 279 μg/m³ (Table 5). By contrast, during the tobacco smoke-free religious services, despite an occupancy of 7.0 persons per 100 m³, 30 burning votive candles, and several processions, the RSP density was 30 μg/m³. The elevated RSP levels in the bingo game clearly appear to be due to smoking. Similarly, measurements taken in the nonsmoking section of a sandwich restaurant showed considerably lower levels than in the smoking section, indicating that the contribution of smoking to RSP was much larger than the effect of cooking, even at the low cigarette densities shown (Table 5). Figure 3 shows that, in general, RSP levels increase with active smoker density, although there is

considerable scatter in the data. The question now is whether Eq. 1 is useful in explaining this scatter.

We hypothesize that the levels of RSP for finite D_s (Fig. 3) are due to near-equilibrium levels of cigarette smoke adding to much smaller background levels, and that the scatter in the RSP levels for fixed cigarette density is due primarily to differences in the mean ventilation time τ. Analyzing the background corrected data given in Table 5, we use Eq. 4 to calculate a range for C_a between 1.2 and 10.7 air changes per hour; C_a is used instead of τ to facilitate comparison with building code-specified ventilation rates. The range determined for C_a is consistent with two known values of C_a derived from the cocktail party and roadside restaurant experiments (Table 5).

The C_a for tobacco aerosol is affected by the rate of mechanical ventilation and infiltration, the rate of smoke adsorption, and mixing. The range of mechanical ventilation and infiltration can be calculated from tables of standards determined by the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) (29), the authority specified by the local building code (30). For each premise listed in Table 5, the recommended maximum number of outdoor air changes per hour (based on the estimated floor area, maximum occupancy, and volume) was calculated from the ASHRAE tables; a two-thirds recirculation of air (the maximum permitted by ASHRAE) was assumed. This yielded a range of 0.7 to 9.4 air changes per hour. Infiltration, resulting mainly from the opening of doors, was estimated from the actual occupancy during the sampling (29): we assumed a 100 percent turnover of occupants per hour. This was added to the calculated mechanical ventilation rates, giving a final estimated range of $1.3 \leq C_v \leq 13.4$ air changes per hour, where $C_v = 60/\tau_v$.

The practical range of physical decay from adsorption for cigarette aerosol can be computed from our experiments and the literature. Most establishments possess simple filters that are relatively ineffective at removing tobacco smoke (22). The shortest ideal decay time measured (in experiment 1) was equivalent to six air changes per hour (Table 2). By contrast, Penkala and DeOliviera (15) measured a mean life for tobacco smoke, under uniform mixing in a chamber with unreactive walls, equivalent to one air change per hour. These two extremes given an estimated range of $1 \leq C_d \leq 6$ air changes per hour for RSP from tobacco smoke, where $C_d = 60/\tau_d$.

The range of mixing m appropriate for the spaces listed in Table 5 is $1/4 \leq m \leq 1/2$, as determined from Table 1. By using Eq. 2, a theoretical range of mean air change rates, $1/2 \leq C_{aTh} \leq 10$ air changes per hour, is calculated from the estimated ranges for C_v, C_d, and m. This is consistent with the 1 to 11 air changes per hour determined with our model from the experimental results. In other words, the variations in the observed RSP density for fixed cigarette density can be phenomenologically ac-

Table 5. Field survey of indoor RSP sampled in the presence of smoking. Where the standard deviation is given, the value is an average of 2-minute samples; where it is not given, the sampling time is the averaging time.

Locale	Estimated volume (m^3)	Average number of smokers	Indoor sampling time (min)	Average occupancy (persons)	Active smoker density per 100 m^3	Indoor RSP ($\mu g/m^3$)	Outdoor RSP ($\mu g/m^3$)	Outdoor sampling time (min)	Occupants smoking (%)	Date	Time
A. Cocktail party*	268	2	15	14	0.75	351 ± 38			14	8 April	9:00 p.m.
B. Lodge hall	3,168	40†	50	350	1.26	697 ± 28	60	6	11†	31 March	11:00 p.m.
C. Bar and grill	507	9	18	75	1.78	589 ± 28	63	6	12	21 March	8:00 p.m.
D. Firehouse bingo	541	10.5	16	125	2.77	417 ± 63	51	15	8.4	27 March	10:00 p.m.
E. Pizzeria	170	5	32	50	2.94	414 ± 58	40	5	10	14 April	8:00 p.m.
F. Bar/cocktail lounge	216	7	26	55	3.24	334 ± 120	50	5	13	25 March	10:00 p.m.
G. Church											
Bingo game	4,224	20	8	150	0.47	279 ± 18			13	31 March	10:00 p.m.
Sunday service	4,224	0	31	300	0	30			0	13 May	11:00 a.m.
H. Inn	338	2.5	12	70	0.74	239 ± 9	22	10	3.5	23 March	1:00 p.m.
I. Bowling alley	918	14	20	128	1.53	202 ± 19	49	5	11	25 March	8:00 p.m.
J. Hospital waiting room	93	2	12	19	2.15	187 ± 52	58	6	11	28 March	10:30 p.m.
K. Shopping plaza restaurant											
Sample 1	1,369	2.5	18	95	0.18	153 ± 8	59	5	2.6	24 March	7:30 p.m.
Sample 2	1,369	2.5	18	50	0.18	163 ± 4	36	10	5	24 March	9:30 p.m.
L. Barbeque restaurant	225	2	10	25	0.89	136 ± 17			8	24 March	9:00 p.m.
M. Sandwich restaurant A											
Smoking section	781	2.25	20	30	0.29	110 ± 36	40	5	7.5	25 March	8:00 p.m.
Nonsmoking section	326	0	20	40	0	55 ± 5	40	5	0	25 March	7:30 p.m.
N. Fast food restaurant											
Sample 1	360	1.5	40	30	0.42	109 ± 38			5	26 March	7:00 p.m.
Sample 2	360	0	7	30	0	30			0	26 March	1:30 p.m.
O. Sports arena	823,000	759†	12	6,700‡	0.09	94 ± 13	24	5	11†	29 March	10:00 p.m.
P. Neighborhood restaurant/bar	250	1	12	35	0.40	93 ± 17			2.9	25 March	8:30 p.m.
Q. Hotel bar	169	1	12	25	0.59	93 ± 2			8		2:30 p.m.
R. Sandwich restaurant B											
Smoking section	781	1	8	30	0.13	86 ± 7	55	5	3.3	14 April	11:00 a.m.
Nonsmoking section	326	0	21	50	0	51	55	5	0	14 April	1:30 p.m.
S. Roadside restaurant											
Sample 1	90	1	18	5	1.12	107§			20	29 March	3:00 p.m.
Sample 2	90	0	2	3	0	30			0	29 March	3:00 p.m.

*Only the cocktail party microenvironment was unventilated. †Estimated. See (31). ‡Paid attendance. §Calculated, equilibrium value.

counted for by ventilation, recirculation, infiltration, decay, mixing, and average smoking behavior. We conclude that the finite D_s RSP levels shown in Fig. 3 are indeed generated primarily by cigarette smoke and that this is consistent with the predictions of our model.

The Range of Public Exposure

We can now model the full range of exposure of the nonsmoking public to cigarette smoke. Equation 4 may be rewritten as

$$R = 25.6 \frac{P_s}{C_s} \qquad (5)$$

where P_s is the occupancy (persons per 1000 square feet). (The volumetric measure is implicit, assuming a 10-foot ceiling.) The P_s is three times the density of habitual smokers D_{hs} and nine times the density of active smokers D_s (*31*). A family of RSP curves is generated from Eq. 5 by varying C_s and P_s over their ranges. Representative samples of this family are plotted in Fig. 4. A lower limit for C_s of about one-half to one mean air change per hour has been determined experimentally and theoretically for removal of cigarette aerosol from private dwellings ventilated by infiltration and from commercial establishments whose mechanical ventilation is poor. A realistic upper bound for C_s may be obtained from the well-ventilated environment of the commercial airliner. A mechanical (design) ventilation rate of 15 to 20 air changes per hour with no recirculation is typical of the Boeing 707 (*32*). The best ideal decay rate measured in the experiments was six air changes per hour. Assuming a mixing factor of unity, we calculate an upper limit for C_s of 26 air changes per hour. The practical range for P_s is obtained from the ASHRAE (*29*), which specifies mechanical ventilation rates for typical average occupancies in various structures. For commercial structures, these densities (in persons per 1000 square feet) range from 10 for general office space to 70 for dining rooms to 150 for such places as stand-up bars, auditoriums, arenas, and commercial aircraft. The design ventilation rate C_v is typically determined from both the design occupancy and the intended use of the structure. For example, 15 to 25 cubic feet per minute per occupant is specified for general office space, 10 to 20 for dining rooms, and 30 to 40 for cocktail lounges. In 1975, *ASHRAE Standard 90-75*, "Energy conservation in new building design," decreased these rates by factors of one-half to one-third. *ASHRAE Standard 62-73* is currently being revised to specify higher rates of ventilation for premises in which smoking is permitted. How effective would increases in C_v be in lowering the levels of RSP from tobacco smoke? Equation 5 shows that such levels decrease only exponentially with increasing C_s. Furthermore, as Kalika *et al.* (*33*) observed, "the current practice of recirculation or reuse of air is largely dictated by the economics of heating and cooling, with little regard for changes in indoor air quality." That is, ventilation may be subject to arbitrary reduction by building management or by legislative or bureaucratic fiat; in many nonurbanized areas, it may not even be regulated by building codes (*34*).

Figure 4 illustrates the estimated range

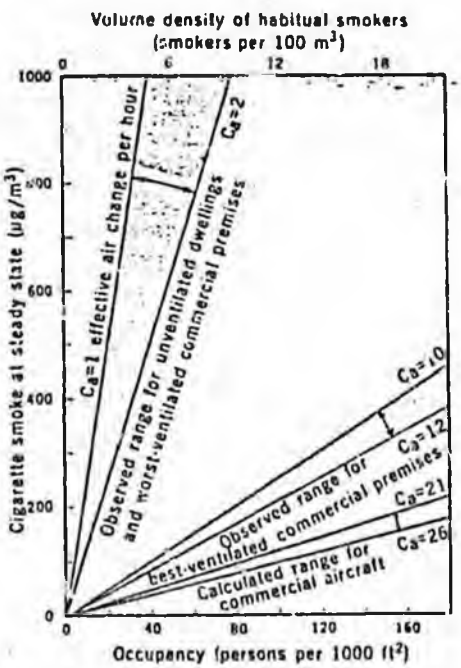

Fig. 4. Theoretical steady-state density of respirable particulates from environmental cigarette smoke in habitable indoor spaces, as related to the design occupancy P_s. On the average, one-third of adults are habitual smokers; for every three such smokers, we calculate that an average of one cigarette burns constantly throughout a 16-hour day. According to standard engineering criteria (*29*), occupancy and the type of microenvironment determine the design rate of mechanical ventilation C_v. The effective air change rate (C_s) for the removal of tobacco aerosol from room interiors is determined by C_v, by mixing, and by the rate of adsorption of tobacco particles on room surfaces. Generally C_v and hence C_s increase with P_s. [Typical P_s (in persons per 1000 square feet) ranges from 10 for office buildings to 70 for restaurants to 150 for bars, sports arenas, and aircraft (*29, 32*).] We estimate the practical range of C_s to be from 1 to 12 air changes per hour. It appears that over the combined practical ranges of P_s and C_s, repeated exposure to tobacco smoke can lead to annual RSP burdens that violate the primary annual NAAQS.

of exposure of the nonsmoking public to RSP from cigarette smoke. The actual dose of RSP is clearly a function of personal activity patterns; differences in respiration rate also affect the dose. Many different scenarios can be imagined. In the following, we express a range of RSP burdens from the cigarette aerosol relative to a typical RSP ambient background level. For an air shed (air quality control region) that is in compliance with the annual secondary (public welfare) NAAQS for TSP of 60 $\mu g/m^3$, the RSP fraction of the ambient aerosol is conservatively estimated at 50 $\mu g/m^3$ and is likely to be composed largely of combustion-produced sulfates (*35*). Since the particle size distributions of this fraction and the cigarette aerosol are both in the respirable range, we first compare them on a mass basis, without regard for differences in the chemical composition of each.

Let A, B, C, and D be nonsmokers who dwell in the same air shed and who breathe at the average rate of 20 m^3/day. All have different occupations and lifestyles that lead, as we shall see, to dramatically different RSP burdens.

Nonsmoker A is a mailman who walks a regular route and is able to live in a completely tobacco smoke-free environment. He is exposed only to the background ambient and therefore inhales 365 mg of RSP annually.

Nonsmoker B is an office worker who works a 40-hour week 50 weeks per year in a 40-m^3 office with two other persons, one of whom is a habitual smoker. Replacing D_s in Eq. 4 with $D_{hs}/3$, we find that B's mass RSP exposure is more than three times that of A (we calculate an expected C_s of 1.1 for office buildings).

Nonsmoker C is a musician who entertains in a popular, poorly ventilated nightclub 8 hours nightly, 5 nights per week, 50 weeks per year. The average P_s in the club is 100 persons per 1000 square feet (about 33 smokers). Further, C shares a 100-m^3 apartment with a roommate who is a chain smoker. C is exposed to the roommate's smoke 5 hours per day, 7 days per week, annually. By using Eqs. 4 and 5 and a C_s of one air change per hour, we find that C's mass RSP burden is more than 15 times that of A.

An alternative way of approaching the excess RSP exposure is in terms of cigarette equivalents. The cigarette with the least tar in the May 1978 FTC scale has 0.55 mg of TPM. In these terms, B's excess RSP burden is equivalent to 5 cigarettes per day and C's burden to 27 cigarettes per day. However, this may un-

derestimate the true impact, since many nonsmokers have greater sensitivity to smoke than smokers (*7*).

Nonsmoker D is a flight attendant who spends 40 hours per week, 50 weeks per year on board a commercial airliner with a C_a of 23 air changes per hour. The average P_a on the plane is 150 persons per 1000 square feet. D's RSP burden is nearly twice that of A. Even with one of the best ventilation systems in use, the high density of smokers causes a substantial increase in mass RSP inhaled by D.

The following three considerations may help to place these scenarios into perspective. First, an annual exposure 1.5 times that of A is sufficient to exceed the primary annual NAAQS; the exposure of D, B, and C to RSP all violate the standard by factors of 1.2, 2, and 10, respectively. Second, pulmonary clearance studies show that the half-life of inert respirable particles (2.8 μm in MMD) in the lungs of nonsmokers is ~ 70 days (*36*): residence of RSP in the lungs is prolonged. Third, in a series of pulmonary lavage studies on 400 nonrandomly selected volunteers (250 nonsmokers and 150 smokers) (*37*), two of the nonsmokers had tarry lavage fluids with pigmented pulmonary alveolar macrophages strikingly similar to those found in smokers. In these two volunteers, the levels of aryl hydrocarbon hydroxylase, an inducible carcinogen-detoxifying pulmonary enzyme, were intermediate in value between the levels found in smokers and most nonsmokers. These findings were attributed to the effects of exposure to tobacco smoke (*38*).

Health Policy Implications

There is good toxicologic evidence that elevated levels of particulates in outdoor air, perhaps in combination with other pollutants, cause illness and death during air pollution episodes (particulate levels in excess of 1000 $\mu g/m^3$ per 24 hours). There is much epidemiologic evidence, some of it conflicting, that lower levels of particulates, perhaps in combination with other pollutants, affect respiratory health adversely when exposure to them is sustained (*39*). (This evidence has been used to establish the thresholds for harm on which the primary annual NAAQS for TSP is based.) There is excellent toxicologic evidence that mainstream cigarette smoke causes chronic obstructive pulmonary disease (*7, 40*). Epidemiological evidence, some of it conflicting, indicates that exposure to tobacco smoke in the home affects respiratory health adversely (*7, 41*). Finally, there is excellent evidence that mainstream cigarette smoke causes cancer in many organs (*7*). Sidestream smoke is chemically identical to mainstream smoke, and typically is more concentrated (*2*). Coke-oven emissions, which chemically are similar to tobacco smoke, are associated with increased rates of many forms of cancer in coke-oven workers (*42*). Animal studies demonstrate that the particulate phase of tobacco smoke contains numerous potent carcinogens and tumor promoters, initiators, and accelerators (*7*). One of these, benzo[*a*]pyrene, was detected at a concentration of 40 parts per million in ambient tobacco smoke (*13*). Strong evidence supports a correlation between the magnitude of long-term exposure to carcinogens and the incidence of cancer (*43*). Therefore, given the efforts by public health authorities to eliminate involuntary public exposure to saccharin and the fire retardant Tris—which have, respectively, one-fifty-thousandth and one-tenth the experimental carcinogenic potency of benzo[*a*]pyrene alone (*44, 45*)—similar efforts to prevent involuntary exposure to ambient tobacco smoke (*46*) appear justified.

Conclusions

We have defined the probable range of exposure of the nonsmoking public to a common pathological aerosol, cigarette smoke. We showed, both experimentally and theoretically, that under the practical range of ventilation conditions and building occupation densities, the RSP levels generated by smokers overwhelm the effects of ventilation and inflict significant air pollution burdens on the public. Our observations show that levels of RSP in places where tobacco is smoked greatly exceed levels found in smoke-free environments, outdoors, and vehicles on busy commuter highways. Our experimental results are consistent with the large differences in 24-hour average RSP levels reported for smoking and nonsmoking homes in the Harvard Six-City Study (*47*), with a survey of short-term RSP levels in commercial and public buildings in Houston (*28*), and with other studies of tobacco-generated TSP (*7, 11-13*).

Attempts to reduce RSP levels from smoking by increasing the rate of mechanical ventilation or the efficiency of filtration yield exponentially diminishing returns for linear increases in ventilation energy (and cost). Moreover, efforts to conserve energy in buildings will decrease ventilation rates (*48*). Therefore, increased ventilation does not appear to be a solution to the problem. Indoor air is a resource whose quality should be maintained at a high level. Smoking indoors may be incompatible with this goal (*33, 49*).

Further research is necessary to define the integrated particulate exposure of various segments of the population; compliance with the NAAQS, as indicated by the establishment of outdoor TSP sampling stations, does not imply protection of the public from excessive RSP burdens. Repeated exposure to ambient cigarette smoke imposes air pollution burdens on nonsmokers that exceed the primary annual NAAQS. It appears that the RSP burdens from ambient tobacco smoke are so large that they must be incorporated explicitly in future epidemiological assessments (*50, 51*) of the relation between particulate levels and morbidity or mortality.

The Clean Air Act of 1970 and its amendments mandate the control of public exposure to outdoor TSP. However, little legislative attention has been devoted to the quality of indoor air—other than the passage of the Public Health Service Act of 1978, which provides for an ongoing study of the health costs of indoor air pollution. Clearly, indoor air pollution from tobacco smoke presents a serious risk to the health of nonsmokers. Since this risk is involuntary, it deserves as much attention as outdoor air pollution.

Note added in proof: A very recent epidemiological study concluded that long-term exposure to tobacco smoke, limited to the work environment only, is deleterious to the nonsmoker and significantly reduces small-airway function to the same extent as smoking one to ten cigarettes per day. This is consistent with scenario B (*52*). *ASHRAE Standard 62-73R*, a proposed standard for ventilation required for minimum acceptable indoor air quality, has been published (see *29*). Using data supplied in the standard, we calculate a C_a of ≤ 1.28 for office buildings where smoking is permitted.

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Paying the piper

When experiments on animals turn up carcinogens in our favorite foods and everyday consumer items, some critics invariably dismiss the data as coming only from animals. The tobacco industry has, of necessity, taken the opposite tack; for years it has argued that the evidence incriminating cigarettes shows merely a "statistical association" because it comes from studies of human deaths, not animal experiments. By now, though, the evidence that cigarettes shorten life is overwhelming; the causal connection is as firmly established as any in medicine. "Indeed," writes John Cairns, a molecular biologist and expert on cancer, "in retrospect, it is almost as if Western societies had set out to conduct a vast and fairly well controlled experiment in carcinogenesis, bringing about several million deaths and using their own people as the experimental animals."

But the cancer connection, which was the most obvious and easiest to establish, is not the major cause of death in smokers. Rather, it is coronary heart disease. Second comes lung cancer. General deterioration of the lung tissue is third. After these three major causes, a variety of other diseases and cancers make a further contribution to the high death rate of smokers. Cancers of the larynx, mouth, esophagus, bladder, kidney, and pancreas are all more common in smokers than nonsmokers. So are ulcers of the stomach and intestine, which are more likely to be fatal in smokers.

Women who smoke during pregnancy run a significant risk that their babies will die before or at birth. The newborns are likely to weigh less, to arrive prematurely, and to be more susceptible to "sudden infant death."

The risk of smoking is, in general, a 70 percent increase in the probability of dying at any age—100 percent for a two-pack smoker. As a rule of thumb, each cigarette knocks about five minutes off the smoker's life. For an average habit, that adds up to six or seven years (more for some, less for others). In the meantime, smokers lose more work days to illness than nonsmokers and spend more time in the hospital.

The ill effects of smoking are mostly, but not entirely, a consequence of the amount of inhaled smoke. Virtually all cigarette smokers inhale, even those who say they do not, and they continue to do so when they switch to pipes or cigars.

