EYE INJURY PREVENTION IN INDUSTRY

THE IDENTIFICATION OF EYE INJURY PROBLEMS AND THE STATUS OF PREVENTIVE PROGRAMS, A PLANNING STUDY

by

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O.D., University of Waterloo, 1976

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE
(Health Services Planning)

in

THE FACULTY OF GRADUATE STUDIES
(Department of Health Care and Epidemiology)

We accept this thesis as conforming
to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA
September, 1978

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ABSTRACT

A study was undertaken to examine the major eye injury problems in industry, to determine the hazards that caused them, and to develop methods for improving industrial eye protection programs so as to reduce the incidence of eye injuries. The study was conducted in Alberta through the Occupational Health and Safety Division of Alberta Labour and the Alberta Workers' Compensation Board.

A review of literature was performed to determine the status of eye protection programs, current epidemiological investigations and modes of protection, and to search for historical, legislative and cost benefit information.

The project consisted of seven studies which were designed and carried out independently but, together, would provide a wide perspective concerning eye protection in industry. These studies were:

a) A Review of W.C.B. Statistical Master File Data - which was concerned with a cumulative review of every eye injury claim received by the Workers' Compensation Board over the years 1974, 1975 and 1976. This included a review of permanent disability claims, claims for lost work time and claims where only medical aid was required.

b) A Review of Selected W.C.B. Personal Medical Files - which was concerned with the detailed review of eye injury claims from fifteen high eye injury risk industry classes. Each medical file was examined individually, paying particular attention to prevention-oriented information.

c) A Survey of Occupational Health and Safety Officers - where thirty-one occupational health and safety officers (inspection personnel) were given an in-depth interview to obtain their perceptions and informed opinions on the nature of eye injury hazards, compliance factors,

and the status of eye protection programs in industry.

d) A Survey of Occupational Health and Safety Personnel - where questionnaires were sent to over six hundred persons in Alberta, identified as being involved in the provision of occupational health and safety services in industry. This included physicians, nurses, safety personnel, and persons in government.Questions were similar to those in Section c.

e) A Review of the Minutes of Selected Joint Work Site Committees in Alberta - where the minutes of selected meetings concerning health and safety on the work site between management, the worker, and government, were analyzed to determine the extent of the unsolicited concern for eye injury prevention in companies which were known to have incurred a large number of eye injuries.

f) A Review of Anecdotal Data - where several interviews were held with union and management representatives to determine the concern and need for eye injury prevention, and the development of eye protection programs at a policy level in industry. The comments and concerns of many other persons were also considered.

g) A Review of Selected Site Visits to Industries in Alberta - where the researcher made six plant visits to better understand the conditions which lead to eye injuries and the problems in implementing preventive programs.

It was found that industries involved in the manufacture or use of metal products, chemicals or construction materials were at high risk. More specifically, however, it was determined that certain occupational groups such as machinists, plumbers and pipefitters, welders, and mechanics were also at high eye injury risk. It was concluded that occupational classification and eye injury hazards should be treated as a basis to eye injury prevention.

Injuries were found generally to occur most frequently among the young and inexperienced workers, while grinding and welding operations were found to be the most prevalent source of injury. Injuries occurred most often at certain times of the day, and there was some question of the effects of boredom and fatigue.

It was found that there is a lack of knowledge and education concerning standards of eye protection and in the proper selection of the protector for the hazard. The physical strength of the protector was minor, however, in comparison to the need for better protector design and fitting of the device to the face of the worker.

It was concluded that companies must be encouraged to develop eye protection policies as a basis to the provision of eye protection programs. A plan was recommended for the improvement of eye protection programs in industry. This included the presentation of a comprehensive eye protection program formulated through a review of literature on the subject, and the elucidation of a system of occupational vision care involving the interaction of all groups concerned with eye injury prevention in industry.

C.J.G. Mackenzie

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ACKNOWLEDGEMENT

This study involved the efforts of many dedicated people. My thanks go to those people who contributed to this study by offering their knowledge and experienced perspectives in numerous conversations, interviews, surveys and questionnaires.

I would like to thank my committee members; Dr. Cort Mackenzie, Dr. Bob Orford, and Dr. Linton Kulak for their assistance and valuable advice.

I am most grateful to Dr. Henry Wyatt and the administrative staff at the Department of Ophthalmology, University of Alberta, for their support, and assistance in the administration of the research grant.

I am appreciative of the assistance provided by Mr. Gerry Stocco and his computer staff at Alberta Labour, and by Mr. Ken Coull of the W.C.B. who facilitated the collection of the statistical data.

I would like to extend my most sincere appreciation to the staff of the Medical Services Branch, Occupational Health and Safety Division, Alberta Labour, for their patience in trying times and unselfish efforts in helping me to the conclusion of this study, -- and to Dr. Bob Fish, my thanks for the encouragement and belief in my work that made this experience possible.

Foremost, I wish to express my deepest appreciation and thanks to Mrs. Jeannie Reimer. Her exceptional aptitude, and committment to her work as my research assistant, provided the cornerstone of this study.

My kindest thanks are extended to Mrs. Margaret Crombie for her invaluable assistance in the preparation of the final report.

Finally, I wish to recognize the financial assistance of the Occupational Health and Safety Division of Alberta Labour, and the Department of National Health and Welfare through a National Health Research Fellowship.

It is gratifying to bear the fruits of cooperation, and the interest of others, to improve occupational health care in Canada.

CHAPTER 1

INTRODUCTION

A. Background to the Study

Occupational eye protection is a component of the total occupational health and safety scheme. The eyes have always been considered the most essential and important sensory organ and, hence, especially worthy of protection. The eye is responsible for transmitting a majority of the sensory information that the brain receives and, therefore, is essential to the worker's performance and productivity.

Concern for the safety of the eyes seems to have developed in line with general occupational health concerns. In Alberta in 1975, 11,966 (12.9%) of the 92,412 accidents reported to the Alberta Workers' Compensation Board directly involved the eyes. This was third only to the incidence of injuries to the fingers (18.6%) and back (14.9%). In 1976 the absolute number of injuries rose to 12,405 out of a total of 96,156 injuries reported to the W.C.B. (12.9%). Although these statistics in no way represent a definable trend, it is evident from the absolute numbers of eye injuries reported in previous years (11,966 injuries in 1975 and 11,053 in 1974) that the proportion of eye injuries per working population is certainly not decreasing and may be on the upswing.

In order to develop recommendations for action which will reduce the incidence of eye injuries in Alberta industry it is necessary to properly identify the problem, its characteristics and extent, and what is being done currently, if anything, to prevent eye injuries in industry. This task is not difficult in comparison with developing programs to effectively reduce the incidence of eye injuries in industry. This planning phase involves the human element where all parties who would potentially be concerned with the implementation of eye protection programs should be involved.

B. The Research Question

Where are the major eye injury problems in industry and what are the major hazards that cause them? Using this information, what are the most appropriate methods for developing and improving eye protection programs so as to reduce the incidence of eye injuries?

The research is divided into two major areas. The first is an analysis of reported cases of eye injuries. The second is an analysis of information gathered through personal interviews, questionnaires, and anecdotes. The former area of inquiry is necessary to establish a research base while the latter is for the purpose of gathering information and perceptions of the problem through human experiences.

C. Definitions

Hours Worked Before the Accident - The difference between the time the claimant commenced work and the hour of the accident.

Industry Code - The Standard Industrial Classification (S.I.C. Code) of the employer charged with the accident experience, from: The Standard Industrial Classification Code, 1971. Note: Industries may be classified on a general 3-digit code or a more detailed 5-digit code.

Language Problem - indicates if the employer considered language as a problem contributing to the accident.

Length of Shift - A statement of the normal hours worked per day by the claimant.

Man Years Worked - An estimate of the size of the workforce insured by the Alberta Workers' Compensation Board, by industry or occurrence class. One man-year is the equivalent of one worker who has worked an average weekly shift over a period of one year.

Nature of Injury - Identifies the injury in terms of the principal physical characteristics (e.g. chemical burn).

Occupation - The occupation of the claimant at the time of the accident, using the Standard Canadian Classification of Occupations, from: Volume II, Occupational Classification Manual, Census of Canada, 1971.

Occurrence Class - The Alberta Workers' Compensation Board assessment classification (for the payment of insurance premiums) of the employer.

Severity Estimate - An initial estimate of the severity of the accident and, hence, the type of claim that will evolve. This classification may be updated as more medical information becomes available. The classifications are:

1 - Medical aid only (no compensation due).

2 - Compensable injury or illness (causing lost work time) not resulting in permanent disability.

3 - Permanent disability.

4 - Medical aid only (involving a multiple injury, e.g. to the eye and face).

Source of Injury - Identifies the object, substance, exposure, or bodily motion which directly produced or inflicted the nature of injury identified (e.g. metal particle).

Time of Accident - The local time of the accident on a 24-hour clock system.

Type of Accident - Identifies the event which directly resulted in the injury (e.g. struck by a flying object).

CHAPTER 2

LITERATURE REVIEW

In order to provide an adequate background for this study of eye protection in industry it was necessary to review several areas of the literature. These were:

A) A historical review of eye protection

B) A review of eye injury hazards and current modes of eye protection

C) The epidemiology of eye injuries

D) A review of eye protection programs, prevention and compliance

E) Provincial legislation concerning eye protection

F) The costs of eye injuries

G) Estimates of the Alberta workforce by occupation

2.A. A Historical Review of Eye Protection

Figure 2.A.1 gives a chronological listing of selected milestones pertaining to the development of eye protection in industry. Although rudimentary forms of protection were used in the 17th century (1), concerted efforts did not begin until the 19th century. As early as 1923 (8) and 1924 (9), major documents were published concerning eye protection in industry. The content of these reports, accounting for changes in literary presentation, and some advances in technology, do not appear radically different from current trends and thoughts on eye protection in industry.

2.B. A Review of Eye Hazards and Current Eye Protection

The classification of eye hazards has been an important aspect of the identification, analysis, and alleviation of entities which may cause eye injuries. Although definitions may be close, there is no acceptable universal classification scheme known. Table 2.B.1 lists the various classifications of ocular hazards that have been put forward in the literature

TABLE 2.A.1

HISTORY AND DEVELOPMENT OF SAFETY MATERIALS, LEGISLATION AND STANDARDS CONCERNING THE PROTECTION OF EYES IN INDUSTRY (1840 - 1978)

YEAR	SELECTED MILESTONE	REFERENCE SOURCE
1840	BEGINNING CONCERN FOR THE USE OF PROTECTION LENSES FOR WORKERS - WIRE GAUZE OR PLAIN GLASS SPECTACLES	2
1850	PLATE GLASS LENSES INTRODUCED (4-6 mm THICK)	2
1860		
1870		
1880		
1884	GERMAN LAWS REQUIRING PROTECTIVE GOGGLES IN CERTAIN OCCUPATIONS	2
1889	GERMAN STONE QUARRIERS GUILD REQUIRE EMPLOYERS TO FURNISH GOGGLES	2
1890		
1893	BERLIN ACCIDENT INSURANCE ORDERS - FIRST MODERN POLICY FOR THE PREVENTION OF EYE INJURIES - SPECIFIED THE USE OF PROTECTIVE EQUIPMENT	2
1900		
1908	FIRST ACTS PASSED IN THE U.S. REQUIRING EYE PROTECTION IN CERTAIN JOBS	2
1910		
1912	DEVELOPMENT OF FINER PROTECTIVE LENSES AND HEAT TEMPERING PROCESSES	2
1915	FIRST W.C.B. LEGISLATION IN CANADA (ONTARIO)	3
1918	U.S. NATIONAL BUREAU OF STANDARDS - CODE FOR THE PROTECTION OF EYES	2
1920		
1930		
1938	AMERICAN STANDARD SAFETY CODE Z26.1 FOR THE PROTECTION OF HEAD, EYES AND RESPIRATORY ORGANS	2
1940		
1948	CANADIAN STANDARDS ASSOCIATION - FIRST CODE (Z94-1948) FOR HEAD AND EYE PROTECTION	4
1950	COMMON USE OF PLASTIC SAFETY SPECTACLES	5
1960		
1968	AMERICAN NATIONAL STANDARDS INSTITUTE - CODE Z87.1-1968 OCCUPATIONAL AND EDUCATIONAL EYE AND FACE PROTECTION	6
1969	CANADIAN STANDARDS ASSOCIATION - CODE Z94.3-1969 EYE PROTECTION	7
1970		
1978	SEE REVIEW OF CANADIAN PROVINCIAL LEGISLATION - LIT REVIEW, SECTION 2.E.	

TABLE 2.B.1

LISTING OF VARIOUS CLASSIFICATIONS OF INDUSTRIAL HAZARDS

BAUSCH AND LAMB CO. (10)	AUSTRALIAN STANDARD C27 (11)	RESNICK (12)	FLETCHER (13)	COLLIN (14)	C.S.A. STANDARDS (15)
Impact from flying articles or objects	Flying fragments and objects	Relatively large flying objects	Mechanical - Large Projectiles	Direct of Indirect Blows	Flying Objects
	Small flying particles	Dust and small flying particles	Small objects	Foreign Bodies - projectiles	Flying particles, dust, wind
Dust and Powder	Dusts	Dust and Wind	Falls and Explosions Dust		Heat, glare, sparks and molten metal splash
Chemicals, Vapours, Splash and Spray	Harmful liquids, gases and vapours	Gas, fumes, and liquid	Chemicals	Chemicals	Chemicals
	Splashing metals, splashing materials, and corrosives	Splashing metal	Splashes of metal		Abrasive Blasting Materials
Glare, Heat, and Radiation	Radiation	Reflected light or glare	Radiation	Radiation	Glare, Stray light
	High Energy Particles	Injurious radiant energy with a moderate reduction in intensity of visible radiant energy			Injurious Radiation
		Injurious radiant energy with a large reduction of visible energy			
		Abrasive Blasting			
			Contagious Disease		

(10-15). Using various components of these hazard classification schemes, a comprehensive classification has been suggested (16)(Table 2.B.2).

Although Collin (17) points out that there are human anatomical and physiological mechanisms that aid in protecting the eye from hazards, eye protection devices that fit about the eyes are still required. In accordance with commonly recognized eye hazards, Fox (18) gives a description of the basic types of eye and face protection that should be worn in various hazardous situations (Table 2.B.3).

Descriptions of eye protection devices available on the market and their uses abound in literature published by commercial firms (19-22). The Canadian Standards Association (23) and American National Standards Institute (24) have published a listing of recommended protectors for use in various hazardous situations. Other authors (25-27) have reported criteria for selecting the appropriate eye protection according to the hazard. A recent survey by the Construction Safety Association of Ontario (28), however, notes disregard for the careful selection of protection by personnel in some optical establishments and safety supply houses, and recommends training of personnel in this area.

In order to ensure that eye protection does the intended job, standards of quality have been formulated by the Canadian Standards Association (29) and the American National Standards Institute (30). In Canada, however, few provinces legislate adherence to the Canadian standards for eye protection (see Literature Review, Section 2.E.). The National Research Council reported in a recent study (31) that 50% of 181 randomly selected eye protectors failed at least one of the tests specified in the C.S.A. Standard on Eye Protectors. To aid workers and safety personnel in selecting quality eye protection, the Canada Safety Council (32) has re-

TABLE 2.B.2

COMPREHENSIVE CLASSIFICATION OF OCCUPATIONAL EYE HAZARDS

Mechanical Hazards

1) Large flying fragments and objects

2) Small flying particles

3) Dusts, powders and winds

Chemical and Splashing Hazards

4) Harmful liquids and corrosives

5) Gases, vapours, and fumes

6) Splashing metals, sparks, heat

Radiation

7) Reflected light or glare

8) Injurious radiant energy

- Large component of non-visible radiant energy
- Small component of visible radiant energy

Disease must also be considered a hazard but is not categorized in the particular classification scheme

TABLE 2.B.3

DESCRIPTION OF THE BASIC TYPES OF EYE AND FACE PROTECTION

from Fox (18)

1. Safety Spectacles	For flying particles and injurious radiation
2. Eye Cup Goggles (Cup Type or Cover Type)	
a) Chippers Model	For flying Particles
b) Dust and Splash Models	For relatively fine dust particles, liquid splashes and impact
c) Welders and Cutters Models	For glare, injurious radiation and impact
3. Flexible Goggles	Which conform to the countours of the face. These also come in Chippers, Dust and Splash and Welders and Cutters Models
4. Foundrymen's Goggles	For impact, hot-metal splashes and radiation hazards under conditions of extreme heat and humidity
5. Helmets and Handshields	For intense radiation and weld splatter
6. Face Shields	For flying particles and chemicals

Protection in categories 5 and 6 are generally worn over the standard protection in category 1.

ported the names of companies who claim their products meet the C.S.A. standards.

2.C. The Epidemiology of Eye Injuries

Carman (33) sets out in Table 2.C.1 the incidence of lost time eye injuries in 1976 as reported by Provincial Workers' Compensation Boards. The rates vary between 9 and 48 eye injuries per 10,000 workers but comparisons are difficult because of discrepancies in reporting procedures. In the same study, Carman reports the cumulative results of a National Survey of eye injuries, shown in Column 1 of Table 2.C.2. Columns 2 through 4 in Table 2.C.2 give comparative figures for the Province of Alberta, these being taken from the detailed results of the survey (34).

Various authors (35-41) have noted the incidence of lost time eye injuries in relation to the total number of injuries. These are given in Table 2.C.3. On average, 4.8% of lost time industrial injuries are accounted for by eye injuries.

Table 2.C.2 shows that about 60% of the lost time eye injuries are incurred by workers with less than 5 years' experience on the job. This figure is supported by Ivanov and Bezugly (42) who found an incidence of 57.8% in the same job experience category.

The results of the Canadian eye injury survey (Table 2.C.2) show that 75% of the injuries occurred in workers who were less than 35 years of age. Veale (36) showed also that 53% of lost time eye injuries occurred in this age group whereas Belfort (38) notes that 85% of his sample of lost time eye injuries occurred in workers who were less than 40 years of age. (58% of the eye injuries in the Belfort study occurred in workers who were less than 30 years of age.)

TABLE 2.C.1

THE INCIDENCE OF EYE INJURIES IN PROVINCIAL WORKFORCES (1976)

Province	1976 Stats Can Labour Force Data (1000's)	Lost Time Eye Injuries in 1976	Rate of Eye Injuries per 10,000 Workers
Alberta*	856	2625	31
B.C.	1135	2429	21
Manitoba	449	1062	24
New Brunswick	261	823	32
Newfoundland	183	317	17
Nova Scotia	326	293	9
Ontario	3931	6547	17
P.E.I.	48	83	17
Quebec	2761	13166	48
Saskatchewan	403	1724	43
Canada	10330	29069	28

*Data not available for Yukon and N.W.T.

TABLE 2.C.2

RESULTS OF A NATIONAL SURVEY ON EYE INJURIES (1977)
FOR CANADA, ALBERTA AND SELECTED ALBERTA INDUSTRIES

SURVEY GROUP / SELECTED VARIABLE	CANADA (Total of Provincial Results)	ALBERTA	ALBERTA (Manufacturing only)	ALBERTA (Construction only)
NUMBER OF INJURIES REPORTED	3107	627	97	213
AGE OF WORKER	(%)	(%)	(%)	(%)
15-20 YEARS	447 (14)	114 (18)	15 (15)	37 (17)
20-25	796 (26)	178 (28)	22 (24)	61 (29)
25-30	517 (19)	111 (18)	23 (24)	36 (17)
30-35	416 (13)	75 (12)	13 (13)	28 (13)
35-40	242 (8)	46 (7)	9 (9)	15 (7)
40-45	214 (7)	44 (7)	7 (7)	17 (8)
45-50	159 (5)	23 (4)	4 (4)	6 (3)
50-55	128 (4)	21 (3)	3 (3)	8 (4)
55-60	74 (2)	10 (2)		3 (1)
60-65	48 (2)	5 (1)	1 (1)	2 (1)
65+	5 (0)			
No Response	1			
YEAR IN INDUSTRY				
00-05 YEARS	1906 (62)	399 (64)	61 (63)	125 (58)
05-10	500 (16)	88 (14)	17 (18)	35 (16)
10-15	263 (8)	56 (9)	11 (12)	23 (11)
15-20	164 (5)	33 (5)	2 (2)	12 (6)
20-25	108 (4)	22 (4)	3 (3)	8 (4)
25+	148 (5)	22 (4)	2 (2)	10 (5)
No Response	18	7	1	
OCCUPATION OF WORKER				
Management	111 (5)	22 (4)	8 (11)	6 (4)
Labourer	857 (36)	157 (32)	16 (21)	49 (28)
Trades	1242 (52)	281 (57)	47 (63)	110 (65)
Clerical	51 (2)	6 (1)	1 (1)	1 (1)
Technical	94 (4)	23 (5)	2 (3)	2 (1)
Student	23 (1)	2 (1)	1 (1)	1 (1)
No Response	728	136	22	44
YEARS IN OCCUPATION				
00-05	1816 (59)	386 (63)	57 (59)	127 (60)
05-10	534 (18)	96 (15)	16 (17)	37 (17)
10-15	305 (10)	59 (9)	15 (16)	18 (8)
15-20	165 (5)	33 (5)	5 (5)	11 (5)
20-25	100 (3)	27 (4)	1 (1)	12 (6)
25+	150 (5)	22 (4)	2 (2)	8 (4)
No Response	37	4	1	
TASK AT THE TIME OF ACCIDENT				
Drilling	172 (6)	31 (5)	1 (1)	17 (8)
Grinding	356 (12)	88 (16)	26 (27)	29 (15)
Welding, Soldering	224 (7)	42 (7)	8 (9)	17 (8)
Cutting	203 (7)	32 (5)	7 (8)	12 (6)
Hammering	241 (8)	48 (8)	4 (4)	27 (13)
Sawing, Filing, Chipping	246 (8)	45 (7)	5 (5)	18 (9)
Working with chemicals, elec.	699 (23)	145 (24)	15 (16)	38 (19)
Housekeeping	146 (5)	33 (5)	5 (5)	4 (2)
Working on or with equipment	310 (10)	49 (8)	3 (3)	9 (4)
Miscellaneous	367 (12)	80 (13)	20 (21)	24 (12)
Plastering, Painting	52 (2)	14 (2)	1 (1)	9 (4)
No Response	91	20	2	9

TABLE 2.C.2 (Continued)

SELECTED VARIABLE / SURVEY GROUP	CANADA (Total of Provincial Results)		ALBERTA		ALBERTA (Manufacturing only)		ALBERTA (Construction only)	
NUMBER OF INJURIES REPORTED	3107		627		97		213	
PROTECTION WORN		(%)		(%)		(%)		(%)
Spectacles	387	(35)	71	(32)	16	(28)	18	(26)
Spectacles with side shields	278	(25)	52	(24)	14	(26)	18	(26)
Radiation Protection	21	(2)	7	(3)	1	(2)	4	(6)
Radiation Protection with SS	44	(4)	14	(6)	4	(7)	5	(7)
Goggles with screened SS	16	(1)	1	(1)			1	(2)
Eye Cup Goggles	20	(2)	3	(1)			2	(3)
Eye Cup Goggles for Radiation	18	(2)	3	(1)				
Cover Type Goggles	11	(1)	2	(1)	1	(2)		
Flexible Goggles	37	(3)	3	(1)	1	(2)	1	(2)
Flexible Goggles with vents	35	(3)	9	(4)	1	(2)	2	(3)
Welders Eye Cup Goggles	8	(1)	1	(1)	1	(2)		
Welder Flexible Goggles	14	(1)	3	(1)				
Welding Helmet	134	(12)	30	(13)	7	(13)	9	(13)
Handshield	8	(1)						
Clear Face Shield	65	(6)	21	(10)	9	(16)	7	(10)
Hood	10	(1)	1	(1)			1	(2)
No protection <u>or</u> no response	2001		401		42		145	
SOURCE OF INJURY								
Dust	543	(16)	107	(15)	14	(13)	39	(16)
Metal particles	1144	(33)	251	(35)	53	(48)	82	(33)
Wood slivers	209	(6)	41	(6)	6	(5)	21	(9)
Arc Rays	196	(6)	43	(6)	4	(4)	21	(9)
Acids (chemicals) and Fumes	207	(6)	41	(6)	3	(3)	7	(3)
Rock, Mud, Dirt, Stones	150	(4)	38	(5)	2	(2)	20	(8)
Liquids	109	(3)	15	(2)	5	(5)	2	(1)
Molten metal, other Molten or hot substances	196	(6)	30	(4)	7	(6)	11	(4)
Glass, Staples, Nails	207	(6)	49	(7)	4	(4)	10	(4)
Radiation	28	(1)	9	(1)	2	(2)	3	(1)
Plaster, Paint, Stucco, Cement, Fiberglass	157	(5)	37	(5)	7	(6)	14	(6)
Tools, Rope, Wire, Rods	269	(8)	52	(8)	2	(2)	14	(6)
No Response	-		-		-		-	
IF WEARING PROTECTION, HOW DID SOURCE REACH THE EYE								
Through Lens	84	(6)	23	(8)	3	(5)	8	(10)
Through Body	51	(4)	7	(3)	3	(5)	2	(2)
Around	357	(28)	84	(31)	21	(33)	31	(36)
Above	244	(19)	44	(16)	8	(13)	13	(15)
Below	263	(20)	48	(18)	12	(19)	13	(15)
Temple	195	(15)	46	(17)	14	(22)	12	(14)
Nose	98	(8)	19	(7)	2	(3)	7	(8)
No Response	1815		356		34		127	
WAS THERE A MANUFACTURER'S MARK ON PROTECTION								
Yes	224	(20)	38	(17)	11	(19)	15	(22)
No	320	(28)	63	(28)	13	(22)	20	(30)
Don't know	559	(52)	124	(55)	35	(59)	32	(48)
No Response	1964		402		38		146	
WAS LENS BROKEN								
Yes	29	(3)	10	(4)	2	(3)	0	(0)
No	1114	(97)	215	(96)	57	(97)	67	(100)
No Response	1964		402		38		145	

TABLE 2.C.2 (Continued)

SURVEY GROUP / SELECTED VARIABLE	CANADA (Total of Provincial Results)		ALBERTA		ALBERTA (Manufacturing Only)		ALBERTA (Construction Only)	
NUMBER OF INJURIES REPORTED	3107		627		97		213	
WAS LENS DRIVEN OUT OF PROTECTION		(%)		(%)		(%)		(%)
Yes	23	(2)	5	(2)	3	(5)	0	(0)
No	1120	(98)	220	(98)	56	(95)	67	(100)
No Response	1964		402		38		145	
PRIOR PARTICIPATION IN ACCIDENT PREVENTION PROGRAM								
Yes	804	(29)	131	(23)	24	(74)	34	(15)
No	1974	(71)	437	(77)	69	(74)	189	(85)
No Response	319		59		4			
WAS USE OF PERSONAL PROTECTIVE EQUIPMENT INVOLVED IN PROGRAM								
Yes	731	(91)	116	(89)	21	(88)	31	(90)
No	73	(9)	15	(11)	3	(12)	3	(9)
No Response	2303		496		73		179	
IF NO PROTECTION WORN, SHOULD IT HAVE BEEN								
Yes	584	(36)	137	(41)	13	(39)	54	(46)
No	1036	(64)	198	(59)	20	(61)	63	(54)
No Response	1487		292		64		96	
WAS PROTECTION WORN AT THE TIME OF THE ACCIDENT								
Yes	1158	(42)	233	(37)	59	(61)	72	(34)
No	1949	(58)	394	(63)	38	(39)	141	(66)
No Response								
IS PROTECTION REGULARLY INSPECTED BY EMPLOYER								
Yes	328	(28)	46	(20)	5	(8)	17	(25)
No	534	(45)	119	(52	42	(70)	30	(45)
Don't Know	320	(27)	65	(28)	13	(22)	20	(30)
No Response	1925		397		37		146	

TABLE 2.C.3

REVIEW OF THE REPORTED INCIDENCE OF LOST TIME EYE INJURIES IN RELATION TO THE TOTAL NUMBER OF INDUSTRIAL ACCIDENTS

AUTHOR	REF. #	PROPORTION OF EYE INJURIES TO TOTAL INJURIES (%)	TOTAL NUMBER OF INJURIES REPORTED IN STUDY
VENKATASWAMY	35	6.3	40,000
VEALE	36	6.0	56,498
LAMBAH	37	4.0	All Industrial Injuries in Britain in 1965
BELFORT	38	5.0	General Statement
YOUNG	39	4.2	155,000
B.C.-W.C.B.	40	4.3	56,110
CARR	41	3.7	Injuries in Britian
Average		4.8%	

Whereas Table 2.C.2 shows that 59% of the people injured in Canada, who completed the survey, were not wearing issued eye protection, Veale (36) notes that 42% of his population were in the same situation. In Veale's group, however, a further 21% of people injured did not have protection supplied. Ten percent of the injured had protection which was not adjusted correctly and 6% had the wrong type of protection.

Table 2.C.4 shows the sources of lost time eye injuries reported by various authors (36, 38, 43, 44). Table 2.C.5 shows the incidence of eye injuries in B.C., by selected occupation, as reported by the British Columbia Workers' Compensation Board (43).

Smith (45) reports that industrial accidents of all types are commoner at certain times of the day, the last hour of the morning shift and the second hour of the afternoon shift. Mason (46) has noted a definite mid-morning peak in all types of injuries, a mid-day low (lunch time), and a mid-afternoon peak.

2.D. A Review of Eye Protection Programs (Prevention), and Worker Compliance in the Use of Eye Protection

Components of each eye protection program described in the literature are recorded in Table 2.D.1 (47-67). The X marks in vertical array indicate the components discussed in each article. A synthesis of the major components suggests a comprehensive eye protection (preventive) program.

Authors from European countries (66,67) emphasize the importance of organized programs in preventing eye injuries. Biran (66) notes that education programs significantly affect the incidence of eye injuries, as do preventive measures in the factory which are based on the analysis of eye injuries. Matiashina et al. (67) note that the prevention of eye injuries is best realized by the organization of effective reporting mechanisms,

TABLE 2.C.4

SOURCES OF LOST WORK TIME EYE INJURIES

SOURCE OF INJURY	INJURY STUDY			
	VEALE (36)	BELFORT (38)	IVANOF (44)	B.C.-W.C.B. (43)
Foreign Bodies	68.0%*	75%		69.7%
Cuts, Lacerations	6.1%			4.0%
Chemicals - Heat Burns	19.6%		12%	11.0%
Bruises, Contusions	4.2%			3.4%
Radiation Effects				11.0%
Other				1.0%

* These figures represent the proportion of the total number of eye injuries reported in the study which are attributable to a particular injury source.

(Due to incomplete reporting of injury sources, figures do not sum to 100%)

TABLE 2.C.5

INCIDENCE OF LOST WORK TIME EYE INJURIES IN BRITISH COLUMBIA,
BY SELECTED OCCUPATION, FOR 1975 AND 1976
(B.C. - WORKERS' COMPENSATION BOARD)

OCCUPATION / YEAR	1976 NUMBER	1976 (%)*	1975 NUMBER	1975 (%)*
Machining Occupations				
8313 - Machinist	59	(2.6)	85	(3.4)
8333 - Sheet Metal Worker	29	(1.3)	38	(1.5)
8335 - Welders and Flame Cutters	269	(12.0)	323	(13.0)
8337 - Boiler Makers, Platers	49	(2.2)	88	(3.6)
8379 - Clay, Glass, and Stone Materials	3	(0.1)	1	-
8393 - Metal Shaping and Forming	31	(1.4)	33	(1.3)
Product Fabricating & Assembling & Repairing				
8528 - Laboring	32	(1.4)	12	(0.5)
8529 - Fabricating Occupations	13	(0.6)	10	(0.4)
8581 - Motor Vehicle Mechanics	139	(6.2)	171	(6.9)
8584 - Heavy Duty Machinery Mechanics	145	(6.5)	179	(7.2)
8590 - Foreman - Product Fabricating	-	-	-	-
8592 - Marine Craft Fabricating	49	(2.2)	51	(2.1)
Construction Trades				
8718 - Laboring: Excavating and Grading	30	(1.3)	18	(0.7)
8733 - Electricians	46	(2.0)	64	(2.6)
8781 - Carpenters	106	(4.7)	18	(3.3)
8791 - Plumbers and Pipefitters	36	(1.6)	47	(1.9)
8793 - Structural Metal Erectors	9	(0.4)	12	(0.5)
8798 - Laboring	67	(3.0)	73	(3.0)
TOTAL PROPORTION OF TOTAL INJURIES		(49.5)		(52.3)

*Represents the proportion of the total number of lost work time eye injuries that occurred in the occupational class within a specific year. The total number of reported lost work time injuries in 1975 and 1976 was 2,473 and 2,244 respectively.

TABLE 2.D.1

LITERATURE REVIEW OF EYE PROTECTION
PROGRAMS IN INDUSTRY

	PROGRAM COMPONENTS	REFERENCES																		
		47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
1	ORGANIZE PROGRAM CRITERIA - DETERMINE STATUS OF PROBLEM AND SET OUT PRELIMINARY OBJECTIVES				X		X			X	X		X							
2	GAIN SUPPORT & ACCEPTANCE OF PROGRAM (ALL GROUPS-PRIMARILY MANAGEMENT) BEFORE IMPLEMENTATION	X	X	X	X	X	X	X	X				X	X		X	X			
3	INITIATE PLANT SURVEY & VISUAL JOB ANALYSIS TO DETERMINE VISION SKILLS, THE ACCIDENT FACTORS & SEVERITY OF THE PROBLEM			X		X	X	X	X	X	X	X				X	X	X	X	
4	SET UP A VISION SCREENING PROGRAM FOR THE WORKER					X	X	X	X	X		X				X	X	X	X	
5	ESTABLISH A REFERRAL SYSTEM TO A VISION CARE PROFESSIONAL FOR THOSE WORKERS WHO NEED VISUAL AID					X	X	X	X	X		X			X	X	X	X	X	X
6	FORMULATE AND/OR REVIEW A/THE PLANT EYE PROTECTION POLICY: INCLUDING WHO SHOULD WEAR THEM, WHERE, ETC.			X			X	X									X	X	X	
7	REVIEW THE EYE PROTECTION WITH THE UNION - GAIN THEIR COOPERATION AND SUPPORT				X					X						X	X	X		
8	DRAW UP A STATEMENT OF PROCEDURES TO COVER THE IMPLEMENTATION OF THE PROGRAM			X				X		X						X	X	X		
9	INFORM ALL EMPLOYEES OF THE PROGRAM & WHY IT IS IMPORTANT (INCLUDING ALL ASPECTS OF EDUC. & MOTIVATION	X				X	X	X	X				X	X	X	X	X	X		X
10	AS A FIRST STEP, ENGINEER THE DANGER OUT OF THE ENVIRONMENT (HAZARD ELIMINATION AND/OR CONTROL)	X								X	X						X	X		
11	SELECT A REPUTABLE SUPPLIER OF EYE PROTECTION WHO HANDLES GOOD MATERIALS <u>OR</u> SECURE BIDS FROM SUPPLIERS		X							X						X				
12	SELECT MOST APPROPRIATE TYPE OF PROTECTION - CONSIDERING HAZARDS, EMPLOYEE COMFORT AND COST				X							X								
13	STANDARDIZE THE EQUIPMENT CARRIED FOR SMALLER INVENTORY AND LOWER VOLUME COST	X					X			X	X	X	X	X	X	X	X	X		
14	ENSURE THAT APPROPRIATE MEASUREMENTS ARE TAKEN BEFOREHAND & THAT THE PROTECTION IS PROPERLY FITTED - INCLUDING FOLLOW-UP		X													X				
15	MAINTAIN AN ADEQUATE INVENTORY AND ENSURE PROPER MAINTENANCE OF THE EYE PROTECTION				X		X	X	X			X	X	X	X	X	X	X	X	X
16	DEVELOP PROCEDURES TO ENSURE UNIFORMITY IN THE APPLICATION OF THE PROBLEM: IE. IDENTIFY AREAS, ETC.						X						X	X		X	X	X	X	
17	DEVELOP SUPERVISION & ENFORCEMENT PROCEDURES FOR THE PROGRAM																			
	- EVERYONE WEARS THEM IN HAZARDOUS AREAS	X														X	X	X		X
	- MANDATORY AT ANY TIME OR ANY PLACE IN THE PLANT	X		X	X	X	X		X				X	X	X	X	X	X		X
	- USE OF PROTECTION MANDATORY AND A CONDITION OF EMPLOYMENT	X		X													X			X
18	MONITOR AND EVALUATE THE PROGRAM		X	X			X			X								X		
19	DEVELOP ACCIDENT EMERGENCY PROCEDURES						X													
20	WHO PAYS FOR THE EYE PROTECTION - TOTALLY BY THE EMPLOYER															X			X	
	- BY THE EMPLOYER & WORKER; VARIOUS NEGOTIATED PROPORTIONS & TIME PERIODS				X												X	X		
21	MENTION OR RECOGNITION OF USING EYE PROTECTION ACCORDING TO AMERICAN OR CANADIANT STANDARDS ASSOCIATION STANDARDS												X			X				

eye injury hazards analysis, the proper use of safety engineering features and personal protection, and the education of the worker.

Matiashina et al. (67) state that the incidence of eye injuries is highly dependent on the degree of industrial development in a country. In the same vein, Veale (68) notes that the increase in eye injuries in Australia from 1962 to 1966 was "...pretty much due to a concurrent increase in the labour force".

In Industrial Vision, Hofstetter (69) describes the Heinrich accident/injury relationship. "A major injury is an inevitable statistical by-product of many minor injuries, and minor injuries, in turn, are the statistical by-product of an excess of no-injury accidents." Heinrich, therefore, regarded all accidents as potential major-injury accidents. Gilmore (70) notes that in most cases the cause of an accident is the same while the severity of the injury varies according to chance. He concludes that reducing the causes of minor injuries reduces the probability of serious, disabling and fatal injuries. Gilmore cites fixed ratios between severity classifications of injury for different types of industry.

Wood (71), quoting the work of Heinrich, notes that 98% of all accidents are preventable, and that 88% of all industrial accidents could be prevented by proper administration (i.e. preventive programs). Belfort (72) states that 88% of reported eye injuries are due to human error, a further 10% due to inherent risks of the job, bad organization or inadequate protection, and only 2% due to unforeseeable circumstances.

Smith (73) states that the prevention of eye injuries is realized in three ways, 1) Automation of machinery (or guarding), 2) The use of protection, to be considered when automation or local protective screening is not practical and, 3) Training in eye safety, to be used in all cases.

This involves the development of skills in avoiding danger to the eyes (of others as well) through; a) safety training, b) encouragement in the use of eye protection, and c) awareness of safety rules.

Carr (74) concludes that it is necessary not only to identify the risk and to provide the appropriate protection, but to contrive that the protection is used on every occasion that the worker is exposed to the risk (the subject of compliance).

Compliance

Schlesinger (75) states that workers have been classified into four groups; 1) those who do not think about the hazard at all, 2) those uncertain about the existence of the hazard (and who tend to equate the uncertainty of the hazard with a lack of real personal risk), 3) those who actually believe no real hazard exists and, 4) those who deliberately appraise the hazard, and the risk involved, and act accordingly. Optimally, all workers should be in the fourth category. Wigglesworth (76) states that methods which motivate towards the use of eye protection may be more effective than methods of compulsion. Those methods which motivate towards compliance are: the need for visual correction, fear of injury, peer acceptance of the protection, choice and proper fitting and the effects of safety training. Those factors which motivate against compliance are: cosmetic unacceptability, discomfort, and poor design. Wigglesworth notes in particular that apprentice safety training is an important practice although no studies have been undertaken to ascertain the effects.

A recent study by Logar (77) showed that there is a 9% non-compliance rate (for eye protection) in American industry. Of the three major compliance factors; physical fit, visual acceptability and cosmetic acceptability, it was found that the physical fit of the appliance was the most important factor in worker compliance.

2.E. Legislation

Table 2.E.1 (78-92) presents a tabular review of Canadian legislation concerning occupational and industrial eye protection. The review is based primarily on regulations made under the respective Acts. Not all relevant legislation is covered, notably legislation concerning mines. The information provided, however, gives a good indication of the status of legislation concerning eye protection in Canadian industry.

2.F. The Costs of Eye Injuries

Although the costs of accidents in general have been documented in the literature and found to be substantially more than the costs of establishing protective programs, the costs of eye injuries versus preventive programs have not been well documented.

Young (93) reports that the approximate costs of the 20,000 reported medical-aid-only and compensable eye injuries in Ontario, in 1976, was $800,000. 1.6% of the lost time claims result in a permanent disability, for a further cost of $1.2 million. Young states that the average cost of a medical-aid-only eye injury is $40-$50, whereas the average lost work time claim costs $200, and a permanent disability award $10,000. Several authors (94, 95, 96) point out, however, that these direct costs (of medical aid and compensation) are only a fraction of the total costs of eye injuries. A common consensus is that the hidden or indirect costs of industrial accidents (interruption of the job, training of another worker, etc.) are four times greater than the direct costs.

Duffy (97) reports the cost benefit results of an eye protection program of 23 years' duration. The potential direct and indirect costs of 160 disabling eye injuries that were prevented by the use of protection was

TABLE 2.E.1

A REVIEW OF PROVINCIAL LEGISLATION CONCERNING
EYE PROTECTION IN INDUSTRY

	PROVINCES														
	B.C.	ALBERTA	SASK.	MANITOBA	ONTARIO		QUEBEC			N.B.	N.S.	P.E.I.	NFLD.	YUKON	N.W.T.
COMPONENTS OF PROVINCIAL LEGISLATION CONCERNING EYE PROTECTION / REFERENCE #	78 99	79	80	81	82	83	84	85	86	87	88	89	90	91	92
EYE PROTECTION AND/OR SCREENS FOR HAZARDS IN GENERAL	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
EYE PROTECTION SHOULD MEET C.S.A. STANDARD Z94.3 (OSHA 87.1)	X						X	X		X					
SPECIFIC NOTE: PROTECTION AGAINST RADIATION (eg. U.V., I.R., MICROWAVE)			X							X		X	X		X
PROTECTION FOR WELDERS & RELATED OCCUP (PROT AND/OR SCREENS)		X		X	X				X	X	X	X	X	X	X
LASER OPERATIONS		X													
ILLUMINATION - FOR ADEQUATE ACCESS OR EGRESS					X	X				X	X	X			
ACCORDING TO C.S.A. STANDARD C92.1		X								X	X				X
ACCORDING TO OTHER ACCEPTED OR ESTABLISHED STANDARDS	X		X	X						X	X	X	X		X
SPECIFIC PROVISION FOR OPTIMIZING VISUAL PERFORMANCE FACTORS	X										X	X			
EYE PROTECTION WHEN HANDLING STORAGE BATTERIES OR ELECTROLYTES	X										X				
EYE PROTECTION WHEN USING EXPLOSIVE ACTIVATED TOOLS	X		X		X	X					X		X		X
EYE PROTECTION WHEN USING COMPRESSED AIR	X	X													
REFERENCE TO THE USE OF GUARDS ON MACHINERY	X			X											
REQUIRED EYE WASH FACILITIES	X		X										X		X
REFERENCE TO THE USE OF CONTACT LENSES	X														
MAINTENANCE OF PERSONAL PROTECTIVE EQUIPMENT						X							X	X	
SPECIFIC REF TO RESPONSIBILITY OF EMPLOYER TO SUPPLY PER PROTECTIVE EQUIP			X		X		X			X					
BLANKET USE OF ANY C.S.A. STANDARD											X				

calculated at $2,412,257.80, whereas the total costs of the eye protection program over this period of time was only $1,080,871.20, a saving of $1,331,386.60.

2.G. Estimates of the Alberta Workforce by Occupation

Using data collected by Walker (98) an estimate was obtained of the number of workers in occupational categories in Alberta industry. Information was obtained from the 1971 Census of Canada Labour Force Activity, Work Experience Catalogue, 94-782, Vol. III, Part VII. The catalogue classifies the number of workers in occupations in Alberta using the Canadian Classification of Occuptaions. The last census of this kind was in 1971 and since the Alberta Labour Force has increased from 688,000 in 1971 to 822,000 in 1976, the use of 1971 statistics is not accurate. However, since there is no reliable method of determining into which of the occupations the increase occurred, provisions could not be made and linear projections were used in each of the occupational categories to account for the population increase. This data is shown in Chapter 4 where occupational eye injury rates have been calculated.

CHAPTER 3

PRESENTATION OF THE METHODOLOGY, RESULTS AND DISCUSSION OF THE STUDY

INTRODUCTION

In a study such as this, which can ultimately affect a number of different groups, it is necessary for political and practical reasons to solicit information from all concerned groups and sources. Inherent in the implementation of any plan must be the commitment of the actors which, in this situation, include the government, the worker, and the private sector. Therefore, in order to examine all potentially relevant sources of data and information, and to gain a wide perspective of the problems of eye protection in industry, seven studies (Sections A - G in Chapter 3) were designed for the research project. Each of the seven studies were designed and carried out independently but together provide a wide perspective concerning eye protection in industry. To avoid confusion, the methods, results, and discussion for each study are presented as a unit, and are designated by the letters M (methodology), R (results), and D (discussion) following the section headings (e.g. 3.A.M., 3.A.R., and 3.A.D.).

The studies (section headings) are:

3.A. A Review of W.C.B. Statistical Master File Data

3.B. A Review of Selected W.C.B. Personal Medical Files

3.C. A Survey of Occupational Health and Safety Officers

3.D. A Survey of Occupational Health and Safety Personnel

3.E. A Review of the Minutes of Selected Joint Work Site Committees in Alberta

3.F. A Review of Anecdotal Data

3.G. A Review of Selected Site Visits to Industries in Alberta.

CHAPTER 3

SECTION A

METHODOLOGY, RESULTS, AND DISCUSSION

OF

A REVIEW OF W.C.B. STATISTICAL MASTER FILE DATA

3.A.M. Methodology - W.C.B. Statistical Master File Data

Rationale

The Alberta W.C.B. keeps a computerized record of all reported accidents. This data represents the most complete source of information in Alberta on eye injuries, and one that would be readily accessible in the future for planning and evaluative work.

Access

In the summer of 1977 this researcher contacted the Alberta W.C.B. and, with the aid of Alberta Labour, was able to obtain access to that segment of the computer file, concerning eye injuries, for review and analysis.

Population

All persons who reported eye injuries to the W.C.B. in Alberta in 1976 were included in the analysis. Some information concerning eye injuries reported in 1974 and 1975 was used for comparison.

The Instrument

The W.C.B. in Alberta requires eye accident reports to be submitted on standard forms, shown in Appendix 1. Reports are submitted for those accidents which involve lost time at work and for those accidents that require medical aid only. Compensation for lost time accidents is not paid unless all pertinent information has been filed, but in the case of accidents where only medical aid is required this is not the rule and reporting is often incomplete. The data are retained at the Board offices.

The Content

Figure 3.A.1 shows a listing of variables coded into the computer files at the W.C.B. by trained personnel, that were used in this study.

Method of Data Collection

The data from the reporting forms is sent to the W.C.B. throughout

FIGURE 3.A.1

LISTING OF THE INFORMATION (VARIABLES) USED IN THE STUDY, CONTAINED WITHIN THE W.C.B. COMPUTER FILES, FOR EACH REPORTED INJURED WORKER (ALBERTA WORKERS' COMPENSATION BOARD)

- Occurrence Class of the Industry in which the worker was injured.
- Month of Injury.
- Standard Industrial Classification of the Industry in which the worker was injured.
- Sex of the injured worker.
- Age of the injured worker.
- Length of time the injured worker has been employed by the company.
- Occupational Classification of the injured worker.
- Length of shift normally worked by the injured worker.
- Time of the accident.
- Number of hours worked before the accident occurred.
- Severity Estimate of the Injury.
- Source of the Injury.
- Type of Accident resulting in the Injury.
- Nature of the Injury.
- Whether first aid was rendered.
- Whether a language problem was a factor in causing the injury.

the year where it is coded immediately and put into the computer files. The data was present in computer storage at the time it was requested.

Possible Bias

The data does not include all eye injuries that occurred in Alberta, or in any particular industrial classification, but only the injuries that were reported to the W.C.B. In addition, there is no formal mechanism to monitor the validity of any accident report. A majority of the information is derived from the worker report and the management report, which may be erroneous depending on the severity of the accident, who was at fault, and other factors.

Method of Analysis

The data in whole was processed using the SPSS Statistical Programming Package, including the use of frequency and cross-tabulation functions. Due to the nature of the data, and its intended use for this project, few statistical operations were performed.

A second part of the mini-study involved looking at industries with the higher rates of eye injuries. Using estimates of the number of man years worked in 1976 in each 3 digit Standard Industrial Classification, and the respective number of injuries, rates of eye injuries per 100 man years worked were calculated for each classification. It was found that most industries had relatively low rates of eye injuries and progressively fewer (in an exponential function) industries had higher rates. Standard industrial classifications with eye injury rates above an acceptable cut-off level were selected for further study. The majority of the industries had a large number of man years worked and the findings can be statistically justified. A few industries were excluded from the analysis because one or two injuries within a small group of workers caused the high rates.

3.A.R. Results of a Review of Alberta W.C.B. Statistical Master File Data

Part 1 - General Results

Table 3.A.1 shows the number of injuries that occurred in Alberta in 1976 by occurrence class. Using estimates of the workforce size in each class (in man years worked), injury rates have been established. The insurance premium paid by companies within each occurrence class is included for comparison purposes. An occurrence class may contain a variety of industries. The highest rates of eye injuries are in occurrence classes which contain a number of mechanical and metal related industries.

Table 3.A.2 shows the total number of reported eye injuries in 1974, 1975 and 1976 by the month in which they occurred. The greatest number of injuries occur in the summer and fall months. The proportion of injuries incurred in the months of January, May and September has increased over a three year period, while the month of November has shown a steady decline.

Table 3.A.3 shows the number of eye injuries that were reported in 1976 by the 3 digit industrial classification in which they occurred. Included in the table are estimates of the size of the workforce in each industrial classification and calculated eye injury rates. The number of eye injuries reported in 1974 and 1975 is included for reference purposes although estimates of the size of the workforce (and, therefore, eye injury rates) were not available for these years. The highest rates of eye injuries are found generally in industries concerned with the manufacture, fabrication or repair of metal products, while the lowest rates are found in business and professional offices.

Table 3.A.4 shows the number of reported eye injuries in 1974, 1975 and 1976 by the sex of the worker. Nearly 97% of the eye injuries over the three year period were incurred by males.

TABLE 3.A.1

TOTAL NUMBER OF REPORTED EYE INJURIES IN ALBERTA, IN 1976, BY OCCURRENCE CLASSIFICATION (ALBERTA W.C.B. STATISTICAL MASTER FILE)

OCCURRENCE CLASS	NUMBER OF REPORTED INJURIES	WORKFORCE SIZE (MAN-YEARS)	RATE OF EYE INJURIES PER 100 MAN/YRS	OCCURRENCE CLASS INSURANCE PREMIUM ($)
01-01	41	826	5.0	$12.75
01-02	79	2364	3.3	2.50
02-01	25	698	3.6	5.75
03-01	47	1465	3.2	10.50
03-02	76	2300	3.3	6.25
04-01	29	13887	0.2	0.50
04-02	33	1586	2.1	3.45
04-03	157	6659	2.4	5.75
04-04	254	13574	1.9	1.35
04-05	60	5320	1.1	1.05
04-06	85	3931	2.2	3.00
05-01	1069	28792	3.7	1.45
06-01	2031	45308	4.5	2.85
06-02	725	13458	5.4	2.50
06-03	435	9348	4.7	3.20
06-04	113	2160	5.2	4.45
06-05	44	1161	3.8	9.50
06-06	304	6.59	4.9	2.25
06-07	518	17333	3.0	4.00
06-08	109	1249	1.0	8.25
06-09	13	426	3.1	8.75
07-01	247	15445	1.6	4.75
08-01	96	1328	7.2	4.10
08-02	1668	11759	14.2	3.00
08-03	788	10414	7.6	2.20
08-04	602	9815	6.1	3.25
08-05	153	1271	12.0	3.60
09-01	98	8288	1.2	1.70
09-02	31	2264	1.4	3.00
09-03	119	6045	2.0	3.40
09-04	39	1883	2.1	3.50
10-01	111	9451	1.2	0.80
10-02	131	6080	2.2	1.80
11-01	9	18230	0.1	0.30
11-02	138	37512	0.4	0.50
11-03	115	26605	0.4	0.60
11-04	37	10279	0.4	1.35
11-05	44	3282	1.3	2.05
11-06	25	2056	1.2	3.35
12-01	42	18732	0.2	0.30
12-02	41	10644	0.4	1.00
12-03	83	36725	0.2	0.95
14-01	81	22424	0.4	0.50
14-02	15	7618	0.2	1.00

TABLE 3.A.1 (Continued)

OCCURRENCE CLASS	NUMBER OF REPORTED INJURIES	WORKFORCE SIZE (MAN-YEARS)	RATE OF EYE INJURIES PER 100 MAN/YRS	OCCURRENCE CLASS INSURANCE PREMIUM ($)
16-01	34	2763	1.2	1.40
17-01	47	2513	1.9	2.05
17-02	48	4492	1.1	1.25
17-03	204	20795	1.0	2.25
17-04	64	10990	0.6	0.70
17-05	47	15356	0.3	0.25
19-01	41	2970	1.4	0.50 - 4.50
19-02	250	25248	1.0	0.50 - 7.50
19-03	1	1717	0.1	-
19-04	99	3514	2.8	-
19-05	13	1571	0.8	-
19-06	8	2041	0.4	-
Unclassed	587	Unknown	-	-
TOTAL	12403	550124	-	-

TABLE 3.A.2

TOTAL REPORTED EYE INJURIES IN ALBERTA
BY THE MONTH OF INJURY (1974, 1975 AND 1976)
(ALBERTA W.C.B. STATISTICAL MASTER FILE)

MONTH \ YEAR	1976	(%)	1975	(%)	1974	(%)	TREND
January	854	(6.9)	761	(6.4)	677	(6.1)	↑
February	883	(7.2)	692	(5.8)	703	(6.5)	-
March	999	(8.1)	740	(6.2)	754	(6.8)	-
April	911	(7.3)	944	(7.9)	810	(7.3)	-
May	1103	(8.9)	1012	(8.5)	896	(8.1)	↑
June	1169	(9.4)	958	(8.0)	972	(8.8)	-
July	1172	(9.4)	975	(8.1)	937	(8.5)	-
August	1191	(9.6)	924	(7.7)	949	(8.6)	-
September	1126	(9.1)	1075	(9.0)	917	(8.3)	↑
October	1119	(9.0)	1419	(11.8)	1154	(10.5)	-
November	1106	(8.9)	1357	(11.3)	1367	(12.4)	↓
December	770	(6.2)	1108	(9.3)	889	(8.1)	-
No Response	2	(-)	1	(-)	28	(0.3)	
TOTAL INJURIES	12403		11966		11053		

TABLE 3.A.3

TOTAL NUMBER AND RATES OF REPORTED EYE INJURIES IN ALBERTA
BY STANDARD INDUSTRIAL CLASSIFICATION (S.I.C., 1971)
FOR 1976, WITH ADDITIONAL DATA FOR 1974 AND 1975
(ALBERTA W.C.B. STATISTICAL MASTER FILE)

INDUSTRY CLASS	NUMBER OF INJURIES (1976)	NUMBER OF MAN-YEARS WORKED (1976)	RATE OF EYE INJURIES (1976) PER 100 MAN YEARS	INJURIES (1975)	INJURIES (1974)	TREND
Livestock Farms	1	309	0.3	2	1	-
Commercial Farms	3	139	2.2	3	-	-
Other Crop Farms	4	306	1.3	2	-	
Miscellaneous Farms	11	883	1.2	10	12	-
Agricultural Services	22	2373	1.0	24	22	-
Logging	44	1465	3.0	37	61	-
Forestry Services	1	19	5.3	-	-	-
Coal Mines	117	3130	3.7	102	72	↑
Petroleum and Gas Wells	156	16639	1.0	180	194	↓
Natural Gas Plants	68	3980	1.7	71	46	-
Oil Shale Pits	21	2378	0.9	21	31	-
Salt Mines	1	121	0.8	2	-	-
Other Non-Metal Mines	3	110	2.7	1	2	-
Sand Pits or Quarries	35	1104	3.2	43	36	-
Petroleum Prospecting	33	1586	2.1	40	29	-
Other Prospecting	2	201	1.0	1	1	-
Contract Drilling for Petroleum	134	5205	2.6	102	94	↑
Other Contract Drilling	4	54	7.4	2	2	-
Other Services Incidental to Mining	104	5317	2.0	110	79	-
Slaughtering and Meat Processors	120	5821	2.1	107	88	↑
Poulty Processors	12	735	1.6	14	6	-
Dairy Factories	23	2345	1.1	20	21	-
Fruit and Vegetable Canners	2	363	0.6	6	8	↓
Feed Manufacturers	13	1017	1.3	34	18	-
Flour Mills	9	585	1.5	6	3	↑
Bakeries	5	1851	0.3	9	5	-
Confectionery Manufacturers	1	124	0.8	-	1	-
Sugar Refineries	6	305	2.0	6	5	-
Vegetable Oil Mills	7	334	2.1	6	7	-
Miscellaneous Food Industries	12	627	1.9	4	3	↑
Soft Drink Manufacturers	23	1185	1.9	9	19	-
Distilleries	3	219	1.4	1	2	-
Breweries	15	720	2.1	13	12	↑
Tire and Tube Manufacturers	23	806	2.9	16	37	-
Other Rubber Industries	1	104	1.0	6	5	-
Leather Tanneries	3	137	2.2	2	1	-
Luggage and Leather Goods Manufacturers	1	171	0.6	-	1	-
Canvas Products Industry	4	264	1.5	3	3	-
Miscellaneous Textile Industries	2	457	0.4	3	-	-
Other Clothing Industries	17	2276	0.8	17	8	-
Sawmills	72	2174	3.3	90	92	↓
Veneer and Plywood Mills	36	541	6.7	13	30	-
Sash and Door and Planing Mills	424	10554	4.0	433	440	-
Wooden Box Factories	4	126	3.2	2	1	-
Coffin and Casket Industry	1	74	1.4	6	-	-
Miscellaneous Wook Industries	5	300	1.7	11	13	↓
Household Furniture Industry	17	960	1.8	25	22	-
Office Furniture Industry	20	265	7.5	13	21	-
Other Furniture Industries	7	389	1.8	4	4	-
Pulp and Paper Mills	60	1225	4.9	63	55	-
Asphalt Roofing Manufacturers	13	515	2.5	28	18	-
Paper Box and Bag Manufacturers	4	404	1.0	3	6	-
Commercial Printing	17	3510	0.5	18	13	-
Printing and Publishing	3	2766	0.1	7	5	-
Iron and Steel Mills	152	1271	12.0	224	193	-
Steel Pipe and Tube Mills	64	1073	6.0	91	67	-
Copper and Alloy Casting	7	97	7.2	1	6	-
Boiler and Plate Works	584	2830	20.6	603	431	-
Fabricated Structural Metal Industry	295	1814	16.3	354	264	-
Ornamental Metal Industry	202	2607	7.7	185	149	↑
Metal Stamping, Pressing Industry	97	1701	5.7	95	114	-
Wire and Wire Products Manufacturers	1	7	14.2	-	-	-
Hardware Manufacturers	2	9	22.2	-	-	-
Heating Equipment Manufacturers	29	291	10.0	29	11	-
Machine Shops	397	3702	10.5	408	440	↓
Misc. Metal Fabricating Industries	8	186	4.3	11	12	-
Agricultural Implement Industry	51	513	9.9	41	60	-
Misc. Machinery and Equip Manufacturers	30	633	4.5	26	35	-
Aircraft and Parts Manufacturers	25	829	3.0	32	31	-
Motor Vehicle Manufacturers	47	304	15.5	43	25	↑
Truck Body and Trailer Manufacturers	312	2405	13.0	207	171	↑
Boatbuilding and Repair	5	60	8.3	9	10	-
Communications Equipment Manufacturers	6	943	0.6	2	2	-
Manufacturers of Electrical Indust Equip	36	398	9.0	5	-	-
Battery Manufacturers	4	146	2.7	5	2	-
Electric Wire and Cable Manufacturers	10	379	2.6	7	8	-
Misc Electrical Products Manufacturers	2	147	1.4	8	2	-
Cement Manufacturers	32	650	4.9	13	11	↑

TABLE 3.A.3 (Continued)

INDUSTRY CLASS	NUMBER OF INJURIES (1976)	NUMBER OF MAN-YEARS WORKED (1976)	RATE OF EYE INJURIES (1976) PER 100 MAN YEARS	INJURIES (1975)	INJURIES (1974)	TREND
Lime Manufacturers	12	94	12.8	8	23	-
Gypsum Products Manufacturers	4	195	2.1	9	4	-
Concrete Products Manufacturers	96	1344	7.1	87	65	↑
Ready-Mix Concrete Manufacturers	53	1798	2.9	68	51	-
Regractories Manufacturers	7	325	2.2	8	16	↓
Mineral Wool Manufacturers	28	539	5.2	32	10	-
Glass and Glass Products Manufacturers	5	345	1.4	13	10	-
Other Non-Metallic Mineral Industries	21	1025	2.0	10	5	↑
Petroleum Regineries	13	1170	1.1	22	14	-
Manufacturers of Mixed Fertilizers	21	1546	1.4	33	27	-
Manuf of Plastics and Synthetic Resins	22	1164	1.9	17	18	-
Manuf of Soap and Soap Compounds	1	80	1.3	2	2	-
Manuf of Industrial Chemicals	35	2033	1.9	37	50	↓
Other Chemical Industries	2	104	1.9	8	3	-
Scientific Equipment Manufacturers	21	1793	1.2	31	26	-
Jewellery and Silverware Manufacturers	5	131	3.8	2	1	-
Plastic Fabricators	13	244	5.3	13	16	-
Signs and Displays Industry	11	347	3.2	12	21	↓
Misc Manufacturing Industries	2	173	1.2	1	-	-
Building Construction	1603	37711	4.3	1215	1108	↑
Highway, Bridge and Street Construction	248	10492	2.4	301	285	-
Other Construction	209	4972	4.2	256	208	-
Special-Trade Contractors	1817	36548	5.0	1624	1424	↑
Air Transport	12	1257	1.0	19	23	-
Services Incidental to Air Transport	5	808	0.6	8	2	-
Water Transport	16	N/A	-	17	9	-
Railway Transport	169	N/A	-	219	219	-
Truck Transport	225	14735	1.5	203	229	-
Bus Transport	13	1486	0.9	11	14	-
Pipeline Transport	30	3299	0.9	32	22	-
Other Services Incidental to Transport	2	404	0.5	5	-	-
Other Transportation	1	251	0.4	-	-	-
Grain Elevators	25	2056	1.2	22	25	-
Warehousing	13	1776	0.7	11	18	-
Radio and Television Broadcasting	6	2019	0.3	7	6	-
Telephone Systems	16	N/A	-	25	11	-
Electric Power	34	2736	1.2	20	31	-
Gas Distribution	39	2611	1.5	38	31	-
Water Systems	5	282	1.8	2	3	-
Other Utilities	13	349	3.7	14	6	-
Wholesalers of Livestock	1	394	0.3	-	2	-
Wholesalers of Petroleum Products	3	1366	0.2	5	12	↓
Wholesalers of Farm Machinery	210	5354	3.9	230	226	↓
Wholesalers of Machinery	72	4704	1.5	70	60	-
Wholesalers of Scrap and Waste Materials	37	668	5.5	26	35	-
Wholesalers, Not Elsewhere Classified	115	27988	0.4	111	137	-
Food Stores	28	9693	0.3	22	18	-
Department Stores	73	22563	0.3	84	57	-
Accessory, Parts, Tire & Battery Shops	40	1453	2.8	33	35	-
Gasoline Service Stations	173	7633	2.3	191	196	↓
Motor Vehicle Dealers	289	10338	2.8	277	315	-
Motor Vehicle Repair Shops	359	4410	8.1	359	375	-
Shoe Stores	1	1043	0.1	-	-	-
Clothing Stores	3	6298	0.1	2	6	-
Hardware Stores	19	4118	0.5	16	16	-
Household Furniture Stores	18	3414	0.5	7	11	-
Radio, Television Shops	10	1024	0.5	5	8	-
Book and Stationery Stores	1	1732	0.1	4	2	-
Florists' Shops	1	572	0.2	2	-	-
Fuel Dealers	4	508	0.8	4	7	-
Liquor Stores	3	N/A	-	6	4	-
Retail Stores, NEC	31	5460	0.6	50	37	-
Elementary and Secondary Schools	60	12875	0.5	52	66	-
Vocational Schools	4	437	0.9	3	5	-
Universities and Colleges	45	13587	0.3	43	48	-
Libraries	3	906	0.3	1	-	-
Hospitals	123	25720	0.5	159	143	-
Offices of Dentists	4	767	0.5	2	2	-
Other Health Services	1	1043	0.1	3	2	-
Welfare Organizations	14	6783	0.2	4	18	-
Recreational Services	4	1783	0.2	12	4	-
Engineering and Scientific Service	21	8336	0.3	19	10	-
Services to Business Management	23	5304	0.4	22	24	-
Shoe Repair Shops	1	73	1.4	-	-	-
Barber and Beauty Shops	1	1961	0.1	-	-	-
Laundries	10	99	0.4	6	10	-
Hotels, Restaurants and Taverns	86	38124	0.2	83	62	↑
Labour Organizations	6	1610	0.4	3	4	-
Blacksmithing and Welding Shops	311	1857	16.7	282	247	↑
Miscellaneous Repair Shops	42	1088	3.9	58	46	-
Services to Buildings	28	7060	0.4	22	35	-
Miscellaneous Services	64	7856	0.8	58	67	-
Other Federal Administration	119	N/A	-	115	118	-
Provincial Administration	192	N/A	-	183	154	↑

TABLE 3.A.3 (Continued)

INDUSTRY CLASS	NUMBER OF INJURIES (1976)	NUMBER OF MAN-YEARS WORKED (1976)	RATE OF EYE INJURIES (1976) PER 100 MAN YEARS	INJURIES (1975)	INJURIES (1974)	TREND
Local Administration	303	28107	1.1	314	277	-
Unspecified or Undefined	92	3159	2.9	124	139	+
Not Classified	347			271	257	
TOTAL	12405	551124	2.3	11966	11053	

TABLE 3.A.4

TOTAL NUMBER OF REPORTED EYE INJURIES, IN ALBERTA,
IN 1974, 1975 AND 1976, BY THE
SEX OF WORKER
(ALBERTA W.C.B. STATISTICAL MASTER FILE)

SEX \ YEAR	1976	(%)	1975	(%)	1974	(%)
MALES	11986	(96.6)	11541	(96.4)	10711	(96.9)
FEMALES	418	(3.4)	395	(3.3)	333	(3.0)
NOT CLASSIFIED	1	(0.0)	30	(0.3)	9	(0.1)
TOTAL	12405		11966		11053	

TABLE 3.A.5

TOTAL NUMBER OF REPORTED EYE INJURIES, IN ALBERTA,
IN 1974, 1975 AND 1976, BY THE
AGE OF INJURED WORKER
(ALBERTA W.C.B. STATISTICAL MASTER FILE)

AGE CATEGORY \ YEAR	1976	(%)	1975	(%)	1974	(%)
70+	5	(0.0)	7	(0.1)	3	(0.0)
65-69	25	(0.2)	28	(0.2)	39	(0.4)
60-64	130	(1.0)	126	(1.1)	165	(1.5)
55-59	231	(1.9)	275	(2.3)	265	(2.4)
50-54	435	(3.5)	396	(3.3)	384	(3.5)
45-49	665	(5.4)	632	(5.3)	606	(5.5)
40-44	840	(6.8)	885	(7.4)	813	(7.4)
35-39	1072	(8.6)	1059	(8.9)	978	(8.9)
30-34	1611	(13.0)	1438	(12.0)	1323	(11.9)
25-29	2342	(18.9)	2298	(19.2)	2056	(18.6)
20-24	3485	(28.1)	3158	(26.4)	2874	(26.0)
15-19	1470	(11.9)	1523	(12.7)	1390	(12.6)
14	1	(0.0)	4	(0.0)	7	(0.0)
AGE UNCLASSIFIED	93	(0.7)	137	(1.1)	150	(1.3)
TOTAL	12405		11966		11053	

Table 3.A.5 shows the number of reported eye injuries in 1974, 1975 and 1976 according to the age of the injured worker. The greatest pro-proportion of injuries occurred in the 20-24 year age group. High proportions were found also among the 15-19, 25-29, and 30-34 year age groups, over the three year period.

Table 3.A.6 shows the number of reported eye injuries in 1974, 1975 and 1976 by the length of time the injured worker has been employed. The greatest number of injuries occurred among workers with less than one year of work experience in their present job. There were a great number of missing responses.

