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A STUDY OF WRESTLING INJURIES
IN HIGH SCHOOLS THROUGHOUT SEVEN
MIDWEST STATES

Thesis for the Degree of M. A.
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Ignatius John Konrad
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A STUDY OF WRESTLING INJURIES IN HIGH SCHOOLS
THROUGHOUT SEVEN MIDWEST STATES

By

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A THESIS

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THESIS

ABSTRACT

Title of Study: A Study of Wrestling Injuries in High Schools Throughout Seven Midwest States.

Statement of Problem: This problem consists of a study that reveals the incidence and cause of injuries in high school wrestlers in seven Midwest States during the 1950-1951 wrestling season.

Why the Problem was Selected: This study is intended to be mainly informative regarding the frequency of injuries, the most common types of injuries, and the causes of injuries. The writer felt that the material of the study would aid coaching personnel in taking measures to avoid injury. The wrestling season of 1950-1951 was chosen as the latest year for which data and records were available for study.

Questions It Is Hoped This Investigation Will Answer:

1. What are the average number of injuries that occur during a wrestling season?
2. What are the main causes contributing to wrestling injuries?
3. What types of injuries account for the greatest number of injuries?
4. What, if any, is the relationship of coaching experience to the frequency of injury?

Method of Securing and Source of Data: Information was obtained from the returned questionnaires sent to the high school wrestling coaches in seven Midwest States. The thesis was written from the data secured by tabulating the results of these returned questionnaires.

Some of the Significant Findings:

1. The average high school wrestling squad was 40.29 boys.
2. The average daily practice was two hours long.
3. The average number of years of coaching experience was 7.6 years.
4. Of the 4835 total wrestling participants, 735 received an injury of some type.
5. The rate of injury was, 1 in every 6.5 participant.
6. Cauliflower ears and infections accounted for the greatest number of injuries.
7. Boys wrestling one or two years received twice as many injuries as boys wrestling three or **four** years.
8. The greatest number of injuries occurred in the 145 pound weight classification.

9. Wrestlers carelessness was ranked as the major cause of injury.
10. Schools using cotton flannel mat covers reported a bigger percentage of infections than those using plastic mat covers.
11. Schools using no daily disinfectant on the wrestling surfaces had a greater number of infections than those schools disinfecting daily.
12. Medical examination was required in 116 schools of the 120 schools sampled.

Defense of the Study: The safety of wrestling is of primary concern. With factual knowledge of the frequency and contributing causes of injuries the individual coach and athletic organizations can take measures toward reducing the present rate of injury.

Suggestions for Further Study:

1. Detailed study of measures that are being used and can be used to avoid injury.
2. Detailed study of the general health of the individual wrestler in relation to the frequency of injury.
3. Detailed study comparing the number of high school wrestling injuries to the number of injuries sustained in other high school sports.

Approved: Randolph W. Webster
Major Professor

Acknowledgement

The writer wishes to express his appreciation to those who have assisted in making this study possible. Special thanks are due to the wrestling coaches of the high schools in the various states for their cooperation.

I. J. K.

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CHAPTER I

THE PROBLEM AND DEFINITIONS OF TERMS USED

For many years the injuries involved in the amateur sport of high school wrestling have posed important problems to the individual coach. No catalogue has been made of the factors and causes of injuries sustained in connection with high school wrestling.

I. THE PROBLEM

Statement of the problem. It is the purpose of this study to increase the safety of wrestling as a high school sport by cataloguing evidence (1) of the frequency of injuries; (2) of the most common types of injuries; (3) of the causes of injuries; and (4) of the possible precautionary measures to avoid injuries, as revealed through a questionnaire study.

Importance of the study. Safety in high school athletics (i.e. wrestling) has been frequently discussed by various groups of educators. However, in spite of such discussions accurate studies of specific injuries have not been made. The individual coach has been limited to his own particular coaching experience, regarding the incidence of injuries in wrestling. In this study an attempt has been made to bring to the attention of coaches and other educators

factual knowledge of the actual injuries sustained by wrestlers in seven Midwest States during the 1950-1951 season.

II. THE DATA

Methods of collecting the data.

1. The first step in the study was to send letters¹ to the State High School Athletic Directors in the Midwest States in which the study was to be conducted. These directors then mailed to the writer a list of high schools in their respective states who sponsored wrestling.

2. From the lists received from the State Directors, a mailing list was prepared.

3. A letter² requesting cooperation accompanied the questionnaire³ sent to the high school coaches.

4. The schools cooperating in this study were asked to return the questionnaires in the self-addressed and stamped envelopes that were provided.

Methods of organizing and analyzing the data. Results from the returned questionnaires were tabulated and analyzed.

¹ Appendix, page 43

² Appendix, page 44

³ Appendix, page 45

A final evaluation was made through the use of tables and figures, including (1) the ranking of factors causing injury (2) the number of injuries per weight classification (3) the number of injuries per years of competition (4) the frequency of injuries (5) the rate of injuries (6) the rate of incidence of injury per thousand participating (7) the correlation of coaching experience with the total number of injuries, and (8) the relationship between the type of mat cover and the number of infections per squad.

III. DEFINITIONS OF TERMS USED

Injury. Throughout the study the term "injury" shall be interpreted as meaning any damage done to an individual which would in any manner impair medically approved participation in normal competitive wrestling activity, either because of possible further damage to the individual or because of the communicable qualities of the damage.

Infection. For the purposes of this study the term infection shall be classed as an injury.

Mat burns. This injury is caused by the scraping off of the epidermis, due to the swift rubbing over the wrestling mat, resulting in an abrasion which is highly infectious.

Cauliflower ear. The cauliflower ear is a common type of injury to wrestlers, and evidence shows that it was

known to man as far back as Ancient Rome.⁴ The blood vessels of the ear are not well protected by fatty tissue, and therefore are easily injured. When blood vessels are ruptured by a blow, blood flows between the skin and the cartilage, forming a large swelling. When the blood separates the skin from the cartilage, it deprives the cartilage of its nutrition. As healing takes place, the blood clots and the cartilage contracts, causing the ear to take on an unnatural appearance.⁵

High School Wrestling. The amateur sport of high school wrestling is often times confused with the professional version of the sport. Competitive, high school wrestling is primarily taught for the welfare, development, and enjoyment of the participant.

IV. LIMITATIONS OF THE PROBLEM

The study was limited to:

1. One hundred and twenty schools that responded to the questionnaire out of the one hundred and seventy-six schools

⁴F. S. Lloyd, G. G. Deaver, and F. R. Eastwood, *Safety in Athletics*. Philadelphia and London: W. B. Saunders Company, 1939. p. 278.

⁵Ibid., p. 279.

having wrestling in the seven Midwest States included in the study.

2. A total wrestling squad enrollment of 4835 high school boys.

3. One hundred and twenty high schools located in the Midwest, an area including:

- a. Illinois
- b. Indiana
- c. Iowa
- d. Michigan
- e. Minnesota
- f. Ohio
- g. Wisconsin

4. The wrestling injuries incurred during the 1950-1951 high school wrestling season.

5. High school wrestling engaged in as an extra-curricular activity.

CHAPTER II

PERTINENT FACTS REGARDING THE PERSONNEL OF THE GROUPS STUDIED

Facts regarding the personnel of the groups studied and to be discussed: (1) the coaches responding to the questionnaire; (2) the average number of years of coaching experience, taking the seven Midwest States collectively and singly; (3) the average number of wrestlers per squad, grouping the seven Midwest States collectively and singly; (4) the number of hours of daily practice with relation to the number of schools participating in the study.

The coaches responding to the questionnaire. A complete list of the coaches responding to the questionnaire may be found, grouped according to state, in Tables I through VII inclusive.

The average number of years of coaching experience. Through tabulation of the returned questionnaires it was found that the average number of years of coaching experience was 7.6 years, taking the seven Midwest States collectively. See Table VIII for the average number of years of coaching experience for each state.

It has been stated, without factual evidence, that the number of years of coaching experience has a bearing

TABLE I
WRESTLING COACHES FROM ILLINOIS
RESPONDING TO QUESTIONNAIRE

Name	Affiliation	Number years coaching
Armer, M.	Lyons Twp. H. S., LaGrange	5
Bandy, L. W.	Danville H. S., Danville	20
Bay, O. A.	Waukegan H. S., Waukegan	11
Blunk, C. L.	Blue Island H. S., Blue Island	22
Brooks, H. M.	Western Military Academy, Alton	2
Custer, J. B.	Pekin H. S., Pekin	13
Czech, T.	Thornton Twp. H. S., Harvey	5
Garner, D. S.	Wheaton H. S., Wheaton	2
Goranson, P.	Joliet Twp. H. S., Joliet	20
Gottfried, C.	Urbana H. S., Urbana	1
Greene, K.	Rock Island H. S., Rock Island	14
Gross, C.	Woodruff H. S., Peoria	10
Hasbargen, G. J.	Morgan Park Military Academy, Chicago	2
Henrichs, K. A.	Manual H. S., Peoria	3
Hurley, A. A.	New Tier Twp. H. S., Winnetka	14
Koll, W. H.	University H. S., Chicago	3
Murray, J.	Franklin Park H. S., Franklin Park	4
Musgrove, H.	Sterling Twp. H. S., Sterling	18
Parsons, W. B.	Evanston Twp. H. S., Evanston	5
Pempek, C. J.	Maine Twp. H. S., DesPlaines	4
Sanders, M. D.	Brookfield H. S., Riverside	9
Sarff, C. M.	Chicago Hts. H. S., Chicago Hts.	29
Scharf, A.	Elgin H. S., Elgin	3
Scharf, F.	Woodriver H. S., East Alton	7
Schmitt, W.	Granite City H. S., Alton	4
Sherman, W.	Hinsdale H. S., Clarendon	1
Slimmer, L. F.	Proviso Twp. H. S., Maywood	26
Sloan, D. H.	Quincy H. S., Quincy	15
Sowinski, J.	Thorton Fractional H. S., Calumet	4
Swindell, R. W.	Champaign H. S., Champaign	15
Vavrus, J.	Moline H. S., Moline	7
Wilson, R.	Mattoon H. S., Mattoon	4
Wojciekowski, E.	Morton H. S., Cicero	8

TABLE II
WRESTLING COACHES FROM INDIANA
RESPONDING TO QUESTIONNAIRE

Name	Affiliation	Number years coaching
Concialdi, F. G.	G. R. Clark H. S., Whiting	3
Dill, P. E.	Shortridge H. S., Indianapolis	20
Fisher, C. R.	Muncie Central H. S., Muncie	2
Foster, J.	Peru H. S., Peru	2
Freiberger, C.	Washington H. S., East Chicago	11
French, K. R.	Roosevelt H. S., East Chicago	17
Hiatt, M.	Broad Ripple H. S., Indianapolis	4
Hoke, R.	Crawfordsville H. S., Crawfordsville	8
Jones, R.	Central H. S., South Bend	16
Kelly, R. R.	Howe Military Academy, Howe	5
McDaniel, C.	Southport H. S., Southport	11
Meyers, C. R.	Bloomington H. S., Bloomington	11
Shively, L. H.	Decatur Central H. S., Decatur	14
Treichler, W. S.	Arsenal Technical H. S., Indianapolis	18
Willey, N. B.	Jefferson H. S., Lafayette	5
n.n.	Hammond H. S., Hammond	--