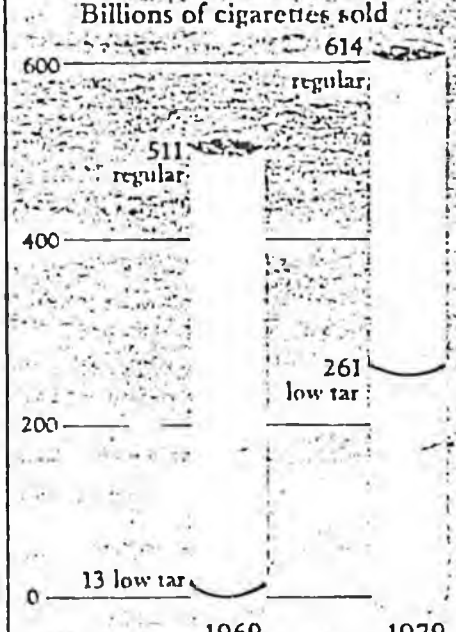
Cigarette smoke is loaded with poisons and carcinogens. The "tars," particles of organic matter, are largely responsible for causing cancer, or, perhaps, for promoting the growth of tumors started by other agents. Nicotine and carbon monoxide are thought to be the main cause of heart disease; there is debate about their relative importance.

In response to public worry about the health hazards of smoking, cigarette manufacturers over the last decade have progressively lowered the tar and nicotine content. These "lighter" brands appear to be effective in reducing rates of lung cancer. There may be a similar effect for heart disease, but the evidence is not as good. Smokers of low-tar cigarettes appear to get no protection from other respiratory illnesses.

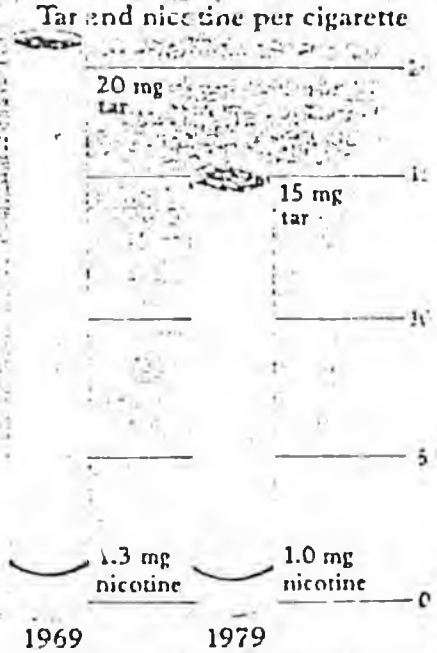
In order to elicit recommendations for his 1981 report on smoking, Surgeon General Julius B. Richmond recently called a conference to set research priorities for low-tar cigarettes. One area of concern was quickly established: The light cigarettes may pose a risk for pregnant women. Dr. Jesse Steinfeld, dean of the Medical College of Virginia in Richmond, speculates that the villain in low-tars may be carbon monoxide, since it "binds hemoglobin and may restrict the oxygen a baby needs from the mother's blood."

Carbon monoxide may turn out to be harmful to adults as well. In fact, questions abound on the safety of light cigarettes. We still do not know whether smokers who switch to low-tar cigarettes smoke more and inhale more deeply. If they do, those smokers are at least partly offsetting the presumed advantage of switching. Another question concerns whether the availability of these "safer" cigarettes has encouraged a large number of young people who otherwise would not have smoked to begin the habit. All in all, we are still far from knowing whether the low-tar, low-nicotine cigarettes will ultimately prove to be a Good Thing.

—*W. D.*



Low tar sales have soared in a decade.

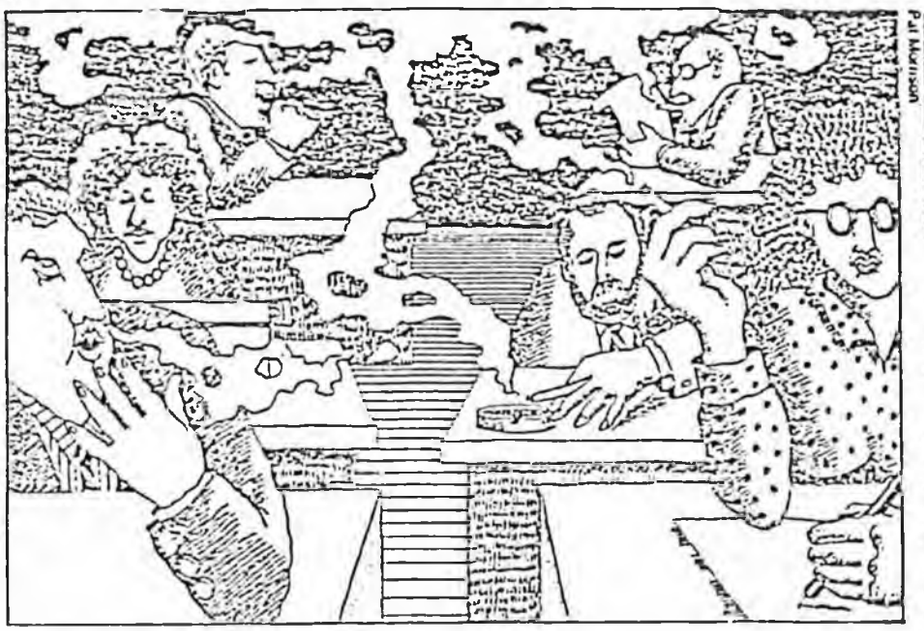


Tar and nicotine content has dropped.

Smoke gets in your eyes . . . and lungs

SAN DIEGO—For years, nonsmokers have endured the tobacco fumes of the smoking public in restaurants, elevators, conference rooms, and the workplace—all the while worrying about the effects on their health. Now there is evidence to back up their fears: A study at the University of California at San Diego shows that the breathing ability of nonsmokers exposed to tobacco smoke on the job is measurably less than that of workers in smoke-free environments.

Researchers James White and Herman Froeb tested 2 100 men and women from the San Diego area by measuring the rates at which they could force air out of their lungs. On average, they found a ten percent lower exhalation rate among nonsmokers who had worked in smoked-filled offices more than 20 years. These so-called passive smokers displayed breathing rates comparable to those of persons who smoked up to ten cigarettes a day.



Paul Madison

There is no evidence as yet that passive smokers risk such illnesses as emphysema and cancer. But their reduced lung capacity does indicate that nonsmokers forced to breathe smoke at work suffer the same kind of damage to small airways deep inside the lungs as do smokers. That damage is in the form of mucous and scar tissue, which block the smooth flow of air and can inhibit the transfer of oxygen into the bloodstream. "This is permanent damage occurring in people who have chosen not to smoke," says White, who studiously avoids the smokers among his colleagues at the university.

Unrestricted smoking at work is permitted by nearly 75 percent of all employers in the United States. Dozens of lawsuits have been filed by nonsmokers and most have been settled out of court. John Banzhaf, executive director of Action on Smoking and Health, knows of only one case that came before a judge, who ruled in favor of the plaintiff. The judge reportedly was impressed by the fact that the plaintiff's company had banned smoking in a nearby computer room because the equipment malfunctioned when exposed to cigarette smoke. He ruled that if smoking could be curtailed for the sake of a machine, it could be curtailed for the sake of a human being.

through sponsorship of the U.S. Department of Agriculture, National Science Foundation, Southwest Border Regional Commission, Four-Corners Regional Commission, and the state of California.

Germplasm collections have been made from wild guayule plants in Mexico and Texas. Plantings have been established to test yields, to increase seed supplies, and to conduct plant breeding work. Test plots have been established to determine desirable planting and cultivating practices. Research is being conducted on the possibility of increasing rubber yield by treating guayule plants with plant growth regulators.

The recent development of a seed coating process to promote germination, and the development of selective herbicides, will make direct seeding in field plantations a possibility. Eliminating nursery or greenhouse propagation could produce considerable savings in production costs.

The only guayule yield figures now available are estimates developed during the ERP. During the life of the ERP the per hectare, approximately 480 kg of guayule rubber per year. Kelly (*15*) obtained yields of approximately 860 kg per hectare per year from one test plot in California. Foster *et al.* (*16*) have outlined the state of the art of guayule technology and described present and projected world rubber market conditions and areas of the United States where conditions favor guayule cultivation.

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Indoor Air Pollution, Tobacco Smoke, and Public Health

James L. Repace and Alfred H. Lowrey

Serious health effects from air pollution have led to federal standards for the regulation of outdoor exposure levels. However, Americans spend about 90 percent of their time indoors (*1*). Thus the levels of indoor air pollution are important in determining total exposure to air pollutants (*2–6*). Indeed, in a recent review article (*4*) it was concluded that indoor air pollution in public office buildings is of greater potential harm than the outdoor variety, and that these exposures may constitute a real threat to the health of many urban people. The U.S. Surgeon General asserted in his report on *Smoking and Health* that tobacco smoke can be a significant source of atmospheric pollution in enclosed areas (*7*). Some 53 million U.S. smokers consumed 615 billion cigarettes in 1978 (*8*). Thus it is apparent that indoor air pollution from tobacco smoke is pandemic.

In the presence of cigarette smoke, many normal nonsmokers experience eye and throat irritation, headache, rhinitis, and coughing; allergic persons report wheezing, sneezing, and nausea as well. Particularly acute symptoms may be found in infants, children, persons with cardiovascular or respiratory disease, and wearers of contact lenses (*7, 9*). Determining the extent of the exposure of nonsmokers to cigarette smoke is important because smoking is a cause of chronic obstructive pulmonary disease, cardiovascular disease, and lung cancer, and is associated with cancers in other parts of the body (*7*); because these diseases also occur in nonsmokers; and because the products of tobacco combustion have been detected in nonsmokers (*10*).

Although measurements of indoor carbon monoxide pollution from smoking are abundant (*7*), published reports of the exposure of the population to the particulate phase of ambient tobacco smoke are rare (*7, 11–13*). Furthermore, a comprehensive theory of the generation and removal mechanisms for tobacco particulates in naturally or mechanically ventilated habitable spaces has not been presented.

We therefore undertook a systematic study of the levels of respirable suspended particulates (RSP) in several common indoor environments in an attempt (i) to determine the relation of these levels to the aerosol from tobacco smoking, (ii) to understand the effect of ventilation on tobacco smoke concentra-

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for estimating the range of the public's exposure. Our goal was to provide a quantitative basis for assessing the health hazards to nonsmokers posed by repeated exposure to tobacco combustion products.

Model Development

To relate the contribution of smoking to indoor RSP requires a model describing the behavior of the tobacco aerosol in indoor spaces. Bridge and Corn (*6*) found that a reduced form of an equation by Turk (*14*) reliably predicts carbon monoxide (CO) concentrations from tobacco smoke in ventilated spaces and so is of major value in assessing the possible hazards in occupied spaces (*11*). The equation is not valid, however, for a pollutant that is affected by physical decay due to adsorption on room surfaces. Penkala and DeOliviera (*15*) showed that decay of the tobacco aerosol in a well-mixed unventilated chamber is exponential.

We modify the Turk equation in differential form by adding a decay term to the removal rate and equating the rate of change of pollutant mass to the algebraic sum of the generation and removal rates. The solution yields the density $A(t)$, in micrograms per cubic meter, of smoke in the room as a function of time:

$$A(t) = A_{eq}(1 - e^{-t/\tau}) \qquad (1)$$

where $A_{eq} = G\tau/V$ is the equilibrium concentration of the pollutant in the room, and where the time constant

$$\tau = \frac{\tau_a \tau_v}{m(\tau_a + \tau_v)} \qquad (2)$$

is the mean ventilation time, or the time for the smoke concentration to decrease to $1/e$ of its value (where e is the base of natural logarithms); V is the room volume in cubic meters; $\tau_v = V/Q$ is the ideal ventilation time, or the time required to replace a volume of air equal to the volume of the room by ventilation and infiltration; Q is the volume rate of ventilation and infiltration; τ_a is the ideal decay time, a time constant associated with the removal of a pollutant from a room through adsorption on surfaces and filtration; and m is the mixing factor, an empirically determined number (*16*) that modifies the ventilation time as τ_v/m, where $m \leq 1$ ($m = 1$ implies ideal mixing). Corn (*11*) suggested values of m for various ventilation systems (Table 1). We postulate that m also modifies the ideal decay time as τ_a/m. The pollution generation rate, in micrograms per minute, is given as $G = nC_0/t_b$, where n is the number of cigarettes being smoked at time t; C_0 is the total particulate matter (TPM) from both sidestream and exhaled mainstream smoke; and t_b is the duration of cigarette smoking.

Equation 1 has two special cases: (i) in the case of ventilation only ($\tau = \tau_v/m$) it becomes the reduced Turk equation of Bridge and Corn (*6*), with $m = 1$; and (ii) in the case of adsorption only (the unventilated room), $\tau = \tau_a/m$. Then, if the generation of smoke ceases at time t_b, prior to equilibrium, A will decay according to

$$A(t) = A_0 e^{-mt/\tau_a} \qquad (3)$$

where A_0 is a constant related to the equilibrium concentration by

$$A_0 = A_{eq}[e^{mt_b/\tau_a} - 1]$$

factor m, after Corn (*11*). The mixing factor is an empirical number that accounts for room-specific effects on pollutant transport. Pollutant removal is more rapid in a well-mixed atmosphere (where m is large) than in a poorly mixed, stable one (where m is small). Factors that affect m include type and placement of ventilation grills, ventilation flow rates, inhomogeneous pollutant distribution, barriers, circulation fans, and room traffic.

Configuration of air supply system	m
Perforated ceiling*	1/2
Trunk system with anemostats	1/3
Trunk system with diffusers	1/4
Natural draft and ceiling exhaust fans	1/6
Infiltration and natural draft	1/10

*This is the best standard condition.

Summary. An experimental and theoretical investigation is made into the range and nature of the exposure of the nonsmoking public to respirable suspended particulates from cigarette smoke. A model incorporating both physical and sociological parameters is shown to be useful in understanding particulate levels from cigarette smoke in indoor environments. Observed levels of particulates correlate with the predictions of the model. It is shown that nonsmokers are exposed to significant air pollution burdens from indoor smoking. An assessment of the public health policy implications of these burdens is presented.

described by Penkala and DeOliviera (*15*) for $m = 1$.

The modified Turk equation (Eq. 1) contains only measurable quantities, and thus in principle can be used to estimate the concentration of TPM or CO from tobacco smoke (or other indoor air pollutants), as a function of time, for any room for which the pollutant generation rate, volume, and mean ventilation time are known.

Controlled Experiments

Equation 2 shows that the mixing factor affects the time constant for decay as well as ventilation. Experiments under conditions of known ventilation were therefore necessary to assess the influence of mixing factors, decay time constants, and generation rates on the growth and decay of tobacco smoke particulates. To increase the usefulness of the experimental values determined for the mean ventilation time for the removal of tobacco smoke, we conducted these experiments in actual occupied spaces rather than in experimental chambers.

A piezobalance (TSI model 3500) (*17–19*) was used in sampling the aerosol. It collects respirable particulates (*20*) between 0.01 and 3.0 micrometers in diameter with near 100 percent efficiency (decreasing to 50 percent at 3.5 μm and to 10 percent at 4 μm). The sampling rate is 1 liter/min (*18*); the sampling time is variable. Factory-calibrated with welding smoke, the detecting crystal in the instrument used has a sensitivity of 5.74 μg/min-m^3 per hertz. The instrument underestimates the mass concentration of tobacco aerosol by about 15 percent compared to measurements made with low-volume filter sampling techniques. Readings can be affected by changes in humidity; the maximum expected error due to changes in relative humidity when sampling a hygroscopic aerosol (such as tobacco smoke) is given as $\pm$ 10 μg/m^3. The overall instrument error is about $\pm$ 10 percent compared with low-volume filter measurements of welding smoke (*19*). The aerosol from sidestream cigarette smoke (that portion emitted by the burning tip), an important component of many indoor aerosols, is lognormal, with 99 percent of the mass < 1 μm in aerodynamic diameter and with an initial mass median diameter (MMD) from 0.2 to 1.5 μm depending on dilution (*20, 21*). The relative particle sizes of fresh sidestream and mainstream smoke (the latter being that portion inhaled by the smoker) are about the same; for ex-

Table 2. Parameters for Eq. 1, as determined with experiments 1 to 3 (unventilated rooms).

Experiment	A_{eq} ($\mu g/m^3$)	A_0 ($\mu g/m^3$)	τ_a/m (min)	m	r^{2*}	C_0† (mg of TPM)	Cigarette condition
1‡	530	503	10	1	.98	12.3	Smoldered
2‡	5178	551	89	1/9	.42	16.0	Smoldered
3§	1773	681	16.4	< 1	.81	23.0	Smoked

*Coefficient of determination for the decay curve. †The estimated amount of TPM liberated if the entire cigarette had been consumed, according to FTC protocol. The FTC mainstream TPM level for this cigarette is 16 mg (24). ‡V = 21.9 m^3. §V = 29 m^3.

haled mainstream smoke, particle size is estimated to be ~ 0.8 μm (MMD). Since the ambient cigarette smoke aerosol is reproducible and coagulates very slowly, it has been used as a test aerosol (*21*) and in evaluation of heating, air-conditioning, and ventilating systems (*22*). [The bulk of the ambient tobacco aerosol is probably due to cigarettes, since less than 15 percent of smokers smoke cigars or pipes (*23*).]

Unventilated Growth and Decay of Tobacco Smoke

Experiments were carried out to determine the usefulness of Eq. 3, which predicts a rapid decay for good mixing and a slow decay for poor mixing; and also to discover the limits of τ_a/m.

Experiments 1 and 2 were conducted in a wood-panelled den in a private residence. In the geometric center of the room (volume, 21.9 m^3), a popular filter cigarette [containing 65 millimeters of tobacco and ranking 94th on the Federal Trade Commission (FTC) scale of tar and nicotine content (17 milligrams of tar and 1 milligram of nicotine) (*24*)] was ignited and allowed to smolder until 89 percent of its tobacco was consumed. During the first experiment, two box fans (51 centimeters in diameter) with antiparallel exhausts were used to ensure ideal mixing; each fan's exhaust, measured with a Velometer, was 55 m^3/min. The growth and decay of the RSP were measured with the piezobalance. Experiment 2 was similar to experiment 1, except that the cigarette was extinguished after 75 percent of its tobacco was consumed and the circulating fans were not used, so that mixing was natural. The results of both experiments are plotted in Fig. 1, with the background levels of RSP subtracted. The data points generally represent 1-minute average values. The differences in mixing dramatically affect the slopes of the decay curves.

The theoretical curves shown in Fig. 1 were generated by fitting the data points from the decay curves to Eq. 3 with a regression analysis; A_0 and τ_a/m were determined and used to calculate the growth curves from Eq. 1, case (ii). The ratio of the slopes of the decay curves for ideal and natural mixing yields the mixing factor for the room. Table 2 gives the values obtained for the various parameters. The value of the mixing factor obtained is in good agreement with the expected value given in Table 1 for the case of infiltration and natural draft. The growth curve for the case of natural mixing (experiment 2) shows a poor fit initially because of the effect of the warm smoke rising to the ceiling and remaining

Table 3. Field survey of indoor RSP in the absence of smoking.

Locale	Room volume (m^3)	Persons per room	Persons per 100 m^3	Indoor RSP level* ($\mu g/m^3$)	Average time per RSP sample (min)	Outdoor RSP level† ($\mu g/m^3$)	Comment
Crepes restaurant (Washington, D.C.)	124	43	35	29	20	44	No smoking section; aroma of frying crepes evident
Sandwich restaurant (Laurel, Md.)	326	40	12	55	21	40	No smoking section; near kitchen; three smokers in smoking section
Sandwich restaurant (Laurel, Md.)	326	55	17	51	21	55	No smoking section; near kitchen; one smoker in smoking section
Fast-food restaurant (Bowie, Md.)	1,400	22	1.6	38	7		Aroma of hamburgers frying
Private residence (Seabrook, Md.)	120	11	9	24	20		Cocktail party; one candle burning 6 m from RSP detector
Private residence (Bowie, Md.)	124	1	0.8	44	15		One hour after sweeping basement floor
Private residence (Greenbelt, Md.)	22	2	9	24	6		Natural mixing‡
	22	2	9	55	1		Two fans moving 110 m^3 of air per minute§
Private residence (Glenn Dale, Md.)	29	7	24	57	5		One fan moving 55 m^3 of air per minute‖
Conference room (Greenbelt, Md.)	113	10	9	53	10		Two fans moving 50 m^3 of air per minute¶
Public library meeting room (Bowie, Md.)	1,415	30	2.1	29	30		During piano recital
Library of Congress (Washington, D.C.)	27,000	130	0.48	30	10		Main reading room
Church (Bowie, Md.)	4,224	300	7	30	42		During Sunday service
Bagel bakery (Yonkers, N.Y.)	510	30	6	25	10	8	Aroma of baking bagels evident
Private residence (Hawthorne, N.Y.)	150	17	11	26	16		During dinner party

*Mean ± standard deviation for the Washington area samples, 40 ± 13 $\mu g/m^3$. †Duration of sampling, 5 minutes. ‡Experiment 2 background. §Experiment 1 background. ‖Experiment 3 background. ¶Experiment 4 background.

out of the detector's range for about 3 minutes. Experiment 3 demonstrated that Eq. 3 is valid under more general conditions, that is, when a cigarette is actually smoked.

We conclude that these experiments show that for the unventilated room, Eq. 3, the reduced form of Eq. 1, is useful in describing the growth and decay of cigarette smoke particulates.