Table 3.A.7 shows the number of reported eye injuries in 1976 by the occupation of the injured worker. Estimates of the number of persons in each occupational classification (see Literature Review - Section G) are given, in order to establish injury rates. The number of reported eye injuries in 1974 and 1975, by occupation, are included for comparison purposes. The highest rates of eye injuries occur among metal related occupations such as mechanics, machinists, plumbers and pipefitters, and welders. The lowest rates of eye injuries occur in the professions and clerical trades.

Table 3.A.8 shows the number of reported eye injuries in 1974, 1975 and 1976 by the length of shift the injured person worked per day. The majority of injuries occurred during an eight hour shift although a substantial number of injuries occurred among workers who were on a nine to ten hour shift.

Table 3.A.9 shows the number of reported eye injuries in 1974, 1975 and 1976 by the hour of the day in which the accident occurred. The greatest proportion of injuries occurred during the 1000, 1100, 1400 and 1500 hour periods (e.g. before lunch time and the end of the normal work

TABLE 3.A.6

TOTAL NUMBER OF REPORTED EYE INJURIES, IN ALBERTA, IN 1974, 1975 AND 1976 BY THE LENGTH OF TIME THE INJURED WORKER HAS BEEN EMPLOYED (ALBERTA W.C.B. STATISTICAL MASTER FILE)

LENGTH EMPLOYED \ YEAR	1976	(%)	1975	(%)	1974	(%)
<1 mnth	535	(17.6)	472	(16.7)	435	(16.9)
1 mnth - <6 mnths	1086	(35.7)	954	(33.7)	862	(33.4)
6 mnths - <1 yr	381	(12.5)	384	(13.6)	387	(15.0)
≥1 yr	1042	(34.2)	1019	(36.0)	897	(34.7)
Unknown	9361		9137		8472	
TOTAL	12405		11966		11053	

TABLE 3.A.7

TOTAL NUMBER AND INCIDENCE RATES OF REPORTED EYE INJURIES, IN ALBERTA, IN 1976, BY OCCUPATIONAL CLASSIFICATION - INCLUDING DATA FOR 1974 AND 1975 (ALBERTA W.C.B. STATISTICAL MASTER FILE)

OCCUPATIONAL CLASSIFICATION OF INJURED WORKERS	WORKFORCE (NUMBER OF WORKERS)	INJURIES 1976	INJURY RATE 1976 (PER 100 WORKERS)	INJURIES 1975	INJURIES 1974	TREND
Administrators	840	3	0.36	1	2	-
Inspectors; Government	1115	2	0.18	-	-	-
General Managers	2445	7	0.29	5	5	-
Production Management	390	2	0.51	4	3	-
Construction Management	410	15	3.66	12	15	-
Other Managers	1720	7	0.41	9	4	-
Financial Officers	8340	2	0.02	1	-	-
Personnel Officers	1955	1	0.05	-	-	-
Purchasing Officers	1255	2	0.16	-	-	-
Occupations: Management	3060	1	0.03	-	-	-
Geologists	2145	1	0.05	3	3	-
Meteorologists	90	1	1.10	-	-	-
Physical Sciences Technologists	1545	15	0.97	19	14	-
Agriculturists	685	2	0.29	3	4	-
Biologists	320	1	0.31	-	-	-
Life Sciences Technologists	900	9	1.00	3	5	-
Civil Engineers	1690	7	0.41	6	5	-
Electrical Engineers	970	5	0.51	1	3	-
Mechanical Engineers	680	4	0.59	1	4	-
Petroleum Engineers	1090	1	0.37	-	1	-
Aerospace Engineers	125	5	4.00	5	1	-
Surveyors	1050	9	0.86	5	7	-
Draughtsmen	2200	6	0.27	5	7	-
Engineering Technologists	1875	4	0.21	3	8	-
Other occupations: Engineering	1210	13	1.07	13	16	-
Analysts and Programmers	1375	1	0.07	1	-	-
Community Services Occupation	1810	1	0.06	3	2	-
Librarians	510	1	0.20	-	-	-
Social Sciences Occupations	195	2	1.03	-	-	-
Elementary Teachers	12515	2	0.02	2	1	-
Community College Teachers	1130	4	0.35	5	1	-
Fine Arts Teachers	1175	2	0.17	2	-	-
Post-Secondary Teachers	460	5	1.09	2	1	↑
Flying Instructors	570	1	0.18	1	2	-
Other Teaching Occupations	345	1	0.29	-	1	-
Veterinarians	190	1	0.53	-	-	-
Health Diagnosing Occupations	N/A	1	-	-	-	-
Nurses	9260	24	0.26	23	6	-
Nursing Aides	6500	20	0.31	21	21	-
Physiotherapists	760	2	0.26	3	4	-
Nursing Assisting Occupations	3385	7	0.21	-	3	-
Dispensing Opticians	140	1	0.71	1	-	-
Radiological Technologists	815	1	0.12	1	1	-
Medical Laboratory Technologists	1730	12	0.69	14	11	-
Other Occupations in Medicine	390	2	0.51	1	3	-
Interior Designers	815	4	0.49	-	1	-
Illustrating Artists	540	1	0.19	1	1	-
Secretaries	18395	2	0.01	3	2	-
Typists	10885	2	0.02	5	2	-
Bookkeepers	17576	2	0.01	-	4	-
Cashiers	1785	6	0.34	4	4	-
Statistical Clerks	375	1	0.27	-	-	-
Office Machine Operators	2400	1	0.04	-	1	-
Data-Processing Operators	2220	2	0.09	-	-	-
Scheduling Occupations	635	1	0.16	-	1	-
Production Clerks	485	2	0.41	1	1	-
Shipping Clerks	3845	33	0.86	34	34	-
Stock Clerks	3775	14	0.37	6	12	-
Weighers	300	1	0.33	1	3	-

TABLE 3.A.7 (Continued)

OCCUPATION CLASSIFICATION OF INJURED WORKERS	WORKFORCE (NUMBER OF WORKERS)	INJURIES 1976	INJURY RATE 1976 (PER 100 WORKERS)	INJURIES 1975	INJURIES 1974	TREND
Material Recording Occupations	120	1	0.83	3	1	-
Medical-Records Librarians	3610	3	0.08	1	2	-
Receptionists	4635	1	0.02	2	1	-
Mail Carriers	1325	9	0.68	5	7	-
Postal Clerks	3225	4	0.12	5	4	-
Telephone Operators	3175	1	0.03	5	-	-
Messengers	540	1	0.19	-	-	-
Message Distribution Occupations	1110	1	0.09	-	1	-
Hotel Clerks	1070	2	0.19	-	1	-
Office Clerks	8970	4	0.04	3	3	-
Other Clerical occupations	6915	5	0.07	10	7	-
Managing Supervisors	20895	56	0.27	44	45	-
Commercial Travellers	3715	1	0.03	1	2	-
Salesmen	6060	11	0.18	1	13	-
Sales Clerks	24940	61	0.24	62	38	-
Newsboys	1095	1	0.09	-	-	-
Service Station Attendants	3405	23	0.68	17	18	-
Sales Occupations	N/A	3	-	-	-	-
Driver-Salesmen	2025	5	0.25	5	6	-
Fire-Fighters	1570	25	1.59	26	10	-
Policemen	2740	9	0.33	7	11	-
Guards	3245	17	0.52	3	6	-
Protective Service Occupations	875	2	0.23	1	1	-
Supervisors; Food and Beverage	3125	3	0.10	1	2	-
Chefs and Cooks	8015	11	0.14	20	16	-
Bartenders	N/A	3	-	5	1	-
Waiters	14220	12	0.08	9	10	-
Food Preparation Occupations	2100	12	0.57	21	12	-
Supervisors & Lodging Occupations	2275	15	0.66	15	22	-
Chambermaids	N/A	7	-	4	3	↓
Occupations in Lodging	155	2	1.29	-	-	-
Barbers and Hairdressers	4795	2	0.04	-	-	-
Hostesses and Stewards	3270	1	0.03	-	-	-
Personal Service Occupations	4080	3	0.07	-	1	-
Supervisors; Laudering Occupations	570	1	0.17	-	-	-
Apparel Service Occupations	555	1	0.18	-	1	-
Janitors	N/A	95	-	81	91	-
Occupations in Labouring	6915	20	0.29	28	24	-
Other Service Occupations	655	2	0.30	1	-	-
Farm Workers	N/A	9	-	6	7	-
Nursery Workers	N/A	12	-	12	21	-
Farm-Machinery Operators	N/A	1	-	1	1	-
Animal Care Occupations	N/A	1	-	3	2	1
Fishermen	155	1	0.65	-	-	-
Forestry Conservation Occupations	1020	4	0.39	4	7	-
Timber Cutting Occupations	660	10	1.52	10	23	-
Log Inspecting	N/A	1	-	-	-	-
Log Hoisting	265	4	1.51	6	10	↓
Labouring; Forestry and Logging	270	2	0.74	-	3	-
Forest Related Occupations	110	1	0.91	2	5	-
Supervisors; Drilling Operations	1875	11	0.58	6	14	-
Rotary Well-Drilling	2050	93	4.53	88	72	↑
Rock Drilling Occupations	400	1	0.25	3	6	↓
Mining and Quarrying	745	12	1.60	19	21	↓
Labouring in Mining and Quarrying	970	24	2.47	32	32	-
Oil and Gas Field Occupations	1695	58	3.46	48	26	↑
Supervisors-Mineral Ores Operations	50	1	2.00	-	-	-
Crushing and Grinding Occupations	N/A	1	-	5	-	-
Supervisors-Ore Testing Operations	230	2	0.87	4	3	-
Metal Furnacemen	115	2	1.74	5	14	-
Metal Rolling Occupations	85	1	1.17	1	1	-
Metal Casting	185	11	5.95	9	14	-
Plating, Metal Occupations	75	3	4.00	3	3	-
Labouring in Metal Processing	95	4	4.20	2	8	-

TABLE 3.A.7 (Continued)

OCCUPATION CLASSIFICATION OF INJURED WORKERS	WORKFORCE (NUMBER OF WORKERS)	INJURIES 1976	INJURY RATE 1976 (PER 100 WORKERS)	INJURIES 1975	INJURIES 1974	TREND
Metal Processing	270	8	2.96	15	14	-
Furnacemen: Clay,Glass,Stone	185	5	2.70	9	6	-
Mixing Occupations: Clay,Glass,Stone	360	2	0.56	9	5	-
Clay,Glass,Stone Forming Occupations	175	7	4.00	5	18	-
Chemicals; Mixing and Blending	105	1	1.00	-	-	-
Chemicals; Distilling, Carbonizing	835	6	0.70	8	-	-
Chemicals; Crushing and Grinding	N/A	1	-	1	2	-
Chemicals,Petroleum-Inspecting	210	2	0.95	2	-	-
Labouring in Chemicals,Petroleum	205	2	0.97	2	6	-
Chemicals,Petroleum-Processing Occu.	965	1	0.10	3	3	-
Foremen: Food Occupations	850	2	0.24	-	2	-
Grain Milling Occupations	310	3	0.97	2	5	-
Baking Occupations	1485	2	0.13	1	1	-
Slaughtering and Meat Cutting	3720	35	0.94	20	35	-
Milk Processing Occupations	460	1	0.21	1	2	-
Inspecting,Testing: Food,Beverages	215	1	0.47	-	-	-
Beverage Processing Occupations	200	1	0.50	2	3	-
Labouring in Food & Beverages	750	73	9.73	42	44	-
Food & Beverage Occupations	515	5	0.97	4	5	-
Sawmill Sawyers	355	1	0.28	1	-	-
Plywood Making	50	1	2.00	-	3	-
Wood Treating Occupations	N/A	2	-	-	2	-
Inspecting & Testing-Wood Processing	55	1	1.81	-	-	-
Labouring in Wood Processing	395	1	0.25	4	6	-
Wood Processing Occupations	N/A	2	-	-	-	-
Pulp Preparing Occupations	60	2	3.30	3	1	-
Labouring in Pulp and Papermaking	65	1	1.54	2	3	-
Pulp and Papermaking	55	2	3.60	1	2	-
Textile Winding and Reeling	175	1	0.57	-	-	-
Textile Finishing	175	1	0.57	-	-	-
Other Processing Occupations	75	1	1.33	-	-	-
Foremen: Machining Operations	445	3	0.67	3	4	-
Tool and Die Making	90	4	4.44	8	3	-
Machinist	1315	209	15.42	223	212	-
Machine-Tool Operating	640	7	1.09	5	17	-
Metal Machining	55	2	3.64	3	4	-
Foremen: Metal Shaping & Forming	775	3	0.38	2	10	-
Forging Occupations	185	3	1.62	5	5	-
Sheet-Metal Workers	1480	306	20.68	256	245	+
Metalworking-Machine Operators	280	6	2.14	5	10	-
Welding and Flame Cutting	4910	1511	30.77	1405	1342	+
Inspecting Metal Shaping & Forming	N/A	1	-	1	-	-
Boilermakers, Platers	280	91	32.50	90	70	-
Metal Shaping and Forming	65	4	6.15	4	2	-
Wood Sawing	320	9	2.81	10	24	+
Wood Machining	185	4	2.16	2	2	-
Wood Sanding	N/A	1	-	-	-	-
Cutting,Shaping-Clay,Glass,Stone	75	3	4.00	4	4	-
Abrading,Polishing-Stone,Cement,Clay	110	1	0.90	-	3	-
Clay,Glass,Stone Machining	75	9	12.00	6	3	+
Filing,Grinding,Buffing Occupations	260	64	24.62	79	72	-
Motor Vehicle Fabricating	180	8	4.40	12	2	-
Business Machines Fabricating	N/A	1	-	-	-	-
Other Fabricating Occupations	215	19	8.83	12	28	-
Electrical Equip. Fab & Assembling	255	6	2.35	9	8	-
Electrical Equip. Installing,Repair	1215	12	0.99	14	17	-
Electronic Equip. Fab & Assembling	140	3	2.14	1	3	-
Radio & TV Repairmen	815	4	0.49	2	4	-
Labouring: Fab, Assembling, Installing, Repairing Electrical Equip.	N/A	1	-	-	-	-
Cabinet Makers	1000	40	4.00	21	22	-
Labouring: Fab, Assembling, Repairing Wood Products	80	6	7.50	6	14	-

TABLE 3.A.7 (Continued)

OCCUPATION CLASSIFICATION OF INJURED WORKERS	WORKFORCE (NUMBER OF WORKERS)	INJURIES 1976	INJURY RATE 1976 (PER 100 WORKERS)	INJURIES 1975	INJURIES 1974	TREND
Fab, Assembling, Repairing: Wood Products	N/A	2	-	2	3	-
Upholsterers	555	12	2.16	15	9	-
Sewing Machine Operators	2630	10	0.38	10	2	-
Fab, Assembling: Textile, Fur & Leather Products	205	1	0.49	-	-	-
Bonding & Cementing: Rubber,Plastic	525	31	5.90	20	37	-
Moulding Rubber,Plastic	110	2	1.82	3	1	-
Cutting & Finishing: Rubber,Plastic	N/A	1	-	-	-	-
Fab,Assembling Rubber,Plastic	N/A	1	-	-	-	-
Foremen: Motor Vehicle Mechanics	2735	2	0.07	9	8	-
Motor-Vehicle Mechanics	9915	758	7.60	836	845	↓
Aircraft Mechanics	635	11	1.73	12	15	-
Rail Transport Mechanics	630	39	6.19	51	50	-
Heavy Duty Machinery Mechanics	N/A	303	-	204	202	↑
Watch Repairmen	265	1	0.38	-	2	-
Other Mechanics	1215	14	1.15	21	16	-
Foremen: Product Fab,Assembling & Repairing	205	27	13.17	4	9	-
Jewellery & Silverware Fabricating	60	1	1.67	1	2	-
Painting & Decorating	325	9	2.77	20	19	-
Labouring in Product Fabricating, Assembling and Rapairing	N/A	365	-	272	279	↑
Musical Instrument Fabricating, Assembling and Repairing	325	5	1.54	1	10	-
Foremen: Excavating,Grading,Paving	2030	9	0.44	23	20	-
Excavating and Grading	2895	36	1.24	7	33	-
Paving and Surfacing	355	1	0.28	3	-	-
Railway Sectionmen	1180	14	1.19	19	12	-
Excavating,Grading,Paving	1025	76	7.41	81	33	-
Foremen: Electrical Power & Wire Communication Equipment	1395	6	0.43	3	3	-
Electrical Power Lineman	485	18	4.14	8	26	-
Construction Electricians	3780	347	9.18	347	276	-
Wire Communications Installing	2195	11	0.50	8	11	-
Inspecting & Testing: Electrical Power and Wire Communications	215	2	0.93	-	-	-
Electrical Power: Wire Communications Equipment	300	3	1.00	1	1	-
Foremen: Other Construction Trades	6340	50	0.79	19	34	-
Carpenters	8515	475	5.58	374	354	↑
Brick and Stone Masons	875	51	5.94	34	30	↑
Concrete Finishing	900	13	1.44	18	24	↓
Plasterers	1375	43	3.13	26	44	-
Painters & Paperhangers	3270	68	2.08	57	50	↑
Insulating Occupations	495	34	6.87	36	24	-
Roofing	800	28	3.50	27	20	↑
Pipefitting, Plumbing	4275	636	14.88	482	411	↑
Structural-Metal Erectors	630	129	20.48	107	80	↑
Glaziers	275	10	3.64	10	18	-
Inspecting & Testing Construction	495	2	0.40	-	2	-
Labouring in Construction	6675	486	7.28	344	451	-
Other Construction Trade Occupations	2380	42	1.76	26	36	-
Air Pilots	N/A	2	-	-	3	-
Air Transport Support Occupations	N/A	1	-	1	1	-
Foremen: Railway Operations	N/A	1	-	1	3	-
Locomotive Engineers	N/A	3	-	2	4	-
Conductors and Brakemen	N/A	11	-	14	17	↓
Railway Transport Operating Occup.	N/A	9	-	19	7	-
Ship's Carpenters	N/A	2	-	1	-	-
Foremen: Motor Transport Operations	1315	2	0.15	2	2	-
Bus Drivers	3180	14	0.44	8	9	-
Truck Drivers	20135	190	0.94	170	221	-
Motor Transport Operating Occup.	550	1	0.73	-	1	-

TABLE 3.A.7 (Continued)

OCCUPATION CLASSIFICATION OF INJURED WORKERS	WORKFORCE (NUMBER OF WORKERS)	INJURIES 1976	INJURY RATE 1976 (PER 100 WORKERS)	INJURIES 1975	INJURIES 1975	TREND
Motormen and Dinkeymen	300	4	1.33	1	5	-
Other Transport Operating Occup.	95	1	1.05	-	2	-
Foremen: Material Handling	2200	6	0.27	7	7	-
Hoisting Occupations	990	37	0.20	21	23	-
Longshoremen	3055	53	0.03	60	60	-
Material-Handling Equip. Operators	3500	96	2.74	116	106	-
Packaging Occupations	3680	15	0.41	14	9	-
Labouring in Material-Handling	2470	25	1.00	20	21	-
Other Material-Handling Occupations	515	5	0.97	4	5	-
Typesetting	715	3	0.28	1	6	-
Printing Press	440	2	0.45	5	5	-
Printing-Engraving	85	1	1.17	1	-	-
Bookbinding	400	1	0.25	-	2	-
Printing	N/A	4	-	-	2	-
Power Station Operators	245	2	0.80	1	3	-
Other Stationary Engine Operating Occupations	2855	10	0.35	9	16	-
Radio and TV Broadcasting	85	7	1.18	2	-	-
Foremen Occupations	1075	1	0.09	1	1	-
Inspecting, Testing and Sampling Occupations	565	3	0.53	-	3	-
Labouring Occupations	7780	746	9.59	878	801	-
Other Occupations	N/A	124	-	107	78	+
Not Classified		3326		3676	2859	
TOTAL	470970	12405	-	11966	11053	+

TABLE 3.A.8

TOTAL NUMBER OF REPORTED EYE INJURIES, IN ALBERTA.
IN 1974, 1975 AND 1976 BY THE
LENGTH OF SHIFT WORKED BY THE INJURED WORKER
(ALBERTA W.C.B. STATISTICAL MASTER FILE)

YEAR / LENGTH OF SHIFT	1976	(%)	1975	(%)	1974	(%)
1 - 4 Hours/Day	28	(0.3)	33	(0.4)	18	(0.3)
5 - 6 "	37	(0.4)	33	(0.4)	18	(0.3)
7 "	371	(4.0)	478	(5.4)	284	(4.1)
8 "	7498	(81.0)	6947	(78.7)	5391	(77.0)
9 -10 "	1171	(12.6)	1192	(13.5)	1148	(16.4)
11-12 "	146	(1.6))	142	(1.6)	128	(1.8)
13-14 "	4	(0.1)	2	(0.0)	8	(0.1)
15 "	1	(0.0)	0	(0.0)	3	(0.0)
Unknown	3143		3139		4055	
TOTAL	12405		11966		11053	

TABLE 3.A.9

TOTAL NUMBER OF REPORTED EYE INJURIES, IN ALBERTA
IN 1974, 1975 AND 1976, BY THE
TIME OF THE ACCIDENT (ON A 24 HOUR SCALE)
(ALBERTA W.C.B. STATISTICAL MASTER FILES)

YEAR / TIME 24 HR. CLOCK	1976	(%)	1975	(%)	1974	(%)
01	41	(0.5)	32	(0.4)	44	(0.5)
02	47	(0.5)	39	(0.5)	39	(0.5)
03	33	(0.4)	35	(0.4)	32	(0.4)
04	31	(0.4)	25	(0.3)	15	(0.2)
05	21	(0.2)	27	(0.3)	28	(0.3)
06	41	(0.5)	39	(0.5)	33	(0.4)
07	114	(1.3)	119	(1.4)	88	(1.1)
08	361	(4.2)	304	(3.6)	291	(3.6)
09	703	(8.2)	668	(8.0)	633	(7.9)
10	1069	(12.4)	986	(11.8)	900	(11.2)
11	977	(11.4)	946	(11.4)	944	(11.8)
12	343	(4.0)	300	(3.6)	285	(3.6)
13	635	(7.4)	632	(7.6)	632	(7.9)
14	1360	(15.8)	1258	(15.1)	1226	(1.5)
15	1145	(13.3)	1240	(14.9)	1167	(14.6)
16	804	(9.4)	815	(9.8)	814	(10.2)
17	222	(2.6)	253	(3.0)	219	(2.7)
18	133	(1.5)	138	(1.7)	123	(1.5)
19	110	(1.3)	106	(1.3)	123	(1.5)
20	110	(1.3)	107	(1.3)	115	(1.4)
21	96	(1.1)	84	(1.0)	72	(0.9)
22	105	(1.2)	79	(0.9)	100	(1.2)
23	71	(0.8)	67	(0.8)	65	(0.8)
24	22	(0.3)	31	(0.4)	26	(0.3)
Unknown	3811		3636		3039	
TOTAL	12405		11966		11053	

day).

Table 3.A.10 shows the number of eye injuries reported in 1974, 1975 and 1976 according to the number of hours that were worked on the job before the accident occurred. The greatest proportion of injuries occurred during the sixth hour of the work shift, although a substantial proportion of injuries occurred also during the third, fifth and seventh hours.

Table 3.A.11 shows the number of reported eye injuries in 1974, 1975 and 1976 by the severity estimate of the injury. Because they are estimates, permanent disability injuries (severity #3) are often first classified as compensation injuries (severity #2) until the prognosis has been established. Over the three year period, 23 percent of the injury claims were for compensation. Excepting a proportion of less than 0.5% (permanent disabilities), the remainder of the reported injuries only required medical aid.

Table 3.A.12 shows the number of reported eye injuries in 1974, 1975 and 1976 by the source of the injury. Approximately 50 percent of the injuries were caused by unidentified particles, while approximately 20 percent were due to metal chips and particles. The remaining injuries were caused primarily by welding equipment, acids and other chemicals.

Table 3.A.13 shows the number of reported eye injuries in 1974, 1975 and 1976 by the type of injury incurred. Three-quarters of the injuries were a result of being abraded by foreign matter in the eyes while a further 15% were due to contact with radiations. The remaining injuries were a result of a great variety of events.

Table 3.A.14 shows the number of reported eye injuries in 1974, 1975 and 1976 by the nature of the injury, while Table 3.A.15 shows the nature of eye injuries in 1976 by the severity estimate. Table 3.A.14 shows that

TABLE 3.A.10

TOTAL NUMBER OF REPORTED EYE INJURIES, IN ALBERTA, IN 1974, 1975 AND 1976, BY THE NUMBER OF HOURS WORKED BEFORE THE ACCIDENT OCCURRED (ALBERTA W.C.B. STATISTICAL MASTER FILE)

HOUR OF ACCIDENT \ YEAR	1976	(%)	1975	(%)	1974	(%)
00	376	(4.7)	310	(3.9)	259	(3.5)
01	715	(8.8)	661	(8.4)	570	(7.7)
02	985	(12.2)	932	(11.9)	897	(12.2)
03	1051	(13.1)	1005	(12.8)	989	(13.4)
04	676	(8.4)	659	(8.4)	564	(7.6)
05	989	(12.3)	957	(12.2)	903	(12.2)
06	1258	(15.6)	1208	(15.3)	1107	(15.0)
07	1137	(14.1)	1197	(15.2)	1134	(15.4)
08	617	(7.7)	683	(8.7)	676	(9.2)
09	145	(1.8)	141	(1.8)	147	(2.0)
10	55	(0.7)	52	(0.7)	70	(0.9)
11	21	(0.3)	22	(0.3)	31	(0.4)
12	21	(0.3)	24	(0.3)	14	(0.2)
13	4	(0.0)	4	(0.1)	5	(0.1)
14	1	(0.0)	1	(0.0)	5	(0.1)
15	1	(0.0)	3	(0.0)	3	(0.1)
16	0	(0.0)	1	(0.0)	0	(0.0)
17	0	(0.0)	1	(0.0)	0	(0.0)
19	0	(0.0)	0	(0.0)	1	(0.0)
Unknown	4353		4105		3678	
TOTAL	12405		11966		11053	

TABLE 3.A.11

TOTAL NUMBER OF REPORTED EYE INJURIES, IN ALBERTA.
IN 1974, 1975 AND 1976 BY THE
SEVERITY ESTIMATE OF THE INJURY
(ALBERTA W.C.B. STATISTICAL MASTER FILE)

SEVERITY ESTIMATE \ YEAR	1976	(%)	1975	(%)	1974	(%)
No Compensation Medical Aid Only	9534	(76.9)	9133	(76.3)	7721	(69.9)
Compensation	2854	(23.0)	2771	(23.2)	2597	(23.5)
Permanent Disability	7	(0.1)	40	(0.3)	51	(0.5)
Multiple - No Compensation	5	(0.0)	4	(0.0)	1	(0.0)
Unknown and Other	7	(0.0)	7	(0.0)	683	(6.2)
TOTAL	12405		11966		11053	

TABLE 3.A.12

TOTAL NUMBER OF REPORTED EYE INJURIES, IN ALBERTA,
IN 1974, 1975 AND 1976, BY THE
SOURCE OF THE INJURY
(ALBERTA W.C.B. STATISTICAL MASTER FILE)

INJURY SOURCE / YEAR	1976	(%)	1975	(%)	1974	(%)	TREND
Air pressure	-	-	2	(0.0)	3	(0.0)	-
High pressure, deep diving	1	(0.0)	-	-	-	-	-
High pressure	3	(0.0)	3	(0.0)	5	(0.0)	-
Insects	1	(0.0)	3	(0.0)	6	(0.1)	↓
Persons	21	(0.2)	27	(0.2)	21	(0.2)	-
Bones	2	(0.0)	2	(0.0)	7	(0.1)	-
Fur, hair, wool	2	(0.0)	-	-	-	-	-
Pressure lines	3	(0.0)	4	(0.0)	1	(0.0)	-
Boxes, crates, cartons	5	(0.0)	9	(0.1)	11	(0.1)	↓
Containers, NEC	3	(0.0)	5	(0.0)	5	(0.0)	-
Buildings-office-plant-residential-etc.	1	(0.0)	0	(0.0)	-	-	-
Buildings and structures, NEC	4	(0.0)	2	(0.0)	5	(0.0)	-
Ceramic Items, NEC	2	(0.0)	1	(0.0)	2	(0.0)	-
Acids	189	(1.5)	181	(1.5)	154	(1.4)	↑
Alcohols	3	(0.0)	8	(0.1)	8	(0.1)	-
Alkalies	43	(0.3)	58	(0.5)	50	(0.5)	-
Aromatic compounds	1	(0.0)	1	(0.0)	1	(0.0)	-
Halogenated compounds	3	(0.0)	1	(0.0)	8	(0.1)	-
Other metallic compounds	1	(0.0)	2	(0.0)	1	(0.0)	-
Oxides of nitrogen	1	(0.0)	2	(0.0)	-	-	-
Cement or calcium silicates	30	(0.2)	38	(0.3)	44	(0.4)	↓
Chlorine and chlorine compounds	7	(0.1)	16	(0.1)	17	(0.2)	↓
Disinfectants	6	(0.0)	2	(0.0)	6	(0.1)	-
Resins	-	-	4	(0.0)	6	(0.1)	↓
Sulphur and sulphur compounds	23	(0.2)	26	(0.2)	32	(0.3)	↓
Hydrogen sulphide	3	(0.0)	1	(0.0)	2	(0.0)	-
Chemicals, chemical compounds, NEC	459	(3.7)	437	(3.7)	389	(3.5)	↑
Gloves	1	(0.0)	-	-	2	(0.0)	-
Coal	2	(0.0)	2	(0.0)	1	(0.0)	-
Crude oil, fuel oil	15	(0.1)	14	(0.1)	12	(0.1)	-
Gasoline and liquid hydrocarbon	33	(0.3)	28	(0.2)	31	(0.3)	-
Hydrocarbon gases	3	(0.0)	8	(0.1)	5	(0.0)	-
Keronsene	1	(0.0)	-	-	-	-	-
Lubricating and cutting oils	9	(0.1)	14	(0.1)	4	(0.0)	-
Naptha solvents	12	(0.1)	16	(0.1)	24	(0.2)	↓
Petroleum asphalts	1	(0.0)	3	(0.0)	6	(0.1)	↓
Coal tars	8	(0.1)	17	(0.1)	8	(0.1)	-
Coal and petroleum products	5	(0.0)	12	(0.1)	15	(0.1)	↓
Motors	1	(0.0)	-	-	2	(0.0)	-
Conductors	2	(0.0)	1	(0.0)	2	(0.0)	-
Switchboard and bus structures	1	(0.0)	2	(0.0)	1	(0.0)	-
Electrical apparatus, NEC	8	(0.1)	11	(0.1)	6	(0.1)	-
Flame and fire	13	(0.1)	8	(0.1)	13	(0.1)	-
Smoke	3	(0.0)	2	(0.0)	3	(0.0)	-
Grains and grain products	2	(0.0)	2	(0.0)	3	(0.0)	-
Meats and meat products	3	(0.0)	2	(0.0)	3	(0.0)	-
Milk and milk products	1	(0.0)	-	-	-	-	-
Vegetables and vegetable products	1	(0.0)	1	(0.0)	-	-	-
Food products, NEC	2	(0.0)	1	(0.0)	-	-	-
Cabinets	1	(0.0)	1	(0.0)	6	(0.1)	-
Chairs, benches, etc	1	(0.0)	2	(0.0)	1	(0.0)	-
Furniture, fixtures, furnishings	6	(0.0)	1	(0.0)	1	(0.0)	-
Glass items	191	(1.5)	136	(1.1)	148	(1.3)	-
Axe	2	(0.0)	-	-	-	-	-
Chisel	1	(0.0)	2	(0.0)	1	(0.0)	-
Crowbar, pry bar	2	(0.0)	2	(0.0)	6	(0.1)	-
Hammer, sledge, mallet	11	(0.1)	9	(0.1)	5	(0.0)	↓
Knife	-	-	4	(0.0)	4	(0.0)	-
Pliers, tongs	7	(0.1)	7	(0.1)	6	(0.0)	-

TABLE 3.A.12 (Continued)

INJURY SOURCE / YEAR	1976	(%)	1975	(%)	1974	(%)	TREND
Rope, chain	9	(0.1)	2	(0.0)	2	(0.0)	-
Saw	1	(0.0)	-	-	1	(0.0)	-
Screwdriver	22	(0.2)	12	(0.1)	30	(0.3)	-
Wrench	16	(0.1)	14	(0.1)	16	(0.1)	-
Hand tools, not powered	6	(0.0)	9	(0.1)	3	(0.0)	-
Drill	6	(0.0)	2	(0.0)	7	(0.0)	-
Hammer, tamper	1	(0.0)	1	(0.0)	1	(0.0)	-
Welding tools	5	(0.0)	9	(0.1)	5	(0.0)	-
Cranes, derricks,	1	(0.0)	-	-	-	-	-
Jacks (mechanical)	2	(0.0)	-	-	3	(0.0)	-
Chokers and tongs	1	(0.0)	-	-	1	(0.0)	-
Infectious and parasitic agents	3	(0.0)	1	(0.0)	1	(0.0)	-
Extension ladders	1	(0.0)	-	-	-	-	-
Straight, single, ladders	1	(0.0)	-	-	-	-	-
Ladders, NEC	1	(0.0)	-	-	2	(0.0)	-
Water	6	(0.0)	6	(0.1)	5	(0.0)	-
Other liquids, NEC	15	(0.1)	15	(0.1)	25	(0.2)	-
Agricultural machines, NEC	1	(0.0)	1	(0.0)	-	-	-
Buffers, polishers, sanders, grinders	1	(0.0)	2	(0.0)	3	(0.0)	-
Earth moving & highway const machines NEC	1	(0.0)	-	-	2	(0.0)	-
Office machines	1	(0.0)	-	-	-	-	-
Machines, NEC	2	(0.0)	2	(0.0)	7	(0.1)	-
Chains, ropes, cables	20	(0.2)	14	(0.1)	19	(0.2)	-
Nails, spikes, tacks	127	(1.0)	63	(0.5)	53	(0.5)	↑
Nails and staples	12	(0.1)	10	(0.1)	7	(0.1)	↑
Metal chips and particles	2617	(21.1)	2238	(18.7)	2477	(22.4)	-
Molten metal	201	(1.6)	232	(1.9)	187	(1.7)	-
Structural members	8	(0.1)	7	(0.1)	14	(0.1)	-
Pipe, NEC	16	(0.1)	9	(0.1)	6	(0.1)	↑
Metal items, NEC	142	(1.1)	162	(1.4)	155	(1.4)	-
Rocks, stones and sand	39	(0.3)	65	(0.5)	55	(0.5)	-
Mineral items, nonmetallic, NEC	14	(0.1)	44	(0.4)	105	(0.9)	↓
Paper and pulp items, NEC	17	(0.1)	26	(0.2)	16	(0.1)	-
Particles (unidentified)	6066	(48.9)	6205	(51.9)	5037	(45.6)	-
Trees, saplings	1	(0.0)	11	(0.1)	5	(0.0)	-
Branches, limbs	57	(0.5)	51	(0.4)	75	(0.7)	-
Snags	4	(0.0)	2	(0.0)	4	(0.0)	-
Plants, trees, vegetation, NEC	8	(0.1)	8	(0.1)	8	(0.1)	-
Plastic items, NEC	16	(0.1)	18	(0.2)	17	(0.2)	-
Isotopes or irradiated substances for industrial or medical use	1	(0.0)	-	-	-	-	-
Sun	1	(0.0)	2	(0.0)	3	(0.0)	-
Ultraviolet equipment	7	(0.1)	5	(0.0)	4	(0.0)	-
Welding equipment, electric arc	1010	(8.1)	998	(8.3)	893	(8.1)	↑
X-ray and fluoroscope equipment	1	(0.0)	-	-	-	-	-
Laser equipment	5	(0.0)	2	(0.0)	2	(0.0)	-
Radiating substances or equipment, NEC	5	(0.0)	18	(0.2)	21	(0.2)	↓
Soaps, detergents, cleaning compounds, NEC	78	(0.6)	98	(0.8)	63	(0.6)	-
Steam	7	(0.1)	4	(0.0)	4	(0.0)	-
Textile items, NEC	2	(0.0)	3	(0.0)	3	(0.0)	-
Highway vehicles, powered	2	(0.0)	10	(0.1)	9	(0.1)	-
Handtrucks, dollies	2	(0.0)	1	(0.0)	3	(0.0)	-
Mules, tractors	1	(0.0)	-	-	-	-	-
Lumber	11	(0.1)	9	(0.1)	14	(0.1)	-
Veneer, Plywood	8	(0.1)	-	-	3	(0.0)	-
Slivers, splinters, etc	396	(3.2)	147	(1.2)	122	(1.1)	↑
Chips	59	(0.5)	15	(0.1)	38	(0.3)	-
Wood items, NEC	19	(0.2)	39	(0.3)	58	(0.5)	↓
Ground (outdoors)	1	(0.0)	-	-	4	(0.0)	-
Concrete items, NEC	2	(0.0)	8	(0.1)	54	(0.5)	↓
Miscellaneous, NEC	66	(0.5)	69	(0.6)	84	(0.8)	↓
Unknown, unidentified	85	(0.7)	106	(0.9)	126	(1.1)	↓
TOTAL	12405		11966		11053		↑

TABLE 3.A.13

TOTAL NUMBER OF REPORTED EYE INJURIES, IN ALBERTA,
IN 1974, 1975 AND 1976 BY THE
TYPE OF ACCIDENT RESULTING IN THE INJURY
(ALBERTA W.C.B. STATISTICAL MASTER FILE)

ACCIDENT TYPE / YEAR	1976	(%)	1975	(%)	1974	(%)	TREND
Struck against moving object	1	(0.0)	3	(0.0)	2	(0.0)	-
Step on stationary object	-	(0.0)	1	(0.0)	1	(0.0)	-
Bumping into stationary object	9	(0.1)	7	(0.1)	19	(0.2)	-
Struck against stationary object	39	(0.3)	25	(0.2)	38	(0.3)	-
Struck by falling object during handling	8	(0.1)	2	(0.0)	17	(0.2)	-
Struck by falling object	20	(0.2)	28	(0.2)	61	(0.6)	↓
Flying object due to explosion	12	(0.1)	15	(0.1)	25	(0.2)	↓
Flying object thrown back by a machine	12	(0.1)	28	(0.2)	451	(.1)	↓
Struck by flying object NEC	237	(1.9)	292	(2.4)	250	(2.3)	-
Struck by objects being hoisted, handled	136	(1.1)	127	(1.1)	130	(1.2)	-
Struck by NEC	266	(2.1)	313	(2.6)	293	(2.7)	-
Fall from elevation - on stairs	-	-	-	-	1	(0.0)	-
Fall from stationary vehicles	-	-	-	-	2	(0.0)	-
Fall from chairs, sawhorses, kegs	1	(0.0)	-	-	-	-	-
Fall from buildings, roofs	-	-	-	-	1	(0.0)	-
Fall from poles, trees, logs	1	(0.0)	-	-	-	-	-
Fall into or against objects	6	(0.0)	6	(0.1)	8	(0.1)	-
Fall to walkway	-	-	-	-	1	(0.0)	-
Fall to walkway or working surface	-	-	1	(0.0)	3	(0.0)	-
Fall to walkway or working surface NEC	1	(0.0)	-	-	-	-	-
Caught in a moving and a stationary object	2	(0.0)	1	(0.0)	2	(0.0)	-
Caught in, under, or between NEC	2	(0.0)	3	(0.0)	2	(0.0)	-
Abraded by leaning, kneeling, or sitting	-	-	-	-	1	(0.0)	-
Abraded by objects being handled	-	-	-	-	4	(0.0)	-
Abraded by vibrating objects	-	-	-	-	2	(0.0)	-
Abraded by foreign matter in eyes	9411	(75.9)	8784	(73.4)	7599	(68.8)	↑
Abraded by repetition of pressure	-	-	12	(0.1)	15	(0.1)	↓
Abraded by foreign matter in nose, ears	36	(0.7)	79	(0.7)	90	(0.8)	↓
Rubbed or abraded NEC	7	(0.1)	14	(0.1)	31	(0.3)	↓
Bodily reaction from voluntary motions	-	-	-	-	1	(0.0)	-
Overexertion in lifting objects	1	(0.0)	2	(0.0)	5	(0.0)	↓
Overexertion in carrying objects	-	-	1	(0.0)	2	(0.0)	-
Overexertion NEC	1	(0.0)	1	(0.0)	2	(0.0)	-
Contact with electric current	3	(0.0)	-	-	2	(0.0)	-
General heat - atmosphere or environment	-	-	1	(0.0)	4	(0.0)	-
General cold - atmosphere or environment	-	-	-	-	1	(0.0)	-
Hot objects or substances	163	(1.3)	121	(1.0)	164	(1.5)	-
<u>Contact with radiations, caustics, toxic, and noxious substances</u>:							
By absorption	7	(0.1)	199	(1.7)	438	(4.0)	↓
By inhalation of water	-	-	4	(0.0)	1	(0.0)	-
By inhalatin NEC	3	(0.0)	2	(0.0)	6	(0.1)	-
Contact with radiations, caustics	1945	(15.7)	1793	(15.0)	1242	(11.2)	
Human assault	12	(0.1)	13	(0.1)	6	(0.1)	-
Uncalssified, Insufficient data	63	(0.5)	82	(0.7)	126	(1.1)	↓
TOTAL	12405		11966		11C53		↑

NEC - Not Elsewhere Classified

TABLE 3.A.14

TOTAL NUMBER OF REPORTED EYE INJURIES, IN ALBERTA, IN 1974, 1975 AND 1976 BY THE NATURE OF THE INJURY (ALBERTA W.C.B. STATISTICAL MASTER FILE)

NATURE OF INJURY \ YEAR	1976	(%)	1975	(%)	1974	(%)	TREND
Enucleation	2	(0.0)	5	(0.0)	1	(0.0)	-
Burn or Scald (heat)	158	(1.3)	142	(1.2)	171	(1.5)	-
Electric burn	1	(0.0)	1	(0.0)	1	(0.0)	-
Contusion, Bruise	206	(1.7)	149	(1.3)	173	(1.5)	-
Cut, Laceration	113	(0.9)	153	(1.3)	249	(2.3)	↓
Hernia, Rupture	-	(0.0)	-	(0.0)	2	(0.0)	-
Scratches, Abrasions	9910	(79.9)	9430	(78.8)	8647	(78.2)	↑
Sprains, Strains	-	(0.0)	-	(0.0)	6	(0.1)	-
Multiple Injuries	-	(0.0)	-	(0.0)	1	(0.0)	-
Occup. Injury NEC	14	(0.1)	38	(0.3)	62	(0.6)	↑
Burn (chemical)	922	(7.4)	978	(8.2)	763	(6.9)	-
Contagious Disease	-	(0.0)	-	(0.0)	11	(0.1)	-
Dermatitis	1	(0.0)	2	(0.0)	2	(0.0)	-
Freezing, Frostbite	-	(0.0)	-	(0.0)	1	(0.0)	-
Irritation	-	(0.0)	-	(0.0)	6	(0.1)	-
Poisoning, systemic	-	(0.0)	-	(0.0)	8	(0.1)	-
Radiation effects	892	(7.2)	1031	(8.6)	892	(8.1)	↑
Radiation NEC	1	(0.0)	-	(0.0)	-	(0.0)	-
Nonionizing Radiation	147	(1.2)	-	(0.0)	-	(0.0)	-
Non-personal damage	-	(0.0)	-	(0.0)	1	(0.0)	-
Unclassified disorder	38	(0.3)	36	(0.3)	55	(0.5)	-
TOTAL	12405		11966		11053		

NEC - Not Elsewhere Classified

TABLE 3.A.15

TOTAL NUMBER OF REPORTED EYE INJURIES, IN ALBERTA, IN 1974, 1975 AND 1976, BY THE NATURE OF INJURY, BY THE SEVERITY ESTIMATE (ALBERTA W.C.B. STATISTICAL MASTER FILE)

NATURE OF INJURY	COUNT ROW PCT COL PCT TOT PCT	Multiple No Compensation 5	Permanent Disability 3	Compensation 2	No Compensation Medical Aid Only 1	Not Classified X	ROW TOTAL
Unclassified Disorder		0 0.0 0.0 0.0	0 0.0 0.0 0.0	10 26.3 0.4 0.1	28 73.7 0.3 0.2	0 0.0 0.0 0.0	38 0.3
Non-Ionizing Radiation		0 0.0 0.0 0.0	0 0.0 0.0 0.0	35 23.8 1.2 0.3	112 76.2 1.2 0.9	0 0.0 0.0 0.0	147 1.2
Ionizing Radiation		0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 100.0 0.0 0.0	0 0.0 0.0 0.0	1 0.0
Radiation Effects		1 0.1 33.3 0.0	0 0.0 0.0 0.0	332 37.2 11.6 2.7	558 62.6 5.9 4.5	1 0.1 16.7 0.0	892 7.2
Dermatitis		0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 100.0 0.0 0.0	0 0.0 0.0 0.0	1 0.0
Chemical Burns		2 0.2 66.7 0.0	0 0.0 0.0 0.0	202 21.9 7.1 1.6	718 77.9 7.5 5.8	0 0.0 0.0 0.0	922 7.4
Occupational Injury-NEC		0 0.0 0.0 0.0	0 0.0 0.0 0.0	5 35.7 0.2 0.0	9 64.3 0.1 0.1	0 0.0 0.0 0.0	14 0.1
Scratches, Abrasions		0 0.0 0.0 0.0	3 0.0 42.9 0.0	2105 21.2 73.8 17.0	7796 78.7 81.8 62.8	6 0.1 83.3 0.0	9910 79.9
Cuts, Lacerations		0 0.0 0.0 0.0	3 2.7 42.9 0.0	40 35.4 1.4 0.3	70 61.9 0.7 0.6	0 0.0 0.0 0.0	113 0.9
Contusions		0 0.0 0.0 0.0	0 0.0 0.0 0.0	70 34.0 2.5 0.6	136 66.0 1.4 1.1	0 0.0 0.0 0.0	206 1.7
Electric Burn		0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 100.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 0.0
Burn (Heat)		0 0.0 0.0 0.0	0 0.0 0.0 0.0	53 33.5 1.9 0.4	105 66.5 1.1 0.8	0 0.0 0.0 0.0	158 1.3
Enucleation		0 0.0 0.0 0.0	1 50.0 14.3 0.0	1 50.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	2 0.0
	COLUMN TOTAL	3 0.0	7 0.1	2854 23.0	9534 76.9	7 0.0	12405 100.0

NEC - Not Elsewhere Classified

three categories (of nature of injury) account for a majority of eye injuries (95.7%): Radiation effects (i.e. from welding flash (8.4%), chemical burns (7.4%) and scratches or abrasions (79.9%)). The eye injury statistics for 1974 and 1975 show similar trends. Table 3.A.15 shows that these three categories account for 96.4% of the medical-aid-only (severity #1) eye injuries; radiation effects (7.1%), chemical burns (7.5%) and scratches or abrasions (81.8%). The same categories of nature of injury (in 1976) accounted for 93.7% of the lost time (severity #2) injuries; radiation effects (12.8%), chemical burns (7.1%), and scratches or abrasions (73.8%).

Table 3.A.16 shows the number of reported eye injuries in 1974, 1975 and 1976 according to whether first aid was rendered at the time of the accident. In 1976, 40% of the total number of reported eye injuries were provided with first aid. This proportion has increased slightly since 1974.

Table 3.A.17 shows the number of reported eye injuries in 1974, 1975 and 1976 according to the possibility that language difficulty may have contributed to the injury. In 1976, 0.6% of the reported injuries had some language (communication) problem associated with them.

TABLE 3.A.16

TOTAL NUMBER OF REPORTED EYE INJURIES, IN ALBERTA,
IN 1974, 1975 AND 1976,
ACCORDING TO WHETHER FIRST AID WAS RENDERED
(ALBERTA W.C.B. STATISTICAL MASTER FILE)

YEAR / FIRST AID	1976	(%)	1975	(%)	1974	(%)
Yes	3485	(40)	3380	(41)	2897	(37)
No	5266	(60)	4780	(59)	4870	(63)
Unknown	3654		3806		3286	
TOTAL	12405		11966		11053	

TABLE 3.A.17

TOTAL NUMBER OF REPORTED EYE INJURIES, IN ALBERTA,
IN 1974, 1975 AND 1976,
ACCORDING TO WHETHER A LANGUAGE PROBLEM
WAS A FACTOR IN CAUSING THE INJURY
(ALBERTA W.C.B. STATISTICAL MASTER FILE)

YEAR / LANGUAGE PROBLEM	1976	(%)	1975	(%)	1974	(%)
Yes	51	(0.6)	39	(0.5)	41	(0.5)
No	8672	(99.4)	8198	(99.5)	7894	(99.5)
Unknown	3682		3729		3118	
TOTAL	12405		11966		11053	

Part 2 - Detailed Results - High Eye Injury Risk Industry Classes

Figure 3.A.2 shows a frequency distribution of standard industry classes (S.I.C. Code), showing various rates of eye injuries in Alberta in 1976. The graph is exponential in nature, with the greatest number of industry classes having low rates and progressively fewer industry classes having higher rates of eye injuries.

With two exceptions, industry classes with an eye injury rate of greater than 9 injuries per 100 man years worked were selected for further study. These are listed in Table 3.A.18. The two industry classes with eye injury rates greater than 9/100 man years, but with very small workforces, were excluded from the study because even one injury gave an artificially high eye injury rate. These were classes 305 (wire manufacturers), and 306 (hardware manufacturers).

Tables 3.A.19 to 3.A.29 concern selected eye injury characteristics (variables), for severity #1 injuries, taken from the Alberta W.C.B. Statistical Master File, while Tables 3.A.30 to 3.A.40 are concerned with information for severity #2 injuries. (These tables are found at the end of 3.A.R., Part 2.) The eye injury characteristics, or variables, that were selected are:

(Sev. #1)	(Sev. #2)	Variable
3.A.19	3.A.30	Preliminary information concerning the industry classes
3.A.20	3.A.31	Age of Injured Worker
3.A.21	3.A.32	Occupation of Injured Worker
3.A.22	3.A.33	Length of Shift Worked per Day
3.A.23	3.A.34	Time of Day the Accident Occurred

(cont'd)

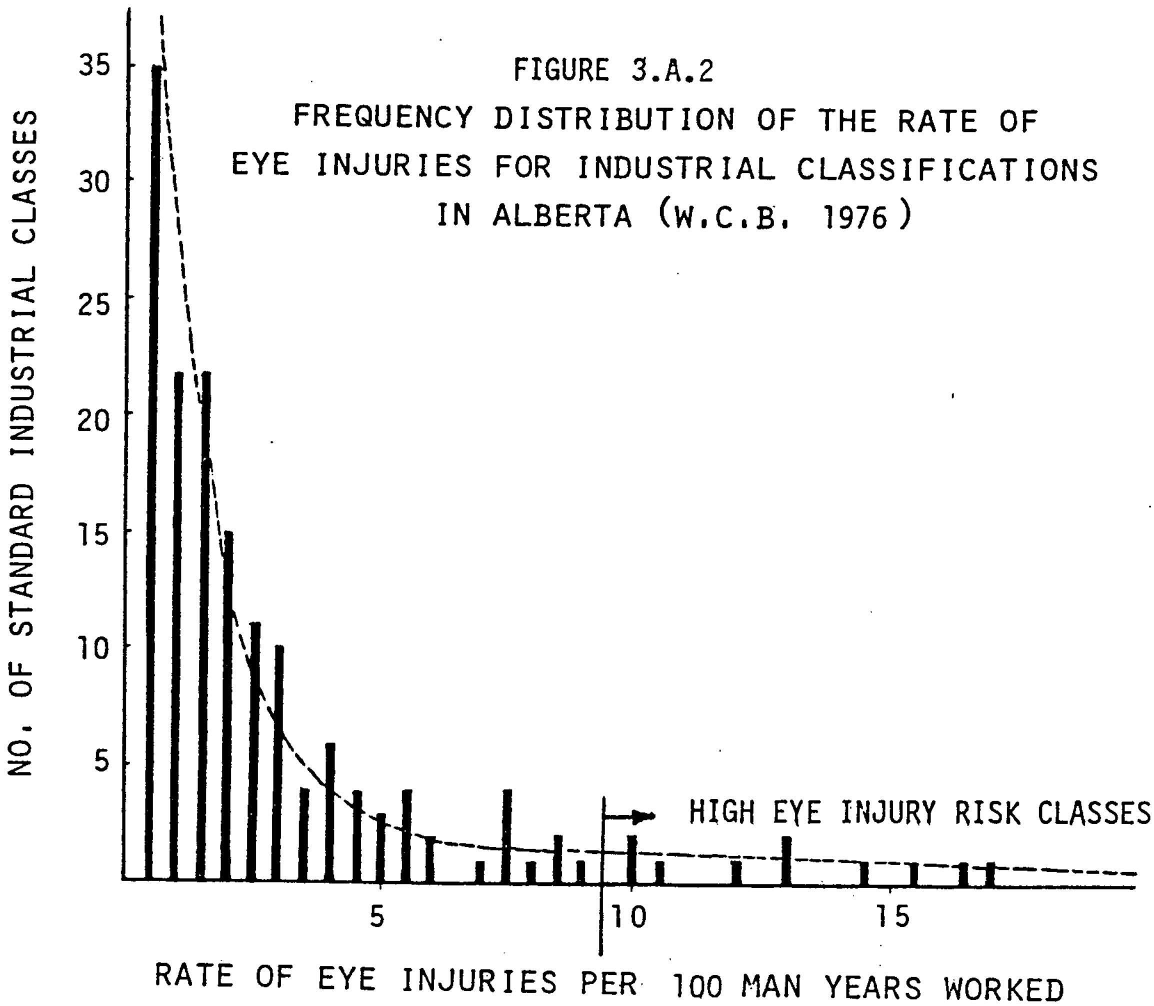


FIGURE 3.A.2
FREQUENCY DISTRIBUTION OF THE RATE OF
EYE INJURIES FOR INDUSTRIAL CLASSIFICATIONS
IN ALBERTA (W.C.B. 1976)
NO. OF STANDARD INDUSTRIAL CLASSES
35
30
25
20
15
10
5
HIGH EYE INJURY RISK CLASSES
5
10
15
RATE OF EYE INJURIES PER 100 MAN YEARS WORKED

TABLE 3.A.18

LISTING OF FIVE DIGIT STANDARD INDUSTRIAL CLASSES (S.I.C., 1971)
SELECTED FOR DETAILED EYE INJURY ANALYSIS
(SHOWN IN THE ORDER IN WHICH THEY APPEAR IN TABLES 3.A.19 TO 3.A.40)

INDUSTRY CLASS	DESCRIPTION
31100	Mfg. of Agricultural Implements
30700	Mfg. of Heating Equipment
30800	Automotive Machine Shops
30801	Machine Shops
29100	Mfg. of Steel
" 02	Foundry - Iron and Steel
34300	Mfg. of Lime
32400	Mfg. of Holiday Trailers and Campers
" 01	Mfg. of Truck Bodies and Cabs
" 03	Mfg. of Wooden Truck Boxes
32300	Mfg. of Vehicles
30200	Fabrication of Structural Steel
89400	Blacksmith Shop
" 01	Welding Shop
30100	Mfg., Fabrication and Repair of Metal Products

Variable (Cont'd)

(Sev. #1)	(Sev. #2)	
3.A.24	3.A.35	Hours worked before Accident
3.A.25	3.A.36	Source of Injury
3.A.26	3.A.37	Type of Accident
3.A.27	3.A.38	Nature of Injury
3.A.28	3.A.39	First Aid Provided
3.A.29	3.A.40	Language problem involved in Injury

There were only 4 injuries in these selected classes that were classed as severity #2 (permanent disability) or severity #5 (multiple injuries which involve medical aid only). These were found in classes 301, 302 and 311. Instead of looking only at these few permanent disability injuries it was decided to look at all permanent disabilities that were reported in 1976, regardless of industry (see Part 3).

Fifteen industry classes (using 5 digit classifications) were analyzed individually, with the same variables used in the general analysis (Part 1). As fifteen five digit classifications arose from an initial number of ten three digit classifications, the rates of eye injuries in Tables 3.A.19 and 3.A.30 no longer follow an ascending trend. Industry class 29100, for instance, shows a low rate of eye injury, this being masked and averaged in the three digit code 291 by industry class 29102 which has a high incidence of eye injuries. The analysis is not hampered by this factor, however, but it must be taken into account.

Table 3.A.20 shows that a high percentage (similar to the general results discussed previously) of severity #1 eye injuries occur in workers less than 30 years of age. Workers who incur severity #1 eye injuries in the machine shop and steel fabrication industries are older in general. Table 3.A.31 indicates a similar trend for severity #2 injuries, although

in the machine shop and steel fabrication industries, the more serious injuries occur in the slightly older worker. On the other hand, automotive machine shops and industries manufacturing agricultural implements and heating equipment incur more serious injuries in their slightly younger workers.

In a majority of the industries cited in Table 3.A.21, welders and pipefitters incur the greatest number of severity #1 injuries. Machinists, metal shapers and formers and mechanics top the list in three industries. Each of these occupations involve handling metal products. Much the same situation exists in Table 3.A.32 for severity #2 injuries. Welders do not figure as prominently, but this is due mainly to the lower number of severity #2 eye injuries which allow other occupations to dominate by virtue of chance.

The majority of severity #1 and severity #2 injuries, in all industry classes, were most prevalent among workers who worked the normal 8 hour shift (Tables 3.A.22 and 3.A.33). In five out of twelve industry classes a relatively greater proportion of severity #1 than severity #2 eye injuries occurred in the 9 hour shift, while another five classes showed the opposite trend. The remaining classes showed no difference or could not be compared due to lack of numbers. Severity #1 eye injuries were prevalent among workers who worked 7 hour shifts, while very few severity #2 injuries occurred in this category.

Tables 3.A.23 and 3.A.34 show that the majority of industry classes have eye injury peaks at 10 a.m. and 2 p.m. Welding shops and manufacturers of agricultural equipment had peaks occurring at 9 a.m. and 2 p.m. Machine shops and vehicle manufacturers showed peaks at 10 a.m. and 3 p.m., while trailer manufacturers showed peaks at 11 a.m. and 1 p.m., and metal products fabricators at 11 a.m. and 2 p.m. The duration between peaks varied between three and five hours. All industry classes excepting cab and truck body manufacturers and heating equipment manufacturers showed a higher peak in the afternoon, while the latter showed a higher peak in the morning.

The majority of high risk industry classes studied in Table 3.A.25 show that between 30% and 40% of the severity #1 eye injuries are caused by metal chips and particles. Among steel manufacturing industries and trailer manufacturers this figure is lower. Lime manufacturers show no injury source of this kind. Metal chips and particles contribute to a high proportion of the severity #2 injuries also shown in Table 3.A.36. Automotive machine shops, trailer manufacturers and vehicle manufacturers show lower rates. A high proportion of severity #1 and severity #2 eye injuries are caused by unidentified particles and welding equipment.

All industry classes, with the exception of lime manufacturers, show in Table 3.A.26 that a very high proportion of eye injuries occur as a result of foreign matter being rubbed or abraded on the anterior segment. Table 3.A.37 shows that this proportion is lower, although still high, for severity #2 eye injuries. Contact with radiations and caustics is the second most prevalent type of severity #2 accident. Truck body and cab manufacturers and lime manufacturers show a higher than average incidence of severity #1 injuries in this category. Hot objects (which could include molten metal and sparks) were responsible for a moderate proportion of lost work time injuries in industries concerned with the manufacture of agricultural implements and heating equipment.

In general, this type of accident variable does not prove fruitful in this analysis as it is highly generalized and repetitious.

Excepting lime manufacturers with 40%, Table 3.A.27 shows that superficial abrasions to the cornea were responsible for 78% to 100% of the severity #1 injuries in the high eye injury risk industry classes. The range becomes greater, and the proportion lower, for severity #2 injuries (Table 3.A.38) (e.g. between 62% and 91%). Notable exceptions are lime manufacturers and vehicle manufacturers with proportions of 0 and 42% respectively. The proportion of severity #1 injuries due to ionizing radiations is variable, between 2.2% and 14.7%. With the exception of lime manufacturers, where no severity #1 injury is due to radiations, no trends in the nature of the injuries can be seen and variation is likely due to chance. A high proportion of severity #2 eye injuries is caused by radiation effects. Again, the prevalence of this injury among high eye injury risk industry classes is highly variable and ranges from 9% to 51%. Severity #2 eye injuries caused by chemical burns are prevalent in lime manufacturers, automotive machine shops and structural steel fabrication plants. Severity #2 eye injuries due to contact with hot substances appear consistently but are not in high proportion.

The provision of first aid among these selected industry classes is highly variable. Tables 3.A.28 and 3.A.39 show that it ranges from 20% to 80% for severity #1 eye injuries and 13% to 68% for severity #2 injuries, respectively. The provision of first aid services, especially for lost time injuries, however, is extremely low.

Tables 3.A.29 and 3.A.40 show that language problems did not play a significant part in the causation of severity #2 eye injuries among the selected industry classes although it is notable that language problems were involved in five severity #1 eye injury cases in the metal products fabrication, manufacture and repair industry.

