

1960

# The development of an instrument to predict the potential ice hockey abilities of secondary school boys,

---

<https://hdl.handle.net/2144/14701>

*Downloaded from DSpace Repository, DSpace Institution's institutional repository*

128515  
DiVincenzo, R. P., et al.  
1960

BOSTON UNIVERSITY  
SCHOOL OF EDUCATION

THESIS

THE DEVELOPMENT OF AN INSTRUMENT TO PREDICT THE  
POTENTIAL ICE HOCKEY ABILITIES OF  
SECONDARY SCHOOL BOYS

Submitted by

Ronald A. DiVincenzo  
(B.S., Boston University, June, 1959)

Paul A. Kelly  
(B.S., Boston University, June, 1959)

John A. Leaman, Jr.  
(B.S., Boston University, June, 1959)

In Partial Fulfillment of Requirements for  
the Degree of Master of Education

1960

Boston University  
School of Education  
Library

FIRST READER: Arthur G. Miller, Professor of Education

SECOND READER: John M. Harmon, Professor of Education

## TABLE OF CONTENTS

Chapter I -- Introduction .....	1
A. Purpose of the Study .....	1
B. Scope of the Problem .....	1
C. Justification of the Problem .....	2
D. Limitations of the Problem .....	3
Chapter II -- Review of the Literature .....	4
Chapter III -- Methods and Procedures .....	8
A. Origin of the Test .....	8
B. Explanation of the Four Tests	
1. Shooting for Accuracy Test .....	12
2. Speed Test .....	14
3. Skating Agility Test .....	14
4. Stick-Handling Test .....	15
Chapter IV -- Treatment of the Data .....	21
Charts	
1. Shooting for Accuracy "T" Scores .....	23
2. 80 Yard Sprint "T" Scores .....	24
3. 80 Yard Obstacle Sprint (Agility) "T" Scores ...	25
4. 100 Yard Obstacle Sprint with Puck (Stick-Handling) "T" Scores .....	26
5. Frequency Distribution for Total "T" Scores ....	30
Chapter V -- Summary and Conclusions .....	31
A. Summary .....	31
B. Conclusions .....	32
C. Recommendations for Further Study .....	32
 Bibliography .....	 45

LIST OF DIAGRAMS

Diagram

1A -- Diagram of Target .....	17
1B -- Diagram of Dimensions of Shooting Test .....	17
2 -- Diagram for Speed Test .....	18
3 -- Diagram for Skating Agility Test .....	19
4 -- Diagram for Stick-Handling Ability Test .....	20

APPENDIX

Individual's Scores, Ratings, and Coaches' Ratings

Team A .....	35
Team B .....	36
Team C .....	37
Team D .....	38
Team E .....	39
Team F .....	40
Team G .....	41
Team H .....	42
Team I .....	43
Team J .....	44

CHAPTER I  
INTRODUCTION

A. PURPOSE OF THE STUDY

The purposes of this study are to develop an instrument which is valid, reliable, and easy for the coach to administer and score. A second purpose is to use the instrument and test local high school ice hockey players through a series of four individual tests and to determine whether this instrument can predict the player's hockey ability. Finally, a third purpose is to formulate T-scores for the instrument using the scores of the aforementioned ice hockey players on the secondary school level.

B. SCOPE OF THE PROBLEM

There has been a substantial increase in the use of skill tests in the field of physical education and athletics. Today more coaches are using such tests as an aid in the selection of players of the various sports involved.

After formulating an instrument consisting of four ice hockey skill tests; namely, shooting for accuracy, agility, stick handling, and speed, the tests were then administered to various local secondary school ice hockey teams. The schools included: Boston College High School, Brockton High School, Cambridge High and Latin School, Charlestown High School, East Boston High School, Medford High School, Rindge Technical High School, Walpole High School, Winchester High School, and Woburn High School.

The tests were given on only one-half of the total ice surface

which permitted use of the other half for the practice session.

As there seems to be no established objective means for the measurement of a player's ice hockey ability, the coaches' subjective judgment at the end of the season was used to determine each player's ability. To prove if there was any measurable validity of the study, the skill test's objective rating and the coaches' subjective rating of each player was then compared.

### C. JUSTIFICATION OF THE PROBLEM

There is a definite trend toward research and the use of skill tests in physical education and athletics. An increasing number of such tests have been devised for baseball, football, field hockey, and basketball, but testing of this nature in ice hockey has been almost negligible.

Ice hockey has increased in popularity to such a degree that it has become an integral part of the athletic program of many secondary schools. Due to the fact that organized hockey has been introduced to some communities which are unfamiliar with the technical aspects of the game, schools occasionally appoint educators from their own system to coach ice hockey although they have only a limited understanding of the sport. This study is directed toward aiding coaches in similar situations to acquire a faster and more accurate understanding of the potential abilities of their team.

Ice hockey is a very expensive sport. A one hour practice session costs the school approximately \$30. In addition to this salient expenditure, there is a serious shortage of suitable ice hockey rinks which are available for practice. These two factors

and the ever-increasing number of ice hockey candidates puts an added burden on the high school coach. Not having the budget or the ice time, the coach is unable to examine each candidate and to give each player an equal opportunity to make the team. Since the coach has no way of judging his prospective players objectively, it is the hope of the authors that this instrument will supply the objective factor which will be of great assistance in preventing a player from being "cut" from the squad without being observed by the coach.

#### D. LIMITATIONS OF THE PROBLEM

Since the instrument consists of a series of skill tests, there is no measurement for such significant characteristics as desire, attitude, cooperation, sportsmanship, physical size, and grade level.

In some instances the entire instrument could not be given in one practice session; therefore, another day was needed for completion.

The skill test included forwards and defensemen, but there were no ways used to measure the ability of a goalie in this test.

In administering the instrument there were no practice tries and each player's score was recorded only once in each of the four events.

The objective test results were correlated with the coaches' subjective judgment at the conclusion of the season.



## CHAPTER II

### REVIEW OF LITERATURE

The popularity of ice hockey as a secondary school sport has been increasing rapidly in the past ten years. This rise in interest in the sport has brought about the construction of more suitable hockey rinks than ever before. Even though there are more facilities available now than in the past, they still do not meet the demands of the participants. Former Princeton hockey coach, Richard Vaughan,<sup>1</sup> reports that these limited facilities tend to make hockey a sport on paper; that is, a squad is written down on paper before the season starts and this procedure fails to give all an equal opportunity to make the team.