Ventilated Growth and Equilibrium of Tobacco Smoke

An experiment was conducted in a ventilated conference room of a modern office building to test Eq. 1 in the case of removal of uniformly generated tobacco smoke by both decay and ventilation. The experiment involved measuring the growth of cigarette-generated RSP from background levels to near equilibrium. Analysis of the RSP-versus-time curve determines τ, the mean ventilation time, and C_T, the total RSP liberated from the combined sidestream and exhaled mainstream smoke.

The RSP detector was located in the geometric center of the 113-m³ room. Two fans with antiparallel exhausts were used to establish a vigorous circulation of 100 m³/min. The ideal ventilation time τ_v, calculated from the volumetric flow rates of the ventilation system, was 49.2 minutes for a complete change of air. Thirty-two cigarettes were smoked in 49 minutes by a relay of seven smokers, with an average of four persons smoking at any given time. When smoking their own brands, they averaged 9.8 minutes per cigarette; when smoking cigarettes supplied to them, they averaged 5.8 minutes per cigarette. All butts were collected and the amount of tobacco consumed was measured for each cigarette. The estimated mainstream TPM (M) (tar plus nicotine) generated by the 32 cigarettes was determined by weighting the TPM values for each cigarette (*24*) by the fraction of tobacco consumed, and adding the results to obtain M = 418 mg [TPM is emitted from cigarettes at a linear rate after the fourth puff (*25*)].

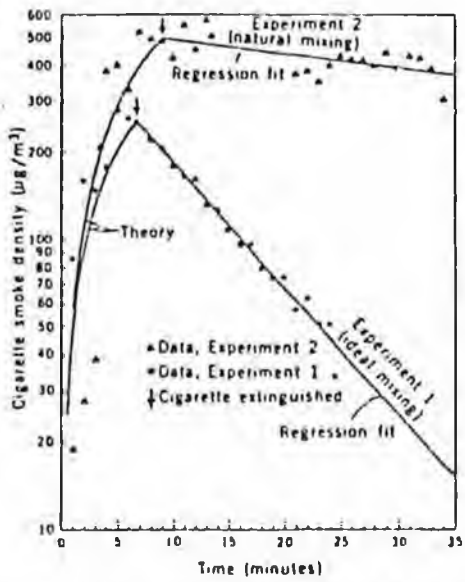

Fig. 1. Theoretical predictions versus experimental results for the growth and decay of RSP from a smoldering, average-tar cigarette in a 22-m³ unventilated room. The dramatic difference in the slopes of the decay curves reflects the difference in room air turbulence (mixing) for the otherwise similar experiments.

Figure 2 shows the growth against time of RSP from the cigarette smoke. The data points are corrected for background RSP levels and are 2-minute averages. A regression analysis using Eq. 1 yields A_{eq} = 1947 µg/m³ and τ = 14 minutes, with a coefficient of determination = .964 (from Eq. 2, τ_v = 19.5 minutes). Finally, C_T, or the total amount of RSP liberated in the room during the entire smoking period, 772 mg, is calculated by using Eq. 1; C_T/M = 1.85. This ratio represents a weighted average for six different brands of filter cigarettes that together commanded a 23 percent share of the market in 1976 (*26*).

From the goodness of fit of the theory to the data and from the observation of predicted interactive behavior among mixing, growth, and decay processes for RSP from cigarette smoke, it appears that all the room-specific factors affecting the removal of tobacco smoke (ventilation, decay, and mixing) can be combined into a single time constant τ, which can be determined for any room by regression analysis of the decay or growth-equilibrium curves, or by calculation from the equilibrium concentration if the smoke generation rate and room volume are known. The ratio of the slopes of the decay curves for ideal and natural mixing yields the mixing factor. We conclude that Eq. 1 is a useful tool for predicting the levels of tobacco smoke in both ventilated and unventilated occupied space.

Field Survey of RSP

We now address the complex problem of surveying the levels of RSP indoors and determining what portion of this aerosol may be attributed to cigarette smoke by means of Eq. 1. The problem is complicated by differences in smoking rates, numbers of smokers, room volumes, effective ventilation rates, and the TPM values of various brands of cigarettes. The problem may be simplified by assuming that smoking is a random process when it occurs among large groups of people. It follows that cigarette smoke RSP values may be treated as equilibrium values; that all of the smokers may be treated as habitual smokers who smoke identical average-tar cigarettes in the same way at the same average rate, uniformly distributed over a 16-hour day. An average smoking rate r of two cigarettes per hour is calculated from the 1975 figures for the number of U.S. smokers and the U.S. domestic cigarette consumption (*8*). In 1978, the sales-weighted average mainstream TPM value M_a was 17.6 mg for all the cigarettes sold in the United States (*7*). The estimated emission rate C_0 (combined sidestream plus exhaled mainstream TPM) from a habitual smoker is given by $E = 1.85\,rM_a$ = 65 mg/hour, where 1.85, used for the ratio C_0/M_a, is taken from the conference room experiment. Physically observable in any field survey of smoking is n_s, the number of burning cigarettes (the number of "active" smokers); n_s can be related to the number of habitual smokers n_{hs} by considering that the average time for smoking a cigarette is 10 minutes (*2*, *6*). This number and the previously calculated average smoking rate indicate that $n_{hs} = 3n_s$.

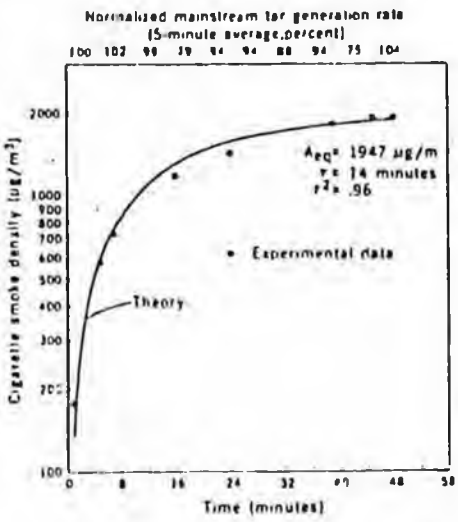

Fig. 2. Theoretical predictions versus experimental results for the attainment of equilibrium A_{eq} for the combined emission of sidestream and exhaled mainstream cigarette smoke from four chain smokers in a 113-m³ conference room with well-mixed ($m \sim 1$) ventilation in a modern office building. Under natural mixing conditions, about 11 habitual smokers would generate an equivalent equilibrated concentration of smoke. This many smokers would be expected in a group of 33 adults (well within the capacity of this 50-person conference room).

From the equilibrated form of Eq. 1, we determine that

$$R = A_{eq} = 650 \frac{D_s}{C_e} \quad (4)$$

where R is the smoker-generated equilibrium RSP level in micrograms per cubic meter, D_s is the density of active smokers (number per 100 m³), and C_e is the effective rate for the removal of cigarette aerosol (air changes per hour), with $C_e = 60/\tau$.

The aerosol sampling described in this article was performed from late March through early June 1978 in the Washington, D.C., metropolitan area. The MMD (seasonal average) of the outdoor urban aerosol for Washington in 1970 was 0.5 μm, with 90 percent of the aerosol mass less than 3 μm in aerodynamic diameter and lognormally distributed (27).

It is important to note that all of the RSP measurements we report represent time-averaged values.

Factors other than tobacco smoke may contribute to indoor RSP. These include infiltration of outdoor RSP, cooking, dust raised by indoor traffic, and industry. By restricting the sampling to nonindustrial indoor locations where tobacco smoking is absent, the effect of the remaining variables may be assessed. Table 3 gives the RSP levels for several indoor spaces in which smoking did not take place: three restaurants, four private residences, an office building conference room, two libraries, and a church during services. The mean of these measurements is 40 μg/m³. In three instances, fans were mixing the air at a high rate and RSP levels were elevated, apparently because of dust entrainment. No correlation between the volumetric density of people (occupancy) and RSP is evident. Hemperly (28), in sampling RSP in Houston, found similar RSP levels in two schools, a library, and a museum—all nonsmoking areas.

Table 4 gives the results of RSP sampling in nonsmokers' automobiles traveling along two major commuter highways (Route 50 in Maryland and U.S. I-295 in Washington) during the rush hour. The samples were taken on different days and were measured in different vehicles. In all cases, the windows were slightly open and the ventilation fans were running. The mean of the data, 38 μg/m³, is not very different from the mean of the indoor readings, 40 μg/m³ (Table 3).

The impact of actual ventilation practice on ambient RSP levels from smoking was investigated at eight restaurants, three cocktail lounges, two bingo games, a dinner-dance, a bowling alley, a sports arena, and a hospital emergency waiting room. For contrast, one unventilated private residence was sampled during a cocktail party. With the exception of the hospital waiting room and the hotel bar, each space sampled represented the major part of the building and was subject to ventilation requirements specified by building codes. Sampling was generally performed well after opening time to ensure that an approximately steady-state level of smoking had been reached.

Table 4. Levels of RSP in nonsmokers' cars during rush-hour traffic on a busy commuter highway in Washington, D.C., measured with the vehicles' windows slightly open and the ventilation fans running. Each car carried four persons and had a volume of 2 m³, so that the occupancy was equal to 200 persons per 100 m³.

Date	Time	Sampling time (min)	RSP level (μg/m³)
23 March	a.m.	10	40
23 March	p.m.	35	20
24 March	a.m.	20	54
28 March	a.m.	26	49
31 March	a.m.	8	25
Mean ± standard error			38 ± 15

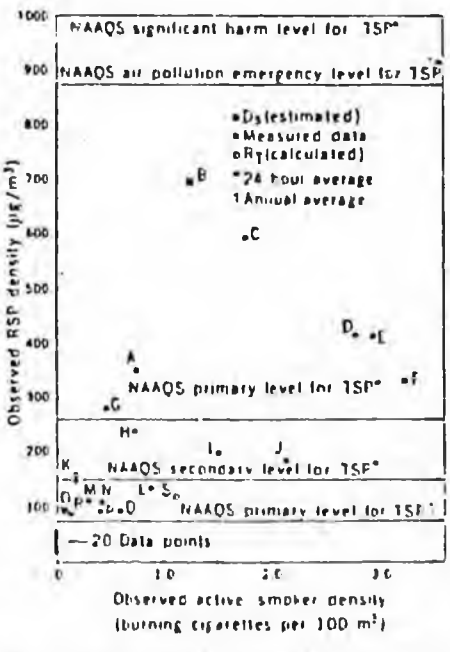

Fig. 3. Results of a field survey of short-term time-averaged levels of RSP in 38 enclosed spaces (see Tables 3, 4 and 5). Levels corresponding to federal standards for TSP are indicated for comparison only. The microenvironments include ten restaurants, three cocktail lounges, two bingo games, a dinner-dance hall, a bowling alley, a sports arena, two libraries, a church, a hospital waiting room, five vehicles, and five residences. The letters A through S correspond to those given in Table 5. The effective air change rates for microenvironments A and S are known from experiments to be C_e = 1.5 and 9.2, respectively.

The piezobalance and a stopwatch were used to take tabletop-level RSP samples for periods ranging from 10 to 50 minutes (mean, 20 minutes). The piezobalance was equilibrated in advance to avoid errors due to changes in temperature or humidity.

The room dimensions were estimated and the number of active smokers was sampled periodically throughout the measurement period and averaged. It was usually not possible to sample the premises when there was no smoking; in most cases, the RSP outside the premises was sampled for comparison. Table 5 gives the results of the measurements. Figure 3 shows the average density of active smokers (defined as the number of burning cigarettes per 100 m³) plotted against the total indoor RSP sampled. As a guide to whether a given datum is "high" or "low," the National Ambient Air Quality Standards (NAAQS) for total suspended particulates (TSP) are also shown. Since a specific averaging time is incorporated into these standards, violation of the standard is not demonstrated here. However, repeated exposure to such elevated levels can lead to "violation" of the annual standards, as will be shown later. Note that all the data for finite smoker density exceeded the level of the annual primary (health-related) NAAQS, whereas none of the data for zero smoker density exceeded this level. Further, the background RSP measured outside the smoking premises suggests that the source of these elevated levels was not the outdoor air. The mean and the standard deviation for the outdoor RSP are 46 ± 13 μg/m³, and in every case the outdoor level is less than the indoor. In certain cases, indoor controls are available. In bingo game 2, held in the nave of a church, the active smoker density was 0.47 per 100 m³, the occupancy was 3.6 persons per 100 m³, and the RSP density was 279 μg/m³ (Table 5). By contrast, during the tobacco smoke-free religious services, despite an occupancy of 7.0 persons per 100 m³, 30 burning votive candles, and several processions, the RSP density was 30 μg/m³. The elevated RSP levels in the bingo game clearly appear to be due to smoking. Similarly, measurements taken in the nonsmoking section of a sandwich restaurant showed considerably lower levels than in the smoking section, indicating that the contribution of smoking to RSP was much larger than the effect of cooking, even at the low cigarette densities shown (Table 5). Figure 3 shows that, in general, RSP levels increase with active smoker density, although there is

considerable scatter in the data. The question now is whether Eq. 1 is useful in explaining this scatter.

We hypothesize that the levels of RSP for finite D_s (Fig. 3) are due to near-equilibrium levels of cigarette smoke adding to much smaller background levels, and that the scatter in the RSP levels for fixed cigarette density is due primarily to differences in the mean ventilation time τ. Analyzing the background corrected data given in Table 5, we use Eq. 4 to calculate a range for C_s between 1.2 and 10.7 air changes per hour; C_s is used instead of τ to facilitate comparison with building code-specified ventilation rates. The range determined for C_s is consistent with two known values of C_s derived from the cocktail party and roadside restaurant experiments (Table 5).

The C_s for tobacco aerosol is affected by the rate of mechanical ventilation and infiltration, the rate of smoke adsorption, and mixing. The range of mechanical ventilation and infiltration can be calculated from tables of standards determined by the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) (*29*), the authority specified by the local building code (*30*). For each premise listed in Table 5, the recommended maximum number of outdoor air changes per hour (based on the estimated floor area, maximum occupancy, and volume) was calculated from the ASHRAE tables; a two-thirds recirculation of air (the maximum permitted by ASHRAE) was assumed. This yielded a range of 0.7 to 9.4 air changes per hour. Infiltration, resulting mainly from the opening of doors, was estimated from the actual occupancy during the sampling (*29*); we assumed a 100 percent turnover of occupants per hour. This was added to the calculated mechanical ventilation rates, giving a final estimated range of $1.3 \leq C_v \leq 13.4$ air changes per hour, where $C_v = 60/\tau_v$.

The practical range of physical decay from adsorption for cigarette aerosol can be computed from our experiments and the literature. Most establishments possess simple filters that are relatively ineffective at removing tobacco smoke (*22*). The shortest ideal decay time measured (in experiment 1) was equivalent to six air changes per hour (Table 2). By contrast, Penkala and DeOliviera (*15*) measured a mean life for tobacco smoke, under uniform mixing in a chamber with unreactive walls, equivalent to one air change per hour. These two extremes given an estimated range of $1 \leq C_d \leq 6$ air changes per hour for RSP from tobacco smoke, where $C_d = 60/\tau_d$.

The range of mixing m appropriate for the spaces listed in Table 5 is $1/4 \leq m \leq 1/2$, as determined from Table 1. By using Eq. 2, a theoretical range of mean air change rates, $1/2 \leq C_{aTh} \leq 10$ air changes per hour, is calculated from the estimated ranges for C_v, C_d, and m. This is consistent with the 1 to 11 air changes per hour determined with our model from the experimental results. In other words, the variations in the observed RSP density for fixed cigarette density can be phenomenologically ac-

Table 5. Field survey of indoor RSP sampled in the presence of smoking. Where the standard deviation is given, the value is an average of 2-minute samples; where it is not given, the sampling time is the averaging time.

Locale	Estimated volume (m^3)	Average number of smokers	Indoor sampling time (min)	Average occupancy (persons)	Active smoker density per 100 m^3	Indoor RSP ($\mu g/m^3$)	Outdoor RSP ($\mu g/m^3$)	Outdoor sampling time (min)	Occupants smoking (%)	Date	Time
A. Cocktail party*	268	2	15	14	0.75	351 ± 38			14	8 April	9:00 p.m.
B. Lodge hall	3,168	40†	50	350	1.26	697 ± 28	60	6	11‡	31 March	11:00 p.m.
C. Bar and grill	507	9	18	75	1.78	589 ± 28	63	6	12	21 March	8:00 p.m.
D. Firehouse bingo	541	10.5	16	125	2.77	417 ± 63	51	15	8.4	27 March	10:00 p.m.
E. Pizzeria	170	5	32	50	2.94	414 ± 32	40	5	10	14 April	8:00 p.m.
F. Bar/cocktail lounge	216	7	26	55	3.24	334 ± 120	50	5	13	25 March	10:00 p.m.
G. Church											
Bingo game	4,224	20	8	150	0.47	279 ± 18			13	31 March	10:00 p.m.
Sunday service	4,224	0	31	300	0	30			0	13 May	11:00 a.m.
H. Inn	338	2.5	12	70	0.74	239 ± 9	22	10	3.5	23 March	1:00 p.m.
I. Bowling alley	918	14	20	128	1.53	202 ± 19	49	5	11	25 March	8:00 p.m.
J. Hospital waiting room	93	2	12	19	2.15	187 ± 52	58	6	11	28 March	10:30 p.m.
K. Shopping plaza restaurant											
Sample 1	1,369	2.5	18	95	0.18	153 ± 8	59	5	2.6	24 March	7:30 p.m.
Sample 2	1,369	2.5	18	50	0.18	163 ± 4	36	10	5	24 March	9:30 p.m.
L. Barbeque restaurant	225	2	10	25	0.89	136 ± 17			8	24 March	9:00 p.m.
M. Sandwich restaurant A											
Smoking section	781	2.25	20	30	0.29	110 ± 36	40	5	7.5	25 March	8:00 p.m.
Nonsmoking section	326	0	20	40	0	55 ± 5	40	5	0	25 March	7:30 p.m.
N. Fast-food restaurant											
Sample 1	360	1.5	40	30	0.42	109 ± 38			5	26 March	2:00 p.m.
Sample 2	360	0	7	30	0	30			0	26 March	1:30 p.m.
O. Sports arena	823,000	759†	12	6,700‡	0.09	94 ± 13	24	5	11†	29 March	10:00 p.m.
P. Neighborhood restaurant/bar	250	1	12	35	0.40	93 ± 17			2.9	25 March	8:30 p.m.
Q. Hotel bar	169	1	12	25	0.59	93 ± 2			8		2:30 p.m.
R. Sandwich restaurant B											
Smoking section	781	1	8	30	0.13	86 ± 7	55	5	3.3	14 April	11:00 a.m.
Nonsmoking section	326	0	21	50	0	51	55	5	0	14 April	1:30 p.m.
S. Roadside restaurant											
Sample 1	90	1	18	5	1.12	107§			20	29 March	3:00 p.m.
Sample 2	90	0	2	3	0	30			0	29 March	3:00 p.m.

*Only the cocktail party microenvironment was unventilated. †Estimated. See (*31*). ‡Paid attendance. §Calculated, equilibrium value.

infiltration, decay, mixing, and average smoking behavior. We conclude that the finite D_s RSP levels shown in Fig. 3 are indeed generated primarily by cigarette smoke and that this is consistent with the predictions of our model.

The Range of Public Exposure

We can now model the full range of exposure of the nonsmoking public to cigarette smoke. Equation 4 may be rewritten as

$$R = 25.6 \frac{P_s}{C_s} \quad (5)$$

where P_s is the occupancy (persons per 1000 square feet). (The volumetric measure is implicit, assuming a 10-foot ceiling.) The P_s is three times the density of habitual smokers D_{hs} and nine times the density of active smokers D_s (*31*). A family of RSP curves is generated from Eq. 5 by varying C_s and P_s over their ranges. Representative samples of this family are plotted in Fig. 4. A lower limit for C_s of about one-half to one mean air change per hour has been determined experimentally and theoretically for removal of cigarette aerosol from private dwellings ventilated by infiltration and from commercial establishments whose mechanical ventilation is poor. A realistic upper bound for C_s may be obtained from the well-ventilated environment of the commercial airliner. A mechanical (design) ventilation rate of 15 to 20 air changes per hour with no recirculation is typical of the Boeing 707 (*32*). The best ideal decay rate measured in the experiments was six air changes per hour. Assuming a mixing factor of unity, we calculate an upper limit for C_s of 26 air changes per hour. The practical range for P_s is obtained from the ASHRAE (*29*), which specifies mechanical ventilation rates for typical average occupancies in various structures. For commercial structures, these densities (in persons per 1000 square feet) range from 10 for general office space to 70 for dining rooms to 150 for such places as stand-up bars, auditoriums, arenas, and commercial aircraft. The design ventilation rate C_v is typically determined from both the design occupancy and the intended use of the structure. For example, 15 to 25 cubic feet per minute per occupant is specified for general office space, 10 to 20 for dining rooms, and 30 to 40 for cocktail lounges. In 1975, *ASHRAE Standard 90-75*, "Energy conservation in new building design," decreased these rates by factors of 2 to 3. The current *Standard 62-73* is currently being revised to specify higher rates of ventilation for premises in which smoking is permitted. How effective would increases in C_v be in lowering the levels of RSP from tobacco smoke? Equation 5 shows that such levels decrease only exponentially with increasing C_s. Furthermore, as Kalika *et al.* (*33*) observed, "the current practice of recirculation or reuse of air is largely dictated by the economics of heating and cooling, with little regard for changes in indoor air quality." That is, ventilation may be subject to arbitrary reduction by building management or by legislative or bureaucratic fiat; in many nonurbanized areas, it may not even be regulated by building codes (*34*).