TABLE 3.A.19

PRELIMINARY INFORMATION CONCERNING THE DISTRIBUTION OF REPORTED SEVERITY #1 EYE INJURIES IN 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, IN ALBERTA, IN 1976 (ALBERTA W.C.B. STATISTICAL MASTER FILE)

PRELIMINARY INFORMATION	INDUSTRY CLASS														
	AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY TRAILERS, CAMPERS	TRUCK BODIES, CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	BLACKSMITH SHOP	WELDING	FAB,MFG & REPAIR METAL PRODUCTS
POPULATION OF INDUSTRY CLASS (MAN YEARS)	513	291	843	2843	678	593	94	1494	818	63	310	1814	19	1822	2848
NUMBER OF SEVERITY #1 EYE INJURIES (1976)	34	18	54	244	35	80	10	139	94	3	35	196	1	239	399
RATE OF EYE INJURIES/100 MAN YEARS	6.6	6.2	6.4	8.6	5.2	13.5	10.6	9.3	11.5	4.8	11.3	10.8	5.3	13.1	14.0
PROPORTION OF TOTAL INJURIES SEVERITY #1	67%	62%	75%	77%	95%	70%	83%	85%	66%	60%	74%	66%	100%	77%	68%
OCCURRENCE CLASSIFICATION	8-03	6-02	5-01	8-02 8-03	8-05	8-05	19-02	8-04	8-02	8-04	8-03	8-02	8-02	8-02	8-02
PROPORTION OF INJURED WORKERS OF THE MALE SEX	97%	89%	100%	98%	100%	100%	100%	84%	100%	100%	100%	100%	100%	99.6%	99%

TABLE 3.A.20

THE DISTRIBUTION OF REPORTED SEVERITY #1 EYE INJURIES OCCURRING IN 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, ACCORDING TO THE AGE OF THE INJURED WORKER, IN ALBERTA, IN 1976
(ALBERTA W.C.B. STATISTICAL MASTER FILE)

AGE OF INJURED WORKER / NO. (%)	INDUSTRY CLASS: AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDARY: STEEL, IRON	LIME	HOLIDAY TRAILERS, CAMPERS	TRUCK BODIES, CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	BLACKSMITH SHOP	WELDING	FAB,MFG & REPAIR METAL PRODUCTS
-70+ YRS															
65-69 YRS														1 (0.4)	
60-64 YRS				4 (1.6)	1 (2.9)							1 (0.5)			12 (3.0)
55-59 YRS		1 (5.6)		5 (2.0)		6 (7.5)	1 (10.0)	1 (0.7)	3 (3.2)			3 (1.5)			5 (1.3)
50-54 YRS	1 (2.9)		2 (3.7)	11 (4.5)		3 (3.8)		2 (1.4)	2 (2.1)		1 (2.9)	4 (2.0)		3 (1.3)	11 (2.8)
45-49 YRS	3 (8.8)		1 (1.9)	11 (4.5)	2 (5.7)	4 (5.0)	1 (10.0)	5 (3.6)	4 (4.3)		3 (8.6)	10 (5.1)		13 (5.4)	19 (4.8)
40-44 YRS	3 (8.8)		5 (9.2)	22 (9.1)	2 (5.7)	4 (5.0)	1 (10.0)	7 (5.0)	3 (3.2)	1 (33.2)	2 (5.7)	13 (6.6)		18 (7.5)	22 (5.5)
35-39 YRS	2 (5.9)	1 (5.6)	5 (9.2)	25 (10.2)	3 (8.6)	7 (8.8)	2 (20.0)	3 (2.2)	7 (7.4)		3 (8.6)	24 (12.2)	1 (100)	21 (8.8)	47 (11.8)
30-34 YRS	3 (8.8)	3 (16.6)	6 (11.1)	51 (20.8)	6 (17.0)	10 (12.5)		15 (10.8)	11 (11.7)		5 (14.3)	42 (21.4)		35 (14.6)	61 (15.3)
25-29 YRS	2 (5.9)	1 (5.6)	11 (20.4)	43 (17.6)	8 (22.9)	13 (16.3)	1 (10.0)	17 (12.2)	14 (14.9)		5 (14.3)	44 (22.4)		55 (23.0)	97 (24.3)
20-24 YRS	11 (32.4)	8 (44.4)	15 (27.8)	60 (24.6)	12 (34.3)	22 (27.5)	2 (20.0)	49 (35.3)	40 (42.6)	2 (66.7)	12 (34.3)	40 (20.4)		63 (26.4)	114 (28.6)
15-19 YRS	9 (26.5)	4 (22.2)	9 (16.7)	11 (4.5)	1 (2.9)	11 (13.8)	2 (20.0)	39 (28.1)	9 (9.6)		3 (8.6)	13 (6.6)		28 (11.7)	30 (7.5)
≤14 YRS															
MISSING VALUES				1 (0.4)				1 (0.7)	1 (1.1)		1 (2.9)	2 (1.0)		2 (0.8)	
TOTAL	34 (100)	18 (100)	54 (100)	244 (100)	35 (100)	80 (100)	10 (100)	139 (100)	94 (100)	3 (100)	35 (100)	196 (100)	1 (100)	239 (100)	399 (100)

TABLE 3.A.21

THE DISTRIBUTION OF REPORTED SEVERITY #1 EYE INJURIES OCCURRING IN 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, ACCORDING TO THE OCCUPATION OF THE INJURED WORKER, IN ALBERTA, IN 1976 (ALBERTA W.C.B. STATISTICAL MASTER FILES)

OCCUPATION OF INJURED WORKER	NO. (%)	INDUSTRY CLASS														
		AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY TRAILERS, CAMPERS	TRUCK BODIES, CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	BLACKSMITH SHOP	WELDING	FAB,MFG & REPAIR METAL PRODUCTS
NOT CLASSIFIED		12 (35.3)	3 (16.7)	10 (18.5)	72 (29.5)	5 (14.3)	13 (16.2)	3 (30.0)	49 (35.3)	17 (18.1)		7 (20.0)	53 (27.0)		72 (30.1)	90 (22.6)
CIVIL ENGINEERS									1 (0.7)							
MECHANICAL ENGINEERS					1 (0.4)											
BOOKKEEPERS																1 (0.3)
SHIPPING CLERKS									1 (0.7)				1 (0.5)			
COMMERCIAL TRAVELLERS									1 (0.7)							
FIRE-FIGHTERS								1 (10.0)								
JANITORS				1 (1.9)		1 (2.9)	1 (1.2)		1 (0.7)							
SUPERVISORS: DRILLING OPERATIONS																1 (0.3)
ROTARY WELL-DRILLING								1 (10.0)								2 (0.5)
CRUSHING AND GRINDING OCCUPATIONS								1 (10.0)								
SUPERVISORS: ORE TREATING OPERATIONS							1 (1.2)									
METAL FURNACEMEN							1 (1.2)									
METAL CASTING						3 (8.6)	4 (5.0)									
PLATING, METAL OCCUPATIONS					1 (0.4)											
LABOURING IN METAL PROCESSING							2 (2.5)									
LABOURING IN CHEMICALS, PETROLEUM								1 (10.0)								
METAL PROCESSING						1 (2.9)	2 (2.5)									2 (0.5)
LABOURING IN FOOD & BEVERAGE			1 (5.6)													
TOOL-AND-DIE MAKING					2 (0.8)				1 (0.7)							
MACHINIST				17 (31.5)	69 (28.3)	2 (5.7)	2 (2.5)					3 (8.6)	2 (1.0)		1 (0.4)	10 (2.5)
FOREMEN:METAL SHAPING AND FORMING															1 (0.4)	
FORGING OCCUPATIONS					1 (0.4)											2 (0.5)

TABLE 3.A.21 - CONTINUED

	AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY TRAILERS, CAMPERS	TRUCK BODIES, CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	BLACKSMITH SHOP	WELDING	FAB,MFG & REPAIR METAL PRODUCTS
SHEET-METAL WORKERS						1 (1.2)			1 (1.1)		2 (5.7)	4 (2.0)			11 (2.8)
METALWORKING-MACHINE OPERATORS												1 (0.5)			
WELDING AND FLAME CUTTING	9 (26.5)	6 (33.3)	3 (5.6)	62 (25.4)	4 (11.4)	3 (3.7)		4 (2.9)	42 (44.7)	2 (66.7)	17 (48.6)	63 (32.1)	1 (100)	144 (60.3)	194 (48.6)
INSPECTING: METAL SHAPING AND FORMING												1 (0.5)			
BOILERMAKERS, PLATERS												1 (0.5)		1 (0.4)	6 (1.5)
METAL SHAPING AND FORMING					1 (2.9)										
FILING, GRINDING, BUFFING OCCUPATIONS					4 (1.6)		20 (25.0)					2 (1.0)		1 (0.4)	4 (1.0)
MOTOR VEHICLE FABRICATING								1 (0.7)	1 (1.1)						
OTHER FABRICATING AND ASSEMBLING OCCUPATIONS												2 (1.0)		1 (0.4)	
ELECTRICAL EQUIP FABRICATING & ASSEMBLING								1 (0.7)							
MOTOR-VEHICLE MECHANICS			11 (20.4)	4 (1.6)	1 (2.9)			2 (1.4)	16 (17.0)		1 (2.9)	1 (0.5)			6 (1.5)
HEAVY DUTY MACHINERY MECHANICS			7 (13.0)	7 (2.9)	6 (17.1)				9 (9.6)			1 (0.5)			1 (0.3)
FOREMEN: PRODUCT FAB,. ASSEMBLING & REPAIR	1 (2.9)		1 (1.9)			1 (1.2)						1 (1.5)			1 (0.3)
LABOURING IN PRODUCT FAB,ASSEMB, & REPAIR	5 (14.7)	5 (27.8)		3 (1.2)	1 (2.9)	7 (8.7)		55 (39.6)	3 (3.2)	1 (33.3)	2 (5.7)	5 (2.6)		1 (0.4)	14 (3.5)
EXCAVATING, GRADING							1 (10.0)								
ELECTRICAL POWER LINEMEN								1 (0.7)							
CONSTRUCTION ELECTRICIANS					1 (2.9)						1 (2.9)				1 (0.3)
FOREMEN: OTHER CONSTRUCTION TRADES		1 (5.6)													
CARPENTERS								2 (1.4)							1 (0.3)
CONCRETE FINISHING														1 (0.4)	
PAINTERS, PAPERHANGERS	1 (2.9)			2 (0.8)					2 (2.1)		1 (2.9)	5 (2.6)		1 (0.4)	1 (0.3)
PIPEFITTING, PLUMBING												25 (12.8)		2 (0.8)	28 (7.0)
STRUCTURAL-METAL ERECTORS				1 (0.4)	1 (2.9)							3 (1.5)			2 (0.5)
LABOURING IN CONSTRUCTION		1 (5.6)		1 (0.4)				7 (5.0)			1 (2.9)	2 (1.0)		3 (1.3)	

TABLE 3.A.21 - CONTINUED

	AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY TRAILERS, CAMPERS	TRUCK BODIES, CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	BLACKSMITH SHOP	WELDING	FAB,MFG & REPAIR METAL PRODUCTS
HOISTING OCCUPATIONS					3 (8.6)	2 (2.5)						2 (1.0)			
LONGSHOREMEN				1 (0.4)											
MATERIAL-HANDLING EQUIPMENT OPERATORS	1 (2.9)				1 (2.9)										
FOREMEN OCCUPATIONS									1 (1.1)						
INSPECTING, TESTING, GRADING & SAMPLING						1 (1.2)						1 (0.5)			
LABOURING OCCUPATIONS	5 (14.7)	1 (5.6)	4 (7.4)	12 (4.9)	4 (11.4)	19 (23.7)	2 (20.0)	12 (8.6)	2 (2.1)			17 (8.7)		10 (4.2)	20 (5.0)
OTHER OCCUPATIONS				1 (0.4)											
TOTAL	34 (100)	18 (100)	54 (100)	244 (100)	35 (100)	80 (100)	10 (100)	139 (100)	94 (100)	3 (100)	35 (100)	196 (100)	1 (100)	239 (100)	399 (100)

TABLE 3.A.22

THE DISTRIBUTION OF REPORTED SEVERITY #1 EYE INJURIES OCCURRING IN 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, ACCORDING TO THE LENGTH OF SHIFT WORKED BY THE INJURED WORKER, IN ALBERTA, IN 1976 (ALBERTA W.C.B. STATISTICAL MASTER FILES)

LENGTH OF SHIFT WORKED / NO. (%)	INDUSTRY CLASS														
	AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY CAMPERS, TRAILERS	TRUCK BODIES, CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	BLACKSMITH SHOP	WELDING	FAB,MFG & REPAIR METAL PRODUCTS
UNKNOWN	8	6	4	61	3	9		43	25		5	49		88	89
5 THRU 6 HOURS PER DAY				2 (1.1)											1 (0.3)
7 HOURS PER DAY	1 (3.8)			1 (0.5)	4 (12.5)		1 (1.0)				1 (3.3)	4 (2.7)		4 (2.6)	13 (4.2)
8 HOURS PER DAY	22 (84.6)	12 (100)	46 (92.0)	163 (88.1)	28 (87.5)	71 (100)	8 (80.0)	95 (99.0)	63 (91.3)	3 (100)	27 (90.1)	133 (90.5)	1 (100)	104 (68.8)	259 (8.4)
9 THRU 10 HOURS PER DAY	3 (11.5)		4 (8.0)	16 (8.7)			1 (10.0)	1 (1.0)	5 (7.2)		2 (6.6)	10 (6.8)		40 (26.5)	32 (10.3)
11 THRU 12 HOURS PER DAY				1 (0.5)					1 (1.4)					3 (1.9)	5 (1.6)
TOTAL	34 (100)	18 (100)	54 (100)	244 (100)	35 (100)	80 (100)	10 (100)	139 (100)	94 (100)	3 (100)	35 (100)	196 (100)	1 (100)	239 (100)	399 (100)

TABLE 3.A.23

THE DISTRIBUTION OF REPORTED SEVERITY #1 EYE INJURIES OCCURRING IN 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, ACCORDING TO THE TIME OF DAY THE ACCIDENT OCCURRED, IN ALBERTA, IN 1976

(ALBERTA W.C.B. STATISTICAL MASTER FILES)

TIME OF ACCIDENT / NO. (%)	INDUSTRY CLASS														
	AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY TRAILERS, CAMPERS	TRUCK BODIES, CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	BLACKSMITH SHOP	WELDING	FAB.MFG, & REPAIR METAL PRODUCTS
01				1 (0.6)											2 (0.8)
02				1 (0.6)										1 (0.8)	
03	1 (4.0)		1 (2.3)		2 (6.7)	2 (3.4)									
04					1 (3.3)										1 (0.4)
05					3 (10.0)										
06				1 (0.6)	1 (3.3)									1 (0.8)	
07	1 (4.0)			1 (0.6)	2 (6.7)	1 (1.7)		1 (1.1)	2 (3.1)		2 (7.7)	2 (1.5)		1 (0.8)	8 (3.0)
08	1 (4.0)	1 (7.7)	1 (2.3)	6 (3.8)	2 (6.7)	4 (6.9)	2 (20.0)	4 (4.5)	1 (1.5)		2 (7.7)	7 (5.4)		2 (1.7)	5 (1.9)
09	5 (20.0)	4 (30.8)	6 (13.6)	7 (4.5)	1 (3.3)	3 (5.2)	1 (10.0)	11 (12.5)	4 (6.2)		3 (11.5)	7 (5.4)		17 (14.3)	25 (9.4)
10		1 (7.7)	7 (15.9)	14 (8.9)		7 (12.1)		14 (15.9)	11 (16.9)		4 (15.4)	16 (12.3)		13 (10.9)	31 (11.7)
11	2 (8.0)		5 (11.4)	18 (11.5)	2 (6.7)	5 (8.6)	3 (30.0)	16 (18.2)	4 (6.2)	1 (50.0)	1 (3.8)	14 (10.8)		14 (11.8)	36 (13.6)
12		1 (7.7)		6 (3.8)	3 (10.0)	1 (1.7)		5 (5.7)	2 (3.1)	1 (50.0)	1 (3.8)	4 (3.1)		5 (4.2)	8 (3.0)
13		1 (7.7)	2 (4.5)	13 (8.3)	2 (6.7)	3 (5.2)	1 (10.0)	13 (14.8)	4 (6.2)		3 (11.5)	12 (9.2)		5 (4.2)	18 (6.8)
14	5 (20.0)	3 (23.1)	6 (13.6)	26 (16.6)	2 (6.7)	9 (15.5)		10 (11.4)	13 (20.0)		5 (19.2)	18 (13.8)		22 (18.5)	56 (21.1)
15	2 (8.0)	1 (7.7)	7 (15.9)	35 (22.3)	1 (3.3)	9 (15.5)	1 (10.0)	8 (9.1)	11 (16.9)		3 (11.5)	19 (14.6)	1 (100)	19 (16.0)	43 (16.2)
16	4 (16.0)	1 (7.7)	5 (11.4)	17 (10.8)	2 (6.7)	4 (6.9)	1 (10.0)	6 (6.8)	5 (7.7)		1 (3.8)	6 (4.6)		13 (10.9)	14 (5.3)
17	3 (12.0)		1 (2.3)	3 (1.9)	1 (3.3)	1 (1.7)	1 (10.0)		2 (3.1)		1 (3.8)	2 (1.5)		1 (0.8)	4 (1.5)
18				3 (1.9)		1 (1.7)			2 (3.1)			7 (5.4)		2 (1.7)	
19				1 (0.6)					2 (3.1)			2 (1.5)		3 (2.5)	4 (1.5)
20				1 (0.6)		3 (5.2)			2 (3.1)			5 (3.8)			2 (0.8))
21	1 (4.0)			2 (1.3)	1 (3.3)	3 (5.2)						5 (3.8)			3 (1.1)
22			1 (2.3)	1 (0.6)	2 (6.7)							3 (2.3)			3 (1.1)
23			1 (2.3)		2 (6.7)	2 (3.4)						1 (0.8)			1 (0.4)
24			1 (2.3)												1 (0.4)
MISSING VALUE	9	5	10	87	5	22		51	29	1	9	66		120	134
TOTAL	34 (100)	18 (100)	54 (100)	244 (100)	35 (100)	80 (100)	10 (100)	139 (100)	94 (100)	3 (100)	35 (100)	196 (100)	1 (100)	239 (100)	399 (100)

TABLE 3.A.24

THE DISTRIBUTION OF REPORTED SEVERITY #1 EYE INJURIES OCCURRING IN 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, ACCORDING TO THE NUMBER OF HOURS WORKED BEFORE THE ACCIDENT, IN ALBERTA, IN 1976
(ALBERTA W.C.B. STATISTICAL MASTER FILES)

HOURS WORKED BEFORE ACCIDENT / NO. (%)	INDUSTRY CLASS														
	AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: IRON, STEEL	LIME	HOLIDAY TRAILERS, CAMPERS	TRUCK BODIES, CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	BLACKSMITH SHOP	WELDING	FAB,MFG & REPAIR METAL PRODUCTS
00	3 (12.5)	1 (9.1)	1 (2.4)	4 (2.8)	4 (14.8)	1 (1.8)		3 (3.5)	4 (6.3)		2 (8.0)	6 (5.0)		2 (1.9)	11 (4.3)
01	2 (8.3)	2 (18.2)	6 (14.3)	9 (6.3)	1 (3.7)	8 (14.0)	3 (33.3)	8 (9.4)	3 (4.8)		3 (12.0)	5 (4.2)		11 (10.4)	15 (5.9)
02	3 (12.5)	2 (18.2)	4 (9.5)	13 (9.1)	3 (11.1)	4 (7.0)		7 (8.2)	10 (15.9)		4 (16.0)	14 (11.7)		12 (11.3)	28 (11.1)
03	2 (8.3)		5 (11.9)	11 (7.7)	1 (3.7)	6 (10.5)	2 (22.2)	20 (23.5)	8 (12.7)	1 (50.0)	1 (4.0)	18 (15.0)		18 (17.0)	37 (14.6)
04		1 (9.1)	2 (4.8)	16 (11.2)	5 (18.5)	5 (8.8)	1 (11.1)	7 (8.2)	4 (6.3)	1 (50.0)	1 (4.0)	8 (6.7)		7 (6.6)	19 (7.5)
05	2 (8.3)	2 (18.2)	6 (14.3)	16 (11.2)	3 (11.1)	6 (10.5)	1 (11.1)	14 (16.5)	8 (12.7)		2 (8.0)	19 (15.8)		10 (9.4)	37 (14.6)
06	3 (12.5)	2 (18.2)	5 (11.9)	16 (11.2)	7 (25.9)	8 (14.0)	1 (11.1)	7 (8.2)	10 (15.9)		6 (24.0)	21 (17.5)		12 (11.3)	42 (16.6)
07	3 (12.5)	1 (9.1)	10 (23.8)	28 (19.6)	2 (7.4)	9 (15.8)	1 (11.1)	13 (15.3)	9 (14.3)		4 (16.0)	13 (10.8)	1 (100)	24 (22.6)	45 (17.8)
08	5 (20.8)		2 (4.8)	23 (16.1)	1 (3.7)	7 (12.3)		4 (4.7)	6 (9.5)		2 (8.0)	11 (9.2)		7 (6.6)	16 (6.3)
09	1 (4.2)			4 (2.8)		2 (3.5)		2 (2.4)	1 (1.6)			2 (1.7)			2 (0.8)
10				3 (2.1)		1 (1.8)						2 (1.7)		2 (1.9)	1 (0.4)
11			1 (2.4)									1 (0.8)		1 (0.9)	
UNKNOWN	10	7	12	101	8	23	1	54	31	1	10	76		133	146
TOTAL	34 (100)	18 (100)	54 (100)	244 (100)	35 (100)	80 (100)	10 (100)	139 (100)	94 (100)	3 (100)	35 (100)	196 (100)	1 (100)	239 (100)	399 (100)

TABLE 3.A.25

THE DISTRIBUTION OF REPORTED SEVERITY #1 EYE INJURIES, OCCURRING IN 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, ACCORDING TO THE SOURCE OF THE INJURY, IN ALBERTA, IN 1976 (ALBERTA W.C.B. STATISTICAL MASTER FILES)

	INDUSTRY CLASS														
SOURCE OF INJURY (NO. (%))	AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY TRAILERS, CAMPERS	TRUCK BODIES, CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	BLACKSMITH SHOP	WELDING	FAB,MFG & REPAIR METAL PRODUCTS
HIGH PRESSURE														1 (0.4)	
PRESSURE LINES												1 (0.5)			
ACIDS			1 (1.9)		1 (2.9)			1 (0.7)	1 (.1)					1 (0.4)	
ALKALIES							4 (40.0)								
CHEMICALS, NOT ELSEWHERE CLASSIFIED				3 (1.2)			1 (10.0)	1 (0.7)	3 (3.2)			1 (0.5)		3 (1.3)	3 (0.8)
GLOVES						1 (1.2)									
CRUDE OIL, FUEL OIL								1 (0.7)							
GASOLINE						1 (1.2)									
NAPTHA SOLVENTS								1 (0.7)				1 (0.5)			
FLAME AND FIRE						1 (1.2)								1 (0.4)	
GLASS ITEMS		1 (5.6)		1 (0.4)				3 (2.2)	1 (1.1)		1 (2.9)				
HAMMER, SLEDGE, MALLET									1 (1.1)					1 (0.4)	
PLIERS, TONGS	1 (2.9)														

TABLE 3.A.25 - CONTINUED

	AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY TRAILERS, CAMPERS	TRUCK BODIES, CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	BLACKSMITH SHOP	WELDING	FAB, MFG & REPAIR METAL PRODUCTS
SCREWDRIVER								1 (0.7)	1 (1.1)						
INFECTIOUS AND PARASITIC AGENTS															1 (0.3)
NAILS, SPIKES, TACKS	2 (5.9)			4 (1.6)		1 (1.2)		1 (0.7)				2 (1.0)		6 (2.5)	1 (0.3)
METAL CHIPS AND PARTICLES	11 (32.4)	7 (38.9)	20 (37.0)	96 (39.3)	6 (17.1)	33 (41.2)		29 (20.9)	24 (25.5)	2 (66.7)	11 (31.4)	62 (31.6)		76 (31.8)	134 (33.6)
MOLTEN METAL	2 (5.9)	2 (11.1)		3 (1.2)	2 (5.7)	3 (3.7)	1 (10.0)		1 (1.1)	1 (33.3)	2 (5.7)	13 (6.6)		16 (6.7)	16 (4.0)
STRUCTURAL MEMBERS														1 (0.4)	1 (0.3)
METAL ITEMS				1 (0.4)				3 (2.2)						1 (0.4)	3 (0.8)
ROCKS, STONES, SAND				3 (1.2)											
MINERAL ITEMS, NON-METALLIC, NEC						1 (1.2)									
PARTICLES (UNIDENTIFIED)	13 (38.2)	4 (22.2)	31 (57.4)	112 (45.9)	23 (65.7)	37 (46.2)	2 (20.0)	74 (53.2)	44 (46.8)		16 (45.7)	91 (46.4)	1 (100)	93 (38.9)	176 (44.1)
WELDING EQUIPMENT, ELECTRIC ARC	5 (14.7)	3 (16.7)	2 (3.7)	19 (7.8)	3 (8.6)	2 (2.5)		3 (2.2)	15 (16.0)		5 (14.3)	24 (12.2)		35 (14.6)	60 (15.0)
HIGHWAY VEHICLES, POWERED									1 (1.1)						
SLIVERS, SPLINTERS, ETC							2 (20.0)	16 (11.5)						1 (0.4)	1 (0.3)
CHIPS								3 (2.2)	2 (2.1)						1 (0.3)
WOOD ITEMS, NOT ELSEWHERE CLASSIFIED								1 (0.7)							
MISCELLANEOUS, NOT ELSEWHERE CLASSIFIED		1 (5.6)													
UNKNOWN, UNIDENTIFIED				2 (0.8)				1 (0.7)				1 (0.5)		3 (1.3)	2 (0.5)
TOTAL	34 (100)	18 (100)	54 (100)	244 (100)	35 (100)	80 (100)	10 (100)	139 (100)	94 (100)	3 (100)	35 (100)	196 (100)	1 (100)	239 (100)	399 (100)

TABLE 3.A.26

THE DISTRIBUTION OF REPORTED SEVERITY #1 EYE INJURIES, OCCURRING IN 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, ACCORDING TO THE TYPE OF ACCIDENT, IN ALBERTA, IN 1976 (ALBERTA W.C.B. STATISTICAL MASTER FILES)

	INDUSTRY CLASS														
TYPE OF ACCIDENT — NO. (%)	AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY TRAILERS, CAMPERS	TRUCK BODIES, CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	BLACKSMITH SHOP	WELDING	FAB, MFG & REPAIR METAL PRODUCTS
STRUCK AGAINST MOVING OBJECT															1 (0.3)
STRUCK AGAINST STATIONARY OBJECT									1 (1.1)						
STRUCK BY FALLING OBJECT														1 (0.4)	
FLYING OBJECT THROWN BACK BY A MACHINE															1 (0.3)
FLYING OBJECT, NOT ELSEWHERE CLASSIFIED				3 (1.2)	1 (2.9)			3 (2.2)				2 (1.0)			5 (1.3)
STRUCK BY OBJECTS BEING HOISTED	1 (2.9)					1 (1.2)		3 (2.2)	1 (1.1)			1 (0.5)		1 (0.4)	
STRUCK BY, NOT ELSEWHERE CLASSIFIED		1 (5.6)		2 (0.8)				2 (1.4)	1 (1.1)						1 (0.3)
CAUGHT IN A MOVING/STATIONARY OBJECT															1 (0.3)
FOREIGN MATTER IN EYES	28 (82.4)	12 (66.7)	51 (94.4)	212 (86.9)	30 (85.7)	73 (91.2)	4 (40.0)	123 (88.5)	70 (74.5)	3 (100.0)	29 (82.9)	160 (81.6)	1 (100.0)	185 (77.4)	311 (77.9)
ABRADED BY FOREIGN MATTER				1 (0.4)					1 (1.1)					1 (0.4)	2 (0.5)
HOT OBJECTS OR SUBSTANCES		2 (11.1)		2 (0.8)		2 (2.5)	1 (10.0)		1 (1.1)		1 (2.9)	6 (3.1)		10 (4.2)	11 (2.8)
CONTACT WITH RADIATIONS, CAUSTICS	5 (14.7)	3 (16.7)	3 (5.6)	22 (9.0)	4 (11.4)	4 (5.0)	5 (50.0)	7 (5.0)	19 (20.2)			26 (13.3)		39 (16.3)	65 (16.3)
UNCLASSIFIED, INSUFFICIENT DATA				2 (0.8)				1 (0.7)			5 (14.3)	1 (0.5)		2 (0.8)	1 (0.3)
TOTAL	34 (100)	18 (100)	54 (100)	244 (100)	35 (100)	80 (100)	10 (100)	139 (100)	94 (100)	3 (100)	35 (100)	196 (100)	1 (100)	239 (100)	399 (100)

TABLE 3.A.27

THE DISTRIBUTION OF REPORTED SEVERITY #1 EYE INJURIES, OCCURRING IN 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, ACCORDING TO THE NATURE OF THE INJURY, IN ALBERTA, IN 1976 (ALBERTA W.C.B. STATISTICAL MASTER FILES)

NATURE OF INJURY	NO. (%)	INDUSTRY CLASS														
		AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY TRAILERS, CAMPERS	TRUCK BODIES CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	BLACKSMITH SHOP	WELDING	FAB;MFG & REPAIR METAL PRODUCTS
BURN (HOT SUBSTANCE)		1 (2.9)	1 (5.6)		2 (0.8)	1 (2.9)	3 (3.7)	1 (10.0)		1 (1.1)		1 (2.9)	6 (3.1)		9 (3.8)	10 (2.5)
CONTUSIONS					1 (0.4)					1 (1.1)		1 (2.9)			1 (0.4)	1 (0.3)
CUTS, LACERATIONS					1 (0.4)				1 (0.7)						2 (0.8)	2 (0.5)
SCRATCHES OR ABRASIONS		28 (82.4)	14 (77.8)	51 (94.4)	218 (89.3)	30 (85.7)	73 (91.2)	4 (40.0)	131 (94.2)	72 (76.6)	3 (100)	28 (80.0)	164 (83.7)	1 (100)	187 (78.2)	323 (81.0)
UNCLASSIFIED OCCUP. INJURY													1 (0.5)			
CHEMICAL BURN				1 (1.9)	3 (1.2)	1 (2.9)	1 (1.2)	5 (50.0)	4 (2.9)	5 (5.3)			2 (1.0)		5 (2.1)	2 (0.5)
RADIATION EFFECTS		5 (14.7)	2 (11.1)	2 (3.7)	16 (6.6)	3 (8.6)	3 (3.7)		3 (2.2)	12 (12.8)		2 (5.7)	18 (9.2)		27 (11.3)	54 (13.5)
NON-IONIZING RADIATION			1 (5.6)		3 (1.2)					3 (3.2)		3 (8.6)	5 (2.6)		7 (2.9)	6 (1.5)
UNCLASSIFIED															1 (0.4)	1 (0.3)
TOTAL		34 (100)	18 (100)	54 (100)	244 (100)	35 (100)	80 (100)	10 (100)	139 (100)	94 (100)	3 (100)	35 (100)	196 (100)	1 (100)	239 (100)	399 (100)

TABLE 3.A.28

THE DISTRIBUTION OF REPORTED SEVERITY #1 EYE INJURIES
OCCURRING IN 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES,
ACCORDING TO WHETHER FIRST AID WAS PROVIDED, IN ALBERTA, IN 1976
(ALBERTA W.C.B. STATISTICAL MASTER FILES)

FIRST AID GIVEN — NO. (%)	INDUSTRY CLASS: AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY TRAILERS, CAMPERS	TRUCK BODIES, CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	BLACKSMITH SHOP	WELDING	FAB,MFG & REPAIR METAL PRODUCTS
YES	4 (16.0)	6 (46.2)	9 (20.0)	49 (28.7)	23 (76.7)	16 (22.2)	8 (80.0)	47 (51.6)	13 (21.0)		6 (21.4)	49 (37.1)		36 (25.7)	84 (29.2)
NO	21 (84.0)	7 (53.8)	37 (80.0)	122 (71.3)	7 (23.3)	56 (77.8)	2 (20.0)	44 (48.4)	49 (79.0)	2 (100)	22 (78.6)	83 (62.9)	1 (100)	104 (75.3)	204 (70.8)
UNKNOWN	9	5	8	73	5	8		48	32	1	7	64		99	111
TOTAL	34 (100)	18 (100)	54 (100)	244 (100)	35 (100)	80 (100)	10 (100)	139 (100)	94 (100)	3 (100)	35 (100)	196 (100)	1 (100)	239 (100)	399 (100)

TABLE 3.A.29

THE DISTRIBUTION OF REPORTED SEVERITY #1 EYE INJURIES OCCURRING IN 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, ACCORDING TO WHETHER A LANGUAGE PROBLEM WAS INVOLVED IN ALBERTA, IN 1976
(ALBERTA W.C.B. STATISTICAL MASTER FILES)

LANGUAGE PROBLEM — NO. (%)	INDUSTRY CLASS: AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY TRAILERS, CAMPERS
YES								1 (1.2)
NO	24 (100)	12 (100)	44 (100)	168 (100)	34 (100)	72 (100)	10 (100)	82 (98.8)
UNKNOWN	10	6	10	76	1	8		56
TOTAL	34 (100)	18 (100)	54 (100)	244 (100)	35 (100)	80 (100)	10 (100)	139 (100)

LANGUAGE PROBLEM — NO. (%)	TRUCK BODIES, CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	BLACKSMITH SHOP	WELDING	FAB,MFG & REPAIR METAL PRODUCTS
YES							5 (1.7)
NO	65 (100)	3 (100)	27 (100)	129 (100)	1 (100)	137 (100)	284 (98.3)
UNKNOWN	29		8	67		102	110
TOTAL	94 (100)	3 (100)	35 (100)	196 (100)	1 (100)	239 (100)	399 (100)

TABLE 3.A.30

PRELIMINARY INFORMATION CONCERNING THE DISTRIBUTION OF
REPORTED SEVERITY #2 EYE INJURIES IN 14 HIGH EYE INJURY RISK
INDUSTRIAL CLASSES, IN ALBERTA, IN 1976
(ALBERTA W.C.B. STATISTICAL MASTER FILES)

	INDUSTRY CLASS													
PRELIMINARY INFORMATION	AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY CAMPERS, TRAILERS	TRUCK BODIES, CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	WELDING	FAB,MFG & REPAIR METAL PRODUCTS
POPULATION OF INDUSTRY CLASS (MAN YEARS)	513	291	843	2943	678	593	94	1494	818	63	310	1814	1822	2848
NUMBER OF SEVERITY #2 EYE INJURIES (1976)	16	11	18	71	2	35	2	25	49	2	12	97	71	184
RATE OF SEV #2 INJURIES PER 100 MAN YRS	3.1	3.8	2.1	2.5	0.3	5.9	2.1	1.7	6.0	3.2	3.9	5.3	3.9	6.5
PROPORTION OF INJURED WORKERS OF MALE SEX	100%	100%	94.4%	98.6%	100%	100%	100%	84.0%	100%	100%	100%	100%	100%	100%

TABLE 3.A.31

THE DISTRIBUTION OF REPORTED SEVERITY #2 EYE INJURIES OCCURRING IN 14 HIGH EYE INJURY RISK CLASSES, ACCORDING TO THE AGE OF THE INJURED WORKER, IN ALBERTA, IN 1976 (ALBERTA W.C.B. STATISTICAL MASTER FILE)

AGE OF INJURED WORKER / NO. (%)	INDUSTRY CLASS: AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY TRAILERS, CAMPERS	TRUCK BODIES CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	WELDING	FAB,MFG & REPAIR METAL PRODUCTS
-70+														
65-69				1 (1.4)										
60-64	1 (6.3)					1 (2.9)								2 (1.1)
55-59		1 (9.1)		1 (1.4)										3 (1.6)
50-54	2 (12.5)		1 (5.6)	2 (2.8)		2 (5.7)			1 (2.0)			2 (2.1)	1 (1.4)	2 (1.1)
45-49	1 (6.3)	1 (9.1)	3 (16.7)			1 (2.9)			1 (2.0)		1 (8.3)	2 (2.1)	1 (1.4)	10 (5.4)
40-44	1 (6.3)	1 (9.1)	1 (5.6)	4 (5.6)		2 (5.7)		1 (4.0	6 (12.2)		5 (41.7)	7 (7.2)	3 (4.2)	7 (3.8)
35-39	2 (12.5)		1 (5.6)	10 (14.1)		4 (11.4)			2 (4.1)			10 (10.3)	10 (14.1)	14 (7.6)
30-34	3 (18.8)	2 (18.2)	3 (16.7)	14 (19.7)		4 (11.4)		6 (24.0)	4 (8.2)		1 (8.3)	18 (18.6)	14 (19.7)	31 (16.8)
25-29	1 (6.3)	2 (18.2)	3 (16.7)	11 (15.5)	1 (50.0)	10 (28.6)		1 ((4.0)	10 (20.4)		4 (33.3)	15 (15.5)	13 (18.3)	47 (25.5)
20-24	2 (12.5)	3 (27.3)	5 (27.8)	19 (26.8)	1 (50.0)	7 (20.0)	1 (50.0)	13 (52.0)	19 (38.8)	2 (100)	1 (8.3)	36 (37.1)	25 (35.2)	54 (29.3)
15-19	3 (18.8)	1 (9.1)	1 (5.6)	9 (12.7)		4 (11.4)	1 (50.0)	4 (16.0)	6 (12.2)			7 (7.2)	4 (5.6)	14 (7.6)
14														
MISSING VALUES														
TOTAL	16 (100)	11 (100)	18 (100)	71 (100)	1 (100)	35 (100)	2 (100)	25 (100)	49 (100)	2 (100)	12 (100)	97 (100)	71 (100)	184 (100)

TABLE 3.A.32

THE DISTRIBUTION OF REPORTED SEVERITY #2 EYE INJURIES
OCCURRING IN 14 HIGH EYE INJURY RISK INDUSTIRAL
CLASSES, ACCORDING TO THE OCCUPATION OF THE INJURED WORKER
IN ALBERTA, IN 1976
(ALBERTA W.C.B. STATISTICAL MASTER FILES)

OCCUPATION OF INJURED WORKER / NO. (%)	AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY TRAILERS, CAMPERS	TRUCK BODIES CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	WELDING	FAB, MFG. & REPAIR METAL PRODUCTS
UNKNOWN	1 (6.3)	2 (18.2)	4 (22.2)	6 (8.5)		2 (5.7)		2 (8.0)	6 (12.2)	1 (50.0)	1 (8.3)	10 (10.3)	7 (9.9)	9 (4.9)
SHIPPING CLERKS	1 (6.3)													
WEIGHERS					1 (50.0)									
JANITORS			1 (5.6)		1 (50.0)									
SUPERVISORS, DRILLING OPERATIONS													1 (1.4)	
LABOURING IN MINING AND QUARRYING														1 (0.5)
OIL AND GAS FIELD OCCUPATIONS														1 (0.5)
METAL CASTING						3 (8.6)								
METAL PROCESSING														1 (0.5)

TABLE 3.A.32 (Continued)

OCCUPATION OF INJURED WORKER	AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY TRAILERS, CAMPERS	TRUCK BODIES CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	WELDING	FAB, MFG & REPAIR METAL PRODUCTS
MOTOR VEHICLE MECHANICS			3 (16.7)	2 (2.8)					5 (10.2)			1 (1.0)		1 (0.5)
HEAVY DUTY MACHINERY MECHANICS			2 (11.1)	1 (1.4)					8 (16.3)					4 (2.2)
FOREMAN: PRODUCT FABRICATING ASSEMBLING AND REPAIRING														2 (1.1)
LABOURING IN PRODUCT FAB, ASSEMBLING AND REPAIRING	1 (6.3)		1 (5.6)			4 (11.4)		13 (52.0)	1 (2.0)		1 (8.3)	4 (4.1)	1 (1.4)	5 (2.7)
EXCAVATING, GRADING, PAVING														1 (0.5)
CONSTRUCTION ELECTRICIANS		1 (9.1)				1 (2.9)								
CARPENTERS								4 (16.0)		1 (50.0)				
PAINTERS, PAPERHANGERS		1 (9.1)										1 (1.0)		1 (0.5)
PIPEFITTING, PLUMBING				1 (1.4)				1 (4.0)				15 (15.5)	2 (2.8)	11 (6.0)
STRUCTURAL-METAL ERECTORS												2 (2.1)		1 (0.5)
LABOURING IN CONSTRUCTION		1 (9.1)	1 (5.6)					2 (8.0)				1 (1.0)		

TABLE 3.A.32 (Continued)

OCCUPATION OF INJURED WORKER	AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY TRAILERS, CAMPERS	TRUCK BODIES CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	WELDING	FAB, MFG & REPAIR METAL PRODUCTS
CRUSHING AND GRINDING CHEMICALS														1 (0.5)
MACHINIST	1 (6.3)		3 (16.7)	27 (38.0)							1 (8.3)		1 (1.4)	6 (3.3)
MACHINE-TOOL OPERATING												1 (1.0)		1 (0.5)
METAL MACHINING						1 (2.9)								
FOREMEN: METAL SHAPING AND FORMING														1 (0.5)
SHEET-METAL WORKERS				1 (1.4)		2 (5.7)					1 (8.3)	4 (4.1)	1 (1.4)	7 (3.8)
METALWORKING-MACHINE OPERATORS	1 (6.3)													1 (0.5)
WELDING AND FLAME CUTTING	8 (50.0)	3 (27.3)	1 (5.6)	24 (33.8)		3 (8.6)			28 (57.1)		8 (66.7)	49 (50.5)	48 (67.6)	111 (60.3)
BOILERMAKERS, PLATERS				1 (1.4)										2 (1.1)
FILING, GRINDING, BUFFING OCCUPATIONS	1 (6.3)			2 (2.8)		8 (22.9)								
OTHER FABRICATING AND ASSEMBLING OCCUPATIONS												1 (1.0)		

TABLE 3.A.32 (Continued)

OCCUPATION OF INJURED WORKER	AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY TRAILERS, CAMPERS	TRUCK BODIES CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	WELDING	FAB, MFG & REPAIR METAL PRODUCTS
TRUCK DRIVERS			1 (5.6)											
HOISTING OCCUPATIONS						2 (5.7)								
MATERIAL-HANDLING EQUIPMENT OPERATORS													1 (1.4)	1 (0.5)
PACKAGING OCCUPATIONS			1 (5.6)											
OTHER MATERIAL-HANDLING OCCUPATIONS							1 (50.0)							
LABOURING OCCUPATIONS	2 (12.5)	3 (27.3)		6 (8.5)		8 (22.9)	1 (50.0)	3 (12.0)	1 (2.0)			8 (8.2)	9 (12.7)	15 (8.2)
OTHER OCCUPATIONS						1 (2.9)								
TOTAL	16 (100)	11 (100)	18 (100)	71 (100)	2 (100)	35 (100)	2 (100)	25 (100)	49 (100)	2 (100)	12 (100)	97 (100)	71 (100)	184 (100)

TABLE 3.A.33

THE DISTRIBUTION OF REPORTED SEVERITY #2 EYE INJURIES OCCURRING IN 14 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, ACCORDING TO THE LENGTH OF SHIFT WORKED BY THE INJURED WORKER, IN ALBERTA, IN 1976
(ALBERTA W.C.B. STATISTICAL MASTER FILES)

LENGTH OF SHIFT	NO. (%) INDUSTRY CLASS: AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY TRAILERS, CAMPERS	TRUCK BODIES, CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	WELDING	FAB, MFG & REPAIR METAL PRODUCTS
7 HRS/DAY				1 (1.4)										6 (3.3)
8 HRS/DAY	12 (75.0)	8 (72.7)	18 (100)	65 (91.5)	1 (50.0)	31 (88.6)	2 (100)	24 (06.0)	40 (81.6)	2 (100)	11 (1.7)	92 (94.8)	53 (74.6)	155 (84.2)
9 THRU 10 HRS/DAY	4 (25.0)	3 (27.3)		2 (2.8)	1 (50.0)	2 (5.7)			6 (12.2)			2 (2.1)	12 (16.9)	19 (10.3)
UNKNOWN				3 (4.2)		2 (5.7)		1 (4.0)	3 (6.1)		1 (8.3)	3 (3.1)	6 (8.5)	4 (2.2)
TOTAL	16 (100)	11 (100)	18 (100)	71 (100)	2 (100)	35 (100)	2 (100)	25 (100)	49 (100)	2 (100)	12 (100)	97 (100)	71 (100)	184 (100)

TABLE 3.A.34

THE DISTRIBUTION OF REPORTED SEVERITY #2 EYE INJURIES OCCURRING IN 14 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, ACCORDING TO THE TIME OF DAY THE ACCIDENT OCCURRED, IN ALBERTA, IN 1976
(ALBERTA W.C.B. STATISTICAL MASTER FILES)

TIME OF ACCIDENT / NO. (%)	INDUSTRY CLASS													
	AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY TRAILERS CAMPERS	TRUCK BODIES CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	WELDING	FAB,MFG & REPAIR METAL PRODUCTS
01												1 (1.3)		
02	1 (6.3)	1 (9.1)												
03														2 (1.4)
04														
05														
06														
07				1 (1.7)		1 (3.4)								2 (1.4)
08	1 (6.3)	1 (9.1)	1 (5.6)	2 (3.4)		1 (3.4)					1 (12.5)	3 (3.8)	2 (3.7)	4 (2.7)
09	1 (6.3)			3 (5.2)		2 (6.9)	1 (50.0)	3 (12.5)	3 (7.5)		1 (12.5)	4 (5.1)	4 (7.0)	6 (4.1)
10		1 (9.1)	2 (11.1)	9 (15.5)		3 (10.3)		1 (4.2)	4 (10.0)		1 (12.5)	7 (8.9)	7 (13.0)	13 (8.8)
11	2 (12.5)	2 (18.2)	2 (11.1)	2 (3.4)		4 (13.8)		6 (25.0)	5 (12.5)	1 (50.0)		5 (6.3)	5 (9.3)	19 (12.9)
12		1 (9.1)		5 (8.6)		1 (3.4)		1 (4.2)	1 (2.5)			1 (1.3)	1 (1.9)	7 (4.8)
13		2 (18.2)	2 (11.1)	3 (5.2)		1 (3.4)		6 (25.0)	2 (5.0)			6 (7.6)	3 (5.6)	14 (9.5)
14	3 (18.8)		5 (27.8)	4 (6.9)		5 (17.2)		4 (16.7)	13 (32.5)			19 (24.1)	12 (22.2)	27 (18.4)
15	1 (6.3)	2 (18.2)	1 (5.6)	17 (29.3)		4 (13.8)	1 (50.0)	1 (4.2)	6 (15.0)		5 (62.5)	10 (12.7)	9 (16.7)	32 (21.8)
16	2 (12.5)	1 (9.1)	2 (11.1)	5 (8.6)	1 (100)			2 (8.3)	2 (5.0)			4 (5.1)	9 (16.7)	15 (10.2)
17	1 (6.3)		1 (5.6)	2 (3.4)		1 (3.4)			2 (5.0)	1 (50.0)		1 (1.3)	1 (1.9)	
18	1 (6.3)					1 (3.4)			1 (2.5)			3 (3.8)		1 (0.7)
19	1 (6.3)		1 (5.6)	1 (1.7)		1 (3.4)						3 (3.8)		
20	1 (6.3)											2 (2.5)		
21				2 (3.4)					1 (2.5)			1 (1.3)		1 (0.7)
22	1 (6.3)			1 (1.7)		3 (10.3)						7 (8.9)		1 (0.7)
23			1 (5.6)	1 (1.7)		1 (3.4)						1 (1.3)	1 (1.9)	3 (2.0)
24												1 (1.3)		
UNKNOWN			1	13	1	6		1	9		4	18	17	37
TOTAL	16 (100)	11 (100)	18 (100)	71 (100)	2 (100)	35 (100)	2 (100)	25 (100)	49 (100)	2 (100)	12 (100)	97 (100)	71 (100)	184 (100)

TABLE 3.A.35

THE DISTRIBUTION OF REPORTED SEVERITY #2 EYE INJURIES OCCURRING IN 14 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, ACCORDING TO THE NUMBER OF HOURS WORKED BEFORE THE ACCIDENT, IN ALBERTA, IN 1976
(ALBERTA W.C.B. STATISTICAL MASTER FILES)

HOURS WORKED BEFORE ACCIDENT / NO. (%)	INDUSTRY CLASS: AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY TRAILERS, CAMPERS	TRUCK BODIES, CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	WELDING	FAB,MFG & REPAIR METAL PRODUCTS
00	1 (6.3)	1 (10.0)	1 (5.6)	1 (1.9)		2 (6.9)			1 (2.6)			1 (1.3)	1 (1.9)	5 (3.5)
01	1 (6.3)		1 (5.6)	4 (7.4)			1 (50.0)	2 (8.3)	3 (7.9)		1 (12.5)	1 (1.3)	5 (9.3)	6 (4.2)
02			2 (11.1)	7 (13.0)		6 (20.7)		2 (8.3)	2 (5.3)		1 (12.5)	7 (9.3)	4 (7.4)	11 (7.6)
03	3 (18.8)	2 (20.0)	2 (11.1)	5 (9.3)		2 (6.9)		4 (16.7)	3 (7.9)	1 (50.0)	1 (12.5)	10 (13.3)	9 (16.7)	16 (11.1)
04	2 (12.5)	1 (10.0)		5 (9.3)		4 (13.8)	1 (50.0)	3 (12.5)	6 (15.8)			6 (8.0)	2 (3.7)	17 (11.8)
05	1 (6.3)	2 (20.0)	4 (22.2)	5 (9.3)		3 (10.3)		6 (25.0)	4 (10.5)			9 (12.0)	8 (14.8)	18 (12.5)
06	3 (18.8)	1 (10.0)	3 (16.7)	3 (5.6)		4 (13.8)		3 (12.5)	9 (23.7)			12 (16.0)	8 (14.8)	25 (17.4)
07	4 (25.0)	2 (20.0)	2 (11.1)	8 (14.8)		8 (27.6)		3 (12.5)	6 (15.8)		3 (37.5)	17 (22.7)	12 (22.2)	30 (20.8)
08			2 (11.1)	13 (24.1)	1 (100)			1 (4.2)	3 (7.9)	1 (50.0)	2 (25.0)	7 (9.3)	4 (7.4)	13 (9.0)
09	1 (6.3)	1 (10.0)		2 (3.7)					1 (2.6)			2 (2.7)	1 (1.9)	3 (2.1)
10												2 (2.7)		
11-12			1 (5.6)	1 (1.9)								1 (1.3)		
UNKNOWN		1		17	1	6		1	11		4	22	17	40
TOTAL	16 (100)	11 (100)	18 (100)	71 (100)	2 (100)	35 (100)	2 (100)	25 (100)	49 (100)	2 (100)	12 (100)	97 (100)	71 (100)	184 (100)

TABLE 3.A.36

THE DISTRIBUTION OF REPORTED SEVERITY #2 EYE INJURIES, OCCURRING IN 14 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, ACCORDING TO THE SOURCE OF THE INJURY, IN ALBERTA, IN 1976 (ALBERTA W.C.B. STATISTICAL MASTER FILES)

	INDUSTRY CLASS													
SOURCE OF THE INJURY / NO. (%)	AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY TRAILERS, CAMPERS	TRUCK BODIES CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	WELDING	FAB,MFG & REPAIR METAL PRODUCTS
BOXES, CRATES, CARTONS														1 (0.5)
ACIDS			2 (11.1)											
ALKALIES												1 (1.0)		
RESINS													1 (1.4)	
SULPHUR AND SULPHUR COMPOUNDS														1 (0.5)
CHEMICAL, CHEMICAL COMPOUNDS, NOT ELSEWHERE CLASSIFIED			1 (5.6)	1 (1.4)			2 (100.0)					2 (2.1)		
COAL TARS								1 (4.0)						
ELECTRICAL APPARATUS, NOT ELSEWHERE CLASSIFIED						1 (2.9)								
FLAME AND FIRE			1 (5.6)											
GLASS ITEMS								1 (4.0)						1 (0.5)
SCREWDRIVER								1 (4.0)						
WRENCH												1 (1.0)		
DRILL				1 (1.4)										

TABLE 3.A.36 CONTINUED

	AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY TRAILERS, CAMPERS	TRUCK BODIES CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	WELDING	FAB,MFG & REPAIR METAL PRODUCTS
WELDING TOOLS													1 (1.4)	1 (0.5)
CHAINS, ROPES, CABLES												1 (1.0)		
NAILS, SPIKES, TACKS			1 (5.6)	2 (2.8)		1 (2.9)			2 (4.1)			1 (1.0)	1 (1.4)	
METAL CHIPS AND PARTICLES	6 (37.5)	5 (45.5)	3 (16.7)	29 (40.8)		14 (40.0)		4 (16.0)	23 (46.9)	1 (50.0)	1 (8.3)	36 (37.1)	28 (39.4)	61 (33.2)
MOLTEN METAL	2 (12.5)	2 (18.2)		2 (2.8)		3 (8.6)				1 (50.0)		1 (1.0)	3 (4.2)	9 (4.9)
METAL ITEMS, NOT ELSEWHERE CLASSIFIED		1 (9.1)		1 (1.4)								1 (1.0)	1 (1.4)	
ROCKS, STONES AND SAND											1 (8.3)			
PARTICLES (UNIDENTIFIED)	4 (25.0)	1 (9.1)	10 (55.6)	23 (32.4)	1 (50.0)	16 (45.7)		13 (52.0)	10 (20.4)		3 (25.0)	28 (28.9)	16 (22.5)	55 (29.9)
BRANCHES, LIMBS														1 (0.5)
PLASTIC ITEMS, NOT ELSEWHERE CLASSIFIED		1 (9.1)												1 (0.5)
WELDING EQUIPMENT, ELECTRIC ARC	4 (25.0)	1 (9.1)		12 (16.9)	1 (50.0)			1 (4.0)	13 (26.5)		7 (58.3)	25 (25.8)	20 (28.2)	53 (28.8)
SLIVERS, SPLINTERS								3 (12.0)	1 (2.0)					
MISCELLANEOUS, NOT ELSEWHERE CLASSIFIED								1 (4.0)						
TOTAL	16 (100)	11 (100)	18 (100)	71 (100)	2 (100)	35 (100)	2 (100)	25 (100)	49 (100)	2 (100)	12 (100)	97 (100)	71 (100)	184 (100)

TABLE 3.A.37

THE DISTRIBUTION OF REPORTED SEVERITY #2 EYE INJURIES, OCCURRING IN 14 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, ACCORDING TO THE TYPE OF ACCIDENT, IN ALBERTA, IN 1976 (ALBERTA W.C.B. STATISTICAL MASTER FILES)

	INDUSTRY CLASS													
TYPE OF ACCIDENT / NO. (%)	AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY TRAILERS, CAMPERS	TRUCK BODIES CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	WELDING	FAB,MFG & REPAIR METAL PRODUCTS
FLYING OBJECT THROWN BACK BY MACHINE		1 (9.1)												
FLYING OBJECT, NOT ELSEWHERE CLASSIFIED	1 (6.3)		1 (5.6)							1 (50.0)				
STRUCK BY OBJECTS BEING HOISTED				1 (1.4)				1 (4.0)				1 (1.0)	1 (1.4)	1 (0.5)
STRUCK BY, NOT ELSEWHERE CLASSIFIED			1 (5.6)					1 (4.0)						2 (1.1)
FOREIGN MATTER IN EYES	9 (56.3)	7 (63.6)	12 (66.7)	54 (76.1)	1 (50.0)	32 (91.4)			36 (73.5)		5 (41.7)	67 (68.0)	45 (63.4)	120 (65.2)
ABRADED BY FOREIGN MATTER				1 (1.4)									1 (1.4)	
CONTACT WITH ELECTRIC CURRENT						1 (2.9)								
HOT OBJECTS OR SUBSTANCES	2 (12.5)	2 (18.2)	1 (5.6)	2 (2.8)		2 (5.7)				1 (50.0)		1 (1.0)	3 (4.2)	7 (3.8)
CONTACT WITH RADIATIONS, CAUSTICS	4 (25.0)	1 (9.1)	3 (16.7)	13 (18.3)	1 (50.0)		2 (100)	1 (4.0)	13 (26.5)		7 (58.3)	28 (28.9)	21 (29.6)	54 (29.3)
TOTAL	16 (100)	11 (100)	18 (100)	71 (100)	2 (100)	35 (100)	2 (100)	25 (100)	49 (100)	2 (100)	12 (100)	97 (100)	71 (100)	184 (100)

TABLE 3.A.38

THE DISTRIBUTION OF REPORTED SEVERITY #2 EYE INJURIES, OCCURRING IN 14 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, ACCORDING TO THE NATURE OF THE INJURY, IN ALBERTA, IN 1976 (ALBERTA W.C.B. STATISTICAL MASTER FILES)

NATURE OF INJURY	INDUSTRY CLASS													
NO. (%)	AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY CAMPERS, TRAILERS	TRUCK BODIES, CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	WELDING	FAB,MFG & REPAIR METAL PRODUCTS
BURN (HOT SUBSTANCE)	2 (12.5)	1 (9.1)	1 (5.6)	2 (2.8)		2 (5.7)				1 (50.0)		1 (1.0)	3 (4.2)	6 (3.3)
ELECTRIC BURN						1 (2.9)								
CONTUSTIONS		1 (9.1)	1 (5.6)							1 (50.0)			1 (1.4)	1 (0.5)
CUTS, LACERATIONS				1 (1.4)								2 (2.1)		1 (0.5)
SCRATCHES OR ABRASIONS	10 (62.5)	7 (63.6)	13 (72.2)	55 (77.5)	1 (50.0)	32 (91.4)		24 (96.0)	36 (73.5)		5 (41.7)	66 (68.0)	46 (64.8)	122 (66.3)
CHEMICAL BURN		1 (9.1)	3 (16.7)	1 (1.4)			2 (100)					3 (3.1)	1 (1.4)	2 (1.1)
RADIATION EFFECTS	4 (25.0)	1 (9.1)		9 (12.7)	1 (50.0)			1 (40.0)	12 (24.5)		7 (58.3)	23 (23.7)	18 (25.4)	50 (27.2)
NON-IONIZING RADIATION				3 (4.2)					1 (2.0)			2 (2.1)	2 (2.8)	2 (1.1)
TOTAL	16 (100)	11 (100)	18 (100)	71 (100)	2 (100)	35 (100)	2 (100)	25 (100)	49 (100)	2 (100)	12 (100)	97 (100)	71 (100)	184 (100)

TABLE 3.A.39

THE DISTRIBUTION OF REPORTED SEVERITY #2 EYE INJURIES
OCCURRING IN 14 HIGH EYE INJURY RISK INDUSTRIAL CLASSES,
ACCORDING TO WHETHER FIRST AID WAS PROVIDED, IN ALBERTA, IN 1976
(ALBERTA W.C.B. STATISTICAL MASTER FILES)

	INDUSTRY CLASS													
FIRST AID GIVEN — NO. (%)	AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY TRAILERS, CAMPERS	TRUCK BODIES, CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	WELDING	FAB,MFG & REPAIR METAL PRODUCTS
YES	2 (15.4)	3 (30.0)	5 (29.4)	15 (24.6)	1 (50.0)	6 (18.2)	2 (100)	17 (77.3)	11 (26.2)			15 (18.5)	11 (19.6)	40 (26.3)
NO	11 (84.6)	7 (70.0)	12 (70.6)	46 (75.4)	1 (50.0)	27 (81.8)		5 (22.7)	31 (73.8)	1 (100)	12 (100)	66 (81.5)	45 (80.4)	112 (73.7)
UNKNOWN	3	1	1	10		2		3	7	1		16	15	32
TOTAL	16 (100)	11 (100)	18 (100)	71 (100)	2 (100)	35 (100)	2 (100)	25 (100)	49 (100)	2 (100)	12 (100)	97 (100)	71 (100)	184 (100)

TABLE 3.A.40

THE DISTRIBUTION OF REPORTED SEVERITY #2 EYE INJURIES OCCURRING IN 14 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, ACCORDING TO WHETHER A LANGUAGE PROBLEM WAS INVOLVED IN ALBERTA, IN 1976
(ALBERTA W.C.B. STATISTICAL MASTER FILES)

LANGUAGE PROBLEM / NO. (%)	INDUSTRY CLASS													
	AGRICULTURAL IMPLEMENTS	HEATING EQUIPMENT	AUTOMOTIVE MACHINE SHOP	MACHINE SHOP	MFG STEEL	FOUNDRY: STEEL, IRON	LIME	HOLIDAY TRAILERS, CAMPERS	TRUCK BODIES, CABS	WOODEN TRUCK BOXES	VEHICLES	FABRICATION STRUCTURAL STEEL	WELDING	FAB,MFG & REPAIR METAL PRODUCTS
YES		1 (9.1)						1 (4.0)				1 (1.3)		
NO	14 (100)	10 (90.9)	17 (100)	63 (100)	2 (100)	31 (100)	2 (100)	21 (96)	44 (100)	1 (100)	12 (100)	74 (98.7)	57 (100)	158 (100)
UNKNOWN	2		1	8		4		3	5	1		22	14	26
TOTAL	16 (100)	11 (100)	18 (100)	71 (100)	2 (100)	35 (100)	2 (100)	25 (100)	49 (100)	2 (100)	12 (100)	97 (100)	71 (100)	184 (100)

Part 3 - Severity #3 Eye Injuries - Results, with Discussion

Initially, only 7 permanent disability claims could be found, but through a further search at the W.C.B., 9 more were located. There were, most likely, more than 16 permanent disability injuries incurred in 1976. It is probable, however, that not all of the claims have been finalized to date, and these claims are still coded as severity #2 injuries. Tables 3.A.41 to 3.A.54 show selected eye injury characteristics for the 16 identified permanent disability injuries that occurred in 1976. The selected characteristics are:

Table 3.A.41	Occurrence Class in which injury occurred
3.A.42	Month of accident
3.A.43	Industry Classification
3.A.44	Sex of injured worker
3.A.45	Age of injured worker
3.A.46	Occupation of injured worker
3.A.47	Length of time injured worker employed
3.A.48	Length of shift worked per day
3.A.49	Hours worked before accident
3.A.50	Source of injury
3.A.51	Type of accident
3.A.52	Nature of injury
3.A.53	First aid rendered
3.A.54	Language problem

Tables 3.A.41 through 3.A.54 show data concerning 16 permanent disability eye injury claims. Table 3.A.42 shows that 40% of the injuries occurred through February and March of 1976. Table 3.A.43 shows that no particular industry class is prone to permanent disability claims. In all cases, the injured persons were male (Table 3.A.44). Forty-four percent

TABLE 3.A.41

NUMBER OF REPORTED SEVERITY #3 EYE INJURIES,
RESULTING IN PERMANENT DISABILITY CLAIMS, IN ALBERTA, IN 1976,
BY THE OCCURRENCE CLASS OF THE INDUSTRY IN WHICH THE ACCIDENT OCCURRED
(ALBERTA W.C.B. STATISTICAL MASTER FILE)

OCCURRENCE CLASS	NUMBER OF INJURIES	(%)
04-04	1	(6.3)
04-06	1	(6.3)
05-01	2	(12.5)
06-01	1	(6.3)
06-04	1	(6.3)
06-07	3	(18.8)
08-03	1	(6.3)
08-04	2	(12.5)
09-03	1	(6.3)
09-04	1	(6.3)
12-03	1	(6.3)
22-01	1	(6.3)
TOTAL	16	

TABLE 3.A.42

NUMBER OF REPORTED SEVERITY #3 EYE INJURIES,
RESULTING IN PERMANENT DISABILITY CLAIMS, IN ALBERTA, IN 1976,
BY THE MONTH IN WHICH THE ACCIDENT OCCURRED
(ALBERTA W.C.B. STATISTICAL MASTER FILE)

MONTH OF INJURY	NUMBER OF INJURIES	(%)
January	2	(12.5)
February	5	(31.3)
March	3	(18.8)
August	1	(6.3)
October	2	(12.5)
November	2	(12.5)
December	1	(6.3)
TOTAL	16	

TABLE 3.A.43

NUMBER OF REPORTED SEVERITY #3 EYE INJURIES, RESULTING IN PERMANENT DISABILITY CLAIMS, IN ALBERTA, IN 1976, BY THE INDUSTRY CLASS IN WHICH THE INJURY OCCURRED (ALBERTA W.C.B. STATISTICAL MASTER FILE)

INDUSTRY CLASS		NUMBER OF INJURIES	(%)
09912	Well Testing and Coring	1	(6.3)
10100	Meat Packing Plant	1	(6.3)
25405	Mfg, Prefab Wood Bldgs, Sections	1	(6.3)
25900	Peeling and Pointing of Posts	1	(6.3)
31100	Mfg of Agricultural Implements	1	(6.3)
37902	Chemical Blending and Packaging	1	(6.3)
40400	Construction of Bldgs, Plants	1	(6.3)
40601	Highway, Road, Railway Construction	1	(6.3)
40604	Excavating, Bulldozing, etc.	1	(6.3)
40905	Construction of Pipe Lines	1	(6.3)
42102	Masonry, Brick, Block Laying	1	(6.3)
62303	Sale-Service Oilfield Equipment	1	(6.3)
65600	New, Used Car Dealers	1	(6.3)
65802	Brake Shop	1	(6.3)
87501	Restaurant or Drive-In	1	(6.3)
93100	Provincial Government	1	(6.3)
TOTAL		16	(100)

TABLE 3.A.44

NUMBER OF REPORTED SEVERITY #3 EYE INJURIES, RESULTING IN PERMANENT DISABILITY CLAIMS, IN ALBERA, IN 1976, BY THE SEX OF THE INJURED WORKER (ALBERTA W.C.B. STATISTICAL MASTER FILE)

SEX	NUMBER OF INJURIES	(%)
Male	16	(100)
TOTAL	16	(100)

of the permanent disability claims involved workers who were less than 35 years of age (Table 3.A.45). This is somewhat lower than the proportion in the same age category for severity #1 and severity #2 injuries. Significantly, 25% of the permanent disability claims involved motor vehicle mechanics and repairmen, while the remainder were spread over a large range of occupations, although a majority were metal related trades (Table 3.A.46).

Table 3.A.47 shows that 69% of the permanent disability claims occurred among persons who had worked less than one year on their present job. This finding is inconsistent with the ages of these workers unless there was a considerable change in occupations in mid-career. Reporting procedures may also be at fault.

Table 3.A.48 shows that the legnth of shift worked by persons with permanent disability claims is not inconsistent with the general trends in the eye injuries reported previously.

Table 3.A.49 shows that the permanent disability claims do not show the normal time trends illustrated in previous analyses where a peak appears toward the end of the shift. This anomaly may be due to low numbers (only 16 cases) or because permanent disability claims are a matter of chance where boredom and fatigue factors do not play a significant part.

Table 3.A.50 shows that 50% of the permanent disability claims were caused by metal particles or nails. Two of these claims were due to nails from explosive actuated tools. The remaining injuries are spread over a range of sources including radiation and caustics.

Table 3.A.51 indicates the type of injury where a majority were due to being struck by a flying object.

TABLE 3.A.45

NUMBER OF REPORTED SEVERITY #3 EYE INJURIES, RESULTING IN PERMANENT DISABILITY CLAIMS, IN ALBERTA, IN 1976, BY THE AGE OF THE INJURED WORKER (ALBERTA W.C.B. STATISTICAL MASTER FILE)

AGE GROUP	NUMBER OF INJURIES	(%)
70+		
65-69	1	(6.3)
60-64		
55-59	1	(6.3)
50-54	1	(6.3)
45-49	2	(12.5)
40-44	4	(25.0)
35-39		
30-34	2	(12.5)
25-29	2	(12.5)
20-24	2	(12.5)
15-19		
TOTAL	16	(100)

TABLE 3.A.46

NUMBER OF REPORTED SEVERITY #3 EYE INJURIES, RESULTING IN PERMANENT DISABILITY CLAIMS, IN ALBERTA, IN 1976, BY THE OCCUPATION OF THE INJURED WORKER (ALBERTA W.C.B. STATISTICAL MASTER FILE)

OCCUPATION OF WORKER		NUMBER OF INJURIES	(%)
0000	Unknown	1	(6.3)
2117	Physical Sciences Technologists	1	(6.3)
6121	Chefs and Cooks	1	(6.3)
8176	Inspecting, Testing: Chemicals-Petro	1	(6.3)
8541	Cabinet Makers	1	(6.3)
8581	Motor-Vehicle Mechanics	4	(25.0)
8711	Excavating, Grading	1	(6.3)
8719	Excavating, Grading, Paving	1	(6.3)
8781	Carpenters	1	(6.3)
8782	Brick and Stone Masons	1	(6.3)
8798	Labouring in Construction	1	(6.3)
9175	Truck Drivers	1	(6.3)
9918	Labouring Occupations	1	(6.3)
TOTAL		1 16	(100)

TABLE 3.A.47

NUMBER OF REPORTED SEVERITY #3 EYE INJURIES, RESULTING IN PERMANENT DISABILITY CLAIMS, IN ALBERTA, IN 1976, BY THE LENGTH OF TIME THE INJURED WORKER HAS BEEN EMPLOYED (ALBERTA W.C.B. STATISTICAL MASTER FILE)

TIME EMPLOYED	NUMBER OF INJURIES	(%)
< 1 Month	4	(25.0)
1 Mth to < 6 Mths	4	(25.0)
6 Mths to < 1 Yr	3	(18.8)
1 Year or more	5	(31.2)
Unknown	-	-
TOTAL	16	(100)

TABLE 3.A.48

NUMBER OF REPORTED SEVERITY #3 EYE INJURIES, RESULTING IN PERMANENT DISABILITY CLAIMS, IN ALBERTA, IN 1976, BY THE LENGTH OF SHIFT WORKED BY THE INJURED PERSON PER DAY (ALBERTA W.C.B. STATISTICAL MASTER FILE)

LENGTH OF SHIFT	NUMBER OF INJURIES	(%)
7 Hours	1	(6.3)
8 Hours	11	(68.6)
9 - 10 Hours	2	(12.5)
11 - 12 Hours	1	(6.3)
Unknown	1	(6.3)
TOTAL	16	(100)

TABLE 3.A.49

NUMBER OF REPORTED SEVERITY #3 EYE INJURIES,
RESULTING IN PERMANENT DISABILITY CLAIMS, IN ALBERTA, IN 1976,
BY THE NUMBER OF HOURS WORKED BY THE INJURED PERSON BEFORE THE ACCIDENT
(ALBERTA W.C.B. STATISTICAL MASTER FILE)

HOURS OF WORK	NUMBER OF INJURIES	(%)
00	1	(6.3)
01	2	(12.5)
02	1	(6.3)
03	2	(12.5)
04	1	(6.3)
05	1	(6.3)
06	1	(6.3)
07	2	(12.5)
08	2	(12.5)
09	1	(6.3)
XX Unknown	2	(12.5)
TOTAL	16	(100)

TABLE 3.A.50

NUMBER OF REPORTED SEVERITY #3 EYE INJURIES,
RESULTING IN PERMANENT DISABILITY CLAIMS, IN ALBERTA, IN 1976,
BY THE SOURCE OF THE INJURY
(ALBERTA W.C.B. STATISTICAL MASTER FILE)

INJURY SOURCE	NUMBER OF INJURIES	(%)
Chemicals, NEC	1	(6.3)
Rope, Chain	1	(6.3)
Chains, Ropes, Cables	1	(6.3)
Nails, Staples	2	(12.5)
Metal Chips and Particles	6	(37.2)
Particles (Unidentified)	2	(12.5)
Slivers, Splinters, etc.	1	(6.3)
Wood Chip	1	(6.3)
Wood Items, NEC	1	(6.3)
TOTAL	16	(100)

NEC - Not Elsewhere Classified

TABLE 3.A.51

NUMBER OF REPORTED SEVERITY #3 EYE INJURIES,
RESULTING IN PERMANENT DISABILITY CLAIMS, IN ALBERTA, IN 1976,
BY THE TYPE OF ACCIDENT
(ALBERTA W.C.B. STATISTICAL MASTER FILE)

ACCIDENT TYPE	NUMBER OF INJURIES	(%)
Struck against stationary object	1	(6.3)
Flying object thrown back by machine	1	(6.3)
Flying object, NEC	4	(25.0)
Struck by, NEC	3	(18.8)
By vibrating objects	5	(31.2)
Rubbed or Abraded, NEC	1	(6.3)
Contact with radiations, caustics	1	(6.3)
TOTAL	16	(100)

TABLE 3.A.52

NUMBER OF REPORTED SEVERITY #3 EYE INJURIES,
RESULTING IN PERMANENT DISABILITY CLAIMS, IN ALBERTA, IN 1976,
BY THE NATURE OF THE INJURY
(ALBERTA W.C.B. STATISTICAL MASTER FILE)

NATURE OF INJURY	NUMBER OF INJURIES	(%)
Enucleation	2	(12.5)
Cut, Laceration	5	(31.2)
Scratches, abrasions	8	(50.0)
Burn (chemical)	1	(6.3)
TOTAL	16	(100)

Table 3.A.52 shows that 50% of the claims were due to scratches and abrasions and a further 31% due to cuts and lacerations. The nature of the injury in a permanent disability case, therefore, appears to be only a more serious form of an injury that is often classed as severity #1 or severity #2.

First aid was rendered in only 56% of the cases (Table 3.A.53). It is uncertain as to how many of these permanent disability claims could have been reduced in severity or degree of disability had first aid been rendered.

It does not appear that a communication (language) problem played a part in any of the injuries (Table 3.A.54).

TABLE 3.A.53

NUMBER OF REPORTED SEVERITY #3 EYE INJURIES,
RESULTING IN PERMANENT DISABILITY CLAIMS, IN ALBERTA, IN 1976,
ACCORDING TO WHETHER FIRST AID WAS RENDERED AT THE TIME OF THE ACCIDENT

FIRST AID	NUMBER OF INJURIES	(%)
Yes	9	(56.0)
No	7	(44.0)
TOTAL	16	(100)

TABLE 3.A.54

NUMBER OF REPORTED SEVERITY #3 EYE INJURIES,
RESULTING IN PERMANENT DISABILITY CLAIMS, IN ALBERTA, IN 1976,
ACCOUNTING FOR A LANGUAGE PROBLEM
(ALBERTA W.C.B. STATISTICAL MASTER FILE)

LANGUAGE PROBLEM	NUMBER OF INJURIES	(%)
Yes	0	(0.0)
No	16	(100)
TOTAL	16	(100)

3.A.D. Discussion of the Results of a Review of Alberta W.C.B. Statistical Master File

Part 1 - Discussion of General Results

Figure 3.A.3 illustrates the relation between the rate of eye injuries in each occurrence classification by the insurance premium (per $100 payroll), an assessment rate which reflects the overall injury experience of industries within the classes. The points on the graph are widely dispersed and the regression analysis of $r = +.06$ indicates little relation to the regression equation of $y = 2.29 + .29X$. There appears to be little relation between W.C.B. insurance premiums and the rate of eye injuries per occurrence classification.

In 1976, the number of injuries was lower in the winter months and higher in the spring and summer months (Table 3.A.2). This trend may be due to the relative size of the workforce during these periods of the year, including the use of student labour during the summer months. As the majority of injuries occur within buildings, there is no clear association with climatic changes.