TABLE III
WRESTLING COACHES FROM IOWA
RESPONDING TO QUESTIONNAIRE

Name	Affiliation	Number years coaching
Alitz, L. A.	Osage H. S., Osage	3
Barker, H. T.	Mason City H. S., Mason City	20
Bellock, C.	Oelwein H. S., Oelwein	4
Black, R.	Britt H. S., Britt	2
Brand, D. E.	Clarion H. S., Clarion	8
Chambers, W.	Carroll H. S., Carroll	15
Chism, E. H.	Newton H. S., Newton	11
Doty, V. E.	Abraham Lincoln H. S., Council Bluffs	2
Farber, W. J.	Independence H. S., Independence	4
Flanagan, G. F.	Cresco H. S., Cresco	17
Fox, J.	Davenport H. S., Davenport	6
Iverson, L.	Iowa School for the Blind	2
King, J.	Franklin H. S., Cedar Rapids	4
Lenth, D. A.	Traer H. S., Traer	6
Martin, L.	Algona H. S., Algona	5
McCabe, W.	Maquoketa H. S., Maquoketa	2
McQuoid	Waverly H. S., Waverly	1
Natvig, D.	East H. S., Waterloo	8
Pelisek, J.	Wilson H. S., Cedar Rapids	3
Rabey, H. W.	Cedar Falls H. S., Cedar Falls	7
Sidders, R.	West H. S., Waterloo	2
Stone, R.	Eagle Grove H. S., Eagle Grove	5
Wilson, L. M.	Clinton H. S., Clinton	10
Wilson, L. R.	McKinley H. S., Cedar Rapids	11

TABLE IV
WRESTLING COACHES FROM MICHIGAN
RESPONDING TO QUESTIONNAIRE

Name	Affiliation	Number years coaching
Cooper, D.	Battle Creek H. S., Battle Creek	1
Craig, R.	Cranbrook H. S., Detroit	4
Duch, R.	Davison H. S., Davison	1
Finlay, R.	Sturgis H. S., Sturgis	10
Hetherington, F.	Mich. School for the Blind, Lansing	4
Johnson, D.	Eastern H. S., Lansing	4
Kline, F.	Ann Arbor H. S., Ann Arbor	10
Konrad, I. J.	Sexton H. S., Lansing	4
Shippey, D.	Everett H. S., Lansing	1
Sullivan, P.	East Lansing H. S., East Lansing	2
Vevne, O.	Berkley H. S., Berkley	2

TABLE V
WRESTLING COACHES FROM MINNESOTA
RESPONDING TO QUESTIONNAIRE

Name	Affiliation	Number years coaching
Becker, P.	Owatanna H. S., Owatanna	35
Beiersdorf, K.	Robbinsdale H. S., Robbinsdale	3
Bockhans, H.	Mound Consolidated H. S., Mound	18
Emerson, C.	Edina Morningsdale H. S., Minneapolis	5
Curran, W.	Roosevelt H. S., Minneapolis	4
Gerdes, G. R.	Faribault H. S., Faribault	5
Grim, G.	Blue Earth H. S., Blue Earth	1
Helleckson, R.	Washburn H. S., Minneapolis	7
Kolesch, W. A.	Willman H. S., Willman	3
Lappin, G. E.	Anoka H. S., Anoka	2
Maas, L.	Albert Lea H. S., Albert Lea	11
Miller, J. E.	Lake City H. S., Lake City	2
Pegors, K. W.	Waseca H. S., Waseca	1
Ridenour, C.	Rochester H. S., Rochester	15
Turrell, G. V.	New Ulm H. S., New Ulm	6
Wilcox, E. S.	Austin H. S., Austin	13

TABLE VI
WRESTLING COACHES FROM OHIO
RESPONDING TO QUESTIONNAIRE

Name	Affiliation	Number years coaching
Breed, F. W.	DeVilbiss H. S., Toledo	10
Busha, A. E.	John Marshall H. S., Cleveland	13
Chase, E.	Garfield Hts. H. S., Cleveland	4
Davis, T. M.	John Hay H. S., Cleveland	3
Eckert, C. F.	Euclid Sr. H. S., Euclid	15
Foust, J.	Barberton H. S., Barberton	3
Harger, P. C.	Lakewood H. S., Lakewood	8
Hinkle, C. A.	Cuyahoga Falls H. S., Cuyahoga Falls	12
Kester, H.	West H. S., Cleveland	21
Lazzaro	West Technical H. S., Cleveland	4
Mancuso, I. A.	VanBuren H. S., VanBuren	4
Slough, J.	Mt. Cory Rawson H. S., Rawson	2
Vendittle, L. A.	East Liverpool H. S., East Liverpool	2
Zednek, E.	Shaker Hts. H. S., Shaker Hts.	3

TABLE VII
WRESTLING COACHES FROM WISCONSIN
RESPONDING TO QUESTIONNAIRE

Name	Affiliation	Number years coaching
Chalupa, F.	Luxemburg H. S., Luxemburg	2
Currier, K.	Beloit H. S., Beloit	3
Jankiewicz, P.	Milwaukee H. S., Milwaukee	4
Jankowski, H. M.	Pulaski H. S., Pulaski	1
Roberts, J. E.	Stevens Point H. S., Stevens Point	7
Weaver, G.	Washington Park H. S., Racine	22

TABLE VIII
THE AVERAGE NUMBER OF YEARS OF
COACHING EXPERIENCE PER STATE

State	Average number of years coaching
Illinois	9.0
Indiana	9.8
Iowa	6.1
Michigan	3.9
Minnesota	8.1
Ohio	7.4
Wisconsin	6.5

on the number of injuries sustained by a wrestling squad. To determine the possible validity of this statement a tabulation was made from the returned questionnaires. As is evidenced by Figure 1 and Table IX, there were no significant findings, taking the seven Midwest States either collectively or singly. The conclusion, therefore, is that there is no concrete evidence on which to base the statement that the coach with more years of experience has fewer squad injuries or vice versa.

The average number of wrestlers per squad. The total number of high school wrestlers in the schools in the seven Midwest States which participated in the study was 4835. Since there were 120 schools sampled, the average number of wrestlers per squad was 40.29, during the 1950-1951 wrestling season. The average number of wrestlers per squad in each state, may be found by referring to Table X.

The relation of the number of hours of daily practice to the number of schools participating in the study. The relationship of the number of hours of daily practice to the number of schools participating in the study is shown in Figure 2. As is readily seen from Figure 2, the greatest majority of the schools practice two hours daily. If the relationship is discussed in terms of percentages, we find