Figure 4 illustrates the estimated range

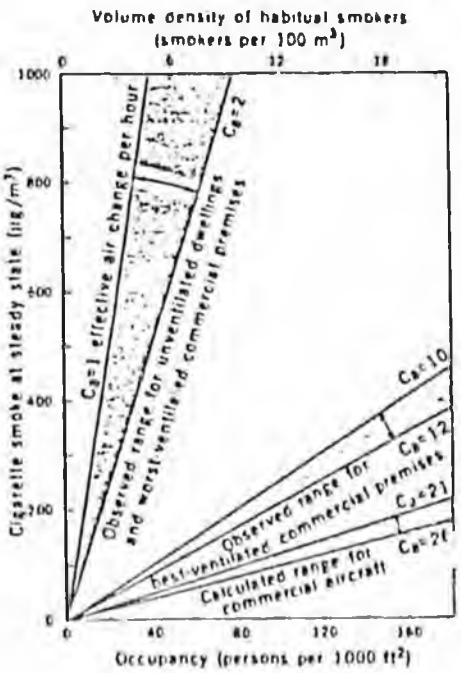

Fig. 4. Theoretical steady-state density of respirable particulates from environmental cigarette smoke in habitable indoor spaces, as related to the design occupancy P_s. On the average, one-third of adults are habitual smokers; for every three such smokers, we calculate that an average of one cigarette burns constantly throughout a 16-hour day. According to standard engineering criteria (*29*), occupancy and the type of microenvironment determine the design rate of mechanical ventilation C_v. The effective air change rate (C_s) for the removal of tobacco aerosol from room interiors is determined by C_v, by mixing, and by the rate of adsorption of tobacco particles on room surfaces. Generally C_v, and hence C_s, increase with P_s. (Typical P_s (in persons per 1000 square feet) ranges from 10 for office buildings to 70 for restaurants to 150 for bars, sports arenas, and aircraft (*29*, *32*).) We estimate the practical range of C_s to be from 1 to 12 air changes per hour. It appears that over the combined practical ranges of P_s and C_s, repeated exposure to tobacco smoke can lead to annual RSP burdens that violate the primary annual NAAQS.

RSP from cigarette smoke. The actual dose of RSP is clearly a function of personal activity patterns, differences in respiration rate also affect the dose. Many different scenarios can be imagined. In the following, we express a range of RSP burdens from the cigarette aerosol relative to a typical RSP ambient background level. For an air shed (air quality control region) that is in compliance with the annual secondary (public welfare) NAAQS for TSP of 60 $\mu g/m^3$, the RSP fraction of the ambient aerosol is conservatively estimated at 50 $\mu g/m^3$ and is likely to be composed largely of combustion-produced sulfates (*35*). Since the particle size distributions of this fraction and the cigarette aerosol are both in the respirable range, we first compare them on a mass basis, without regard for differences in the chemical composition of each.

Let A, B, C, and D be nonsmokers who dwell in the same air shed and who breathe at the average rate of 20 m^3/day. All have different occupations and lifestyles that lead, as we shall see, to dramatically different RSP burdens.

Nonsmoker A is a mailman who walks a regular route and is able to live in a completely tobacco smoke-free environment. He is exposed only to the background ambient and therefore inhales 365 mg of RSP annually.

Nonsmoker B is an office worker who works a 40-hour week 50 weeks per year in a 40-m^3 office with two other persons, one of whom is a habitual smoker. Replacing D_s in Eq. 4 with $D_{hs}/3$, we find that B's mass RSP exposure is more than three times that of A (we calculate an expected C_s of 1.1 for office buildings).

Nonsmoker C is a musician who entertains in a popular, poorly ventilated nightclub 8 hours nightly, 5 nights per week, 50 weeks per year. The average P_s in the club is 100 persons per 1000 square feet (about 33 smokers). Further, C shares a 100-m^3 apartment with a roommate who is a chain smoker. C is exposed to the roommate's smoke 5 hours per day, 7 days per week, annually. By using Eqs. 4 and 5 and a C_s of one air change per hour, we find that C's mass RSP burden is more than 15 times that of A.

An alternative way of approaching the excess RSP exposure is in terms of cigarette equivalents. The cigarette with the least tar in the May 1978 FTC scale has 0.55 mg of TPM. In these terms, B's excess RSP burden is equivalent to 5 cigarettes per day and C's burden to 27 cigarettes per day. However, this may un-

derestimate the true impact, since many nonsmokers have greater sensitivity to smoke than smokers (*7*).

Nonsmoker D is a flight attendant who spends 40 hours per week, 50 weeks per year on board a commercial airliner with a C_v of 23 air changes per hour. The average P_v on the plane is 150 persons per 1000 square feet. D's RSP burden is nearly twice that of A. Even with one of the best ventilation systems in use, the high density of smokers causes a substantial increase in mass RSP inhaled by D.

The following three considerations may help to place these scenarios into perspective. First, an annual exposure 1.5 times that of A is sufficient to exceed the primary annual NAAQS: the exposure of D, B, and C to RSP all violate the standard by factors of 1.2, 2, and 10, respectively. Second, pulmonary clearance studies show that the half-life of inert respirable particles (2.8 μm in MMD) in the lungs of nonsmokers is ~ 70 days (*36*): residence of RSP in the lungs is prolonged. Third, in a series of pulmonary lavage studies on 400 nonrandomly selected volunteers (250 nonsmokers and 150 smokers) (*37*), two of the nonsmokers had tarry lavage fluids with pigmented pulmonary alveolar macrophages strikingly similar to those found in smokers. In these two volunteers, the levels of aryl hydrocarbon hydroxylase, an inducible carcinogen-detoxifying pulmonary enzyme, were intermediate in value between the levels found in smokers and most nonsmokers. These findings were attributed to the effects of exposure to tobacco smoke (*38*).

Health Policy Implications

There is good toxicologic evidence that elevated levels of particulates in outdoor air, perhaps in combination with other pollutants, cause illness and death during air pollution episodes (particulate levels in excess of 1000 $\mu g/m^3$ per 24 hours). There is much epidemiologic evidence, some of it conflicting, that lower levels of particulates, perhaps in combination with other pollutants, affect respiratory health adversely when exposure to them is sustained (*39*). (This evidence has been used to establish the thresholds for harm on which the primary annual NAAQS for TSP is based.) There is excellent toxicologic evidence that mainstream cigarette smoke causes chronic obstructive pulmonary disease (*7*, *40*). Epidemiological evidence, some of it conflicting, indicates that exposure to tobacco smoke in the home affects respiratory health adversely (*7*, *41*). Finally, there is excellent evidence that mainstream cigarette smoke causes cancer in many organs (*7*). Sidestream smoke is chemically identical to mainstream smoke, and typically is more concentrated (*2*). Coke-oven emissions, which chemically are similar to tobacco smoke, are associated with increased rates of many forms of cancer in coke-oven workers (*42*). Animal studies demonstrate that the particulate phase of tobacco smoke contains numerous potent carcinogens and tumor promoters, initiators, and accelerators (*7*). One of these, benzo[*a*]pyrene, was detected at a concentration of 40 parts per million in ambient tobacco smoke (*13*). Strong evidence supports a correlation between the magnitude of long-term exposure to carcinogens and the incidence of cancer (*43*). Therefore, given the efforts by public health authorities to eliminate involuntary public exposure to saccharin and the fire retardant Tris—which have, respectively, one fifty-thousandth and one-tenth the experimental carcinogenic potency of benzo[*a*]pyrene alone (*44*, *45*)—similar efforts to prevent involuntary exposure to ambient tobacco smoke (*46*) appear justified.

Conclusions

We have defined the probable range of exposure of the nonsmoking public to a common pathological aerosol, cigarette smoke. We showed, both experimentally and theoretically, that under the practical range of ventilation conditions and building occupation densities, the RSP levels generated by smokers overwhelm the effects of ventilation and inflict significant air pollution burdens on the public. Our observations show that levels of RSP in places where tobacco is smoked greatly exceed levels found in smoke-free environments, outdoors, and vehicles on busy commuter highways. Our experimental results are consistent with the large differences in 24-hour average RSP levels reported for smoking and nonsmoking homes in the Harvard Six-City Study (*47*), with a survey of short-term RSP levels in commercial and public buildings in Houston (*28*), and with other studies of tobacco-generated TSP (*7*, *11*-*13*).

Attempts to reduce RSP levels from smoking by increasing the rate of mechanical ventilation or the efficiency of filtration yield exponentially diminishing returns for linear increases in ventilation energy (and cost). Moreover, efforts to conserve energy in buildings will decrease ventilation rates (*48*). Therefore, increased ventilation does not appear to be a solution to the problem. Indoor air is a resource whose quality should be maintained at a high level. Smoking indoors may be incompatible with this goal (*33*, *49*).

Further research is necessary to define the integrated particulate exposure of various segments of the population; compliance with the NAAQS, as indicated by the establishment of outdoor TSP sampling stations, does not imply protection of the public from excessive RSP burdens. Repeated exposure to ambient cigarette smoke imposes air pollution burdens on nonsmokers that exceed the primary annual NAAQS. It appears that the RSP burdens from ambient tobacco smoke are so large that they must be incorporated explicitly in future epidemiological assessments (*50*, *51*) of the relation between particulate levels and morbidity or mortality.

The Clean Air Act of 1970 and its amendments mandate the control of public exposure to outdoor TSP. However, little legislative attention has been devoted to the quality of indoor air—other than the passage of the Public Health Service Act of 1978, which provides for an ongoing study of the health costs of indoor air pollution. Clearly, indoor air pollution from tobacco smoke presents a serious risk to the health of nonsmokers. Since this risk is involuntary, it deserves as much attention as outdoor air pollution.

Note added in proof: A very recent epidemiological study concluded that long-term exposure to tobacco smoke, limited to the work environment only, is deleterious to the nonsmoker and significantly reduces small-airway function to the same extent as smoking one to ten cigarettes per day. This is consistent with scenario B (*52*). *ASHRAE Standard 62-73R*, a proposed standard for ventilation required for minimum acceptable indoor air quality, has been published (see *29*). Using data supplied in the standard, we calculate a C_v of ≤ 1.28 for office buildings where smoking is permitted.

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Nonsmokers and Cigarette Smoke: A Modified Perception of Risk

The article by Repace and Lowrey (*1*) is an interesting and useful aid for evaluating the exposure levels of nonsmokers to cigarette smoke. The article, however, is flawed because it compares the levels to those of smokers of cigarettes delivering the lowest amount of tar of any brand on the market. This cigarette delivered 0.55 mg of tar in 1978 and accounted for less than 2 percent of the cigarettes consumed that year and for less than 3 percent of the cigarettes sold in 1979 (*2*). The exposure of various nonsmokers was found to be the equivalent of smoking 2 to 27 such cigarettes per day. Twenty years ago, smoking as few as ten cigarettes daily was hazardous (*3*). Hence, the article implies that the health of exposed nonsmokers is seriously jeopardized.

The consequences of smoking on health have not been measured for consumers of the brand yielding the lowest tar, but rather for all smokers. In 1977 the average tar yield of American cigarettes, based on sales, was about 16 mg (*4*). Thus, "nonsmoker B" was exposed to the equivalent of one-sixth of the average 1977 cigarette per day, "nonsmoker C" to one per day, and "nonsmoker D" to one-sixteenth. It might be more pertinent to consider the tar delivery of cigarettes that were smoked about 20 years ago. The average cigarette in 1959 delivered about 29 mg in ten puffs. Thus, the model nonsmokers then would have been exposed to the equivalent of one-third to five *puffs* per day.

To be sure, we do not know that any level of cigarette smoke is harmless. The model nonsmokers were exposed to levels exceeding the primary annual National Ambient Air Quality Standards. Small amounts of smoke are irritating to many nonsmokers and may physically impair some. Such effects by themselves are sufficient cause for concern about passive exposure to cigarette smoke. Risk of cancer and other diseases for which dose is important should not, however, be imputed from comparisons of nonsmokers with the least affected 2 percent of the smoking population.

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Bock raises an important issue: How is the estimated range of exposure of nonsmokers to cigarette smoke translated into an increased risk of incurring the diseases of smoking? However, Bock both misinterprets our analysis and understates the risks. First, we did not derive an exposure-response relation between tobacco smoke and risk on the basis of low-tar cigarette equivalents inhaled by nonsmokers. Rather, we expressed the range of exposure in terms of such equivalents and confined our assessment of risk to the statement that such exposure represents a serious risk to the health of nonsmokers. We justified this not only by comparison with low-tar cigarettes, but also by references to outdoor air standards, pulmonary lavage experiments, coke-oven emissions, and carcinogenic potency. Second, we do not agree with Bock's assertion that comparisons with low-tar cigarettes are inappropriate because such cigarettes are smoked by the "least affected 2 percent of the smoking population." The latest report of the Surgeon General (*1*) advises that "there is no safe cigarette and no safe level of consumption" and that although lower yields of tar and nicotine reduce the risk of lung cancer and "to some extent improve the smoker's chance for longer life . . . it is not clear what reductions in risk may occur in the case of diseases other than lung cancer."

More to the point, Bock's comparisons of nonsmokers' exposures to those of inhaling smokers of high-tar cigarettes are misleading. As we have shown, the exposure of certain nonsmokers to tobacco smoke appears to be similar to the exposure of low-tar cigarette smokers. The cloud of pollution surrounding low-tar smokers appears to be not very different from the cloud surrounding high-tar smokers who are noninhalers. In fact, our low-tar cigarette produces sidestream emissions that are nearly 80 percent of those of the 1977 cigarette and nearly 40 percent of those of the 1959 cigarette (*2*). This is significant because a study begun in 1959 (*3*) has shown that 45- to 54-year-old male smokers who were noninhalers suffered a 41 percent higher mortality rate than male "nonsmokers" (*4*). A number of studies now indicate that carcinogenic, respiratory, and cardiovascular effects result from nonsmokers' exposure to indoor tobacco smoke (*5*).

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sponding to the average reflectivity is 11 ± 4, a moderately high value for a dry planetary surface at radar frequencies. For other parts of Venus where the reflectivity approaches 0.4, K calculated by assuming negligible conductivity and loss rises to 20.

How can these relatively high reflectivities be explained? From Eq. 2 we see that both the real and imaginary parts of ϵ contribute to the reflectivity. It seems extremely unlikely that dielectric losses (L) of naturally occurring dry rocks could be large enough to dominate the reflection mechanism; they normally control only the attenuation with depth (*9*). For the conductivity, S, to be important in reflection, not only must it exceed about 0.1 mho/m at our radar's operating frequency, but the conductive region must extend over an area with dimensions comparable to a wavelength or larger. If such large areas of conductive surface exist, it would seem likely that, at least occasionally, reflectivities near unity would be encountered, since occurrence of the precise frequency-dependent threshold value of S necessary to yield reflectivities consistently between 0.3 and 0.4 seems highly fortuitous.

We are left, then, with the necessity for explaining how the real part, K, of the dielectric constant can be raised to values between 11 and 20. The most likely mechanism is the presence in the rock of conducting inclusions much smaller than the observing wavelength. Meteorites containing relatively large amounts of free iron-nickel mixtures and sulfides display values of K ranging up to 100 or more (*9*). Free metals seem unlikely and in any case could not exist for long in any part of the Venus surface exposed to the atmosphere; highly conducting metallic sulfides would also be unstable to atmospheric exposure (*11*). But if overturning of the first few centimeters of surface proceeds slowly enough, or if material is being steadily stripped off the surface and blown elsewhere, atmospherically unstable minerals could be maintained sufficiently near the surface to be effective in raising the dielectric constant.

Nozette and Lewis (*12*) suggested that chemical erosion takes place at high elevations on Venus, where winds are comparatively strong and atmospheric densities and temperatures relatively low. The fine-grained eroded material is subsequently delivered to lower elevations, where it is chemically modified and possibly compacted. In the process, the putative conducting inclusions are transformed into gases and nonconducting minerals. If the "original" Venus surface contained on the order of 15 percent free metal—or, more likely, pyrite (FeS_2), which has been postulated independent of radar observations to explain the observed atmospheric chemical composition (*11*)—the high values of reflectivity seen at high elevations could be readily explained. Pyrite is one of very few minerals with the necessary high conductivity, having values between 1 and 10^5 mho/m (*8*).

The model that emerges from this discussion requires that the surface of Venus in the vicinity of the highly reflecting regions contain a significant amount of conducting mineral as inclusions in the rock. From a consideration of the present lower atmospheric composition, this material is likely to be pyrite and may be widespread in the original crustal rock, lying in radar view only at higher elevations, where new surface is constantly being exposed. It is also possible that pyrite is preferentially produced in sulfur-rich volcanic material.

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Cigarette Smoke Contains Anticoagulants Against Fibrin Aggregation and Factor XIIIa in Plasma

Abstract. *Gas-phase, water-soluble components of cigarette smoke cause delayed fibrin self-assembly and prevent fibrin cross-linking by inactivation of factor XIIIa (plasma transglutaminase). These anticoagulant properties of smoke are demonstrable in plasma, suggesting they play a role in the pathophysiology of smoking.*

There is little information on the effects of cigarette smoke on important biochemical interactions, though considerable information on its physiologic effects is available. Studies on interactions of cigarette smoke with certain proteins have provided biochemical evidence that specific functions of such proteins are inhibited (*1*, *2*) or augmented (*3*) by smoke components. In view of the shortened half-life of radioactively labeled fibrinogen in dogs exposed to cigarette smoke (*4*) and of the reported increase in fibrinogen in human smokers (*5*), we examined the possible effect of smoke on certain fibrinogen functions in vitro. We found that water-soluble smoke components include two types of anticoagulants: one is directed against fibrin self-assembly and the other inactivates factor XIIIa, thereby preventing cross-link formation (that is, stabilization) in fibrin clots.

Fibrinogen, a plasma glycoprotein, consists of three pairs of disulfide-bridged polypeptide chains termed Aα (molecular weight, ~ 70,000), Bβ (~ 60,000), and γ (~ 50,000). Cleavage by thrombin of arginyl-glycine peptide bonds at positions Aα16 and Bβ14 results in release of small polar peptides A and B from their respective chains: the resulting fibrin monomers polymerize noncovalently and form the fibrin gel.

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factor XIIIa which catalyzes the formation of ε-(γ-glutamyl)lysine cross-links between adjacent fibrin molecules. Certain other proteins are also cross-linked in this way to fibrin, for example, fibronectin (*6*) and fast-reacting α_2-plasmin inhibitor (*7*).

In this work, the effect of cigarette smoke on fibrin aggregation was investigated by the use of water-soluble, gas-phase components of smoke, obtained (*8*) by bubbling the smoke produced from one cigarette through 3 ml of buffer or distilled water. This extract (SE) was incorporated in varying dilutions in the buffer to which fibrin monomer solution (in 0.25 percent acetic acid) was added in order to initiate fibrin aggregation, which was monitored turbidimetrically at 350 nm (*9*). A dose-dependent delay in fibrin aggregation was observed (Fig. 1A). Increasing the amount of smoke extract resulted in decreased absorbance of the clot (1:10 and 1:5 dilution) and (1:5 dilution) delayed the onset of fibrin aggregation. The decreased absorbance (indicating a less opaque or more transparent clot) remained undiminished for several hours. These effects were partly decreased in dialyzed smoke solutions and could not be corrected by incorporating calcium chloride (20 m*M*) in the buffer (not shown).

The fibrin aggregation inhibitor was also examined by use of two differing fibrin preparations with α chains lacking COOH-terminal segments. One fraction, termed I-6 and isolated from plasma, lacked approximately one-fifth of the native peptide from most of its α chains [that is, its α chains were of similar size (*10*)]. Another fraction, termed I-9D, was obtained from an 88 percent coagulable plasmic digest of fibrinogen and lacked longer segments, approximately two-thirds of the native peptide, from most of its α chains (*11*). Neither preparation displayed a delay in fibrin aggregation in the presence of smoke extract (Fig. 1, B and C). In addition, the clot absorbance of I-6 was decreased, suggesting that aggregation was partially inhibited or that this effect was distinct from that of the delay in fibrin aggregation (Fig. 1A). These results implied that the fibrin aggregation inhibitor required the presence of intact α chains to exert its effect. What is more, they suggested that the inhibitor interacted either directly with the α chains of fibrin or with another fibrin site which lost its capacity to interact with the inhibitor following conformational changes induced by the loss of intact α chains.