Table 3.A.55, taken from Table 3.A.3, shows a listing of the 20 industry classes with the highest rates of eye injuries for 1976. Overall rates for severity #1 and severity #2 injuries and the ratio between the latter two are included. The rates of severity #1 and severity #2 injuries do not fall consistently with their respective overall rates, but the downward trend is seen for both. Little relation is seen (correlation coefficient -0.11) between the overall rate of eye injuries and the ratio of severity #1 to severity #2 eye injuries. The average company size varies greatly and no relation can be seen between the average industry size (below an average of 200 man years in size) and the rate of eye injuries. The majority of these high eye injury rate industry classes in-

FIGURE 3.A.3

THE CORRELATION BETWEEN THE RATE OF EYE INJURIES (PER 100 MAN YEARS) IN EACH ALBERTA W.C.B. OCCURRENCE CLASS AND THE INSURANCE ASSESSMENT (IN DOLLARS) PAID BY INDUSTRIES WITHIN THE OCCURRENCE CLASSES

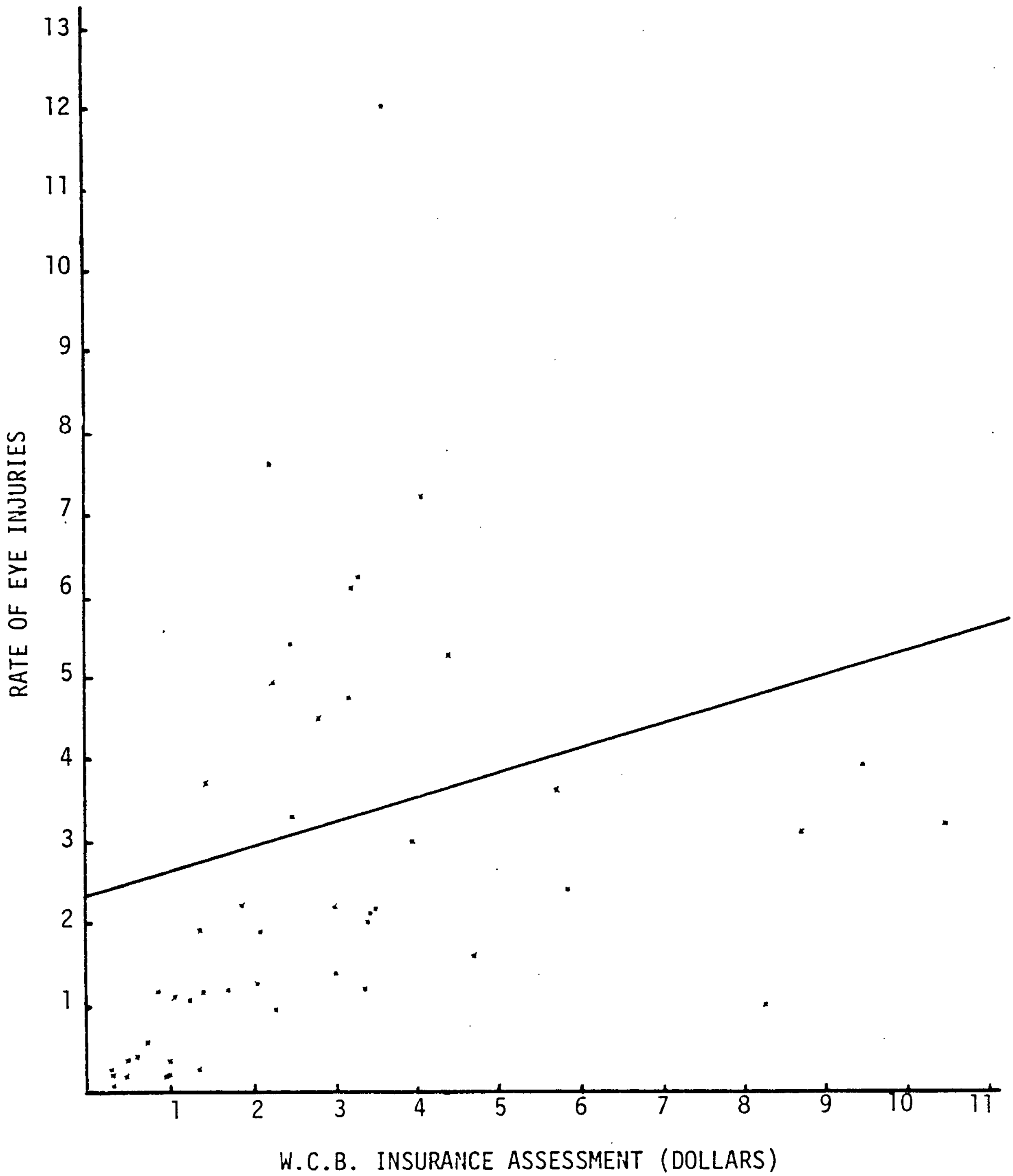


TABLE 3.A.55

LISTING OF THE 20 INDUSTRY CLASSES WITH THE HIGHEST RATES OF REPORTED EYE INJURIES, IN ALBERTA, IN 1976
(ALBERTA W.C.B. STATISTICAL MASTER FILE)

INDUSTRY CLASS	DESCRIPTION	OVERALL EYE INJURY RATE (PER 100 MAN YEARS)	RATE OF SEVERITY #1 EYE INJURIES (PER 100 MAN YEARS)	RATE OF SEVERITY #2 EYE INJURIES (PER 100 MAN YEARS)	RATIO: SEV #1/SEV #2 INJURIES	AVERAGE SIZE OF THE COMPANY WITHIN THE INDUSTRY CLASS	NUMBER OF COMPANIES WITHIN INDUSTRY CLASS
301	Boiler and Plate Works	20.6	14.1	6.5	0.46	2.6	110
894	Blacksmith and Welding Operations	16.7	12.9	3.8	0.29	2.5	772
302	Fabrication of Structural Steel	16.3	10.8	5.3	0.49	42.0	43
323	Mfg. of Vehicles	15.5	11.5	3.9	0.25	34.0	9
324	Mfg. of Trailers, Trucks and Campers	13.0	9.8	3.2	0.33	19.0	129
343	Mfg. of Lime	12.8	10.6	2.1	0.16	47.0	2
291	Mfg. of Steel	12.0	9.0	2.9	0.32	98.0	13
308	Machine Shops	10.5	8.0	2.4	0.23	13.0	282
307	Mfg. of Furnaces and Registers	10.0	6.2	3.8	0.61	49.0	6
311	Mfg. of Farm Implements	9.9	6.6	3.1	0.47	24.0	21
336	Mfg. of Generators and other Electrical Equip.	9.0	6.3	2.8	0.44	27.0	15
328	Mfg. of Fiberglass Boats	8.3	6.7	1.7	0.25	5.0	13
658	Auto Repair and Unloading	8.1	6.1	2.1	0.34	5.0	948
303	Mfg. of Doors and Windows	7.7	5.4	2.3	0.43	12.0	225
264	Mfg. of Metal Office Furniture and Installation	7.5	6.0	1.5	0.25	29.0	9
098	Diamond Drilling	7.4	5.6	1.9	0.34	7.0	7
297	Foundries - Brass, Bronze and Lead	7.2	6.2	1.0	0.16	11.0	9
347	Mfg. of Concrete Products	7.1	4.4	2.8	0.64	31.0	44
252	Mfg. of Plywood	6.7	4.1	2.6	0.63	180.0	3
292	Mfg. of Steel Pipe	6.0	4.2	1.8	0.43	134.0	8

volve the manufacture or processing of metals or metal products.

Industry classes which have shown a consistent increase in the absolute number of eye injuries from 1974 to 1976 are shown in Table 3.A.56. Even though rates cannot be applied to these absolute figures, it is still significant to note that an absolute increase did occur. Table 3.A.57 shows the industry classes which have shown consistent decreases in the absolute number of eye injuries over the same time period. These tables show no noticeable patterns, either in industry type or size.

In 1976, over 96% of the injured workers were males (Table 3.A.4). This is not an unusual finding as a majority of workers in high eye hazard industries (those which manufacture metals or metal products) are male. From 1974 to 1976, the proportion of injuries among women increased from 3.0 to 3.3 percent; however this is likely due to an increase in the female workforce during this period.

The results of this study show that a majority (69% - 72%) of eye injuries between 1974 and 1976 occurred among workers less than 35 years of age. Forty percent of reported eye injuries occurred among workers who were 25 years of age or less. It appears, then, that a high proportion of injuries occur among young workers.

Because data concerning the injured workers' length of employment (Table 3.A.6) was reported infrequently, it was difficult to judge the effect of experience on eye injuries. 62% - 65% of injury claims that included this information in 1974-76 concerned workers with less than one year of work experience. Although this suggests a relation between experience and eye injury, the findings could be explained also by rapid turnover or selective reporting of this information for those with little time with the company.

TABLE 3.A.56

LISTING OF THE INDUSTRY CLASSES, IN ALBERTA, THAT HAVE SHOWN A CONSISTENT INCREASE IN THE NUMBER OF REPORTED EYE INJURIES OVER THE YEARS 1974, 1975 AND 1976 (INDEPENDENT OF VARIATIONS IN WORKFORCE SIZE) (ALBERTA W.C.B. STATISTICAL MASTER FILE)

INDUSTRY CLASS	DESCRIPTION	WORKFORCE IN 1976 (MAN YEARS)	NO. OF COMPANIES IN 1976	AVERAGE SIZE
061	Coal Mines	3130	26	120
096	Drilling for Petroleum	5205	69	75
101	Slaughtering	5821	146	40
124	Flour Mills	585	8	73
139	Misc. Food Industries	627	11	57
145	Breweries	720	7	103
303	Ornamental Metal Industry	2607	12	225
323	Motor Vehicle Manufacturers	304	9	34
324	Truck Body and Trailer Manufacturer	2405	129	19
341	Cement Manufacturer	650	8	81
347	Concrete Products Manufacturer	1344	44	31
359	Other Non-metallic Mineral Indust.	1025	1	1025
404	Building Construction	37711	6421	6
421	Special Trade Contractors	36548	7003	5
875	Hotels - Restaurants	38124	3055	12
894	Blacksmithing and Welding Shops	1857	772	2.4
931	Provincial Administration	149	44	3

TABLE 3.A. 57

LISTING OF THE INDUSTRY CLASSES, IN ALBERTA,
THAT HAVE SHOWN A CONSISTENT DECREASE IN THE NUMBER OF
REPORTED EYE INJURIES OVER THE YEARS 1974, 1975 AND 1976
(INDEPENDENT OF VARIATIONS IN WORKFORCE SIZE)
(ALBERTA W.C.B. STATISTICAL MASTER FILE)

INDUSTRY CLASS	DESCRIPTION	WORKFORCE IN 1976 (MAN YEARS)	NO. OF COMPANIES IN 1976	AVERAGE SIZE
063	Petroleum and Gas Wells	16639	638	26
112	Fruit and Vegetable Canners	363	5	72
251	Sawmills	2174	310	7
259	Misc. Wood Industries	300	31	10
308	Machine Shops	3702	282	13
352	Refractories Manufacturers	325	3	108
378	Industrial Chemicals Manufacturer	2033	36	56
397	Signs and Displays Industry	347	31	11
608	Wholesalers of Petroleum Products	1366	495	3
622	Wholesalers of Machinery	5354	496	11
654	Gasoline Service Stations	7633	1716	4.4
999	Unspecified or Undefined	3159	315	10

Table 3.A.58 gives a listing of the occupations with the highest occurrence of reported eye injuries in 1976 (greater than 5.9 injuries per 100 man years). Most are occupations involving work with metals or metal products (including mechanics) or the construction industry, where there are constant hazards from flying particles.

The results show (Table 3.A.8) that 81% of the workers who incurred eye injuries in 1976 worked an eight hour shift. Fiften percent of the workers who incurred eye injuries worked greater than eight hours per day. It is difficult to establish any relation between the length of shift (and possibly fatigue) and eye injury as it is not possible to know the proportion of the workforce who work these shifts.

Figure 3.A.4 (from Table 3.A.9) shows how the incidence of reported eye injuries in 1976 varies with the time of day. The majority of accidents occurred during normal working hours, consistent with the working patterns of the workforce. The graph shows a peak at mid-morning, declining at the lunch hour, and returning to an even higher peak in mid-afternoon, then declining again in the late afternoon. Figure 3.A.5 shows the incidence of reported eye injuries in 1976 (from Table 3.A.10) relative to the number of hours the person had worked prior to the accident. The results show a peak after 2 to 3 hours of work, declining in the 4th hour, which is usually a lunch period, and rising again to the highest incidence of eye injuries in the 6th hour of work. The proportion of eye injuries declines rapidly in the 9th hour as a majority of the workforce have completed their shifts. The findings in Figures 3.A.4 and 3.A.5 follow the normal patterns of injury, relative to time, reported in the literature. One can speculate from these findings that boredom and fatigue contribute to the incidence of eye injuries in industry.

TABLE 3.A.58

THE INCIDENCE OF EYE INJURIES REPORTED TO THE W.C.B.
IN ALBERTA, IN 1976, BY SELECTED OCCUPATION
(ALBERTA W.C.B. STATISTICAL MASTER FILE)

RATING	STANDARD OCCUP. CODE	OCCUPATION DESCRIPTION	ALBERTA WORKFORCE (1976)	RATE OF EYE INJURIES PER 100 WORKERS
1	8337	Boiler Makers, Platers and Structural Metal Workers	280	32.50
2	8335	Welding and Flame Cutting	4910	30.80
3	8393	Metal Shaping and Forming	260	24.60
4	8333	Sheet Metal Workers	1480	20.70
5	8793	Structural Metal Erectors	630	20.50
6	8313	Machinist and Machine Tool Setting Up	1355	15.40
7	8791	Pipefitting, Plumbing and Related Occupations	4275	14.90
8	8590	Foreman: Product Fabricating Assembling and Repairing	205	13.20
9	8379	Clay, Glass, Stone and Related Meterials Making	75	12.00
10	8228	Laboring and Other Elemental Work; Food and Beverage	750	9.70
11	9918	Laboring and Elemental Work NEC	7780	9.60
12	8733	Construction Electricians	3780	9.20
13	8529	Fabricating Occupations; Metal Products, NEC	215	8.80
14	8581	Motor Vehicle Mechanics and Repairmen	9915	7.60
15	8548	Occupations in Laboring, Fabricating, Assembling and Repairing; Wood Products	80	7.50
16	8798	Occupations in Laboring, Other Construction	6675	7.28
17	8786	Insulating Occupations - Construction	495	6.87
18	8583	Rail Transport Equipment, Mechanics and Repairmen	630	6.19
19	8339	Other Metal Shaping and Forming Occupations Except Machining	65	6.15
20	8137	Moulding, Coremaking and Metal Casting	185	5.95
21	8782	Brick and Stone Masons and Tile Setters and Related Occup.	875	5.94
22	8571	Bonding and Cementing Occup. Rubber, Plastic, Etc.	525	5.90
23	8781	Carpenters and Related Occupations	8515	5.58

NEC - Not Elsewhere Classified

FIGURE 3.A.4

Distribution (in percent) of the Reported Eye Injuries, in Alberta, in 1976, by the Time of the Accident (on a 24 hour scale) Alberta W.C.B. Statistical Master Files

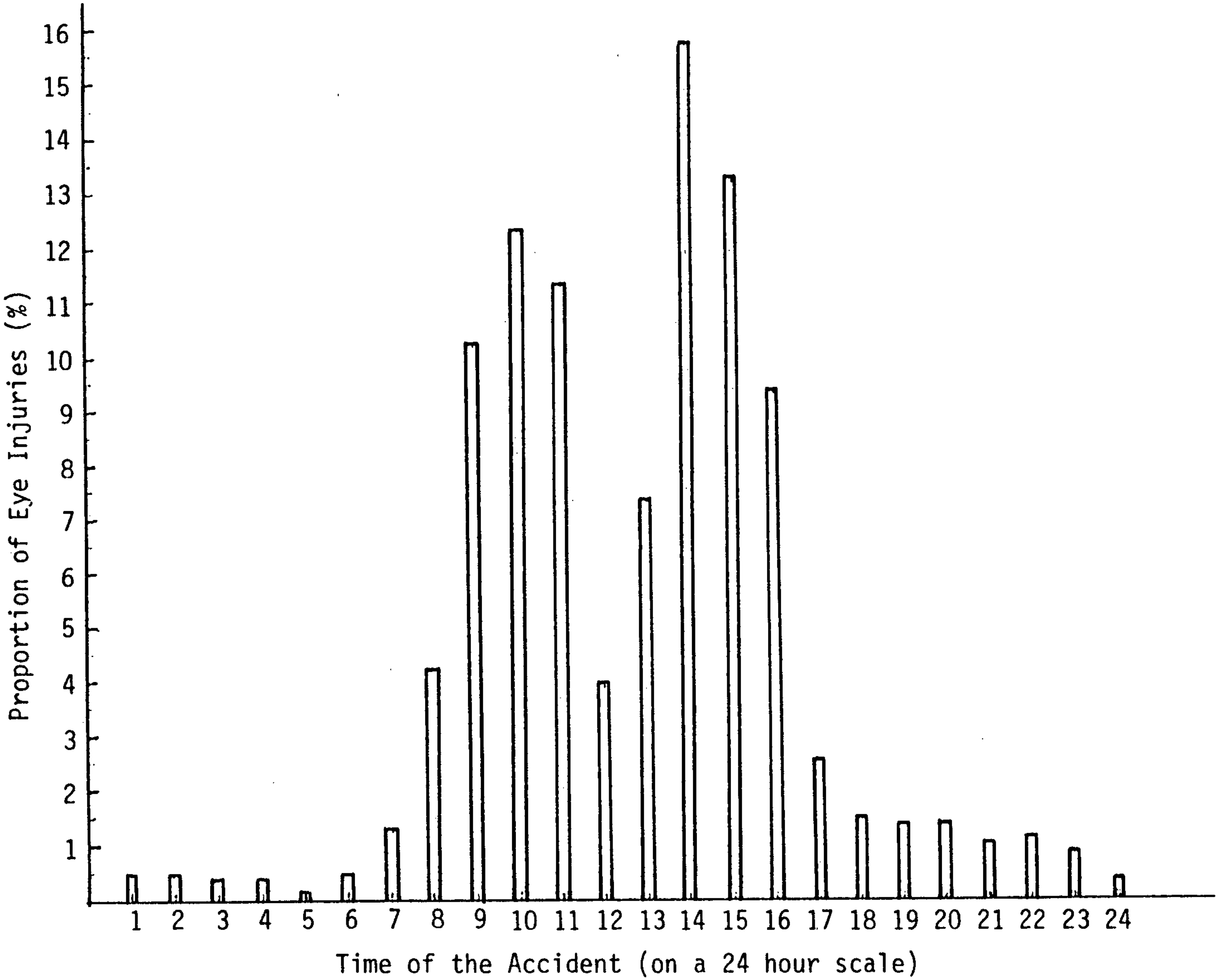
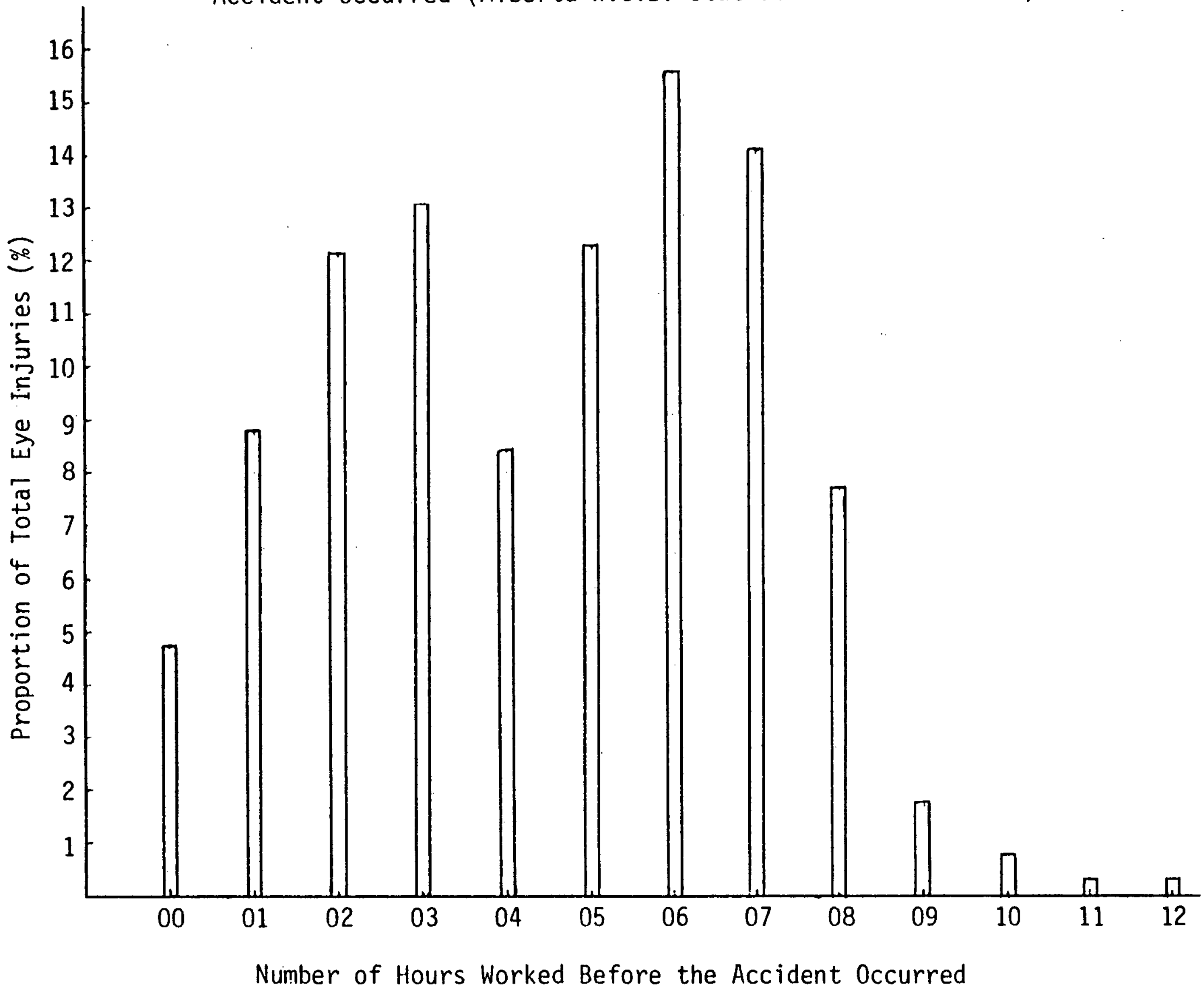


FIGURE 3.A.5

Distribution (in percent) of the Reported Eye Injuries, in Alberta, in 1976, by the Number of Hours Worked before the Accident Occurred (Alberta W.C.B. Statistical Master Files)



A great proportion of eye injuries (77%) do not result in lost work time and only require medical aid. In the years 1974, 1975 and 1976, 23% of the injuries consistently involved the payment of compensation for lost work time. In 1974 and 1975 there were 40 and 51 permanent disability awards respectively, whereas only 7 were recorded in the W.C.B. Statistical Master File for 1976. Although there may be some trend toward a slight reduction in these claims, as indicated by the 1974 and 1975 figures, the very low figure in 1976 is due to the fact that settlement of permanent disability claims takes some time and many had not yet been finalized. Fortunately, the number of permanent disability claims is very low relative to the number of lost time and medical-aid-only claims. One could speculate, in line with the literature, that a reduction in severity #1 and severity #2 injuries would also bring a reduction in the number of permanent disability claims.

It is interesting to note that 9 injury sources are responsible for 91% of the reported eye injuries in 1976 (Table 3.A.12). These are:

Source	Proportion of Injuries (%)
Particles (unidentified)	48.9
Metal chips and particles	21.1
Welding Equipment, Electric Arc	8.1
Misc. Chemicals	3.7
Wood slivers and splinters, etc.	3.2
Acids	1.5
Glass items	1.5
Hand tools	1.5

This is due primarily to the gross classification system that is used at the W.C.B., but the results do show that the majority of injuries result from metal, wood and other foreign bodies, with chemicals and radiation (primarily ultra-violet) contributing to about 13% of the reported injuries. Over the time period 1974 to 1976, the absolute frequency of a majority of the injury sources has not altered significantly. Table 3.A.59 shows those injury sources that have increased in number from 1974 to 1976 while Table 3.A.60 shows those sources of injury that have consistently decreased.

Over the three year period 1974 to 1976, scratches or abrasions have grown in proportion to represent nearly 80% of all the reported eye injuries. A substantial proportion of the remaining 20% involve chemical burns, radiation effects and contusions. Table 3.A.61 gives a comparison of the nature of lost time eye injuries reported to the Workers' Compensation Board in Alberta in 1976, and in B.C. in 1976, as reported in the literature. Although the overall rates of eye injuries are quite different, the relative proportions of the different kinds of injuries are remarkably similar. These statistics suggest the presence of common injury denominators and, thus, predictable and perhaps controllable causes of injury.

It is difficult to assess the provision of first aid in relation to eye injuries, as it is not known how many of the eye injuries studied required it. In addition, the non-response rate to this question (Table 3.A.16) was high (29% in 1976). There has been concern registered by occupational health personnel where workers are providing their own first aid, often to the detriment of their eyes. A notable example is where welders apply topical anaesthetic to their eyes after an arc flash.

The proportion of eye injuries that had some communication problem associated with them (0.6%) appears unnecessarily high. This exposes the need for proper employee orientation and the use of appropriate signals if noise or language prevent verbal communication.

TABLE 3.A.59

LISTING OF EYE INJURY SOURCES THAT HAVE BECOME MORE PREVALENT OVER THE YEARS 1974 TO 1976, IN ALBERTA
(FROM TABLE 3.A.12)

INJURY SOURCE	DESCRIPTION
0901	Acids
0999	Chemicals, NEC
4101	Nails, Spikes and Tacks
4103	Nails and Staples (From Power Actuated Tools)
4129	Pipe, NEC
5070	Welding equipment, Electric Arc
5708	Slivers and Splinters; Wood

NEC - Not Elsewhere Classified

TABLE 3.A.60

LISTING OF EYE INJURY SOURCES THAT HAVE BECOME LESS PREVALENT OVER THE YEARS 1974 TO 1976, IN ALBERTA
(FROM TABLE 3.A.12)

INJURY SOURCE	DESCRIPTION
250	Insects
630	Boxes and Crates
965	Cement or Calcium Compounds
970	Chlorine and Chlorine Compounds
1180	Sulphur and Sulpher Compounds
1190	Petroleum Asphalts and Road Oils
1199	Coal and Petroleum Products
2230	Hammer, Sledge or Mallet
4399	Non-Metallic Mineral Items
5090	Laser Equipment
5799	Wood Items, NEC
5900	Concrete Items, NEC
8800	Miscellaneous, NEC
9800	Unknown, Unidentified (Other than Particles)

NEC - Not Elsewhere Classified

TABLE 3.A.61

A COMPARISON OF THE NATURE OF LOST TIME EYE INJURIES REPORTED IN ALBERTA AND BRITISH COLUMBIA, IN 1976

NATURE OF INJURY	NUMBER OF INJURIES			
	ALBERTA		B.C.	
	NUMBER	(%)	NUMBER	(%)
Unclassified	15	(0.6)	34	(1.4)
Radiation Effects	367	(12.8)	194	(8.0)
Conjunctivitis	-	-	67	(2.8)
Chemical Burn	202	(7.1)	197	(8.1)
Scratches, Abrasions	2105	(73.8)	1693	(69.7)
Cuts, Lacerations	40	(1.4)	97	(4.0)
Contusions, Bruises	70	(2.5)	82	(3.4)
Heat Burn	53	(1.9)	63	(2.6)
Electric Burn	1	(0.0)	-	-
Enucleation	1	(0.0)	-	-
Multiple	-	-	2	(0.1)
TOTAL	2854	(100%)	2429	(100%)

Part 2 - Discussion of the Detailed Results of a Review of 15 High Eye Injury Risk Industry Classes

The fifteen industries listed in Tables 3.A.19 to 3.A.40 contribute 2.73% of the Alberta workforce (in man years), but in 1976 accounted for 17.57% of the total number of reported eye injuries, 20.4% of the severity #2 eye injuries and 16.6% of the severity #1 eye injuries. This substantiates the fact that a disproportionate number of eye injuries occur in specific industry classes related to metals and metal products. It is apparent that a substantial decrease in the total number of eye injuries could be realized by concentrating legislative and educational programs on a relatively small proportion of the industrial population.

Because of the predominance of this data in the overall number of eye injuries in Alberta in 1976, the results from this section (Part II) show much the same findings as in Part I. There are, however, a few notable additions to the discussion.

The incidence of severity #1 and severity #2 injuries in relation to time are very consistent. It is interesting to note in Tables 3.A.23 and 3.A.34, however, that steel foundries, heating equipment manufacturers, and welding shops showed severity #2 peaks in the morning that were one hour later than the severity #1 peak. This may indicate the possibility of more serious injuries with the onset of fatigue. This relation, however, did not exist in the afternoon.

Table 3.A.62 shows the time during the workers' shift in which the majority of eye injuries occurred. The first peak, which would usually correspond to the morning peak, is not as dominant as the second peak. With the exception of holiday trailer manufacturers, industries show an increasing trend in the number of eye injuries toward the end of the workers' shift.

TABLE 3.A.62

LISTING OF THE TIMES DURING THE WORKER'S SHIFT IN WHICH THERE WERE PEAKS IN THE OCCURRENCE OF ALL TYPES OF EYE INJURIES, IN ALBERTA, IN 1976, FOR EACH OF THE SELECTED HIGH EYE INJURY RISK INDUSTRIAL CLASSES (ALBERTA W.C.B. STATISTICAL MASTER FILE)

INDUSTRY CLASS	DESCRIPTION	FIRST PEAK	SECOND PEAK
31100	Mfg. of Agricultural Implements	3	7
30700	Mfg. of Heating Equipment	No Peak	5
30800	Automotive Machine Shops	5	7
30801	Machine Shops	No Peak	7
29100	Mfg. of Steel	No Peak	6
29102	Foundry - Iron and Steel	No Peak	7
34300	Mfg. of Lime	-	-
32400	Mfg. of Holiday Trailers and Campers	3	No Peak
32401	Mfg. of Truck Bodies and Cabs	2	6
32403	Mfg. of Wooden Truck Boxes	-	-
32300	Mfg. of Vehicles	2	7
30200	Fabrication of Structural Steel	3	6
89400	Blacksmith Shop	-	-
89401	Welding Shop	3	7
30100	Mfg., Fab. and Repair of Metal Products	3	7

Fatigue and boredom factors should be considered in the etiology of these injuries.

In both severity #1 and severity #2 injuries, it appears that the lower proportion or absence of metal chips and particles (Tables 3.A.25 and 3.A.36) is due, in some cases, to the absence of operations (such as hand grinding) which create metal particles. A high proportion of severity #1 and severity #2 injuries are caused by injury sources classified as unidentified particles. In most industry classes this proportion is less for severity #2 injuries. This may be due to the greater required attention that is demanded in completing forms if compensation is to be paid, or the fact that compensable injuries arise from more significant (recognizable) causes. Severity #1 injuries from chemical sources are uncommon in the industry classes with the exception of lime manufacturing. Significantly, chemicals (including acids) account for 17% of the severity #2 injuries in automotive machine shops and 100% of the severity #2 injuries in lime manufacturing industries. Severity #1 eye injuries due to welding equipment (radiation) figure prominently in the majority of industry classes with the exception of foundries, lime manufacturers, trailer manufacturers, and blacksmith shops. The same situation is apparent respecting severity #2 injuries although, in general, welding equipment contributes to a higher proportion of the injuries.

CHAPTER 3

SECTION B

METHODOLOGY, RESULTS AND DISCUSSION

OF

A REVIEW OF SELECTED W.C.B. PERSONAL MEDICAL FILES

3.B.M. Methodology-Review of Alberta W.C.B. Personal Medical Files

Rationale

Questions asked in the W.C.B. accident reporting forms emphasize the type of information that is required to pay a claim rather than that needed for research in accident prevention research. The validity of the information recorded on the forms, and the manner in which it is extracted and coded into the computer files may also be questioned . To examine the information reported to the W.C.B. from a preventive point of view and to provide a check against the W.C.B. data stored in the computer files, a number of the personal files stored in the W.C.B. office in Edmonton were examined.

Access to Information

In December of 1977 this researcher approached the Alberta W.C.B. through their Director of Statistics and Research, to obtain permission to examine a number of claim files. In January of 1978 the permission was obtained, provided the files were kept in the W.C.B. offices and those examining the files signed a statement of confidentiality.

Population

All claims that were within the high eye injury risk Standard Industrial Classifications, identified for further study in Part A, were selected. This included 1581 claims that required medical-aid-only, and 584 claims that involved compensation for lost time or permanent disability. All compensable injury files were examined because of their relative seriousness. Only a sample of the total number of medical-aid-only files were selected because of more common and easily recognized etiologies. A stratified (by industrial classification) random sampling technique was used to select a 37%

sample of the medical-aid-only claims (586).

The Instrument

The data was taken from the W.C.B. reporting forms which appear in Appendix I. A data retrieval form was designed to record specific information and, thereby, to obtain the information in a usable format.

Data Content

Figure 3.B.1 lists the information (variables) that were extracted from the medical files. Most of the variables are similar to those extracted from the W.C.B. Computer files, with the exception that they are coded in much greater detail and with a preventive reporting orientation.

Method of Data Collection

In order to identify the medical files to be examined, the claim number of each accident case was obtained and categorized according to the standard industrial class in which the accident occurred. A research assistant was appointed and trained to extract the information from the medical files. The information was coded by hand onto data sheets. The completed sheets were sent to the Alberta Labour administration offices for key punching and transfer onto the computer.

Possible Bias

This data suffers from the same possible biases as the data in Part A. It was, of course, impossible to remove bias that may have occurred prior to the data extraction and coding.

Method Analysis

The data was processed using the SPSS Statistical Programming Package on an I.B.M. 370 Computer. In addition to the computerized information, the research assistant was instructed to make special detailed notes on any

FIGURE 3.B.1

REVIEW OF W.C.B. PERSONAL MEDICAL FILES

VARIABLES

Occurrence Class
Type of Industry
Workers Occupation
Month of Injury
Language Problem
Cause of Injury
Detailed Source of Injury
Eye Protection
Eye Involved
Machine, Tool or Equipment Used by the Worker
Work for the Purpose of Business
Part of Workers Regular Work
First Aid
When was Accident Reported to the Employer
To Whom was the Accident Reported
Location of Accident
Prior Similar Disability
Time and Type of Previous Claims
Detailed Nature of Injury
Treatment
Physician who Rendered Treatment
Chance of Permanent Disability
Mis-representation or Concealment
Length of Hospitalization
Was Operation Performed
Estimated Time off Work
Real Length of Time off Work
Workers Wages per Week
Cost of Physicians Services
Cost of Hospitalization

medical file where the injury appeared to have an uncommon etiology, or an injury that was particularly serious.

3.B.R. Results of a Review of Selected W.C.B. Personal Medical Files

Table 3.B.1 shows the distribution of severity #1 and severity #2 eye injuries by industry class. In addition to the five digit standard industrial classification, two extra digits have been added to define the operation within the class. The findings show the presence of the majority of injuries in metal related work environments. Among these industry classes there is a marked variation in the ratio of severity #1 to severity #2 injuries, some being greater than one, and others less than one.

Table 3.B.2 shows the distribution of severity #1 and severity #2 eye injuries by the W.C.B. occurrence class in which they occurred. The premiums paid in each occurrence class are included for reference. The majority of injuries are within classes which contain companies concerned with manufacturing and repairing metal and wood products.

Table 3.B.3 shows the distribution of selected eye injury claims according to the month in which the injury occurred. There is little variation in the number of severity #1 and severity #2 eye injuries over the months of the year.

Table 3.B.4 shows the distribution of selected eye injury claims according to whether the work performed at the time of the accident was for normal business purposes. The great majority of eye injuries occurred as a result of work related activities, although two severity #1 injuries occurred while workers were attending apprentice classes.

Table 3.B.5 shows the number of severity #1 and severity #2 eye injuries according to whether the activity at the time of the injury was a regular part of the person's work. The great majority of eye injuries occurred while the person was engaged in his regular work. One severity #2 eye injury occurred as a result of a worker engaging in extra duties.

TABLE 3.B.1

DISTRIBUTION OF SELECTED SEVERITY #1 AND SEVERITY #2 EYE INJURIES, FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, IN ALBERTA, IN 1976, BY THE INDUSTRY CLASS IN WHICH THE INJURED PERSON WORKED (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

INDUSTRY CLASS	SEVERITY #1 INJURIES		SEVERITY #2 INJURIES	
	#	(%)	#	(%)
2910002 - MANUFACTURER OF STEEL: STEEL FOUNDRY	34	(5.8)	2	(0.3)
2910201 - FOUNDRY IRON OR STEEL: NON-SPECIFIC	6	(1.0)	13	(2.2)
2910202 - STEEL FOUNDRY	7	(1.2)	16	(2.7)
2910203 - IRON FOUNDRY	31	(5.3)	4	(0.7)
2910214 - FOUNDRY IRON OR STEEL: MANUFACTURING	6	(1.0)	-	-
3010001 - FABRICATION, MANUFACTURING & REPAIR METAL PRODUCTS: NON-SPECIFIC	35	(6.0)	20	(3.4)
3010002 - FABRICATION, MANUFACTURING & REPAIR METAL PRODUCTS: STEEL INDUSTRY	2	(0.3)	18	(3.1)
3010006 - FARM MACHINERY MANUFACTURER	-	-	1	(0.2)
3010011 - MACHINE SHOP, WELDING SHOP	9	(1.5)	11	(1.9)
3010012 - OILFIELD MAINTENANCE AND MANUFACTURER	7	(1.2)	17	(2.9)
3010013 - METAL FABRICATION	20	(3.4)	66	(11.3)
3010014 - MANUFACTURING METAL PRODUCTS	13	(2.2)	34	(5.8)
3010018 - IRON WORKS COMPANY	-	-	1	(0.2)
3010019 - AUTOMOTIVE METAL WORKS	3	(0.5)	2	(0.3)
3010020 - CRANE MANUFACTURER	-	-	1	(0.2)
3010021 - STEEL TANK FABRICATION	-	-	1	(0.2)
3010022 - CONSTRUCTION AND MANUFACTURING: IRON AND METAL WORKS	-	-	1	(0.2)
3010023 - METAL PIPE FABRICATION	7	(1.2)	10	(1.7)
3010024 - METAL TANK FABRICATION	2	(0.3)	1	(0.2)
3010025 - METAL FABRICATION AND MANUFACTURING	1	(0.2)	-	-
3010026 - HEAVY EQUIPMENT MANUFACTURER	1	(0.2)	-	-
3020001 - FABRICATION STRUCTURAL STEEL: NON-SPECIFIC	12	(2.0)	6	(1.1)
3020002 - FABRICATION STRUCTURAL STEEL: STEEL FOUNDRY, STEEL INDUSTRY	7	(1.2)	13	(2.2)
3020003 - FABRICATION STRUCTURAL STEEL & IRON FOUNDRY	1	(0.2	-	-
3020008 - TRAVEL TRAILER, RECREATIONAL VEHICLE MANUFACTURER	-	-	2	(0.3)
3020013 - FABRICATION STRUCTURAL STEEL: OTHER METAL FABRICATION	28	(4.8)	71	(12.2)
3020014 - FABRICATION STRUCTURAL STEEL, MANUFACTURING	-	-	5	(0.9)
3070001 - MANUFACTURING HEATING COOLING EQUIPMENT	3	(0.5)	5	(0.9)
3070004 - AIR CONDITIONER AND HEATING PRODUCTION	15	(2.6)	3	(0.5)
3070005 - FURNACE PRODUCTION	-	-	3	(0.5)
3080001 - AUTOMOTIVE MACHINE SHOP	40	(6.9)	43	(7.4)
3080011 - AUTOMOTIVE MACHINE SHOP, WELDING SHOP	12	(2.0)	-	-
3080014 - AUTOMOTIVE MACHINE SHOP, MANUFACTURER	2	(0.3)	-	-
3080101 - MACHINE SHOP	43	(7.3)	29	(5.0)
3080102 - MACHINE SHOP, STEEL INDUSTRY	-	-	5	(0.9)
3080112 - MACHINE SHOP, OILFIELD MAINTENANCE, MANUFACTURER	-	-	1	(0.2)
3080113 - MACHINE SHOP, METAL FABRICATION	-	-	1	(0.2)
3080114 - MACHINE SHOP, MANUFACTURING	5	(0.9)	4	(0.7)
3080119 - MACHINE SHOP, AUTOMOTIVE	2	(0.4)	-	-
3110001 - MANUFACTURER OF AGRICULTURAL IMPLEMENTS	34	(5.8)	16	(2.8)
3230001 - MANUFACTURER OF VEHICLES	34	(5.8)	11	(1.9)
3230007 - TRUCK BODY AND TRUCK EQUIPMENT MANUFACTURER	1	(0.2)	1	(0.2)
3240001 - MANUFACTURER OF HOLIDAY TRAILERS, CAMPERS	46	(7.9)	3	(0.5)
3240009 - PRE-FABRICATED HOME MANUFACTURER	-	-	1	(0.2)
3240029 - BODY SHOP: HOLIDAY TRAILERS, CAMPERS	1	(0.2)	-	-
3240031 - AUTOMOTIVE REBUILDER: HOLIDAY TRAILERS, CAMPERS	1	(0.2)	-	-
3240032 - TRAILER REPAIRS	2	(0.3)	-	-
3240101 - MANUFACTURER TRUCK BODIES, CABS, TRAILERS	44	(7.6)	49	(8.4)
3240129 - BODY SHOP: TRUCK BODIES, CABS, TRAILERS	4	(0.7)	-	-
3240130 - HEAVY EQUIPMENT SALES AND SERVICE	1	(0.2)	-	-
3240301 - MANUFACTURER OF WOODEN TRUCK BOXES	3	(0.5)	2	(0.4)
3430001 - MANUFACTURER OF LIME	9	(1.5)	2	(0.3)
3430028 - MINING LIME	1	(0.2)	-	-
8940001 - BLACKSMITH SHOP	1	(0.2)	-	-
8940101 - WELDING	37	(6.4)	52	(8.9)
8940102 - WELDING: STEEL FOUNDRY, STEEL INDUSTRY	-	-	7	(1.2)
8940112 - WELDING: OILFIELD MAINTENANCE	4	(0.7)	2	(0.3)
8940113 - WELDING: METAL FABRICATION	7	(1.2)	-	-
8940114 - WELDING: MANUFACTURING	1	(0.2)	4	(0.7)
8940115 - WELDING: CONSTRUCTION	1	(0.2)	2	(0.4)
8940116 - WELDING: CAST IRON REPAIR COMPANY	-	-	1	(0.2)
TOTAL	586		584	

TABLE 3.B.2

DISTRIBUTION OF SELECTED SEVERITY #1 AND SEVERITY #2 EYE INJURIES, FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, IN ALBERTA, IN 1976, BY THE OCCURRENCE CLASSIFICATION OF THE INDUSTRY (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

OCCURRENCE CLASS	SEVERITY #1 INJURIES		SEVERITY #2 INJURIES		INSURANCE PREMIUM
	#	(%)	#	(%)	
05-01	55	(9.4)	13	(2.2)	$1.45
06-02	18	(3.1)	11	(1.9)	$2.50
06-08	3	(0.3)	1	(0.2)	$8.25
08-02	246	(42.0)	396	(67.8)	$3.00
08-03	117	(20.0)	99	(17.0)	$2.20
08-04	53	(9.0)	26	(4.5)	$3.25
08-05	85	(14.5)	34	(5.8)	$3.60
19-02	10	(1.7)	1	(0.2)	$0.50 - $7.50
Unknown	-	-	3	(0.5)	Unknown
TOTAL	586	(100%)	584	(100%)	

TABLE 3.B.3

DISTRIBUTION OF SELECTED SEVERITY #1 AND SEVERITY #2 EYE INJURIES,
FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES,
IN ALBERTA, IN 1976
BY THE MONTH IN WHICH THE INJURY OCCURRED
(ALBERTA W.C.B. PERSONAL MEDICAL FILES)

MONTH OF INJURY	SEVERITY #1 INJURIES		SEVERITY #2 INJURIES	
	#	(%)	#	(%)
January	52	(8.9)	47	(8.0)
February	41	(7.0)	40	(6.8)
March	58	(9.9)	57	(9.8)
April	43	(7.3)	49	(8.4)
May	53	(9.0)	56	(9.6)
June	45	(7.7)	41	(7.0)
July	55	(9.4)	65	(11.1)
August	51	(8.7)	62	(10.6)
September	55	(9.4)	63	(10.8)
October	49	(8.4)	44	(7.5)
November	45	(7.7)	31	(5.3)
December	39	(6.7)	28	(4.8)
Unknown	-	-	1	(0.2)
TOTAL	586	(100%)	584	(100%)

TABLE 3.B.4

DISTRIBUTION OF SELECTED SEVERITY #1 AND SEVERITY #2 EYE INJURIES, FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, IN ALBERTA, IN 1976, ACCORDING TO WHETHER THE WORK PERFORMED AT THE TIME OF THE ACCIDENT WAS FOR NORMAL BUSINESS PURPOSES (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

WORK FOR BUSINESS	SEVERITY #1 INJURIES		SEVERITY #2 INJURIES	
	#	(%)	#	(%)
No Response	92	(15.7)	13	(2.2)
Yes	491	(83.8)	570	(97.6)
During Lunch	-	-	1	(0.2)
Worker Attending SAIT	2	(0.3)	-	-
Personal Business	1	(0.2)	-	-
TOTAL	586		584	

TABLE 3.B.5

DISTRIBUTION OF SELECTED SEVERITY #1 AND SEVERITY #2 EYE INJURIES, FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, IN ALBERTA, IN 1976, ACCORDING TO WHETHER THE WORK ACTIVITY AT THE TIME OF THE EYE INJURY WAS A REGULAR PART OF THE PERSONS WORK (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

PART OF REGULAR WORK	SEVERITY #1 INJURIES		SEVERITY #2 INJURIES	
	#	(%)	#	(%)
No Response	92	(15.7)	13	(2.2)
Yes	491	(83.8)	570	(97.6)
Apprentice Class	2	(0.3)	-	-
Personal Work	1	(0.2)	-	-
Extra Duty	-	-	1	(0.2)
TOTAL	586		584	

Table 3.B.6 gives the distribution of selected severity #1 and severity #2 eye injuries by the occupation of the injured worker. The standard four digit Canadian classification of occupations is used in addition to two extra digits which are used to clarify the activity or status of the tradesman. The greatest number of severity #1 and severity #2 injuries, in the industry classes studied, occur among machinists, welders, mechanics, plumbers and pipefitters and labouring occupations. In the case of severity #1 injuries, it is interesting to note that 11.1% of the injured welders were apprentices, while 3.8% were welders' helpers. 14% of the severity #1 injuries among plumbers and pipefitters were shared equally by apprentices and helpers. In the case of severity #2 injuries, 5.4% of the total number of injuries incurred by machinists were incurred by apprentices. Forty of the 295 (14%) severity #2 injuries incurred by welders happened to apprentices, while a further 3.1% of the total number of injuries to welders were incurred by welders' helpers.

Table 3.B.7 shows the distribution of selected eye injuries by the cause of the injury. A large proportion of the severity #1 and severity #2 eye injuries studied in this section were caused by a flying piece of metal which usually came in the form of a spark from a grinder. Non-specific foreign bodies contributed to 12% of the severity #1 injuries, but only 4% of the severity #2 injuries. In total, 85% of the severity #1 injuries and 72% of the severity #2 injuries were caused by a foreign body in the eye. Significantly, radiation (from welding operations) contributed to 9% of the severity #1 injuries and 21% of the severity #2 injuries. The majority of other causes of eye injuries relate to metallic or non-metallic particles or fragments. Chemicals contribute only to about 2% of the injuries in either category. Compressed air and/or wind are responsible for 6% of the

TABLE 3.8.6

DISTRIBUTION OF SELECTED SEVERITY #1 AND SEVERITY #2
EYE INJURIES, FROM A REVIEW OF 15 HIGH EYE INJURY
RISK INDUSTRIAL CLASSES, IN ALBERTA, IN 1976
BY THE OCCUPATION OF THE INJURED WORKER
(ALBERTA W.C.B. PERSONAL MEDICAL FILES)

OCCUPATION	SEVERITY #1 INJURIES		SEVERITY #2 INJURIES	
	#	(%)	#	(%)
000000 - NO CLASSIFICATION	63	(10.8)	13	(2.2)
415301 - SHIPPING AND RECIEVING CLERKS	2	(0.3)	1	(0.2)
415701 - WEIGHERS	-	-	1	(0.2)
513501 - SALESMEN	1	(0.2)	-	-
611138 - FIRE-FIGHTERS: KILN FIREMANS HELPER	1	(0.2)	-	-
619101 - JANITORS	2	(0.3)	1	(0.2)
771001 - SUPERVISORS; DRILLING OPERATIONS	1	(0.2)	1	(0.2)
771140 - ROTARY WELL-DRILLING	1	(0.2)	-	-
771901 - OIL AND GAS FIELD OCCUPATIONS	-	-	1	(0.2)
811101 - CRUSHING AND GRINDING OCCUPATIONS	1	(0.2)	-	-
813701 - METAL CASTING	3	(0.5)	2	(0.3)
813702 - METAL CASTING: CUPOLA OPERATOR	-	-	1	(0.2)
813716 - METAL CASTING: STEEL WORKER	1	(0.2)	-	-
813747 - METAL CASTING: COREMAKER	1	(0.2)	-	-
814301 - PLATING, METAL OCCUPATIONS	1	(0.2)	-	-
814801 - LABOURING IN METAL PROCESSING	2	(0.3)	-	-
814822 - LABOURING IN METAL PROCESSING: EQUIPMENT OPERATOR	-	-	1	(0.2)
814901 - METAL PROCESSING	1	(0.2)	-	-
814927 - METAL PROCESSING: METAL TRADESMAN	-	-	1	(0.2)
817103 - CRUSHING AND GRINDING CHEMICALS	-	-	1	(0.2)
817813 - LABOURING IN CHEMICALS, PETROLEUM: BULK LOADER, BAGGER	2	(0.3)	-	-
817835 - LABOURING IN CHEMICALS, PETROLEUM: MAINTENANCE	1	(0.2)	-	-
817838 - LABOURING IN CHEMICALS, PETROLEUM: KILN FIREMANS HELPER	2	(0.3)	-	-
831001 - FOREMAN; MACHINING OPERATIONS	2	(0.3)	-	-
831301 - MACHINIST	48	(8.2)	35	(6.0)
831303 - MACHINIST: GRINDER	1	(0.2)	1	(0.2)
831314 - MACHINIST: MACHINIST HELPER	1	(0.2)	-	-
831315 - MACHINIST: APPRENTICE	1	(0.2)	2	(0.3)
831322 - MACHINIST: EQUIPMENT OPERATOR	-	-	1	(0.2)
831516 - MACHINE-TOOL OPERATING: STEEL WORKER	-	-	1	(0.2)
831522 - MACHINE-TOOL OPERATING: EQUIPMENT OPERATOR	-	-	1	(0.2)
831901 - METAL MACHINING	-	-	1	(0.2)
833001 - FOREMAN; METAL SHAPING AND FORMING	6	(1.1)	2	(0.3)
833301 - SHEET-METAL WORKERS	1	(0.2)	11	(1.9)
833304 - SHEET-METAL WORKERS: WELDER	-	-	1	(0.2)
833305 - SHEET-METAL WORKERS: ASSEMBLER/PRODUCTION WORKER	1	(0.2)	-	-
833310 - SHEET-METAL WORKERS: TINSMITH	-	-	1	(0.2)
833316 - SHEET-METAL WORKERS: STEEL WORKER	-	-	1	(0.2)
833401 - METALWORKING-MACHINE OPERATORS	-	-	1	(0.2)
833422 - METALWORKING-MACHINE OPERATORS: EQUIPMENT OPERATOR	-	-	1	(0.2)
833426 - METALWORKING-MACHINE OPERATORS: SHEAR HELPER	-	-	1	(0.2)
833501 - WELDING AND FLAME CUTTING OCCUPATIONS	173	(29.6)	242	(41.4)
833503 - WELDING AND FLAME CUTTING OCCUPATIONS: GRINDER	-	-	1	(0.2)
833515 - WELDING AND FLAME CUTTING OCCUPATIONS: APPRENTICE	23	(3.9)	40	(6.8)
833517 - WELDING AND FLAME CUTTING OCCUPATIONS: PIPEFITTER	3	(0.5)	-	-
833518 - WELDING AND FLAME CUTTING OCCUPATIONS: WELDERS HELPER	8	(1.4)	10	(1.7)
833524 - WELDING AND FLAME CUTTING OCCUPATIONS: PRESSURE WELDER	-	-	1	(0.2)
833529 - WELDING AND FLAME CUTTING OCCUPATIONS: MACHINIST	-	-	1	(0.2)
833548 - WELDING AND FLAME CUTTING OCCUPATIONS: WELDING FOREMAN	1	(0.2)	-	-
833601 - INSPECTING, METAL SHAPING AND FORMING	1	(0.2)	-	-
833701 - BOILERMAKERS, PLATERS	2	(0.4)	1	(0.2)
833716 - BOILERMAKERS, PLATERS: STEEL WORKER	-	-	1	(0.2)
833915 - METAL SHAPING AND FORMING OCCUPATIONS: APPRENTICE	-	-	1	(0.2)
833943 - METAL SHAPING AND FORMING OCCUPATIONS: CASTING OPERATOR	1	(0.2)	-	-
839301 - FILING, GRINDING AND BUFFING OCCUPATIONS	4	(0.7)	8	(1.4)
839303 - FILING, GRINDING AND BUFFING OCCUPATIONS: GRINDER	15	(2.6)	2	(0.3)
851309 - MOTOR VEHICLE FABRICATING: PUNCH MACHINE OPERATOR	-	-	1	(0.2)
851319 - MOTOR VEHICLE FABRICATING: FABRICATOR	1	(0.2)	-	-
852903 - OTHER FABRICATING AND ASSEMBLING OCCUPATIONS: GRINDER	-	-	1	(0.2)
853101 - ELECTRICAL EQUIPMENT FABRICATING AND ASSEMBLING	1	(0.2)	-	-
853801 - LABOURING IN FABRICATING, ASSEMBLING, INSTALLING & REPAIRING ELECTRICAL EQUIPMENT	1	(0.2)	-	-
854801 - LABOURING IN FABRICATING, ASSEMBLING AND REPAIRING WOOD PRODUCTS	-	-	1	(0.2)
858101 - MOTOR-VEHICLE MECHANICS	20	(3.4)	15	(2.6)
858112 - MOTOR-VEHICLE MECHANICS: SHOP FOREMAN	-	-	1	(0.2)
858123 - MOTOR-VEHICLE MECHANICS: MILLWRIGHT	2	(0.3)	-	-
858136 - MOTOR-VEHICLE MECHANICS: MECHANICS HELPER	1	(0.2)	-	-
858145 - MOTOR-VEHICLE MECHANICS: BODY MECHANIC	2	(0.3)	-	-
848401 - HEAVY DUTY MACHINERY MECHANICS	13	(2.2)	12	(2.1)
858403 - HEAVY DUTY MACHINERY MECHANICS: GRINDER	-	-	1	(0.2)

TABLE 3.B.6 - Continued

OCCUPATION	SEVERITY #1 INJURIES		SEVERITY #2 INJURIES	
	#	(%)	#	(%)
858415 - HEAVY DUTY MACHINERY MECHANICS: APPRENTICE	1	(0.2)	-	-
858423 - HEAVY DUTY MACHINERY MECHANICS: MILLWRIGHT	3	(0.5)	2	(0.3)
858901 - OTHER MECHANICS	-	-	1	(0.2)
859001 - FOREMAN: PRODUCT FABRICATING, ASSEMBLING AND REPAIRING	5	(0.9)	2	(0.3)
859801 - LABOURING IN PRODUCT FABRICATING, ASSEMBLING AND REPAIRING	32	(5.5)	17	(2.9)
859803 - LABOURING IN PRODUCT FABRICATING, ASSEMBLING AND REPAIRING: GRINDER	2	(0.3)	4	(0.7)
859805 - LABOURING IN PRODUCT FABRICATING, ASSEMBLING AND REPAIRING: ASSEMBLER/PRODUCTION WORKER	16	(2.7)	6	(1.0)
859811 - LABOURING IN PRODUCT FABRICATING, ASSEMBLING AND REPAIRING: WOODWORKER	-	-	1	(0.2)
859816 - LABOURING IN PRODUCT FABRICATING, ASSEMBLING AND REPAIRING: STEEL WORKER	-	-	1	(0.2)
859841 - LABOURING IN PRODUCT FABRICATING, ASSEMBLING AND REPAIRING: TRUCK BODY BUILDER	1	(0.2)	-	-
871139 - EXCAVATING, GRADING: SCRAPER OPERATOR	1	(0.2)	-	-
871922 - EXCAVATING, GRADING, PAVING: EQUIPMENT OPERATOR	-	-	1	(0.2)
873301 - CONSTRUCTION ELECTRICIANS	3	(0.5)	2	(0.3)
873601 - INSPECTING AND TESTING: ELECTRICAL POWER, WIRE COMMUNICATIONS	1	(0.2)	-	-
878001 - FOREMAN: OTHER CONSTRUCTION TRADES	1	(0.2)	-	-
878101 - CARPENTERS	1	(0.2)	5	(0.9)
878501 - PAINTERS, PAPERHANGERS	3	(0.5)	2	(0.3)
878531 - PAINTERS, PAPERHANGERS: PAINTERS HELPER	1	(0.2)	2	(0.3)
879101 - PIPEFITTING, PLUMBING	5	(0.9)	21	(3.6)
879103 - PIPEFITTING, PLUMBING: GRINDER	-	-	1	(0.2)
879115 - PIPEFITTING, PLUMBING: APPRENTICE	1	(0.2)	3	(0.5)
879117 - PIPEFITTING, PLUMBING: PIPEFITTER	7	(1.2)	2	(0.3)
879133 - PIPEFITTING, PLUMBING: FITTERS HELPER	1	(0.2)	3	(0.5)
879134 - PIPEFITTING, PLUMBING: BOILERMAKER	1	(0.2)	-	-
879301 - STRUCTURAL-METAL ERECTORS	2	(0.3)	-	-
879304 - STRUCTURAL-METAL ERECTORS: WELDER	-	-	1	(0.2)
879321 - STRUCTURAL-METAL ERECTORS: IRON WORKER	-	-	2	(0.4)
879801 - LABOURING IN CONSTRUCTION	1	(0.2)	1	(0.2)
879803 - LABOURING IN CONSTRUCTION: GRINDER	1	(0.2)	-	-
879805 - LABOURING IN CONSTRUCTION: ASSEMBLER/PRODUCTION WORKER	5	(0.9)	3	(0.5)
917501 - TRUCK DRIVERS	-	-	1	(0.2)
931101 - HOISTING OCCUPATIONS	1	(0.2)	2	(0.3)
831144 - HOISTING OCCUPATIONS: CRANE OPERATOR	3	(0.5)	-	-
931501 - MATERIAL-HANDLING EQUIPMENT OPERATIONS	1	(0.2)	-	-
931522 - MATERIAL-HANDLING EQUIPMENT OPERATIONS: EQUIPMENT OPERATOR	-	-	1	(0.2)
931525 - MATERIAL-HANDLING EQUIPMENT OPERATIONS: FORK LIFT OPERATOR	-	-	1	(0.2)
931544 - MATERIAL-HANDLING EQUIPMENT OPERATIONS: CRANE OPERATOR	1	(0.2)	-	-
931801 - LABOURING IN MATERIAL-HANDLING	-	-	2	(0.4)
931913 - OTHER MATERIAL-HANDLING OCCUPATIONS: BULK LOADER, BAGGER	-	-	1	(0.2)
991601 - INSPECTING, TESTING, GRADING, AND SAMPLING OCCUPATIONS	1	(0.2)	1	(0.2)
991801 - LABOURING OCCUPATIONS: NON-SPECIFIC	35	(6.0)	24	(4.1)
991802 - LABOURING OCCUPATIONS: CUPOLA OPERATOR	1	(0.2)	-	-
991803 - LABOURING OCCUPATIONS: GRINDER	8	(1.4)	16	(2.7)
991804 - LABOURING OCCUPATIONS: WELDER	-	-	4	(0.7)
991805 - LABOURING OCCUPATIONS: ASSEMBLER - PRODUCTION WORKER	2	(0.3)	3	(0.5)
991806 - LABOURING OCCUPATIONS: DRILLER	-	-	2	(0.3)
991807 - LABOURING OCCUPATIONS: STEAM CLEANER	-	-	1	(0.2)
991808 - LABOURING OCCUPATIONS: ENGINE TESTER	-	-	1	(0.2)
991813 - LABOURING OCCUPATIONS: BULK LOADER/BAGGER	-	-	1	(0.2)
991814 - LABOURING OCCUPATIONS: MACHINIST HELPER	-	-	1	(0.2)
991815 - LABOURING OCCUPATIONS: APPRENTICE	1	(0.2)	-	-
991816 - LABOURING OCCUPATIONS: STEEL WORKER	-	-	2	(0.3)
991817 - LABOURING OCCUPATIONS: PIPEFITTER	-	-	1	(0.2)
991818 - LABOURING OCCUPATIONS: WELDERS HELPER	6	(1.0)	7	(1.2)
991819 - LABOURING OCCUPATIONS: FABRICATOR	-	-	1	(0.2)
991827 - LABOURING OCCUPATIONS: METAL TRADESMAN	2	(0.4)	1	(0.2)
991828 - LABOURING OCCUPATIONS: BRAKE HELPER	-	-	1	(0.2)
991830 - LABOURING OCCUPATIONS: SWAMPER	-	-	1	(0.2)
991833 - LABOURING OCCUPATIONS: FITTERS HELPER	1	(0.2)	-	-
991835 - LABOURING OCCUPATIONS: MAINTENANCE WORKER	1	(0.2)	1	(0.2)
991836 - LABOURING OCCUPATIONS: MECHANICS HELPER	1	(0.2)	-	-
991837 - LABOURING OCCUPATIONS: SHOP ASSISTANT	3	(0.5)	-	-
991842 - LABOURING OCCUPATIONS: HELPER, FURNACE	2	(0.3)	-	-
991846 - LABOURING OCCUPATIONS: SINGLE PUNCH OPERATOR	1	(0.2)	-	-
991849 - LABOURING OCCUPATIONS: RIGGER	1	(0.2)	-	-
TOTAL	586		584	

TABLE 3.B.7

DISTRIBUTION OF SELECTED SEVERITY #1 AND SEVERITY #2 EYE INJURIES FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, IN ALBERTA, IN 1976, BY THE CAUSE OF THE INJURY (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

CAUSE OF INJURY	SEVERITY #1 INJURIES		SEVERITY #2 INJURIES	
	#	(%)	#	(%)
Unknown	2	(0.3)	1	(0.2)
Foreign Body; Non-Specific	72	(12.3)	25	(4.3)
Flying Spark/Piece of Metal	327	(55.8)	353	(60.4)
Welding Flash/Radiation	55	(9.4)	120	(20.5)
Foreign Body; Non-Metallic	58	(9.9)	26	(4.5)
Electrical Flash	-	-	1	(0.2)
Hot Metal Splatter	12	(2.0)	-	-
Sharp Object	2	(0.3)	5	(0.9)
Harmful Liquids & Corrosives	10	(1.7)	13	(2.2)
Welding Injury	4	(0.7)	5	(0.9)
Flying Fragment or Object	14	(2.4)	13	(2.2)
Welding Flash and Metallic Foreign Body	-	-	7	(1.2)
Wind Blew Foreign Body into Eye	24	(4.1)	11	(1.9)
Blunt Object	1	(0.2)	1	(0.2)
TOTAL	586		584	

severity #1 injuries, but only 2% of the severity #2 injuries.

Table 3.B.8 shows the distribution of severity #1 and severity #2 eye injuries by the source of the injury. This information represents a more detailed look at the cause of injuries shown in Table 3.B.7. Although the type of metallic foreign body was not defined in most cases, a high proportion that were defined were found to be steel. Although steel was responsible for a substantially greater proportion of severity #2 than severity #1 injuries, this may be due to reporting anomalies. Similar numbers of severity #1 and severity #2 injuries were caused by non-specified hot metal substances. Out of nine lime dust injuries, 78% resulted in compensation for lost work time.

Table 3.B.9 gives the distribution of eye injuries according to the nature of the injury. Approximately 55% of the eye injuries studied resulted in corneal abrasions. The results show a multitude of specialized incidents which cannot be well categorized.

Table 3.B.10 records the distribution of severity #1 and severity #2 eye injuries according to whether eye protection was worn at the time of the accident. An extremely large number of the personal medical files that were surveyed did not offer any information on whether eye protection was worn at the time of the accident (83% for severity #1, 73% for severity #2). Of those who reported the information, 13% of severity #1 injuries and 28% of severity #2 did not use any eye protection. Safety glasses were used in 42% of the severity #1 cases and 31% of the severity #2 cases. Injuries occurred while goggles were being worn in 12% of the severity #1 cases and 4% of the severity #2 cases. The remaining cases where eye protection was worn are highly varied.