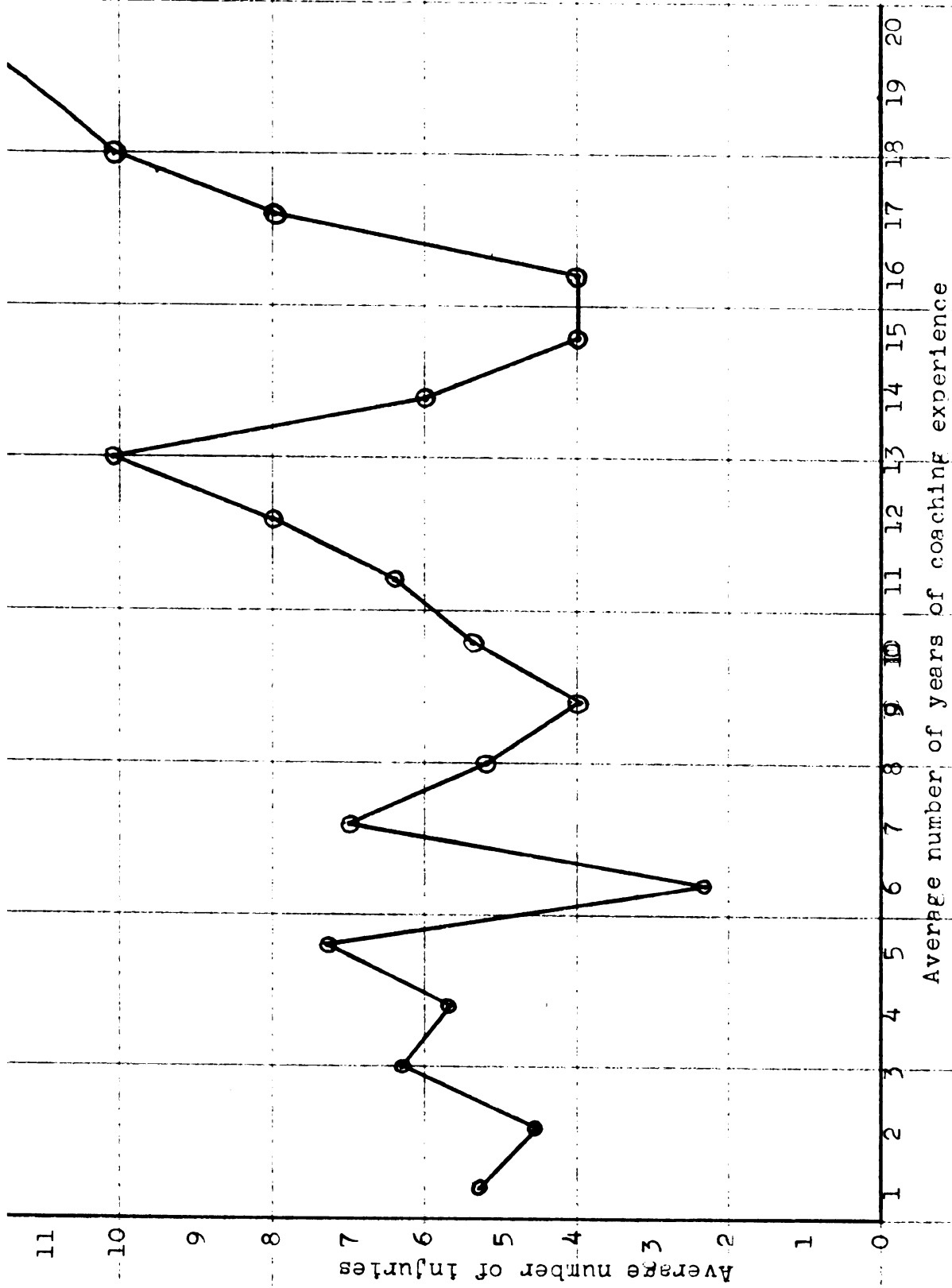


FIGURE 1

RELATIONSHIP OF THE AVERAGE NUMBER OF INJURIES
TO THE AVERAGE NUMBER OF YEARS OF COACHING

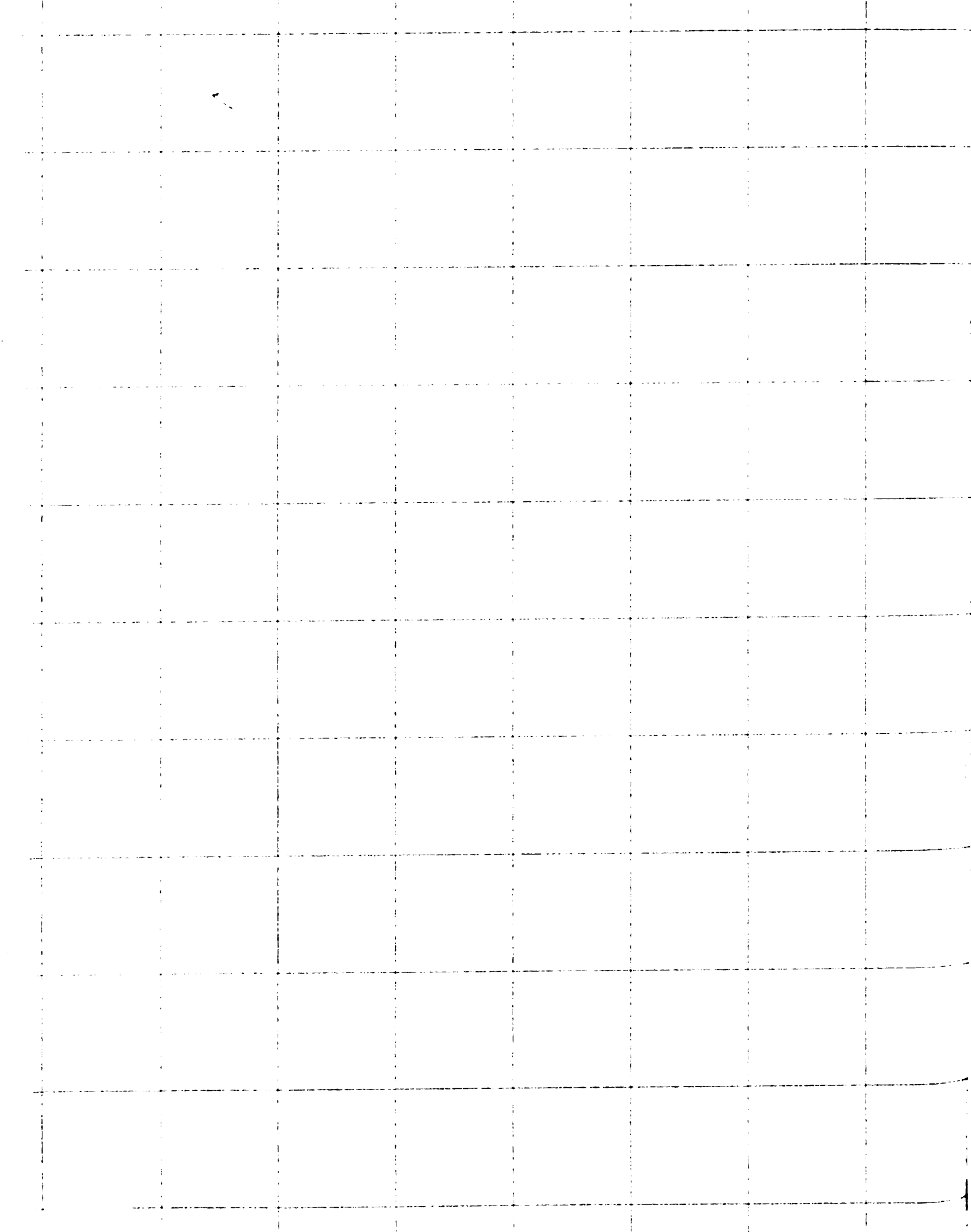


TABLE IX
AVERAGE NUMBER OF YEARS OF COACHING AND
THE AVERAGE NUMBER OF INJURIES PER STATE

State	Average number years of coaching	Average number of injuries
Illinois	9.0	7.5
Indiana	9.8	6.4
Iowa	6.1	6.3
Michigan	3.9	4.3
Minnesota	8.1	6.8
Ohio	7.4	3.5
Wisconsin	6.5	6.8

TABLE X
NUMBER OF SCHOOLS, TOTAL NUMBER OF WRESTLERS,
AND THE AVERAGE NUMBER PER SQUAD
ACCORDING TO STATE

State	Number of schools	Total number wrestlers	Average number per squad
Illinois	33	1625	49
Indiana	16	667	41.6
Iowa	24	973	40.5
Michigan	11	354	32
Minnesota	16	592	37
Ohio	14	421	30
Wisconsin	6	203	33.8

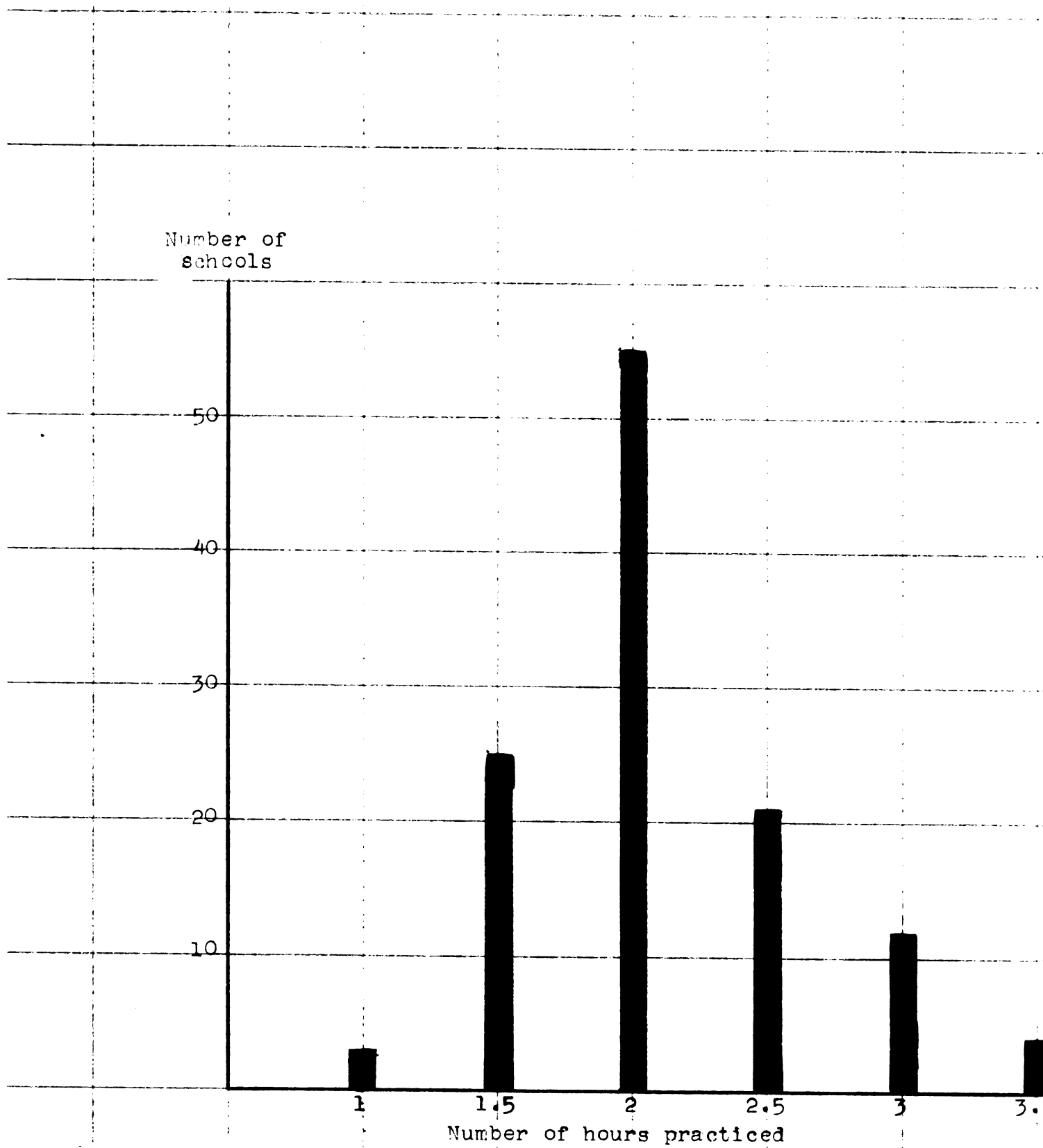
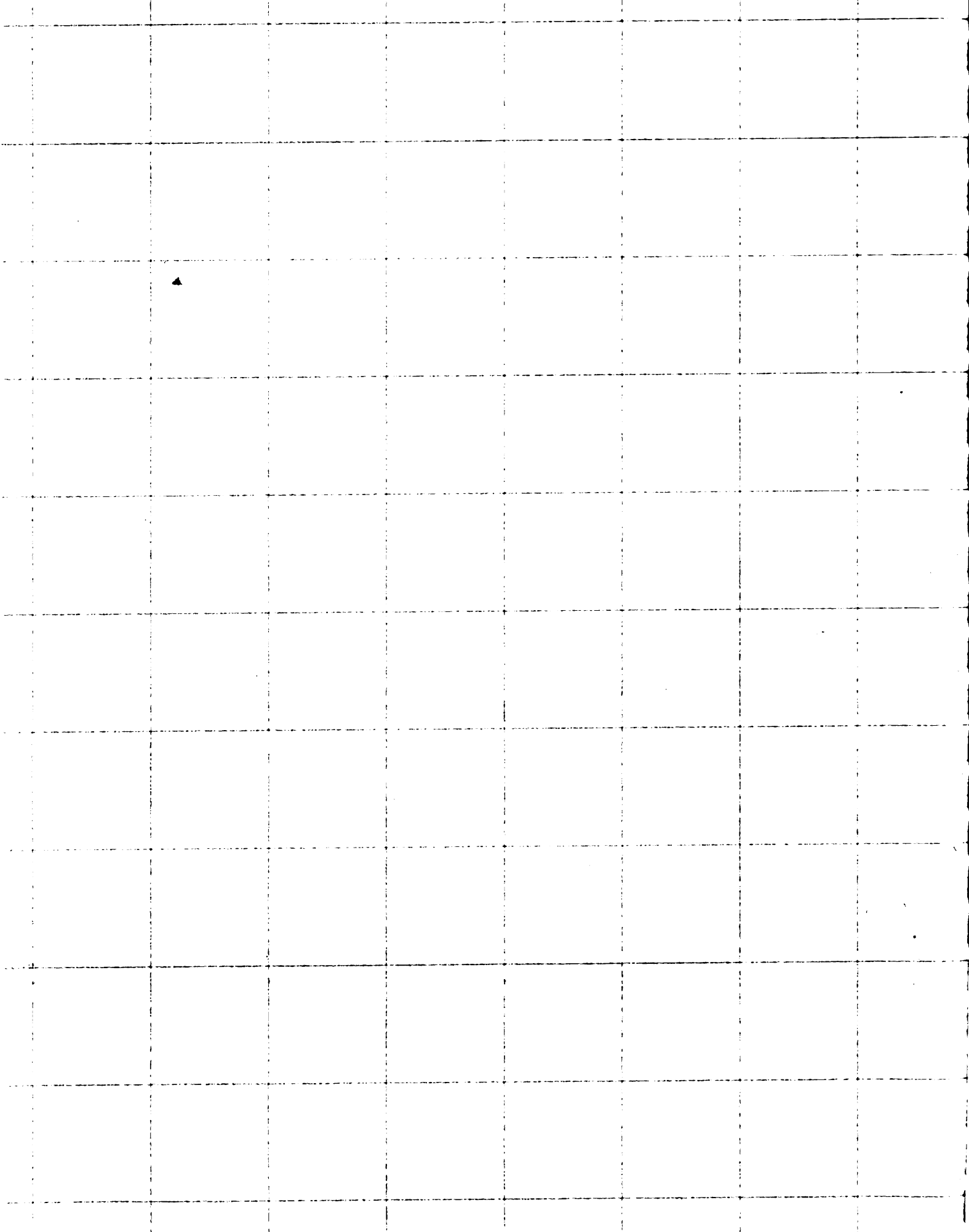