We also determined whether the Smoke extract consistently prolonged the thrombin clotting times of plasma (Fig. 1D), but this effect could be abolished by decreasing the amount of extract added. In related analyses the clotting times of isolated fibrinogen fractions were examined in plasma containing the extract. To fresh plasma that had been depleted of its fibrinogen by heat precipitation, band I fibrinogen and thrombin and determined clotting times. Consistent with the results on fibrin aggregation (Fig. 1A), the smoke extract prolonged clotting times in samples containing band I fibrinogen, and this defect was not corrected by the presence of calcium chloride (Fig. 1E). Samples containing fraction I-6 fibrinogen exhibited no

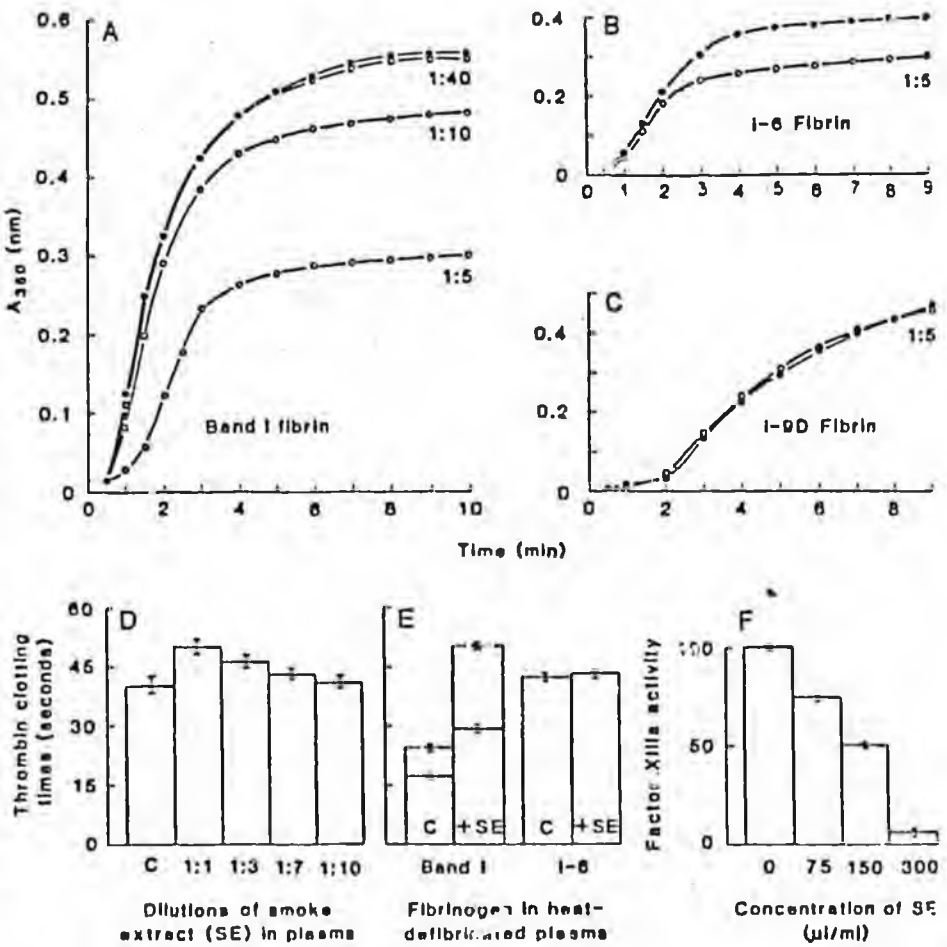

Fig. 1. Anticoagulant effects of smoke extract (*SE*) on fibrin and factor XIIIa. (A) Effect of different dilutions (open circles) on the time course of aggregation of (band I) fibrin which has intact α chains (*10*); closed circles indicate buffer control. After dilution of the fibrin solution with 20 volumes of buffer (0.025*M* tris-hydrochloride, *p*H 7.4, 0.135*M* NaCl) (*9*) containing SE, the final concentration of fibrin was 0.5 mg/ml. The *p*H remained constant during the experiments; in certain control experiments buffer containing SE alone or SE plus human albumin (0.5 mg/ml) in buffer was monitored for several hours and displayed no increase in absorbance (not shown). (B and C) Effect of SE on the aggregation of fibrin which lacks COOH-terminal segments from its α chains: fraction I-6 lacks approximately one-fifth (*10*) and fraction I-9D lacks approximately two-thirds (*11*) from their α chains. The final concentration was 0.4 mg/ml; the buffer was as in (A) and the SE dilution was 1:5. (D) The effects of SE on the clotting times of fresh human plasma (*9*). The height of each column reflects the mean and the brackets the range of at least three determinations in the presence of different dilutions of SE as shown; control plasma is designated *C*. Human thrombin (in 0.01*M* tris-hydrochloride, *p*H 7.4, and 0.15*M* sodium chloride) was added to citrated plasma (to 0.4 U/ml) and the clotting times were determined. (E) Histograms of clotting times for two differing fibrinogen preparations, showing that the inhibitory effect of SE on band I is not present when I-6 fibrinogen is clotted. The experiments were carried out in plasma that had previously been heat-treated (56°C, 10 minutes) to remove its own fibrinogen [which is heterogeneous (*10*)]. To this treated plasma, fibrinogen (either band I or I-6) was added (to 2 mg/ml) and clotting times were determined. Final thrombin concentration was 0.5 U/ml and SE dilution was 1:3 in all experiments (*C*, control). Columns with solid or interrupted lines indicate the presence and absence of calcium chloride (20 m*M*), respectively. (F) Effect of SE on the activity of isolated factor XIIIa, showing inhibition of [^{14}C]putrescine incorporation into casein. The conditions of the assay (*16*) as applied here were as follows: To 0.5 ml of 0.01*M* tris-acetate buffer, *p*H 7.4, containing calcium chloride (20 m*M*), dithiothreitol (5 m*M*), Hammerstein casein (1 percent), different concentrations of SE (as shown), and [^{14}C]putrescine (0.1 μCi/μmole), we added 5 μg of XIIIa. The mixture was incubated for 60 minutes at 37°C, and the reaction was stopped by adding 4 ml of 7 percent cold trichloroacetic acid. The precipitate was assayed by liquid scintillation (*16*).

change in their clotting times in the presence of the extract (Fig. 1E), again in agreement with the fibrin aggregation results. These findings indicated that smoke extract inhibits fibrin aggregation in the plasma environment. Moreover, the similarity of its dose-response whether plasma or isolated fibrin was used implied that competitive interaction between the smoke inhibitor and nonfibrinogen plasma proteins was minimal.

We then examined factor XIIIa–catalyzed fibrin cross-linking in the presence of the smoke extract. Fresh whole blood or plasma fibrin clots are cross-linked and therefore insoluble in 5*M* urea. When such clots were obtained in the presence of smoke extract (1:3 dilution) they were soluble in 5*M* urea (not shown). Similarly soluble were clots obtained from isolated fibrinogen and factor XIIIa in the presence of the extract. Cross-linking inhibition was also demonstrated by subjecting reduced fibrin samples to polyacrylamide gel electrophoresis in the presence of sodium dodecyl sulfate (*12*). In this analysis cross-linking can be shown by the characteristic depletion of α and γ chains and the concurrent appearance of more cathodal electrophoretic bands, termed α-polymers and γ-γ dimer, respectively (Fig. 2, gel 1). The presence of smoke extract resulted in a concentration-dependent inhibition of α-polymer and γ-γ dimer formation (Fig. 2, gels 2 and 3). Moreover, higher concentrations of the extract were required to inhibit the [more rapid (*13*)] formation of γ-γ dimer than that of α-polymers.

The possibility that this inhibitor was directed against (or binding to) fibrin cross-linking sites was examined. Non-cross-linked fibrin clots (*14*) exposed to smoke extract, followed by extensive washing and subsequent exposure to XIIIa, resulted in unimpaired fibrin cross-linking, indicating that the inhibitor did not bind to fibrin. In addition, dialysis removed the cross-linking inhibitor from the smoke extract (Fig. 2, gel 4), and its activity remained in freeze-dried samples.

Factor XIIIa–catalyzed incorporation of monodansyl cadaverine (fluorescence) (*15*) and of ^{14}C-labeled putrescine (*16*) into casein was used to assess the smoke inhibitor effect on XIIIa. These amines compete with the ε-amino group of peptide-bound lysine and prevent its cross-linking to peptide-bound γ-glutamine; thus measurement of casein-bound fluorescence or radioactivity serves to assay XIIIa by use of substrates other than fibrin. Both assays disclosed irreversible inhibition of XIIIa which depended on the concentration of smoke extract and required calcium chloride. Fig. 1F illustrates the results of the experiments with [^{14}C]putrescine. Direct inactivation of XIIIa was demonstrated after it was incubated with smoke extract. That is, the loss of XIIIa activity was proportional to the concentration of the smoke extract, and it could not be reversed by removal of the smoke inhibitor by dialysis or by gel filtration (G-25 Sephadex). By contrast, when the inactive zymogen (XIII) was subjected to the same treatment, it displayed no loss of activity following dialysis and activation to XIIIa.

Thus cigarette smoke contains two distinct coagulation inhibitors: one prolongs the clotting times of plasma by inducing delayed fibrin aggregation and requires the COOH-terminal region of fibrin α chains to exert its effect; the other inactivates XIIIa, preventing the cross-linking of fibrin polymers. By extension, this second smoke inhibitor may similarly affect other physiologically important proteins (*6*, *7*) also known to be cross-linked to fibrin by XIIIa.

We believe that these results permit speculation on potential pathophysiologic effects that may result from the exposure of lungs or other tissues to cigarette smoke. Diminished fibrin cross-linking could result in premature removal of fibrin, by proteolytic enzymes, thereby impairing the role of fibrin in initiating the provisional or temporary extracellular matrix during normal tissue repair. Besides protective fibrin-to-fibrin cross-links, other proteins [such as fibronectin (*6*) and α_2-plasmin inhibitor (*7*)] are cross-linked by XIIIa to fibrin, the latter conferring additional resistance to proteolysis (*7*). The presence of the smoke inhibitor is therefore likely to result in an initial wound matrix lacking the protective effect of such cross-links and consequently susceptible to early degradation. Blood complement abnormalities, suggesting ongoing low-grade inflammation in cigarette smokers (*17*), are consistent with this possibility, and the elevated fibrinogen levels (*5*) as well as the shortened half-life of radioactively labeled fibrogen (*4*) associated with smoking can be explained as a response to such an inflammatory process. What is more, that fibrin(ogen) degradation fragments induce a leukocyte-mediated increase in fibrinogen synthesis in cultured hepatocytes (*18*) is also consistent with this speculation.

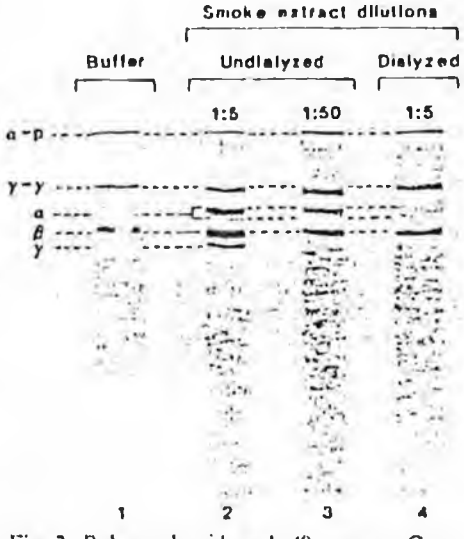

Fig. 2. Polyacrylamide gels (9 percent, Coomassie stained) of cross-linked fibrin clots (*9*) which had been washed and reduced prior to electrophoresis (*12*), showing non-cross-linked α-polymer (gels 2 and 3) and γ chains (gel 2) in clots obtained in the presence of smoke extract (SE). The absence of γ chains in gel 3 reflects the higher rate of γ-γ dimer (than α-polymer) formation (*13*) and indicates that the rate of XIIIa inactivation by the 1:50 SE dilution was lower than that of γ-γ dimer formation. The cross-linking mixture (*9*) contained dialyzed (gel 4) or undialyzed (gels 2 and 3) SE, isolated (band 1) fibrinogen, and factor XIII.

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Metabolism of 2,4',5-Trichlorobiphenyl by the Mercapturic Acid Pathway

Abstract. *Carbon-14–labeled 2,4',5-trichlorobiphenyl was found to be metabolized by the mercapturic acid pathway to metabolites that are excreted in bile. About 57 percent of the carbon-14 was excreted in the bile; 30 to 35 percent was present as mercapturic acid pathway metabolites. Mercapturic acid was also isolated from the urine (0.3 percent of the dose).*

Although polychlorinated biphenyls (PCB's) have not been shown to be metabolized by the mercapturic acid pathway (MAP), there is evidence that the MAP may be involved. Biphenyl and 2,2',5,5'-tetrachlorobiphenyl are metabolized to dihydrodiols (*1*, *2*), and the NIH shift occurs in the metabolism of 4-chloro- and 4,4'-dichlorobiphenyl (*3*, *4*). Both of these metabolic routes usually indicate that an arene oxide precursor was formed, and compounds that form arene oxides are often metabolized in part by conjugation with glutathione, that is, by the MAP. Also, biphenyl is known to be metabolized by the MAP (*5*).

The most common indication that a xenobiotic was metabolized by the MAP is the isolation of the appropriate mercapturic acid from the excreta; however, this may also be indicated by formation of metabolites that contain metabolically introduced thiol, *S*-glucuronyl, methylthio, methylsulfinyl, or methylsulfonyl groups (*6–8*). Several chlorinated biphenyls were found to be excreted by mice as metabolites containing methylthio and methylsulfonyl groups (*9*), and chlorinated biphenyl methyl sulfones were also isolated from various tissues (*10–12*) and from milk from a lactating female (*13*). The radioactivity from intraperitoneally administered [^{35}S]cysteine was incorporated into 2,4',5-trichlorobiphenyl (triCB) methyl sulfones that accumulated in the lungs of mice given oral doses of triCB (*14*).

The evidence cited above indicated that some chlorinated biphenyls are metabolized by the MAP and that the common products of this pathway (the corresponding mercapturic acid and its precursors) are metabolized further before excretion. The mechanism was thought to be similar to that described for pentachlorothioanisole, where the biliary MAP metabolites were excreted mainly in the feces as bis-(methylthio)tetrachlorobenzene and nonextractable residues (*15*) and about 1 percent of the dose was present in the urine as *N*-acetyl-*S*-(methylthiotetrachlorophenyl)cysteine. The excretion of triCB methyl sulfide and methyl sulfone in feces from mice given triCB (*9*) prompted a search for MAP metabolites in bile from rats given ^{14}C-labeled triCB. In addition, triCB is a significant component of technical PCB containing 42 to 48 percent chlorine.

Bile collected from four bile duct–cannulated rats given single oral doses of ^{14}C-labeled triCB (*16*) (4 mg, 3.94 μCi per rat) contained 52.7 ± 19.2 percent of the dose after 48 hours, and 84 to 90 percent of the radioactivity was extracted from the bile (*17*). The radioactivity in the extract was separated into six fractions by reversed-phase high-performance liquid chromatography (HPLC) (*18*). The fractions were examined for possible MAP metabolites by converting the xenobiotic moieties to the corresponding triCB-*S*-acetates (*19*). Fractions 4 and 5, which contained 4.5 and 33.5 percent of the biliary ^{14}C, respectively, yielded significant quantities of triCB-*S*-acetates. Small quantities were obtained from fractions 1, 2, and 3. Two isomeric triCB-*S*-acetates were separated by gas chromatography (*20*) and found to have retention times and mass spectra identical with those of authentic triCB-3-*S*-acetate and triCB-4-*S*-acetate (*21*). After derivatization (*22*) of fraction 4, the derivatized triCB-*S*-cysteinylglycine and -cysteine conjugates were isolated by HPLC. After derivatization of fraction 5, the methyl ester of triCB-*S*-(*N*-acetyl)cysteine was isolated by HPLC. From the mass spectral data (*23*), structures were assigned to these derivatives and to the underivatized mercapturic acid as outlined in Fig. 1 (*21*).

About 30 to 35 percent of the radioactivity in the bile was present as MAP metabolites, showing that the MAP is a major metabolic pathway for this chlorinated biphenyl and that significant quantities of the metabolites are available for further metabolism by intestinal enzyme systems.

The fate of biliary triCB MAP metabolites in the intestine could not be deduced from the identities of the metabolites reported previously (*24*); therefore, the metabolic fate of ^{14}C-labeled triCB in

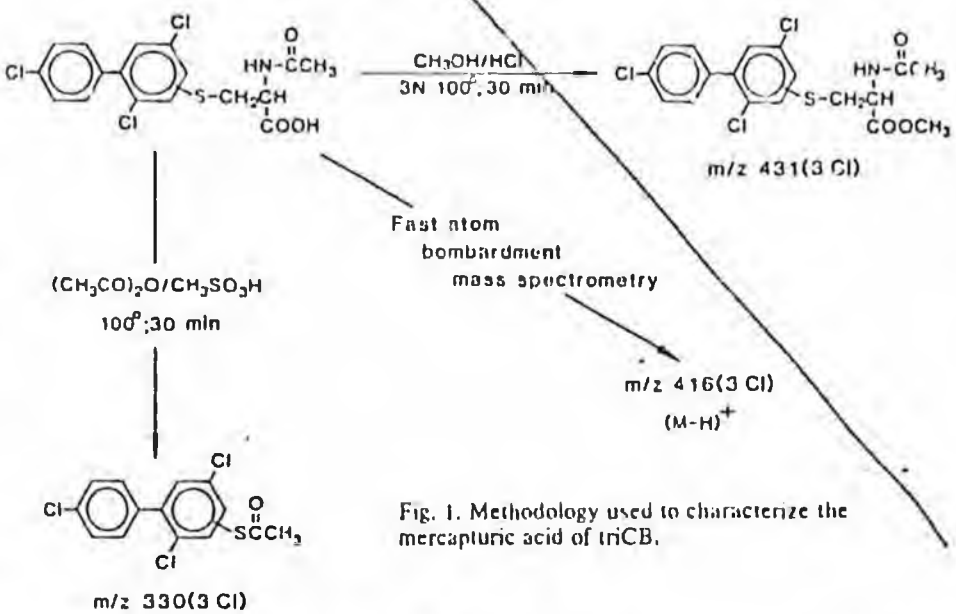

Fig. 1. Methodology used to characterize the mercapturic acid of triCB.

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Anchorage Daily News - 22 Oct 82

Non-smoker gets disability pay

The Associated Press

SAN FRANCISCO — A non-smoking federal worker transferred to an office with several smokers is entitled to about $20,000 in disability pay because she developed breathing difficulties, a federal appeals court ruled Thursday.

Irene Parodi cannot "perform her job due to its location in a smoke-filled office," the 9th U.S. Circuit Court of Appeals wrote in what the woman's lawyer called a landmark ruling.

"Unlike a person with a physical limitation, a person with an enviromental limitation can physically perform the assigned work in a proper environment," the court said.

"She is as disabled for her job at her assigned worksite as she would be had she actually suffered permanent and severe chronic bronchitis or another physically disabling disease," the court said.

The court said that unless Parodi is offered a job in a smoke-free office within 60 days, she will become eligible for disability retirement benefits of about $500 a month.

Mike Copies for Committee.

The Menace of Indoor Pollution

As we insulate, weatherstrip and seal our homes to conserve energy, we are also sealing in pollutants that are odorless, invisible and sometimes highly dangerous

By Lowell Ponte

On a brisk autumn day in 1979, James L. Repace, a policy analyst for the Environmental Protection Agency (EPA), used himself as a guinea pig. He carried a sophisticated air-monitoring device with him throughout the day—at home and at work. It was at his side as he drove through rush-hour traffic in smoggy Washington, D.C. Like him, it took in gusts of bus exhaust as he lugged it along city streets. To Repace's surprise, the monitor revealed that he suffered the most severe air pollution while waiting for his dinner to cook in his own kitchen.

Many scientists warn that pollution *inside* our homes and offices frequently reaches concentrations that would be illegal out-of-doors. Since the typical American spends 90 percent of each day indoors, pollution here is clearly a serious problem. And it is aggravated by the well-motivated efforts of energy-conscious consumers to insulate, weatherstrip and otherwise seal living areas to reduce fuel costs.

Unfortunately there have been few, if any, efforts on the part of either government or environmentalists to publicize the problem or to warn citizens of possible danger. The information presented here is published to acquaint readers with the facts so that they can take individual measures to reduce the risks.

Gas appliances. Most Americans live today in homes with fires burning night and day—the tiny blue pilot lights in furnaces, water heaters, clothes dryers, stoves and ovens fueled by natural gas. Gas burns far cleaner than the coal and wood stoves it replaced; it almost never pours visible smoke into homes. But where there's fire, there's smoke. Scientists are finding that some combustion products emitted by gas appliances may be more hazardous than we suspected.

Researchers at California's Lawrence Berkeley Laboratory measured the pollution output of gas stoves cooking at 350° F. and found that in kitchens with poor ventilation, the room's air could soon contain as much carbon-monoxide and nitrogen-dioxide gas as the Los Angeles sky on a smoggy day.

Carbon monoxide can be deadly. Just before last Halloween, a Los Angeles father turned on his home gas heater, apparently neglecting to check its vent. Days later he and his two daughters were found dead, asphyxiated by carbon monoxide. Each year in the United States, roughly 1700 people die in similar accidents.

When carbon monoxide enters our lungs, it binds to the red blood cells' hemoglobin 210 times more strongly than oxygen does. Thus even a small amount of carbon monoxide impairs our blood's ability to carry oxygen.

The EPA has set a standard of nine "parts per million" (ppm)—nine molecules of carbon monoxide mixed with every million molecules of air—as the maximum safe exposure to carbon monoxide during an eight-hour period. Victims of cardiovascular disease can suffer the pains of angina at this level. When carbon monoxide reaches 15 ppm, some subjects experience ominous changes in heart rhythm. At 30 ppm some will suffer distortions in vision and physical dexterity that impair driving.