Table 3.B.11 reports whether the right, left or both eyes were involved in the selected eye injuries. Severity #1 injuries occurred in the

TABLE 3.B.8

DISTRIBUTION OF SELECTED SEVERTIY #1 AND SEVERITY #2 EYE INJURIES
FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, IN ALBERTA, IN 1976
BY THE SOURCE OF THE INJURY
(ALBERTA W.C.B. PERSONAL MEDICAL FILES)

SOURCE OF INJURY	SEVERITY #1 INJURIES		SEVERITY #2 INJURIES	
	#	(%)	#	(%)
Not Classified	2	(0.3)	5	(0.9)
foreign body; non-specific	80	(13.7)	24	(4.1)
metallic foreign body; non-specific	218	(37.2)	157	(26.9)
steel	88	(15.0)	155	(26.5)
iron	7	(1.2)	15	(2.6)
manganese	-	-	1	(0.2)
rust	1	(0.2)	5	(0.9)
hot metal; non-specific	19	(3.2)	14	(2.4)
copper	-	-	1	(0.2)
rivet, nut	-	-	2	(0.3)
gumdoll	1	(0.2)	1	(0.2)
sand	6	(1.0)	5	(0.9)
electrical; non-specific	-	-	1	(0.2)
piece of plastic	-	-	2	(0.3)
ultraviolet radiation	54	(9.2)	119	(20.4)
degreaser	-	-	1	(0.2)
sulphuric acid	-	-	1	(0.2)
staples	-	-	1	(0.2)
dirt, dust	44	(7.5)	18	(3.1)
hot water, steam with detergent	-	-	1	(0.2)
chromic acid	-	-	1	(0.2)
hot cinder	1	(0.2)	1	(0.2)
wood (fiber, chip, splinter, sawdust)	21	(3.6)	7	(1.2)
chemically treated tar chip	-	-	1	(0.2)
fiberglass	5	(0.9)	4	(0.7)
glass	1	(0.2)	3	(0.5)
air hose nozzle	1	(0.2)	1	(0.2)
aluminum	4	(0.7)	4	(0.7)
lime dust	7	(1.2)	2	(0.3)
dirty oil	-	-	1	(0.2)
lead	1	(0.2)	1	(0.2)
caustic soda	1	(0.2)	1	(0.2)
drill bit	-	-	1	(0.2)
ultraviolet radiation and metallic FB	-	-	7	(1.2)
hot welding rod	-	-	2	(0.3)
sulphur dust	-	-	1	(0.2)
ultraviolet radiation & hot welding rod	-	-	1	(0.2)
wrench handle	1	(0.2)	1	(0.2)
paint	1	(0.2)	1	(0.2)
hot steel	-	-	3	(0.5)
nitrogen	-	-	1	(0.2)
coal dust	1	(0.2)	1	(0.2)
hot zinc cone	1	(0.2)	1	(0.2)
cardboard box flap	-	-	1	(0.2)
hot steel bar	-	-	1	(0.2)
dust and iron filings	-	-	1	(0.2)
dry paint chip	1	(0.2)	-	-
screwdriver	1	(0.2)	-	-
Liquid metal conditioner acid	1	(0.2)	-	-
brass	1	(0.2)	-	-
wood panel	1	(0.2)	-	-
copper tubing	1	(0.2)	-	-
hot sand	1	(0.2)	-	-
pliers	1	(0.2)	-	-
piece of cement	1	(0.2)	-	-
query ultraviolet radiation	-	-	2	(0.3)
piece of carbon	1	(0.2)	-	-

TABLE 3.B.8 (Continued)

SOURCE OF INJURY	SEVERITY #1 INJURIES		SEVERITY #2 INJURIES	
	#	(%)	#	(%)
metal dust	1	(0.2)	-	-
hot metal wire	1	(0.2)	-	-
paint thinner	1	(0.2)	-	-
metal chain	-	-	1	(0.2)
solvent	-	-	2	(0.3)
TOTAL	586		584	

TABLE 3.B.9

DISTRIBUTION OF SELECTED SEVERITY #1 AND SEVERITY #2
EYE INJURIES, FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRY CLASSES,
IN ALBERTA, IN 1976, BY THE NATURE OF THE INJURY
(ALBERTA W.C.B. PERSONAL MEDICAL FILES)

NATURE OF INJURY	SEVERITY #1 INJURIES		SEVERITY #2 INJURIES	
	#	(%)	#	(%)
NOT KNOWN	15	(2.6)	7	(1.2)
CORNEAL ABRASION	246	(42.0)	173	(29.6)
CORNEAL ABRASION-CORNEAL EDEMA	1	(0.2)	3	(0.5)
CORNEAL ABRASION-RUST RING	39	(6.7)	84	(14.4)
DEEP CORNEAL ABRASION	-	-	3	(0.5)
CORNEAL ABRASION-CONJUNCTIVITIS	21	(3.6)	38	(6.5)
REDDENED CONJUNCTIVA	2	(0.3)	2	(0.3)
SUBCONJUNCTIVAL HEMORRHAGE	3	(0.5)	1	(0.2)
CONJUNCTIVAL SCRATCH	1	(0.2)	3	(0.5)
CORNEAL ABRASION (STROMA)-ORBITAL CONTUSION	-	-	1	(0.2)
CORNEAL ABRASION-CONJUNCTIVAL LACERATION	-	-	1	(0.2)
CONJUNCTIVITIS	39	(6.7)	21	(3.6)
CORNEAL ABRASION-CONJUNCTIVITIS-ULCERATION	-	-	1	(0.2)
INTRACONJUNCTIVAL FOREIGN BODY WITH INFLAMMATION	-	-	1	(0.2)
SCRATCH ON EYELID	-	-	1	(0.2)
CORNEAL ABRASION-RUST RING-CONJUNCTIVITIS	4	(0.7)	8	(1.4)
KERATITIS-SUBEPITHELIAL SCAR-CONJUNCTIVITIS	-	-	1	(0.2)
CONJUNCTIVITIS-MILD CONTUSION TO LIDS	-	-	1	(0.2)
IRITIS-CORNEAL ABRASION	-	-	1	(0.2)
DEEP CORNEAL ABRASION-IRITIS-RUST RING	-	-	1	(0.2)
MULTIPLE CORNEAL ABRASIONS	14	(2.4)	14	(2.4)
CONTUSION-CORNEAL ABRASION & EROSION-CONJUNCTIVAL & CILIARY INJECTION-ECCHYMOSIS OF EYELIDS	-	-	1	(0.2)
CONJUNCTIVAL ERYTHEMA-SCLERAL LACERATION	-	-	1	(0.2)
CORNEAL ABRASION-MINIMAL IRITIS CHANGES	-	-	2	(0.3)
CORNEAL ABRASION-ULCER	1	(0.2)	7	(1.2)
ACUTE CORNEAL ULCER ASSOCIATED WITH CORNEAL ABRASION	6	(1.0)	1	(0.2)
EYE IRRITATION	13	(2.2)	30	(5.1)
RUST RING	2	(0.3)	2	(0.3)
FOREIGN BODY: EDGE OF IRIS	-	-	1	(0.2)
CORNEAL ABRASION-CELLULITIS UPPER EYELID-CONJUNCTIVITIS	-	-	1	(0.2)
CORNEAL ULCER-DEEP RUST RING WITH STROMAL EDEMA	-	-	1	(0.2)
FOREIGN BODY: DEEP IN STROMA	1	(0.2)	1	(0.2)
FOREIGN BODY: CONJUNCTIVA	11	(1.9)	1	(0.2)
CORNEAL FOREIGN BODY	20	(3.4)	8	(1.4)
CORNEAL ULCER WITH EPITHELIAL EDEMA	-	-	1	(0.2)
CONJUNCTIVAL FOREIGN BODY-CORNEAL ABRASIONS-RUST RING	-	-	1	(0.2)
DEEP CORNEAL ABRASION-CONJUNCTIVITIS	-	-	2	(0.3)
POST-TRAUMATIC RETINAL TEAR WITH SECONDARY VITREOUS HEMORRHAGE	-	-	1	(0.2)
CORNEAL FOREIGN BODY-LACERATION	1	(0.2)	2	(0.3)
RUST SPOT ON CORNEA-RECURRENT ULCERATION	-	-	1	(0.2)
SMALL EROSION UNDER UPPER LID-CONJUNCTIVAL INJECTION	-	-	1	(0.2)
SCLERAL FOREIGN BODY	1	(0.2)	2	(0.3)
SWOLLEN EYELID-CONJUNCTIVITIS	-	-	1	(0.2)
CORNEAL ABRASION-SUBCONJUNCTIVAL HEMORRHAGE	1	(0.2)	1	(0.2)
CORNEAL ABRASION-CORNEAL EDEMA-CONJUNCTIVITIS	-	-	1	(0.2)
LACERATION OF EYELIDS-HAEMATOMA	-	-	1	(0.2)
PENETRATING CORNEAL LACERATION	-	-	1	(0.2)
LACERATION OF EYELID-HYPHEMA	-	-	1	(0.2)

TABLE 3.B.9 - Continued

NATURE OF INJURY	SEVERITY #1 INJURIES		SEVERITY #2 INJURIES	
	#	(%)	#	(%)
MULTIPLE CORNEAL ULCERS-RUST RING	-	-	1	(0.2)
NO INJURY NOTED	6	(1.0)	2	(0.3)
SULFURIC ACID BURNS TO CORNEA AND CONJUNCTIVA	-	-	1	(0.2)
CHROMIC ACID BURNS TO CORNEA AND CONJUNCTIVA	-	-	1	(0.2)
LIME BURNS	-	-	1	(0.2)
LIME BURNS-CHEMICAL SCLERITIS	-	-	1	(0.2)
CAUSTIC SODA BURNS-EPITHELIAL BREAKDOWN-BLEPHAROSPASM	-	-	1	(0.2)
CONJUNCTIVITIS DUE TO NITROGEN SPLASH	-	-	1	(0.2)
CHEMICAL CONJUNCTIVITIS-SULPHUR DUST	-	-	1	(0.2)
BILATERAL CORNEAL ABRASIONS AND CONJUNCTIVITIS FROM PAINT	-	-	1	(0.2)
CONJUNCTIVAL ABRASION	-	-	1	(0.2)
MARKED PURULENT CONJUNCTIVITIS WITH SMALL ABCESS ON LID	-	-	1	(0.2)
ULTRAVIOLET RADIATION BURN: CORNEA	41	(7.0)	36	(6.2)
ULTRAVIOLET RADIATION BURN: CORNEA AND CONJUNCTIVA WITH CILIARY SPASM	-	-	2	(0.3)
ULTRAVIOLET RADIATION BURN: CORNEA AND CONJUNCTIVA	-	-	29	(5.0)
ULTRAVIOLET RADIATION BURN: CORNEA, CONJUNCTIVA AND EYELIDS	-	-	2	(0.3)
CONJUNCTIVITIS DUE TO ULTRAVIOLET RADIATION BURNS	9	(1.5)	25	(4.3)
ULTRAVIOLET RADIATION BURNS: NON-SPECIFIC	1	(0.2)	12	(2.1)
CONJUNCTIVITIS & PHOTOPHOBIA DUE TO ULTRAVIOLET RADIATION BURN	-	-	3	(0.5)
IRITIS DUE TO ULTRAVIOLET RADIATION	-	-	1	(0.2)
BLEPHARITIS OF UPPER AND LOWER EYELIDS DUE TO ULTRAVIOLET RADIATION BURNS	-	-	1	(0.2)
SWELLING OF EYELIDS DUE TO ULTRAVIOLET RADIATION BURNS	-	-	1	(0.2)
ULTRAVIOLET RADIATION BURNS TO CORNEA AND CONJUNCTIVA WITH BLEPHAROSPASM	-	-	4	(0.7)
QUERY: ULTRAVIOLET RADIATION BURNS	2	(0.3)	1	(0.2)
CONJUNCTIVAL BURN FROM HOT METAL	1	(0.2)	1	(0.2)
CORNEAL AND CONJUNCTIVAL BURNS FROM HOT METAL	1	(0.2)	2	(0.3)
SECOND DEGREE BURN OF SKIN NEAR INNER CANTHUS	-	-	1	(0.2)
SECOND DEGREE BURN OF EYELIDS WITH SECONDARY INFECTION	-	-	1	(0.2)
CORNEAL BURN	-	-	1	(0.2)
DEEP BURNS TO INNER ENDS OF UPPER AND LOWER EYELIDS AND ON THE CARUNCLE	-	-	1	(0.2)
BURN TO MEDIAL CANTHUS	-	-	1	(0.2)
HEAT BURNS TO EYELIDS	5	(0.9)	1	(0.2)
HEAT BURN TO SCLERA	1	(0.2)	-	-
HEAT BURN TO UPPER EYELID	1	(0.2)	-	-
HEAT BURN TO INNER CANTHUS AND CONJUNCTIVA	1	(0.2)	-	-
CORNEAL ABRASION WITH BURN INVOLVEMENT	4	(0.7)	10	(1.7)
CHEMICAL BURN-SUBCONJUNCTIVAL HEMORRHAGE-CORNEAL ABRASION	-	-	1	(0.2)
ULTRAVIOLET RADIATION BURNS TO CORNEA AND CONJUNCTIVA WITH CORNEAL ABRASION AND RUST RING	-	-	2	(0.3)
ULTRAVIOLET RADIATION BURNS TO CORNEA AND CONJUNCTIVA WITH CORNEAL ABRASION	-	-	5	(0.9)
ULTRAVIOLET RADIATION BURNS-CORNEAL ABRASION WITH RUST RING AND STROMAL EDEMA-SECONDARY IRITIS	-	-	1	(0.2)
ULTRAVIOLET RADIATION BURNS WITH ASSOCIATED HEAT BURNS TO UPPER LID-CONTUSION OF THE GLOBE	-	-	2	(0.3)
CONJUNCTIVITIS FROM ULTRAVIOLET RADIATION BURNS-CORNEAL ABRASION-CONJUNCTIVAL HEMORRHAGE	-	-	2	(0.2)
TOTAL	586		584	

TABLE 3.B.10

DISTRIBUTION OF SELECTED SEVERITY#1 AND SEVERITY #2 EYE INJURIES, FROM A REVIEW OF 15 HIGH INJURY RISK INDUSTRIAL CLASSES, IN ALBERTA, IN 1976, ACCORDING TO WHETHER EYE PROTECTION WAS WORN AT THE TIME OF THE ACCIDENT (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

EYE PROTECTION	SEVERITY #1 INJURIES #	(%)	SEVERITY #2 INJURIES #	(%)
Not Discussed	488		424	
No	13	(13.3)	45	(28.1)
Yes; non-specific	-	-	1	(0.6)
Yes; improper fit	-	-	3	(1.9)
Goggles; flexible type (poor fit)	4	(4.1)	1	(0.6)
Yes; blown off by force	-	-	1	(0.6)
Face shield	7	(7.1)	7	(4.4)
Street glasses	-	-	4	(2.5)
Safety glasses	42	(42.9)	50	(31.3)
Helmet	9	(9.2)	13	(8.1)
Helmet and safety glasses	-	-	3	(1.9)
Helmet; glass broke on impact	-	-	3	(1.9)
Glasses; non-specific	-	-	1	(0.6)
Mono-goggles	-	-	1	(0.6)
Helmet; improper shade of glass	-	-	2	(1.3)
Helmet; foreign body in helmet	2	(2.0)	3	(1.9)
Worker had just lifted helmet	2	(2.0)	5	(3.1)
Goggles	12	(12.2)	7	(4.4)
Helmet shield not completly down	1	(1.0)	2	(1.3)
Face shield and safety glasses	1	(1.0)	6	(3.8)
Goggles; had just been removed	11	(1.0)	2	(1.3)
Face shield; had just been lifted	1	(1.0)	-	-
Goggles; not properly worn	1	(1.0)	-	-
Goggles; had holes in them	1	(1.0)	-	-
"Dark" safety glasses	1	(1.0)	-	-
TOTAL	586		584	

TABLE 3.B.11

DISTRIBUTION OF SELECTED SEVERITY #1 AND
SEVERTIY #2 EYE INJURIES, FROM A REVIEW OF
15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES,
IN ALBERTA, IN 1976, BY THE EYE INVOLVED IN THE ACCIDENT
(ALBERTA W.C.B. PERSONAL MEDICAL FILES)

EYE INVOLVED	SEVERITY #1 INJURIES		SEVERITY #2 INJURIES	
	#	(%)	#	(%)
Not Classified	2	(0.3)	3	(0.5)
Right	237	(40.4)	233	(39.9)
Left	283	(48.3)	216	(37.0)
Both	64	(10.9)	132	(22.6)
TOTAL	586		584	

right eye only in 40% of the cases, in the left eye in 48% of the cases, and in both eyes in 10% of the cases. The occurrence of severity #2 injuries is closely divided between the right and left eyes, although both eyes were affected in 23% of the cases.

Table 3.B.12 shows a distribution of selected severity #1 and severity #2 eye injuries by the type of implement or tool that was used at the time of the injury. The eye injuries studied were caused by a wide variety of implements or machines. Grinders and welders dominate, however, accounting for 35% of the severity #2 injuries and 47% of the severity #1 injuries. These implements, in addition to hand tools, were responsible for a greater proportion of the severity #2 accidents than the severity #1. It is important to note, however, that 16.4% and 21.2% of the persons with severity #1 and severity #2 eye injuries respectively were not using any implement or machine at the time of the accident.

Table 3.B.13 gives the distribution of eye injuries in relation to the provision of first aid and who rendered it, while Table 3.B.14 indicates the time at which these injuries were reported. Table 3.B.15 notes the personnel to whom the injuries were reported.

Table 3.B.13 shows that no first aid was rendered in 79.5% of the severity #1 cases and 81.7% of the severity #2 cases. It is speculated that the non-response rate is largely no first aid cases; therefore the proportion of no first aid cases could be as high as 83.0% and 82.1% respectively. The provider of first aid is not listed in a majority of cases while first aid attendants and occupational health nurses aided in approximately the same number of severity #1 as severity #2 injuries.

Table 3.B.14 shows that 54% of the severity #1 accidents and 38% of the severity #2 accidents were reported within five minutes of the acci-

TABLE 3.B.12

DISBRIBUTION OF SELECTED SEVERITY #1 AND SEVERITY #2 EYE INJURIES, FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRY CLASSES, IN ALBERTA, IN 1976, BY THE IMPLEMENT USED AT THE TIME OF THE INJURY (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

TYPE OF IMPLEMENT USED	SEVERITY #1 INJURIES		SEVERITY #2 INJURIES	
	#	(%)	#	(%)
Unknown	16	(2.7)	6	(1.0)
Non-specific	83	(14.2)	47	(8.0)
Not using implement	39	(6.7)	39	(6.7)
Not using implement; standing, walking by	8	(1.4)	9	(1.5)
Cupola	-	-	1	(0.2)
Grinder	145	(24.7)	159	(27.2)
Schecker	-	-	1	(0.2)
Refractory patching gun	-	-	1	(0.2)
Chisel	1	(0.2)	5	(0.9)
Crane	1	(0.2)	2	(0.3)
Welder	66	(11.3)	115	(19.7)
Propane torch	-	-	1	(0.2)
Wrench; power impact wrench	1	(0.2)	3	(0.5)
Soldering iron	-	-	1	(0.2)
Pop rivet gun	2	(0.3)	2	(0.3)
Press machine	-	-	1	(0.2)
Drill; power drill	27	(4.6)	16	(2.7)
Degreaser tank	-	-	1	(0.2)
Air hose	16	(2.7)	16	(2.7)
Stapler	1	(0.2)	-	-
Sand blaster (third party using)	2	(0.3)	3	(0.5)
Furnace	4	(0.7)	1	(0.2)
Cutting torch	12	(2.0)	7	(1.2)
Hammer	8	(1.4)	6	(1.0)
Compression tester	1	(0.2)	1	(0.2)
Hand tools; non-specific	20	(3.4)	24	(4.1)
Punch machine	-	-	1	(0.2)
Router	3	(0.5)	3	(0.5)
Screwdriver	-	-	1	(0.2)
Electric Sander	-	-	2	(0.3)
Air hacksaw, power saw, skilsaw	9	(1.5)	6	(1.0)
Air drill	-	-	5	(0.9)
Impact gun	1	(0.2)	1	(0.2)
Acetelene torch	1	(0.2)	1	(0.2)
Welder (third party using)	22	(3.8)	45	(7.7)
Grinder (third party using)	19	(3.2)	27	(4.6)
Air Tools; air gun	3	(0.5)	2	(0.3)
Fertilizer spreader	-	-	1	(0.2)
Power brush	-	-	2	(0.3)
Sand blaster	1	(0.2)	1	(0.2)
Grease gun	-	-	1	(0.2)
Machining equipment; non-specific	-	-	1	(0.2)
Lathe	8	(1.4)	14	(2.4)
Axe	-	-	1	(0.2)
Air hose (third party using)	1	(0.2)	1	(0.2)
Metal Cutter (third party using)	1	(0.2)	-	-
Welder arc gouger	1	(0.2)	-	-
Electric buffer	6	(1.0)	-	-
Wire brush	1	(0.2)	-	-
Steamer	1	(0.2)	-	-
Belt polisher	1	(0.2)	-	-
Brake drum turning machine	1	(0.2)	-	-
Boring bar	2	(0.3)	-	-
Drill press	1	(0.2)	-	-
Water hose	1	(0.2)	-	-
Shovel	1	(0.2)	-	-
Loader; loading bulk cars	3	(0.5)	-	-
Straightener	1	(0.2)	-	-
Skimmer	1	(0.2)	-	-

TABLE 3.B.12 (Continued)

TYPE OF IMPLEMENT USED	SEVERITY #1 INJURIES #	(%)	SEVERITY #2 INJURIES #	(%)
Impact Tool	27	(4.6)	-	-
Crowbar	1	(0.2)	-	-
Crane (third party using)	1	(0.2)	-	-
File	1	(0.2)	-	-
Paint brush	2	(0.3)	-	-
Milling machine	1	(0.2)	-	-
Knife	2	(0.3)	-	-
Sand muller	1	(0.2)	-	-
Spray paint gun	1	(0.2)	-	-
Pliers	1	(0.2)	-	-
Jack hammer	1	(0.2)	-	-
Drill (third party using)	1	(0.2)	-	-
Blade Sharpener	1	(0.2)	-	-
Impact Tool (third party using)	1	(0.2)	-	-
Shot blast machine	1	(0.2)	-	-
TOTAL	586		584	

TABLE 3.B.13

DISTRIBUTION OF SELECTED SEVERITY #1 AND SEVERITY #2 EYE INJURIES, FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, IN ALBERTA, IN 1976, ACCORDING TO WHETHER FIRST AID WAS RENDERED AT THE TIME OF THE ACCIDENT (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

FIRST AID	SEVERITY #1 INJURIES		SEVERITY #2 INJURIES	
	#	(%)	#	(%)
Not Classified	93		13	
Yes; non-specific	53	(10.8)	53	(9.2)
No	392	(79.5)	467	(81.7)
First aid attendant	34	(6.9)	37	(6.5)
Occupational health nurse	12	(2.4)	9	(1.6)
Fellow employee	1	(0.2)	2	(0.3)
Foreman	-	-	2	(0.4)
Self	-	-	1	(0.2)
Physician	1	(0.2)	-	-
TOTAL	586		584	

TABLE 3.B.14

DISTRIBUTION OF SELECTED SEVERITY #1 AND SEVERITY #2 EYE INJURIES FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRY CLASSES, IN ALBERTA, IN 1976, BY THE LENGTH OF TIME AFTER THE ACCIDENT THAT THE INJURY WAS REPORTED (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

REPORT OF ACCIDENT	SEVERITY #1 INJURIES #	(%)	SEVERITY #2 INJURIES #	(%)
Immediately; within 5 minutes	261	(54.4)	218	(38.1)
Within 1 hour	15	(3.1)	15	(2.6)
Within 4 hours	1	(0.2)	1	(0.2)
Same day	63	(13.2)	55	(9.6)
Next day	80	(16.7)	221	(38.6)
2 days later	13	(2.7)	25	(4.4)
3 days later	18	(3.1)	17	(3.0)
4 days later	4	(0.7)	11	(1.9)
5 days later	3	(0.6)	5	(0.9)
6 days later	5	(1.0)	1	(0.2)
7 days later	2	(0.4)	-	-
8 days later	1	(0.2)	-	-
10 days later	3	(0.6)	-	-
11 days later	1	(0.2)	-	-
14 days later	-	-	1	(0.2)
15 days later	2	(0.4)	-	-
21 days later	1	(0.2)	-	-
25 days later	-	-	1	(0.2)
One month or longer	1	(0.2)	1	(0.2)
Not Reported	5	(0.9)	-	-
Unknown	107	(18.3)	12	(2.1)
TOTAL	586		584	

TABLE 3.B.15

DISTRIBUTION OF SELECTED SEVERITY #1 AND SEVERITY #2
EYE INJURIES, FROM A REVIEW OF 15 HIGH EYE INJURY RISK
INDUSTRIAL CLASSES, IN ALBERTA, IN 1976, ACCORDING TO
WHOM THE EYE INJURY WAS REPORTED
(ALBERTA W.C.B. PERSONAL MEDICAL FILES)

WHOM THE INJURY WAS REPORTED TO	SEVERITY #1 INJURIES		SEVERITY #2 INJURIES	
	#	(%)	#	(%)
Not Classified	96	(16.4)	22	(3.8)
Non-specific	191	(32.6)	76	(13.0)
Purchasing agent	-	-	1	(0.2)
Employer, boss, owner	23	(3.9)	49	(8.4)
Foreman	147	(25.1)	237	(40.6)
Fellow worker	-	-	2	(0.3)
Production manager	1	(0.2)	8	(1.4)
Office manager, shop manager	32	(5.5)	5	(0.9)
Bookeeper, secretary	4	(0.7)	16	(2.7)
Personnel manager, office manager	7	(1.2)	11	(1.9)
Safety co-ordinator	-	-	5	(0.9)
First aid attendant	25	(4.3)	41	(7.0)
Company nurse	8	(1.4)	7	(1.2)
Shipper	6	(1.0)	9	(1.5)
Superintendent, supervisor	19	(3.2)	44	(7.5)
Company manager	2	(0.3)	23	(3.9)
Parts manager	2	(0.3)	7	(1.2)
Sales manager	-	-	1	(0.2)
Service manager	2	(0.3)	7	(1.2)
Worker self-employed	2	(0.3)	1	(0.2)
Maintenance staff	1	(0.2)	2	(0.3)
Inspector	-	-	1	(0.2)
Lead hand	11	(1.9)	3	(0.5)
Time keeper	1	(0.2)	5	(0.9)
Welder inspector	-	-	1	(0.2)
Purchasing agent	1	(0.2)	-	-
Injury not reported	5	(0.9)	-	-
TOTAL	586		584	

dent. In total, 71% and 50% respectively were reported the same day of the accident. A further 17% of the severity #1 accidents and 39% of the severity #2 accidents were reported the next day.

Table 3.B.15 shows that 25% of the severity #1 injuries and 41% of the severity #2 injuries were reported to the foreman (first line supervisor). The employer was notified in 4% of severity #1 cases and 8% of the severity #2 cases, while 6% and 1% respectively were reported to the shop manager. In 49% of severity #1 cases and 21% of the severity #2 cases, there was a non-specific or missing response to the question. Injuries were initially reported to a nurse or first aid attendant in only 5.7% of the severity #1 cases and 9.1% of the severity #2 cases.

Table 3.B.16 shows the number of severity #1 and severity #2 eye injuries that occurred on the employers' premises and, if possible, the location within the premises. A high proportion of the injury claims (69% of severity #1, 58% of severity #2) did not indicate where the accident took place in the employers' premises. 3.1% of the severity #2 injuries and 1.4% of the severity #1 injuries occurred on a job site, while 2.6% of the severity #2 injuries occurred in the yard outside the plant. Most injuries, therefore, occurred in defined spaces, generally where metals were being handled or processed.

Table 3.B.17 shows that 41% of the persons who incurred severity #2 injuries had a similar type of injury previously. Although there were a large number of non-responses to this question in the severity #1 category, 55% of those who responded had a similar type of injury previously. The high proportion of severity #1 injuries is logical although both rates are amazingly high. It is likely that a large number of the persons who had similar disabilities in the severity #2 category were welders. On

TABLE 3.B.16

DISTRIBUTION OF SELECTED SEVERITY #1 AND SEVERITY #2 EYE INJURIES, FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, IN ALBERTA, IN 1976, ACCORDING TO WHERE THE ACCIDENT OCCURRED ON THE EMPLOYER'S PREMISES (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

WHERE ACCIDENT OCCURRED	SEVERITY #1 INJURIES		SEVERITY #2 INJURIES	
	#	(%)	#	(%)
Unknown	92	(15.5)	14	(2.4)
Yes; non-specific	312	(53.2)	327	(56.0)
Not on employer's premises; non-specific	2	(0.3)	-	-
Millroom of plant	1	(0.2)	2	(0.3)
Paint shop	8	(1.4)	5	(0.9)
Grinding room	42	(7.2)	25	(4.3)
Welding booth, room, shop	35	(6.0)	86	(14.7)
Mould department	-	-	1	(0.2)
Furnace room	6	(1.0)	2	(0.3)
Cupola room	-	-	1	(0.2)
Factory; non-specific	-	-	1	(0.2)
Assembly line, production line	8	(1.4)	5	(0.9)
Drilling bench	-	-	1	(0.2)
Steam bay	1	(0.2)	2	(0.3)
Machine shop	17	(2.9)	22	(3.8)
Shipping department	-	-	2	(0.3)
Chrome plating room	-	-	1	(0.2)
Test track	-	-	1	(0.2)
In a mobile home, trailer	1	(0.2)	9	(1.5)
Cabinet department	-	-	1	(0.2)
Trailer shop	-	-	1	(0.2)
At construction site	-	-	4	(0.7)
Valve bay	-	-	1	(0.2)
At caustic soda tank	1	(0.2)	1	(0.2)
Mechanics bay	3	(0.5)	3	(0.5)
Engine room	-	-	1	(0.2)
At job site	8	(1.4)	12	(2.1)
Outside in yard; non-specific	12	(2.0)	15	(2.6)
Inside large pipe or tank	3	(0.5)	11	(1.9)
On oilfield	-	-	2	(0.3)
Under vehicle	16	(2.7)	1	(0.2)
Fabrication shop	4	(0.7)	12	(2.1)
Inside shell	-	-	1	(0.2)
Pipe fitting table	-	-	4	(0.7)
Compressor assembly shop	-	-	1	(0.2)
Axle department	-	-	1	(0.2)
Repair shop	-	-	3	(0.5)
Structural shop	-	-	2	(0.3)
Apprentice classes	2	(0.3)	-	-
Melt shop	1	(0.2)	-	-
Confined area; non-specific	3	(0.5)	-	-
Laminating Room	1	(0.2)	-	-
Plumbing department	1	(0.2)	-	-
Shipping department	1	(0.2)	-	-
Sand mixing area	1	(0.2)	-	-
Sheet metal shop	3	(0.5)	-	-
Service shop	1	(0.2)	-	-
By fuse box	1	(0.2)	-	-
Boiler room	1	(0.2)	-	-
Shot blast room	1	(0.2)	-	-
TOTAL	586		584	

TABLE 3.B.17

DISTRIBUTION OF SELECTED SEVERITY #1 AND SEVERITY #2 EYE INJURIES, FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, IN ALBERTA, IN 1976, ACCORDING TO WHETHER THE INJURED WORKER HAD PREVIOUSLY INCURRED A SIMILAR TYPE OF INJURY (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

SIMILAR INJURY	SEVERITY #1 INJURIES #	(%)	SEVERITY #2 INJURIES #	(%)
Not Classified	174		14	
Yes; non-specific	149	(36.2)	156	(27.4)
No similar injury previously	186	(45.1)	330	(57.9)
Same injury; same eye	49	(11.9)	56	(9.8)
Same injury; other eye	22	(5.3)	8	(1.4)
Same eye; injury non-specific	-	-	5	(0.9)
Other eye; injury non-specific	-	-	2	(0.4)
Same injury; both eyes	5	(1.2)	12	(2.0)
Multiple corneal scars both eyes (as noted by physician)	1	(0.3)	1	(6.2)
TOTAL	586		584	

the other hand, Table 3.A.18 shows the proportion of injured workers who had previously submitted a claim for any type of injury. 66% of the severity #1 claims and 69% of the severity #2 claims were in this category. The majority of injuries involved the eye, and from the claims that this type of information was given, it was found that 50% of the previous severity #1 eye injury claims and 54% of the previous severity #2 eye injury claims had occurred within one year. Three severity #2 claims showed that the workers had claimed compensation for a similar injury one week previous. Twenty-six percent of the claims for severity #1 and severity #2 indicated previous injury to another part of the body. These included the back, legs, ribs, shoulders and head.

Table 3.B.19 gives the distribution of selected severity #1 and severity #2 eye injuries in light of the possibility of a permanent disability (severity #3). Six injury claims were classified in this way.

Table 3.B.20 records the possibility of any concealment by the worker or employer of aspects of the injury as indicated by the physician. One case in each of the severity #1 and severity #2 groups was thought to involve the concealment of facts related to the accident.

Table 3.B.21 records that in one case, there was the possible involvement of a language problem in the injury.

Table 3.B.22 gives the distribution of severity #1 and severity #2 eye injuries according to the physician's estimate of the length of time the injured person would be off work. Table 3.B.23 gives the actual time that was lost by each worker as a result of the eye injury, as reported by the W.C.B. compensation accounting forms. Initially, physicians noted that 40.2% of claims, coded as severity #1, would involve some lost time, somewhere between one and six days in duration. Table 3.B.23 shows that

TABLE 3.B.18

DISTRIBUTION OF SELECTED SEVERITY #1 AND SEVERITY #2 EYE INJURIES
FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRY CLASSES, IN ALBERTA, IN 1976
ACCORDING TO A HISTORY OF PREVIOUS INJURY CLAIMS OF ANY TYPE AND THEIR TIME OF OCCURRENCE
(ALBERTA W.C.B. PERSONAL MEDICAL FILES)

PREVIOUS CLAIMS	DATE	SEVERITY #1 INJURIES		SEVERITY #2 INJURIES	
		#	(%)	#	(%)
Unclassified		16	(2.7)	10	(1.7)
Type of injury unknown	non-specific	5	(0.9)	5	(0.9)
	within 1 week	1	(0.2)	-	-
	within 1 mth	1	(0.2)	1	(0.2)
	within 1 yr	3	(0.5)	2	(0.3)
	>1 yr	4	(0.7)	2	(0.3)
No previous claims	-	197	(33.6)	181	(31.0)
Eye injury	non-specific	88	(15.0)	65	(11.1)
	within 1 week	-	-	3	(0.5)
	within 1 mth	7	(1.2)	15	(2.6)
	within 1 yr	53	(9.0)	72	(12.3)
	>1 yr	60	(10.2)	76	(13.0)
Back injury	non-specific	21	(3.6)	10	(1.7)
	within 1 day	1	(0.2)	-	-
	within 1 mth	3	(0.5)	2	(0.3)
	within 1 yr	3	(0.5)	5	(0.9)
	>1 yr	4	(0.7)	9	(1.5)
Leg-Foot injury	non-specific	19	(3.2)	10	(1.7)
	within 1 week	1	(0.2)	-	-
	within 1 mth	-	-	2	(0.3)
	within 1 yr	8	(1.4)	10	(1.7)
	>1 yr	4	(0.7)	14	(2.4)
Rib injury	non-specific	-	-	2	(0.3)
	within 1 yr	-	-	2	(0.3)
	>1 yr	-	-	2	(0.3)
Hip injury	non-specific	1	(0.2)	-	-
	within 1 yr	1	(0.2)	2	(0.3)
Arm-Shoulder injury	non-specific	2	(0.3)	-	-
	within 1 yr	-	-	3	(0.5)
	>1 yr	2	(0.3)	3	(0.5)
Face injury	within 1 yr	2	(0.3)	-	-
	>1 yr	-	-	1	(0.2)
Hand-Finger injury	non-specific	53	(9.0)	33	(5.7)
	within 1 week	1	(0.2)	-	-
	within 1 mth	-	-	2	(0.3)
	within 1 yr	6	(1.0)	15	(2.6)
	>1 yr	10	(1.7)	17	(2.9)
Head injury	non-specific	14	(2.4)	5	(0.9)
Fumes	non-specific	1	(0.2)	1	(0.2)
Neck injury	within 1 yr	-	-	1	(0.2)
	>1 yr	-	-	1	(0.2)
Hernia	non-specific	1	(0.2)	-	-
TOTAL		593		584	

TABLE 3.B.19

DISTRIBUTION OF SELECTED SEVERITY #1 AND SEVERITY #2 EYE INJURIES
FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRY CLASSES
IN ALBERTA, IN 1976, ACCORDING TO THE POSSIBILITY OF
A PERMANENT DISABILITY IN THE FUTURE
(ALBERT W.C.B. PERSONAL MEDICAL FILES)

POSSIBILITY OF PERMANENT DISABILITY	SEVERITY #1 INJURIES		SEVERITY #2 INJURIES	
	#	(%)	#	(%)
Yes	-	-	1	(0.2)
No	570	(97.3)	492	(84.2)
Not Discussed	15	(2,6)	85	(14,6)
Uncertain but probable	-	-	5	(0.9)
Worker left with corneal scar	1	(0.2)	1	(0.2)
TOTAL	586		584	

TABLE 3.B.20

DISTRIBUTION OF SELECTED SEVERITY #1 AND SEVERITY #2 EYE INJURIES, FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRY CLASSES, IN ALBERTA, IN 1976, ACCORDING TO THE POSSIBILITY OF CONCEALMENT IN THE CLAIM (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

CONCEALMENT	SEVERITY #1 INJURIES #	(%)	SEVERITY #2 INJURIES #	(%)
Not discussed	289	(49.3)	253	(43.4)
No	296	(50.5)	330	(56.5)
Yes	1	(0.2)	1	(0.2)
TOTAL	586		584	

TABLE 3.B.21

DISBTRIBUTION OF SELECTED SEVERITY #1 AND SEVERITY #2 EYE INJURIES FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRY CLASSES, IN ALBERTA, IN 1976, ACCORDING TO THE POSSIBILITY OF THE INVOLVEMENT OF A LANGUAGE PROBLEM IN THE INJURY (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

LANGUAGE PROBLEM	SEVERITY #1 INJURIES #	(%)	SEVERITY #2 INJURIES #	(%)
Unknown	-	-	2	(0.3)
Yes	-	-	1	(0.2)
No	586	(100)	581	(99.5)
TOTAL	586		584	

TABLE 3.B.22

DISTRIBUTION OF SELECTED SEVERITY #1 AND SEVERITY #2 EYE INJURIES FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRY CLASSES, IN ALBERTA, IN 1976, ACCORDING TO THE PHYSICIAN'S ESTIMATE OF THE LENGTH OF TIME THE INJURED WORKER WILL BE OFF WORK (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

ESTIMATED TIME OFF WORK	SEVERITY #1 INJURIES #	(%)	SEVERITY #2 INJURIES #	(%)
1 day	93	(15.9)	94	(16.1)
2 days	40	(6.8)	92	(15.8)
3 days	11	(1.9)	50	(8.6)
4 days	4	(0.7)	19	(3.3)
5 days	1	(0.2)	10	(1.7)
6 days	-	-	6	(1.0)
7 days	-	-	6	(1.0)
8 days	-	-	3	(0.5)
9 days	-	-	1	(0.2)
10 days	-	-	1	(0.2)
11 days	-	-	1	(0.2)
13 days	-	-	1	(0.2)
14 days	-	-	1	(0.2)
No lay off	281	(47.9)	31	(5.3)
Less than 7 days	84	(14.3)	208	(35.6)
7 - 14 days	2	(0.3)	17	(2.9)
One month or longer	-	-	1	(0.2)
Not Discussed	70	(11.9)	42	(7.2)
TOTAL	586		584	

TABLE 3.B.23

DISTRIBUTION OF SELECTED SEVERITY #1 AND SEVERITY #2 EYE INJURIES,
FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRY CLASSES,
IN ALBERTA, IN 1976, BY THE ACTUAL TIME LOST
BY THE WORKER AS A RESULT OF THE EYE INJURY
(ALBERTA W.C.B. PERSONAL MEDICAL FILES)

REAL TIME OFF	SEVERITY #1 INJURIES #	(%)	SEVERITY #2 INJURIES #	(%)
No lost time	577	(98.5)	40	(6.8)
1 day	4	(0.7)	234	(40.1)
2 days	2	(0.3)	145	(24.8)
3 days	1	(0.2)	64	(11.0)
4 days	-	-	40	(6.8)
5 days	-	-	21	(3.6)
6 days	-	-	12	(2.1)
7 days	1	(0.2)	6	(1.0)
8 days	-	-	5	(0.9)
9 days	-	-	8	(1.4)
13 days	-	-	3	(0.5)
14 days	-	-	1	(0.2)
15 days	-	-	1	(0.2)
19 days	-	-	1	(0.2)
22 days	-	-	1	(0.2)
61 days	-	-	1	(0.2)
69 days	-	-	1	(0.2)
164 days	1	(0.2)	-	-
TOTAL	586		584	

only 1.6% finally required compensation, as evidenced by final compensation reports. Table 3.B.22 shows that, for injuries classed as severity #2, physicians initially indicated no time off for 3.8%, time loss of less than one week for 83.4% of the cases, time loss of greater than seven days for 5.6%, and did not discuss the matter in 7.2% of the severity #2 cases. As it finally turned out, 6.8% did not involve lost time, 88.7% involved time loss of one to six days, and the remaining 5.0% involved compensation of greater than seven days. 65% of the cases involved compensation of between one and two days.

Table 3.B.24 gives a distribution of eye injuries according to the need for hospitalization as a result of the injury. Eight severity #2 and one severity #1 cases were in this category. Table 3.B.25 gives the total costs of the hospitalization (including emergency outpatient services) while Table 3.B.26 reports the cost of all physicians' services incurred in treating the reported eye injuries. Table 3.B.27 shows a distribution of eye injuries in relation to the weekly wage of the worker who received compensation. This can be related to the number of days the person was unable to work.

Table 3.B.28 gives a listing of selected serious or unusual events causing eye injuries that were noted while examining the selected severity #1 and severity #2 personal medical files. Very few unusual events caused eye injuries in comparison to the number of injuries that were studied (1070). These unusual or serious events, however, are varied and involve the spectrum of hazards. A few injuries were due to worker negligence and equipment design but most resulted simply from a more severe form of the common hazards.

TABLE 3.B.24

DISTRIBUTION OF SELECTED SEVERITY #1 AND SEVERITY #2 EYE INJURIES FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES IN ALBERTA, IN 1976, BY ANY HOSPITALIZATION THAT OCCURRED AS A RESULT OF THE EYE INJURY (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

HOSPITALIZATION	SEVERITY #1 INJURIES #	SEVERITY #1 INJURIES (%)	SEVERITY #2 INJURIES #	SEVERITY #2 INJURIES (%)
1 Day	2	(0.3)	3	(0.5)
2 Days	-	-	2	(0.3)
3 Days	-	-	2	(0.3)
4 Days	-	-	1	(0.2)
No Hospitalization	584	(99.7)	576	(98.6)
TOTAL	586		584	

TABLE 3.B.25

DISTRIBUTION OF SELECTED SEVERITY #1 AND SEVERITY #2 EYE INJURIES FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES IN ALBERTA, IN 1976, ACCORDING TO THE COSTS OF HOSPITAL SERVICES* FOR TREATING THE INJURIES (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

COSTS OF HOSPITAL SERVICES (DOLLARS)	SEVERITY #1 INJURIES #	SEVERITY #1 INJURIES (%)	SEVERITY #2 INJURIES #	SEVERITY #2 INJURIES (%)
No Costs	215	(36.7)	181	(31.0)
$ 3.00	96	(16.4)	70	(12.0)
4.00	74	(12.6)	43	(7.4)
5.00	20	(3.4)	22	(3.8)
6.00	16	(2.7)	21	(3.6)
7.00	54	(9.2)	54	(9.2)
8.00	38	(6.5)	49	(8.4)
9.00	16	(2.7)	16	(2.7)
10.00	13	(2.2)	14	(2.4)
11.00	7	(1.2)	12	(2.1)
12.00	6	(1.0)	6	(1.0)
13.00	5	(0.9)	8	(1.4)
14.00	4	(0.7)	10	(1.7)
15.00	3	(0.5)	5	(0.9)
16.00	1	(0.2)	9	(1.5)
17.00	3	(0.5)	11	(1.9)
18.00	1	(0.2)	6	(1.0)
19.00	1	(0.2)	4	(0.7)
20.00	-	-	2	(0.3)
21.00	-	-	4	(0.7)
22.00	2	(0.3)	2	(0.3)
23.00	-	-	2	(0.3)
24.00	2	(0.3)	5	(0.9)
26.00	3	(0.5)	1	(0.2)
27.00	1	(0.2)	-	-
28.00	1	(0.2)	1	(0.2)
29.00	-	-	2	(0.3)
30.00	-	-	4	(0.7)
31.00	-	-	2	(0.3)
35.00	1	(0.2)	2	(0.3)
39.00	-	-	1	(0.2)
41.00	1	(0.2)	1	(0.2)
42.00	-	-	1	(0.2)
44.00	-	-	2	(0.3)
50.00	-	-	1	(0.2)
54.00	-	-	1	(0.2)
67.00	-	-	1	(0.2)
74.00	-	-	1	(0.2)
78.00	1	(0.2)	1	(0.2)
81.00	-	-	1	(0.2)
145.00	1	(0.2)	-	-
198.00	-	-	1	(0.2)
238.00	-	-	1	(0.2)

TABLE 3.B.25 (Continued)

COSTS OF HOSPITAL SERVICES (DOLLARS)	SEVERITY #1 INJURIES #	(%)	SEVERITY #2 INJURIES #	(%)
$284.00	-	-	1	(0.2)
342.00	-	-	1	(0.2)
619.00	-	-	1	(0.2)
TOTAL	586		584	

*This figure includes the costs of prescription drugs

TABLE 3.B.26

DISTRIBUTION OF SELECTED SEVERITY #1 AND SEVERITY #2 EYE INJURIES, FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, IN ALBERTA, IN 1976, ACCORDING TO THE COSTS OF PHYSICIANS' SERVICES IN TREATING THE INJURIES (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

COSTS OF PHYSICIANS' SERVICES (DOLLARS)	SEVERITY #1 INJURIES #	(%)	SEVERITY #2 INJURIES #	(%)
No Cost	34	(5.8)	19	(3.3)
$ 4.00	-	-	1	(0.2)
5.00	7	(1.2)	-	-
6.00	7	(1.2)	12	(2.1)
7.00	1	(0.2)	-	-
8.00	-	-	1	(0.2)
10.00	19	(3.2)	8	(1.4)
11.00	335	(57.2)	185	(31.7)
12.00	6	(1.0)	14	(2.4)
13.00	8	(1.4)	4	(0.7)
14.00	-	-	5	(0.9)
15.00	4	(0.7)	4	(0.7)
16.00	8	(1.4)	7	(1.2)
17.00	42	(7.2)	36	(6.2)
18.00	21	(3.6)	33	(5.7)
19.00	4	(0.7)	8	(1.4)
20.00	1	(0.2)	5	(0.9)
21.00	9	(1.5)	6	(1.0)
22.00	22	(3.8)	43	(7.4)
23.00	3	(0.5)	18	(3.1)
24.00	15	(2.6)	27	(4.6)
25.00	1	(0.2)	-	-
26.00	5	(0.9)	7	(1.2)
27.00	2	(0.3)	6	(1.0)
28.00	6	(1.0)	7	(1.2)
29.00	1	(0.2)	11	(1.9)
30.00	2	(0.3)	7	(1.2)
31.00	7	(1.2)	8	(1.4)
32.00	-	-	2	(0.3)
33.00	4	(0.7)	14	(2.4)
34.00	-	-	6	(1.0)
35.00	2	(0.3)	7	(1.2)
36.00	-	-	1	(0.2)
37.00	2	(0.3)	6	(1.0)
38.00	-	-	3	(0.5)
39.00	1	(0.2)	4	(0.7)
40.00	-	-	3	(0.5)
41.00	1	(0.2)	1	(0.2)
42.00	-	-	4	(0.7)
43.00	-	-	3	(0.5)
44.00	-	-	5	(0.9)
45.00	-	-	5	(0.9)

TABLE 3.B.26 (Continued)

COSTS OF PHYSICIANS' SERVICES (DOLLARS)	SEVERITY #1 INJURIES #	(%)	SEVERITY #2 INJURIES #	(%)
46.00	-	-	7	(1.2)
47.00	-	-	4	(0.7)
48.00	1	(0.2)	4	(0.7)
49.00	-	-	3	(0.5)
50.00	-	-	1	(0.2)
52.00	-	-	3	(0.5)
53.00	1	(0.2)	-	-
56.00	-	-	1	(0.2)
58.00	-	-	-	-
59.00	1	(0.2)	-	-
61.00	1	(0.2)	-	-
63.00	1	(0.2)	1	(0.2)
65.00	-	-	1	(0.2)
66.00	-	-	2	(0.3)
68.00	-	-	1	(0.2)
70.00	-	-	1	(0.2)
72.00	-	-	1	(0.2)
73.00	-	-	1	(0.2)
75.00	-	-	1	(0.2)
76.00	-	-	1	(0.2)
78.00	-	-	1	(0.2)
82.00	-	-	1	(0.2)
88.00	1	(0.2)	-	-
171.00	-	-	1	(0.2)
179.00	-	-	1	(0.2)
238.00	-	-	1	(0.2)
TOTAL	586		584	

TABLE 3.B.27

DISTRIBUTION OF SELECTED SEVERITY #1 AND SEVERITY #2 EYE INJURIES FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES IN ALBERTA, IN 1976, BY THE WEEKLY WAGE OF THE INJURED WORKER WHO INCURRED A LOST WORK TIME INJURY (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

WEEKLY WAGE OF WORKER WITH A LOST TIME INJURY	SEVERITY #1 INJURIES #	(%)	SEVERITY #2 INJURIES #	(%)
Not classified	579	(98.6)	40	(6.8)
$ 90.00	-	-	1	(0.2)
93.00	-	-	2	(0.3)
99.00	-	-	1	(0.2)
105.00	-	-	4	(0.7)
110.00	-	-	1	(0.2)
111.00	-	-	1	(0.2)
112.00	-	-	1	(0.2)
113.00	-	-	2	(0.3)
118.00	-	-	1	(0.2)
120.00	-	-	11	(1.9)
123.00	-	-	2	(0.3)
124.00	-	-	2	(0.3)
125.00	-	-	1	(0.2)
126.00	-	-	1	(0.2)
128.00	-	-	4	(0.7)
129.00	-	-	3	(0.5)
130.00	-	-	1	(0.2)
131.00	-	-	4	(0.7)
132.00	-	-	3	(0.5)
133.00	-	-	2	(0.3)
134.00	-	-	1	(0.2)
135.00	-	-	6	(1.0)
136.00	-	-	1	(0.2)
137.00	-	-	3	(0.5)
138.00	-	-	2	(0.3)
139.00	-	-	2	(0.3)
140.00	-	-	6	(1.0)
141.00	-	-	3	(0.5)
142.00	-	-	1	(0.2)
143.00	1	(0.2)	9	(1.5)
144.00	-	-	2	(0.3)
145.00	-	-	6	(1.0)
146.00	-	-	1	(0.2)
148.00	-	-	2	(0.3)
149.00	-	-	4	(0.7)
150.00	-	-	9	(1.5)
151.00	-	-	2	(0.3)
152.00	-	-	4	(0.7)
153.00	-	-	5	(0.9)
155.00	-	-	4	(0.7)
156.00	-	-	8	(1.4)

TABLE 3.B.27 (Continued)

WEEKLY WAGE OF WORKER WITH A LOST TIME INJURY	SEVERITY #1 INJURIES #	(%)	SEVERITY #2 INJURIES #	(%)
$157.00	-	-	2	(0.3)
158.00	8	(1.4)	8	(1.4)
159.00	-	-	2	(0.3)
160.00	-	-	6	(1.0)
161.00	-	-	3	(0.5)
162.00	-	-	3	(0.5)
163.00	-	-	3	(0.5)
164.00	-	-	4	(0.7)
165.00	-	-	12	(2.1)
166.00	-	-	3	(0.5)
167.00	-	-	2	(0.3)
168.00	-	-	8	(1.4)
169.00	1	(0.2)	3	(0.5)
171.00	-	-	7	(1.2)
172.00	-	-	2	(0.3)
173.00	-	-	4	(0.7)
174.00	-	-	2	(0.3)
175.00	-	-	3	(0.5)
176.00	-	-	3	(0.5)
177.00	-	-	4	(0.7)
178.00	-	-	2	(0.3)
179.00	-	-	4	(0.7)
180.00	-	-	13	(2.2)
182.00	1	(0.2)	9	(1.5)
183.00	-	-	5	(0.9)
184.00	-	-	1	(0.2)
185.00	-	-	7	(1.2)
186.00	-	-	3	(0.5)
187.00	-	-	121	(20.7)
188.00	-	-	5	(0.9)
189.00	-	-	4	(0.7)
190.00	-	-	1	(0.2)
191.00	1	(0.2)	2	(0.3)
192.00	-	-	2	(0.3)
193.00	-	-	1	(0.2)
194.00	-	-	1	(0.2)
195.00	-	-	2	(0.3)
196.00	-	-	3	(0.5)
197.00	-	--	1	(0.2)
198.00	-	-	4	(0.7)
199.00	-	-	3	(0.5)
201.00	-	-	2	(0.3)
202.00	1	(0.2)	2	(0.3)
204.00	-	-	2	(0.3)
206.00	-	-	2	(0.3)

TABLE 3.B.27 (Continued)

WEEKLY WAGE OF WORKER WITH A LOST TIME INJURY	SEVERITY #1 INJURIES #	(%)	SEVERITY #2 INJURIES #	(%)
$207.00	-	-	2	(0.3)
208.00	-	-	6	(1.0)
209.00	1	(0.2)	119	(20.4)
255.00	-	-	1	(0.2)
287.00	-	-	1	(0.2)
TOTAL	586		584	

TABLE 3.B.28

LISTING OF SELECTED SERIOUS OR UNUSUAL EVENTS
CAUSING EYE INJURIES, FROM A REVIEW OF 15 HIGH EYE
INJURY RISK INDUSTRIAL CLASSES, IN ALBERTA, IN 1976
(ALBERTA W.C.B. PERSONAL MEDICAL FILES)

INJURY	EVENT
1. Foreign bodies in eye	Worker wore goggles but had drilled small holes in them to prevent fogging. 30-40 pieces of grindings were removed from eyes.
2. Burns to eyelids	Worker was using a lathe when hot metal entered the left eye.
3. Steel foreign bodies (causing deep corneal lacerations)	Machinist was working at milling machine when foreign bodies entered eyes.
4. Corneal abrasions	Worker was drilling metal when flying chip of steel hit glasses breaking them.
5. Deep corneal abrasions and ulceration	Worker was wearing helmet and safety glasses. Foreign body entered helmet and fell behind safety glasses as helmet was being removed.
6. Severe corneal laceration	Welder was grinding brace. Had been wearing a helmet but removed it as he could not see well.
7. Radiation burn as well as burn from hot welding rod	Injury occurred just as helmet was being raised
8. Inner eye hemorrhage	Worker was welding when he was hit from the side by an unspecified blunt object.
9. Corneal abrasion	Worker was standing about 40 feet from grinder changing his safety glasses for a face shield when metallic foreign body flew into right eye.
10. Corneal abrasion	Worker was walking by grinder when foreign body entered eye. Employer did not think language problem was a contributing factor although it was suspected.
11. Foreign body causing deep corneal abrasions	Welder was wearing a helmet and had just lifted it up when material flew into his eye from a grinder beside him.
12. Laceration of eyelid with hemorrhage inside the eye	Welder was hit with hook on a chain that was used to move beams in place for welding. Worker did not speak english.
13. Corneal abrasion and conjunctivitis	Worker was chopping wood with an axe when a piece flew up and hit him in the side of the head and in his eye.
14. Corneal laceration	Worker was checking the bit of a power drill when the drill whipped up striking the side of the eye.
15. Ultraviolet radiation burns	The injured worker was explaining the job to another welder (who did not understand english) who began welding before eye protection could be put on.
16. Laceration of eyelid	Worker was hit in the eye with the handle of a wrench.
17. Chemical burns to cornea and conjunctiva	Worker was transferring chromic acid when it splashed into the eyes.
18. Glass fragment causing corneal abrasion	Worker was grinding a welded pipe joint when the grinding disc broke apart shattering the glass protective lens in the welding helmet.
19. Caustic burns to eyes	Caustic soda tank exploded.
20. Corneal abrasions	Worker struck in eye with part of a pop rivet.

3.B.D. Discussion of the Results of a Review of W.C.B. Personal Medical Files

This section is concerned with the discussion of the results of the study of 1070 personal medical files of workers who reported eye injuries to the W.C.B. in 1976. This analysis concerns injuries within the same high risk industry classes that were discussed in Section 3.A., Part 2. The purpose of this analysis was threefold: first, to look at these files in greater detail, especially in noting sources and natures of injury; second, to retrieve information concerning prevention that the W.C.B. statistical master file did not have, notably, concerning the use of eye protection, the implement used at the time of the injury, if the principal worker in the job task was injured,and the cost of the lost time accident; and, third, to examine this information in detail and validity in relation to the same portion of the W.C.B. statistical master file.

The presentation of results according to industry classes shows much the same findings as in the previous section. It is interesting to note, however, the variation in severity #2 to severity #1 injuries in these detailed classes. It may be speculated that a preponderance of severity #2 injuries over severity #1 may be due to the nature of the hazards in the plant, or that eye protection which could minimize an injury is not issued.

It is significant to note that a majority of the injuries studied occurred among a few occupational groups. Age and experience may account for the fact that apprentices and helpers were frequently involved. A number of the occupations (e.g. welding) rely on teamwork where a lack of communication could easily result in an accident. In that so few groups are involved to any degree, it is interesting to speculate on the effect of specific occupational, educational programs.

The results of this study (Section B, Table 3.B.7)indicate that the majority of eye injuries are caused by foreign bodies or welding radiation. Foreign bodies cause more severity #1 injuries than severity #2 injuries as would be expected. Welding radiation caused twice the proportion of severity #2 injuries than severity #1 injuries because most radiation burns require 24 to 48 hours of convalescence. However, there is probably gross under reporting in this area because radiation (arc eye) injuries are often considered a part of the job, and self-administration of topical anaesthetics is common.

The study of the nature of the injury (Table 3.B.9)shows that uncomplicated corneal abrasions occur in more severity #1 accidents,while corneal abrasions that are complicated by rust and conjunctivitis involve compensation for lost time. In general, the nature of the eye injury in severity #1 cases is more well defined, primarily because of the simplicity of the causes. The nature of severity #2 injuries is similar in causation (excepting chemical and radiation burns which are more prevalent as severity #2 injuries) but generally involve complications. This is a situation where prompt recognition and first aid of the injury could reduce compensation claims.

Information that was obtained on the use of eye protection at the time of the accident was volunteered as the accident reporting forms do not ask this question. Of those who reported on this aspect of their accident, it was found that 13% of the severity #1 accidents and 28% of the severity #2 accidents did not involve the use of eye protection. These figures are very low in relation to a general rate of 59% in the literature. There is reason to believe, therefore, that many non-respondents were not wearing eye protection as well.

In both severity #1 and severity #2 injuries, the majority of respondents, 43% and 31% respectively, were wearing safety glasses only. No indication was given concerning the use of side shields on the safety glasses. There are cases of improper fit in addition to improper use of the protection. It is significant to note that only three cases involve a physical failure of the protection. Each of these cases involved the impact resistance of the glass plate in welding helmets. It is likely that a great proportion of the eye injuries that occurred while protection was worn could be prevented by the proper selection of a protector and proper fitting.

Right hand dominance could be responsible for the high proportion of severity #1 injuries to the left eye (Table 3.B.11). The low incidence of injuries to both eyes follows from the low incidence of chemical and radiation burns in this category, and a preponderance of isolated flying particles. The presence of nearly equal proportions of severity #2 eye injuries for each eye suggests a random selection procedure in cases where the injury source is severe enough to result in lost time. The higher proportion of severity #2 injuries to both eyes suggests the presence of a greater proportion of chemical and radiation injuries.

The results of this section (Table 3.B.12) show that welding machines, grinders and handtools are responsible for the majority of eye injuries. Workers were involved also who were helping on the job or walking by with inadequate protection. It is apparent that carelessness and lack of concern, in addition to non-compliance in the use of eye protection, may be responsible for a large number of these common injuries.

In relation to the results shown in Table 3.B.14 it is logical that a greater proportion of severity #2 accidents than severity #1 accidents would be reported the next day (e.g. radiation burns, which are generally severity

#2 injuries, take four to six hours to manifest) but the overall high rate of reporting the next day is not consistent with the type of injuries where this would be expected. It is possible that prompt reporting and first aid treatment could reduce or eliminate many of the sequellae of these injuries that result in lost time.

Table 3.A.15 shows that eye injuries are reported to a surprisingly diverse group of people, the majority without training in first aid. This is of concern especially in the case of severity #2 injuries, where prompt first aid could reduce the seriousness of a severity #2 claim. A high proportion of the severity #2 accidents are reported to personnel within the company office, just as one might phone in sick. This proportion is, however, far higher than is indicated by the number of people that reported injuries the next day. Injuries should be reported to designated personnel and regulations should be developed to ensure prompt reporting.

A large proportion of the injuries studied in this section involved workers who had incurred similar or other types of injuries in the past. Although it may be speculated that this represents accident proneness, one must consider the worker's occupation, or the risk factor. The recurrence of injury may be called job carelessness more accurately where education could be of great benefit in reducing eye injuries.

Table 3.B.19 severity #1 and severity #2 cases are classified according to the possibility of permanent disability. This aspect of accident reporting was discussed in Part 3.A where many severity #2 injuries were eventually found to be permanent disability claims. In this section, six severity #2 claims were classified in this way. If this proportion of injuries were extrapolated over the entire number of severity #2 claims in 1976 (2,854), one might expect to see about 30 claims classified in this way.

This, in addition to the seven cases already classified as severity #3, brings the total for expected severity #3 claims to 37, which is close to the number of permanent disability claims in 1975 (Table 3.A.11).

Tables 3.A.22 and 3.A.23 show that physicians tended to over-estimate the need for compensation (days off work). This is especially evident where many injuries estimated initially to require time off work did not require compensation at all. It is evident that physicians are attempting to act in the best interests of their patients and in doing so, are extra cautious.

The total direct cost of the severity #2 eye injuries was calculated by adding the costs of hospitalization, physicians' services and compensation for lost time. Table 3.B.29 categorizes the magnitude of the total costs per patient. 45% of the claims cost $75 or less, nearly 75% of the claims cost $125 or less, and 90% of the claims cost $200 or less. The total direct cost of 584 severity #2 eye injuries was $69,513, or $119 per person on average. The literature notes a hidden to direct cost of 4:1 ($69,513 x 4), bringing the total cost of these eye injuries to $347,565.00, or $595.15 per person. The determination of the costs of severity #1 injuries was not approached in this detail, but the total cost of 586 injuries (minus the cost of any reported loss in wages, which by definition, should be a severity #2 injury) was $10,683 for an average cost of $18.23 per person. The same indirect to direct cost ratio does not strictly apply, but one must consider the hidden costs of productivity loss, time off the job for treatment, etc.

To establish relationships between some of the selected variables that have been discussed previously, several cross-tabulations were performed.

Cross-tabulation Table 3.B.30 shows the correlation between the type

TABLE 3.B.29

DISTRIBUTION OF THE DIRECT COSTS* OF 584 EYE INJURIES, SELECTED THROUGH A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, IN ALBERTA, IN 1976 (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

COST	NUMBER OF CLAIMS	(%)	CUMULATIVE FREQUENCY (%)
$ 0. - $ 25.	37	(6.3)	--
$ 26. - $ 50.	76	(13.0)	19.3
$ 51. - $ 75.	152	(26.0)	45.3
$ 76. - $100.	96	(16.4)	61.7
$ 101. - $125.	74	(12.7)	74.4
$ 126. - $150.	41	(7.0)	81.4
$ 151. - $175.	24	(4.1)	85.5
$ 176. - $200.	22	(3.8)	89.3
$ 201. - $225.	14	(2.4)	91.7
$ 226. - $250.	10	(1.7)	93.4
$ 251. - $275.	3	(0.5)	93.9
$ 276. - $300.	8	(1.4)	95.3
$ 301. - $325.	4	(0.7)	96.0
$ 326. - $350.	3	(0.5)	96.5
$ 351. - $375.	3	(0.5)	97.0
$ 376. - $400.	3	(0.5)	97.5
$ 401. - $425.	2	(0.3)	97.8
$ 426. - $450.	1	(0.2)	98.0
$ 451. - $475.	1	(0.2)	98.2
$ 476. - $500.	0	(0.0)	--
$ 501. - $600.	2	(0.3)	98.5
$ 601. - $700.	1	(0.2)	98.7
$ 701. - $800.	1	(0.2)	98.9
$ 801. - $900.	3	(0.5)	99.4
$ 930.	1	(0.2)	99.6
$2870.	1	(0.2)	99.8
$3140.	1	(0.2)	100.0
TOTAL	584		

*DIRECT COST OF INJURY = COST OF PHYSICIANS SERVICES + COST OF HOSPITAL SERVICES (WEEKLY WAGE ÷ 5) X DAYS OF LOST TIME

TABLE 3.B.30

CROSSTABULATION OF 15 HIGH EYE INJURY RISK INDUSTRY CLASSES
WITH THE CAUSES OF INJURY, FOR 586 SEVERITY #1 INJURIES
PROVINCE OF ALBERTA, 1976
(ALBERTA W.C.B. PERSONAL MEDICAL FILES)

INDUSTRY CLASS	ROW % TOTAL %	CAUSE OF INJURY													
		Not Classified	Foreign Body non-specific	Flying spark-piece of metal	Welding flash radiation	Foreign body non-metallic	Air blew FB into eye	Hot metal splatter	Sharp object	Harmful liquids and corrosives	Worker rubbed eyes	flying fragment or object	wind blew FB into eye	Blunt object	Row Total (%)
MFG OF STEEL			16 (0.9)	49 (2.9)	5 (0.3)	3 (0.2)	3 (0.2)	3 (0.2)		3 (0.2)			18 (1.0)		100 (5.9)
FOUNDRY: IRON OR STEEL			5 (0.5)	73 (6.4)	5 (0.4)	13 (1.1)		2 (0.2)					2 (0.2)		100 (8.8)
FAB,MFG,REPAIR METAL PRODUCTS			16 (2.7)	55 (9.0)	12 (1.9)	8 (1.3)	4 (0.7)					1 (0.2)	4 (0.6)		100 (16.4)
FABRICATION STRUCTURAL STEEL			9 (0.7)	76 (6.3)	6 (0.5)		2 (0.2)			2 (0.2)			4 (0.4)		100 (8.3)
MFG HEATING COOLING EQUIPMENT			16 (0.5)	58 (1.8)	10 (0.3)	10 (0.3)						2 (0.2)			100 (3.1)
AUTOMOTIVE MACHINE SHOP			15 (1.4	56 (5.2)		18 (1.7)	5 (0.5)		2 (0.2)	2 (0.2)	2 (0.2)				100 (9.4)
MACHINE SHOP			23 (1.9)	56 (4.7)	15 (1.2)	2 (0.2)		2 (0.2)			2 (0.2)				100 (8.4)
MFG OF AGRICULTURAL IMPLEMENTS			11 (0.6)	52 (3.0)	19 (1.1)	9 (0.5)	3 (0.2)					3 (0.2)	3 (0.2)		100 (5.8)
MFG OF VEHICLES			7 (0.4)	54 (3.3)	11 (0.7)	15 (0.9)	3 (0.2)	5 (0.3)					5 (0.3)		100 (6.1)
MFG OF HOLIDAY TRAILERS,CAMPERS		4 (0.3)	18 (1.6)	34 (3.0)		21 (1.8)	2 (0.2)					16 (1.4)	5 (0.4)		100 (8.7)
MFG OF TRUCK BODIES,CABS,TRAILERS			5 (0.4)	40 (3.4)	22 (1.9)	15 (1.3)			2 (0.2)	5 (0.4)	2 (0.2)		7 (0.6)	2 (0.2)	100 (8.6)
MFG OF WOODEN TRUCK BOXES				60 (0.3)							40 (0.2)				100 (0.5)
MFG OF LIME				12 (0.2)		12 (0.2)				52 (0.9)			12 (0.2)	12 (0.2)	100 (1.7)
BLACKSMITH SHOP				100 (0.2)											100 (0.2)
WELDING				31 (2.5)	44 (3.6)	15 (1.2)	4 (0.3)					4 (0.3)	2 (0.2)		100 (8.1)
TOTAL		(0.3)	(11.6)	(52.2)	(11.9)	(10.7)	(2.5)	(0.9)	(0.4)	(1.9)	(0.8)	(2.5)	(4.1)	(0.2)	(100)

of industry and the cause of the injury for severity #1 injuries. On the whole, the proportion of injury causes per industry class remains fairly consistent among the various industry classes, with flying spark/piece of metal first, following by welding flash or radiation, and foreign body non-specific. There are some notable exceptions. In the foundry and structural steel fabrication industries, there is a higher proportion of injuries due to pieces of metal from flying sparks (grinding) and substantially less injuries due to welding flash. Trailer and camper manufacturers show a low proportion of injuries due to flying sparks and an absence of injuries due to radiation. In this industry, however, there is a preponderance of injuries due to large and small non-metallic bodies, notably wood. Welding shops also report a low proportion of injuries due to flying sparks (pieces of metal) but, naturally, this is compensated by a very high incidence of injuries due to welding flash.

For severity #2 injuries (Cross-tabulation Table 3.B.31) the pattern of injury causes among industry classes is not as consistent as it was for severity #1. About 80% of the severity #2 injuries in the foundry and heating industries were caused by flying sparks (probably due to grinding).

Trailer and camper manufacturers and vehicle manufacturers report a lower than average proportion of injuries due to flying sparks. However, 76% of the severity #2 injuries in the vehicle manufacturing industry are due to welding flash. The majority of claims (48%) in the trailer and camper industry are due to non-metallic foreign bodies. These results show logical increases in specific types of eye injuries in the industries where the respective hazards are present that cause them.