It should be pointed out that there is limited material available today pertaining to skill testing in ice hockey. This is surprising when it is compared to the increasing interest in skill testing in other sports such as basketball, baseball, and football. Today's concept is that ice hockey is primarily a sport for men. However, in 1935 Harriet Brown<sup>2</sup> devised an ice hockey skills and knowledge test for women at Skidmore College. The test consisted of dribbling,

---

<sup>1</sup> Vaughan, Richard F., Hockey, McGraw-Hill Company, Inc., New York and London, 1939.

<sup>2</sup> Brown, Harriet M., "The Game of Ice Hockey," Journal of Health and Physical Education, Vol. VI, No. 1, January, 1935, p. 28.

goal shooting, and speed skating. This particular measurement has a maximum score of 25 points. A knowledge test is presented on a maximum score basis of 50 points, and 25 points are allowed on actual game participation. "Reliability and validity evidence and norms are presented. The test, however, will serve the teachers by providing progressive lessons and descriptive skill, knowledge, and game execution tests."<sup>1</sup>

Many coaches in physical education and athletics are realizing the importance of testing in their respective fields. Even professional coaches are using tests to improve their teams. "One of the projects included in the 1949-50 Sports College Hockey Survey was a recording of the speeds traveled by the famed players in the National Hockey League. Another section of the survey was to stage tests in all player age-limit groups in order to find out rates of speed and develop standards against which individual players and coaches could compare personal or team performances."<sup>2</sup> The skill tests involved were free skating with the puck and free skating without the puck.

After the construction and administration of an ice hockey skill test, many factors must be thoroughly analyzed before the test can be of any significant use to the coach. "Tests are not yet of a

---

<sup>1</sup> Larson, Leonard A., and Yocom, Rachael Dunaven, Measurement and Evaluation in Physical, Health, and Recreation Education, C. V. Mosby Company, St. Louis, 1951.

<sup>2</sup> Percival, Lloyd, The Hockey Handbook, The Copp Clark Company Limited, Toronto, 1951.

quality to enable teachers to make strict individual judgments on the basis of scores obtained. Teachers using procedures for evaluating sport skills must use wise judgments in interpreting and using the data. They will also need to show considerable insight into the meaning and function of sport skill tests in order to avoid disillusionment."<sup>1</sup>

"Since the advent of nationwide hockey telecasts, many of our scholastic players are imitating the professionals. Also, at the present time most of the material that is being written is directed to college and professional players. Very little has been written in the problems peculiar to the beginning player. A high school player is indeed a beginning player, and as a coach our job is to teach the skills as executed by the best. However, we must remember that we are dealing with the unskilled and teach accordingly."<sup>2</sup>

College coaches are recognizing more than ever before the need for the stressing of skills in ice hockey. Former Colorado College hockey coach, Thomas Bedecki, reports that "Skating is ice hockey's most important fundamental; with it a player develops all-around balance, agility, and co-ordination, enabling him to react properly to any type of game situation. The hockey player and coach should work continually to improve skating until it is the most polished of all his skills."<sup>3</sup> Adding still more justification to the stressing of

<sup>1</sup> National Research Council of the Research Section, Measurement and Evaluation Materials in Health, Physical Education, and Recreation, 1950.

<sup>2</sup> Brown, Harry J., "Putting the Puck in the Net," Athletic Journal, Vol. XL No. 4, December, 1959, p. 24.

<sup>3</sup> Bedecki, Thomas, "Hockey Fundamentals," Journal of Health, Physical Education, and Recreation, January, 1956, p. 20.

basic skills in ice hockey, Edward Jeremiah, Dartmouth hockey coach feels that there is a better chance of uniformity of thought and common understanding in the high speed game of hockey if the players practice and drill basic plays.<sup>1</sup>

---

<sup>1</sup> Jeremiah, Edward, "Dartmouth's Seven Basic Hockey Plays," Athletic Journal, Vol. XXXVII, No. 4, December, 1956, p. 22.

CHAPTER III  
METHODS AND PROCEDURES

A. ORIGIN OF THE TEST

In order to determine the skills essential to hockey ability, the authors consulted innumerable individuals with various backgrounds in ice hockey and in tests and measurement in physical education. Among those in consultation were: 1) local college and high school hockey coaches, 2) advisor and physical educators in a seminar group, 3) past and present college hockey players, and 4) educators in the field of tests and measurement.

The authors conducted a preliminary study to determine the best methods and procedures to be used in administering the skill test to secondary school ice hockey players. The schools used were Lynn English High School, Somerville High School, and Stoneham High School. A group of skill tests were developed which included tests for shooting for accuracy, speed, skating agility, and stick-handling ability. In the test for shooting for accuracy, three pieces of canvas, 6 inches wide and 4 feet long, were fastened side by side to the top bar of the goal and next to the side post furthest away from the shooter. This target covered an area of 18 inches. This arrangement left an open area in the goal of 54 inches. This largest opening, which was closest to the shooter was given the numerical value of 2 points. The first piece of canvas next to the opening was given the value of 4 points. The second piece of canvas was given the value of 6 points. The third piece of canvas, which was furthest away from the shooter,

was given the value of 8 points. When a player was shooting from the left side of the ice, the target was placed next to the side post on the right side of the goal. The reverse of this technique was true when the player was shooting from the left side of the goal.

To establish the point from which a player must shoot, the authors measured 30 feet straight out from the post of the goal. From this point they then measured 15 feet toward the side of the rink nearest to them and parallel to the goal. At this point a line was marked on the ice extending 5 feet toward the side of the rink. A second line was drawn parallel to this aforementioned line. This second line was 10 feet beyond toward the center of the rink. These two lines were then connected by a line which was marked on the ice on the side nearest the goal. After the target and designated shooting areas were set up, the following directions were given the players: Each player has 5 shots at the target. Five shots are from the left side area and five shots are from the right side area. The player starts from the line parallel to the goal and nearest to the center of the ice. On a command, "Ready. Go," he skates toward a second parallel line which is 10 feet away. He had two seconds in which to shoot the puck at the target before he crossed this second line.

If the player shot the puck into the largest opening in the goal, he received 2 points. If he hit the piece of canvas nearest the open portion of the goal, he received 4 points. If he hit the second piece of canvas, he received 6 points. If he hit the piece of canvas nearest the closed corner of the goal, he received 8 points.

If he did not hit any of the target areas, he received a score of zero. The scores of each shot, 5 from each side of the ice, were totaled and recorded as the player's score for this phase of the test. The best possible score was 80.