Yet a study by the National Academy of Sciences reports that the air in home kitchens over short periods of up to one hour can reach up to 50 ppm carbon monoxide "as a result of ordinary use of a gas range, especially when the cooking utensils divert or quench the flame."

Gas flames also create oxides of nitrogen, including nitrous oxide (laughing gas) and nitrogen dioxide. The EPA's permissible annual pollution average for nitrogen dioxide in the air is only 0.05 ppm. At 0.1 ppm, it will cause breathing difficulties. At 0.5 ppm, this gas has been shown to lead to a greater susceptibility to disease in animals.

Some scientists suspect that nitrogen dioxide is the prime cause of increased respiratory illness among people in homes with gas stoves. Dr. Frank E. Speizer of Harvard University Medical School studied 8000 children, ages six to nine, half of whom lived in homes where parents cooked with gas and half where electricity was used. He found evidence that children from homes using gas stoves suffered up to 15 percent more respiratory illness than did the other group.

Kerosene heaters. In 1982 Americans bought more than 5 million portable heaters fueled by kerosene. Used to warm single rooms, the heaters vent the chemical by-products of their flame directly into the surrounding air. Test results published by *Consumer Reports* last October revealed that in a small room kerosene heaters put an average of 13 ppm of carbon monoxide into the air, and as much as 1.8 ppm of nitrogen dioxide (many times the EPA permissible level). A kerosene heater could also produce up to 12 ppm of sulfur dioxide in room

air—as much as 85 times the EPA health standard for outdoors. At even one ppm of sulfur dioxide, mild asthmatics can suffer breathing problems within 10 minutes, and at 5 ppm they can experience asthma attacks.

Home fireplaces. Many Americans have reverted to fireplaces for winter warmth. But fireplace chimneys are often poorly vented, and the fires built in them can raise carbon-monoxide levels in the home and produce exotic gases such as benzo[*a*]pyrene, a known cancer-causing chemical. Family members often toss into a fireplace anything that will burn, without knowing that the colored inks of the Sunday funnies, for example, can put a trace of arsenic vapor into the air. Other objects such as wood treated with preservatives can emit toxic fumes.

Insulation. In the 1970s more than half a million Americans fought the energy crunch by insulating their homes with urea-formaldehyde foam. Formaldehyde vapors in concentrations as high as 0.5 ppm or more have since been measured. At as little as 0.1 ppm of formaldehyde, some persons are hit by throat and upper-lung irritation, and at 0.25 ppm asthmatics and children face a serious health risk.

Fire-resistant asbestos, another widely used insulating material, is now recognized as a serious threat to health. Its fiber dust is easily inhaled into the lungs, where its crystals will cause development of fibrous tissue. Now banned in industry, fraying asbestos insulation continues to pollute the air in schools where an estimated three million American children attend classes. Replacing asbestos-backed vinyl tile floor covering can also be a hazard: if the tile is ripped up incorrectly, asbestos dust is released into the air.

Air-conditioning systems. These are sources of living air pollution—germs, fungi and amoeba. The bacterial infection that is known as Legionnaire's disease infected its victims in Philadelphia in 1976 and in other places since then by spawning in air-conditioning systems.

Air-conditioning systems and humidifiers often spread lung ailments through office buildings—especially modern, energy-efficient ones that have windows that can't be opened. These white-collar enclosures also absorb pollution from underground garages.

While factory workers have government agencies regulating pollution in their work place, most white-collar workers have not received such attention. Yet even photocopiers give off a common smog ingredient, ozone, along with other chemicals. Typically these machines are put in backroom offices with little ventilation.

Aerosol sprays. When we disperse insecticides indoors with spray cans, tiny droplets can remain in the air for a few hours, after which the chemicals will settle into the carpet and furniture. Each time an

infant crawls across a rug, subtle clouds of hazardous dust may waft up. Hair and deodorant sprays, oven cleaners and other aerosols also create clouds of chemicals that can be inhaled and ingested into the bloodstream.

Tobacco smoke. While smoking one cigarette, a person inhales more than 3600 different chemicals, including carbon monoxide, formaldehyde and nitrogen dioxide. Young children in homes of smokers suffer significantly higher rates of respiratory illness and receive hospital treatment more often than other children.

In offices where people smoke, scientists have measured levels of inhalable particles many times more concentrated than a factory would be allowed to put into the surrounding outside air in a 24-hour period. The heavy smoker also poses a special hazard in closed automobiles, where airspace is so limited that carbon-monoxide levels can quickly approach 35 ppm, an amount that could affect the driver's ability by distorting his hearing, perception and motor skill.

Radiation. The soil and common building materials such as granite, brick, cement and concrete can be naturally rich in radioactive radon and its by-products polonium 218, lead 214 and bismuth 214. Ironically these are the preferred construction materials for energy-efficient passive solar homes. What has alarmed scientists is that the houses act like closed jars, trapping natural radon gas and causing it to build up.

In Mount Airy, Md., the National Association of Homebuilders created a prototype for the ideal energy-efficient home of the future. Here the old-fashioned, drafty American house was replaced by a dwelling so airtight it exchanged air with the outdoors only about twice in 24 hours.

Trouble was, Mount Airy happens to have a concentration of radon gas, which was producing radioactivity inside the prototype at levels several times higher than might be found inside an ordinary home—levels eight times higher than those deemed safe by government guidelines.

In 1981 an editorial in the *Journal of the American Medical Association* called for "a temporary halt to our home-energy conservation programs" until we knew more about the risks of indoor air pollution. One of the facets needing study is how *mixtures* of pollutants can combine to become more dangerous. Those who smoke and are exposed simultaneously to either radiation or asbestos dust, for example, are apparently at greater risk than separate exposure could cause.

But just when we need to know more about synergistic effects and other unknown dangers, the federal government has cut by more than half its meager research budget for indoor pollution. Until more is known, it is simple prudence for individual Americans to take what-

ever steps they can to protect themselves from the already proven dangers. What can *you* do to reduce indoor pollution?

• Be alert when using a fireplace, kerosene heater or gas stove. A poorly adjusted gas stove can give off carbon monoxide at a greater rate than a properly adjusted one. One sign of a gas range needing adjustment: the tip of the flame is yellow instead of blue. Have a service man correct it.

Ideally you should vent stoves and ovens *outside*, preferably with an exhaust fan that switches on automatically whenever the appliance is in use. If you use a kerosene heater, set it inside your fireplace and let the chimney vent its combustion gases.

• Smokers should confine their air pollution to one room of the house and make sure the window is open. Better still, they shouldn't smoke inside at all.

• If there is a risk of radon gas in your area (a special threat in basements), consider sealing off any leaks or cracks in the foundation of your house. Basement drains are also a potential entry point.

• Consider using an "indoor-outdoor heat exchanger." These devices, which cost from $300 to $1000 and can be installed like a window air conditioner, use the heat from air that they pump *out* of your home to warm the fresh outdoor air that is simultaneously pumped in. They bring in fresh air on a cold winter day while conserving up to 70 percent of a home's costly heat. They can also be installed with filters to remove smoke and other pollutants.

Our home is our castle, but in trying to make it a perfect environment, we've filled it with some dangerous conveniences and made it a bit too snug to breathe in safely. Short of new gadgetry to clear inside air, good ventilation is the quickest remedy for indoor pollution.

For information on reprints of this article, see page 214

Flight Paths

At the Nashville airport I purchased a ticket to Dallas. The flight left from Gate 7, and I asked the ticket agent how to get there. "Take the escalator to the upper level and turn right," he said. "Gate seven is about halfway to Dallas."

—Contributed by Ronald Sanders

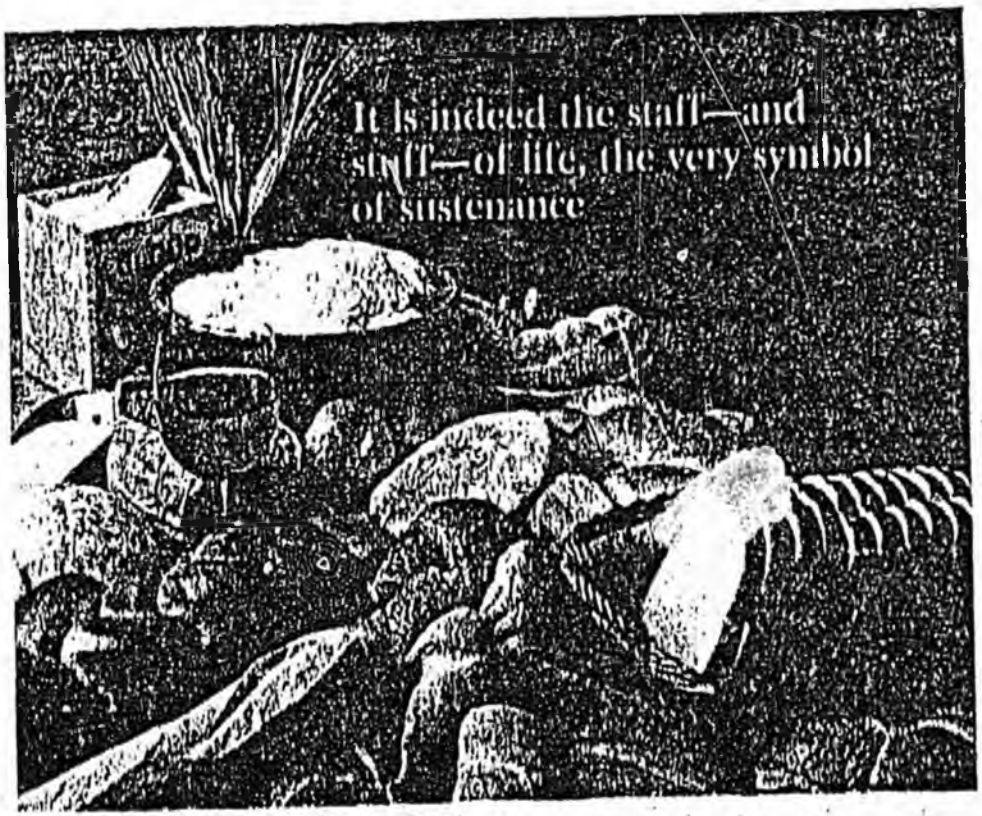
I was in an airport bar with a friend when we were approached by a slightly tipsy stranger. He asked my friend, who has an accent, where he was from. "Central America," my friend said.

"Really? So am I!" the man said in a booming voice.

"What part?" my friend asked.

"Kansas City."

—Contributed by Garry M. Schaeffer



Our Daily Bread

By Jack Denton Scott

The slightest whiff of baking bread starts taste buds blossoming. Its siren scent has even driven men to acts of madness: refused bread that he smelled baking in the little town of Byron, Mich., an enraged Indian launched one of the worst massacres in the state's history in 1827.

Like a country's flag, bread signals nationality at the world's tables: Mexico's tortilla; India's flat *chapati* and puffy *puri;* Scottish scones and oatcakes; England's light cottage loaves; Ireland's soda bread; the flat, pocketed Middle Eastern pita; America's corn bread.

And loaves appear in as many

PHOTO: IRENE STERN

Anti-smoking bill becomes hot issue

HB84

Times 3-18-83

Associated Press

Juneau — A representative who puffed on a cigarette during hearings regarding new smoking regulations apparently was not blowing smoke into the face of the law.

Rep. Ramona Barnes, R-Anchorage, says she was not violating the state's new smoking regulations during a recent House Judiciary Committee meeting, as was charged in a complaint filed by the Alaska Department of Environmental Conservation.

Roberta Banko of Juneau filed a complaint after seeing Barnes smoking during the committee hearing on a bill to prohibit smoking in a variety of public places. The bill being considered would increase the number of public places in which smoking is banned.

Barnes was cited for violating a year-old Alaska statute prohibiting smoking "in a room, chamber, place of meeting or public assembly under auspices of the state, or a department or agency of the state while public meeting held under the auspices of the state, or a department or agency of the state, is in progress." The penalty, if convicted, is $15.

The House majority leader said she was smoking in an approved smoking area. She also said that others were smoking during the meeting.

Barnes denied Banko's charge that she (Barnes) "was being very theatrical — obviously very arrogantly smoking in the meeting. It was apparent to everyone there that she was making a statement about her distain for the proceedings," said the woman, an active supporter of smoking regulations.

Barnes said, "I smoke all the time."

Banko said she was upset that Barnes was smoking in the same room as several people who had come to testify about how smoking aggravated their health problems.

Barnes said a smoke-eater was sitting next to her to prevent the smoke from bothering others.

HB 84

Smoke signals

IF ONE'S ACTIONS can be deemed a statement of that person's position on any given topic, Rep. Ramona Barnes can smoke to her heart's content at legislative committee hearings — and do so under constitutional immunity.

A Juneau woman filed a complaint with the Department of Environmental Affairs against Mrs. Barnes, accusing her of theatrically and arrogantly smoking a cigarette during a meeting of the House Judiciary Committee. At the time, the committee was considering a bill to ban smoking in public places.

BUT ALREADY on the books, as Roberta Banko protested in her complaint, is a year-old law that prohibits smoking "in a room, chamber, place of meeting or public assembly under auspices of the state, or a department or agency of the state while a public meeting held under the auspices of the state, or a department or agency of the state, is in progress."

Said the complaint by the Juneau woman, an active supporter of smoking regulations: "She was being very theatrical — obviously very arrogantly smoking in the meeting. It was apparent to everyone there that she was making a statement about her disdain for the proceedings."

AH, BUT there's the rub. By her own admission, Ms. Banko acknowledges that Rep. Barnes "was making a statement."

And the Alaska constitution specifically says: "Legislators may not be held to answer before any other tribunal for any statement made in the exercise of their legislative duties while the legislature is in session. Members attending, going to, or returning from legislative sessions are not subject to civil process and are privileged from arrest except for felony or breach of the peace."

For Rep. Barnes, apparently, politics still means a smoke-filled room now and then — notwithstanding any law to the contrary.

HB84

Smoking mad about lawsuits

He said. She said. They said. You said. And now I say I'm sick of the Alaska state government using my tax dollars for trivial lawsuits such as the one mentioned in your paper of March 15 regarding Rep. Ramona Barnes having a complaint filed against her by DEC for smoking in a ". . . room, chamber, place of meeting . . . under auspices of the state . . ."

How much is this nonsense going to cost the taxpayer? Wouldn't it have been simpler to ask her to please stop smoking rather than letting it slide so the state could secure solid "evidence" that she abused the law? Being as Juneau is all state government, why not just stop selling cigarettes altogether. That way there would be no chance of abusing the law.

With the ridiculousness that is going on in Juneau these days most of us are wonderng what is really being smoked!

— *Laura M. Schafer*

4/13/83

Letters

Smoking

Dear Editor:

House Bill 84 "An act relating to smoking in public places and vehicles," is not a bill just for the health conscious person who is into aerobic exercise, jogging, etc. It is more than a statement by the 2/3 population, which does not smoke, to the 1/3 that does, to give us a place to breathe smoke-free air. The bill: addresses the health hazards of second hand smoke, acknowledges the recent court decision concerning rights of nonsmokers, and takes note of the cost of smoking to the public.

It has been estimated the State of Alaska pays increased expenses for its smoking employees in excess of three million dollars annually. Alaska also pays workers compensation to people who lose work time because of smoke conditions making them too ill to work.

Some private industry is addressing the smoking problem now. IBM, 3M, and AT&T have set up separate areas for their nonsmoking employees. Some employers have set up separate areas because of court, decisions.

In 1976, a New Jersey court ruled against New Jersey Bell Telephone Co. stating that companies have a duty to give workers a smoke free work area if they want it. In August 1982, Lanny L. Vickers vs. the Veterans Administration, the United States District Court, Western District of Washington, ruled that a person who is physically sensitive to smoke qualifies as handicapped person as defined in 29 U.S.C. 706(7) (B). In October 1982, the United States Court of Appeals, ninth circuit, (Irene C. Parodi vs. Merit Protection Board) ruled a person is eligible for voluntary disability retirement benefits if that person is medically not able to perform the job because of sensitivity to smoke in the work place and the employer does not offer "... Suitable employment in a safe environment ..." Werner H. Peterke, a former Social Security administration worker, was awarded approximately $700 every two weeks in employee compensation payments on the grounds that he suffered from the smoke of fellow employees at work.

Medical research has linked ambient smoke to medical problems in nonsmokers. Children of parents who smoke are more prone to bronchial ailments. Nonsmoking wives of smokers have higher lung cancer rates than nonsmoking wives of nonsmokers.

House bill 84 represents an issue whose time has come. It has moved from arguments between smokers and nonsmokers to a bill before the legislature. It could very well go on to become law. If you have an interest, contact your legislator at Pouch V, Juneau, Alaska, 99811.

Gary Miller
P.O. Box 2436
Juneau, Alaska

Anchorage Daily News photo illustration by Jim Lavrakas

Stickers like this are available from the Alaska Lung Association, and obstetrician Lydia Eastburn is always pleased when she can give one to a patient who's kicked the habit.

Pregnant smokers are 'smoking for two'

By GWEN BARCUS
Daily News reporter

☐ "Warning: The surgeon general has determined that cigarette smoking is dangerous to your health."

For the expectant mother that precautionary notice on every package of cigarettes is doubly important. When she smokes she is smoking for two.

Dr. Lydia Eastburn, an Anchorage obstetrician and gynecologist, says about 40 percent of the pregnant women she sees are smokers.

"When I'm seeing a new patient, one of my first questions is 'Do you smoke?' The next is 'How much?' "

If the answer to the first question is yes, Eastburn says she goes on to explain why now is the time to quit. About one-fifth of her patients heed her advice, and probably an equal number cut down on the number of cigarettes they smoke.

Eastburn is trying to increase those numbers. "I know most mothers want to do everything possible to assure their baby's health," she says. "There are some things over which they have no control, but stopping smoking is one thing they can do, and it's very important in the development of the fetus."

The pregnant woman who smokes increases the risk of having a miscarriage — smokers are almost twice as likely to miscarry as women who don't smoke, according to Peter Fried and Harry Oxorn in their book "Smoking for Two."

Eastburn says another risk is that the baby will die during pregnancy, and low birth weight also appears to be closely related to smoking during pregnancy.

Although there may be several reasons why some newborns are smaller than average, virtually all scientific studies on the subject show a clear relationship between cigarette smoking and lower infant birth weight. And, according to Eastburn, smaller babies mean smaller heads and smaller heads mean smaller brains. She is convinced that the incidence of learning disabilities is higher in babies of smokers.

There are some 200 chemicals in cigarettes, many of which are harmful even for the adult smoker. For the unformed developing life, dependent on its mother for the oxygen and nourishment it needs to develop properly, Eastburn says the results of smoking by the mother can be tragic.

"A couple of years ago I had a patient whose fetus was not growing at the proper

See Page F-3, SMOKING

pared to her husband, arriving in Palmer in 1936 to work as a surgery nurse at the Matanuska Valley Hospital. It was a "far cry from Chicago," where she had taught school, "but I fell in love with the country — and also with Walter. We were married in Seward in 1938."

Walter had gone to Palmer in 1935 while the Matanuska Colonists were enroute there. Following his graduation from Washington State College, now Washington State University, he was working for the Alaska Rural Rehabilitation corporation.

Elsie recalls their honeymoon prospecting trip to Lake Chalatna — with a friend of Walter's. She refers to the trip as "Three on a Honeymoon." They flew into the remote area with a dismantled river boat which they planned to reassemble on arrival. The river ran in a narrow bed between high bluffs and the two men pulled Elsie upstream from the top of the

The Rondy King and Queen Regent will celebrate their 45th anniversary this year, and except for a year spent Outside when Elsie's mother was ill, and time spent in New York while Walter was earning his master's degree at Hunter College, the two have lived in Alaska all that time.

During World War II, Walter served as paymaster and timekeeper with the Army Transport Service based in Seward. He spent 15 years as a teacher at Seward High School, and when the family moved to Anchorage in 1966, taught history in evening classes at the University of Alaska, Anchorage.

Prior to his retirement five years ago, he was Command Historian for the U.S. Army Alaska, and still pursues his interest in history, particularly Alaska history.

Work for Elsie has included teaching, nursing and administration, and

Anchorage Daily News/Paul Brown

Walter and Elsie Blue were chosen by the Pioneers of Alaska to be King and Queen Regent of the 1983 Fur Rendezvous.

13 years operating "The Blue Shop," a women's and children's clothing store in Seward. She served as administrative assistant at Seward General Hospital and was administrator of the Careage House and Ridgeview Manor, both former nursing homes in Anchorage. She retired in 1975, and devotes much of her time to the activities of The Pioneers of Alaska Auxiliary 4. Vitally interested in the welfare of Alaska's long-time residents, she serves as a member of the State of Alaska Pioneer Homes advisory board.

Virginia, their only child, was born in Seward, and now lives in New York City where she is a writer. She was an original member of the Anchorage Community Theater.

When asked what sort of vehicle they would like to ride in during the Rondy parade Feb. 19, Walter Blue replied, his blue eyes twinkling, "a garbage truck."

"Our entire life in Alaska has been like this," Elsie laughs. "There's never been a dull moment."

Smoking and pregnancy don't mix — for you or your baby

Continued from Page F-1

rate," the doctor recalls. "I felt sure it was because she was a heavy smoker. When she went into labor she was rushed to the hospital and in her nervousness smoked almost a package of cigarettes on the way. Her baby was born dead."