Cross-tabulation Table 3.B.32 shows the relation between the injured workers' occupation and the cause of injury, for severity #1 injuries. A

TABLE 3.B.31

CROSSTABULATION OF 15 HIGH EYE INJURY RISK INDUSTRY CLASSES
WITH THE CAUSES OF INJURY, FOR 584 SEVERITY #2 INJURIES
PROVINCE OF ALBERTA, 1976
(ALBERTA W.C.B. PERSONAL MEDICAL FILES)

INDUSTRY CLASS (ROW % / TOTAL %)	CAUSE OF INJURY: Not Classified	Foreign Body non-specific	Flying spark piece of metal	Welding flash radiation	Foreign body non-metallic	Electrical Flash	Hot metal splatter	Sharp object	Harmful liquid and corrosive	Welding injury	Flying frag-ment: object	Welding flash metallic FB	Wind blew FB into eye	Blunt object	TOTAL ROW %
MFG OF STEEL				50 (0.2)							50 (0.2)				100 (0.4)
FOUNDRY: STEEL OR IRON		5 (0.3)	80 (4.5)		7 (0.4)	4 (0.2)	4 (0.2)								100 (5.6)
FAB,MFG,REPAIR METAL PRODUCTS		5 (1.5)	58 (18.7)	25 (7.7)	2 (0.7)			1 (0.2)	1 (0.2)	1 (0.2)	3 (0.8)	1 (0.4)	2 (0.7)	1 (0.2)	100 (31.5)
FABRICATION STRUCTURAL STEEL	1 (0.2)	4 (0.7)	59 (9.7)	22 (3.5)					3 (0.5)	2 (0.3)	2 (0.3)	2 (0.4)	5 (0.9)		100 (16.5)
MFG HEATING COOLING EQUIPMENT			78 (1.5)	11 (0.2)				11 (0.2)							100 (1.9)
AUTOMOTIVE MACHINE SHOP		24 (0.5)	43 (0.9)						33 (0.7)						100 (2.1)
MACHINE SHOP		2 (0.2)	68 (8.3)	14 (1.7)	6 (0.7)		3 (0.4)		3 (0.4)		4 (0.5)				100 (12.2)
MFG OF AGRICULTURAL IMPLEMENTS		11 (0.3)	57 (1.6)	25 (0.7)	7 (0.2)										100 (2.8)
MFG OF VEHICLES		10 (0.2)	14 (0.3)	66 (1.4)	10 (0.2)										100 (2.1)
MFG OF HOLIDAY TRAILERS,CAMPERS		5 (0.2)	27 (1.2)	5 (0.2)	47 (2.1)			11 (0.5)			5 (0.2)				100 (4.4)
MFG OF TRUCK BODIES,CABS,TRAILERS			69 (5.7)	27 (2.2)	4 (0.3)										100 (8.2)
MFG OF WOODEN TRUCK BOXES			50 (0.2)								50 (0.2)				100 (0.4)
MFG OF LIME									100 (0.3)						100 (0.3)
WELDING		4 (0.5)	63 (7.4)	22 (2.5)					2 (0.2)	2 (0.2)		4 (0.5)	3 (0.3)		100 (11.6)
TOTAL	(0.2)	(4.4)	(60.0)	(20.3)	(4.6)	(0.2)	(0.6)	(0.9)	(2.3)	(0.9)	(2.2)	(1.3)	(1.9)	(0.2)	100

TABLE 3.B.32

CROSSTABULATION OF THE OCCUPATION OF THE INJURED WORKER WITH THE CAUSES OF INJURY, FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRY CLASSES, FOR 586 SEVERITY 1 INJURIES, PROVINCE OF ALBERTA, 1976
(ALBERTA W.C.B. PERSONAL MEDICAL FILES)

		CAUSE OF INJURY												
OCCUPATION	TOTAL PCT ROW PCT	FOREIGN BODY NON-SPECIFIC	FLYING SPARK/ PIECE OF METAL	WELDING FLASH (RADIATION)	FOREIGN BODY NON-METALLIC	COMPRESSED AIR BLEW FB INTO EYE	HOT METAL SPLATTER	SHARP OBJECT	HARMFUL LIQUIDS AND CORROSIVES	WORKER RUBBED EYE WITH DUSTY HANDS	FLYING FRAGMENT OR OBJECT	WIND BLEW FB INTO EYE	BLUNT OBJECT	ROW TOTALS (%)
SHIPPING - RECEIVING CLERKS		50 (0.2)										50 (0.2)		0.4
SALESPERSON					100 (0.2)									0.2
FIRE-FIGHTING									100 (0.2)					0.2
JANITORS									50 (0.2)			50 (0.2)		0.4
FOREMEN, MINING: GAS FIELD			50 (0.2)										50 (0.2)	0.4
CRUSHING, GRINDING												100 (0.2)		0.2
MOULDING, METAL CASTING			56 (0.5)		22 (0.2)			22 (0.2)						0.9
PLATING METAL OCCUPATIONS			100 (0.2)											0.2
LABOURING IN METAL OCCUPATIONS		50 (0.2)	50 (0.2)											0.4
METAL PROCESSING			100 (0.2)											0.2
LABOURING IN CHEMICALS, PETROLEUM									78 (0.7)			22 (0.2)		0.9
FOREMEN: MACHINING OPERATIONS				50 (0.2)									50 (0.2)	0.4
MECHINIST		16 (1.4)	58 (5.0)		20 (1.7)	2 (0.2)				2 (0.2)		2 (0.2)		8.7
FOREMEN: METAL SHAPING AND FORMING											100 (0.2)			0.2
SHEET METAL WORKERS			85 (1.1)		15 (0.2)									1.3
WELDING AND FLAME CUTTING		7 (3.2)	69 (31.0)	14 (5.8)	6 (2.5)	1 (0.6)	1 (0.5)			0 (0.2)	0 (0.2)	2 (1.1)	0 (0.2)	45.3
INSPECTING, METAL SHAPING AND FORMING			100 (0.2)											0.2
BOILERMAKERS, PLATERS		100 (0.2)												0.2
METAL SHAPING AND FORMING OCCUPATIONS NOT ELSEWHERE CLASSIFIED			100 (0.2)											0.2
METAL SHAPING AND FORMING			100 (0.2)											0.2
FILING, GRINDING, BUFFING OCCUPATIONS		6 (0.2)	88 (2.8)		6 (0.2)									3.2
MOTOR-VEHICLE FABRICATING			100 (0.2)											0.2
ELECTRICAL EQUIPMENT FABRICATING AND ASSEMBLING		100 (0.2)												0.2

TABLE 3.8.32 (Continued)

OCCUPATION	TOTAL PCT ROW PCT	CAUSE OF INJURY: FOREIGN BODY NON-SPECIFIC	FLYING SPARK/ PIECE OF METAL	WELDING FLASH (RADIATION)	FOREIGN BODY NON-METALLIC	COMPRESSED AIR BLEW FB INTO EYE	HOT METAL SPLATTER	SHARP OBJECT	HARMFUL LIQUIDS AND CORROSIVES	WORKER RUBBED EYE WITH DUSTY HANDS	FLYING FRAGMENT OR OBJECT	WIND BLEW FB INTO EYE	BLUNT OBJECT	ROW TOTALS (%)
LABOURING IN FABRICATING, ASSEMBLING, INSTALLING AND REPAIRING ELECTRICAL EQUIPMENT			100 (0.2)											0.2
MOTOR-VEHICLE MECHANICS		26 (1.1)	49 (2.0)	9 (0.4)	4 (0.2)	4 (0.2)		4 (0.2)	4 (0.2)					4.3
HEAVY DUTY MACHINERY MECHANICS		20 (0.6)	46 (1.4)		17 (0.5)					7 (0.2)		10 (0.3)		3.0
FOREMEN: PRODUCT FABRICATING, ASSEMBLING AND REPAIRING		29 (0.2)	71 (0.5)											0.7
LABOURING IN PRODUCT FABRICATING, ASSEMBLING AND REPAIRING - NEC			100 (0.2)											0.2
LABOURING IN PRODUCT FABRICATING, ASSEMBLING AND REPAIRING		6 (0.5)	47 (3.6)	9 (0.7)	23 (1.8)	6 (0.5)					9 (0.7)			7.8
EXCAVATING, GRADING					100 (0.2)									0.2
ELECTRICAL POWER LINEMEN			100 (0.2)											0.2
CONSTRUCTION ELECTRICIANS			100 (0.3)											0.3
INSPECTION AND TESTING ELECTRICAL POWER WIRE COMMUNICATIONS			100 (0.2)											0.2
FOREMEN: OTHER CONSTRUCTION TRADES			100 (0.2)											0.2
CARPENTERS					100 (0.2)									0.2
PAINTERS PAPERHANGERS				71 (0.5)					29 (0.2)					0.7
PIPEFITTING, PLUMBING		14 (0.4)	65 (1.8)	7 (0.2)								14 (0.4)		2.8
STRUCTURAL METAL ERECTORS			50 (0.2)			50 (0.2)								0.4
LABOURING IN CONSTRUCTION		23 (0.3)	47 (0.6)		15 (0.2)						15 (0.2)			1.3
HOISTING OCCUPATIONS			25 (0.2)	25 (0.2)			25 (0.2)					25 (0.2)		0.8
MATERIAL-HANDLING EQUIPMENT OPERATORS		50 (0.2)	50 (0.2)											0.4
INSPECTING, TESTING, GRADING, AND SAMPLING OCCUPATIONS		100 (0.2)												0.2
LABOURING OCCUPATIONS		12 (1.3)	59 (6.7)	11 (1.2)	6 (0.7)	2 (0.2)			2 (0.2)		6 (0.7)	2 (0.2)		11.2
COLUMN TOTALS (%)		10.4	61.0	8.7	8.8	1.9	0.9	0.2	1.7	0.6	2.2	3.2	0.4	100

few occupations incur the majority of injuries where flying sparks resulting in a piece of metal are the most common causes machinists, sheet metal workers, metal shapers and formers incurred; and related occupations incur very few radiation injuries but tend toward injuries caused by flying metal particles and non-metallic particles. Generally, the more specialized types of eye injury causes occur among occupations where a high population allow their occurrence by chance. It is notable, however, that welders incur a large number of injuries from particles being blown in the eyes. Cross-tabulation Table 3.B.33 shows the same relation for severity #2 injuries. Severity #2 injury causes appear to be more concentrated around specific causations. Flying sparks/pieces of metal (from grinders primarily) dominate in all occupations containing more than four injuries.

Injuries due to welding flash are common in the sheet metal working, welding and labouring trades. Greater than one injury due to chemicals occurred in the labouring, painting and machinists occupations. Non-metallic foreign bodies play a lesser role in causing severity #2 injuries.

Cross-tabulation Table 3.B.34 shows the relation between the cause of severity #1 injuries and the resulting nature of the injury. 29% of the severity #1 injuries were caused by flying sparks which resulted in corneal abrasions. A high proportion of the remaining injuries (10%) were due to this cause and resulted in various more serious corneal abrasions or conjunctival problems. A majority of the welding flashes (95% of the total number of injuries) resulted in corneal burns or conjunctival irritation. Cross-tabulation Table 3.B.35 indicates that the cause-nature relationship for severity #2 injuries tends to be more dispersed with fewer cells showing high proportions. This is because more severity #2 injuries of the common causations (i.e. particles and welding flash) become complicated

TABLE 3.B.33

CROSSTABULATION OF THE OCCUPATION OF THE INJURED WORKER WITH THE CAUSES OF INJURY, FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRY CLASSES, FOR 584 SEVERITY 2 INJURIES, PROVINCE OF ALBERTA, 1976
(ALBERTA W.C.B. PERSONAL MEDICAL FILES)

		CAUSE OF INJURY														
OCCUPATION	TOTAL PCT ROW PCT	NOT KNOWN	FOREIGN BODY NON-SPECIFIC	FLYING SPARK/ PIECE OF METAL	WELDING FLASH (RADIATION)	FOREIGN BODY NON-METALLIC	ELECTRICAL FLASH	HOT METAL SPLATTER	SHARP OBJECT	HARMFUL LIQUIDS AND CORROSIVES	WELDING INJURY	FLYING FRAGMENT OR OBJECT	WELDING FLASH & METALLIC FB	WIND BLEW FB INTO EYES	BLUNT OBJECT	ROW TOTALS (%)
SHIPPING CLERKS						100 (0.2)										0.2
WEIGHERS					100 (0.2)											0.2
JANITORS												100 (0.2)				0.2
SUPERVISORS: DRILLING OPERATIONS										100 (0.2)						0.2
OIL AND GAS FEILD OCCUPATIONS												100 (0.2)				0.2
METAL CASTING				66 (0.4)		33 (0.2)										0.6
LABOURING IN METAL PROCESSING				100 (0.2)												0.2
METAL PROCESSING				100 (0.2)												0.2
CRUSHING AND GRINDING CHEMICALS				100 (0.2)												0.2
MACHINIST			3 (0.2)	72 (4.8)	4 (0.3)	4 (0.3)		3 (0.2)		10 (0.7)		3 (0.2)				6.7
MACHINE-TOOL OPERATING				100 (0.4)												0.4
METAL MACHINING				100 (0.2)												0.2
FOREMEN: METAL SHAPING AND FORMING				50 (0.2)	50 (0.2)											0.4
SHEET METAL WORKERS			8 (0.2)	54 (1.4)	31 (0.8)									8 (0.2)		2.6
METALWORKING AND MACHINE OPERATORS				66 (0.4)	33 (0.2)											0.6
WELDING AND FLAME CUTTING			3 (1.6)	57 (28.9)	30 (15.4)	2 (0.9)		5 (0.2)			2 (0.9)	2 (0.9)	2 (0.9)	2 (1.2)		50.9
BOILERMAKERS, PLATERS				50 (0.2)						50 (0.2)						0.4
METAL SHAPING AND FORMING				100 (0.2)												0.2
FILING, GRINDING, BUFFING				100 (1.7)												1.7
MOTOR VEHICLE FABRICATING			100 (0.2)													0.2
OTHER FABRICATING AND ASSEMBLING OCCUPATIONS				100 (0.2)												0.2
LABOURING IN FABRICATING, ASSEMBLING AND REPAIRING WOOD PRODUCTS				100 (0.2)												0.2
MOTOR-VEHICLE MACHANICS				61 (1.7)	18 (0.5)	7 (0.2)				7 (0.2)				7 (0.2)		2.8

TABLE 3.B.33 (Continued)

OCCUPATION	TOTAL PCT ROW PCT	NOT KNOWN	FOREIGN BODY NON-SPECIFIC	FLYING SPARK/ PIECE OF METAL	WELDING FLASH (RADIATION)	FOREIGN BODY NON-METALLIC	ELECTRICAL FLASH	HOT METAL SPLATTER	SHARP OBJECT	HARMFUL LIQUIDS AND CORROSIVES	WELDING INJURY	FLYING FRAGMENT OR OBJECT	WELDING FLASH & METALLIC FB	WIND BLEW FB INTO EYES	BLUNT OBJECT	ROW TOTALS (%)
		CAUSE OF INJURY														
HEAVY DUTY MACHINERY MECHANICS				85 (2.3)		7 (0.2)									7 (0.2)	2.7
OTHER MECHANICS												100 (0.2)				0.2
FOREMEN: PRODUCT FABRICATING, ASSEMBLING AND REPAIRING				50 (0.2)	50 (0.2)											0.4
LABOURING IN PRODUCT FABRICATING, ASSEMBLING AND REPAIRING			4 (0.2)	55 (2.7)	4 (0.2)	24 (1.2)			6 (0.3)			6 (0.3)				4.9
EXCAVATING, GRADING, PAVING				100 (0.2)												0.2
CONSTRUCTION ELECTRICIANS							50 (0.2)		50 (0.2)							0.4
CARPENTERS				63 (0.5)	27 (0.3)											0.8
PAINTERS, PAPERHANGERS				50 (0.3)						50 (0.3)						0.6
PIPEFITTING, PLUMBING			11 (0.6)	67 (3.6)	7 (0.4)	4 (0.2)						4 (0.2)	7 (0.4)			5.4
STRUCTURAL-METAL ERECTORS				66 (0.4)										33 (0.2)		0.6
LABOURING IN CONSTRUCTION			25 (0.2)	50 (0.4)					25 (0.2)							0.8
TRUCK DRIVER			100 (0.2)													0.2
HOISTING OCCUPATIONS				50 (0.2)				50 (0.2)								0.4
MATERIAL-HANDLING EQUIPMENT OPERATORS			50 (0.2)	50 (0.2)												0.4
LABOURING IN MATERIAL-HANDLING				100 (0.2)												0.2
OTHER MATERIAL-HANDLING OCCUPATIONS										100 (0.2)						0.2
INSPECTING, TESTING, GRADING AND SAMPLING OCCUPATIONS				100 (0.2)												0.2
LABOURING OCCUPATIONS			3 (0.3)	64 (7.5)	18 (2.1)	7 (0.8)			2 (0.2)	3 (0.4)		2 (0.2)		2 (0.2)		11.7
COLUMN TOTALS (%)			3.9	60.4	20.5	4.5	0.2	0.6	0.9	2.2	0.9	2.4	1.3	2.0	0.2	584

TABLE 3.8.34

CROSSTABULATION OF THE CAUSE OF INJURY BY THE RESULTING NATURE OF INJURY, FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRY CLASSES, FOR 586 SEVERITY #1 INJURIES, PROVINCE OF ALBERTA, 1976 (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

		CAUSE OF INJURY														
NATURE OF INJURY	TOTAL %	NOT KNOWN	FOREIGN BODY: NON-SPECIFIC	FLYING SPARK/ PIECE OF METAL	WELDING FLASH (RADIATION)	FOREIGN BODY NON-METALLIC	COMPRESSED AIR BLEW FB INTO EYE	HOT METAL SPLATTER	SHARP OBJECT	HARMFUL LIQUIDS AND CORROSIVES	WORKER RUBBED EYE WITH DUSTY HANDS	FLYING FRAGMENT OR OBJECT	WIND BLEW FOREIGN BODY INTO EYE	BLUNT OBJECT	NUMBER OF INJURIES	ROW TOTALS (%)
NOT SPECIFIED				1.2	0.3	0.7				0.2			0.2		15	2.6
CORNEAL ABRASION		0.2	4.7	29.1		3.8	1.4		0.2		0.2	0.2	1.8		246	41.8
CORNEAL ABRASION-CORNEAL EDEMA				0.2											1	0.2
CORNEAL ABRASION-RUST RING				6.3									0.2		39	6.6
CORNEAL ABRASION-CONJUNCTIVITIS			0.3	1.8		0.7	0.2					0.2	0.3		21	3.5
REDDENED CONJUNCTIVA			0.2	0.2											2	0.4
SUBCONJUNCTIVAL HEMORRHAGE				0.2								0.2	0.2		4	0.6
CONJUNCTIVAL SCRATCH				0.2											1	0.2
CONJUNCTIVITIS			2.0	1.8		1.2	0.2	0.2		0.2		0.2	0.7		39	6.6
CORNEAL ABRASION-RUST RING-CONJUNCTIVITIS				0.7											4	0.7
MULTIPLE CORNEAL ABRASIONS			0.7	1.0		0.3	0.2						0.2		14	2.4
CORNEAL ABRASION-ULCER				0.2											1	0.2
ACUTE CORNEAL ULCER ASSOCIATED WITH CORNEAL ABRASION			0.2	0.5		0.3									6	1.0
EYE IRRITATION			0.9	1.9	0.2	1.0		0.2	0.2	0.2	0.3	0.2			32	5.2
RUST RING			0.2	0.2											2	0.4
FOREIGN BODY: DEEP IN STROMA				0.2											1	0.2
FOREIGN BODY: CONJUNCTIVA				1.5		0.2	0.2								11	1.9
CORNEAL FOREIGN BODY			0.9	2.1		0.2				0.2					20	3.4
CORNEAL FOREIGN BODY-LACERATION				0.2											1	0.2
CORNEAL ABRASION-SUBCONJUNCTIVAL HEMORRHAGE						0.2									1	0.2
MILD TRAUMATIC IRITIS						0.2									1	0.2
SUBTARSAL FOREIGN BODY			1.0	1.4		0.7						0.7	0.2		23	3.9
CONJUNCTIVAL LACERATION												0.2			1	0.2
CORNEAL ULCER WITH MIDSTROMAL OPACITY				0.2								0.2			2	0.4
FOREIGN BODY: EYELID				0.5											3	0.5
VITREOUS HEMORRHAGE														0.2	1	0.2
CONJUNCTIVAL FOREIGN BODY-CORNEAL ABRASION				0.3											2	0.3
PIGMENT SPOT ON IRIS		0.2													1	0.2
CONTUSION: EYELID AND CONJUNCTIVA												0.2			1	0.2
PUNCTURE UPPER LID-CORNEAL ULCER				0.2											1	0.2
PIGMENT SPOTS ON LENS AND IRIS				0.2											1	0.2
BLEPHARITIS				0.2											1	0.2
BOIL ON EYE LID			0.2												1	0.2
ACUTE IRITIS				0.2											1	0.2
LACERATION ABOVE EYE												0.2			1	0.2
CORNEAL ABRASION-SUBCONJUNCTIVAL HEMORRHAGE												0.2			1	0.2
OLD RUST RING DEEP IN CORNEA: OLD INJURY			0.2												1	0.2
CORNEAL ABRASION-TRICHIASIS PRESENT				0.2											1	0.2
NO INJURY NOTED			0.3	0.5		0.2									6	1.0
CONJUNCTIVITIS-POSSIBLE IRITIS													0.2		1	0.2
CONJUNCTIVITIS										0.7					4	0.7
REACTIVE SCLERITIS										0.2					1	0.2
BLEPHAROSPASM										0.2					1	0.2
ULTRAVIOLET RADIATION BURN: CORNEA					6.7										41	6.8
CONJUNCTIVITIS DUE TO ULTRAVIOLET RADIATION BURN					1.5										9	1.5
ULTRAVIOLET RADIATION BURNS: NONSPECIFIC					0.2										1	0.2
QUERY: ULTRAVIOLET RADIATION					0.2						0.2				2	0.4
CONJUNCTIVAL BURN FROM HOT METAL				0.2											1	0.2
CORNEAL & CONJUNCTIVAL BURNS FROM HOT METAL								0.2							1	0.2
BURNS TO EYELIDS				0.5		0.2		0.2							5	0.9
BURN TO SCLERA-MARKED REACTIVE CONJUNCTIVITIS				0.2											1	0.2
BURN TO UPPER EYELID												0.2			1	0.2
INNER CANTHUS & CONJUNCTIVAL BURN				0.2											1	0.2
CORNEAL ABRASION FROM HOT METAL PARTICLES: BURN INVOLVEMENT AS WELL				0.5				0.2							4	0.7
NUMBER OF INJURIES		2	71	324	55	57	13	5	2	11	4	16	25	1	586	
COLUMN TOTALS (%)		0.4	12.0	55.1	9.4	10.0	2.2	0.9	0.4	1.9	0.7	2.7	4.3	0.2		100%

TABLE 3.B.35

CROSSTABULATION OF THE CAUSE OF INJURY BY THE RESULTING NATURE OF INJURY, FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRY CLASSES, FOR 584 SEVERITY #2 INJURIES, PROVINCE OF ALBERTA, 1976 (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

NATURE OF INJURY	TOTAL PCT	CAUSE OF INJURY															
		NOT KNOWN	FOREIGN BODY: NON-SPECIFIC	FLYING SPARK/ PIECE OF METAL	WELDING FLASH RADIATION	FOREIGN BODY NON-METALLIC	ELECTRICAL FLASH	HOT METAL SPLATTER	SHARP OBJECT	HARMFUL LIQUIDS AND CORROSIVES	WELDING INJURY	FLYING FRAGMENT OR OBJECT	WELDING FLASH AND METALLIC FOREIGN BODY	WIND BLEW FOREIGN BODY INTO EYE	BLUNT OBJECT	ROW TOTALS (%)	NUMBER OF INJURIES
NOT KNOWN		0.2	0.2	0.2	0.2	0.2	0.2									1.2	7
CORNEAL ABRASION			2.2	24 3		2.1			0.2			0.3		0.5		29.6	113
CORNEAL ABRASION-CORNEAL EDEMA				0.3								0.2				0.5	3
CORNEAL ABRASION-RUST RING			0.2	13 9		0.2								0.2		14.4	84
DEEP CORNEAL ABRASION				0.5												0.5	3
CORNEAL ABRASION-CONJUNCTIVITIS			0.3	5.5		0.3			0.2	0.2						6.5	38
REDDENED CONJUNCTIVA				0.3												0.3	2
SUBCONJUNCTIVAL HEMORRHAGE						0.2										0.2	1
CONJUNCTIVAL SCRATCH				0.3					0.2							0.5	3
CORNEAL ABRASION (STROMA)-ORBITAL CONTUSION				0.2												0.2	1
CORNEAL ABRASION-CONJUNCTIVAL LACERATION				0.2												0.2	1
CONJUNCTIVITIS			0.7	1.5		1.2								0.2		3.6	21
CORNEAL ABRASION-CONJUNCTIVITIS-ULCERATION				0.2												0.2	1
INTRACONJUNCTIVAL FOREIGN BODY WITH INFLAMMATION				0.2												0.2	1
SCRATCH ON EYELID				0.2												0.2	1
CORNEAL ABRASION-RUST RING-CONJUNCTIVITIS				1.4												1.4	8
KERATITIS-SUBEPITHELIAL SCAR-CONJUNCTIVITIS									0.2							0.2	1
CONJUNCTIVITIS-MILD CONTUSION TO LIDS												0.2				0.2	1
IRITIS-CORNEAL ABRASION				0.2												0.2	1
DEEP CORNEAL ABRASION-IRITIS-RUST RING				0.2												0.2	1
MULTIPLE CORNEAL ABRASIONS				2.1		0.2						0.2				2.4	14
CONTUSION-CORNEAL ABRASION & EROSION-CONJUNCTIVAL & CILIARY INJECTION-ECCHYMOSIS OF EYELIDS												0.2				0.2	1
CONJUNCTIVAL ERYTHEMA-SCLERAL LACERATION				0.2												0.2	1
CORNEAL ABRASION-MINIMAL IRITIS CHANGES				0.2								0.2				0.3	2
CORNEAL ABRASION-ULCER				1.2												1.2	7
ACUTE CORNEAL ULCER ASSOCIATED WITH CORNEAL ABRASION				0.2												0.2	1
EYE IRRITATION			0.2	1.0	0.2						0.3			0.5		2.2	13
RUST RING				0.3												0.3	2
FOREIGN BODY: EDGE OF IRIS														0.2		0.2	1
CORNEAL ABRASION-CELLULITIS UPPER EYELID-CONJUNCTIVITIS												0.2				0.2	1
CORNEAL ULCER-DEEP RUST RING WITH STROMAL EDEMA				0.2												0.2	1
FOREIGN BODY: DEEP IN STROMA														0.2		0.2	1
FOREIGN BODY: CONJUNCTIVA				0.2												0.2	1
CORNEAL FOREIGN BODY				1.2										0.2		1.4	8
CORNEAL ULCER WITH EPITHELIAL EDEMA				0.2												0.2	1
CONJUNCTIVAL FOREIGN BODY-CORNEAL ABRASIONS-RUST RING				0.2												0.2	1
DEEP CORNEAL ABRASION-CONJUNCTIVITIS				0.3												0.3	2
POST-TRAUMATIC RETINAL TEAR WITH SECONDARY VITREOUS HEMORRHAGE															0.2	0.2	1
CORNEAL FOREIGN BODY-LACERATION				0.2								0.2				0.3	2
RUST SPOT ON CORNEA-RECURRENT ULCERATION				0.2												0.2	1
SMALL EROSION UNDER UPPER LID-CONJUNCTIVAL INJECTION			0.2													0.2	1
SCLERAL FOREIGN BODY				0.3												0.3	2
SWOLLEN EYELID-CONJUNCTIVITIS				0.2												0.2	1
CORNEAL ABRASION-SUBCONJUNCTIVAL HEMORRHAGE				0.2												0.2	1
CORNEAL ABRASION-CORNEAL EDEMA-CONJUNCTIVITIS				0.2												0.2	1
LACERATION OF EYELIDS-HAEMATOMA												0.2				0.2	1
PENETRATING CORNEAL LACERATION												0.2				0.2	1
LACERATION OF EYELID-HYPHEMA												0.2				0.2	1
MULTIPLE CORNEAL ULCERS-RUST RING				0.2												0.2	1
NO INJURY NOTED			0.2	0.2												0.3	2
SULFURIC ACID BURNS TO CORNEA AND CONJUNCTIVA											0.2					0.2	1
CHROMIC ACID BURNS TO CORNEA AND CONJUNCTIVA											0.2					0.2	1
LIME BURNS											0.2					0.2	1
LIME BURNS-CHEMICAL SCLERITIS											0.2					0.2	1
CAUSTIC SODA BURNS-EPITHELIAL BREAKDOWN-BLEPHAROSPASM											0.2					0.2	1
CONJUNCTIVITIS DUE TO NITROGEN SPLASH											0.2					0.2	1
CHEMICAL CONJUNCTIVITIS-SULPHUR DUST											0.2					0.2	1
BILATERAL CORNEAL ABRASIONS AND CONJUNCTIVITIS FROM PAINT											0.2					0.2	1
CONJUNCTIVAL ABRASION											0.2					0.2	1
MARKED PURULENT CONJUNCTIVITIS WITH SMALL ABCESS ON LID											0.2					0.2	1
ULTRAVIOLET RADIATION BURN: CORNEA					6.0							0.2				6.2	36
ULTRAVIOLET RADIATION BURN: CORNEA AND CONJUNCTIVA WITH CILIARY SPASM					0.3											0.3	2
ULTRAVIOLET RADIATION BURN: CORNEA AND CONJUNCTIVA					5.0											5.0	29
ULTRAVIOLET RADIATION BURN: CORNEA, CONJUNCTIVA AND EYELIDS					0.3											0.3	2
CONJUNCTIVITIS DUE TO ULTRAVIOLET RADIATION BURNS					4.3											4.3	25
ULTRAVIOLET RADIATION BURNS: NON-SPECIFIC					2.1											2.1	12
CONJUNCTIVITIS & PHOTOPHOBIA DUE TO ULTRAVIOLET RADIATION BURN					0.5											0.5	3
IRITIS DUE TO ULTRAVIOLET RADIATION					0.2											0.2	1
BLEPHARITIS OF UPPER AND LOWER EYELIDS DUE TO ULTRAVIOLET RADIATION BURNS					0.2											0.2	1
SWELLING OF EYELIDS DUE TO ULTRAVIOLET RADIATION BURNS					0.2											0.2	1
ULTRAVIOLET RADIATION BURNS TO CORNEA AND CONJUNCTIVA WITH BLEPHAROSPASM					0.7											0.7	4
QUERY: ULTRAVIOLET RADIATION BURNS					0.2											0.2	1
CONJUNCTIVAL BURN FROM HOT METAL									0.2							0.2	1
CORNEAL AND CONJUNCTIVAL BURNS FROM HOT METAL				0.3												0.3	2
SECOND DEGREE BURN OF SKIN NEAR INNER CANTHUS				0.2												0.2	1
SECOND DEGREE BURN OF EYELIDS WITH SECONDARY INFECTION				0.2												0.2	1
CORNEAL BURN				0.2												0.2	1
DEEP BURNS TO INNER ENDS OF UPPER AND LOWER EYELIDS AND ON THE CARUNCLE									0.2							0.2	1
BURN TO MEDIAL CANTHUS				0.2												0.2	1
BURNS TO EYELIDS									0.2							0.2	1
CORNEAL ABRASION WITH BURN INVOLVEMENT				1.0				0.2			0.3	0.2				1.7	10
CHEMICAL BURN-SUBCONJUNCTIVAL HEMORRHAGE-CORNEAL ABRASION										0.2						0.2	1
ULTRAVIOLET RADIATION BURNS TO CORNEA AND CONJUNCTIVA WITH CORNEAL ABRASION AND RUST RING										0.2			0.2			0.3	2
ULTRAVIOLET RADIATION BURNS TO CORNEA AND CONJUNCTIVA WITH CORNEAL ABRASION				0.2	0.2								0.5			0.9	5
ULTRAVIOLET RADIATION BURNS-CORNEAL ABRASION WITH RUST RING AND STROMAL EDEMA-SECONDARY IRITIS													0.2			0.2	1
ULTRAVIOLET RADIATION BURNS WITH ASSOCIATED HEAT BURNS TO UPPER LID-CONTUSION OF THE GLOBE											0.2		0.2			0.3	2
CONJUNCTIVITIS FROM ULTRAVIOLET RADIATION BURNS-CORNEAL ABRASION-CONJUNCTIVAL HEMORRHAGE													0.2			0.2	1
NUMBER OF INJURIES		1	25	353	120	26	1	3	5	13	5	13	7	11	1	584	
COLUMN TOTALS (%)		0.2	4.3	60.4	20.5	4.5	0.2	0.5	0.9	2.2	0.9	2.2	1.2	1.9	0.2		100

injuries which, in turn, are coded separately. Welding flashes resulted in a variety of corneal and conjunctival injuries accounting for 18.7% of the total. Nearly 49% of the severity #2 injuries were caused by flying sparks which resulted in corneal abrasions.

Cross-tabulation Table 3.B.36 shows the relation between the implement used at the time of the injury and the cause of the injury, for the severity #1 category. 22% of the flying sparks, which resulted in injuries, were caused by grinders, 3.8% were caused by welding machines,3.4% by drills, 2.7% by grinders that the injured worker was not using, and 3.8% by impact tools. It is interesting to note that 1.7% of the injuries were due to foreign bodies blown into the eye, while the worker was not using any machine. This provides adequate rationale for the use of eye protection at all times and not only when performing a task. Cutting torches and hand tools were responsible also for a proportion of the flying sparks which lead to injuries. Cross-tabulation Table 3.B.37 shows that the majority of severity #2 injuries are concentrated in a fewer number of implement-causation relationships than in severity #1 injuries. The majority of injuries occur from welders and grinders which result in flying sparks (pieces of metal). 20% of the severity #2 injuries were caused by welding machines which resulted in a radiation flash.

Cross-tabulation Table 3.B.38 shows the relation between the use of eye protection and the cause of the injury. A majority of the severity #1 injury claims, however, did not report on the use of eye protection. About 38% of the severity #1 claims, that reported on the use of eye protection, indicated that the person was wearing safety glasses when a flying spark entered the eye. The use of side shields was not discussed. 11.6% were wearing goggles when a flying spark entered the eye. This figure is irregular unless the goggles were poorly fitted or were vented

TABLE 3.B.36

CROSSTABULATION OF THE IMPLEMENT USED AT THE TIME OF THE INJURY BY THE CAUSE OF THE INJURY, FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRY CLASSES, FOR 586 SEVERITY #1 INJURIES, PROVINCE OF ALBERTA, 1976
(ALBERTA W.C.B. PERSONAL MEDICAL FILES)

		CAUSE OF INJURY														
IMPLEMENT USED	TOTAL PCT	UNKNOWN	FB: NON-SPECIFIC	FLYING SPARK/PIECE OF METAL	WELDING FLASH (RADIATION)	FB: NON-METALLIC	COMPRESSED AIR BLEW FB INTO EYE	HOT METAL SPLATTER	SHARP OBJECT	HARMFUL LIQUIDS CORROSIVES	WORKER RUBBED EYE WITH DUSTY HANDS	FLYING FRAGMENT OR OBJECT	WIND BLEW FB INTO EYE	BLUNT OBJECT	ROW TOTALS (%)	NUMBER OF INJURIES
UNKNOWN		0.3	0.5	1.0	0.2	0.3					0.2		0.2		2.7	16
NON-SPECIFIC			4.6	6.0		1.9	0.2	0.3	0.2	0.3		0.2	0.5		14.0	83
NOT USING MACHINE			1.5	0.9	0.3	1.2	0.2			0.5		0.3	1.7		6.6	39
NOT USING MACHINE-WALKING BY				0.3	0.2	0.5							0.3		1.4	8
GRINDER			1.4	22.0		1.2					0.2				24.7	145
CHISEL				0.2											0.2	1
WELDER			0.9	3.8	5.6	0.3					0.3	0.2		0.2	11.1	66
WRENCH												0.2			0.2	1
RIVETING GUN				0.3											0.3	2
DRILL A			0.5	3.4		0.3	0.2					0.2			4.6	27
AIR HOSE			0.5	1.0			1.0					0.2			2.7	16
STAPLER												0.2			0.2	1
SAND BLASTER-THIRD PARTY INJURY						0.3									0.3	2
FURNACE				0.5				0.2							0.7	4
CUTTING TORCH				1.7				0.2						0.2	2.0	12
HAMMER			0.2	0.9		0.3									1.4	8
COMPRESSION TESTER							0.2								0.2	1
HAND TOOLS (NON-SPECIFIC)			0.3	1.5		0.9			0.2				0.5		3.4	20
ROUTER				0.2		0.3									0.5	3
AIR HACKSAW-POWER SAW			0.3	0.5		0.3						0.3			1.5	9
IMPACT GUN				0.2											0.2	1
ACETELENE TORCH				0.2											0.2	1
WELDER-THIRD PARTY INJURY				0.7	3.1										3.8	22
GRINDER-THIRD PARTY INJURY			0.3	2.7											3.0	19
AIR TOOLS						0.2	0.2					0.2			0.5	3
SAND BLASTER			0.2												0.2	1
LATHE				1.2		0.2									1.4	8
AIR HOSE-THIRD PARTY INJURY													0.2		0.2	1
CRANE				0.2											0.2	1
METAL CUTTER-THIRD PARTY INJURY			0.2												0.2	1
WELDER ARC GOUGER			0.2												0.2	1
ELECTRIC BUFFER			0.3	0.2		0.3							0.2		1.0	6
WIRE BRUSH				0.2											0.2	1
STEAMER				0.2											0.2	1
BELT POLISHER						0.2									0.2	1
BRAKE DRUM TURNING MACHINE				0.2											0.2	1
BORING BAR				0.3											0.3	2
DRILL PRESS				0.2											0.2	1
WATER HOSE						0.2									0.2	1
SHOVEL										0.2					0.2	1
LOADING BULK CARS										0.3			0.2		0.5	3
STRAIGHTENER				0.2											0.2	1
SKIMMER				0.2											0.2	1
IMPACT TOOLS				3.8		0.2	0.2	0.2	0.2		0.2	0.2			4.6	27
CROWBAR			0.2												0.2	1
CRANE-WORKER OBSERVING			0.2												0.2	1
FILE				0.2											0.2	1
PAINT BRUSH						0.2				0.2					0.3	2
MILLING MACHINE				0.2											0.2	1
KNIFE						0.2						0.2			0.3	2
SAND MULLER						0.2									0.2	1
SPRAY PAINT GUN				0.2											0.2	1
PLIERS												0.2			0.2	1
JACK HAMMER						0.2									0.2	1
DRILL-THIRD PARTY INJURY				0.2											0.2	1
BLADE SHARPENER				0.2											0.2	1
IMPACT TOOL-THIRD PARTY INJURY				0.2											0.2	1
SHOT BLAST MACHINE				0.2											0.2	1
COLUMN TOTALS (%)		0.3	12.3	55.8	9.4	9.9	2.0	0.9	0.3	1.7	0.7	2.4	4.1	0.2	100%	
(NUMBER OF INJURIES)		2	72	327	55	58	12	5	2	10	4	14	24	1		586

TABLE 3.B.37

CROSSTABULATION OF THE IMPLEMENT USED AT THE TIME OF THE INJURY BY THE CAUSE OF THE INJURY, FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRY CLASSES FOR 584 SEVERITY #2 INJURIES, PROVINCE OF ALBERTA, 1976
(ALBERTA W.C.B. PERSONAL MEDICAL FILES)

TOTAL PCT	CAUSE OF INJURY															
IMPLEMENT USED	UNKNOWN	FB: NON-SPECIFIC	FLYING SPARK/PIECE OF METAL	WELDING FLASH (RADIATION)	FB: NON-METALLIC	ELECTRICAL FLASH	HOT METAL SPLATTER	SHARP OBJECT	HARMFUL LIQUIDS AND CORROSIVES	WELDING INJURY	FLYING FRAGMENT OR OBJECT	WELDING FLASH AND METALLIC FB	WIND BLEW FB INTO EYE	BLUNT OBJECT	ROW TOTALS (%)	NUMBER OF INJURIES
UNKNOWN	0.2	0.2	0.5			0.2									1.0	6
NON-SPECIFIC		1.2	5.7		0.5			0.2	0.2				0.2	0.2	8.0	47
NOT USING MACHINE		0.3	2.1		1.4		0.2	0.2	1.0		0.3		1.2		6.7	39
WALKING BY MACHINE--(NOT USING)		0.2	1.0	0.3											1.5	9
CUPOLA			0.2												0.2	1
GRINDER		0.9	25.2		0.5						0.3		0.3		27.2	159
SCHECKER					0.2										0.2	1
REFRACTORY PATCHING GUN											0.2				0.2	1
CHISEL			0.9												0.9	5
CRANE							0.2								0.2	1
WELDER		0.2	4.5	13.0						0.9		1.2			19.7	115
PROPANE TORCH			0.2												0.2	1
WRENCH			0.2								0.3				0.5	3
SOLDERING IRON			0.2												0.2	1
RIVETING GUN			0.3												0.3	2
PRESS MACHINE			0.2												0.2	1
DRILL			2.1		0.3						0.3				2.7	16
DEGREASER TANK							0.2								0.2	1
AIR HOSE		0.5	1.7					0.2	0.2		0.2				2.7	16
SAND BLASTER-THIRD PARTY INJURY			0.3		0.2										0.5	3
FURNACE				0.2											0.2	1
CUTTING TORCH		0.2	0.9		0.2										1.2	7
HAMMER			1.0												1.0	6
COMPRESSION TESTER			0.2												0.2	1
HAND TOOLS (NON-SPECIFIC)		0.2	2.9		0.3			0.2	0.3				0.2		4.1	24
PUNCH MACHINE		0.2													0.2	1
ROUTER			0.3		0.2										0.5	3
SCREWDRIVER								0.2							0.2	1
ELECTRIC SANDER					0.3										0.3	2
AIR HACKSAW			0.9		0.2										1.0	6
AIR DRILL			0.9												0.9	5
IMPACT GUN			0.2												0.2	1
ACETELENE TORCH			0.2												0.2	1
WELDER-THIRD PARTY INJURY			0.7	7.0											7.7	45
GRINDER-THIRD PARTY INJURY		0.2	4.5												4.6	27
AIR TOOLS		0.2									0.2				0.3	2
FERTILIZER SPREADER									0.2						0.2	1
POWER BRUSH			0.3												0.3	2
SAND BLASTER				0.2											0.2	1
GREASE GUN									0.2						0.2	1
MACHINING EQUIPMENT--(NON-SPECIFIC)			0.2												0.2	1
LATHE			2.2			0.2									2.4	14
AXE											0.2				0.2	1
AIR HOSE			0.2												0.2	1
CRANE											0.2				0.2	1
COLUMN TOTALS (%)	0.2	4.3	60.4	20.5	4.5	0.2	0.5	0.9	2.2	0.9	2.2	1.2	1.9	0.2		
(NUMBER OF INJURIES)	1	25	353	120	26	1	3	5	13	5	13	7	11	1		

TABLE 3.B.38

CROSSTABULATION OF INFORMATION REGARDING THE USE OF EYE PROTECTION AT THE TIME OF THE ACCIDENT WITH THE CAUSE OF THE INJURY, FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, FOR 586 SEVERITY #1 EYE INJURIES, PROVINCE OF ALBERTA, 1976, (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

EYE PROTECTION WORN (COL PCT / TOTAL PCT)	CAUSE OF INJURY: UNKNOWN	FB: NON-SPECIFIC	FLYING SPARK/PIECE OF METAL	WELDING FLASH (RADIATION)	FB: NON-METALLIC	COMPRESSED AIR BLEW FB INTO EYE	HOT METAL SPLATTER	SHARP OBJECT	HARMFUL LIQUIDS AND CORROSIVES	WORKER RUBBED EYE WITH DUSTY HANDS	FLYING FRAGMENT OR OBJECT	WIND BLEW FB INTO EYE	BLUNT OBJECT	ROW TOTALS (%)
NOT DISCUSSED	(100) 0.3	(84) 10.4	(77) 44.2	(89) 8.4	(84) 8.4	(90) 1.9	(100) 0.9	(100) 0.3	(100) 1.7	(100) 0.7	(91) 2.2	(92) 3.8	(100) 0.2	83.2
NO		(5) 0.7	(1) 0.2	(7) 0.7	(2) 0.2	(10) 0.2					(9) 0.2	(4) 0.2		2.2
GOGGLES: FLEXIBLE TYPE - POOR FIT			(1) 0.5		(2) 0.2									0.7
FACE SHIELD			(2) 1.0		(2) 0.2									1.2
SAFETY GLASSES		(7) 0.9	(9) 5.5		(6) 0.7							(4) 0.2		7.2
HELMET			1.4		(2) 0.2									1.5
HELMET: FOREIGN BODY IN HELMET			(1) .3											0.3
WORKER JUST LIFTED HELMET		(2) 0.2	(1) 0.2											0.3
GOGGLES		(2) 0.2	(3) 1.7		(2) 0.2									2.0
HELMET: SHIELD NOT COMPLETELY LOWERED				(2) 0.2										0.2
FACE SHIELD AND SAFETY GLASSES			(1) 0.2											0.2
GOGGLES: WORKER HAD JUST REMOVED			(1) 0.2											0.2
WORKER HAD JUST LIFTED FACE SHIELD			(1) 0.2											0.2
GOGGLES NOT DOWN			(1) 0.2											0.2
GOGGLES HAD HOLES IN THEM			(1) 0.2											0.2
'DARK' SAFETY GLASSES				(2) 0.2										0.2
TOTALS (%)	(100) 0.3	(100) 12.3	(100) 55.7	(100) 9.4	(100) 9.9	(100) 2.1	(100) 0.9	(100) 0.3	(100) 1.7	(100) 0.7	(100) 2.4	(100) 4.1	(100) 0.2	(100.0) -

incorrectly, or the particle dropped into the eye when the protection was being removed. Nearly 10% of the respondents were wearing welding helmets at the time of the injury. Even face shields were inadequate in protecting against flying sparks in 7% of the cases. Cross-tabulation Table 3.B.39 shows that much the same situation exists for severity #2 injuries, with the exception that more compensable injuries were caused by large flying fragments, even when protection was being worn. These occurred in two cases because of the fit of the protection and the impact resistance. These results indicate the need to examine the design of eye protection and the way in which workers use it, especially upon removal.

Cross-tabulation Table 3.B.40 reports the relation between the location of the accident and the implement used, for severity #1 injuries. Most claims were non-specific as to the location of the accident on the employers' premises; but of those that did specify, it appears that injuries did not take place in unusual surroundings (i.e. grinders were in grinding booths, welders were in welding booths). It is interesting to note that a substantial number of injuries occurred under vehicles while using hand tools. Cross-tabulation Table 3.B.41 shows the same situation for severity #2 injuries. Once again a majority of the reports did not specify where the accident occurred. The correlations between location of accident and the implement used are diverse and less concentrated in comparison to severity #1 injuries. The same basic relations exist however. It is notable that a substantial number of severity #2 injuries occurred while using a grinder in large pipes or tanks. Several other injuries were caused while using welding equipment in open spaces outdoors.

Cross-tabulation Table 3.B.42 shows the relation between the worktime loss due to severity #2 injuries and the occupation of the injured person.

TABLE 3.B.39

CROSSTABLULATION OF INFORMATION REGARDING THE USE OF EYE PROTECTION AT THE TIME OF THE ACCIDENT WITH THE CAUSE OF THE INJURY, FROM A REVIEW OF 14 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, FOR 584 SEVERITY #2 EYE INJURIES, PROVINCE OF ALBERTA, 1976 (ALBERTA W.C.B. STATISTICAL MASTER FILE)

EYE PROTECTION WORN	CAUSE OF INJURY														
	UNKNOWN	FOREIGN BODY: NON-SPECIFIC	FLYING SPARK/ PIECE OF METAL	WELDING FLASH (RADIATION)	FOREIGN BODY NON-METALLIC	ELECTRICAL FLASH	HOT METAL SPLATTER	SHARP OBJECT	HARMFUL LIQUIDS AND CORROSIVES	WELDING INJURY	FLYING FRAGMENT OR OBJECT	WELDING FLASH & METALLIC FB	WIND BLEW FB INTO EYE	BLUNT OBJECT	ROW TOTALS (%)
UNKNOWN	100 (0.2)	5 (0.2)													(0.3)
NOT DISCUSSED		76 (3.3)	66 (42.5)	82 (16.5)	59 (2.6)	100 (0.2)	100 (0.5)	38 (0.3)	91 (2.1)	56 (0.5)	64 (1.5)	100 (1.2)	55 (1.0)	100 (0.2)	(72.3)
NO		12 (0.5)	4 (2.6)	11 (2.2)	29 (1.4)			38 (0.3)	9 (0.2)	22 (0.2)			17 (0.3)		(7.7)
YES: NON-SPECIFIC			1 (0.2)												(0.2)
IMPROPER FIT			1 (0.5)												(0.5)
GOGGLES: FLEXIBLE TYPE-IMPROPER FIT			1 (0.2)												(0.2)
YES: BLOWN OFF BY FORCE OF INJURY											9 (0.2)				(0.2)
FACE SHIELD			2 (1.2)												(1.2)
STREET GLASSES			1 (0.3)					24 (0.2)			9 (0.2)				(0.7)
SAFETY GLASSES		7 (0.3)	11 (7.5)	1 (0.2)	4 (0.2)								17 (0.3)		(8.6)
HELMET			3 (1.9)	1 (0.3)											(2.2)
HELMET AND SAFETY GLASSES			1 (0.3)										11 (0.2)		(0.5)
HELMET: GLASS BROKEN BY IMPACT			1 (0.2)	1 (0.2)							9 (0.2)				(0.5)
GLASSES: NON-SPECIFIC			1 (0.2)												(0.2)
MONO-GOGGLES			1 (0.2)												(0.2)
HELMET WORN: IMPROPER SHADE OF GLASS				1 (0.3)											(0.3)
HELMET: FOREIGN BODY IN HELMET			1 (0.5)												(0.5)
WORKER HAD JUST LIFTED HELMET			1 (0.2)	1 (0.3)						22 (0.2)	9 (0.2)				(0.9)
GOGGLES			2 (0.9)	1 (0.2)	4 (0.2)										(1.2)
HELMET: SHIELD NOT LOWERED				1 (0.3)											(0.3)
FACE SHIELD AND SAFETY GLASSES			2 (0.9)		4 (0.2)										(1.0)
GOGGLES: WORKER HAD JUST REMOVED			1 (0.3)												(0.3)
COLUMN TOTALS (%)	(0.2)	(4.3)	(60.3)	(20.5)	(4.5)	(0.2)	(0.5)	(0.9)	(2.2)	(0.9)	(2.2)	(1.2)	(1.9)	(0.2)	100%

TABLE 3.B.40

CROSSTABULATION OF THE LOCATION OF THE ACCIDENT BY THE IMPLEMENT USED WHEN THE INJURY OCCURRED, FOR 586 SEVERITY #1 EYE INJURIES, FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRY CLASSES, PROVINCE OF ALBERTA, 1976 (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

		LOCATION OF THE ACCIDENT																													
IMPLEMENT USED	TOTAL PCT	EMPLOYERS PREMISES: NON-SPECIFIC	NOT ON EMPLOYERS PREMISES	PAINT SHOP	GRINDING ROOM	WELDING BOOTH	FURNACE ROOM	ASSEMBLY LINE, PRODUCTION LINE	STEAM BAY	MACHINE SHOP	MOBILE HOME, TRAILER	PAINT SHOP	CAUSTIC SODA TANK	MECHANICS BAY	JOB SITE	OUTSIDE IN YARD	INSIDE LARGE PIPE OR TANK	UNDER VEHICLE	FABRICATING SHOP	APPRENTICE CLASSES	MELT SHOP	IN CONFINED AREA	LAMINATING ROOM	PLUMBING DEPARTMENT	MILLROOM	SAND MIXING AREA	SHEET METAL SHOP	SERVICE SHOP	FUSE BOX	BOILER ROOM	SHOT BLAST ROOM	ROW TOTALS (%)
UNKNOWN		0.6																														0.6
NON-SPECIFIC		8.6			0.2	0.2				0.2			0.2	0.2	0.2			0.2		0.2	0.2	0.2		0.2								10.9
NOT USING MACHINE		5.7			0.2	0.2	0.2	0.4																								7.4
NOT USING MACHINE: WALKING BY		1.1										0.2				0.2													0.2			1.5
GRINDER		14.4			7.5	1.4		0.4		1.2		0.2		0.2	0.4	0.8	0.4		0.4			0.2			0.2							26.9
CHISEL		0.2																														0.2
WELDER		6.1	0.2			2.4	0.2			0.4								0.2				0.2						0.2				10.1
WRENCH																0.2																0.2
RIVET GUN		0.2								0.2																						0.3
DRILL		3.1						0.6		0.2				0.2	0.2			0.4									0.4					5.0
AIR HOSE		2.4						0.2		0.2					0.2																	3.1
STAPLER																							0.2									0.2
SAND BLASTER (THIRD PARTY USING)			0.2							0.2																						0.3
FURNACE							0.8								0.2																	1.0
CUTTING TORCH		1.4				0.4										0.4																2.2
HAMMER		1.1																0.4														1.5
COMPRESSION TESTER		0.2																														0.2
HAND TOOLS (NON-SPECIFIC)		2.3																1.8														4.1
ROUTER		0.4														0.2																0.6
AIR HACKSAW, POWER SAW		1.8																														1.8
IMPACT GUN		0.2																														0.2
ACETELENE TORCH		0.2																														0.2
WELDER (THIRD PARTY USING)		2.3				0.6									0.2																	3.1
GRINDER (THIRD PARTY USING)		2.3			0.4	0.6										0.2			0.4													3.9
AIR TOOLS		0.2									0.2																			0.2		0.5
SAND BLASTER		0.2																														0.2
LATHE		1.1								0.6																						1.7
AIR HOSE (THIRD PARTY USING)		0.2																														0.2
CRANE					0.2																											0.2
METAL CUTTER (THIRD PARTY USING)		0.2																														0.2
WELDER ARC GOUGER						0.2																										0.2
ELECTRIC BUFFER		1.1													0.2																	1.2
WIRE BRUSH		0.2																														0.2
STEAMER									0.2																							0.2
BELT POLISHER		0.2																														0.2
BRAKE DRUM TURNING MACHINE		0.2																														0.2
BORING BAR		0.4																														0.4
DRILL PRESS										0.2																						0.2
WATER HOSE		0.2																														0.2
SHOVEL		0.2																														0.2
LOADER (LOADING BULK CARS)																0.6																0.6
STRAIGHTENER		0.2																														0.2
SKIMMER		0.2																														0.2
IMPACT TOOL		2.6				1.2				0.2						0.2	0.2															4.5
CROWBAR		0.2																														0.2
CRANE (WORKER OBSERVING)		0.2																														0.2
FILE		0.2																														0.2
PAINT BRUSH												0.2						0.2														0.3
MILLING MACHINE		0.2																														0.2
KNIFE		0.2																									0.2					0.3
SAND MULLER																										0.2						0.2
SPRAY PAINT GUN				0.2																												0.2
PLIERS		0.2																														0.2
JACK HAMMER		0.2																														0.2
DRILL (THIRD PARTY USING)		0.2																														0.2
BLADE SHARPENER		0.2																														0.2
SHOT BLAST MACHINE																															0.2	0.2
COLUMN TOTALS (%)		13.3	0.4	0.2	8.6	6.9	1.1	1.7	0.2	3.5	0.2	0.8	0.2	0.6	1.7	2.4	0.6	3.2	0.8	0.4	0.2	0.6	0.2	0.2	0.2	0.2	0.6	0.2	0.2	0.2	0.2	100

TABLE 3.B.41

CROSSTABULATION OF THE LOCATION OF THE ACCIDENT BY THE IMPLEMENT USED WHEN THE INJURY OCCURRED, FOR 584 SEVERITY #2 EYE INJURIES, FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRY CLASSES, PROVINCE OF ALBERTA, 1976 (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

LOCATION OF THE ACCIDENT

IMPLEMENT	TOTAL PCT	EMPLOYERS PREMISES: NON-SPEC	MILLROOM OF PLANT	PAINT SHOP	GRINDING ROOM	WELDING BOOTH	MOULD DEPARTMENT	FURNACE ROOM	CUPOLA ROOM	FACTORY	ASSEMBLY LINE, PRODUCTION	DRILLING BENCH	STEAM BAY	MACHINE SHOP
NOT KNOWN		0.7	0.2											
NON-SPECIFIC		0.9	4.8				0.9							
NOT USING MACHINE			3.1		0.3		0.5		0.2		0.2			
NOT USING MACHINE: WALKING BY			1.0				0.3							
CUPOLA			0.2											
GRINDER			13.9	0.3	0.3	3.9	3.4		0.2			0.2		
SCHECKER			0.2											
REFRACTORY PATCHING GUN			0.2											
CHISEL							0.9							
CRANE								0.2						
WELDER		0.5	11.6				5.3					0.2		
PROPANE TORCH			0.2											
WRENCH			0.3							0.2				
SOLDERING IRON												0.2		
RIVETING GUN												0.2		
PRESS MACHINE			0.2											
DRILL			2.1										0.2	
DEGREASER TANK														0.2
AIR HOSE			1.4			0.3								
SAND BLASTER (THIRD PARTY USING)			0.3											
FURNACE			0.2											
CUTTING TORCH			0.9				0.2							
HAMMER			0.3				0.2							
COMPRESSION TESTER			0.2											
HAND TOOLS (NON-SPECIFIC)			2.7				0.2					0.2		
PUNCH MACHINE			0.2											
ROUTER			0.2											
SCREWDRIVER			0.2											
ELECTRIC SANDER			0.2											
AIR HACKSAW, POWER SAW			0.5				0.2							
AIR DRILL			0.5											
IMPACT GUN			0.2											
ACETELENE TORCH			0.2											
WELDER (THIRD PARTY USING)		0.2	4.3				2.2							
GRINDER (THIRD PARTY USING)			3.4				0.5							
AIR TOOLS			0.2											
FERTILIZER SPREADER														
POWER BRUSH			0.3											
SAND BLASTER			0.2											
GREASE GUN			0.2											
MACHINING EQUIPMENT: NON-SPECIFIC														
LATHE		0.2	1.4											
AXE														
AIR HOSE (THIRD PARTY USING)			0.2											
CRANE														
NUMBER OF INJURIES		14	327	2	4	25	86	1	2	1	1	5	1	2
COLUMN TOTALS (%)		2.4	5 0	0.3	0.7	4.3	1 7	0.2	0.3	0.2	0.2	0.9	0.2	0.3

IMPLEMENT	SHIPPING DEPARTMENT	CHROME PLATING ROOM	TEST TRACK	MOBILE HOME, TRAILER	CABINET DEPARTMENT	PAINT SHOP	TRAILER SHOP	CONSTRUCTION SITE	VALVE BAY	BY CAUSTIC SODA TANK	MECHANICS BAY	ENGINE ROOM	JOB SITE
NOT KNOWN													
NON-SPECIFIC	0.2								0.2		0.2		
NOT USING MACHINE	0.7	0.3	0.2		0.2			0.2				0.2	
NOT USING MACHINE: WALKING BY													
CUPOLA													
GRINDER	0.9												
SCHECKER													
REFRACTORY PATCHING GUN													
CHISEL													
CRANE													
WELDER									0.3				
PROPANE TORCH													
WRENCH													
SOLDERING IRON													
RIVETING GUN					0.2								
PRESS MACHINE													
DRILL	0.3				0.2								
DEGREASER TANK													
AIR HOSE	0.3				0.2	0.2							
SAND BLASTER (THIRD PARTY USING)				0.2									
FURNACE													
CUTTING TORCH													
HAMMER	0.2											0.2	
COMPRESSION TESTER													
HAND TOOLS (NON-SPECIFIC)	0.2				0.2					0.2			
PUNCH MACHINE													
ROUTER					0.2							0.2	
SCREWDRIVER													
ELECTRIC SANDER							0.2						
AIR HACKSAW, POWER SAW	0.2				0.2								
AIR DRILL					0.3				0.2				
IMPACT GUN													
ACETELENE TORCH													
WELDER (THIRD PARTY USING)													
GRINDER (THIRD PARTY USING)													
AIR TOOLS													
FERTILIZER SPREADER													
POWER BRUSH													
SAND BLASTER													
GREASE GUN													
MACHINING EQUIPMENT: NON-SPECIFIC													0.2
LATHE	0.9												
AXE													
AIR HOSE (THIRD PARTY USING)													
CRANE													
NUMBER OF INJURIES	22	2	1	1	9	1	1	1	4	1	1	3	1
COLUMN TOTALS (%)	3.8	0.3	0.2	0.2	1.5	0.2	0.2	0.2	0.7	0.2	0.2	0.5	0.2

IMPLEMENT	OUTSIDE IN YARD	INSIDE LARGE PIPE OR TANK	OILFIELD	UNDER VEHICLE	FABRICATING SHOP	INSIDE SHELL	PIPE FITTING TABLE	COMPRESSOR ASSEMBLY SHOP	AXLE DEPARTMENT	REPAIR SHOP	STRUCTURAL SHOP	APPRENTICE CLASSES	NUMBER OF INJURIES	ROW TOTALS (%)
NOT KNOWN						0.2							6	1.0
NON-SPECIFIC		0.2	0.3				0.2	0.2					47	8.0
NOT USING MACHINE	0.3	0.3											39	6.7
NOT USING MACHINE: WALKING BY						0.2							9	1.5
CUPOLA													1	0.2
GRINDER	0.9	0.3	1.0	0.3	0.2	0.7		0.5			0.6		159	27.2
SCHECKER													1	0.2
REFRACTORY PATCHING GUN													1	0.2
CHISEL													5	0.9
CRANE													1	0.2
WELDER	0.5	0.3				0.3					0.3	0.2	115	19.7
PROPANE TORCH													1	0.2
WRENCH													3	0.5
SOLDERING IRON													1	0.2
RIVETING GUN													2	0.3
PRESS MACHINE													1	0.2
DRILL													16	2.7
DEGREASER TANK													1	0.2
AIR HOSE			0.2						0.2				16	2.7
SAND BLASTER (THIRD PARTY USING)													3	0.5
FURNACE													1	0.2
CUTTING TORCH						0.2							7	1.2
HAMMER		0.2											6	1.0
COMPRESSION TESTER													1	0.2
HAND TOOLS (NON-SPECIFIC)	0.2	0.2											24	4.1
PUNCH MACHINE													1	0.2
ROUTER													3	0.5
SCREWDRIVER													1	0.2
ELECTRIC SANDER													2	0.3
AIR HACKSAW, POWER SAW													6	1.0
AIR DRILL													5	0.9
IMPACT GUN													1	0.2
ACETELENE TORCH													1	0.2
WELDER (THIRD PARTY USING)		0.9				0.2							45	7.7
GRINDER (THIRD PARTY USING)	0.2					0.3							27	4.6
AIR TOOLS										0.2			2	0.3
FERTILIZER SPREADER	0.2												1	0.2
POWER BRUSH													2	0.3
SAND BLASTER													1	0.2
GREASE GUN													1	0.2
MACHINING EQUIPMENT: NON-SPECIFIC													1	0.2
LATHE													14	2.4
AXE		0.2											1	0.2
AIR HOSE (THIRD PARTY USING)													1	0.2
CRANE												0.2	1	0.2
NUMBER OF INJURIES	12	15	11	2	1	12	1	4	1	1	3	2	584	
COLUMN TOTALS (%)	2.1	2.6	1.9	0.3	0.2	2.1	0.2	0.7	0.2	0.2	0.5	0.3		100%

TABLE 3.B.42

CROSSTABULATION OF THE OCCUPATION OF THE INJURED WORKER AND THE MAGNITUDE OF LOST WORK TIME DUE TO SEVERITY #2 INJURIES, FROM A REVIEW OF 15 HIGH EYE INJURY RISK INDUSTRIAL CLASSES, (586) INJURIES, IN ALBERTA, IN 1976 (ALBERTA W.C.B. PERSONAL MEDICAL FILES)

	LOST WORK TIME (DAYS)																	
OCCUPATIONS (COLUMN % / TOTAL %)	NO LOST TIME	1 DAY	2 DAYS	3 DAYS	4 DAYS	5 DAYS	6 DAYS	7 DAYS	8 DAYS	9 DAYS	13 DAYS	14 DAYS	15 DAYS	19 DAYS	22 DAYS	61 DAYS	69 DAYS	COLUMN TOTALS (%)
Not Known	69 (1.5)	8 (0.2)		8 (0.2)		15 (0.3)												100 (2.1)
Shipping Clerks			100 (0.2)															100 (0.2)
Weighers				100 (0.2)														100 (0.2)
Janitors		100 (0.2)																100 (0.2)
Supervisors, Drilling Operations				100 (0.2)														100 (0.2)
Oil & Gas Field Occup.		100 (0.2)																100 (0.2)
Metal Casting		25 (0.2)		50 (0.2)				25 (0.2)										100 (0.6)
Labouring in Metal Processing			100 (0.2)															100 (0.2)
Metal Processing		100 (0.2)																100 (0.2)
Crushing & Grinding Chemicals		100 (0.3)																100 (0.3)
Machinist	4 (0.3)	38 (2.6)	28 (1.9)	14 (0.2)	3 (0.2)	4 (0.3)			3 (0.2)	3 (0.2)				3 (0.2)				100 (6.6)
Machine-Tool Operating		50 (0.2)			50 (0.2)													100 (0.3)
Metal Machining		100 (0.2)																100 (0.2)
Foremen: Metal Shaping and Forming		50 (0.2)	50 (0.2)															100 (0.3)
Sheet-Metal Workers		64 (1.6)	24 (0.6)		12 (0.3)													100 (2.5)
Metalworking-Machine Operators		33 (0.2)		33 (0.2)	33 (0.2)													100 (0.5)
Welding & Flamecutting	5 (2.5)	41 (21.1)	26 (13.9)	10 (5.3)	6 (3.1)	2 (1.2)	3 (1.3)	1 (0.7)		1 (0.5)	1 (0.3)	1 (0.2)			1 (0.2)	1 (0.2)	1 (0.2)	100 (50.5)
Boilermakers-Platers		50 (0.2)				50 (0.2)												100 (0.3)
Metal Shaping and Forming		100 (0.2)																100 (0.2)
Filing, Grinding, Buffing	22 (0.4)		28 (0.5)	11 (0.2)	17 (0.3)	11 (0.2)	11 (0.2)											100 (1.0)
Motor Vehicle Fabricating				100 (0.2)														100 (0.2)
Other Fabricating & Assembling Occup.				100 (0.2)														100 (0.2)
Labouring in Fab., Assembling & Repairing Wood Products	100 (0.2)																	100 (0.2)
Motor-Vehicle Mechanics	11 (0.2)	15 (0.3)	26 (0.5)	11 (0.2)	11 (0.2)			11 (0.2)		15 (0.3)								100 (1.8)
Heavy Duty Mechanics	7 (0.2)	33 (0.9)	41 (1.1)		12 (0.3)								7 (0.2)					100 (2.7)
Other Mechanics					100 (0.2)													100 (0.2)
Foremen: Product Fab., Assemb. & Repair		50 (0.2)	50 (0.2)															100 (0.3)
Labouring in Product Fabricating, Assemb., and Repairing	10 (0.5)	36 (1.9)	22 (1.1)	24 (1.2)	4 (0.2)	4 (0.2)												100 (5.0)
Excavating, Grading, Paving			100 (0.2)															100 (0.2)
Const. Electrician.	50 (0.2)					50 (0.2)												100 (0.3)
Carpenters	20 (0.2)	40 (0.3)		20 (0.3)		20 (0.2)												100 (1.0)
Painters-Paperhangers		42 (0.3)	29 (0.2)	29 (0.2)														100 (0.6)
Pipefitting-Plumbing		41 (2.2)	24 (1.3)	9 (0.5)	4 (0.2)	6 (0.3)	4 (0.2)		8 (0.4)	4 (0.2)								100 (5.1)
Structural-Metal Erectors		67 (0.4)		33 (0.2)														100 (0.6)
Labouring in Const.		25 (0.2)	25 (0.2)			25 (0.2)	25 (0.2)											100 (0.6)
Truck Drivers			100 (0.2)															100 (0.2)
Hoisting Occupations		50 (0.2)							50 (0.2)									100 (0.3)
Material-Handling Equip. Operators		50 (0.2)			50 (0.2)													100 (0.3)
Labouring in Material Handling					100 (0.2)													100 (0.3)
Other Material Handling Occupations						100 (0.2)												100 (0.2)
Inspecting, Testing, Grading & Sampling Occupations	100 (0.2)																	100 (0.2)
Labouring Occupations	4 (0.5)	40 (5.0)	25 (3.1)	11 (1.3)	9 (1.1)	2 (0.2)	3 (0.4)		2 (0.2)	2 (0.2)			2 (0.2)					100 (12.0)
ROW TOTALS (%)	(6.7)	(39.4)	(25.4)	(11.4)	(6.7)	(3.5)	(2.1)	(1.0)	(0.9)	(1.3)	(0.3)	(0.2)	(0.3)	(0.2)	(0.2)	(0.2)	(0.2)	

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Welders and flame cutters are responsible for over 50.5% of the lost work days due to severity #2 eye injuries, as well as incurring the most lengthy time loss accidents. There did not, however, appear to be any one occupation with a majority of unduly long or short lost time accidents. As the incidence of injuries within an occupational category increased, so did the range of time in which workers are off work.

Table 3.B.43 shows a graphical representation of the lost days of work time among selected occupations with a high incidence of severity #2 eye injuries (these occupations represent 88% of the total number of injuries studied). Sheet metal workers, welders, and industrial and farm machinery mechanics incurred the greatest proportion of injuries involving only one or two days of lost work time. On the other hand, metal shapers and formers and motor vehicle mechanics incurred the greatest proportions of injuries involving three or more days of lost work time. Although these latter occupations do not represent a high proportion of the total number of injuries, these workers seem to incur the more serious injuries.