The test for speed consisted of a sprint of 80 feet. The distance between the goal line and the nearest blue line being 60 feet, the authors used the goal line as the start and a line drawn on the ice 20 feet beyond the blue line and parallel to the goal line as the finish. The players were given the following directions: The testee starts on the goal line and, on a signal from the coach, skates as fast as possible toward the finish line 80 feet away. The coach, positioned at the finish line, acts as starter and timer. The testee's time, recorded to the nearest tenth of a second, was the player's established score for the event.

The next part of the test was a test for skating agility. The obstacles used for this event were folding chairs, 31 inches high and 14 inches wide. Using the red line as the start and finish, the first obstacle was placed 20 feet from this point. The five remaining obstacles were then placed in sequence, 10 feet apart, so as to constitute a straight line. The testee started from the red line and on the command, "Ready. Go," skated at top speed to the first obstacle 20 feet away, and he began the process of weaving in and out and back through the obstacles in the fastest possible time without hitting the chairs. This event is done without a stick. The time it took each player to successfully complete the event was his recorded time.

In the test for stick-handling ability, the total distance covered was 80 feet. The obstacles used were regular folding chairs, 31 inches high and 14 inches wide. Using the red line as the start and finish, the first obstacle was placed 20 feet from this point. The 4 remaining obstacles were then placed in sequence 5 feet apart, so that they constituted a straight line. On the command, "Ready. Go," the testee skated from the starting point to the first obstacle, 20 feet away, and began the process of weaving in and out and back through the obstacles in the fastest possible time without hitting the chairs. This event was done with the puck and stick. The time it took each participant to successfully complete the entire event was his recorded time.

After the completion of this study, the following changes were made. The original three-piece canvas target was replaced by a one-piece target to facilitate scoring. The scoring was changed from a 2, 4, 6 point score value to a 1, 2, 3 point score value. The majority of the players could not reach the target with a reasonable degree of accuracy from the distance of 30 feet out. Therefore, a shorter distance of 20 feet was tried and found to be satisfactory. The study showed that six shots at the target were a sufficient number to determine the shooting ability of a player. Any further increase in the number of shots would have only lengthened the time of the test which was not advisable. The original tests for speed and agility were found to be satisfactory for use in testing secondary school hockey players. However, in the test for stick-handling ability, it was found that the five feet distance between obstacles



was not of adequate length to enable the majority of players to successfully complete this phase of the test. The distance between the obstacles was then increased from five feet to ten feet, which proved satisfactory. It was also found that a short warm-up period was necessary if the players tested were to be able to give their best performance.

After careful consideration of all the findings of the preliminary study, it was decided that the following skills were the significant factors necessary for the testing of ice hockey ability.

1. Shooting for Accuracy
2. Speed
3. Skating Agility
4. Stick-Handling Ability

Shooting for accuracy -- The goal, which was used as the target, was divided into three parts by fastening a piece of canvas, 16 inches wide and 4 feet long, to the top post of the goal. This canvas was placed 12 inches from the side post furthest away from the shooter. At the base of the canvas was attached a metal weight which held the canvas in a taut position. Therefore, the canvas was secured on the right side of the net, 12 inches from the post furthest away from the shooter, when the player is shooting from the left hand side of the rink. The reverse of this technique follows when the player is shooting from the right side. The largest portion of the net, which is 44 inches wide and 4 feet long, has a point value of 1. The canvas has a point value of 2. The smallest remaining section of the goal, which is 12 inches wide and 4 feet

long, has a point value of 3. For a clearer understanding, consult Diagram 1A on page 17.

To establish the point from which a player must shoot, the coach measures 20 feet straight out from the post of the goal. From this point, he then measures 15 feet toward the side of the rink nearest to him and parallel to the goal. At this point a line (marked "A" on the diagram) is marked on the ice extending 5 feet toward the side of the rink. A second line (marked "B" on the diagram) is drawn parallel to line A ten feet beyond toward the center of the rink. These two lines are connected by a line (marked "C" on the diagram) which is marked on the ice on the side nearest to the goal. For further clarification, see Diagram 1B on page 17.

After setting up the goal and designating shooting areas, the following directions are then given the players: Each participant has six shots at the target. Three shots are from the left side area and three shots are from the right side area. The player starts with the puck from line B. On a command, "Ready. Go," he skates toward a second line (A). He has two seconds in which to shoot the puck at the target before he crosses this second line. At no time is the player allowed to cross line C. (Consult Diagram 1B on page 17.)

If the participant shoots the puck into the largest opening in the goal, he receives a score of 1. If he hits the canvas, he has a recorded score of 2. If he shoots the puck into the smallest portion of the goal, he receives a score of 3. If he does not hit any of the aforementioned areas of the target, he receives a score

of zero. The scores of each shot, three from each side of the ice, were then totaled and recorded as the player's score for this phase of the test. The best possible score is 18 points.

Speed Test -- The test for speed consists of a sprint of 80 feet. The distance from the goal line to the nearest red line has a standard length of 60 feet for all hockey rinks; therefore, the goal line is used as the starting point of the sprint. The finish line is drawn on the ice 20 feet beyond the red line toward the center ice area. It is also drawn parallel to the red line. See Diagram 2 on page 18. After marking off the test area, the players are then given the following directions: The participant starts on the goal line and, on a signal from the coach, skates as fast as possible toward the finish line 80 feet away. The coach, positioned at the finish line, acts as starter and timer. The recorded time to the nearest tenth of a second was the player's established score for the event.

Skating Agility -- The total distance to be covered in this event is 80 feet. The obstacles used are regular folding chairs, 31 inches high and 14 inches wide. The reason for selecting chairs as the obstacles is because they are (1) accessible in most hockey rinks, (2) easy to handle, and (3) are of sufficient height as to prohibit a player from putting his leg over them during the administration of the test. Using the red line as the start and finish, the first obstacle is placed 20 feet from this point. The four remaining obstacles are then placed in sequence, 5 feet apart, so that they constitute a straight line. See Diagram 3 on page 19.

On a command, "Ready. Go," the testee skates from the starting point to the first obstacle, 20 feet away, and begins the process of weaving in and out and back through the obstacles in the fastest possible time without hitting the chairs. This event is done without a stick. The time it takes each participant to successfully complete the entire event is his recorded time.