FIGURE 2

RELATIONSHIP OF NUMBER OF SCHOOLS
TO NUMBER OF HOURS PRACTICED PER DAY



(1) that 2.5% of the schools practice 1 hour daily; (2) 20.8% of the schools practice 1.5 hours daily; (3) 45.8% of the schools practice 2 hours daily; (4) 17.5% of the schools practice 2.5 hours daily; and (5) 3.33% of the schools practice 3 hours daily.

Summary. The average high school wrestling squad in the seven Midwest States, taken collectively, was found to be 40.29 boys, who practiced an average of two hours per day and who were coached by a man having an average of 7.6 years of coaching experience.

CHAPTER III

THE FREQUENCY AND THE CAUSES OF INJURIES

The safety of wrestling is of primary concern to the individuals interested in the sport. With this fact in mind, the writer will present (1) the total number of actual occurrences of injuries in the seven Midwest States during the 1950-1951 high school wrestling season; (2) the common types of wrestling injuries and their frequency; and (3) the facts relative to the occurrence of injury.

The total number of injuries. From the 120 schools sampled for the problem, there were found to be a total of 735 injuries out of 4835 participants. One in every 6.5 participants had some type of injury, either major or minor, infectious or noninfectious. For data concerning the average number of injuries in each state, refer to Table IX on page 17.

The common types of wrestling injuries and their frequency. From the returned questionnaires it was learned that there was special interest among the coaches as to exactly what types of injuries occurred most frequently. It is apparent by consulting Figure 3 that while broken bones were relatively few in number, cauliflower ears and infections accounted for the greatest number of injuries.

It should be noted that 1 out of every 28 participants

Types of
injuries

Cauliflower ear

Infections

Pulled muscles

Injured ribs

Sprained ankles

Strained back

Neck injuries

Dislocated shoulder

Sprained wrist

Broken nose

Broken finger

Twisted knee

Dislocated elbow

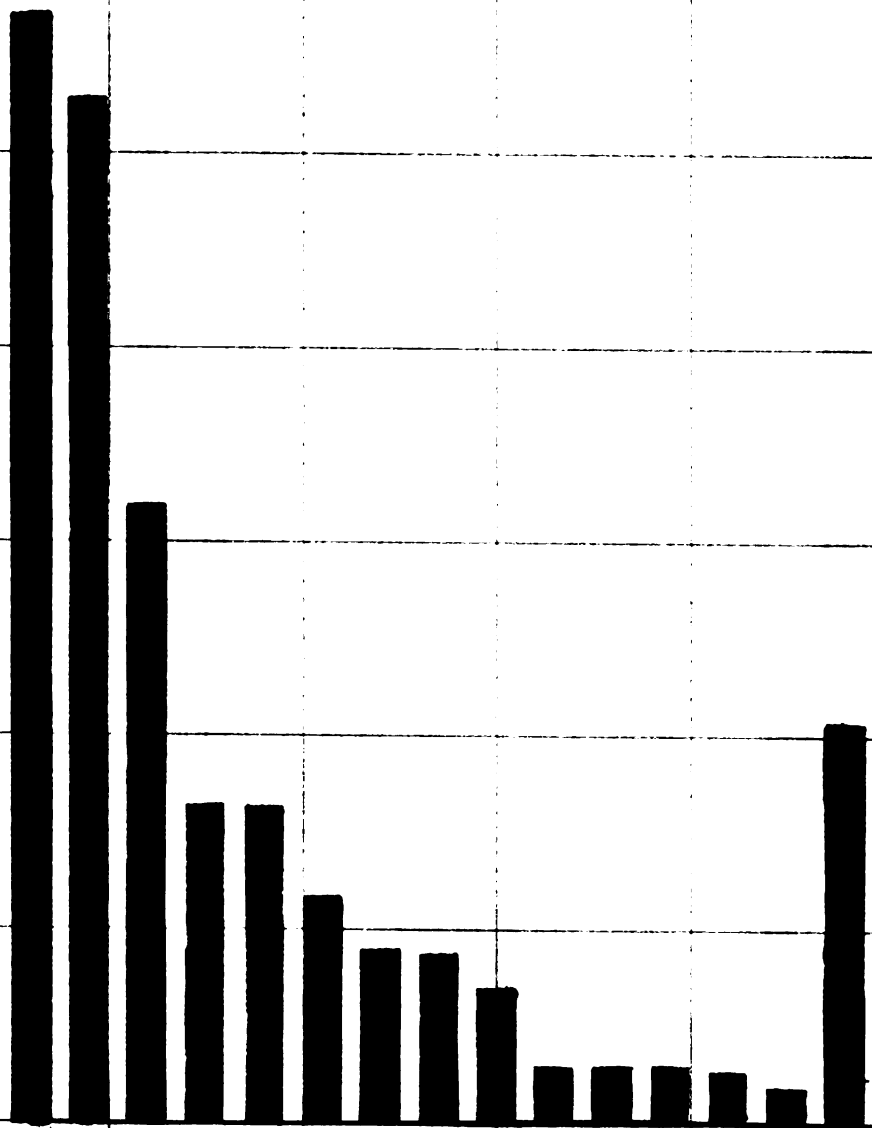
Broken arm

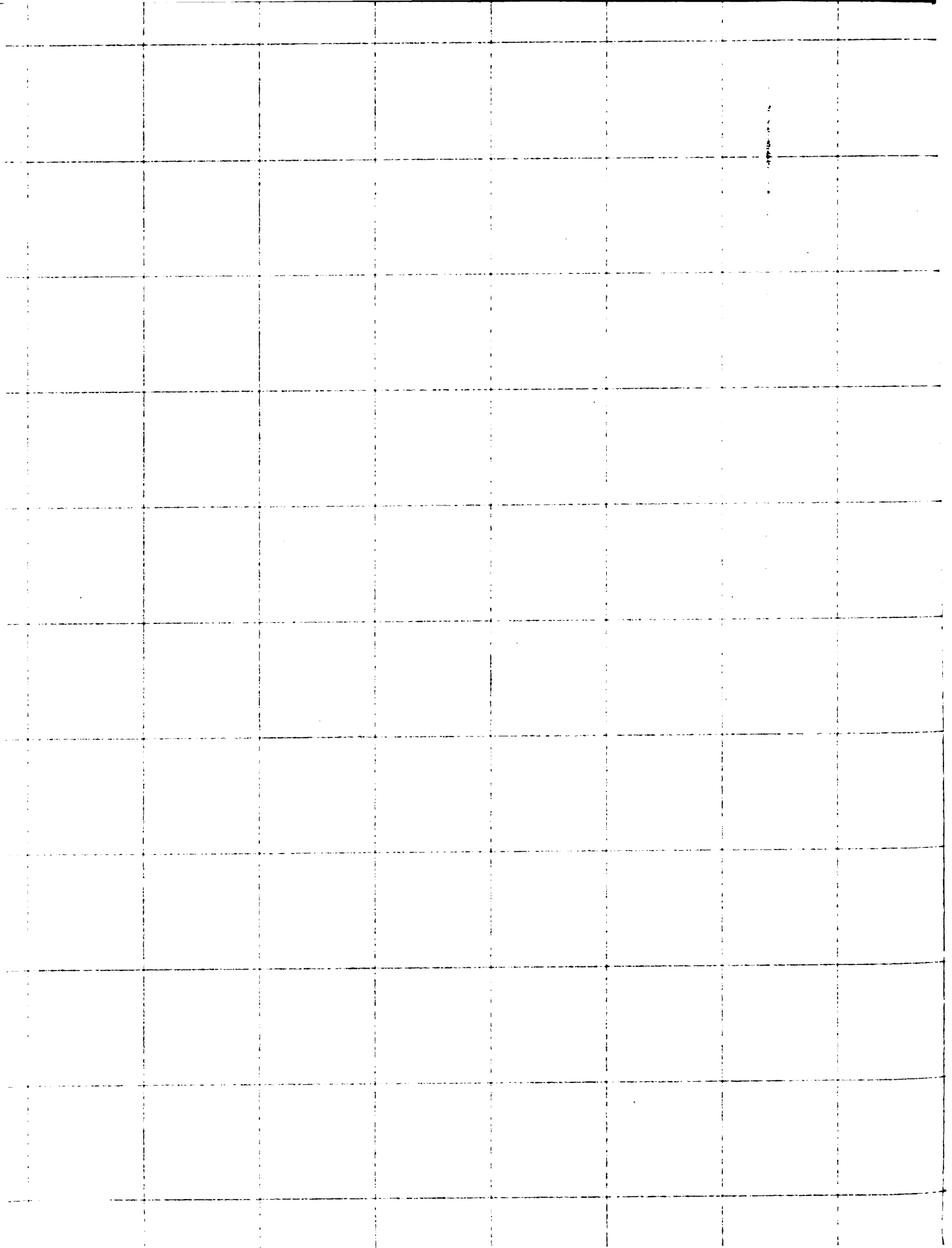
Others

Number of injuries

FIGURE 3

THE FREQUENCY OF COMMON INJURIES





received a cauliflower ear and 1 out of 30.4 participants developed an infection, i.e., mat burns, impetigo, or boils. It would seem, therefore, that if these two types of injuries were reduced, wrestling would be a great deal safer for a high school boy. Table XI presents a further analysis of the percentage and ratio of the types of injuries.