The most active and powerful ingredient in cigarette smoke is nicotine. The amount of nicotine in a single cigarette, if injected rather than inhaled, would paralyze the brain centers controlling the heart and breathing and cause rapid death. In the case of a pregnant smoker, her nicotine-constricted veins narrow the blood vessels that supply the fetus, thus decreasing the amount of oxygen and "food" it receives. In addition, nicotine actually crosses the placenta and directly affects the fetal cardiovascular system.

Frier and Oxorn say "for every cigarette smoked by the mother, the fetus gets the equivalent effects of two."

Eastburn says another danger for the pregnant smoker becomes evident if the baby has to be delivered by cesarian section. The procedure requires a general anaesthetic, which presents a risk to both mother and baby if the mother is a heavy smoker, especially if smoking continues right up to the time of birth.

It helps to stop smoking even a week before the baby is born, says Eastburn. And the new mother should work hard to maintain her resolve, she adds, because the "involuntary smoker" — anyone breathing the air around the smoker — is exposed to even more of tobacco's harmful constituents than the smoker. The smoke from the burning end of a cigarette has *twice* as much nicotine as the inhaled smoke, and *five* times as much carbon monoxide.

According to the Alaska Lung Association, babies in the first year of life have higher rates of pneumonia and bronchitis if their parents smoke at home. And children of smoking parents are twice as likely to smoke as children of non-smokers.

The Lung Association distributes an informational packet for the prospective mother who smokes, and Eastburn gives one to each of her smoking patients. (They are also available from the association at 406 G St., telephone 272-2332. A $1 donation is requested.) She files their charts in blue folders so they're easily distinguishable, and everytime she sees a "blue folder" patient she encourages her to quit.

Other than quitting "cold turkey," what can the smoking mother-to-be do to lessen the danger to her baby?

"If she has tried to quit and has failed, she should at least cut down to no more than 10 cigarettes a day," says the doctor. "If lighting up a cigarette is important to her, perhaps she could light up, take one puff, then throw the cigarette away."

But it would be even better, Eastburn says, if she could say what is printed on a sticker distributed by the lung association: "I quit because I love my baby."

DETAILS No. 16 April 27, 1979

The New England Journal of Medicine

February 9, 1978

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

Edited by
JONATHAN E. FIELDING, M.D., M.P.H., AND PEARL K. RUSSO

SMOKING AND PREGNANCY

JONATHAN E. FIELDING, M.D., M.P.H.

In 1957 Simpson published her original finding that babies born to women who smoke during their pregnancy are on the average 200 g lighter than neonates born to nonsmokers.[1] More than 100 articles on this relation have led to general acceptance that, on the average, smokers' babies weigh 150 to 250 g less than nonsmokers' babies, and twice as many of the former weigh less than 2500 g. Differences in weight are in direct proportion to the number of cigarettes smoked and are independent of other infant and maternal factors known to influence birth weight.[2]

Further information may be obtained from Jonathan E. Fielding, M.D., Commissioner, 600 Washington St., Boston, MA 02111 ([617] 727-2700).

Until recently, however, it had been difficult to explain why observed perinatal mortality ratios (smokers to nonsmokers) varied from lows of 1.01 and 1.03 in sample sizes of 11,700 and 9800[3-5] to highs of 1.28 and 1.40 in respective sample sizes of 15,800* and 12,500,†[6,7] with an intermediate value of 1.12 in a sample of 19,000.[8]

A series of articles analyzing data from the Ontario Perinatal Mortality Study of all single births in 10 Ontario teaching hospitals during 1960-61 indicates progress in untying this Gordian knot.[2,9,10] The study of 51,490 births, including 701 fetal deaths and 655 early neonatal deaths, supplemented usual clinical records with interviews of mothers in the hospital, interviews with anesthetists and attending physicians and autopsy records.[11] Results relate perinatal mortality to social, demographic and physical maternal factors, prenatal care, histories of prior pregnancies, complications of pregnancy, details of anesthesia, delivery and hospital course and infant survival up to eight days. The interviews of mothers included questions on the maximum amount smoked during pregnancy, expressed as packages per day. The study found that perinatal mortality was 27 per cent higher in infants of smokers as a group than in those of nonsmokers. Risk, however, varied greatly according to other factors, including maternal height, weight before pregnancy, hospital pay status (public or private), birthplace, age, parity, previous pregnancy history and sex of the child. When simultaneous adjustments for these variables had been made, smoking less than one package per day increased perinatal mortality risk by 20 per cent versus 35 per cent for smoking more than one package per day.

Controlling for the same variables, the authors found that the increased risk of both in utero deaths and neonatal deaths is concentrated in the period of 20 to 28 weeks' gestation. Increased neonatal mortality rates seem to result from the increased risk of very early delivery rather than lower survival at a particular gestational age. The authors estimate that 30 per cent of the excess perinatal death associated with maternal smoking is due to increases of 25 and 24 per cent respectively in placenta praevia and abruptio placentae for those who smoke less than one package per day and of 92 and 68 per cent for heavier smokers. Other studies have also found an average increase of 28 to 48 per cent in these conditions for smokers.[12-15]

Crucial to an understanding of risk is the differential risk of smoking based on maternal characteristics. The Ontario study found that the excess perinatal death risks of less than 10 per cent were associated with low parity, young age and normal hemoglobin. By contrast, older mothers of higher parity who were of public pay status or who suffered from anemia (hemoglobin less than 11 g per deciliter) had in-

*For neonatal deaths only.

†Approximate.

creased perinatal mortality risks of 70 to 100 per cent when they were heavy smokers.[2,11] The characteristics other than smoking that are associated with differential risk may be important in reconciling the varying risks to smokers observed in the large-scale studies. Differences in population selected for study, as well as different methods of adjustments to match smokers and nonsmokers, appear to have contributed to the wide variation in perinatal mortality ratios for smokers vis-à-vis nonsmokers.[4] In addition to the growing evidence for adverse late outcomes of pregnancy, a recent article in the *Journal* provided convincing demonstration that pregnant smokers have a significantly increased risk of spontaneous abortion, 1.8 to 1.0, when compared to nonsmokers.[16] Not yet fully explored are the combined risks of smoking and alcohol ingestion, although there is no reason to believe that this combination yields fewer adverse effects than the sum of those two behaviors. Also unresolved is whether the effects of maternal smoking on fetal growth and development carry over into childhood.

Although the risks recently reported need confirmation by others, the growing evidence linking maternal smoking to increased perinatal mortality argues strongly for augmented attempts to apprise women of childbearing years of the potential risk of smoking in the outcome of pregnancy. The Surgeon General's 1973 report on the Health Consequences of Smoking estimated 4600 perinatal deaths in the United States annually as a result of maternal smoking.[17] Unfortunately, despite a drop from 52 to 39 in the percentage of men over 21 who smoke, the percentage of women of childbearing age who smoke is growing.[18] A careful cohort study of teen-age girls found that the proportion of regular smokers among girls 15 to 16 years of age had risen from 9.6 per cent in 1968 to 20.2 per cent in 1974, and among girls 17 to 18, an increase from 18.6 to 25.9 per cent in the same period.[19]

Although too little is known about what motivates smokers to stop, some evidence suggests that pregnant women may be particularly susceptible to educational and motivational technics aimed at cessation of smoking. Several studies indicate that most women are sufficiently concerned about the outcome of pregnancy to adhere to medical advice regarding helpful and harmful activities.[20-22] One survey showed that 62 per cent of young women smokers believed that smoking can harm an unborn child; most reported that they either had cut back (32 per cent) or had stopped smoking (35 per cent) during pregnancy.[23] The frequency of contact between pregnant women and health professionals provides an unusual opportunity for education about the dangers of smoking and positive reinforcement for reduction or elimination of this habit.

The Massachusetts Department of Public Health has made the following recommendations to help reduce smoking among pregnant women:

1. In the initial prenatal visit, physicians and nurses should include cigarette smoke in the usual list of drugs that are known to affect adversely the outcome of pregnancy and are to be avoided. Mention may be made that during pregnancy, when use of all pharmacologic agents is to be kept to a minimum, cigarette smoke, which contains over 1000 "drugs," is of special concern.

2. Pregnant women should be told that evidence to date suggests that they are at especially high risk for detrimental effects of smoking on the pregnancy if they have had a history of previous perinatal loss, bleeding or placental complications, if they are anemic or if they are in the older age group.[24]

3. Physicians should consider obtaining a carboxyhemoglobin or expired carbon monoxide level on every patient during the first prenatal visit. If this test is performed, the patient should be shown abnormal laboratory results and told that the high level, which poses a risk to the fetus, can be lowered to the normal range only by cessation of smoking.[25] The success of cessation efforts can be monitored by repeat testing at later prenatal visits. When levels remain elevated, physicians should reinforce their previous strong advice.

4. Any woman with bleeding at any time during pregnancy should be questioned closely on whether or not she smokes, and the dangers of smoking to the fetus re-emphasized.

5. Physicians should obtain a list of reputable local smoking cessation clinics and provide this information to pregnant patients who smoke, with the suggestion that these peer groups may help the patients stop smoking.

6. Health facilities and physician offices should not permit smoking in any areas where staff and patients come in contact. Prominent "No Smoking" signs should be displayed in all patient areas, and abstinence enforced.

7. Blue Cross and commercial insurers should consider inclusion of coverage for approved smoking cessation activities in all subscriber contracts. At a minimum, such activities for pregnant women should become a part of standard master medical coverage. Medicaid should also cover such programs. Insurers should develop reasonable criteria for vendors of these services that address cost, program content, personnel and standardized reporting on results. As an alternative, insurers could consider reinforcing information on the dangers of smoking generally by charging lower premiums to those individuals and families who would sign a certified affidavit that they are nonsmokers. (This approach has worked with life insurance.)

The Massachusetts Department of Public Health is recommending to the Federal Trade Commission that the warning on cigarette packages be revised to read as follows: "Cigarette smoking is hazardous to your health and can cause fatal cancer, heart disease and lung disease. Smoking during pregnancy increases the [illegible] risk of death of the un-

Abstract from Early Human Development

RANTAKALLIO, P., University of Oulu, Finland

"The effect of maternal smoking on birth weight and the subsequent health of the child." (Early Human Development 2/4: 371-82, 1978)

"The effect of maternal smoking during pregnancy on birth weight was studied in 12,068 births, the mothers in 1819 of which were regarded as smokers. The children of the smokers were compared with those of controls of similar age, parity, marital status and place of residence. Maternal smoking reduced birth weight in a dose-related manner. Birth weight was least affected among young, primiparous mothers who smoked only slightly, a difference which was, however, entirely caused by those mothers who stopped smoking for the last 3 mth of pregnancy, and this subgroup showed similar figures for postneonatal mortality and morbidity up to the age of 5 to those of their controls.

Postneonatal mortality was higher in the total group of the smokers than among their controls, the primiparous or young mothers not differing in this respect from the others. Morbidity up to the age of 5 was significantly higher ($P < 0.001$) among the children of the smokers, the children of the primiparas and young mothers being affected in a similar way to the others. The low birth weight infants of the smokers had a higher mean birth weight and lower perinatal mortality than the low birth weight infants of the controls, but morbidity up to age of 5 and postneonatal mortality were higher among the smokers in respect of both low birth weight infants and others."

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Current Comments®

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Nicotine Addiction Is a Major Medical Problem: Why So Much Government Inertia?

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Readers of *Current Contents*® are probably familiar with my feelings about the smoking habit.[1,2] I particularly dislike being forced to suffer the choking pollution so casually created by most smokers. On the other hand, I'm especially appreciative of smokers who understand my concern. Many other non-smokers feel the same way. It doesn't make sense to us that smokers maintain their habit in obvious disregard of its dangers and costs. Nevertheless, this is not without an understanding that the smoker has a need which can at best be delayed only temporarily.

The dangers and costs attributed to smoking are legion. Smoking is linked to a number of diseases: cardiovascular disease; cancers of the throat, lung, mouth, pancreas, and urinary bladder; peptic ulcers; decreased fertility; and increased still-births and spontaneous abortions.

Society loses the most from the smoker's habit. A few years ago the National Institute of Drug Abuse (NIDA) published an important volume on smoking behavior research. In this work, on which I will draw heavily below, Bryan Luce and Stuart Schweitzer (UCLA School of Public Health) state that smoking results in a major drain of the nation's economic resources in both direct health care costs and the costs associated with lost earnings due to sickness and death.[3] The NIDA estimates that smoking-related illnesses cost the American public nearly $8 billion in 1975. Lost earnings resulting from smoking-related illnesses and deaths totalled nearly $18 billion. By comparison the $170 million cost of smoking-caused fire damage seems small. But the National Fire Prevention and Control Administration says that smoking-caused fires account for 47% of all fire-related deaths and injuries.[4]

Most smokers will agree that their habit is dangerous and costly. The majority of them *want* to quit but few are successful. A 1967 survey of adult and adolescent smoking habits in Britain indicated that 77% of current smokers want to stop.[5] However, only one in five stops permanently.

Many non-smokers find it especially ironic and annoying that smokers often dislike the habit. There is a common view that smokers are simply weak people with little will-power. This is a distorted view of a *significant medical problem*. Smoking is more than just a bad habit that is socially and physically unacceptable to non-smokers. Smoking is a *powerful physical addiction*. I agree with M.A.H. Russell, senior lecturer and honorary consultant psychiatrist at Maudsley Hospital Addiction Control Unit, UK, who asserts, "Cigarette-smoking is probably the most addictive and dependence-producing form of... self-administered gratification known to man."[6] Unfortunately the evidence is

growing that the statement is now equally applicable to women.

I cringe when I recall a recurring scene from my youth. A beautiful young woman, dressed as a cheerleader, would stand on the corner outside my high school giving away sample packets of cigarettes. Her supply was inexhaustible: she was never empty-handed. She and her colleagues were the predecessors of the drug-pushers who now pervade the educational establishment. Whether she realized it or not, she was pushing the powerful addictive drug called nicotine.

Unfortunately, most people do not acknowledge this *addictive* aspect of smoking. In fact, the 1964 Surgeon General's Report alleged that smoking is not an addiction because "there are no withdrawal symptoms, no tolerance is developed, and no anti-social behavior is elicited."[7]

Not surprisingly, the Tobacco Institute in Washington, DC, the chief lobbying group for the tobacco industry, also maintains that smoking is not an addiction. Ann Browder, assistant to the president of the Institute, explains: "If nicotine is addictive, we wonder why 30 million people have given up the habit since 1964. Cigarette smoking is not addicting, as opposed to being habituating, in that an individual who began smoking a pack or a pack and a half a day doesn't have to increase that consumption in order to satisfy the desire to smoke. Our stand is certainly that it is habituating but not addictive."[8]

The distinction the Tobacco Institute draws between habituation and addiction has been called artificial by the World Health Organization (WHO). In its reports, WHO has replaced both terms with a single term: drug dependence.[9] Since the 1964 Surgeon General's Report was issued, there has been convincing research to show that at least one component of tobacco, nicotine, is a dependence-producing drug, as defined by WHO: "a drug having the capacity to produce a state of psychic or physical dependence, or both."[7]

WHO defines drug dependence as "a state, psychic and sometimes physical, resulting from the interaction between a living organism and a drug, characterized by behavioral and other responses that always include a *compulsion* to take the drug on a continuous or periodic basis in order to experience its psychic effects, and sometimes to avoid the *discomfort of its absence* [withdraw]. *Tolerance* may or may not be present."[9]

Tolerance is indicated when the addict becomes accustomed to the initial effects of the drug. Also, it usually involves a physical change of some kind in the addict. In its third report on smoking and health, the Royal College of Physicians stated that nicotine fits the definition of tolerance: "When inhaling cigarette smoke for the first time most people have symptoms such as palpitations, dizziness, sweating, nausea and vomiting.... If they continue to smoke, they acquire a tolerance to nicotine, and over a period of two or three years the smoking pattern usually changes so as to allow a high intake of nicotine.... The metabolic type of tolerance also occurs, in that smokers metabolize nicotine more efficiently than do nonsmokers."[10]

Withdrawal symptoms are those "which follow sudden withholding of a drug to which a person has become addicted."[11] (p. 1483) The regular smoker feels withdrawal symptoms an hour or two after his last cigarette. Stanley Schachter, professor of psychology at Columbia University, observes, "Restrained smokers appear to be chronically more irascible, to nibble more, and to have poorer concentration than unrestrained smokers."[12] Russell adds, "Such [withdrawal] symptoms as depression, anxiety, restlessness [and] intense craving...have frequently been described.... More recently, objective physical withdrawal effects have been clearly demonstrated and include sleep disturbance, sweating, gastrointestinal changes, drop in pulse rate and blood pressure, disturbed time perception..., impaired performance at simulated driving...and EEG changes."[5]

Jerome Jaffe, professor of psychiatry at Columbia, points out that society is unwilling to recognize these withdrawal symptoms as signs of illness. Jaffe reported, "Even where severe withdrawal phenomena do occur...society generally has taken the view that such signs and symptoms are 'normal' and to be expected under the circumstances. While tremulousness following abrupt withdrawal of alcohol, or autonomic disturbances from withdrawal of opiates are equally to be expected under the circumstances, they are, for some reason, not regarded as equally 'normal under the circumstances' and are viewed as representing signs of illness."[13] In short, alcohol addiction is now viewed as an illness (it wasn't always) but smoking has not yet reached that stage in the public's perception of the problem.

Smokers are compelled to smoke to avoid the disagreeable symptoms of withdrawal. Compulsion is "an irresistible impulse to perform some act contrary to one's better judgment or will."[11] (p. 332) Not only did 77% of the British smokers surveyed in 1967 want to quit but they also gave good reasons for quitting.[5] Smoking causes physical harm and discomfort, is expensive, and is increasingly disapproved of by other people. Since only one in five of those surveyed quit permanently it is clear that the majority of smokers act against their will and better judgment. For them, cigarette smoking is a compulsion.

I can't avoid mentioning here a certain woman Ph.D. who makes frequent TV and public appearances on behalf of the Tobacco Institute. She is one of those one in five who smokes out of free will. She is well paid to convince smokers that they should cling to their habit in spite of the statistical evidence that smoking is disease related. None of those statistics applies to them, she says. My contempt for such misuses of science is difficult to express briefly. While it may not matter what she says to today's smokers who can't quit even if they want to, it does matter that she convinces individuals who haven't started smoking that they may be exempt from the laws of probability.

Like other addictive compulsions, cigarette smoking leads to antisocial behavior when the available supply is restricted. Gwenda Blair, writing in *Mother Jones*, claims: "Data from Germany after World War II indicates that even under conditions of extreme deprivation, and in situations where food rations were under 1,000 calories a day, smokers still bartered eats for smokes.... Smokers' need for cigarettes was so overwhelming that some also... prostituted themselves or stole other goods that could be traded for cigarettes."[14]

It should be obvious that cigarette smoking is not a minor vice. Nicotine, "the most powerful pharmacological agent in cigarette smoke,"[15] is in the same chemical family as the poison strychnine, the medicine quinine, the hallucinogen mescaline, and the addictive pain relievers cocaine, opium, morphine, codeine, and heroin. Russell suggests that nicotine is addictive because it stimulates the hypothalamus, which is considered to be the "pleasure center" in the brain. He states, "It is likely that the special feature of dependence-producing potential possessed by some psychoactive drugs [including nicotine] rests in their ability to either directly or indirectly influence the hypothalamic reward system."[5] He claims that stimulation of the hypothalamus is a more powerful reinforcer of behavior than hunger, thirst, and sex.[5]

Some researchers now believe that nicotine is the *most* powerful addictive drug. Russell also quotes a survey indicating that 85% of those who smoke

more than *one* cigarette develop a dependence on nicotine.[5] Thus, nicotine addiction is established even more quickly than heroin addiction.

Robert Dupont, former director of the NIDA, estimates that nearly 70% of people who ever smoked (and are still alive) still smoke on a regular basis.[14] He compares this to less than 15% of people who ever used heroin and are still alive and addicted. Once established, the smoking habit is harder to break than addiction to heroin. In fact, heroin addicts consider nicotine to be more "needed" than heroin. In 1974, 278 British opiate users were asked to list a number of drugs in subjective order of greatest personal need. They rated nicotine above heroin, methadone, amphetamine, barbiturates, LSD, cannabis, alcohol, and tea or coffee.[5] I'll have more to say about coffee in a future essay.

There are several reasons why nicotine is more addictive than other dependence-producing drugs. First, the beginning smoker inhales around 200 puffs of nicotine-rich smoke in his or her first pack of cigarettes. The heroin user starts off with only one or two shots a week. The pack-a-day smoker "shoots up" more than 50,000 nicotine puffs in a year! Behavioral psychologists agree that the strength of a habit increases with the frequency of its reinforcement.[5, 16] Nicotine forms the most addictive habit because it is reinforced most frequently.

A second factor affecting habit strength is the timing of reinforcement. After heroin enters the bloodstream through intravenous injection, it takes almost 14 seconds for it to reach the brain. Nicotine enters the bloodstream through the lungs—it takes only eight seconds for it to reach the brain and pay off its pharmacological rewards.[5] The Australian Council on Smoking and Health says this rapid absorption explains why nicotine is so much more dependence-producing than alcohol and other drugs.[16] I suppose when you are addicted, six seconds faster can seem like a vast improvement.