Stick-Handling Ability -- The total distance to be covered in this event is 100 feet. The obstacles used are regular folding chairs, 31 inches high and 14 inches wide. The reason for selecting chairs as obstacles is because they are (1) accessible in most hockey rinks, (2) easy to handle, and (3) are of sufficient height as to prohibit a player from putting his leg over them during the administration of the test. Using the red line as the start and finish, the first obstacle is placed 20 feet from this point. The three remaining obstacles are then placed in sequence, 10 feet apart, so that they constitute a straight line. See Diagram 4 on page 20. On the command, "Ready. Go," the testee skates from the starting point to the first obstacle, 20 feet away, and begins the process of weaving in and out and back through the obstacles in the fastest possible time without hitting the chairs. This event is done with the puck and stick. The time it takes each participant to successfully complete the entire event is his recorded time.

A "successful trial" may be defined as one in which the player has not lost possession of the puck or has not been stopped from completion of the trial although hitting or moving an obstacle. If either puck is lost or obstacle is moved so that the person

cannot continue the trial, a new trial is given. If a chair is moved as it is being passed and it does not interfere with the completion of the trial, the test is not rerun.

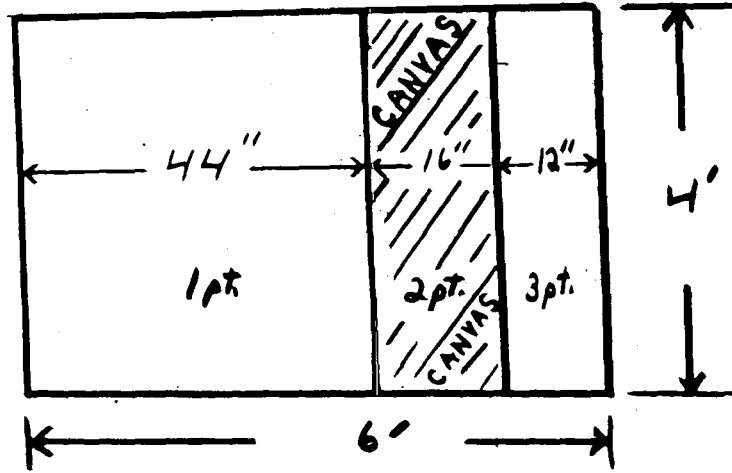


DIAGRAM 1A

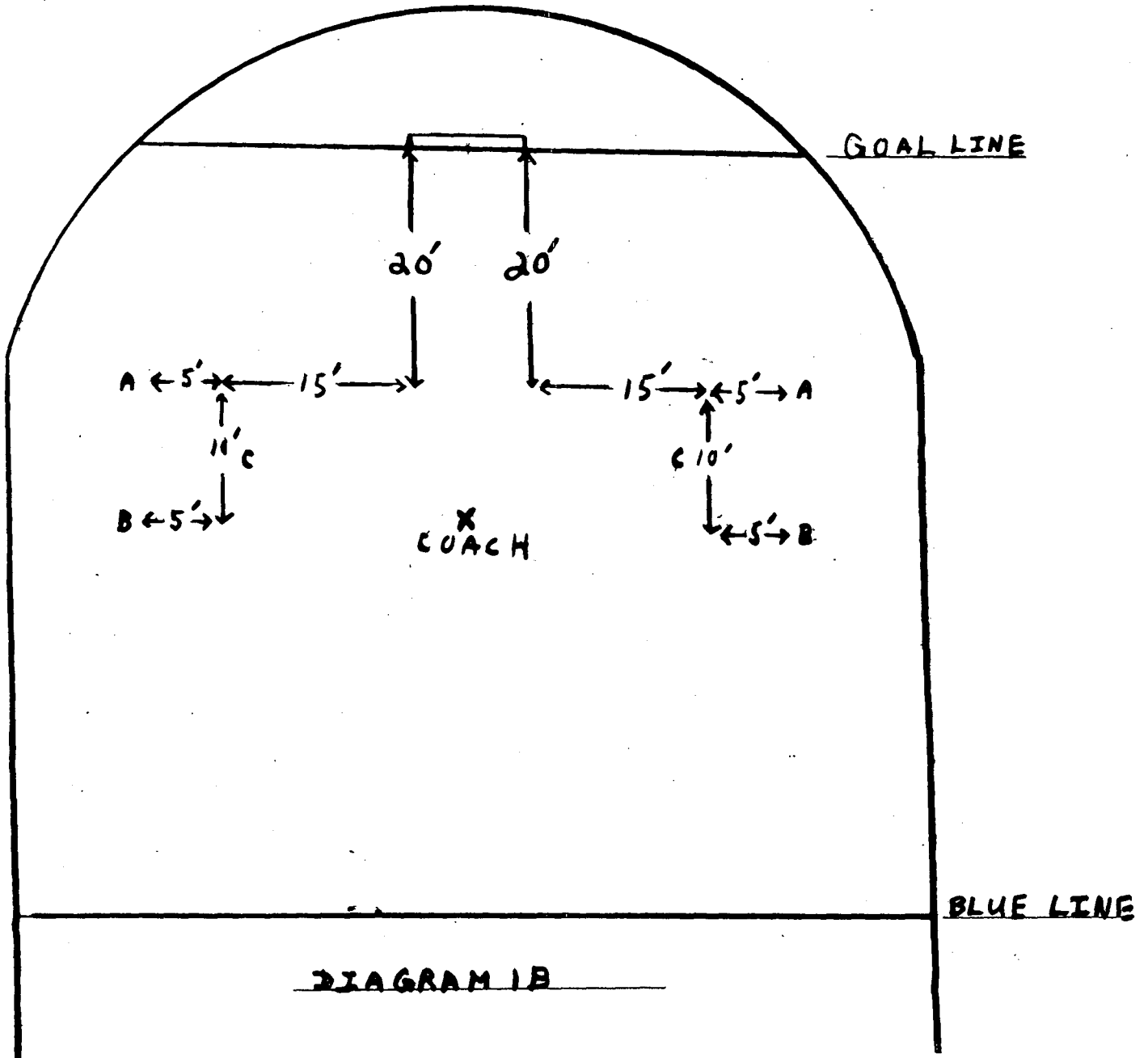


DIAGRAM 1B

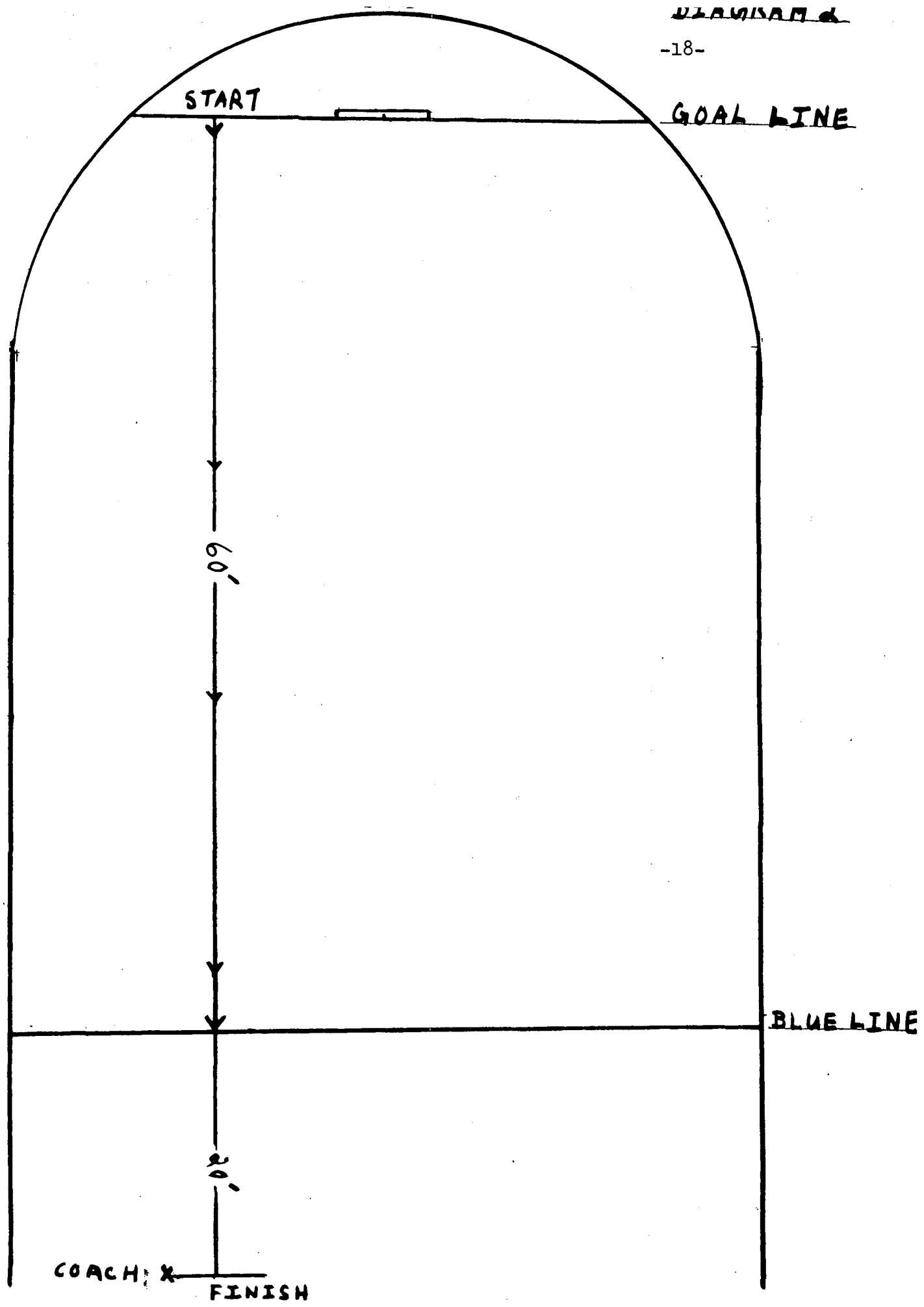
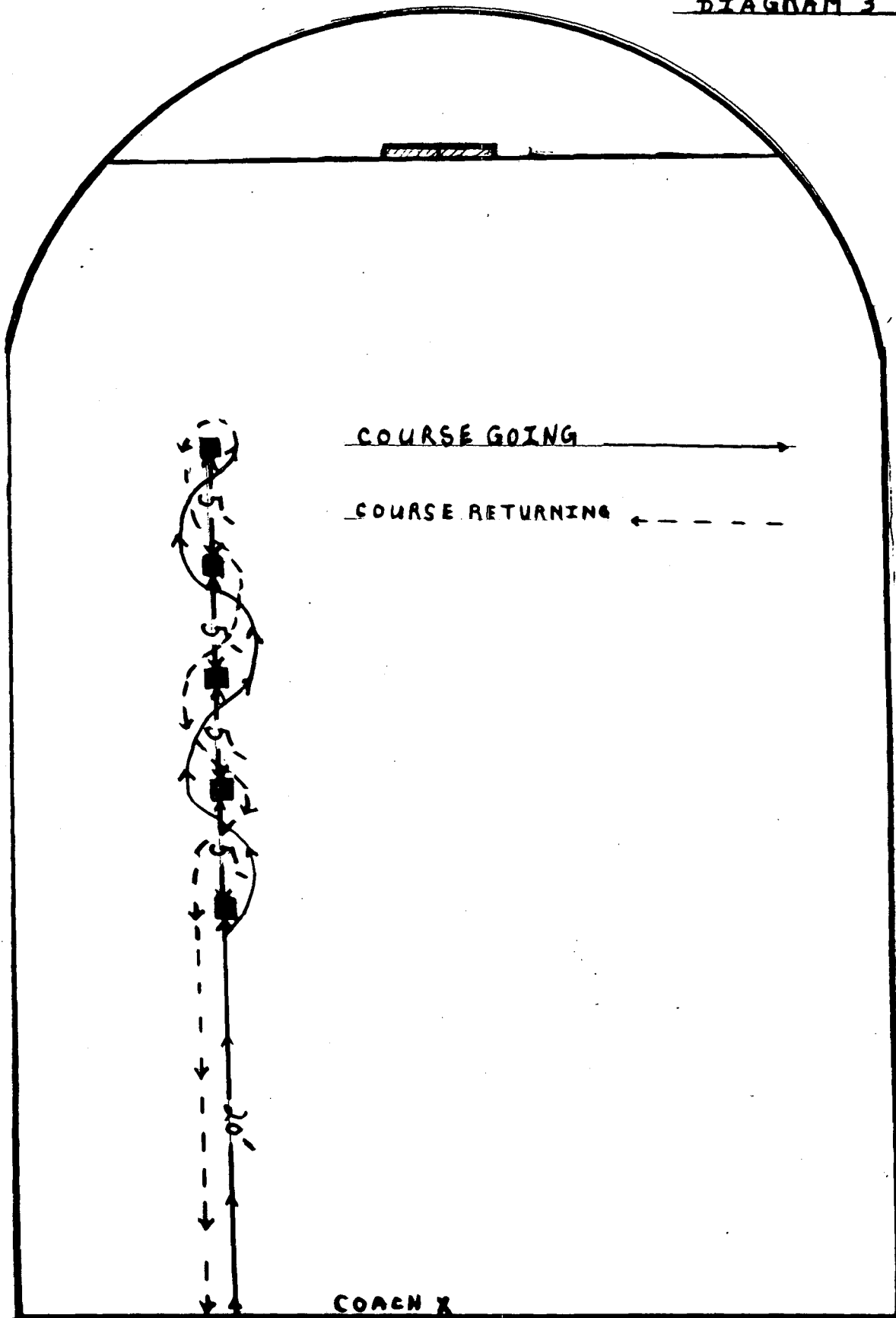