Facts relative to the occurrence of injury. There are numerous elements to be considered regarding the occurrence of injuries. The discussion here will concern (a) the relation of the number of years of competition to the number of injuries; (b) the number of injuries in each weight classification; (c) the number of injuries incurred in practice as compared to the number of injuries incurred in matches; (d) the period during the practice and the match when the injuries occurred; and (e) the rank of the causes of injury.

It was found that boys participating in wrestling for one or two years received twice as many injuries as boys participating three or four years. (See Figure 4) The writer would like to advance possible factors which might account for a greater number of injuries to boys competing in wrestling for one or two years:

1. Many high schools have only the three grade system.
2. Many boys compete for only one or two years.

TABLE XI
PERCENTAGE AND RATIO OF THE TYPES OF INJURIES

Types of injury	Percentage of injuries	Percentage of participants injured	Ratio of injuries to participants	Incidence per thousand
Cauliflower ear	23.4	3.50	1:28	35.8
Infection	21.6	3.20	1:30.4	33.0
Pulled muscles	13.0	1.90	1:50.3	20.0
Injured ribs	6.6	1.00	1:98	10.2
Sprained ankle	6.3	.90	1:103	9.7
Strained back	4.7	.70	1:138	7.2
Neck injuries	3.6	.50	1:179	5.6
Dislocated shoulder	3.5	.50	1:186	5.4
Sprained wrist	2.8	.40	1:230	4.3
Broken finger	1.2	.18	1:537	1.8
Broken nose	1.2	.18	1:537	1.8
Twisted knee	1.2	.18	1:537	1.8
Dislocated elbow	1.0	.16	1:604	1.6
Broken arm	.8	.12	1:806	1.2
Others	8.4	1.20	1:78	12.9

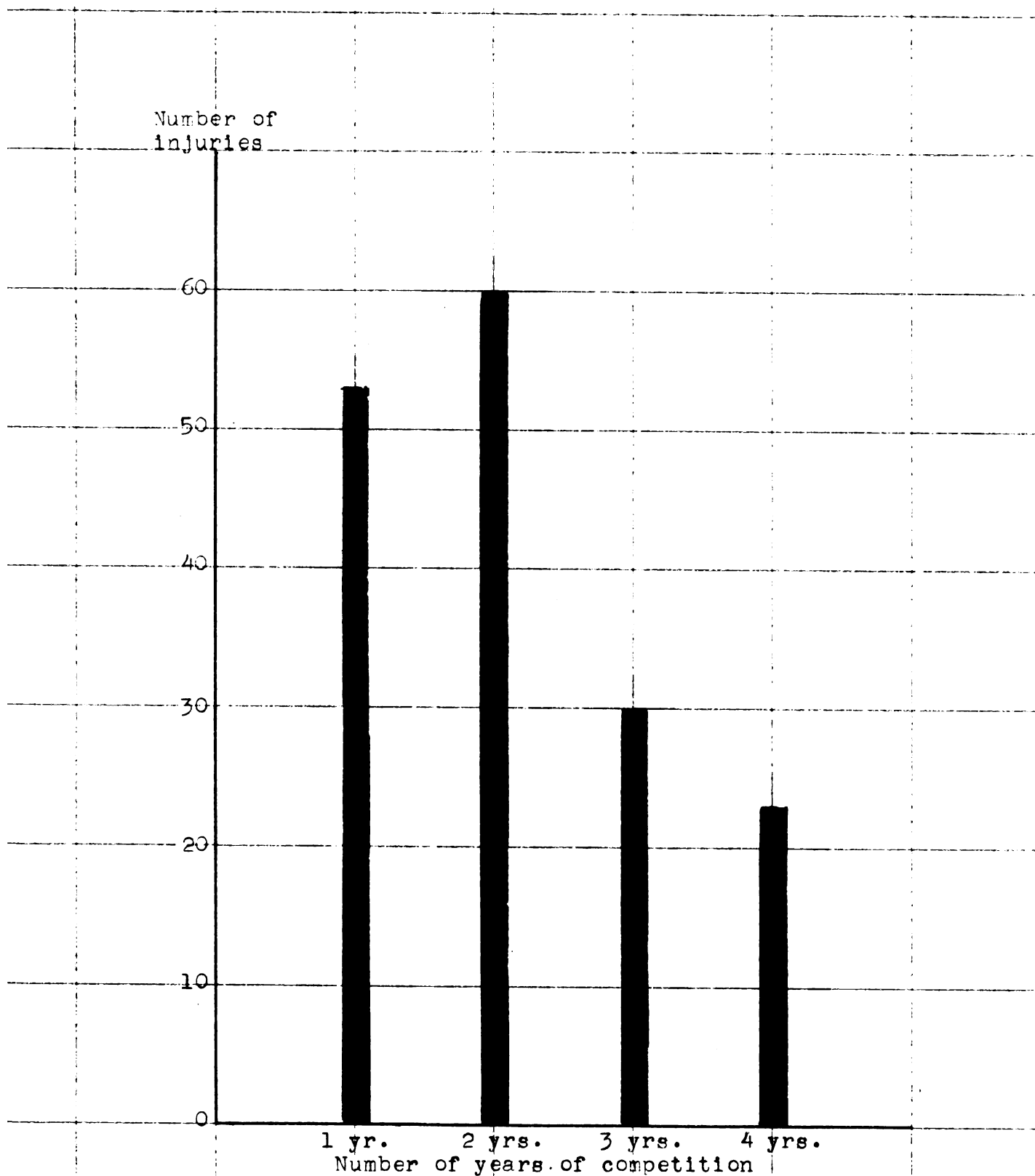


FIGURE 4

THE RELATIONSHIP OF THE NUMBER OF INJURIES
TO THE NUMBER OF YEARS OF COMPETITION



+

+

+

3. Inexperience in using the various wrestling holds could lead to injury.

4. A boy in the first years of high school is not as well coordinated nor as physically developed as a boy a year or two older.

With these factors and the supporting evidence found in the study the individual coach could do much to decrease wrestling injuries by careful instruction and supervision of the beginning wrestlers.

There seems no obvious explanation for the fact that there were more injuries occurring in boys wrestling in the 145 pound weight classification; however, such was the case, as illustrated in Figure 5. Before any conclusion might be drawn that the 95 pound weight and the 175 pound weight are the 'safe' weights, since they are shown to have the fewest injuries, it should be pointed out that both of these weights are optional to the individual school and are not official weights as recommended by the National Wrestling Rules Committee.⁶ Further, it has been the experience of the writer that 145 pounds seems to be an average weight for high school boys and consequently there tend to be more boys competing

⁶ The Official National Collegiate Athletic Association Wrestling Guide for 1951 (New York: The National Collegiate Athletic Bureau, 1951), p. 100.