Cross-tabulation Table 3.B.44 shows the relation between the length of time the injured person was off work and the cause of the injury. Table 3.B.45 shows a graphical representation of this data. 65% of the injuries that were caused by flying sparks/pieces of metal, involved two or less days off work, while 73% of the injuries due to welding flashes were in this same category. Although persons injured with non-metallic foreign bodies were off work two days or less in 65% of the cases, a much higher proportion were off work two days (as compared to one day) than in the flying spark (metal) category. It is notable that 70% of the persons injured by chemicals were off work three days or greater. This appears to be the only category of injury causation that does not show a majority of injuries with a short

TABLE 3.B.43

Distribution of the Number of Work Days Lost per Worker Injury (severity #2), for Selected Occupations

-from a review of 15 High Eye Injury Risk Industrial Classes, 586 Injuries, In Alberta, in 1976. (Alberta W.C.B. Personal Medical Files)

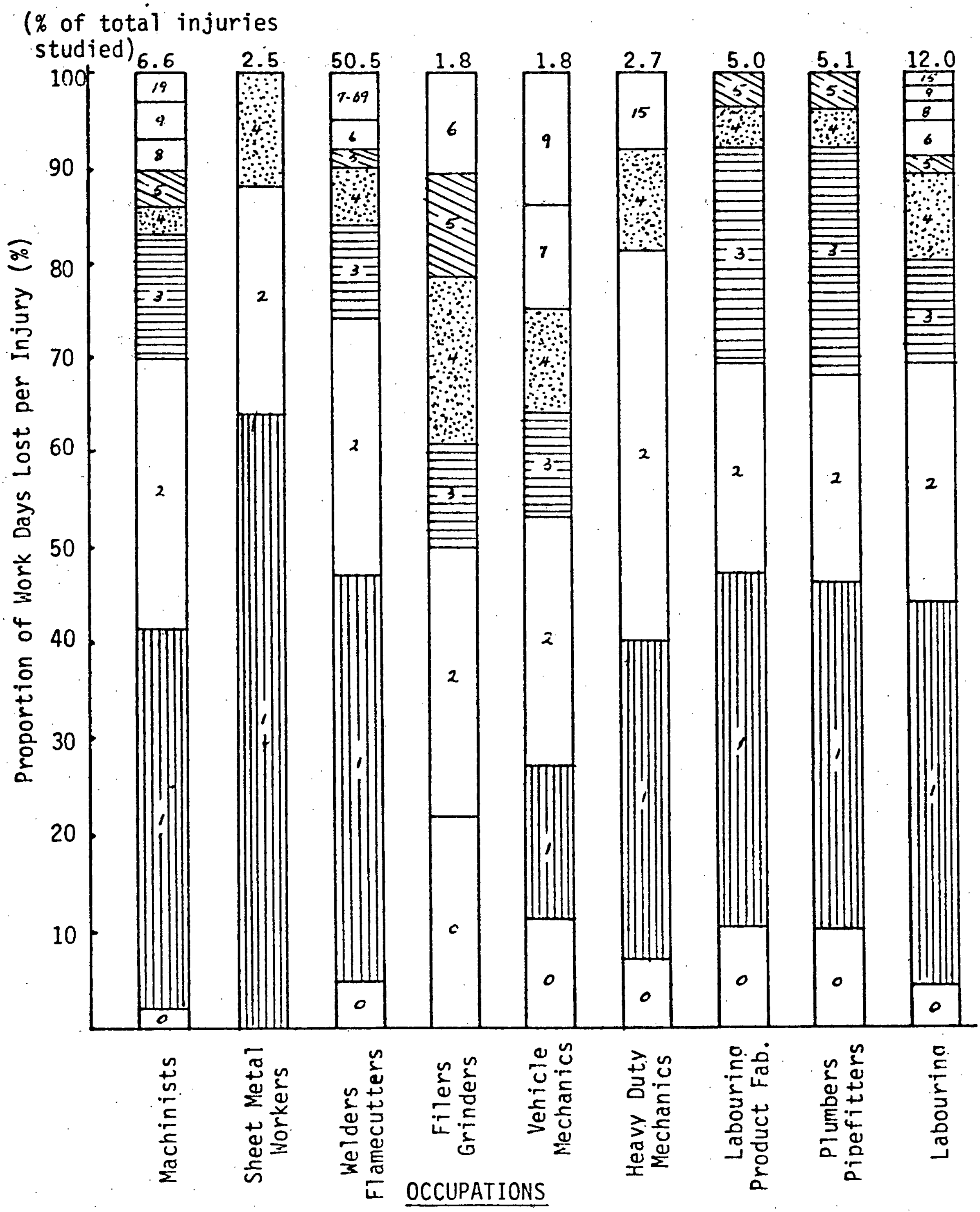


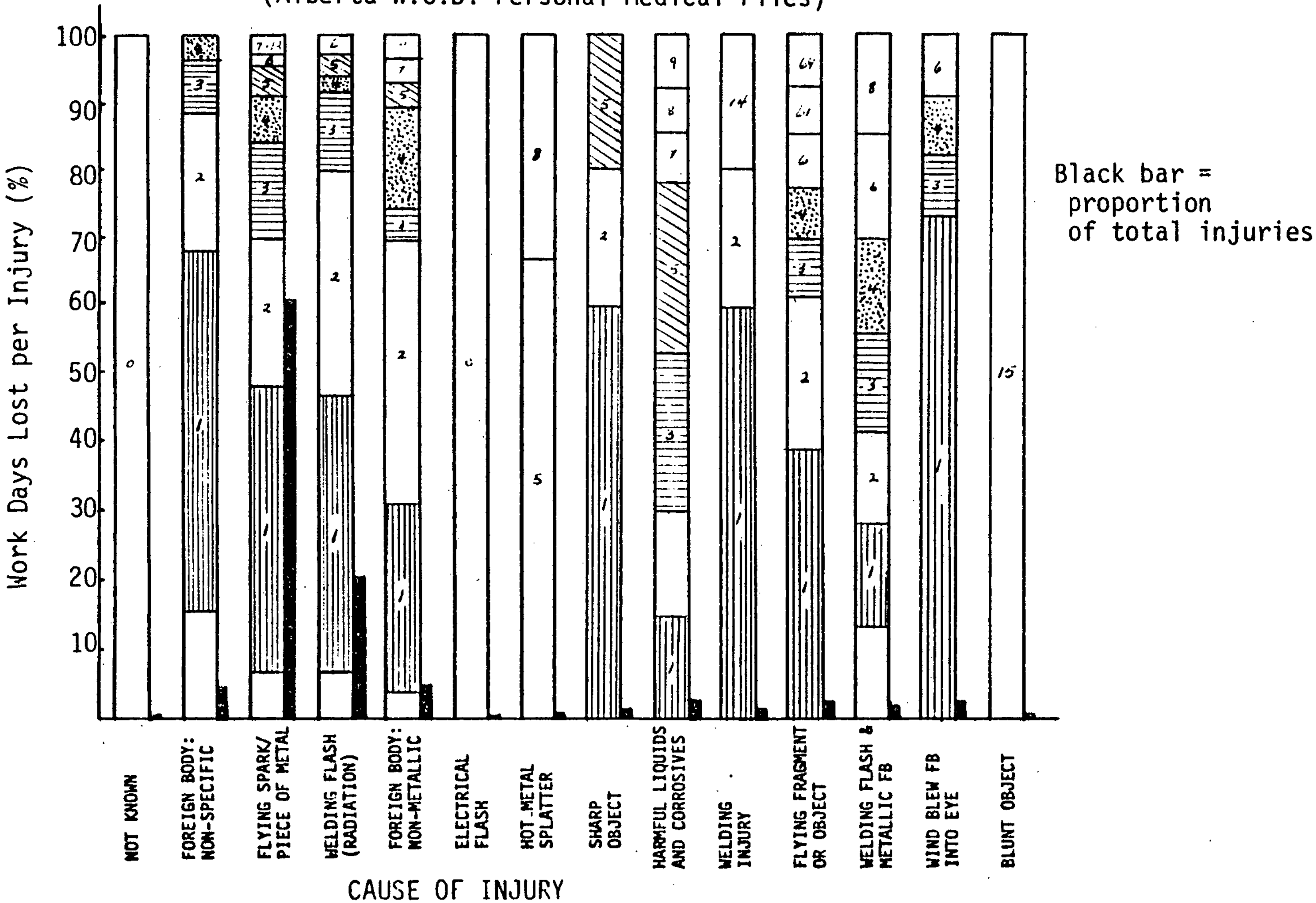
TABLE 3.B.44

CROSSTABULATION OF THE MAGNITUDE OF LOST WORK TIME DUE
TO SEVERITY #2 INJURIES AND THE CAUSE OF THE INJURY,
FROM A REVIEW OF 15 HIGH EYE RISK INDUSTRY CLASSES
(586 INJURIES), IN ALBERTA, IN 1976
(ALBERTA W.C.B. PERSONAL MEDICAL FILES)

COLUMN PCT / TOTAL PCT	CAUSE OF INJURY														
REAL TIME OFF	NOT KNOWN	FOREIGN BODY: NON-SPECIFIC	FLYING SPARK/ PIECE OF METAL	WELDING FLASH (RADIATION)	FOREIGN BODY: NON-METALLIC	ELECTRICAL FLASH	HOT METAL SPLATTER	SHARP OBJECT	HARMFUL LIQUIDS AND CORROSIVES	WELDING INJURY	FLYING FRAGMENT OR OBJECT	WELDING FLASH & METALLIC FB	WIND BLEW FB INTO EYE	BLUNT OBJECT	ROW TOTALS (%)
NO LOST TIME	100 (0.2)	16 (0.7)	7 (4.1)	7 (1.4)	4 (0.2)	100 (0.2)						14 (0.2)			70.0
1 DAY		52 (2.2)	40 (25.0)	40 (8.2)	27 (1.2)			60 (0.5)	15 (0.3)	60 (0.5)	39 (0.9)	14 (0.2)	73 (1.4)		40.0
2 DAYS		20 (0.9)	23 (14.0)	32 (0.7)	38 (1.7)			20 (0.2)	15 (0.3)	20 (0.2)	23 (0.5)	14 (0.2)			25.0
3 DAYS		8 (0.3)	12 (7.0)	11 (2.4)	4 (0.2)				23 (0.5)		8 (0.2)	14 (0.2)	9 (0.2)		11.0
4 DAYS		4 (0.2)	7 (4.5)	5 (1.0)	15 (0.7)						8 (0.2)	14 (0.2)	9 (0.2)		7.0
5 DAYS			4 (2.2)	2 (0.3)	4 (0.2)		33 (0.2)	20 (0.2)	23 (0.5)						3.5
6 DAYS			2 (1.0)	3 (0.5)							8 (0.2)	14 (0.2)	9 (0.2)		2.0
7 DAYS			1 (0.7)		4 (0.2)				8 (0.2)						1.0
8 DAYS			1 (0.2)				67 (0.3)		8 (0.2)			14 (0.2)			0.8
9 DAYS			2 (1.0)		4 (0.2)				8 (0.2)						1.3
13 DAYS			1 (0.5)												0.5
14 DAYS										20 (0.2)					0.2
15 DAYS														100 (0.2)	0.2
19 DAYS			3 (0.2)												0.2
22 DAYS			3 (0.2)												0.2
61 DAYS											8 (0.2)				0.2
69 DAYS											8 (0.2)				0.2
COLUMN TOTALS (%)	100 (0.2)	100 (4.3)	100 (60.3)	100 (20.5)	100 (4.5)	100 (0.2)	100 (0.5)	100 (0.9)	100 (2.2)	100 (0.9)	100 (2.2)	100 (1.2)	100 (1.9)	100 (0.2)	

TABLE 3.B.45 Distribution of the Number of Work Days Lost per Worker Injury (Severity #2), by the Cause of the Injury, from a review of 15 High Eye Injury Risk Industrial Classes, 586 Injuries, In Alberta, In 1976.

(Alberta W.C.B. Personal Medical Files)



time loss, increasing in length of time off work as the number of injuries in the category increases.

CHAPTER 3

SECTION C

METHODOLOGY, RESULTS AND DISCUSSION

OF

A SURVEY OF OCCUPATIONAL HEALTH AND SAFETY OFFICERS

3.C.M. Methodology - Survey of Occupational Health and Safety Officers

Rationale

The purpose of this study was to obtain practical, informed responses on the state of eye protection and the seriousness of eye injuries in industry. The occupational health and safety officer (OHSO) is, generally speaking, a person who is well experienced in industry and who has been given special training in the recognition of occupational health and safety problems. Most OHSO's visit a wide variety of industries and, therefore, encounter a majority of the significant eye hazards. The OHSO is also able to assess the presence and effectiveness of any personal protective program. On this basis, the input of these personnel was felt to be essential.

Access to Information

Permission was obtained from the Director of the Inspection Branch of the Occupational Health and Safety Division of Alberta Labour to interview a number of occupational health and safety officers. This permission was obtained in early March of 1978, two weeks prior to the interviews. The OHSO's who participated were informed that all individual information would be anonymous and confidential.

Population

It was originally intended to interview all the OHSO's in Alberta, who total 47. However this was not practical, and on the basis that most officers are highly experienced and constantly exposed to eye hazards, a sample was taken. A total of 38 officers were selected to be interviewed. Of these, it was possible to interview 31(66%).

The Instrument

An interview survey instrument was designed to quantify the opinions of the officers in regard to eye injuries and eye protection, while still allowing subjective comment. A series of questions were posed and responses requested in accordance with a five-degree Likert scale. A broad range of topics relating to eye injuries and eye protection in industry were covered. The interview questionnaire is shown in Figure 3.C.1.

Method of Collection

A research assistant previously trained and experienced in interviewing was commissioned to conduct the interviews. The research assistant was instructed in the objectives of the interviews and the method of interview. This researcher performed four pre-tests in the presence of the research assistant (the interviewer) and also observed the interviewer carrying out the survey in two additional pre-tests. The results were used to modify the instrument slightly. The interview, which was arranged with the OHSO by appointment, lasted approximately half an hour. The Likert scale questions were asked in a consistent fashion throughout the interviews,and in every case respondents were encouraged to follow up their scaled response with anecdotal data. The respondent was left with a free hand to answer the more open-ended questions, although guidance was given if the response was inappropriate. A separate interview booklet was completed for each OHSO.

Possible Bias

Most of the questions were worded to allow objective responses based on trained observation. The OHSO's background, therefore, was compensated for as much as possible. There were a few questions, however, which allowed responses based on personal bias or background. For this reason, the OHSO's were continually reminded to respond on the basis of overall perceptions gained on the problem in their present position. It was difficult to isolate a response that was based on a recent, serious, isolated

FIGURE 3.C.1

INSPECTORS SURVEY ON EYE INJURIES AND EYE PROTECTION

1. Previous experience and background in industry - jobs, years worked, etc.

2. In which industries are hazards to the eyes most prevalent?

3. What are the most common types of hazards in these industries?
   (lead with mechanical, chemical and radiation if necessary)

4. What are the most potentially serious hazards found in these industries?
   (lead with mechanical, chemical and radiation if necessary)

Please note: ASK THE INSPECTOR TO RESPOND ON THE BASIS OF HIS GENERAL OBSERVATIONS AND EXPERIENCES.

FIGURE 3.C.1 cont'd

SCALED QUESTIONS - Ask that the person respond in light of a noticeable trend in behavior or conditions and not because of specific, outstanding incidents.

ASK THE RESPONDENT TO REPLY ACCORDING TO WHETHER HE STRONGLY DISAGREES, DISAGREES, NEITHER A NOR D, AGREES, OR STRONGLY AGREES WITH THE FOLLOWING STATEMENTS.

EYE INJURIES OCCUR IN INDUSTRY BECAUSE:

1. Eye protection is not being worn.	X	X	X	X	X
2. The proper type of eye protection is not being worn (P if A or SA) (perhaps examples for M,C, and R hazards)	X	X	X	X	X
3. The design of the eye protection is poor, allowing an injury even though protection is being worn. (P if A or SA)	X	X	X	X	X
4. The worker does not take adequate safety precautions.	X	X	X	X	X
5. A fellow worker (ie.welder) does not take adequate safety precautions. (P if A or SA)	X	X	X	X	X
6. The equipment or machine that is being used is poorly designed for safety and affords little protection at the source (P if A/SA)	X	X	X	X	X
7. The worker does not care about the safety of his eyes.	X	X	X	X	X
8. The worker becomes fatigued and is more prone to injury.	X	X	X	X	X
9. Certain jobs are hazardous to the eyes and injuries are bound to occur.	X	X	X	X	X
10. Environmental conditions (smoke dust, etc.) provide for unsafe working conditions. (P if A or SA)	X	X	X	X	X
11. Poor contrast, glare, inadequate lighting, or other visual performance factors create a hazard.	X	X	X	X	X

Additional comments for any of the questions. Specify question number.

FIGURE 3.C.1 cont'd

PLEASE REQUEST THAT THE RESPONDENT REPLY ON THE BASIS OF GENERAL PRECEPTIONS OF THE FOLLOWING SITUATIONS.

IN GENERAL, MANY WORKERS DO NOT WEAR EYE PROTECTION BECAUSE:

1. Commonly there is no eye protection policy established in the plant. X X X X X

2. Eye protection is supplied without the support of an eye protection policy (ie. no mechanism for re-enforcement) X X X X X

3. There is a lack of rigid enforcement of eye safety rules by management (ie. disciplinary measures) X X X X X

4. Management, including first line supervisors, do not show a good example by wearing eye protection themselves while in the plant. X X X X X

5. Peer pressure can affect the motivation of the worker to wear eye protection. (expand on +ve and -ve aspects) X X X X X

6. There is a lack of education about the importance of wearing eye protection (expand). X X X X X

7. Workers are vain or self-concious about wearing eye protection. X X X X X

8. Unions do not promote the eye safety of the worker on the job. X X X X X

9. Unions do little to re-enforce the eye protection policy and programs that have been set up by management. X X X X X

10. The eye protection is generally poorly fitted and uncomfortable. X X X X X

11. Excessive heat, cold, or dust makes wearing eye protection very difficult. X X X X X

12. It inhibits their work performance (ie. lack of peripheral vision) X X X X X

Additional comments for any of the questions. Specify question number.

FIGURE 3.C.1 cont'd

GENERAL QUESTIONS

1. Management, including safety personnel, are aware of the CSA Standards for eye protectors.	X	X	X	X	X
2. Management, including safety personnel, know what industrially approved eye protection is and how to identify it.	X	X	X	X	X
3. Management should strictly inforce the wearing of eye protection with disciplinary measures.	X	X	X	X	X
4. Management, safety personnel, and workers often think that street frames with hardened lenses represent industrial eye protection.	X	X	X	X	X
5. Legislation is one of the best ways to ensure that management provides eye protection for its workers (expand on this, if D/SD .. why?, what are other ways).	X	X	X	X	X

EYE PROTECTION PROGRAMS

1. Are the eye protection programs that are being provided in industry adequate in your opinion?

    If yes, why?
    If no, how can they be improved

2. If the question has not been answered indirectly already please ask:

    Are any of the programs you are familiar with ideal in your opinion?

    If yes, how are they ideal?

FIGURE 3.C.1 cont'd

STRONGLY DISAGREE	DISAGREE	NEITHER AGREE NOR DISAGREE	AGREE	STRONGLY AGREE
1	2	3	4	5

incident, although they were cautioned on this as well.

Method of Analysis

The results of the interviews were hand-tabulated. The Likert questions were tabulated on the basis of the degree of agreement with the statement, on a scale from 1 to 5. The anecdotal comments from the Likert questions and the open-ended questions were analyzed, using content analysis. In these cases, the recorded responses were correlated into broad categories.

Part 3.C.R. - Results of a Survey of Occupational Health and Safety Officers

The first interview question asked the worker's background in industry. This question was asked in order to "break the ice" and the results are not recorded.

Table 3.C.1 shows the most prevalent locations of eye injury hazards in the opinion of the inspection personnel. The men were allowed to give multiple answers. Occupational health and safety officers reported that eye injuries were most prevalent in machine shops, construction sites (which include welding, grinding, woodwork), foundries, metal manufacturing operations, welding and woodwork shops. A number of other industries were reported but the majority of these were of a specialized nature.

Table 3.C.2 shows a frequency distribution of the most common types of eye hazards found in the industries cited in Table 3.C.1. The officers reported that the most common types of hazards in these industries are those from machine work operations, welding and chemicals. As a general category, flying particles and dust was noted. A variety of other hazards were noted, a majority of which were associated with the construction industry.

Table 3.C.3 gives a frequency distribution of what inspection personnel saw as the most potentially serious eye hazards in industry. These were chemicals, laser beams, machining, power-actuated tools and welding operations. Many other hazards were noted but, again, the majority were associated with the construction industry.

Table 3.C.4 shows individual frequency distributions of responses to the six questions pertaining to the occurrence of eye injuries in industry. The responses to the questions were given on a Likert scale where a scale 1 response indicates strong disagreement with the question posed by the

TABLE 3.C.1

DISTRIBUTION OF THE INDUSTRIES IN ALBERTA
WHERE HAZARDS TO THE EYES ARE MOST PREVALENT
(SURVEY OF 31 OCCUPATIONAL HEALTH AND SAFETY OFFICERS, MARCH, 1978)

INDUSTRY	FREQUENCY OF OHSO RESPONSE
MACHINE SHOPS	13
CONSTRUCTION	12
FOUNDRIES	6
METAL MFG OPERATIONS	6
WELDING SHOPS	4
WOODWORK SHOPS	3
INDUSTRIAL SHOP	3
PETRO-CHEMICAL	3
GLASS INDUSTRY	3
CHEMICAL INDUSTRY	2
LUMBERING	2
CONCRETE OPERATIONS	1
HIGH RISE MAINTAINENCE	1
OILFIELD	1
BATTERY SHOP	1
FIGERGLASS MFG	1
RESEARCH LABS	1
GARAGES	1
AIRPORTS	1
PULPING	1

TABLE 3.C.2

DISTRIBUTION OF THE HAZARDS LEADING TO THE MOST COMMON EYE INJURIES,
IN THE INDUSTRIES NOTED IN TABLE 3.C.1.
(SURVEY OF 31 OCCUPATIONSL HEALTH AND SAFETY OFFICERS, MARCH, 1978)

COMMON HAZARDS	FREQUENCY OF OHSO REPONSES
MACHINING	17
FLYING PARTICLES AND DUST	15
WELDING: RADIATION	14
CHEMICALS, CORROSIVES	9
SAWING	4
JACKHAMMERING	3
SANDING	3
MOLTEN METAL	2
DEMOLITION	2
FUMES	2
POWER ACTUATED TOOLS, EXPLOSIVE ACTUATED TOOLS	2
COMPRESSED AIR HOSE	2
WORKING WITH GLASS	2
LOADING TAR POTS	1
WIND	1
GRAPPLER: ROUGHING UP FLOORS	1
WIPING EYES	1
FUEL	1

TABLE 3.C.3

DISTRIBUTION OF THE HAZARDS WHICH LEAD TO THE MOST POTENTIALLY SERIOUS EYE INJURIES, IN THE INDUSTRIES NOTED IN TABLE 3.C.1 (SURVEY OF 31 OCCUPATIONAL HEALTH AND SAFETY OFFICERS, MARCH, 1978)

HAZARDS LEADING TO SERIOUS INJURY	FREQUENCY OF OHSO RESPONSE
CHEMICALS	10
LASER BEAMS	9
MACHINING	6
POWER ACTUATED TOOLS	5
WELDING	4
DUST: FLYING PARTICLES	2
FLYING OBJECTS	3
SAWING	1
COMPRESSED AIR MACHINERY	1
SANDBLASTING	1
MASONRY CUTTING	1
SANDING	2
INRA-RED RADIATION	1
X-RAY	1
CEMENT FINISHERS	1
TAR POTS	1
INADEQUATE LIGHTING	1
BOILER EXPLOSIONS	1
HORSEPLAY	1
UNAWARENESS OF WORKERS	1

TABLE 3.C.4

RESPONSES TO 11 QUESTIONS, ON A FIVE POINT LIKERT SCALE,
CONCERNING THE OCCURRENCE OF EYE INJURIES IN INDUSTRY
(SURVEY OF 31 OCCUPATIONAL HEALTH AND SAFETY OFFICERS, MARCH, 1978)

QUESTION NUMBER / LIKERT RESPONSE	1		2		3		4		5		6		7		8		9		10		11	
	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)
1. Strongly Disagree	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	4	(13)	0	(0)	2	(5)	0	(0)	0	(0)
2. Disagree	1	(3)	2	(5)	10	(32)	1	(3)	1	(3)	12	(39)	18	(58)	12	(39)	19	(63)	1	(3)	5	(16)
3. Neither 1 nor 5	2	(5)	5	(16)	5	(16)	0	(0)	0	(0)	4	(13)	0	(0)	2	(7)	2	(5)	1	(3)	4	(13)
4. Agree	10	(32)	18	(58)	12	(39)	11	(35)	16	(52)	8	(26)	6	(19)	15	(48)	8	(27)	20	(65)	13	(41)
5. Strongly Agree	18	(58)	6	(19)	4	(13)	19	(62)	14	(45)	7	(22)	3	(10)	2	(5)	0	(0)	9	(29)	9	(29)
TOTAL	31		31		31		31		31		31		31		31		31		31		31	

<u>QUESTIONS</u>

<u>EYE INJURIES OCCUR IN INDUSTRY BECAUSE:</u>

1. Eye protection is not being worn.
2. The proper type of eye protection is not being worn.
3. The design of the eye protection is poor, allowing an injury even though protection is being worn.
4. The worker does not take adequate safety precautions.
5. A fellow worker (ie. welder) does not take adequate safety precautions.
6. The equipment or machine that is being used is poorly designed for safety and affords little protection at the source.
7. The worker does not care about the safety of his eyes.
8. The worker becomes fatigued and is more prone to injury.
9. Certain jobs are hazardous to the eyes and injuries are bound to occur.
10. Environmental conditions (smoke,dust,etc.) provide for unsafe working conditions.
11. Poor contrast, glare, inadequate lighting, or other visual performance factors create a hazard.

interviewer, to a scale 5 response indicating strong agreement with the statement. A majority of the officers (90%) agreed with the statement that eye injuries were occurring in industry because eye protection is not being worn. 77% of the officers agreed, or strongly agreed, that injuries occurred because the proper type of eye protection is not being worn. It was noted by nine officers that side shields on safety glasses were nec-eccary. A majority (52%) of the officers agreed that injuries were caused by poor design of equipment, although 32% disagreed with this statement. Those who disagreed felt that the use of side shields and proper fitting were more important. Nearly 100% of the officers stated that injuries occurred because workers did not take adequate safety precautions, while the same high proportion felt that the lack of safety precautions on the part of fellow workers also contributed to the incidence of injuries. In these cases, people helping welders and persons around others who were grinding and chipping were especially vulnerable.

48% of the respondents agreed with the statement that injuries occur because of poor implement design and, therefore, poor protection at the source. However 39% disagreed with the statement. Inspectors reported that guards on machinery were often removed. Others noted that hand tools and the like are very difficult to guard. It was interesting to note that 71% of the inspectors disagreed with the notion that the workers' lack of concern for the health of their eyes caused injuries. 29% of the inspectors agreed with the statement. The officers commented that some workers were not aware of the hazards, while others care but do nothing about it. Still more would rather "take their chance", while the rest simply don't care at all. The majority of inspectors (55)% agreed that injuries can occur be-cause of worker fatigue, while 39% did not agree. Three officers noted the relation between fatigue or boredom and accident trends through the working day.

Nearly 70% of the officers disagreed that injuries were inevitable in certain hazardous jobs. Only 26% of the inspectors thought this was the case. Most of the officers felt that a majority of hazards can be prevented.

94% of the officers agreed that smoke, dust and other factors could result in unsafe working conditions and, therefore, eye injuries. Wind and dust were cited as the greatest hazards, in addition to smoke and fumes. Excessive heat sometimes caused the worker to remove his protection. The officers (71%) agreed that poor lighting and other detrimental visual performance factors caused injuries to occur. 16% did not agree. Lighting was noted as the most important visual performance factor.

Table 3.C.5 shows a frequency distribution of Likert scale responses to statements concerning the use of eye protection in industry. 73% of the officers agreed that eye protection is not worn by workers because there is no eye protection policy established in the company in which they work, while 23% disagreed with the statement. Some officers recommended that the use of eye protection be a condition of employment. A majority (84%) of the officers agreed, however, that eye protection that is supplied is done without the support of a management eye protection policy. Only 16% of the inspectors disagreed with this statement.

90% of the officers agreed with the statement that there is a lack of rigid enforcement of eye safety rules by management. The inspection personnel stated the importance of enforcement (and also education) but also noted the reluctance of management to discipline workers who would be hard to replace.

TABLE 3.C.5

RESPONSES TO 12 QUESTIONS, ON A FIVE POINT LIKERT SCALE,
CONCERNING ASPECTS OF WORKER COMPLIANCE IN THE WEARING OF EYE PROTECTION IN INDUSTRY
(SURVEY OF 31 OCCUPATIONAL HEALTH AND SAFETY OFFICERS, MARCH, 1978)

QUESTION NUMBER / LIKERT RESPONSE	1 #	1 (%)	2 #	2 (%)	3 #	3 (%)	4 #	4 (%)	5 #	5 (%)	6 #	6 (%)	7 #	7 (%)	8 #	8 (%)	9 #	9 (%)	10 #	10 (%)	11 #	11 (%)	12 #	12 (%)
1. Strongly Disagree	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	1	(3)	1	(3)	0	(0)	0	(0)	1	(3)
2. Disagree	7	(23)	5	(16)	2	(6)	2	(6)	2	(6)	3	(10)	14	(45)	5	(16)	10	(32)	11	(35)	5	(16)	17	(55)
3. Neither 1 nor 5	0	(0)	0	(0)	1	(4)	2	(6)	5	(16)	0	(0)	1	(3)	6	(19)	5	(16)	0	(0)	0	(0)	0	(0)
4. Agree	13	(42)	11	(35)	10	(32)	8	(26)	15	(48)	9	(29)	10	(32)	15	(48)	14	(45)	11	(35)	13	(42)	10	(32)
5. Strongly Agree	11	(35)	15	(49)	18	(58)	19	(61)	9	(29)	19	(61)	6	(20)	4	(13)	1	(3)	9	(30)	13	(42)	3	(10)
TOTAL	31		31		31		31		31		31		31		31		31		31		31		31	

QUESTIONS:

IN GENERAL, MANY WORKERS DO NOT WEAR EYE PROECTION BECAUSE:

1. Commonly there is no eye protection policy established in the plant.
2. Eye protection is supplied without the support of an eye protection policy (ie. no mechanism for re-enforcement).
3. There is a lack of rigid enforcement of eye safety rules by management (ie. disciplinary measures).
4. Management, including first line supervisors, do not show a good example by wearing eye protection themselves while in the plant.
5. Peer pressure can affect the motivation of the worker to wear eye protection (expand on positive and negative aspects).
6. There is a lack of education about the importance of wearing eye protection (expand).
7. Workers are vain or self-conscious about wearing eye protection.
8. Unions do not promote the eye safety of the worker on the job.
9. Unions do little to re-enforce the eye protection policy and programs that have been set up by management.
10. The eye protection is generally poorly fitted and uncomfortable.
11. Excessive heat, cold, or dust makes wearing eye protection very difficult.
12. It inhibits their work performance (ie. lack of peripheral vision).

In general (87%), the officers agreed that many workers do not wear eye protection because management does not show a good example by wearing eye protection themselves while in the plant. A majority (77%) agreed also that peer pressure can affect the motivation of the worker to wear eye protection. Of those who answered affirmatively, 50% thought the effect was positive.

In the opinion of 90% of the officers, many workers do not wear eye protection because there is a lack of education about the importance of wearing it. One-half of the officers stated that workers were not being educated about the hazards of their jobs.

52% of the officers agreed with the statement that eye protection is often not worn because workers are self-conscious about their appearance, while 45% disagreed with the statement. One officer commented that this attitude was dependent on whether everyone was wearing the protection or not. Others commented that the younger worker (who, incidentally, incurs the greatest number of injuries) was most prone to this self-consciousness.

A majority (61%) of the officers agreed that eye protection is not worn because unions do not actively promote the eye safety of the worker on the job. 19% were undecided, while 19% did not agree that this was the case. There was optimism from the inspectors that more unions were promoting eye safety, although some unions still did not want to risk their popularity with the workers. Nearly 50% of the officers agreed with the statement that unions do little to reinforce the eye protection policy and programs set out by management. 35% of the inspectors did not agree with the statement. A few inspectors noted that unions were generally cooperative if properly approached, while others stated that unions traditionally oppose management policy.

65% of the inspection personnel agreed that eye protection is not worn because of discomfort and poor fit, while 35% disagreed with the statement. A few officers noted that this was simply an excuse while others felt that fitting was very important. It was the consensus (84%) that excessive heat, cold and dust made wearing eye protection difficult. Fogging of eye protection was cited as the most common problem. It was interesting to note that nearly 60% of the officers disagreed with the statement that eye protection inhibits work performance.

Table 3.C.6 shows a frequency distribution of Likert scale responses by inspection personnel to statements concerning general aspects of eye protection in industry. A majority of officers (87%) disagreed with the statement that management and safety personnel are aware of the CSA Standards for eye protectors. Only 13% of the officers thought that there was some awareness of the standards. In a similar vein, 74% of the officers felt that management does not know what industrially-approved eye protection is or how to identify it. It was pointed out that safety suppliers do counsel management in some cases. It was noted, however, that some companies want the cheapest protection. On the same subject, 94% of the officers agreed with the statement that all persons in industry often think that street frames with hardened lenses represent industrial eye protection.

It was the consensus of 97% of the officers that management should enforce the wearing of eye protection with disciplinary measures. A few inspectors noted that enforcement was especially important in hazardous areas, while others were vehement that it should be a condition of employment.

77% of the officers agreed with the statement that legislation is one of the best ways to ensure that management provides eye protection for

TABLE 3.C.6

RESPONSES TO 5 GENERAL QUESTION, ON A FIVE POINT LIKERT SCALE
CONCERNING EYE PROTECTION IN INDUSTRY
(SURVEY OF 31 OCCUPATIONAL HEALTH AND SAFETY OFFICERS, MARCH, 1978)

QUESTION NUMBER	1		2		3		4		5	
LIKERT RESPONSE	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)
1. Strongly Disagree	3	(10)	2	(6)	0	(0)	0	(0)	0	(0)
2. Disagree	24	(77)	21	(68)	0	(0)	2	(6)	5	(17)
3. Neither 1 nor 5	0	(0)	1	(3)	1	(3)	0	(0)	2	(6)
4. Agree	4	(13)	7	(23)	3	(10)	18	(58)	15	(48)
5. Strongly Agree	0	(0)	0	(0)	27	(87)	11	(36)	9	(29)
TOTAL	31		31		31		31		31	

QUESTIONS

GENERAL QUESTIONS:

1. Management, including safety personnel, are aware of the CSA Standards for eye protection.
2. Management, including safety personnel, know what industrially approved eye protection is and how to identify it.
3. Management should strictly enforce the wearing of eye protection with disciplinary measures.
4. Management, safety personnel, and workers often think that street frames with hardened lenses represent industrial eye protection.
5. Legislation is one of the best ways to ensure that management provides eye protection for its workers.

its workers. Only 16% of the officers disagreed with this statement. Significantly, it was noted that education should be concurrent with legislation, while 6 officers thought that education was more important than legislation. It was noted, however, that legislation should also put the onus on the worker to wear the protection, and on safety supply houses to sell proper eye protection.

Table 3.C.7 shows the distribution of responses to the general question: Are the eye protection programs that are being provided in industry adequate in your opinion? The distribution of suggestions as to how these programs can be improved is given also. A majority of the inspectors (97%) reported that in general, eye protection programs that are being provided in industry are not adequate. The majority of officers felt that education was a key to a successful program, in addition to enforcement and making the use of protection a condition of employment.

Table 3.C.8 gives the responses of inspection personnel concerning the most important components of ideal eye protection programs. 74% of the officers stated that they had seen an ideal eye protection program. The inspectors noted that a key element in these ideal programs was making the use of eye protection a condition of employment. Cooperation between all persons in industry was seen as a very important factor in the ideal program.

The inspectors were encouraged to give additional comments, if they wished, after each question. This anecdotal data is not shown but it will be integrated into the discussion of the results.

TABLE 3.C.7

DISTRIBUTION OF REPONSES CONCERNING THE ADEQUACY OF EYE PROTECTION PROGRAMS IN INDUSTRY, SURVEY OF OCCUPATIONAL HEALTH AND SAFETY OFFICERS, ALBERTA LABOUR, MARCH, 1978

QUESTION:

ARE THE EYE PROTECTION PROGRAMS THAT ARE BEING PROVIDED IN INDUSTRY ADEQUATE IN YOUR OPINION?

	RESPONSES	(%)
YES	1	(3)
NO	30	(97)
TOTAL	31	

REQUIRED MAJOR COMPONENTS OF AN EYE PROTECTION PROGRAM, AS SUGGESTED BY THE OCCUPATIONAL HEALTH AND SAFETY OFFICERS:

PROGRAM COMPONENT	NUMBER OF OHSO RESPONSES
Education of Worker	24
Enforcement of Rules	12
Compliance a condition of employment	8
Eye protection should be company policy	5
Management should set an example	3
Incentive program should be initiated	3
Proper protection for specific jobs should be available	3
Designate 'Eye Protection Areas'	2
Legislation necessary	2
Unions and management should work together	2
Allow workers to have input into safety program	2
Allow workers choice of eye protection	1
Ensure that eye protection fits comfortably	1
Research necessary to design better protection	1
OHSO's, management and safety personnel should work together	1

TABLE 3.C.8

DISTRIBUTION OF RESPONSES CONCERNING THE PRESENCE OF IDEAL EYE PROTECTION PROGRAMS IN ALBERTA INDUSTRY, SURVEY OF OCCUPATIONAL HEALTH AND SAFETY OFFICERS, ALBERTA LABOUR, MARCH 1978

QUESTION:

ARE ANY OF THE PROGRAMS YOU ARE FAMILIAR WITH IDEAL IN YOUR OPINION?

	RESPONSES	(%)
YES	8	(26)
NO	23	(74)
TOTAL	31	

COMMENTS ON THE IDEAL COMPONENTS OF AN IDEAL EYE PROTECTION PROGRAM:

IDEAL COMPONENT	NUMBER OF OHSO RESPONSES
Compliance condition of employment	11
Compulsory to wear eye protection with side shields	2
Visitors must wear eye protection	7
Management policy with enforcement	7
Union and management cooperate	4
Supervisors responsible for ensuring that eye protection is worn	3
Management sets good example	2
Management gives safety personnel full support	2
Local schools involved in eye safety education	1
Proper protection is provided and fitted by trained personnel	

3.C.D. - Discussion of the Results of a Survey of Occupational Health and Safety Officers

The nature of the results of this section actually provide a discussion in themselves. It was the consensus of the occupational health and safety officers that the attitude toward, and structure around, eye protection programs in industry was not good. The officers were consistent with the statistical data in citing common and serious eye injury hazards. Some officers emphasized the dramatic (e.g. lasers),which may reflect a tentency to note the specialized and downplay the routine, which accounts for a majority of the injuries.

It is apparent that the officers are aware of the eye protection problems in industry. It is interesting to speculate, then, why conditions are not better. It may be that there is a lack of personnel to inspect and enforce on a regular basis. On the other hand, the officers may not have sufficient "legislative clout" to ensure permanent resolvement of the problems.

It is interesting to speculate on the role of the office in relation to the enforcement of eye protection programs. If eye protection is being provided by a company, it is outside the current scope of the inspector to ensure that there is an eye protection policy (a real program) as a basis. The degree of enforcement of rules and education is secondary if the company has satisfied the legislative requisite of supplying the protection; yet it is well known that this, in itself, is not enough. Regulation must ultimately concern the individual worker, and only recently have inspection personnel attempted to charge the individual for violations.

It is apparent that industries must be made responsible for providing an entire eye protection program (e.g. policies, education, enforcement) and not just the skeleton (e.g. supplying protection). By the same token, the worker must be given more responsibility for his own safety.

CHAPTER 3

SECTION D

METHODOLOGY, RESULTS AND DISCUSSION

OF

A SURVEY OF OCCUPATIONAL HEALTH AND SAFETY PERSONNEL

3.D.M. - Methodology - Survey of Occupational Health and Safety Personnel

Rationale

A major source of information regarding eye injuries in industry comes from the personnel who are responsible for the health and safety of the worker on the job. This first-hand information is essential to the understanding of the problem and would aid this researcher in putting the W.C.B. statistical data into perspective. Soliciting information from this group is also politically advantageous in that it would make them more aware of the problems and it would also involve them in the planning process.

Population

It was impossible to identify every occupational health worker in Alberta, but three address lists were acquired that identified the majority. The Medical Services Branch of the Occupational Health and Safety Division keeps an up-to-date listing of every nurse and physician who is known to be primarily involved in occupational health. A listing of members was obtained from the Secretary of the Alberta Occupational Health and Safety Society. A third listing was obtained of all members of the Alberta Association of Safety Personnel. The lists were examined for duplications. A master mailing list of 620 names resulted.

The Instrument

A survey questionnaire was designed for mailing to the personnel on the master list. This questionnaire was not designed to find statistically significant responses, but rather, to gather perceptions of the eye injury and protection situation that the respondents had gained through experience. For this reason, a loosely structured questionnaire was designed around a limited set of questions. This would allow the data to be analyzed in a structured fashion, but at the same time gave the respondent the freedom to express his perceptions.

Content

Figure 3.D.1 shows the questionnaire that was used in the survey. The survey included questions on the respondent's background, opinions on the seriousness and sources of eye injuries, eye injury prevention and safety programs.

Method of Data Collection

Questionnaires were sent by mail. An introductory letter outlined the objectives of the survey and the confidentiality of the responses. The respondents were requested to return the questionnaire to the Medical Services Branch of the Occupational Health and Safety Division. A collect phone number was given for the use of any person who wished further information. There was no follow-up procedure performed.

Possible Bias

The initial sample was composed of personnel with a wide variety of backgrounds in the health and safety field. There was, however, no attempt made to ensure this cross-section in the responses or to follow up the questionnaire to obtain a higher rate of response. For the purpose of this survey, because no statistical inferences were to be made of the responses, and because time was a factor, there was only one mailing with no follow-up.

Method of Analysis

Content analysis was used to analyze the results of the questionnaire. Within specific questions, responses which reflected the respondent's major idea were categorized. With the exception of a frequency distribution, no statistical operations were performed.

FIGURE 3.D.1

Survey of Occupational Health and Safety Personnel

Alberta

LABOUR

Occupational Health
and Safety Division
Medical Services Branch

403/427-6724

3rd Floor, Oxbridge Place
9820 - 106 Street
Edmonton, Alberta, Canada
T5K 2J6

February 28, 1978

Dear Colleague:

Under the auspices of the Occupational Health and Safety Division of Alberta Labour I have recently initiated a province-wide study on eye protection in industry. The objectives of the study are to examine the most common and the most serious causes of eye injuries in industrial and occupational environments, and to develop strategies for advising on and implementing eye protection programs in industry.

In order to gain practical knowledge about the problems in eye protection, from those who are in touch with this special health problem, I am asking for your valuable assistance. Although this will take a few minutes of your time, your ideas and comments regarding eye protection would be much appreciated. In the long run, your suggestions will aid in the improvement of current eye protection practices in industry.

To ease the task of compiling your suggestions and comments, it would be appreciated if you could respond according to the guidelines given below. If there are additional comments you would like to make, please do not hesitate to do so.

GUIDELINES FOR COMMENTING ON EYE PROTECTION IN INDUSTRY Please place your written comments to these questions on the following pages.

1. Please state briefly your experience in occupational health and/or safety, and the particular type of industry in which you now work. (Respond to this question under Guideline #1 on the next page.)
2. Are the number of eye injuries occuring in industry a serious problem in your opinion? (Give details)
3. In your experience, a) what are the most frequent causes of eye injuries and,
   b) what are the most serious causes of eye injuries (ie. those which could likely result in permanent eye disability.)
4. How can these injuries be prevented? (ie. by using better safety design on machines, using more specific or better types of protection, etc.) Please give details.
5. Why, in your opinion, do so many eye injuries occur even when eye protection is worn?
6. Who should be responsible for initiating eye protection programs in industry? (ie. government, management, the worker, the union, others) Please explain.
7. Who should be responsible for maintaining (and ensuring the success of) these programs? (ie. government, management, the worker, the union, others) Please explain.
8. In your view, what are the most successful methods or approaches that should be used to ensure that the worker wears proper eye protection? (ie. showing a good example, discipline, incentives, education, etc.) Please explain.

The information you give will be kept completely confidential. Your response will be destroyed after use. Please use the back of the pages or additional paper if you wish. Thank you.

Dr. Brian Schmidt, Optometrist
Eye Protection Consultant

FIGURE 3.D.1 cont'd

Alberta EYE PROTECTION SURVEY

LABOUR

RESPONSE TO:

GUIDELINE #1

GUIDELINE #2

GUIDELINE #3

GUIDELINE #4

GUIDELINE #5

Please use the back of this page,or addition pages, if required.

FIGURE 3.D.1 cont'd

Alberta
LABOUR

EYE PROTECTION SURVEY

RESPONSE TO:

GUIDELINE #6

GUIDELINE #7

GUIDELINE #8

ADDITIONAL COMMENTS

Please use the back of this page, or additional paper, if more room is required for any of your responses.

PLEASE RETURN THIS QUESTIONNAIRE TO THE MEDICAL SERVICES BRANCH, Occupational Health and Safety Division. PLEASE FIND THE ADDRESS ON THE COVERING LETTER.

If you have any questions about the survey please call Dr. Brian Schmidt, person-to-person collect, after 6:00 p.m., at

3.D.R. Results of a Survey of Occupational Health and Safety Personnel

The survey was mailed to 620 occupational health physicians, nurses, members of the Alberta Association of Safety Personnel, and members of the Alberta Occupational Health and Safety Society. 86 questionnaires were returned, a response rate of 14.0%. 10 questionnaires were returned with no useful information, leaving 76 valid responses.

Table 3.D.1 shows the distribution of responses to the questionnaire according to the occupation of the health worker. A wide variety of health and safety personnel responded to the questionnaire. A large number of the respondents were occupational health nurses and other nurses. A number of physicians responded in addition to employees of the Occupational Health and Safety Division of Alberta Labour.

Table 3.D.2 shows the various industries or organizations in which these workers are located. A number of respondents worked in the construction and petro-chemical industries. Hospitals and community health facilities were represented well in addition. The remainder of respondents came from a wide variety of industrial groups.

Table 3.D.3 notes the opinion of the respondents regarding the seriousness of the eye protection situation in industry. A majority (72%) of the respondents thought that the number of eye injuries occurring in industry was a serious problem.

Table 3.D.4 gives a distribution of the causes of eye injuries that were reported to appear most frequently in industry. In this, and subsequent tables, multiple responses were permitted. 75% of the respondents reported that foreign bodies were the most frequent causes of eye injuries. Nearly 20% of the respondents cited chemicals as a common cause, while 18% of the respondents felt that other flying objects commonly caused eye in-

TABLE 3.D.1

DISTRIBUTION OF RESPONDENTS TO A SURVEY ON EYE PROTECTION IN INDUSTRY PROVINCE OF ALBERTA, FEBRUARY 1978

RESPONDENTS	NUMBER OF RESPONDENTS
Occupational Health Nurse	19
Nurses	6
Nursing Instructor	1
Physician	5
Occupational Health & Safety Officer	2
Other Occupational Health & Safety Personnel	35
Not Specific	8
TOTAL	76

TABLE 3.D.2

DISTRIBUTION OF INDUSTRIES TO WHICH THE RESPONDENTS TO A SURVEY ON EYE PROTECTION ARE EMPLOYED OR HAD THEIR PREVIOUS BACKGROUNDS PROVINCE OF ALBERTA, FEBRUARY 1978

INDUSTRY	NUMBER OF RESPONDENTS
Construction	13
Pulp, Paper, Lumber	5
Public Service (Utilities,Road Maint)	6
Food Industry	4
Agriculture	2
Chemical; Petro-Chemical	12
Metal Industry	3
Railway	3
Office Workers, Retail Stores	4
Manufacturing	4
Hospital, Student Health, Community Health	13
Safety Professionals	8
TOTAL	76

TABLE 3.D.3

DISTRIBUTION OF RESPONSES TO THE QUESTION:
ARE THE NUMBER OF EYE INJURIES OCCURRING IN
INDUSTRY A SERIOUS PROBLEM IN YOUR OPINION?
SURVEY OF OCCUPATIONAL HEALTH AND SAFETY PERSONNEL
IN ALBERTA, FEBRUARY 1978

RESPONSE	RESPONDENTS #	%
YES	55	(72)
NO	21	(28)
TOTAL	76	

TABLE 3.D.4

DISTRIBUTION OF RESPONSES TO THE QUESTION:
WHAT ARE THE MOST FREQUENT CAUSES OF EYE INJURIES?
SURVEY OF OCCUPATIONAL HEALTH AND SAFETY PERSONNEL
IN ALBERTA, FEBRUARY 1978

FREQUENT CAUSES OF INJURY	# OF RESPONDENTS WHO NOTED THE CAUSE
Foreign bodies	57
Chemicals	15
Flying object	14
Welding: Radiation	10
Rubbing eyes	3
Radiation (non-specific)	2
Molten metal	1
Wind	2
Direct blow	1

juries. Welding operations were noted also as a common cause.

Table 3.D.5 gives a distribution of the various causes of eye injuries which, in the opinion of the respondents, resulted in the most serious eye injuries. 38% of the respondents reported that chemicals caused the most serious eye injuries. In the opinion of 46% of the respondents, metallic and other foreign bodies caused serious eye injuries. In addition, welding operations and high pressure (explosive) operations were stated as causes of serious eye injuries.

Table 3.D.6 provides a distribution of opinions of the respondents as to how eye injuries can be prevented. The use of eye protection was cited by the greatest number of respondents (40%) as a way of preventing eye injuries. 28% of the respondents stated that education was also important in preventing injuries, while 26% of the respondents thought that injuries would be prevented with better quality and design of eye protection. Other respondents (24%) noted that the use of proper protection for the task was important while 13% of the respondents were of the opinion that protection at the source and the correction of unsafe work procedures was most important in the prevention of eye injuries.

Table 3.D.7 shows the distribution of responses to the question: Why do so many injuries occur, even when eye protection is being worn? It was the opinion of 76% of the respondents that injuries occur even while protection is worn because the eye protection is inappropriate for the task. However, 26% reported that injuries occur (with the use of protection) because of the poor design or quality standards of eye protection. Others noted that the poor fit and inappropriate use of eye protection caused eye injuries. Nearly 15% of the respondents stated that unsafe work conditions caused eye injuries even though eye protection was being worn. A

TABLE 3.D.5

RESPONSES TO THE QUESTION:
WHAT ARE THE MOST SERIOUS CAUSES OF EYE INJURIES?
SURVEY OF OCCUPATIONAL HEALTH AND SAFETY PERSONNEL
IN ALBERTA, FEBRUARY 1978

SERIOUS CAUSES	RESPONDENTS WHO NOTED THE CAUSE
Chemicals	29
Flying object: Particles	16
Foreign Body	11
Metallic Foreign Body	8
Welding	5
High Pressure Injuries (Compressed air, Explosions)	4
Radiation	2
Molten Metal	2
Burns	1
Direct Blow	1
Assault	2

TABLE 3.D.6

RESPONSES TO THE QUESTION:
HOW CAN THE INJURIES FROM THE
AFOREMENTIONED CAUSES (NOTED IN TABLES 3.D.4 AND 3.D.5) BE PREVENTED?
SURVEY OF OCCUPATIONAL HEALTH AND SAFETY PERSONNEL
IN ALBERTA, FEBRUARY 1978

PREVENTIVE MEASURE	RESPONDENTS WHO NOTED THE MEASURE
Ensure that eye protection is worn	30
Educate the worker	21
Better design, quality of eye protection needed	20
Ensure that proper protection is worn for specific type of work being done	18
Work at the source and correct unsafe conditions, and work procedures	10
Make eye protection readily available	6
Implement eye protection program: Management policy	4
Ensure proper fit, comfort of eye protection	4
Constant use of eye protection necessary	3
Keep eye protection clean, well maintained	3
Supervision needed	3
Attitude change of worker necessary	3
Designate 'Eye Protection Areas'	2
Compliance condition of work	2
Communication between workers necessary	1

TABLE 3.D.7.

SURVEY OF OCCUPATIONAL HEALTH AND SAFETY PERSONNEL IN ALBERTA, FEBRUARY 1978.
RESPONSES TO THE QUESTION: WHY DO SO MANY EYE INJURIES OCCUR EVEN WHEN EYE PROTECTION IS WORN?

REASON FOR INJURIES	NUMBER OF RESPONDENTS WHO NOTED THIS REASON
WRONG PROTECTION FOR TYPE OF WORK	29
BAD DESIGN/POOR STANDARDS OF EYE PROTECTION	20
UNSAFE WORK PROCEDURES/CONDITIONS	11
POOR FIT	9
IMPROPER USE OF EYE PROTECTION	9
NOT EXPERIENCED	5
THIRD PARTY NOT PROTECTED	4
NO ANSWER	4
PROTECTION NOT WORN CONTINUOUSLY	3
WORKER BECOMES OVER-CONFIDENT	2
WORKER RUBS EYES AFTER REMOVING PROTECTION	2
FB ENTERS WHILE PROTECTION REMOVED (TRAPPED DUST)	2
EYE PROTECTION NOT KEPT CLEAN	1

few respondents stated that injuries occur with the use of eye protection because of over-confidence, rubbing the eyes, or allowing foreign bodies to enter the eye after the eye protection had been removed.

Table 3.D.8 gives the distribution of opinion by the respondents to the questionnaire regarding who should be responsible for initiating eye protection programs, while Table 3.D.9 reports on who should be responsible for maintaining these programs once they are established. A variety of responses was given, revolving around the participation of management, the worker, unions, and government. In general, the respondents felt that management should be responsible for initiating and maintaining eye protection programs. It was clear from their responses, however, that all concerned groups had a part to play in the success of eye protection programs.

Table 3.D.10 reports on the respondents' perception of the most successful methods or approaches that should be used to ensure that the worker wears proper eye protection. Education was cited by the majority of respondents (92%) as an important approach. Showing an example was noted as being important, as well as worker incentives. A number of respondents noted the importance of disciplinary measures in gaining worker compliance. It was apparent from the responses that an organized approach was best.

TABLE 3.D.8.

SURVEY OF OCCUPATIONAL HEALTH AND SAFETY PERSONNEL IN ALBERTA, FEBRUARY 1978.
RESPONSES TO THE QUESTION: WHO SHOULD BE RESPONSIBLE FOR INITIATING EYE PROTECTION PROGRAMS?

GROUPS RESPONSIBLE FOR INITIATION	NUMBER OF RESPONDENTS WHO NOTED THE GROUP
MANAGEMENT	16
GOVERNMENT	7
UNION	1
ALL PARTIES CONCERNED	13
MANAGEMENT AND WORKER	12
MANAGEMENT AND UNION	7
MANAGEMENT AND GOVERNMENT	6
MANAGEMENT, GOVERNMENT AND UNION	3
MANAGEMENT AND WORKER WITH SAFETY PERSONNEL	2
MANAGEMENT SUPPORTED BY UNION AND SAFETY PERSONNEL	3
GOVERNMENT FOR INDUSTRY AS A WHOLE; MANAGEMENT FOR RESPECTIVE PLANTS	2

TABLE 3.D.9

SURVEY OF OCCUPATIONAL HEALTH AND SAFETY PERSONNEL IN ALBERTA, FEBRUARY 1978 RESPONSES TO THE QUESTION: WHO SHOULD BE RESPONSIBLE FOR MAINTAINING EYE PROTECTION PROGRAMS IN INDUSTRY?

GROUPS RESPONSIBLE FOR MAINTENANCE	NUMBER OF RESPONDENTS WHO NOTED THE GROUP
TEAM EFFORT: ALL PARTIES CONCERNED	23
MANAGEMENT	14
MANAGEMENT AND WORKER	12
GOVERNMENT	8
MANAGEMENT AND UNION	6
MANAGEMENT AND SAFETY PERSONNEL	2
GOVERNMNET WORKING WITH MANAGEMENT AND UNION	2
GOVERNMENT AND MANAGEMENT	2
GOVERNMENT AND WORKERS	1
OCCUPATIONAL HEALTH AND SAFETY COMMITTEES	1
WORKERS SHOULD BE INVOLVED	1
UNION	1
JOB STEWARD	1

TABLE 3.D.10.

SURVEY OF OCCUPATIONAL HEALTH AND SAFETY PERSONNEL IN ALBERTA, FEBRUARY 1978. RESPONSES TO THE QUESTION: WHAT ARE THE MOST SUCCESSFUL METHODS/APPROACHES THAT SHOULD BE USED TO ENSURE THAT THE WORKER WEARS PROPER EYE PROTECTION?

SUCCESSFUL APPROACHES	NUMBER OF RESPONDENTS WHO NOTED THIS APPROACH
EDUCATION	70
EXAMPLE OF WORKERS AND MANAGEMENT	41
INCENTIVES	21
DISCIPLINE	21
DISCIPLINE AS A LAST RESORT	15
OTHER APPROACHES	
MANAGEMENT POLICY IS MOST IMPORTANT	7
SEEKING ENDORSEMENT OF POLICY BY UNION	1
INVOLVING THE WORKER IN THE PROGRAM	4
UTILIZING CONSTANT FOLLOW-UP	2
COMPLIANCE CONDITION OF EMPLOYMENT	4
PROVIDE COMFORTABLE PROTECTION	4

3.D.D. Discussion of the Results of a Survey of Occupational Health and Safety Personnel

The majority of respondents to the questionnaire were provincial occupational health and safety employees, or nurses. It was logical, therefore, to expect they would consider eye injuries to be a significant problem in industry. Although their backgrounds were diverse, there was consistent agreement on the most frequent and serious causes of eye injuries.

The use of eye protection to prevent injuries was an obvious solution and may have been overlooked by some respondents. It was interesting to note that the use of proper protection and better equipment design was emphasized on a magnitude comparable to the need for employee education. This indicates a realistic and informed approach to the problem.

The respondents were well informed of the reasons for the occurrence of eye injuries, even when eye protection was being worn. This knowledge is not reflected in the current practices of industry toward eye protection, however, and one must speculate that there is bias in the results.

It is apparent from the responses to questions #6 and #7 that the respondents were aware of the essential participation that was needed for the initiation and maintenance of eye protection programs. There was, however, a notable lack of perspective as to what the interactions of the agencies should be, and how they would come about. However, this may be due to the manner in which the questions were phrased.

There was a significant orientation towards education as a means of gaining worker compliance. Example was seen as another important feature in gaining compliance. In comparison to the strong responses of the inspection personnel,using disciplinary measures as a means of compliance was not considered as important, and often only as a last resort. This may reflect a significant difference in government attitudes as compared with the more passive approach of those in the field.

CHAPTER 3

SECTION E

METHODOLOGY, RESULTS AND DISCUSSION

OF

A REVIEW OF THE MINUTES OF SELECTED JOINT WORK SITE COMMITTEES IN ALBERTA.

3.E.M. Methodology - Review of the Minutes of Selected Joint Work Site Committees in Alberta

Rationale

A method of evaluating the concern for eye injuries and the efforts that are being made to prevent them in the individual company is to examine the mechanisms for discussing health and safety in the workplace. In Alberta, by legislation, a number of companies have been required to form joint work site health and safety committees composed of worker and management representatives with input from government officials. By examining the minutes of these committee meetings it was possible to determine the unsolicited concern for eye injuries and their prevention.

Access

Permission was obtained from Alberta Labour to examine the minutes of the joint work site committees. These are filed in the Edmonton and Calgary offices of Alberta Labour.

Population

There were 19 companies with joint work site committees that were also categorized within the Standard Industrial Classifications previouly designated for further study in Part A because of high eye injury rates. These were selected for study in this section.

Data Collection - The Instrument

Companies with work site committees are required to submit copies of their monthly meetings to the Inspection Division of the Occupational Health and Safety Division, on standard reporting forms. This form is shown in Figure 3.E.1. The data was taken from these forms.

FIGURE 3.E.1

Alberta
LABOUR
Occupational Health
and Safety Division

JOINT WORK SITE HEALTH AND SAFETY COMMITTEE

MINUTES OF MEETING DATED ______________ OF ______________, 19 ______

EMPLOYER ______________________________

MAILING ADDRESS ______________________________

SITE LOCATION ______________________________

SITE CODE

NUMBER OF WORKERS AT SITE ______________

EMPLOYER MEMBERS

CO-CHAIRMAN ______________________________

WORKER MEMBERS

CO-CHAIRMAN ______________________________

NO.	CONCERN	RECOMMENDATION	TARGET DATE

OTHER BUSINESS ______________________________

IN MY OPINION, THE ABOVE IS AN ACCURATE RECORD OF THIS MEETING:

____
EMPLOYER (CO-CHAIRMAN)

____
WORKER (CO-CHAIRMAN)

ESTIMATED DATE OF NEXT MEETING

______________________________, 19 ______

FOR O.H.S. DIVISION USE ONLY

COPY 2 O.H.S. DIVISION

The Content

Data was taken from the minutes where there was any mention of eye injuries and their prevention.

Method of Data Collection

A listing of companies within the high eye injury risk industrial classifications identified in Part A was obtained. A current listing of joint work sites was obtained. Company names from these two lists were cross-matched, the common companies being designated for study. The minutes of the meetings of these companies were requested, and photocopies of same were received. Analysis was performed directly on the minutes.

Bias

Only companies with generally poor accident experiences (including eye injuries) are selected to have joint work site committees. These companies, therefore, do not always represent the average company within their industrial classification. The general apathy of companies with poor accident experiences toward safety is offset by the fact that a force has been created where safety matters must be discussed.

Method of Analysis

A standard content analysis was performed on the minutes of the meetings, looking for phrases which indicated discussion of incidents or principles involving eye protection, or related safety factors such as plant lighting.

3.E.R. - Results of a Review of Selected Joint Work Site Committee Minutes

In accordance with the criteria set out in the methodology, 19 companies in the Edmonton and Calgary area were selected for a review of their joint work site committee minutes. Among the 19 companies, 60 meetings had been held over a 7-month period. In 39, or 65% of the meetings, there was discussion of some aspect of eye protection, eye safety, or personal protective equipment in general, which included eye protection. Table 3.E.1 shows a listing of the companies selected and the dates, over a seven-month period, in which joint work site committee meetings were held. The X marks indicate the specific topic areas that were discussed at the meetings. Table 3.E.2 defines the topic areas from #1 to #11.

3.E.D. - Discussion of the Results of a Review of Selected Joint Work Site Committee Minutes

It is significant that in 65% of the joint work site meetings studied, the minutes indicated that some aspect of eye safety or visual performance was studied. Table 3.E.2 shows that topics of discussion were varied, but eye protection when using grinders and the general problems of eye protection and worker compliance was discussed in the greatest number of meetings. Eye protection in welding operations was also discussed to some degree as was the improvement of visibility, through better lighting, for safety. A few companies tended toward the discussion of more isolated incidents.

It appears that concern for the protection of the eyes, in these companies, is present. The discussion, in many cases, centers on problems that are common to many industrial groups (e.g. grinders).

TABLE 3.E.1

LISTING OF SELECTED COMPANIES IN THE EDMONTON AND CALGARY AREAS, WITH A REVIEW OF THE TOPIC AREAS, CONCERNING EYE SAFETY DISCUSSED AT THEIR JOINT WORK SITE COMMITTEE MEETINGS, 1977-78

CO.	DATES OF MEETINGS	SUBJECT OF DISCUSSION AT MEETINGS												EYE SAFETY NOT DISCUSSED
		1	2	3	4	5	6	7	8	9	10	11	12	
#1	JAN 26/78													X
	DEC 21/77													X
#2	JAN 17/78													X
	DEC 13/77													X
	NOV 9/77	X												
	NOV 2/77													X
#3	JAN 11/78													X
#4	JAN 13/78													X
	DEC 16/77		X											
	NOV 18/77													X
	OCT 19/77	X												
#5	FEB 2/78			X										
	JAN 4/78				X									
	NOV 23/77				X									
	OCT 27/77				X									
#6	FEB 15/78													X
	JAN 5/78					X								
#7	JAN 19/78	X					X							
	DEC 14/77	X					X							
	NOV 8/77	X			X		X							
#8	JAN 20/78													X
	DEC 16/77							X						
	NOV 26/77							X						
#9	JAN 25/78						X							
	DEC 25/77						X							
	NOV 30/77													X
	OCT 19/77													X
#10	DEC 7/77				X									
#11	NOV 16/77							X						
	OCT 19/77													X
	SEPT 21/77													X
#12	JAN 17/78							X						
	DEC 6/77						X	X						
	NOV 8/77							X						
	OCT 21.77	X			X									
#13	JAN 16/78	X												
	DEC 19/77						X							
#14	JAN 6/78													X
	NOV 18/77													X
	OCT 14/77						X							
#15	JAN 17/78								X					
	DEC 22/77													X
	NOV 14/77													X
	OCT 14/77									X				
	SEPT 12/77									X				
	AUG 15/77													X
#16	JAN 9/78							X						
#17	JAN 17/78									X				
	DEC 13/77-							X			X	X		
	NOV 16/77							X		X				
	OCT 18/77							X						
#18	JAN 9/78						X							
	DEC 7/77													X
	NOV 8/77						X							
	SEPT 29/77													X
	AUG 29/77									X				
#19	JAN 9/77	X												
	DEC 12/77											X		
	NOV 1/77											X		
	OCT 17/77							X				X		

TABLE 3.E.2

LISTING OF THE MAJOR TOPIC AREAS
DISCUSSED AT SELECTED JOINT WORK
SITE COMMITTEE MEETINGS, 1977-78

NO.	MAJOR TOPIC AREAS
1.	THE USE OF SHIELDING, OR LACK THEREOF, AROUND WELDING OR GRINDING OPERATIONS
2.	THE USE OF FACE SHIELDS WITH SMALL GRINDERS
3.	THE OCCUPATIONAL HEALTH AND SAFETY ACT REGARDING PERSONAL PROTECTIVE EQUIPMENT
4.	THE IMPROVEMENT OR REPAIR OF INADEQUATE LIGHTING
5.	EYE SAFETY AND DISCUSSED AS A PRIORITY
6.	NECESSITY OF WEARING EYE PROTECTION, WORKER COMPLIANCE PROBLEMS, NEW EYE PROTECTION AND THE USE OF SIGNS FOR EDUCATION
7.	THE NEED FOR AND REPLACEMENT OF GUARDS ON GRINDERS OR SAWS
8.	WORKER COMPLIANCE IN THE USE OF PROTECTIVE EQUIPMENT IN GENERAL
9.	USE OF EQUIPMENT IN THE PLANT TO IMPROVE VISIBILITY
10.	THE DANGER OF ACID BURNS
11.	POSTING DANGER AREAS FOR EYE HAZARDS
12.	THE USE OF PROTECTIVE SCREENS AROUND EQUIPMENT IN GENERAL

CHAPTER 3

SECTION F

METHODOLOGY, RESULTS AND DISCUSSION

OF

A REVIEW OF ANECDOTAL DATA

3.F.M. Methodology - Anecdotal Data

Rationale

From a political and planning perspective, it is important to seek the involvement and input of all persons concerned with eye protection. Although site visits were planned as well, it was important to speak with labour and management groups, on a policy level, concerning eye protection in industry. For this part of the project, it was impossible to interview every union and worker group, and every management group that was concerned with health and safety. It was decided, therefore, to approach only the major representative organizations of labour and management.

It was decided to try to obtain more anecdotal data through an advertisement of the project and a request for information from the reader.

Access to Information

The Alberta Federation of Labour is the representative labour group. The AFL have a special sub-committee concerned with health and safety. The past president of the AFL was approached for an interview in addition to the current chairman of the committee concerned with health and safety (the environment committee). Only the environment committee chairman was able to meet with the researcher. Two other union representatives were asked to attend, one being a senior person from the Alberta Building Trades Council. Four management sponsored safety councils were identified within the group of previously designated high eye injury risk Standard Industrial Classifications. Two of these committees were active and their chairmen were approached for interviews. One accepted and the other could not be contacted at an appropriate time. The remaining safety councils were inactive but the researcher was able to contact their past chairmen who both agreed to interviews.

The Instrument

A set of questions was designed for the interviews. They were, however, very unstructured, in line with the intent of the interview, which was to gain practical policy perspectives on the eye protection situation in Alberta industry.

The Content

The interviews were quite unstructured although questions relating to broad subject areas were posed. The researcher, at his discretion, probed in various content areas where it was appropriate. The subject areas were similar to those areas of questioning in the questionnaire of Part D. A policy and implementation perspective was stressed.

Method of Data Collection

A pre-arranged interview time was arranged with every person. The interview started with a brief introduction of the researcher and the objectives of the study. All interviews lasted approximately 1 hour, with the exception of the meeting with the union representatives, which lasted 2 hours. Brief notes were taken in the interviews and a detailed summary written immediately following. All recorded comments were subjective.

Bias

Due to the nature of the groups, it was not expected that they would give entirely objective opinions. The purpose, however, was only to gather perspectives on the problem from a certain point of view. Knowledge of their biases was also important.

Method of Analysis

The data was not analyzed to any degree, although their perspectives and answers to questions were taken into account.

Advertisement in the Occupational Health and Safety Division Bulletin

Figure 3.F.1 shows a copy of the news clipping published in the Occupational Health and Safety Division Bulletin. The purpose of the article was to make as many people involved in occupational health and safety in Alberta aware of the project and to solicit their opinions. Approximately 35,000 copies of each issue are printed, with a very diverse readership.

3.F.R. and 3.F.D. - Results and Discussion, Anecdotal Data

One month after the printing of the Occupational Health and Safety Division Bulletin, no responses had been received to the advertisement calling for opinions on eye protection problems. This was not entirely unexpected and it was felt that for the purposes of planning, the article had achieved its objective (of informing the industrial public).

Interviews were held with representatives, or in two cases a past representative, of three management sponsored safety councils. These were:

1) The Alberta Building Materials Safety Council - representing companies within occurrence classes 8-03 and 8-04.
2) The Alberta Automotive Safety Association - representing companies within occurrence class 5-01.
3) The Alberta Metal Trades Accident Prevention Association - representing companies within occurrence classes 8-02, 8-03 and 8-04.

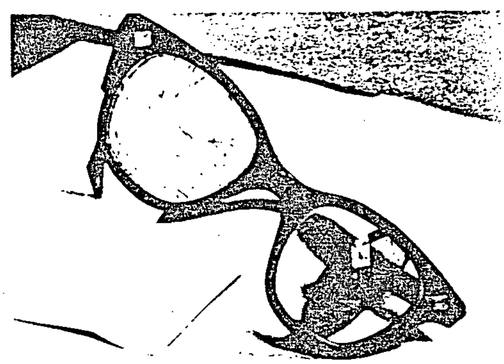
An interview was held with union personnel, who were representatives of the Alberta Federation of Labour and the Alberta Building Trades Council.