DIAGRAM 3



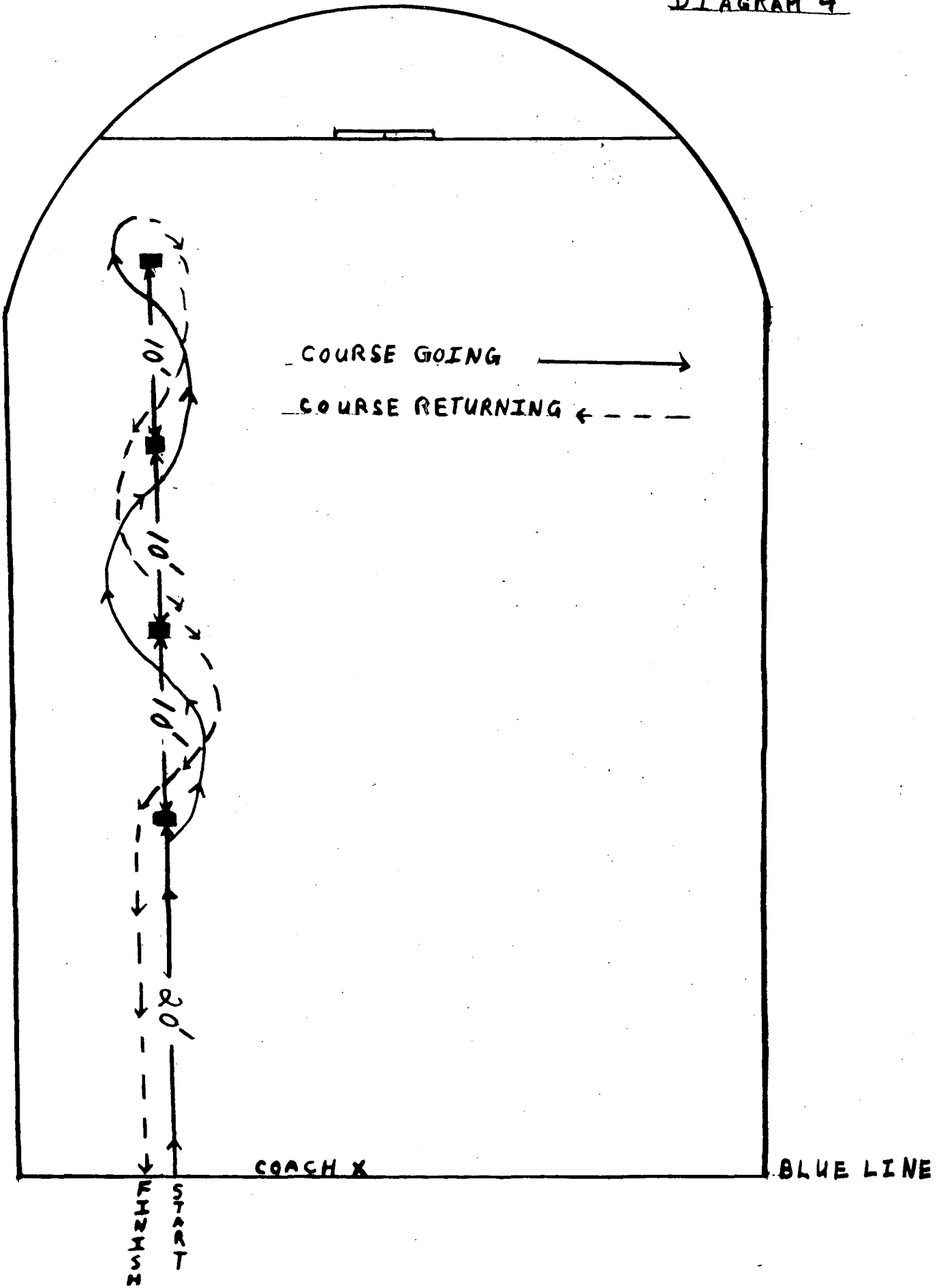
COACH X

BLUE LINE

START  
FINISH  
NUMBER 1



DIAGRAM 4



CHAPTER IV

TREATMENT OF THE DATA

The first objective in the handling of the statistics was to convert the raw data into useable tables of "T" scores. These tables, which would give the authors a method of equating each of the four events, were compiled by the use of McCloy's<sup>1</sup> work. This procedure<sup>2</sup>, which allows for the compiling of comparable scores for tests giving different types of raw scores, was selected on the advice of educational measurement advisors.

<sup>1</sup> C. H. McCloy, Tests and Measurements in Health and Physical Education, Appleton-Century-Crofts, Incorporated, New York, 1942, pp. 98-100.

<sup>2</sup> Explanation of McCloy's Method of compiling "T" scores, as used in this study, found on page 98 Ibid.

Column I --- List of intervals into which raw scores are to be divided, placing the best one at the top and the poorest at the bottom.

Column II -- Contains the frequencies of the raw scores.

Column III - Contains the number of subjects who exceed the score represented by that particular interval.

Column IV -- In this column are listed half of those falling within each interval.

Column V --- This column is the sum of Columns III and IV.

Column VI -- In this column the numbers in Column V are multiplied by 100 and divided by the total number of cases.

Column VII - This column is for the "T" scores and they are obtained by comparing the percentage figure of Column VI with Table VIII found on Page 100 Ibid.

Shooting for Accuracy -- In this section of the test there were 129 boys tested. The maximum score that could be attained was 18 points. The scores ranged from a high of 13 to a low of 1. The mean score for this event was computed at 6.1 and the standard deviation at 2.6. The mode was found at 6.5. The table for converting raw data into "T" scores may be found on page 23.