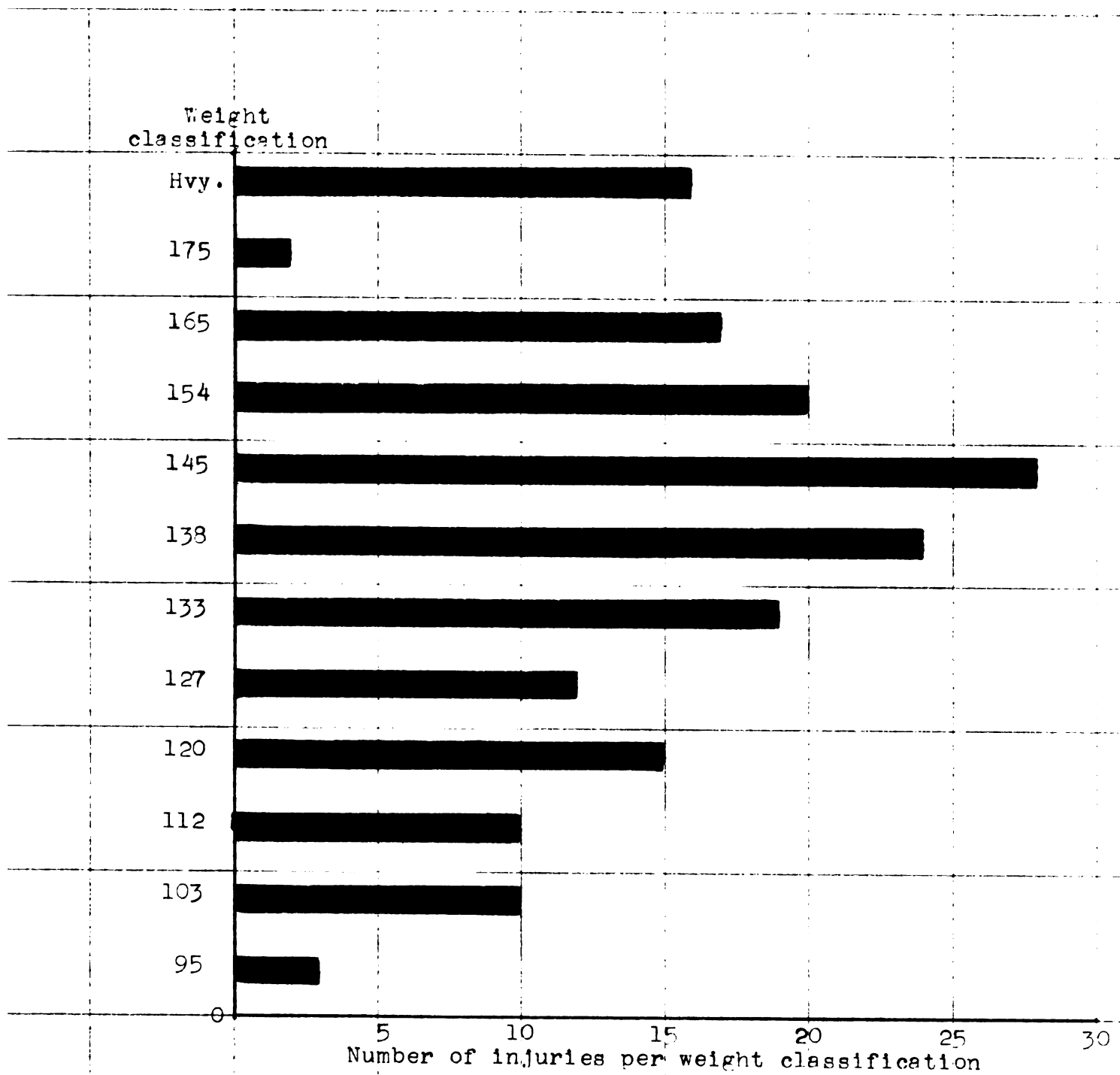
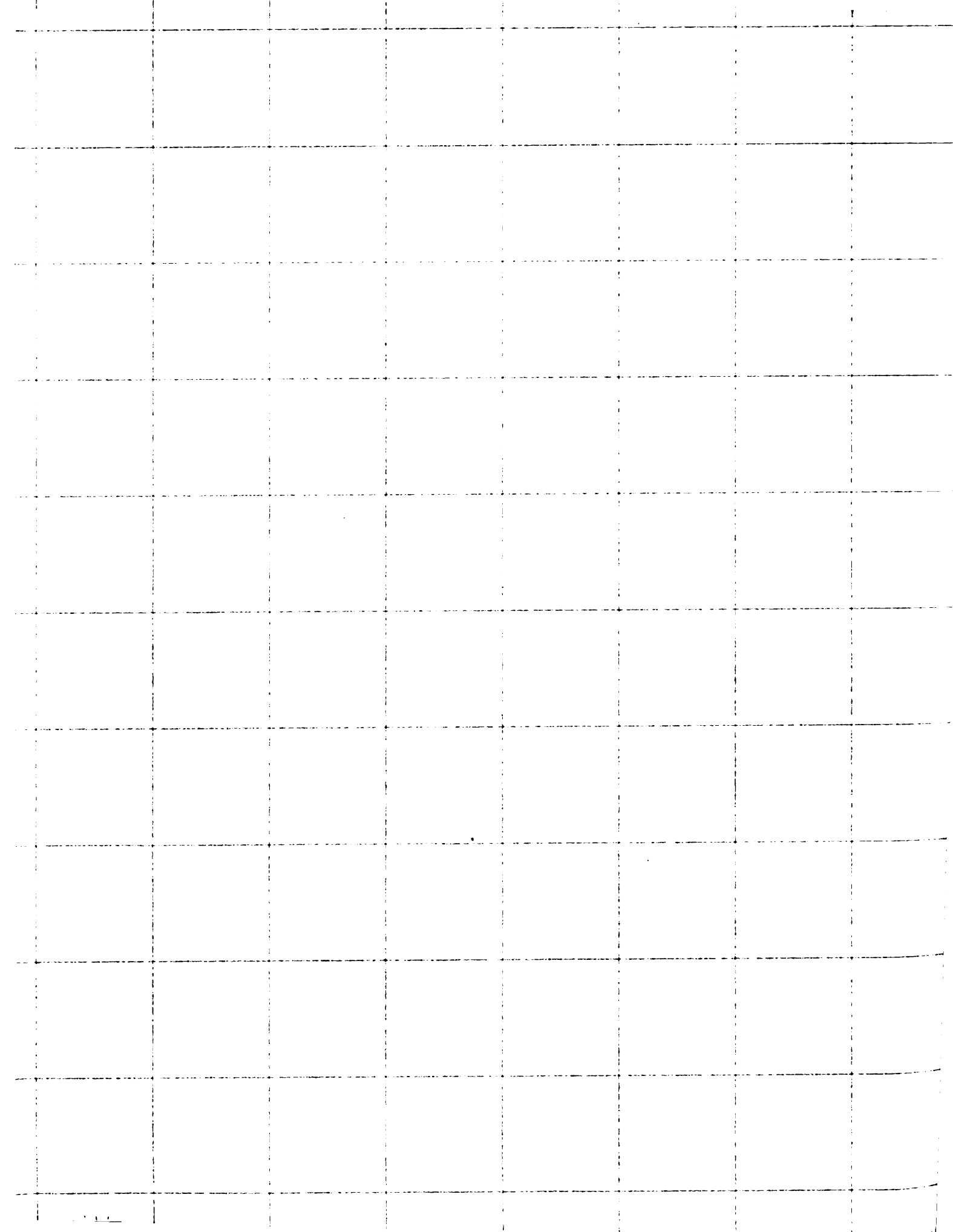


FIGURE 5

THE FREQUENCY OF INJURIES ACCORDING
TO WEIGHT CLASSIFICATION



for a place on the wrestling squad at this weight. It may be simply a case of more boys, causing more injuries.

It is difficult to establish the exact time of the occurrence of some of the injuries, i.e., cauliflower ear and infections. From the questionnaire it would be the opinion of the greatest number of coaches that the majority of injuries occur during the daily practice sessions rather than during the matches, and further, that of the injuries received during these practice periods, the injuries occurred most frequently at the beginning of the practice. The coaches also stated that of the injuries received during matches, those too were usually at the beginning of the match. (See Figure 6) From these coaches opinions it would be possible to say that the warm-up or loosening-up parts of conditioning had not been sufficiently emphasized.

The coaches ranked the major causes of injury in the following manner:

1. Wrestlers carelessness
2. Freak accidents
3. Conditioning
4. Poor practice conditions

Summary. The analysis of the data in this chapter has

Number of
injuries

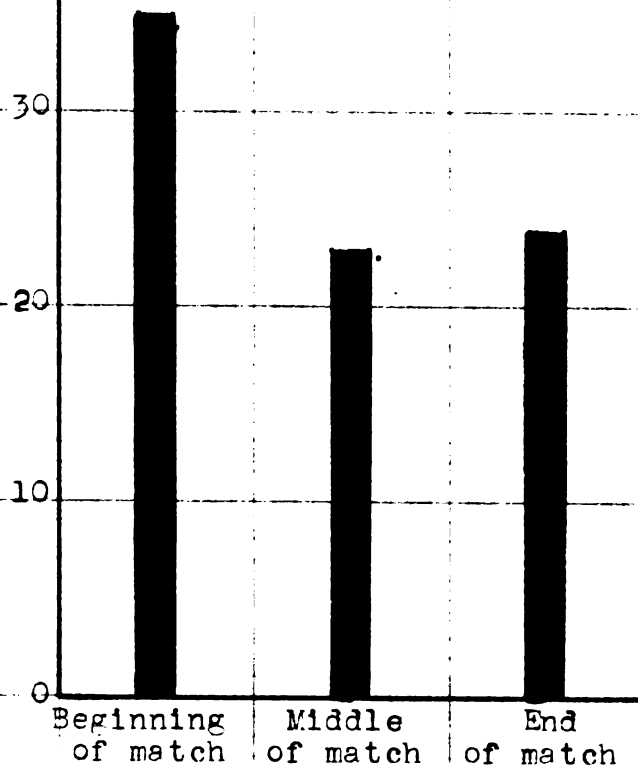
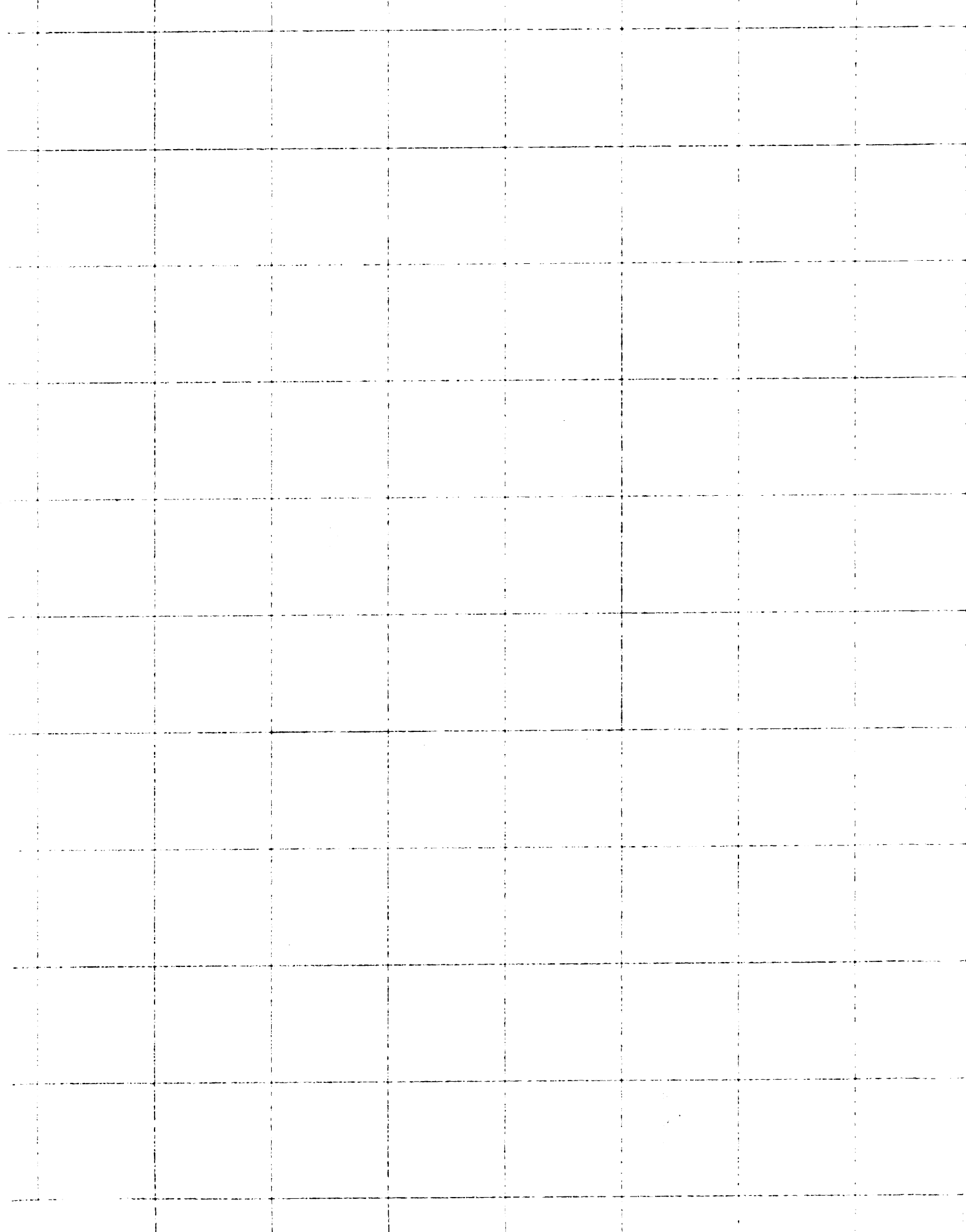


FIGURE 6

THE RELATIONSHIP OF THE NUMBER OF INJURIES
TO OCCURRENCE



revealed the following findings:

1. Of the 4835 participants, 735 received injuries.
2. One in every 6.5 participants received an injury.
3. Cauliflower ears and infections accounted for the greatest number of injuries.
4. Boys wrestling one or two years received twice as many injuries as boys wrestling three or four years.
5. The greatest number of injuries occurred in the 145 pound weight classification.
6. The majority of injuries occurred during the beginning portion of the practice period.
7. The coaches ranked wrestlers carelessness as the major cause of injuries.