Third, cigarette smoking is a socially accepted habit. The Royal College of Physicians contrasts the role of cigarette smoking with alcohol and barbiturate use in society. "Most people who drink alcohol or take sleeping pills are able to do so in moderation or on special occasions and can tolerate periods without them. It is only a small minority who become alcoholics or addicts. Furthermore, dependence on alcohol or barbiturates usually occurs in settings of psychological or social difficulty. With cigarette smoking the situation is altogether different. The most stable and well-adjusted person will, if he smokes at all, almost inevitably become dependent on the habit."[10]

As any cigarette smoker will tell you, it is much harder to kick the habit than to acquire it. Since the 1950s, when public withdrawal clinics first opened in the Scandinavian countries, there have appeared almost as many smoke control programs as there are brands of cigarettes. Jerome Schwartz, chief of health care research at the California Department of Health, Sacramento, classifies the variety of smoke control programs into nine categories: individual counseling by health professionals; educational programs sponsored by schools or commercial groups; group control activities sponsored by volunteer associations, foundations, commercial groups, and health departments; medications used to help smokers overcome their habit and withdrawal symptoms; hypnosis; behavioral conditioning; self-control procedures; mass-media programs on the risks of smoking and ways to kick the habit; and community efforts to involve neighborhoods and cities in educational programs.[17]

Given the evidence for physical dependence on nicotine, you would think that smoke control programs concentrate on handling withdrawal problems. However, most do not. It is no coincidence that these smoke control programs show disappointingly low cure rates. Schwartz surveyed 123 smoking cessation programs and found that only one-fifth had success rates of 40% or better. Nearly one-half of the programs had success rates of 21% or *less*. This would seem to be the expected rate based on the British data. Only three of the programs in the survey claimed success rates higher than 70%.[17]

Edward Lichtenstein, professor of psychology at the University of Oregon, Eugene, admits that behavioral programs are generally unsuccessful because they ignore nicotine dependence as one of the more important clinical aspects of smoking behavior. He says, "Most social learning workers, including myself, consistently ignore the implications of a large body of research which suggests that nicotine is a primary reinforcer for smoking and that, at least for heavy smokers, there are internal or physiological stimuli that drive the smoking habit.... The challenge for social learning workers is to incorporate this information on physiological processes into treatment programs. At least, we should probably cease trying to persuade smokers that their habit is entirely or even largely under external stimulus control."[18] (Incidentally, a social learning worker is a psychologist who studies the situational and environmental factors influencing a person's behavior.)

The Five-Day Plan, organized by the Seven-Day Adventist Church, uses the educational and group approach. While it acknowledges nicotine as an addictive drug, the Plan encourages people to overcome their habit by changing their attitudes toward both themselves and cigarettes. V.E. Gardner, medical director of the Five-Day Plan at the Philadelphia Better Living Center, explains, "We strongly follow concepts of nicotine as an addictive drug with very definite withdrawal symptoms. The plan is designed to minimize these. The withdrawal symptoms clear up in less than one week if no cigarettes are used. We get together each day to support each other during the few days of withdrawal. During this time, focus is placed on changing attitudes—toward the cigarette and towards oneself. The cigarette must not be looked upon as a reward or its denial a deprivation. New health promoting behavior gives a new self image in which smoking is out of character. It is these changed attitudes that are of real help in preventing a return to smoking, for the psychological craving persists even after the physical withdrawal symptoms have cleared."[19]

Smokers in the Five-Day Plan attend five consecutive group-therapy sessions, each lasting one and one-half hours. Sessions include lectures, films, and discussions on the psychological aspects of the smoking habit and ways to overcome it. The Five-Day Plan also encourages physical fitness exercises, balanced diet, hot and cold showers, and abstention from tea, coffee, and alcohol. A series of monthly follow-up meetings is organized to make sure that those who have quit or cut down on their smoking continue to do so.

During the five days of treatment, between 70% and 100% of the participants stop smoking. But, Schwartz points out, "Follow-up reports indicate that recidivism is high.... In-residence treatment at the Seventh Day Adventist Church's facility in St. Helena, California, showed 35% cure rates a year afterward."[17] Data from ten Five-Day Plan programs in different parts of the world show cure rates ranging from 16% to 40% after periods ranging from six months to five years.[17] Again we find that only about one in five can break the habit. Evidently, the changes in attitude and self-image are less permanent than the persistent physiological craving for nicotine.

The Smokenders program uses a behavior modification approach to help

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the smoker kick the habit. The program is designed with nicotine addiction in mind. Participants are given "assignments"—things to do which physically and psychologically recondition them for withdrawal. Lois Rafalko, vice president for program and training at the Smokenders headquarters in Phillipsburg, New Jersey, explains, "We do things to deal with the physiological withdrawal in advance. It happens gradually so that on the day when the member stops smoking he doesn't have the physical trauma of 'cold turkey.'"[20] Cold turkey is the abrupt cessation of drug intake, at which time the drug user begins to feel symptoms of withdrawal.

Participants in the Smokenders program attend eight weekly sessions, each lasting two hours. The first five sessions are smoking sessions—participants can smoke as much as they choose. But participants must stop smoking completely on the day after the fifth session. The last three sessions are reinforcing meetings that prepare reformed smokers to live without the habit. As long as people are not smoking they can return after the program ends for continued reinforcement.

The gradual and "painless" modification of smoking behavior makes the Smokenders program one of the more successful methods. Rafalko claims that 80-85% of those who complete the program are not smoking at all at the end of eight weeks. At the end of one year, 70% of those who quit smoking in the program are still not smoking. These data have not been confirmed by independent reviewers. Let's hope it is true.

Any program that tries to change smoking behavior faces a number of problems from the start. First, little has been done to identify tried and true smoke control techniques. Instead, researchers are influenced by currently popular ideas. Lichtenstein states, "The complexity of smoking permits a wide variety of social learning strategies and tactics to be applied. Unfortunately, choices often seem to depend on current fads or trends rather than flowing from a clinical and empirical analysis of smoking behavior itself."[18]

Also, behavioral smoke control programs must treat a large number of variables. Phoebus Tongas, chief psychologist at the Kaiser-Permanente Medical Center, says, "[Smoking] is under the control of such a great number and variety of discriminative stimuli and reinforcers that the task of eliminating it for long periods of time is immensely difficult as every research study has shown."[21] Lastly, the number of variables is multiplied by the number of individual smokers. John Pinney, director of Health, Education, and Welfare's Office of Smoking and Health, remarks, "If we've got 53 million smokers, we've got 53 million different kinds of smokers."[22]

Treating the cigarette habit as a physical addiction makes the problem of kicking the habit simpler. Instead of balancing hundreds of behavioral stimuli and reinforcers, the researcher can concentrate on the relatively few physiological motivations behind nicotine dependence. Pinney says, "If we can find some common denominators between [smokers]—biochemical or otherwise—then that will help."[22]

Schachter, suggests one such biochemical common denominator. He was interested in the smoker's claim that smoking is calming in stressful, anxious situations. Using a number of experimental subjects and strategies, Schachter found that "the smoker's mind is in the bladder."[12] Stress results in making the urine more acidic. When the urine is acidic nicotine is flushed out of the body. The smoker begins to feel withdrawal symptoms as the level of nicotine in the body decreases. "When the urine is alkaline, only one fourth as much nicotine is excreted as when the urine is acid; this is explained by the fact that nicotine base is reabsorbed from an alkaline urine."[12]

Psychologist James Fix at the University of Nebraska in Omaha thinks this biochemical fact can be practically applied to kick the smoking habit. Fix and co-workers divided a total of 42 subjects into three groups. One group took daily supplies of sodium bicarbonate, which decreases the acid content of the digestive system. Another group took vitamin C, which raises the acid content. The third group took a placebo.[23]

After five weeks, Fix reported "totally astonishing" results: "The bicarbonate group's average daily consumption dropped drastically to 0.14 cigarettes, while the vitamin C group and placebo groups went to 7.8 (up slightly from the fourth week); moreover, bicarbonate takers proved more likely to abstain from smoking for a 48-hour period."[22] Fix cautions that these results are preliminary, since many variables were not controlled in the experiment. However, they are encouraging enough to support the original idea that increased alkaline content makes the craving for nicotine less compelling.

There is good reason to be excited by Fix's advance in smoking control research. Any advance that does not depend upon a behavior modification program is bound to be valuable. It should encourage basic research scientists and others involved in clinical research because a cure for the disease is attainable. Whether we are coming closer to a cure is debatable. The Australian Council on Smoking and Health asserts, "An effective cure [for smoking] would rank with the discovery of penicillin in its effect on the health of mankind."[16] Russell adds, "The effective control of cigarette smoking is potentially the most important health measure that is likely to be open to us for the rest of this century."[5]

But it will not be enough to cure smokers of their addiction to nicotine. It is even more important to prevent people from getting hooked in the first place. This involves changing society's attitude toward the smoking habit. Recently, WHO's Expert Committee on Smoking Control recommended that "nonsmoking be regarded as 'normal social behavior' and [that] governments ...step' up antismoking legislation to establish that objective.... The purpose of smoking-control measures is not to punish the smoker but to encourage recognition of non-smoking as the norm."[24] Perhaps when the smoke clears a bit society may see the wisdom in this position.

Not only would it be illegal for cigarette companies to dispense samples to adolescents, but the government would be ready to discourage tobacco growing. One cannot ignore the economic significance of the cigarette industry. Cigarettes will be produced even if all forms of advertising and promotion are banned. Tobacco production will stop only when a better use for tobacco crop land is found. This is difficult to achieve because thousands of small farmers derive high income from a few acres of tobacco. The complicated nature of agricultural politics makes it doubtful that we would curtail tobacco farming to eliminate "the most lethal of all breathable pollutants."[16] Consider how difficult it has been to prevent production of the poppy plants needed to produce heroin.

The tobacco industry is well aware of society's changing attitude toward the cigarette habit and of the increasing restrictions on cigarette advertising and smoking in public places. As a result, it has turned to Third World countries in order to bolster declining sales. Blair points out that the Third World market is ripe for exploitation because it is "eager for symbols of Western affluence and still unencumbered by health and advertising regulations."[14]

Another recent article noted that the US government is helping the tobacco industry market cigarettes to the Third World at the same time it helps to alleviate malnutrition there. "Perhaps the most cynical foreign use of tobacco by the United States has been the inclusion of tobacco in the...'Food for Peace'

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program of concessional agricultural sales to needy countries. This supposedly humanitarian aid program has been manipulated...to get rid of unwanted domestic tobacco surpluses, to introduce foreigners to US tobacco in hopes of nurturing a future commercial market, and to provide aid to politically favored governments."[25]

But the Third World countries are not as ignorant as the tobacco industry hopes. China, the world's leader in cigarette production, recently acknowledged the link between cigarette smoking and cancer. "The government's first anti-smoking effort is aimed at discouraging the young from taking up the habit.... The reason for the push may not be hard to find: the World Health Organization estimates that cancer is the leading cause of death in China."[4] In Egypt, where smoking has increased *tenfold* in the last two years, cigarette advertising has been banned from television and smoking has been restricted in theaters and on planes. Cairo's English-language newspaper, *The Gazette*, angrily observes, "The tobacco industry, like the arms industry, is looking increasingly to the vast Third World for what sensible people would call suckers with a death instinct."[4]

While the tobacco industry here and abroad will not be dissuaded from pushing nicotine in the Third World, the US government can be. Lest anyone be left with the impression that it is only the profit-minded capitalists who are guilty of indirect mass murder through smoking-induced disease, let me remind you that the smoking habit is equally tolerated, supported, and prevalent in the socialist countries. Clearly it is a problem that is not going to be solved by cliches.

It is also clear that the amount of research directed at a solution is pitifully small. The total research budget this fiscal year for the NIDA is $48 million; only $1.7 million of that is going into smoking research.[26] Not only should there be direct allocations to basic and applied research from tobacco revenues, there should also be allocations for prevention programs and treatments. Two bills, now in the Pennsylvania General Assembly, would allocate funds from the sales of cigarettes for such worthwhile programs. One would place a 1 cent per pack tax on cigarettes to be paid to the Pennsylvania Cancer Control and Research Fund.[27] The other would place a 1 cent per pack tax on cigarettes to be paid to the state's Department of Health for grants and low interest loans for the payment of cancer treatment.[28] Let us hope that these bills and others like them will be passed.

I do not deny that I feel strongly about this issue. My father and three of my best friends died of smoking-related diseases. Every one of them would have supported every effort, financial and otherwise, that would assure future generations would be spared the agony of emphysema and other smoking-induced diseases.

At the same time we need to recognize that the smoking problem is a very complicated issue. Simplistic formulas for resolving the complex issues involved are not enough. While I would never support legislation to outlaw cigarette production, there is not adequate moral justification for cigarette production merely because people want it. The tobacco industry has an obligation to help support research that will produce disease-free alternatives for future generations.

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My Turn

Juneau Empire - 4-5-83

In Defense of Smokers

By MICHAEL COHERN

During the last week I have been inundated by propaganda from anti-smoke lobbyists. I would like to tell you what has transpired to me during this last week that has me wondering why no one has looked at the other side of this one-sided debate.

Late last week as I sat having my morning coffee downtown, I heard two people discussing House Bill 84 (an amendment to existing law on smoking in public places, to include places of employment). I asked if they smoked. They most certainly did not. I asked if any of them drove a motor vehicle. One wouldn't answer, but the other told me she owned a '74 VW. I asked if it used oil. She said it smoked a little.

"Isn't this a little hypocritical?" I asked. "A car puts out more pollution and smoke in one hour than a smoker does in a month! Ever have an accident? How much property is damaged each year by drivers? How many 'innocent' people are hurt every year? Ever known anyone to die from an accident? These are typical complaints of non-smokers to smokers."

She suddenly she realized she was late for work, and promptly left.

The next morning, I heard a young man voice the opinion that smoking in public was terrible, as he had to smell it.

"Have you ever had to set next to a drunk? Does he smell better?" I asked him. "What about a woman who uses so much perfume she makes you choke at twenty feet? Ever smell someone who doesn't shower very often? What about sitting next to someone with bad breath?" He wasn't so nice. Instead of him leaving, he told me where to go.

A few days later, I met two ladies talking about the "foul air around people that smoke." One said she had "rights" to clean air. I told her foul air came with industry, cars, big cities and even refuse burning — as well as a tiny bit from cigarettes.

Rights? Doesn't everyone have rights? It was quoted (incorrectly) that only 40 to 45 percent of the population smoked. What is it that they are not saying? Only that this figure represents everyone, regardless of age. The true fact is well over 50 percent of the adult population smokes. The minors don't count, as they can't legally purchase cigarettes anyway. So why is the minority (of voting age) telling the majority what it can or cannot do? Doesn't the majority rule?

Smokers are already cornered, restricted, punished and regulated. Are non-smokers? Can non-smokers get a ticket for abstaining in certain public places? Are there smoking areas where non-smokers are not permitted? Do airlines save the majority (and the best) seats for smokers? Are non-smokers ridiculed for not smoking? Are non-smokers harassed and hounded to smoke by smokers? Do smokers get the best tables in restaurants segregating smokers from non-smokers? Can smokers

... It was at this point that I finally realized that they were no longer sitting next to, or even near me — they had moved!

Yesterday morning, again having my morning coffee - I was handed a petition for support of the anti-smoke HB 84. Ah-ha! In it, was the statement that smoking was harmful, increased employer costs (through higher costs for health, fire and life insurance, as well as worker compensation coverage.) The person that handed it to me must have already heard of me, though, because he didn't stay to debate the petition. A clear case of hit-and-run!

Now about the petition; someone hasn't done their homework, obviously. Anyone who ever smoked knows that it is far more dangerous to tell a smoker he can't smoke than to let him smoke! Who wants an angry smoker, suffering from withdrawal, to work with?

And who will pay all the lost man-hours a worker will have if he or she has to stop working to run to an obscure, hidden-away smoke room for 5 to 10 minutes every time he or she wants to smoke? What smoker can concentrate on their work properly when they are suffering physical as well as mental withdrawal? The costs for these lost minutes will far outweight any minor additional insurance costs.

Today, at lunch, I listened to a nurse describe her patients. (Not personal information, just general information.) I heard her say that more than 75 percent of the patients at her hospital do not smoke. Hmmm Perhaps people should smoke to lower overcrowding of our hospitals. Maybe non-smokers are the principal cause of exhorbitant hospital costs. (If they smoked, there wouldn't be as many in the hospitals.)

I don't really believe that last paragraph, but any honest person must admit, the statements are just as reasonable as most complaints non-smokers have against smokers. Come to think of it, if you check our hospital you will find the majority of ill patients is there because of auto accidents, alcohol-related diseases and accidents and infections. Very few patients are there from tobacco related problems.

What have I been saying? Listen to me, please. I firmly believe that we all should take a closer look at the other side of HB 84. Is this a minority trying to force a majority to do their will? Will this bill hurt more than it helps? Will it save Alaska money?

I believe each of us has some habit — eating too much, drinking, foul or abusive language, drugs, unmentionable sexual diversities, or any number of other problems. How would you like to be harassed because of yours?

I find it incredible that a society that accepts the murder of the unborn, the public drunkenness and many other far more serious problems should attack the personal rights of an individual to smoke.

Let's quit finding fault with others or their habits. Everone has a habit. What's yours? Cars? Alcohol? Drugs? Are these really safer than smoking? I think not.

Cigarettes are not the No. 1 preventable killer we've been led to believe. Cars are. Followed closely by alcohol. Then abortions. Then possibly tobacco. So should we ban the car? What about alcohol? (That was done once. Anyone remember prohibition? Increased crime, violence, even bloodshed. Did it help? Will prohibition of cigarettes produce the same effects? You bet!)

Perhaps we should ban obnoxious perfumes, outlandish cosmetics, people with bad breath, or maybe blue-eyed people with blue suits. Tax collectors are offensive — let's ban them! How about nasty teachers? Why not make cuss-rooms for all our foul-mouthed friends?

Or should we just stop to realize that the anti-smoke campaign is just as ridiculous as those already mentioned?

Honorable members of the Legislature, I ask that you re-evaluate this highly volatile topic. I ask for rejection of HB 84 in its attack on personal freedom. If you feel you cannot support this opinion, at least leave it up to the people, those who elected you. Let us decide.

Again I ask, let this be put before the people — or reject this willful destruction of personal freedom.

Every Alaskan concerned with the erosion of our personal human rights, should be upset with this House Bill 84, not just smokers. Today, it's smoking. What rights will be under attack tomorrow? If you feel this is an attack on your personal freedoms, contact your local representative and senator today. Let him know how you feel — today! Tomorrow may be too late. The address to write is:

Senator John Q. Public
Alaska Legislature
Pouch V
Juneau, 99811

related activities. Again, we

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1980 – Labor Relations Yearbook

scope of the major issues that the participation teams are empowered to address. As the parties' statement of the terms of their Experimental Agreement puts it:

"Appropriate subjects, among others, which a Team might consider include: use of production facilities; quality of products and quality of the work environment; safety and environmental health; scheduling and reporting arrangements; absenteeism and overtime; incentive coverage and yield; job alignments; contracting out; and energy conservation and transportation pools."

St. John cautioned in his Arden House remarks that "the bottom line for the plan won't be determined for many years." He also said that a "crucial" element in the plan's success will be "effective problem solving through the better communications approach" of the teams.

An advantage of the stress on resolving these issues at the local plant level, he noted, is the flexibility of response this provides. The teams "will have the ability to deal with problems at the local level that may be unique or otherwise special to that particular department."

In the plan, the parties suggest that their experience in collective bargaining, although "successful" in many respects, has been disappointing in the resolution of "many problems . . . at the work site." These "are not readily subject to resolution under existing contractual programs and practices . . .," according to the parties.

They indicated that the joint team attack on such problems "is an essential ingredient in any effort to improve the effectiveness of the company's performance and to provide employees with a measure of involvement adding dignity and worth to their work life."

Study on Employer Anti-Smoking Programs

About 15 percent of the nation's businesses have programs to encourage and help workers stop smoking, according to a study prepared for the Department of Health and Welfare.

The study, which surveyed top-level management and medical officials in 3,000 U.S. firms, found that one-third of the companies are interested in developing or expanding smoking and health programs for workers.

Employer Cost

The National Interagency Council on Smoking and Health (NICSH), which conducted the survey, said cigarette smoking accounts for $5 billion to $8 billion in direct health care expenses and another $12 billion to $18 billion in indirect costs for lost productivity, wages and absenteeism.

A significant number of responding companies have policies that restrict or prohibit smoking in the workplace, said NICSH, a coalition of more than 30 public and private health groups concerned with reducing smoking.

"Most policies had been initiated by management, and policies were most frequently applied to blue-collar work areas, where smoking often poses a safety as well as a health hazard," NICSH said. According to the survey, 65 percent of the firms established those policies after release of the first Surgeon General's report in 1964.

Companies responding to the NICSH survey ranked smoking programs third among health education and promotion efforts, following high blood pressure and weight control programs. Larger firms are more likely to have smoking programs, NICSH said.

Most workplace smoking and health programs are operated in-house, with distribution of materials on how to stop smoking, physician counseling and other health professional counseling, the study found. Most firms use their own staff to administer the programs and support activities with existing medical resources rather than separate funds, the report said.

Of the companies interested in developing or expanding worker anti-smoking programs, more than 70 percent said they would like assistance. One-third of the companies responding to the survey said they are unsure at present whether they want to begin or expand worker health programs.

More information on anti-smoking efforts and copies of the survey are available from NICSH, 291 Broadway, Suite 1005, New York, N.Y. 10008, Tel. 212-227-4390.