80 Yard Sprint -- In this section there were 148 boys tested. The scores ranged from the fastest of 3.8 seconds to the slowest of 5.2 seconds. The mean was computed to be 4.5 seconds and the standard deviation was .3 seconds. The mode was found at 4.3 seconds. The table for converting raw data into "T" scores may be found on page 24.

80 Yard Obstacle Sprint -- Here there were 147 boys tested. The scores for the event ranged from the fastest of 9.5 seconds to the slowest of 15.1 seconds. The mean score was computed to be 10.99 seconds and the standard deviation to be .9 seconds. The mode was found to be 11 seconds. The table for converting raw data into "T" scores may be found on page 25.

100 Yard Obstacle Sprint with Puck -- Here 135 boys were tested. The scores ranged from the fastest of 8.9 seconds to the slowest of 15 seconds. The mean score was computed to be 10.9 seconds and the standard deviation was 1.2 seconds. The mode was found at 11 seconds. The tables for converting the raw data into "T" scores may be found on page 26.

After completion of the tables, the individual's raw score for each of the four events was changed into a "T" score; and these were totaled to give a numerical value on which the testee was rated with

CHART NO. 1

RAW SCORES CONVERTED INTO "T" SCORES

Shooting For Accuracy\*

---

<u>Raw Score</u>	<u>"T" Score</u>
18	100
17	96
16	91
15	86
14	81
13	76
12	71
11	68
10	65
9	60
8	56
7	53
6	49
5	46
4	43
3	39
2	34
1	28

Mean = 6.1

Standard Deviation = 2.6

\*Scored in points

Scores above 13 and 76 respectively are extrapolated

CHART NO. 2

RAW SCORES CONVERTED INTO "T" SCORES

80 Yard Sprint\*

---

<u>Raw Score</u>	<u>"T" score</u>
3.3	100
3.4	95
3.5	91
3.6	87
3.7	82
3.8	77
3.9	73
4.0	66
4.1	61
4.2	58
4.3	54
4.4	51
4.5	48
4.6	45
4.7	43
4.8	40
4.9	37
5.0	33
5.1	28
5.2	25

Mean = 4.5

Standard Deviation = .3

\*Measured in Tenths of Seconds  
Scores above 3.8 and 77 respectively are extrapolated

CHART NO. 3

RAW SCORES CONVERTED INTO "T" SCORES

80 Yard Obstacle Sprint (Agility)\*

Raw Score	"T" Score	Raw Score	"T" Score	Raw Score	"T" Score
8.2	100	10.0	67	11.7	44
8.3	98	10.1	64	11.8	44
8.4	96	10.2	62	11.9	43
8.5	94	10.3	61	12.0	41
8.6	92	10.4	59	12.1	39
8.7	90	10.5	58	12.2	38
8.8	88	10.6	56	12.3	37
8.9	86	10.7	54	12.4	36
9.0	84	10.8	53	12.5	35
9.1	82	10.9	53	12.6	34
9.2	80	11.0	51	12.7	34
9.3	78	11.1	49	12.9	33
9.4	76	11.2	48	13.0	30
9.5	74	11.3	47	13.1	28
9.6	72	11.4	46	14.1	27
9.8	70	11.5	45	14.2	25
9.9	68	11.6	45	15.1	23

Mean - 11.0

Standard Deviation - .9

\*Measured in Tenth of Seconds

Scores above 9.5 and 74 respectively are extrapolated

CHART NO. 4

RAW SCORES CONVERTED INTO "T" SCORES

100 Yard Obstacle Sprint with Fucks\*  
(Stick Handling)

Raw Score	"T" Score	Raw Score	"T" Score	Raw Score	"T" Score
8.4	100	10.4	53	12.4	38
8.5	95	10.5	52	12.5	37
8.6	90	10.6	52	12.6	37
8.7	86	10.7	51	12.7	36
8.8	82	10.8	51	12.9	36
8.9	77	10.9	50	13.0	35
9.0	71	11.0	49	13.1	35
9.1	70	11.1	47	13.2	34
9.2	69	11.2	46	13.3	33
9.3	68	11.3	46	13.4	33
9.4	67	11.4	45	13.5	32
9.5	65	11.5	44	13.6	31
9.6	62	11.6	44	13.7	31
9.7	61	11.7	43	13.8	30
9.8	61	11.8	42	13.9	30
9.9	59	11.9	41	14.3	29
10.0	58	12.0	40	14.4	28
10.1	56	12.1	39	14.5	27
10.2	55	12.2	38	14.6	26
10.3	54	12.3	38	15.0	23

Mean = 10.9

Standard Deviation = 1.2

\*Measured in Tenths of Seconds

Scores above 8.9 and 77 respectively are extrapolated

with his teammates. The numerical value was achieved by giving the testee with the highest total a "1", the next highest a "2", and on down with the poorest receiving the largest numerical rating within the group. Having rated each member of the team as a result of this system, the authors then computed the coefficient of correlation with the coaches' subjective ability rating, also highest ("1") to the lowest (largest numerical rating), made at the end of the season.

This was done by use of the formula  $r = \frac{\sum XY}{\sqrt{\sum X^2 \cdot \sum Y^2}}$  taken from Garrett's Calculation of "r" directly from paired scores.<sup>1</sup>

The following chart denotes the teams and the correlations obtained in this study.

Team A -- Correlation .74	Team F -- Correlation .58
Team B -- Correlation .66	Team G -- Correlation .45
Team C -- Correlation .14	Team H -- Correlation .54
Team D -- Correlation .55	Team I -- Correlation .11
Team E -- Correlation .67	Team J -- Correlation .61

The raw data, the coaches' ratings, the instrument's ratings, and the total "T" scores, which resulted in the following information, may be found in the Appendix.

#### TEAM A

19 players were tested. The total "T" scores for the team ranged from a high of 255.5 to a low of 180.5. The mean was 201.8 while the mean score for the entire study was 201. The computed correlation with the coach's ability rating was .74.

<sup>1</sup> Garrett, Henry E., Elementary Statistics, Longmans, Green, and Company, New York, London, Toronto, 1956, p. 110.



TEAM B

16 players were tested. The total "T" scores for the team ranged from a high of 213 to a low of 151.5. The mean score was 181.4 while the mean for the entire study was 201. The computed correlation with the coach's ability rating was .66.