CHAPTER IV

PHYSICAL CONDITIONS RELATIVE TO INJURY

The previous chapters have dealt primarily with the actual frequency of injury. The discussion here will be confined to the physical surroundings of the sport, (1) the wrestling surfaces; (2) disinfection of the wrestling surfaces; and (3) medical examination.

Wrestling surfaces. For the purposes of study it is of interest to note the kind of equipment used in the various schools. The sizes of the wrestling mats vary considerably. It was reported that, 10 schools used 18' by 18' mats, 73 schools used 20' by 20' mats and 37 schools used 24' by 24' wrestling mats. Only 35 of the schools had 1 mat, while 72 schools had 2 mats, and 13 schools had 3 or more mats. (See Figures 7 and 8)

There has been a need for a mat cover which, among other factors, would be easy to care for. There are two commonly used types of mat covers, canton flannel and plastic. Plastic covers are the newest type being used, and from the results of the survey they seem to have proven their merit. Of the 135 plastic mat covers used, there were 60 infections reported or 37% of the total number of infections, whereas, of the 68 canton flannel mat covers used, there were 29

Number of
mats

60

40

20

0

18' by 18'

20' by 20'

24' by 24'

FIGURE 7

NUMBER AND SIZE OF MATS USED

Number of
schools

60

40

20

0

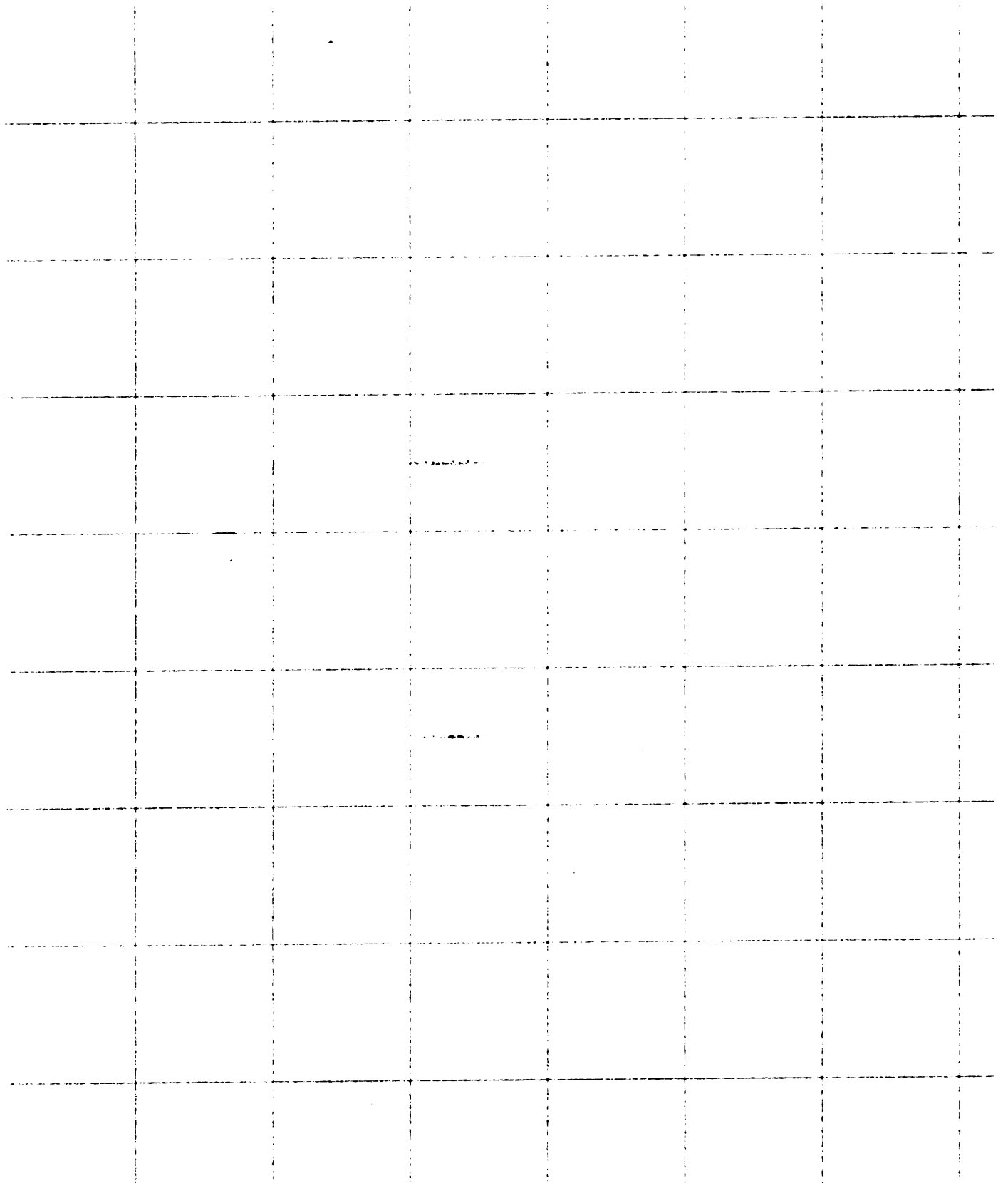
1 mat

2 mats

3 mats
or more

FIGURE 8

NUMBER OF SCHOOLS USING
1, 2, 3 OR MORE MATS



infections reported or 63% of the total number of infections. As Figures 9 and 10 illustrate, plastic covers accounted for 29 cases of boils, 8 infected mat burns, and 23 cases of impetigo. Canton flannel covers accounted for 14 cases of boils, 37 infected mat burns, and 38 impetigo cases, although almost twice as many plastic covers were used as canton flannel covers.

Disinfection of wrestling surfaces. Because of the close body contact in wrestling, the control of infection can be difficult. Of the 71 schools that used a daily disinfectant on the wrestling surfaces, 26 infections occurred. Of the 41 schools that reported no daily disinfection there were 123 infections. In other words, by the use of a daily disinfectant on the wrestling surfaces, there were 65% fewer infections. It should be pointed out that of the schools using a daily disinfectant there were no cases of infected mat burns, 17 cases of boils, and 9 cases of impetigo, while the schools not disinfecting daily had 45 infected mat burns, 26 cases of boils, and 52 cases of impetigo. (See Figures 11 and 12)

Medical examination. The tendency in recent years has been to require a medical examination before participating in athletics. Through the questionnaire results it was shown