The minutes of these meetings are not submitted as data results but, rather, will be reflected in this researcher's opinions and conclusions concerning the eye protection problems in industry.

FIGURE 3.F.1

OCCUPATIONAL HEALTH AND SAFETY BULLETIN - ALBERTA LABOUR
VOL. 2. NO. 1 MARCH 1978

COMMENTS WANTED ON OCCUPATIONAL EYE INJURIES



He forgot to put his safety glasses on, but luckily a friend reminded him.

Dr. Brian Schmidt is currently carrying out a review of occupational eye injuries and prevention programs for the Occupational Health and Safety Division, and is looking for your suggestions and observations.

He has been asked to examine the causes of eye injuries in occupational environments and to develop standards and programs directed to vision protection in industry.

In order to obtain as much information as possible about eye injuries in industry, their underlying causes, and about ways of reducing them, Dr. Schmidt would like to obtain comments from any concerned persons or organizations.

If you can help, please forward your comments to Dr. Schmidt as soon as possible. Information can be sent to his attention at the Medical Services Branch, Occupational Health and Safety Division, Alberta Labour, 3rd Floor, Oxbridge Place, 9820 - 106 Street, Edmonton, Alberta T5K 2J6.

During the summer of 1977, Dr. Schmidt worked for the Medical Services Branch compiling currently available information on optimum eye protection systems and programs. This is to be edited and made available to industry shortly.

CHAPTER 3

SECTION G

METHODOLOGY, RESULTS AND DISCUSSION

OF

SELECTED SITE VISITS TO INDUSTRIES IN ALBERTA

3.G.M. Methodology - Site Visits

Rationale

To better understand the conditions which lead to eye injuries and the problems in implementing programs, several plant visits were made by the researcher.

Population

Six companies were selected from the previously identified group of high eye injury risk Standard Industrial classifications. These companies were in the vicinity of Calgary and this researcher was assured, by government personnel, that they were representative of companies in these industry classifications.

Method

In February of 1978 the researcher travelled to Calgary where the six site visits had been arranged by Alberta Labour personnel. Four of the plants were visited. In March of 1978, as a result of discussions with management safety council personnel, this researcher made two more site visits.

Along with an OHSO who had been assigned to coordinate the site visits, the researcher met the safety personnel in every company before entering the working area. The researcher was allowed to walk through any area of the plant and to stop and speak with workers. No particular format was used in observing the hazards and safety conditions. The researcher looked for evidence or the lack thereof of eye protection, and for eye hazards which had been previously identified in the literature (and from the data the researcher had collected). Brief notes were recorded at the end of each site visit.

Bias

In four cases, the researcher visited the plants with an inspection officer. Because the visits were prearranged, the true picture may not have been shown. However, a considerable number of infractions were evident and worker behaviour did not appear to have been altered.

3.G.R. and 3.G.D. - Results and Discussion of Site Visits

The notes taken during the course of the site visits are not submitted as data results but, similar to the anecdotal data, the information received will be included in the general discussion on eye protection.

CHAPTER 4

GENERAL DISCUSSION

4.A. Integration of the Results and Discussion of Studies 3.A. - 3.G.

The methodology, results and discussions of seven separate studies have been presented in the previous section. The studies represent the components of a "system of inquiry", used to identify and assess the problems in eye protection and causes of eye injuries. As this was a planning study, it was necessary to pursue all avenues to develop an overview of the system. In this section, this overview will be presented and discussed.

The review of the W.C.B. Statistical Master Files (Section 3.A.) gave a macro-epidemiological view of the reported eye injury statistics in Alberta. This review allowed the identification of high eye injury risk industry classes, which could then be studied in detail. The detailed analysis of high eye injury risk industry classes was facilitated through the review of selected W.C.B. personal medical files (Section 3.B.). Although these same cases had been identified and reviewed in Section 3.A., this review (Section 3.B.) allowed for a more detailed analysis of eye injuries, and the collection of information from a preventive point of view. Significant points of information regarding eye injury prevention that were not included in the statistical master files (Section 3.A.), but were identified in the review of the personal medical files (Section 3.B.) were: a) whether eye protection was worn at the time of the accident, b) which machine or implement was being used at the time of the accident, and c) the number of similar claims that had been reported previously by the worker.

Section C, the survey of occupational health and safety officers, provided expert, first-hand, information on the eye injury and eye protection situation. The nature of some of the questions allowed for the verification of some of the statistical data in Sections A and B. Section D, the survey of occupational health and safety personnel in industries in Alberta, also provided a verification of some of the statistical data relating to the seriousness of eye injuries. Both the inspectors (Section C) and the occupational health personnel (Section D) were able to provide information concerning the implementation, or lack thereof, of preventive eye protection programs. This type of information was not available from the statistical master files or the review of personal medical files.

Contrary to Sections A to D, Section E examined the unsolicited concern for eye injuries and eye protection programs in industry, through a study of safety committee minutes. This data illustrated concern for the prevention of eye injuries, independent of the bias introduced by asking directed questions.

Section F outlined the interviews (anecdotal data) that the researcher had with various organized labour and management groups. Little hard data was collected but, rather, perceptions of the eye protection situation were gathered that the researcher could use in formulating his final opinions. As opposed to the practical opinions given in Sections C and D, the labour and management groups provided information from a broad policy perspective.

The researcher's site visits, described in Section G, allowed him to integrate the statistical and other information by acquiring first-hand information on industrial eye protection problems.

These studies, therefore, represent the gamut of available data and opinions concerning eye injuries and eye protection in industry. The discussion shows that the sections of this study are highly differentiated, but can be synthesized and integrated as a unit. The next section (4.B.) provides the synthesis of the results and discussions of these studies.

4.B. Synthesis of Results and Discussions

Occurrence Classification

There is little relation between the rate of eye injuries in an industry class and the occurrence classification in which it has been placed. This indicates the presence of hazards which are specific to the causation of eye injuries (e.g. flying particles) and which appear in industry disproportionately to the hazards (and overall injury rates) which determine the insurance premiums.

Industry

The high eye injury risk industries include those which are associated with the manufacture or processing of metals or metal products, the lime manufacturing industry, and the construction industry. There is no relation between the average size of a company within an industry class and the rate of eye injuries.

In general, however, it is neither advantageous or appropriate to study eye injuries on the basis of industry class. It has been illustrated that the identification of the occupation of the worker and the identification of the hazard is more appropriate than a discussion of the industry class which simply contain them.

Occupation

The majority of high eye injury risk occupations are those which involve work with metals and metal products. Specifically, these include welders, plumbers and pipefitters, machinists, and mechanics. Workers in construction occupations, such as carpentry and masonry, are also "at risk" because of the presence of stone and wood particles. A large number of eye injuries are incurred by helpers of persons who are in metal related occupations and by persons who are walking by when these tradesmen engaged in their work. The high incidence of eye injuries within specific occupational groups suggests that they receive special attention concerning education and/or enforcement of safety rules on the use of eye protection. This is a departure from past practice, where such efforts were directed at the industry as a whole.

In metal related occupations the sources of worker injury remain stable and are fairly predictable. In occupational groups with large memberships, however, a greater variety of injury sources are evident because odd injuries can occur by chance.

Age and Work Experience of the Injured Worker

Nearly 75% of the injured workers were less than 35 years of age, and over 45% were less than 25 years of age. It is likely that these findings are disproportionately high in relation to the size of the work force in these same age categories. More than half the workers (who reported this information) stated they had less than one year of work experience in the industry. Nearly 70% of the workers who incurred injuries that resulted in permanent disabilities had less than one year of work experience with the company. It can be concluded, therefore, that the greatest proportion of eye injuries occur in young and inexperienced workers, and educational and enforcement efforts directed toward these workers should be given special attention.

Time of Accident and Length of Shift

A majority of the eye injuries occurred among workers who worked eight hour shifts. A relatively high proportion of injuries, however, occurred among workers who worked nine hour shifts. It is not likely this high proportion is congruent with the proportion of the workforce who actually work nine hour shifts, but the data to substantiate this finding would be difficult to obtain.

The incidence of eye injuries is highest at certain times of the day, with a mid-morning peak and a higher mid-afternoon peak. The majority of eye injuries occur in the latter portion of the worker's shift, although a peak in the middle of the first half of the shift is present in some industry classes. This data, and the information concerning the length of the workers' shift, indicates that boredom and/or fatigue may be factors which contribute to the causation of eye injuries.

Cause (Source)and Nature of Eye Injuries

The majority of eye injuries are caused by metal (mainly steel) and other particles, followed by radiation and chemicals. In most cases these injury sources result in corneal abrasions, radiation burns and chemical burns to the eye respectively. Metal and other particles cause a higher proportion of medical-aid-only accidents than chemicals and radiation, which cause a higher proportion of the injuries resulting in lost work time. The source and resulting nature of most injuries are predictable, and control measures are therefore possible.

Over the years 1974 to 1976, injuries due to chemicals, welding equipment (radiation), and particles increased in prevalence,while only the less common injury sources decreased in prevalence. There may be some centralization of injuries toward the more common etiologies and away from the rarer events. This may indicate the use of eye protection in the special cases, but the same contempt for safety in "everyday situations".

Implement or Machine Used at the Time of the Accident

The greatest number of eye injuries from a single implement occurred while the worker was using a grinder or welding equipment. These implements often resulted in injuries when the injured worker was not directly involved in its use. Handtools and explosive-actuated tools are other implements which caused a significant number of injuries.

Directed enforcement and education programs concerning grinders, welding equipment, and other implements could have a significant impact on the occurrence of eye injuries in industry.

Many injuries were reported to have been caused by particles being blown in the eyes, even when the worker was not using any equipment. This indicates the need for appropriate eye protection at all times when the worker is in a hazardous area. The minimum standard for protection should be safety spectacles with side shields.

Use of Eye Protection when the Accident Occurred

On the basis of available data, it appears that the majority of workers who incurred eye injuries were not wearing eye protection at the time of the accident. This conclusion is based on the presumption that the majority of workers who gave no information about the use of eye protection were not wearing any at the time of the accident. The majority of workers who were wearing eye protection at the time of the accident were wearing safety spectacles only. No information could be obtained concerning the use of side shields or whether the spectacles used were appropriate for the task. Safety spectacles with side shields should be considered the minimum standard. An evaluation of the hazard, which may indicate the need for additional protection, should also be performed.

In a significant number of cases, however, accidents occurred even though the proper type of protection was being worn. In these cases, metal particles fell behind the protection or fell into the eye as the protection was being removed. The design of certain types of eye protection, notably face shields and welding helmets, should be evaluated.

In many cases, although protection was worn, the fit was poor. This may be as much a hazard as using the incorrect type of eye protection.

Few eye injuries occur as a result of the physical failure of the protector. The present C.S.A. standards appear to be adequate. More attention must be placed upon the design, fit and selection of the protectors.

Reporting of Eye Injuries and First Aid

The review of selected W.C.B. personal medical files showed that accidents are reported to a diverse group of people, from janitors to management executives. There is great inconsistency in the time of reporting also. Reports are frequently made the day after the event despite the small number of injuries (e.g. radiation burns) that might normally be reported the next day. Inappropriate reporting or delays in treatment may lead to more serious injury. This idea is supported by the fact that a low proportion of lost work time injuries receive first aid. First aid was given in only 56% of the cases which resulted in permanent disability. First aid, of course, cannot be offered in all cases, but it appears more is needed than is presently being given.

Many of the injuries that result in lost work time are simply complications of common injuries that normally require medical aid only (e.g. unattended metal foreign bodies that can cause rust deposition in the cornea). Prompt reporting to specified occupational health and safety personnel, with first aid leading to medical care if necessary, could reduce or eliminate many of the injuries that result in lost work time.

Prevalence of Similar Injuries and Other Claims

The review of selected personal medical files from the W.C.B. showed that a large proportion of the workers had submitted claims for eye injuries in the past. A past history of other types of injuries was also common. The most likely explanation is that there are particular job tasks and occupational classes that receive more exposure to the threat of injury than others. The concept of job carelessness or indifference to safety may also be a factor, but apart from anecdotal reports, was not examined in this study. A more detailed investigation into the cause of eye injuries with appropriate education and/or equipment should be made in the case of each eye injury to prevent recurrences.

The Cost of Eye Injuries

The total cost of the majority of injuries resulting in lost work time is approximately $400, while the cost on average is $600. The review of personal medical files shows that the majority of lost work time eye injuries are between one and two days in duration. There are relatively few eye injuries of high cost. It is apparent, therefore, that a general reduction in the incidence of the common eye injuries is the best way to reduce the cost of eye injuries.

The Severity of Eye Injuries

In general, the ratio of severity #1 to severity #2 eye injuries is four to one. This ratio, however, varies widely among industry classes and bears no relation to their size or type. The incidence of permanent disability injuries (severity #3) is minute in comparison and, once again, these cannot be attributed to any particular industry.

It has been hypothesized that, according to the industry or task, the number of permanent disability, lost work time, and medical aid only eye injuries varies by chance (70). This is supported by data from this study which indicates that the majority of eye injuries are caused by common and easily recognizable sources. Few injuries can be attributed to unusual events. The more serious injury appears to be a result of a more serious form (occurring by chance) of a common hazard.

Eye Protection Programs

There is a lack of management policy concerning eye protection in industry and, therefore, an absence of effective eye protection programs. In general, currently established eye protection programs are limited in scope and effectiveness. Inspection personnel and other occupational health personnel cited the following deficient factors:

a) lack of education as to the importance of wearing eye protection

b) lack of well established eye protection policies

c) lack of rigid enforcement (including discipline where necessary)

d) lack of adequate peer and management example.

It was the opinion of a majority of industrial personnel and occupational health personnel that management is primarily responsible for the initiation and maintenance of eye protection programs. Legislation is one of the best ways to ensure that management provides adequate eye protection programs although it is important that worker and management education be concurrent with such legislation. Inspection personnel concluded that there is little knowledge of C.S.A. Eye Protector Standards or how to identify protection claimed by manufacturers to meet these Standards. Since recommendations for the selection of the appropriate type of eye protection for the task are given in the C.S.A. standards, it is implicit that there is a lack of information and knowledge by management and workers in this area also. Furthermore, some suppliers of eye protection must upgrade their knowledge. Legislation was suggested as a feasible method of ensuring that suppliers of eye protection provide quality advice and products.

The lack of the essential elements of an eye protection program (e.g. policy, education, enforcement, follow-up, etc.) can affect worker compliance. Other factors which affect worker compliance are the fit of the appliance and cosmetic acceptability. Improvements can be made in this area.

Eye injuries are a significant problem in industry. The majority of eye injuries, however, are caused by common hazards. There is an awareness of the magnitude of the problem in industry but efforts to contain the problem are often absent or, at best, incomplete. It is apparent that there has been inadequate problem solving which has centered around coping with isolated incidents (e.g. fire fighting), rather than establishing policies which, in time, could contain a majority of the problems. The development and enforcement of adequate eye protection programs will be an important part of this process.

4.C. Conclusions and Recommendations - General Applicability

Industry Classes

The manufacture and processing of metal products and chemicals and the use of construction materials are associated with high rates of eye injuries. It is recommended that:

1. INDUSTRIES INVOLVED IN THE MANUFACTURE OR USE OF METAL PRODUCTS, CHEMICALS OR CONSTRUCTION MATERIALS, BE DESIGNATED AS HIGH RISK INDUSTRY CLASSES AND GIVEN SPECIAL ATTENTION IN REGARD TO THE DEVELOPMENT OF EYE PROTECTION PROGRAMS OVER THE SHORT TERM.

Occupation and Hazard Classification

The classification of eye injuries on the basis of the hazard which caused them, instead of the industry in which they occurred, is well documented in literature. It is an appropriate classification in relation to the hazards which were found, and studied, in this thesis.

The literature (43) shows that certain occupational classes have high eye injury risks. The occupations are similar to the ones identified in this study and include machinists, plumbers and pipefitters, and welders. Rates of eye injuries were not available by occupation in the literature and have been determined in this study apparently for the first time (Table 3.A.3).

The findings of this study suggest that certain occupational groups receive special attention when developing eye protection programs.

It is recommended that:

2. A NEW EMPHASIS BE INITIATED BY TREATING OCCUPATIONAL CLASSIFICATIONS AND EYE INJURY HAZARDS AS A BASIS TO EYE INJURY PREVENTION, RATHER THAN INDUSTRY CLASSES; and

   a) THAT OCCUPATIONS CONCERNED WITH THE MANUFACTURE OR PROCESSING OF METALS OR METAL PRODUCTS BE DESIGNATED AS HIGH RISK OCCUPATIONS; and

b) THAT SPECIAL PROGRAMS BE DEVELOPED, THROUGH APPRENTICE TRAINING PROGRAMS, UNIONS AND COMPANIES, TO INFORM AND EDUCATE THESE WORKERS IN THE PROTECTION OF THE EYES AND THE PREVENTION OF EYE INJURIES, AND THAT SPECIAL CONSIDERATION BE GIVEN TO WELDERS, PLUMBERS AND PIPEFITTERS, MACHINISTS, AND MECHANICS; and

c) THAT EYE PROTECTION PROGRAMS BE DEVELOPED ON THE BASIS OF THE IDENTIFICATION OF EYE INJURY HAZARDS, RATHER THAN UPON THE INDUSTRIES WHICH MAY CONTAIN THEM.

Many eye injuries are incurred by helpers of persons who are in metal related occupations and by persons who are walking by when tradesmen are engaged in their work. It is recommended that:

3. SPECIAL EDUCATIONAL PROGRAMS BE DEVELOPED TO EDUCATE THOSE PERSONS WHO ARE HELPERS, OR THOSE WHO ARE PASSING BY WHEN A HAZARDOUS TASK IS BEING PERFORMED, OF THE DANGERS TO THE EYES AND THE METHODS OF PROTECTION; and

   a) THAT IT BE KNOWN THAT EYE PROTECTION IS NECESSARY EVEN WHEN PASSING BY A HAZARDOUS TASK OR HELPING AT A TASK.

Eye Protection Standards

One study (31) notes a high failure rate of eye protectors, measured against the C.S.A. Standards. This is not a critical factor in light of the findings of this study, where few injuries were due to the physical failure of the protector. These standards must not be disregarded, however, and the quality of protectors must be maintained at a high level. It is recommended that:

4. GOVERNMENTS RECOGNIZE, IN THE FORM OF REGULATIONS, THE STANDARDS SET OUT BY THE C.S.A., NAMELY THE C.S.A. STANDARD FOR EYE PROTECTORS, 1969.

It is also recommended that:

5. GOVERNMENTS LEGISLATE THAT OPTICAL AND SAFETY SUPPLY HOUSES CARRY EYE PROTECTION WHICH IS MANUFACTURED BY COMPANIES WHO CLAIM THEIR PRODUCTS MEET THE C.S.A. STANDARDS. A LISTING OF THESE MANUFACTURERS IS GIVEN IN A CANADA SAFETY COUNCIL BULLETIN; and
   a) THAT GOVERNMENTS PUBLISH A LIST, FOR DISTRIBUTION TO INDUSTRY, OF THOSE COMPANIES WHO CLAIM THAT THE PROTECTORS THEY SELL IN THE PROVINCE MEET THE C.S.A. STANDARDS.

There is, however, a disregard for the careful and appropriate selection of eye protectors by those who supply and use them, as noted earlier in this thesis and in the work by Chartrand (28). More use should be made of the standardized charts which indicate the appropriate protection for the job hazard. It is recommended that:

6. EMPHASIS BE PLACED, THROUGH EDUCATION, ON THE SELECTION OF APPROPRIATE EYE PROTECTORS FOR THE HAZARD. THIS INCLUDES THE TRAINING OF THE SAFETY PERSONNEL WHO WILL CHOOSE THE PROTECTION AND SAFETY SUPPLY REPRESENTATIVES WHO MUST AID IN THE SELECTION AND PROVISION OF THE EQUIPMENT.

The Canadian literature on eye protectors tends to emphasize their physical protection characteristics. It is apparent from this study and an American study by Logar (77) that more emphasis needs to be placed on the fit and function of the protector, and more attention must be given to design, including cosmetic acceptability. It is recommended that:

7. PROVISIONS BE MADE IN EACH COMPANY FOR THE FITTING OF EACH PROTECTOR TO THE FACE OF THE WORKER. THIS MAY INVOLVE THE DEVELOPMENT OF A SHORT PROGRAM TO TEACH SAFETY PERSONNEL THE BASIC ELEMENTS OF FITTING. CONSIDERATION MIGHT BE GIVEN TO USING VISION CARE PROFESSIONALS FOR THE FIRST FITTING.

It is also recommended that:

8. APPROPRIATE STUDIES BE CONDUCTED TO EXAMINE THE DESIGN OF EYE PROTECTION IN RELATION TO THE HAZARD IT MUST PROTECT AGAINST.

The Incidence and Nature of Eye Injuries

It is difficult to correlate the rate of eye injuries in Alberta with the rate of eye injuries in the other Canadian provinces because of reporting discrepancies and the difficulty in estimating the size of the workforce. The incidence of eye injuries in Alberta is relatively high but so is the overall injury incidence. The proportion of lost time eye injuries, in relation to the total number of injuries of all kinds, is slightly lower (3.4%) than that reported elsewhere.

The findings of this study are consistent with the literature (34) which shows that the majority of eye injuries occur in the young and inexperienced worker. It is recommended that:

9. THE MAJORITY OF THE EDUCATIONAL PROGRAMS IN INDUSTRY BE ORIENTED TOWARD THE YOUNGER AND MORE INEXPERIENCED WORKER. THIS INCLUDES THE INTEGRATION OF EDUCATIONAL PROGRAMS INTO APPRENTICE TRAINING COURSES AND ANY INITIAL ORIENTATION PROGRAMS IN INDUSTRY.

This and another study (34) show that grinding and welding are prominent causes of eye injuries. The proportion of injuries due to chemicals is variable, accounting for between 8.1% (40) and 24% (34) of eye injuries in previous studies. Only 7.1% of the eye injuries in Alberta in 1976 were related to chemical injury. The lower proportion may be due to differences in the industries represented in this province, or to sampling bias in other studies. In light of this information, it is recommended that:

10. SPECIAL CONSIDERATION BE GIVEN TO THE PROTECTION OF THE EYES AROUND ALL GRINDING AND WELDING OPERATIONS AND THAT SPECIAL EDUCATIONAL AND ENFORCEMENT PROGRAMS BE DEVELOPED CONCERNING THEIR USE. SPECIAL

PROGRAMS CONCERNING THE USE OF EXPLOSIVE ACTUATED TOOLS AND CHEMICALS ARE HIGHLY RECOMMENDED ALSO.

British Columbia data (34) concerning the nature of lost time eye injuries was compared with findings of this study (Table 3.A.61). Although the overall rate of eye injuries is quite different, the relative proportions of the different kinds of injuries are remarkably similar. These statistics suggest the presence of common eye injury denominators and, thus, predictable and controllable causes of injury.

One Canadian study (34) shows that nearly 42% of the reported eye injuries (using Canadian and Alberta totals) occurred while eye protection was being worn. Information concerning the use of eye protection was not usually provided in Alberta W.C.B. forms, so this finding can neither be confirmed nor denied by this thesis. Anecdotal data, however, suggests that far fewer injuries occur while protection is being worn than is cited in the literature.

The findings of this study are consistent with the literature (46) with regard to morning and afternoon peaks in the occurrence of injuries, and suggests that attention must be paid to the effects of fatigue and boredom. It is recommended that:

11. WORKER FATIGUE AND/OR BOREDOM BE CONSIDERED AS A POSSIBLE CAUSE OF EYE INJURIES. CONSIDERATION SHOULD BE GIVEN TO THE STAGGERING OR MODIFICATION OF BREAK PERIODS IN LIGHT OF PEAK PERIODS DURING THE WORKER'S SHIFT IN WHICH EYE INJURIES OCCUR.

Eye Protection Programs

This thesis reviewed the various components of eye protection programs (eg. education, enforcement) in relation to their importance, as indicated by the responses to two surveys. The literature, on the other hand, discusses the structure and resulting processes that would be found in the complete eye protection program. The results of this study are consistent with the literature in citing policy development, education, and enforcement as important components of an eye protection program. It is recommended that:

12. COMPANIES BE ENCOURAGED TO DEVELOP EYE PROTECTION POLICIES AS A BASIS TO THE PROVISION OF EYE PROTECTION PROGRAMS, AND THAT EDUCATION, MANAGEMENT EXAMPLE, AND ENFORCEMENT BE USED AS COMPONENTS IN EYE PROTECTION PROGRAMS.

It is also recommended that:

13. DISCUSSION OF EYE PROTECTION AT JOINT WORK SITE COMMITTEE MEETINGS BE DIRECTED, GRADUALLY, TOWARD POLICY AND PROGRAM DEVELOPMENT RATHER THAN THE DISCUSSION OF SPECIFIC EYE PROTECTION PROBLEMS. AT SUCH TIME AS PROGRAMS HAVE BEEN DEVELOPED, SPECIFIC PROBLEMS COULD BE DISCUSSED IN THEIR LIGHT.

A synthesis of the components (structure) of eye protection programs reported in the literature (Table 2.D.1) leads to the formulation of a comprehensive eye protection program. It is clear that the successful eye protection program is multi-factorial, and, such programs cannot be separated from the general personal protection program. It is recommended that:

14. THE COMPREHENSIVE EYE PROTECTION PROGRAM, OUTLINED IN TABLE 2.D.1, FORMULATED THROUGH A REVIEW OF THE LITERATURE ON THE SUBJECT, BE USED AS A BASIS FOR THE IMPLEMENTATION OF EYE PROTECTION PROGRAMS IN INDUSTRY. THIS INVOLVES THE DEVELOPMENT OF IMPLEMENTATION STRATEGIES FOR EACH STEP OUTLINED IN TABLE 2.D.1.

It is also recommended that:

15. EXPERTISE BE DEVELOPED WITHIN THE OCCUPATIONAL HEALTH AND SAFETY DIVISIONS OR OTHER AGENCIES OF GOVERNMENT TO ADVISE ON THE DEVELOPMENT OF EYE PROTECTION PROGRAMS IN INDUSTRY.

The more serious injury appears to be a result of a more serious form (occurring by chance) of a common hazard. This is consistent with the literature (70) which notes that the cause of an injury is often the same while the severity of the injury varies according to chance. It may be concluded, therefore, that the best approach to preventing serious eye injury is to adopt general policies which will reduce the overall incidence of injuries and, in doing so, will reduce the number of lost time and permanent disability injuries. It is recommended that:

16. THE PREVENTION OF ANY AND ALL TYPES OF EYE INJURIES BE RECOGNIZED AS A METHOD OF REDUCING THE NUMBER OF PERMANENT DISABILITY EYE INJURIES.

Injury Reporting

The literature did not contain any information concerning the severity of industrial eye injuries in relation to when first aid or treatment was provided. It is suggested in this study that prompt reporting and first aid could reduce the number of lost time injuries. It is recommended that:

17. EDUCATIONAL PROGRAMS BE DEVELOPED, FOR THE WORKER AND OCCUPATIONAL HEALTH PERSONNEL, TO EMPHASIZE THE NEED FOR THE REPORTING OF EYE INJURIES TO DESIGNATED PERSONNEL, WITH PROMPT FIRST AID, THAT WILL POSSIBLY REDUCE THE COMPLICATIONS WHICH APPEAR TO LEAD TO LOST WORK TIME.

Prevalence of Similar Injuries and Other Claims

The results of this study show that a large proportion of workers, whose claims were studied, had submitted claims for eye injuries and other types of injuries in the past. The literature did not provide any similar information for comparison. It is recommended that:

18. PROVISIONS BE MADE IN THE W.C.B. STATISTICAL MASTER FILE TO RECORD WHETHER AN INJURED WORKER HAS HAD PREVIOUS SIMILAR CLAIMS AND THAT

THOSE SO IDENTIFIED BE CONTACTED AND ASKED TO TAKE INJURY PREVENTION EDUCATION. A PROGRAM, ANALAGOUS TO A DEFENSIVE DRIVING COURSE, COULD BE DEVELOPED.

Legislation

Canadian legislation, at this time, deals with limited aspects of eye protection. Only B.C. and New Brunswick demand adherence to the C.S.A. Eye Protector Standards, and other provinces have regulations only for specific hazards (eg. lasers). There is no legislation addressing the subject of worker compliance, an essential element in eye injury prevention. Comprehensive eye protection policies, in line with established standards, are needed to reduce the incidence of eye injuries in the future.

Recommendations regarding the development of regulations for eye injury prevention are found earlier in this section.

CHAPTER 5

PLANNING THE ORGANIZATION AND IMPLEMENTATION OF EYE PROTECTION PROGRAMS

How can the recommendations arising from this study be implemented? In the absence of government policy concerning eye protection programs in industry, the recommendations from this study will serve as the objectives upon which a plan for providing eye protection programs in industry can be formulated. In addition, the review of literature concerning eye protection programs in industry serves to identify the specific components of successful programs. There are, therefore, two levels of planning which must be identified: at the organizational level, and the program implementation level.

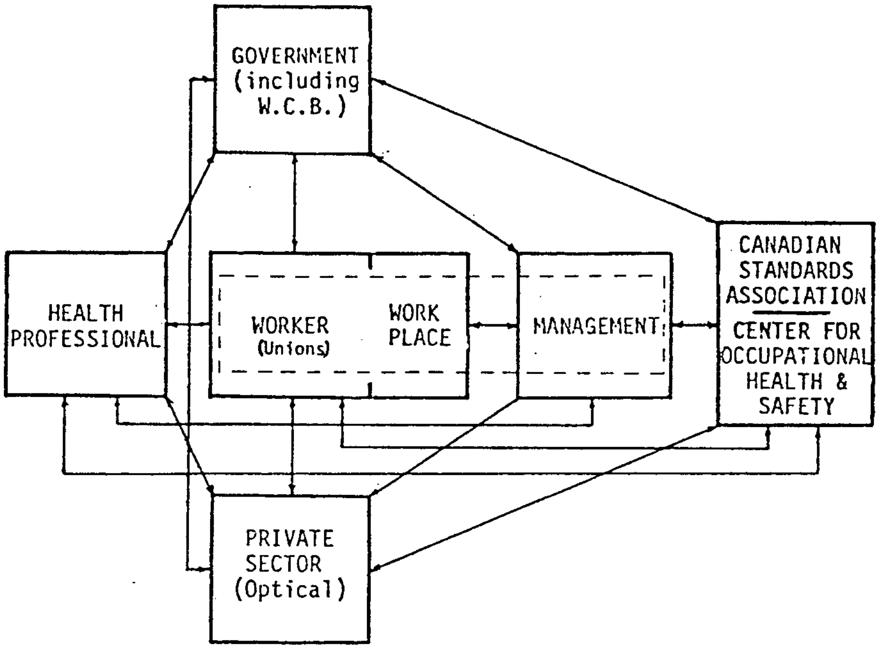
5.A. Planning Eye Protection Programs - the Organizational Level

Each recommendation from this study involves a group or groups of people who are involved in giving or receiving occupational vision care services. It is logical, therefore, to plan the organizational framework of eye protection programs around the groups who are ultimately concerned.

Role Definitions and Inter-Relationships of Involved Groups

Figure 5.A.1 illustrates the existing and/or potential involvement of groups in occupational vision care. In general, government (including the Workers' Compensation Board) is responsible for monitoring and regulating the health and safety of the worker. Government is also responsible to a great extent for initiating and/or facilitating education and research in this area. It is commonly agreed (and often legislated) that management is responsible for the initiation and maintenance of occupational safety programs in their industry. They receive service and advice from, and feed back information to government. Management must also interact with the private sector (e.g. optical companies) who provide protective equipment

Figure 5.A.1 THE OCCUPATIONAL VISION CARE SYSTEM



and other information for health and safety programs. The health (vision care) professional advises government on health and safety matters (including research) and interacts with optical companies by providing advice on the most suitable types and design of protective equipment and screening devices. Most importantly, the health professional examines and advises the worker, in the plant or the examination room, on eye protection and visual performance. Optical companies can advise government and the professional on standards of materials and vision screening devices. In turn, they receive feedback from all groups to improve the quality of their products. Workers must have access to all bodies concerned with occupational vision care. Their responsibility is compliance, which ultimately includes taking some responsibility for their own health and safety while in the workplace. The Canadian Standards Association must also interact with all concerned groups in order to attain standards which improve performance, comfort, safety, and ease of regulation. The recently legislated National Center for Occupational Health and Safety is another potential forum for policy and standards development.

Communication Networks

Within the system shown in Figure 5.A.1 independent and joint committees should be formed to ensure ongoing communication. There appears to be a trend toward work site committees (shown as a dotted line in Figure 5.1), composed of representatives from labour and management, often with input from government. Individual groups in the system have their own forums in which to discuss health matters; health professionals have their professional organizations, some workers have unions, and management have access to their own safety councils.

Government committees, involving all concerned departments, should be formed where there are areas of occupational health and safety with fragmented responsibilities. Government has the ultimate authority to bring the occupational health system into operation, to ensure that the health and safety of the worker is optimized.

In Alberta, the basic structures such as shown in Figure 5.A.1 are in existence but the coordination is lacking. Regardless of final jurisdiction on occupational health matters, an interdepartmental unit composed of representatives from health, labour and the W.C.B. should be present to coordinate the government's efforts. An example of the cooperation that is required between government departments is seen by exploring the provision of occupational health care to small industry. A high proportion of industry is composed of companies with less than ten employees. These smaller companies do not have the expertise, the resources, nor the appropriate pressure to provide occupational health services independently. In these cases, one alternative would be to provide services through local public health units. This proposed integration of occupational and public health would require internal communication and cooperation.

Management, in most cases, bears the costs of vision screening and personal protection programs and will ask to see the cost-benefit result of providing eye protection or optimizing visual performance factors in their plant. Little effort has been made in the past to demonstrate the benefits and inform industry of them. Recent communication with a management safety council leader reinforced this notion when he stated that a majority of companies simply don't see the potential benefits results of providing and enforcing protection programs. The government of Alberta must view this task as a priority and be able to substantiate the benefits of legislated occupational health programs in this area.

In most provinces, companies within broad industry groups pay similar insurance premiums to the W.C.B. This provides little incentive for the individual company to provide health and safety programs. Governments should consider more extensive schemes in which insurance premiums can be based on individual company accident experience. Another possibility would be to provide additional incentives to companies who promote safety programs.

It would be naive to presume an eye protection program could be developed in isolation from general safety programs. Industrial eye protection must, therefore, be treated as a component of general occupational health and safety programs. With this in mind, a discussion of specific strategies for program implementation can take place.

5.B. Planning Eye Protection Programs - the Program Implementation Level

Table 2.D.1, shown once again on the following page, represents a correlation of expert opinion concerning the components of an eye protection program. The table is self-explanatory and outlines, in approximate order, the steps an organization could take in implementing an eye protection program. The development of each point is best done at the company level, allowing modification according to individual differences.

Occupational vision care is an essential element of the eye protection program. It includes the evaluation of visual performance factors and vision screening. For this reason, the role of the professional vision care worker in industry (the optometrist and the ophthalmologist) is important. Traditionally neither profession has involved themselves extensively in this field but it is clear that their participation and support is required. It is unreasonable to suggest, from a cost-benefit point of view, that the vision care professional be involved in every aspect of the eye protection

TABLE 2.D.1

LITERATURE REVIEW OF EYE PROTECTION
PROGRAMS IN INDUSTRY

	PROGRAM COMPONENTS	REFERENCES																		
		47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
1	ORGANIZE PROGRAM CRITERIA - DETERMINE STATUS OF PROBLEM AND SET OUT PRELIMINARY OBJECTIVES				X		X			X	X		X							
2	GAIN SUPPORT & ACCEPTANCE OF PROGRAM (ALL GROUPS-PRIMARILY MANAGEMENT) BEFORE IMPLEMENTATION	X	X	X	X	X	X	X	X				X	X		X	X			
3	INITIATE PLANT SURVEY & VISUAL JOB ANALYSIS TO DETERMINE VISION SKILLS, THE ACCIDENT FACTORS & SEVERITY OF THE PROBLEM			X		X	X	X	X	X	X	X				X	X	X	X	
4	SET UP A VISION SCREENING PROGRAM FOR THE WORKER					X	X	X	X	X		X				X	X	X	X	
5	ESTABLISH A REFERRAL SYSTEM TO A VISION CARE PROFESSIONAL FOR THOSE WORKERS WHO NEED VISUAL AID					X	X	X	X	X		X			X	X	X	X	X	X
6	FORMULATE AND/OR REVIEW A/THE PLANT EYE PROTECTION POLICY: INCLUDING WHO SHOULD WEAR THEM, WHERE, ETC.			X			X	X									X	X	X	
7	REVIEW THE EYE PROTECTION WITH THE UNION - GAIN THEIR COOPERATION AND SUPPORT				X					X						X	X	X		
8	DRAW UP A STATEMENT OF PROCEDURES TO COVER THE IMPLEMENTATION OF THE PROGRAM			X				X		X						X	X	X		
9	INFORM ALL EMPLOYEES OF THE PROGRAM & WHY IT IS IMPORTANT (INCLUDING ALL ASPECTS OF EDUC. & MOTIVATION	X				X	X	X	X				X	X	X	X	X	X		X
10	AS A FIRST STEP, ENGINEER THE DANGER OUT OF THE ENVIRONMENT (HAZARD ELIMINATION AND/OR CONTROL)	X								X	X						X	X		
11	SELECT A REPUTABLE SUPPLIER OF EYE PROTECTION WHO HANDLES GOOD MATERIALS OR SECURE BIDS FROM SUPPLIERS		X							X						X				
12	SELECT MOST APPROPRIATE TYPE OF PROTECTION - CONSIDERING HAZARDS, EMPLOYEE COMFORT AND COST				X							X								
13	STANDARDIZE THE EQUIPMENT CARRIED FOR SMALLER INVENTORY AND LOWER VOLUME COST	X					X			X	X	X	X	X	X	X	X	X		
14	ENSURE THAT APPROPRIATE MEASUREMENTS ARE TAKEN BEFOREHAND & THAT THE PROTECTION IS PROPERLY FITTED - INCLUDING FOLLOW-UP		X													X				
15	MAINTAIN AN ADEQUATE INVENTORY AND ENSURE PROPER MAINTENANCE OF THE EYE PROTECTION				X		X	X	X			X	X	X	X	X	X	X	X	X
16	DEVELOP PROCEDURES TO ENSURE UNIFORMITY IN THE APPLICATION OF THE PROBLEM: IE. IDENTIFY AREAS, ETC.						X						X	X		X	X	X	X	
17	DEVELOP SUPERVISION & ENFORCEMENT PROCEDURES FOR THE PROGRAM																			
	- EVERYONE WEARS THEM IN HAZARDOUS AREAS	X														X	X	X		X
	- MANDATORY AT ANY TIME OR ANY PLACE IN THE PLANT	X		X	X	X	X		X				X	X	X	X	X	X		X
	- USE OF PROTECTION MANDATORY AND A CONDITION OF EMPLOYMENT	X		X													X			X
18	MONITOR AND EVALUATE THE PROGRAM		X	X			X			X								X		
19	DEVELOP ACCIDENT EMERGENCY PROCEDURES						X													
20	WHO PAYS FOR THE EYE PROTECTION - TOTALLY BY THE EMPLOYER															X			X	
	- BY THE EMPLOYER & WORKER; VARIOUS NEGOTIATED PROPORTIONS & TIME PERIODS				X												X	X		
21	MENTION OR RECOGNITION OF USING EYE PROTECTION ACCORDING TO AMERICAN OR CANADIANT STANDARDS ASSOCIATION STANDARDS												X			X				

program but, clearly, they can play a major role in the coordination of the components. More study is required to determine the roles of vision care professionals in industry, and especially, how they will interact in the most fruitful way with the private sector.

5.C. A Time Frame for Implementation

It is not possible, or advisable at this point, to lay out a set of steps whereby the Alberta government could achieve industry-wide awareness and acceptance of eye protection programs. The changing nature of people and the political climate (both governmental and inter-professional) would surely prove this author incorrect, even with the most viable plan. Using the recommendations of this study as a base, the planning of such programs must take place in Alberta, through the government, with the cooperation of all bodies concerned, near the time that implementation is feasible.

The following outlines suggested yearly goals that a plan might encompass. The elements discussed are not inclusive.

YEAR 1

General Awareness

General promotional campaigns to create awareness of the need for eye protection in industry. Communication to industry and other concerned groups of the results of this study and the underlying philosophies that were developed as a result.

Committee Structures

Establishment of an intra-governmental committee (labour, health and the W.C.B.) to examine the problems of providing eye protection programs to industry. This committee, under the chairmanship of the Occupational Health and Safety Division, should utilize representation from the vision care professions, management, labour, and the private sector, to receive informed opinion and to establish cooperation between the groups. Because of the large number of groups in the labour movement and the private sector (optical industry), some consideration will have to be given to the selection of representatives from these groups.

Development Within the Occupational Health and Safety Division

Expertise in industrial eye protection should be developed in the Division during this time, in preparation for the development of programs. Although it is feasible to use outside consultants, it is vital that some degree of internal expertise be present.

Legislation

Development of regulations which legislate the use of appropriate eye protection by any person involved in, helping with, or passing by any welding, grinding, or machining operation.

Development of a regulation whereby all eye protection used by workers in Alberta must meet the C.S.A. standards for eye protectors, and recognition that the selection of appropriate protection for the hazard must, within reason and accounting for special circumstance, comply with guidelines set out in the C.S.A. standard.

Development of a regulation which legislates the use of side shields on all safety spectacles, excepting cases where extreme discomfort would be caused, or performance or perception is unreasonably affected.

Evaluation

Set up evaluation schemes for any established programs.

YEAR 2

General Awareness

Continuation of the promotional activities of Year 1. In addition, the development of special programs to educate helpers to welders, machinists, etc. on the importance of wearing eye protection.

Education Programs

Development of mandatory programs, within apprentice training courses, to educate young and inexperienced tradesmen on the importance of personal protection and safety (specifically concerning eyes). To begin, welding, plumbing and pipefitting, machining and mechanics courses should contain this safety education component.

Development of programs, sponsored by the Occupational Health and Safety Division, for any person involved in company safety programs, to learn the basic elements of fitting non-prescription eye protection, and selecting the appropriate protection for the hazard. (It is presumed that prescription safety eyewear would be properly fitted by the vision care professional or the optician who has supplied the device.)

Evaluation

Set up evaluation schemes for any established programs.

YEAR 3

Continuation of programs established in the first and second years, including an evaluation of their effectiveness.

Other Activities

Regulation of safety supply houses to ensure that only C.S.A. approved eye protection is marketed in Alberta. Informal regulation of safety supply houses to ensure their representatives have adequate training and knowledge in the eye protection field.

Establishment of a pilot project to identify those persons who incur eye injuries frequently. Coordination of an educational program for these identified persons.

CHAPTER 6

CODA

6.A. The Study

This study has, for the most part, progressed through its methodological steps without exception. The study, therefore, has been successful.

Although it was intended that statistical data currently available would be examined, it is apparent, in retrospect, that the data collected from W.C.B. accident reporting forms do not contain sufficient "prevention-oriented" information (e.g. was eye protection worn at the time of the accident). The study may have given more fruitful conclusions if such data had been collected.

A great deal is now known about persons who incurred eye injuries, but little is known about those who apparently used proper protection and/or avoided injury. Herein lies the fallacy of using secondary, accident oriented information. Further research in this area should involve the entire working population, not only those who were injured.

The recommendations arising from the conclusions of this study are, for the most part, practical and should be considered for inclusion in current government policy. It is difficult, however, to isolate eye protection from other kinds of personal protection and, for this reason, such specific policy objectives may not be adequate or may not have sufficient impact. It will depend also on the political climate; at this time, eye protection in industry is not a priority in occupational health circles.

The coordination of the structural elements of the occupational vision care system (Fig.5.A.1)is the biggest problem facing the successful implementation of sound industrial eye protection programs. It may be difficult to bring together groups with widely disparate goals and objectives. Profit and non-profit motives must be meshed in the best interests of the worker. Professional standards must be meshed with the free enterprise objectives of the private sector. The ultimate success of this study will depend on cooperation, trust, and coordination of effort between all parties.

6.B. The Ideal Situation

This thesis is limited by its approach, and the necessity to use incremental planning techniques. For political and other reasons, the solutions (recommendations) are mainly modifications or extensions of current ideas. This is not uncommon, and certainly not objectionable to the majority of people, but it is clear that the problem is much more basic and the real solution must involve innovative planning techniques.

If one examines how the general population lives and copes with daily physical hazards it is evident that the majority show little concern for their well-being. The individual takes risks daily : driving a car too fast, drinking excessively, and even performing hazardous tasks without the benefit of personal protective equipment. Humans exhibit the unique ability to disregard the dangerous -- until it happens to them. This may be due to an innate sense of adventure, but is more likely due to the way in which they are taught, from a young age, to regard the physical environment.

Children grow up and assume many different professions: a company manager, a government official, a tradesman, a health professional. If a regard for health and safety can be instilled at an early age, through the educational systems, before profit motives, vanity or an unhealthy sense of self-regard become manifest, a super-ordinate goal will have been created. Compliance would not be an issue. The coordination of effort, which is now so difficult to obtain, would be facilitated by a common sense of purpose.

6.C. Future Research

This study has exposed areas of concern that require research in the future. Briefly, some of these are:

1. A medical examination of the complications that can result if common injuries do not receive prompt first aid, and particularly, a determination of the time and cost savings that result if treatment is prompt.

2. Determination of the roles of various health personnel (including vision care professionals) in the provision of occupational vision care and eye protection programs.

3. Research into the effectiveness of common eye protector designs in preventing injuries, and researching the efficacy of new eye protector designs.

4. Research into the importance of coordinating ergonomic-visual performance type programs with eye safety programs.

5. Researching the effectiveness of the common vision screening devices in the industrial setting.

6. Researching the psychological-sociological determinants of compliance in the use of eye protection in industry.

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APPENDIX I

EMPLOYER'S REPORT OF ACCIDENT OR INDUSTRIAL DISEASE

THE WORKERS' COMPENSATION BOARD
Box 2415, Edmonton Alta. T5J 2S5

ANSWER ALL PERTINENT QUESTIONS, SIGN ON REVERSE AND MAIL TO THE BOARD WITHIN 24 HOURS IN EVERY CASE OF ACCIDENT OR SICKNESS DUE TO INDUSTRIAL DISEASE.

THIS SPACE FOR WCB USE ONLY

EMPLOYER'S ACCOUNT NO	
OCCURRENCE CLASS	
CLAIM NUMBER	
EMPLOYER'S AREA CODE	
AMOUNT OF PERSONAL COVERAGE	

WORKER'S LAST NAME

FIRST NAME(S)

FULL ADDRESS

POSTAL CODE

SOCIAL INSURANCE No. | MARITAL STATUS | Date of Birth | SEX

WAS WORKER INJURED ON THE EMPLOYER'S PREMISES? YES NO

DATE AND HOUR OF ACCIDENT 19 at M.

EMPLOYER'S FULL NAME PROPRIETORS, PARTNERS OR CORPORATIONS

TRADE NAME

MAILING ADDRESS

POSTAL CODE

TYPE OF INDUSTRY | PHONE No.

STATE ADDRESS WHERE ACCIDENT HAPPENED IF NOT THE SAME AS EMPLOYER MAILING ADDRESS

STREET, PLANT, MILL OR SITE NAME

DATE AND HOUR ACCIDENT FIRST REPORTED 19 at m.

CITY TOWN R R COUNTY OR DISTRICT NAME | PROVINCE

WHAT TIME DID WORKER COMMENCE WORK? | WHAT WERE WORKER'S REGULAR HOURS OF EMPLOYMENT? | WORKER'S OCCUPATION

NAME AND ADDRESS OF ATTENDING DOCTOR OR HOSPITAL

1 HISTORY OF ACCIDENT — USE BACK OF FORM OR ATTACH SHEET IF NECESSARY

A. WHAT HAPPENED TO CAUSE INJURY?

B. WHAT WAS THE WORKER DOING?

C. WHAT MACHINE, TOOL, EQUIPMENT OR MATERIAL WAS THE WORKER USING?

D. STATE ANY INVOLVEMENT OF GAS, CHEMICAL OR EXTREME TEMPERATURE

2 NATURE OF INJURY — IF INDUSTRIAL DISEASE DETAIL EXPOSURE ON BACK OF FORM

A. WHAT PART OF THE BODY WAS INJURED? (HAND, EYE, BACK, ETC., STATE LEFT OR RIGHT)

B. WHAT TYPE OF INJURY WAS SUSTAINED? (BURN, FRACTURE, BRUISE, ETC.)

3 QUESTIONS ANSWERED "NO" REQUIRE FULL EXPLANATION — USE BACK OF FORM OR ATTACH SHEET IF NECESSARY

A. WERE THE WORKER'S ACTIONS AT THE TIME OF INJURY FOR THE PURPOSE OF YOUR BUSINESS? YES NO

B. WERE THEY PART OF THE REGULAR WORK? YES NO

C. ARE YOU SATISFIED INJURY OCCURRED AS STATED? YES NO

D. WAS FIRST AID RENDERED? IF YES, STATE WHEN AND BY WHOM YES NO

4 A. DO YOU HAVE AN ACCOUNT ESTABLISHED WITH THIS BOARD? IF YES, QUOTE FILE NUMBER YES NO

B. DOES THIS WORKER HAVE PERSONAL COVERAGE WITH THE BOARD? IF SO, PLEASE QUOTE HIS ACCOUNT NUMBER YES NO

C. (1) IS WORKER RELATED TO EMPLOYER? IF YES, STATE RELATIONSHIP

(2) IF WORKER IS A MEMBER OF THE IMMEDIATE FAMILY OF THE EMPLOYER AND LIVING IN HIS HOUSEHOLD AT THE TIME OF ACCIDENT, WAS HE OR SHE PAYING ROOM AND BOARD? IF SO, THE WEEKLY AMOUNT YES NO

D. IS WORKER A PARTNER, DIRECTOR OR OTHER OFFICER OF THE COMPANY? IF YES, SPECIFY YES NO

E. DOES HE EMPLOY HIS OWN WORKERS? IF YES, EXPLAIN YES NO

5 IS WORKER DISABLED? IF YES, COMPLETE REVERSE SIDE YES NO

C040-77 COMPLETE REVERSE AS INDICATED AND SIGN IN SPACE PROVIDED

Employer's Report of Accident or Industrial Disease - continued

DO NOT ANSWER QUESTIONS 6 TO 11 UNLESS WORKER DISABLED LONGER THAN DAY OF ACCIDENT

6 A. GIVE DATE AND HOUR WORKER FIRST LAID OFF ....19.......... AT ....M.

B. HAS WORKER RETURNED TO WORK? YES ☐ NO ☐ IF YES, GIVE DATE AND TIME

DAY	MO.	YR.	TIME	AM	PM

C. DID CLAIMANT WORK BETWEEN FIRST LAYING OFF AND FINAL RETURN? YES ☐ NO ☐ IF YES, GIVE DATE AND TIME

	DAY	MO.	YR.	TIME	AM	PM
FROM						
TO AND INCLUDING						

D. WILL YOU PAY OR ALLOW WORKER ANYTHING FOR THE PERIOD OF LAYOFF? IF SO, EXPLAIN

7 A. USUAL DAILY WORKING HOURS WERE FROM ....M TO ....M

B. HOW MUCH TIME OFF FOR LUNCH? .... IS WORKER PAID IN FULL FOR THIS TIME? ....

C. NUMBER OF DAYS IN USUAL WORK WEEK ....DAYS NUMBER OF HOURS IN USUAL WORK WEEK ....HRS.

D. CHECK USUAL DAYS OFF

MON	TUE	WED	THU.	FRI.	SAT	SUN.

8 A. RATE OF PAY AT TIME OF ACCIDENT WAS $.................................... PER ....

B. IF BOARD PROVIDED IN ADDITION TO WAGES, GIVE DETAILS

C. HOW LONG WAS WORKER EMPLOYED BY YOU? FROM ....19........ TO ....19 ......

9 GIVE GROSS EARNINGS AND INCLUDE ANY ENTITLEMENT FOR HOLIDAY PAY FOR 12 MONTHS PRIOR TO ACCIDENT (NOT BEYOND DATE OF ACCIDENT) OR SUCH LESSER PERIOD AS WORKER WAS EMPLOYED BY YOU.

FROM ....19....... TO ....19 .... $.................... GROSS

10 GIVE DETAILS OF ANY TIME LOST WITHOUT PAY DURING THIS PERIOD OF EMPLOYMENT INCLUDING SICKNESS, AND SHUTDOWN

TOTAL WEEKS .... DAYS ....

11 ESTIMATED YEARLY EARNINGS FOR SIMILARLY EMPLOYED WORKER WOULD BE $..................

I DECLARE THE ABOVE TO BE TRUE AND CORRECT AND I AM AUTHORIZED TO SIGN THIS REPORT ON BEHALF OF THE EMPLOYER.

EMPLOYER'S NAME

SIGNED BY ....

DATE	Day	Month	Year	SIGNED AT .... ALBERTA

TITLE

COMPLETE AND RETURN FORM AT ONCE

WORKER'S REPORT OF ACCIDENT

THE WORKERS' COMPENSATION BOARD
Box 2415, Edmonton Alta. T5J 2S5

PLEASE PRINT YOUR FULL NAME, ADDRESS, SOCIAL INSURANCE NUMBER, EMPLOYER'S NAME AND ADDRESS IN AREA BELOW IF NOT SHOWN CORRECTLY AT RIGHT

MAILING ADDRESS

LAST NAME

FIRST NAME(S)

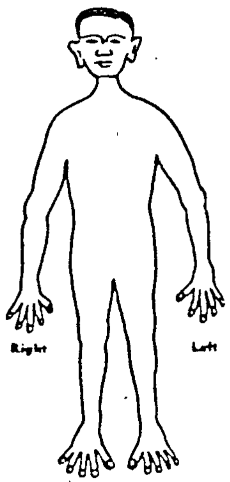
MAILING ADDRESS

POSTAL CODE

SOCIAL INSURANCE No.	PHONE	MARITAL STATUS	DATE OF BIRTH	OCCUPATION
EMPLOYER'S NAME		EMPLOYER'S MAILING ADDRESS		

1. A. DATE AND HOUR OF ACCIDENT. THE ... DAY OF ..., 19 ... AT ... O'CLOCK ... M.
   B. DATE AND HOUR YOU FIRST LAID OFF WORK. THE ... DAY OF ..., 19 ... AT ... O'CLOCK ... M.
   C. GIVE YOUR REGULAR HOURS OF EMPLOYMENT. HOURS PER WEEK ...
   D. WHEN DID YOU REPORT THE ACCIDENT TO YOUR EMPLOYER?
   E. WHO DID YOU REPORT TO? NAME ... TITLE ...
   F. IF NOT REPORTED IMMEDIATELY, GIVE REASON.
   G. IN WHAT CITY, TOWN OR PLACE DID THE ACCIDENT HAPPEN?
   H. DID IT HAPPEN ON THE EMPLOYER'S PREMISES? STATE EXACTLY WHERE
2. WAS THE WORK YOU WERE DOING FOR THE PURPOSE OF YOUR EMPLOYER'S BUSINESS? WAS IT PART OF YOUR REGULAR WORK?
3. HOW DID THE ACCIDENT HAPPEN AND WHAT INJURY DID YOU RECEIVE? (STATE LEFT OR RIGHT IF APPLICABLE). DOING THIS WORK.

MARK PART INJURED



IMPORTANT PLEASE LIST ANY WITNESSES.

NAME	ADDRESS

C060-76 FOR YOUR FUTURE PROTECTION, COMPLETE, SIGN AND RETURN THIS REPORT

Worker's Report of Accident - continued

4	IF FIRST AID RENDERED, GIVE NAME OF ATTENDANT .... WHEN RENDERED? ....
5	A. GIVE NAME AND ADDRESS OF ATTENDING PHYSICIAN. .... B. TO WHAT HOSPITAL DID YOU GO, IF ANY? .... C. IF TEETH INJURED, NAME DENTIST. ....
6	A. HAVE YOU HAD A SIMILAR DISABILITY BEFORE? .... B. HAVE YOU HAD PREVIOUS CLAIMS WITH THIS BOARD? [NO] [YES]
7	A. ARE YOU RELATED TO YOUR EMPLOYER AND WERE YOU LIVING IN HIS HOUSE AT THE TIME OF ACCIDENT? [NO] [YES] B. ARE YOU A PARTNER, DIRECTOR, OR OTHER OFFICER OF THE COMPANY? IF YES, SPECIFY. [NO] [YES] .... C. DO YOU EMPLOY WORKERS YOURSELF? IF YES, SPECIFY [NO] [YES] .... D. DO YOU HAVE PERSONAL COVERAGE ESTABLISHED WITH THIS BOARD? IF YES, PLEASE QUOTE ACCOUNT NUMBER. [NO] [YES] ....

DO NOT ANSWER QUESTIONS 8 TO 11 UNLESS DISABLED LONGER THAN THE DAY OF ACCIDENT

8	A. ARE YOU BACK AT WORK? [NO] [YES] IF YES, SINCE WHEN? .... 19....... B. IF NO, WHEN WILL YOU BE ABLE TO WORK.................... C. IF YOU HAVE WORKED SINCE YOU FIRST LAID OFF — GIVE DATES — FROM.........., AT..........M. TO.........., AT..........M.
9	IF YOU HAVE BEEN PAID, OR WILL BE PAID ANYTHING BY YOUR EMPLOYER FOR THE PERIOD OF YOUR DISABILITY, GIVE PARTICULARS.......... TOTAL AMOUNT $..........
10	A. WHAT ARE YOUR USUAL DAILY WORKING HOURS?..........M TO..........M. (a) HOW MUCH TIME OFF FOR LUNCH?.......... (b) ARE YOU PAID FOR THIS TIME?.......... B. WHAT ARE THE NUMBER OF DAYS IN YOUR USUAL WORK WEEK?..........DAYS. C. WHAT ARE YOUR USUAL DAYS OFF?.......... D. WHAT WAS YOUR RATE OF PAY AT TIME OF ACCIDENT?.......... IF BOARD PROVIDED IN ADDITION TO WAGES, GIVE DETAILS ....
11	GIVE THE FOLLOWING PARTICULARS OF YOUR EMPLOYMENT IN ALBERTA

Periods of Employment During 12 Months Prior To Accident	Name and Address of Employer	Total Earnings Covering This Period $	¢
From.......... 19....... to.......... 19.......			
From.......... 19....... to.......... 19.......			
From.......... 19....... to.......... 19.......			
From.......... 19....... to.......... 19.......			
From.......... 19....... to.......... 19.......			

12 SPACE FOR ADDITIONAL INFORMATION OR COMMENTS —

I DECLARE THAT THE ABOVE INFORMATION IS TRUE AND CORRECT AND I CLAIM COMPENSATION ACCORDINGLY.

SIGNED THIS..........DAY OF.......... 19.........., AT.......... ALBERTA

..........CLAIMANT SIGN HERE..........

AUTOMATED BUSINESS FORMS(WESTERN)LTD.

46826

THE WORKMEN'S COMPENSATION BOARD OF ALBERTA

P.O. BOX 2415 EDMONTON, ALBERTA PHONE 423-6110

PLEASE PRINT CLEARLY

DOCTOR'S FIRST REPORT — EYE INJURIES

PLEASE COMPLETE AND MAIL AS SOON AS POSSIBLE. PAYMENT OF COMPENSATION CANNOT BE CONSIDERED UNTIL THIS REPORT IS RECEIVED.

RETAIN COPY FOR YOUR RECORDS.

SOCIAL INSURANCE NO. | CLAIM NO.

MR. MRS. MISS SURNAME

GIVEN NAMES

ADDRESS

DATE OF BIRTH	DAY	MONTH	YEAR	DATE OF ACCIDENT	DAY	MONTH	YEAR

EMPLOYER'S NAME

EMPLOYER'S ADDRESS

PLEASE PRINT LEGIBLY

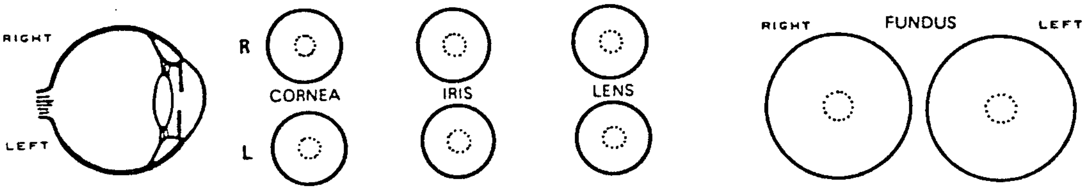
1. WHO RENDERED FIRST TREATMENT? DATE YOU FIRST TREATED: HOUR ___ DAY ___ MONTH ___ YEAR ___

2. WHAT DOES HE CLAIM CAUSED HIS INJURY? ______

3. WHICH EYE WAS INJURED? RIGHT ___ LEFT ___ BOTH ___

4. VISION (AT YOUR FIRST EXAMINATION AND BEFORE TREATMENT): RIGHT EYE ______ LEFT EYE ______

5. FINDING AND TREATMENT AT THE TIME OF YOUR FIRST EXAMINATION (INDICATE ON DIAGRAMS LOCATION AND EXTENT OF INJURY AFTER FLUORESCEIN):



6. IS THERE ANY EVIDENCE OF PREVIOUS DISEASE OR INJURY IN EITHER EYE? YES ______ NO ______
   IF SO, GIVE PARTICULARS: ______

7. DO YOU EXPECT ANY COMPLICATIONS? YES ☐ NO ☐

8. IS PERMANENT DISABILITY PROBABLE? YES ☐ NO ☐

9. ESTIMATE PERIOD OF DISABILITY AS APPLICABLE ☐ NO LAY OFF ☐ LESS THAN 7 DAYS ☐ 7 TO 14 DAYS ☐ MORE THAN 14 DAYS

10. ESTIMATE DATE FIT TO RETURN TO WORK: DAY ___ MONTH ___ YEAR ___

11. DO YOU THINK THERE IS ANY MISREPRESENTATION OR CONCEALMENT IN THIS CASE? YES ☐ NO ☐

12. IS HOSPITAL CARE REQUIRED? YES ☐ NO ☐ IF YES, NAME OF HOSPITAL ______

13. STATE ANY OTHER CIRCUMSTANCES ______

DOCTOR'S NAME ___ ADDRESS ___ PHONE ___ DOCTOR'S SIGNATURE ___ DATE ___

C-053-72

DETACH, RETURN ORIGINAL AND RETAIN COPY FOR YOUR RECORDS

THE WORKERS' COMPENSATION BOARD
OF ALBERTA
P.O. BOX 2415 EDMONTON, ALBERTA PHONE 423-6110

PLEASE PRINT CLEARLY

IMPORTANT
SOCIAL INSURANCE NO
MUST BE GIVEN

ALBERTA HEALTH CARE INSURANCE COMMISSION NO	CLAIM NO
MR / MRS / MISS	SURNAME
GIVEN NAMES	
ADDRESS	
DATE OF BIRTH: DAY / MONTH / YEAR	DATE OF ACCIDENT: DAY / MONTH / YEAR
EMPLOYER'S NAME	
EMPLOYER'S ADDRESS	

DOCTOR'S FIRST REPORT

PLEASE COMPLETE AND MAIL AS SOON AS POSSIBLE. PAYMENT OF COMPENSATION CANNOT BE CONSIDERED UNTIL THIS REPORT IS RECEIVED.

RETAIN COPY FOR YOUR RECORDS.

PLEASE PRINT LEGIBLY

1. WHO RENDERED FIRST TREATMENT? — DATE YOU FIRST TREATED: HOUR / DAY / MONTH / YEAR
2. WHAT DOES THE WORKER CLAIM CAUSED THE INJURY? — DO YOU THINK THERE IS ANY MISREPRESENTATION OR CONCEALMENT IN THIS CASE? YES ☐ NO ☐
3. DESCRIBE FULLY THE INJURY WHEN FIRST EXAMINED. STATE RIGHT OR LEFT. — ARE DENTAL SERVICES REQUIRED? YES ☐ NO ☐
4. DIAGNOSIS — IS PERMANENT DISABILITY PROBABLE? YES ☐ NO ☐
5. TREATMENT
6. DESCRIBE ANY SIGNIFICANT PREVIOUS DISEASE OR INJURY
7. IS HOSPITAL CARE REQUIRED YES ☐ NO ☐ IF YES, NAME OF HOSPITAL
8. ESTIMATE PERIOD OF DISABILITY AS APPLICABLE ☐ NO LAY OFF ☐ LESS THAN 7 DAYS ☐ 7 TO 14 DAYS ☐ MORE THAN 14 DAYS ☐ ONE MONTH OR MORE
9. ESTIMATE DATE FIT TO RETURN TO WORK: DAY / MONTH / YEAR
10. STATE ANY OTHER CIRCUMSTANCES

NOTE:
SINCE THIS IS A WORKERS' COMPENSATION CLAIM NO AMOUNT IS PAYABLE BY A.H.C.I.C.

DOCTOR'S NAME — ADDRESS — PHONE — DOCTOR'S SIGNATURE — DATE

C-050-77

THE WORKERS' COMPENSATION BOARD FILE NO.
P.O. BOX 2415, EDMONTON, ALBERTA T5J 2S5

DOCTOR'S PROGRESS REPORT

THIS FORM SHOULD BE USED WHEN NECESSARY TO SUPPLEMENT PROGRESS REPORTS DIRECTLY REQUESTED BY THE BOARD.

PLEASE PRINT CLEARLY

IMPORTANT SOCIAL INSURANCE NO MUST BE GIVEN				SOCIAL INSURANCE NO.			
ALBERTA HEALTH CARE INSURANCE COMMISSION NO				CLAIM NO			
MR MRS MISS	SURNAME						
GIVEN NAMES							
ADDRESS							
DATE OF BIRTH	DAY	MONTH	YEAR	DATE OF ACCIDENT	DAY	MONTH	YEAR
Employer's Name & Address	EMPLOYER'S NAME						
	EMPLOYER'S ADDRESS						

1.	DATE OF EXAMINATION ON WHICH REPORT IS BASED	Day	Month	Year
2.	ESTIMATE DATE FIT TO RETURN TO WORK	Day	Month	Year
3.	IS WORKER HOSPITALIZED ? NO YES	DATE ADMITTED: Day Month Year	DISCHARGED: Day Month Year	
4.	HAS THERE BEEN ANY CHANGE IN DIAGNOSIS ?			
5.	HAS ANY OPERATION BEEN PERFORMED ?	DATE: Day Month Year		
6.	DESCRIBE COMPLETELY THE WORKER'S PRESENT CONDITION			
7.	ESTIMATED PERIOD OF CONTINUING DISABILITY	LESS THAN 7 DAYS	7 TO 14 DAYS	MORE THAN 14 DAYS
		WILL ANY PERMANENT DISABILITY RESULT FROM THE INJURY ?		
8.	WOULD TREATMENT AT THE BOARD'S REHABILITATION CENTRE BE BENEFICIAL?			

Doctor's Name	Phone	Doctor's Signature ______
Address		Date ______

C-150-77

THE WORKERS' COMPENSATION BOARD
P. O. Box 2415,
EDMONTON, ALBERTA T5J 2S5

DOCTOR'S FINAL REPORT AND ACCOUNT

NOTE
REGULATIONS MADE UNDER THE WORKERS' COMPENSATION ACT REQUIRE ACCOUNTS TO BE RENDERED AS SOON AS PRACTICABLE AND IN A CURRENT AND REGULAR MANNER'

A.H.C.I.C. No. ....

SOCIAL INS. NO.

BIRTH DATE

DAY	MONTH	YEAR

Date of Accident	Day	Month	Year	Claim No.

Mr. Mrs. Miss — Surname

Given Names

Employer's Name

Nature of injury ....

Date worker fit to return to work { Suitable .... Full ....

Date you so advised worker ....

Any permanent disability? yes ☐ no ☐

PLEASE PRINT CLEARLY

Code: O–Office H–Hospital V–Visit N–Night Visit C–Consult Z–Operation X–X-Ray

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Jan.																															
Feb.																															
Mar.																															
Apr.																															
May.																															
June																															
July																															
Aug.																															
Sep.																															
Oct.																															
Nov.																															
Dec.																															

ACCOUNT FOR SERVICES RENDERED

First Visit and Report		
Subsequent House or Office Visit		
Subsequent Hospital Visits		
Night Visits		
Consultation		
X–Ray		
TOTAL		

ACCOUNT WHERE FLAT FEE APPLIES

DATE	ITEM No.			
		TOTAL		

I hereby certify that the above is a correct statement of services rendered for this claimant.

Doctor's Name	Phone
Address	

Doctor's Signature ____________________

Date ____________________

C-153-76