Number of cases

30

20

10

0

Boils

Infected mat burns

Impetigo

FIGURE 9

FREQUENCY OF INFECTIONS
ON PLASTIC MAT COVERS

Number of cases

30

20

10

0

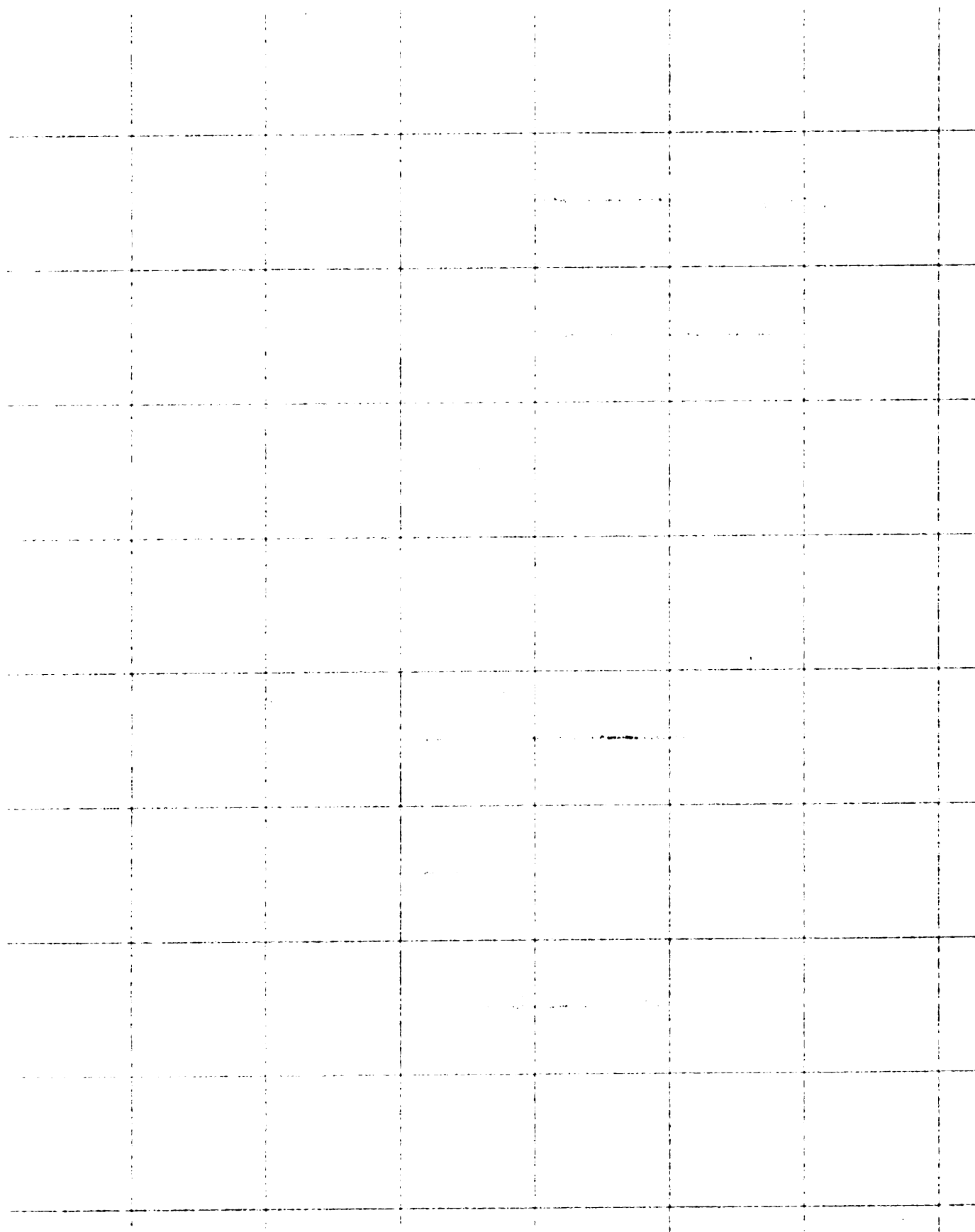
Boils

Infected mat burns

Impetigo

FIGURE 10

FREQUENCY OF INFECTIONS
ON CANTON FLANNEL MAT COVERS



Number of
infections

50

40

30

20

10

0

Boils

Infected
mat burns

Impetigo

FIGURE 11

NUMBER OF INFECTIONS CORRELATED
WITH NO DAILY DISINFECTION

Number of
infections

30

20

10

0

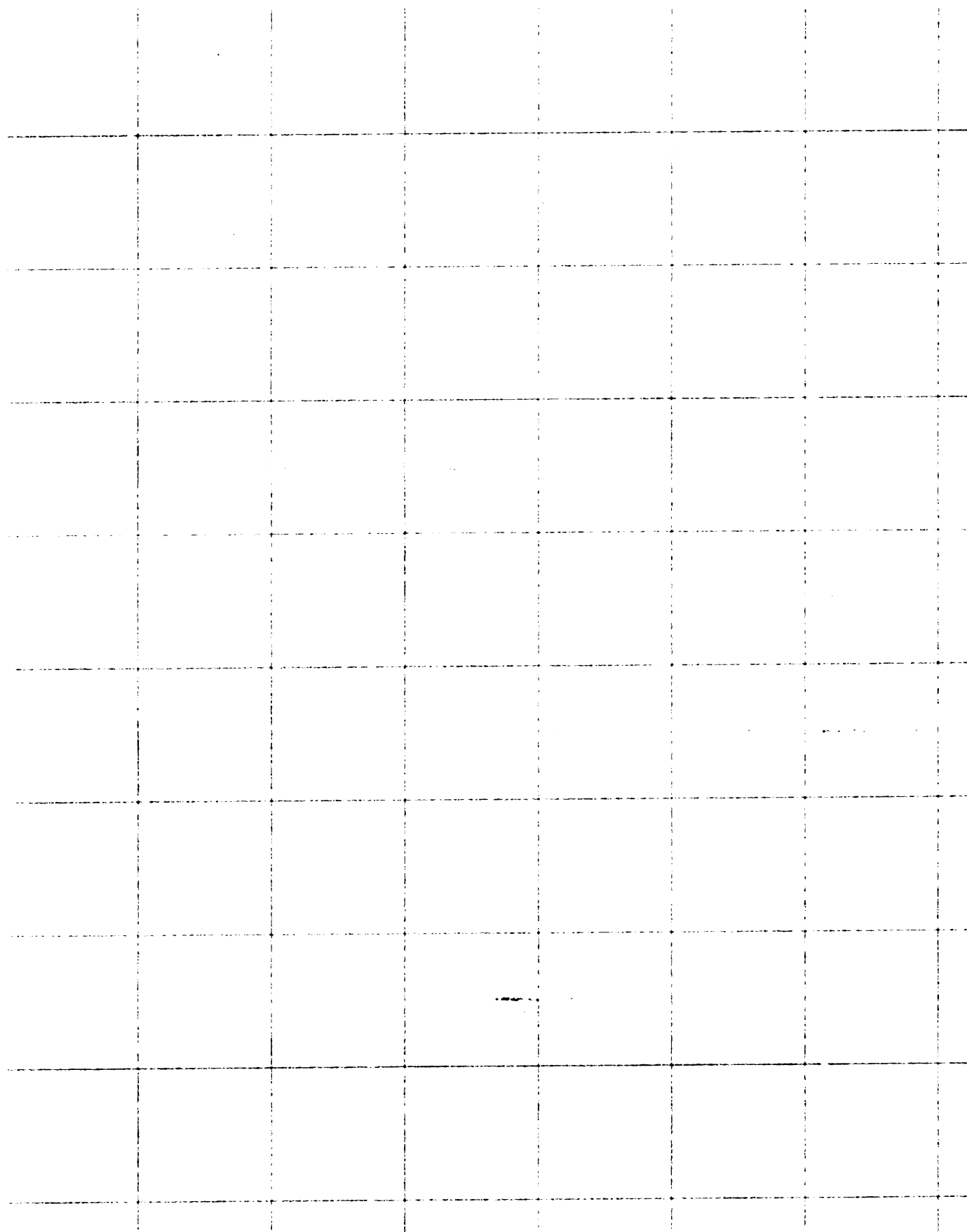
Boils

Infected
mat burns

Impetigo

FIGURE 12

NUMBER OF INFECTIONS CORRELATED
WITH DAILY DISINFECTION



that 116 schools required medical examination and 4 schools did not, previous to competition. It should be noted that the schools not requiring medical examination reported comparatively no more injuries than those schools where medical examination was a prerequisite. However, since the number of schools which had no requirement of medical examination was small, no definite conclusion can be fairly drawn.

Summary. Those schools using cotton flannel covers reported 63% of the total number of infections and those schools using plastic mat covers reported only 37% of the total number of infections, even though there were almost twice as many plastic mat covers used as cotton flannel. The 71 schools using a daily disinfectant on the wrestling surfaces had 26 infections and the 41 schools using no daily disinfectant reported 123 infections. 116 schools of the 120 schools sampled required medical examination before participating in athletics.

CHAPTER V

SUMMARY

The preceeding survey presented the frequency, cause, and contributing factors of injury that actually occurred in the seven Midwest States of, Illinois, Indiana, Iowa, Michigan, Minnesota, Ohio, and Wisconsin, during the 1950-1951 high school wrestling season. Data was collected and tabulated from returned questionnaires sent to the coaches in the seven states listed above. Relationships and correlations of the various factors of injury were presented with the hope of aiding the individual coach and athletic committee in obtaining a better factual knowledge of the injuries occurring in high school wrestling. The major findings of the survey were briefly as follows:

1. The average high school wrestling squad was 40.29 boys.
2. The average daily practice was two hours long.
3. The average number of years of coaching experience was 7.6 years.
4. Of the 4835 total wrestling participants, 735 received an injury of some type.
5. The rate of injury was, 1 in every 6.5 participant.
6. Cauliflower ears and infections accounted for the greatest number of the injuries.

7. Boys wrestling one or two years received twice as many injuries as boys wrestling three or four years.

8. The greatest number of injuries occurred in the 145 pound weight classification.

9. The majority of injuries occurred during the beginning of the practice period.

10. The coaches ranked the carelessness of the wrestlers as the major cause of injury.

11. Schools using cotton flannel mat covers had 63% of the total number of infections, whereas, the schools using plastic mat covers reported only 37% of the total number of infections, even though there were twice as many plastic covers used as there were cotton flannel.

12. Wrestling surfaces were disinfected daily in 71 of the schools and they reported a total of 26 infections. Of the 41 schools using no daily disinfectant there were 123 infections reported.

13. Medical examination was required before participation in athletics in 116 schools of the 120 schools sampled.

Recommendations. The writer has the following recommendations for further study:

1. A study of wrestling injuries throughout the United States.
2. The number of years of wrestling experience of the coach correlated with the number of injuries on the squad.
3. The factors of general health of the individual wrestler in relation to the number of injuries.
4. A detailed study of the type and effectiveness of disinfectants used on wrestling surfaces.
5. A detailed study of measures that may be taken to reduce and possibly eliminate cauliflower ears.
6. A detailed study comparing the number of high school wrestling injuries to the number of injuries sustained in other high school sports.

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APPENDIX

January 1951

Dear Sir:

I am making a study of wrestling injuries among high school boys. I would appreciate your cooperation in furnishing me with a list of all schools sponsoring wrestling in your state.

If you so desire, I will mail you a summary of the above mentioned study.

Sincerely,

I. J. Konrad
Wrestling Coach
J. W. Sexton
High School,
Lansing, Michigan

LANSING PUBLIC SCHOOLS

LANSING, MICHIGAN

J. W. SEXTON
HIGH SCHOOL

CHRISTIAN H. ROSENRAAD
PRINCIPAL

March 1951

Dear Coach,

It is my belief that wrestling needs a "shot in the arm" to put it on a crowd-pleasing level with other sports. Because of this belief, I am making a survey of wrestling injuries, their causes and their frequency, in order to have some selling point in favor of wrestling other than its' development powers. I believe that, if the wrestling coaches would bind together as the football and basketball coaches have done, we would be able to make wrestling a real drawing card.

Your help is needed. Please fill in the enclosed questionnaire and return it to me soon. Perhaps we can include the results of this survey in one of the Wrestling Association's bulletins.

Sincerely,



Ignatius J. Konrad
Wrestling Coach

IJK:GAB

Enclosure:

1. Questionnaire
2. Return envelope

A Survey of High School Wrestling Injuries for 1951

Name _____ Position _____

School _____ No. of Years of Coaching Experience _____

1. Number of men on your wrestling squad _____
2. Number of hours of practice per day _____
3. Number of injuries on your squad in 1951 _____
4. Number of cases of the following injuries:

Cauliflower ear	()	Dislocated elbows	()	Sprained ankles	()
Infections	()	Broken arms	()	Sprained wrists	()
Neck injuries	()	Broken fingers	()	Pulled muscles	()
Dislocated shoulders	()	Broken noses	()	Strained backs	()
Injured ribs	()			Others	()
5. Did you have any cases of boils? Yes (); No (); No. of cases ().
6. Did you have any cases of impetigo? Yes (); No (); No. of cases ().
7. Did you have any infected mat burns? Yes (); No (); No. of cases ().
8. When do most injuries occur? Practice (); in Matches ().
9. Number of injuries in Practice () In Matches ()
10. When do most injuries occur? Takedowns (); Escapes (); Pin Holds ()
11. List holds you believe are dangerous and cause the most injuries.

12. How many injuries occurred in each weight?

95 ()	112 ()	127 ()	138 ()	154 ()	175 ()
103 ()	120 ()	133 ()	145 ()	165 ()	Hvy ()
13. How many injuries occurred in boys out 1 year (), 2 Years (), 3 years (), 4 years ()?
14. Rank according to frequency, with no's. 1, 2, 3, etc., the cause of injuries:

Carelessness	()	Dangerous holds	()	Poor practice conditions	()
Conditioning	()	Illegal holds	()	Poor meet conditions	()
Freak accidents	()	Lack of knowledge of the sport	()	Others	()
15. What size of mat do you use for meets? 18 x 18 (); 20 x 20 (); 24 x 24 ()
16. How large is your practice area? 1 mat (); 2 Mats (); 3 Mats ().
17. What type of cover do you use? Canton flannel (); Plastic ().
18. Do you disinfect your wrestling area? Yes () No () With what? _____
How often? _____
19. How often do you wash mat covers? _____
20. How often do you launder practice equipment? _____
21. Are the walls in your wrestling room padded? Yes () No ()
22. Do you use tights for meets? Yes () No () Practice? Yes () No ()
23. Do you require a medical examination before each season of all participants?
Yes () No ()
24. Do you tape cauliflower ears or use headgears in practice ? _____
In meets? _____
25. What type of headgear do you use? Canvas () Leather () Plastic ()
26. When do most injuries occur during practice? Beginning () Middle () End ()
27. of practice period? In Match: Beginning (), Middle (), End ()?
28. Would you like a summary of the results of this questionnaire? Yes () No ()

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