TEAM C

11 players were tested. The total "T" scores for the team ranged from a high of 250 to a low of 188.5. The mean score was 211.8 while the mean for the entire study was 201. The computed correlation with the coach's ability rating was .14.

TEAM D

12 players were tested. The total "T" scores for the team ranged from a high of 229.5 to a low of 145.5. The mean score was 200.5 while the mean for the entire study was 201. The computed correlation with the coach's ability rating was .55.

TEAM E

10 players were tested. The total "T" scores for the team ranged from a high of 202 to a low of 127.5. The mean score was 169.4 while the mean for the entire study was 201. The computed correlation with the coach's ability rating was .67.

TEAM F

14 players were tested. The total "T" scores for the team ranged from a high of 222.5 to a low of 133.5. The mean score was 185.7 while the mean for the entire study was 201. The computed correlation with the coach's ability rating was .58.

TEAM G

11 players were tested. The total "T" scores for the team ranged from a high of 256.5 to a low of 156.5. The mean score was 196.9 while the mean for the entire study was 201. The computed correlation with the coach's ability rating was .45.

TEAM H

13 players were tested. The total "T" scores for the team ranged from a high of 253 to a low of 193. The mean score was 227.7 while the mean for the entire study was 201. The computed correlation with the coach's ability rating was .54.

TEAM I

10 players were tested. The total "T" scores for the team ranged from a high of 257.5 to a low of 177.5. The mean score was 220.8 while the mean for the entire study was 201. The computed correlation with the coach's ability rating was .11.

TEAM J

13 players were tested. The total "T" scores for the team ranged from a high of 258 to a low of 191. The mean score was 213.2 while the mean for the entire study was 201. The computed correlation with the coach's ability rating was .61.

The final step in the handling of the data was to place the total "T" scores for the entire test on a frequency distribution. The total scores ranged from a high of 258 points to a low of 127.5 points. The mean score was computed at 201 and the standard deviation at 26.7 points. Approximately 64 boys scored above the mean while the remainder scored on or below it. The frequency distribution may be found on page 30.

To facilitate the classification of a player's ability by the coaches, an explanatory chart was developed from Chart V on page 30. This new chart divides Chart V into 4 sections and classifies each according to the ice hockey ability of the players found in it. This provides the coach with a quick means to realize the boys' potential from the scores obtained on this instrument.

- 251 and above -- an excellent prospect
- 201 to 250 ----- a good prospect
- 151 to 200 ----- a fair prospect
- 150 and below -- a poor prospect

CHART NO. 5

FREQUENCY DISTRIBUTION FOR TOTAL "T" SCORES

---

250 - 259	### //	7
240 - 249	//	2
230 - 239	### //	7
220 - 229	### ### ////	14
210 - 219	### ### ### ////	19
200 - 209	### ### ### ///	18
190 - 199	### ### ### ### /	21
180 - 189	### ### ### /	16
170 - 179	### ///	8
160 - 169	### //	7
150 - 159	### //	7
140 - 149	/	1
130 - 139	/	1
120 - 129	/	1

N equals 129

Mean = 201

Standard Deviation = 27

CHAPTER V

SUMMARY AND CONCLUSIONS

A. SUMMARY

The purpose of this study was to develop an instrument that would predict the potential ice hockey ability of secondary school boys. The instrument, which consisted of four tests (shooting for accuracy, speed, skating agility, and stick handling), was administered to 148 secondary school ice hockey players. These players represented ten different high schools from various leagues. The schools cooperating in this study were: Boston College High School, Brockton High School, Cambridge High and Latin School, Charlestown High School, East Boston High School, Medford High School, Rindge Technical High School, Walpole High School, Winchester High School, and Woburn High School. After completion of the skill tests by all participants, tables of "T" scores were developed for each event. By use of these tables, the raw data of each player for the four events was then converted into "T" scores which were totaled to give the testee a single score. The testee was then ranked with his teammates with the highest total receiving a rating of "1", the next highest a rating of "2", and the remainder following in numerical sequence until the lowest score was reached. Since there was no established objective means for the measurement of a player's ice hockey ability, the coaches' subjective judgment of each player at the conclusion of the season was used to determine the player's ability. The skill test rating was then compared with the coaches'

subjective rating of each player to find the coefficient of correlation. The total "T" scores were then placed on a frequency distribution from which a chart was developed to facilitate the classification by the coaches of a player's potential ice hockey ability.

#### B. CONCLUSIONS

1. An instrument to predict the potential ice hockey ability of secondary school boys has been developed. However, it is in need of validation.
2. Workable tables of "T" scores have been set up to equate each of the four events of the instrument.
3. An explanatory chart has been developed to provide the coaches with a quick method of realizing the player's potential from scores obtained in this instrument.
4. An analysis of the data shows that the correlation between the instrument's ratings and the coaches' ratings were low and inconclusive. This was believed to be due to the attempt to correlate an objective rating with a subjective rating.

#### C. RECOMMENDATIONS FOR FURTHER STUDY

1. The coaches' subjective skill rating did not prove successful in this study; therefore, another method of subjectively rating the players' ability could be used.
2. A test-retest of the instrument should be conducted to indicate the reliability of the series of tests.
3. A test for measuring the potential ability of a goalie should be developed.

4. This instrument could be administered to all the teams of the same league, and the results of their standing in league competition compared with the final analysis of data obtained.

APPENDIX

35  
HOCKEY SKILL TEST

RATING FORM

SCHOOL \_\_\_\_\_

A

COACH \_\_\_\_\_

A

NAME	TEST 1 T-SCORE	TEST 2 T-SCORE	TEST 3 T-SCORE	TEST 4 T-SCORE	TOTAL T-SCORES	AUTHOR'S RATING	COACH'S RATING
1	49.5	61.5	56	43	210	7	11
2	65	66.5	54.5	46	231	2	7
3	49.5	54.5	59.5	54.5	218	5	3
4	53.5	43	51	41.5	189	15	13
5	49.5	61.5	49	44.5	204.5	8.5	4
6	34.5	48.5	53	44.5	180.5	18	12
7	60.5	51.5	35.5	45.5	193	12	14
8	60.5	45.5	36.5	47.5	190	14	8
9	76.5	58	56	65	255.5	1	1
10	53.5	54.5	59.5	61	228.5	3	2
11	65	45.5	46.5	47.5	204.5	8.5	15
12	68.5	45.5	58	49	221	4	6
13	49.5	48.5	56	49	203	10	16
14	34.5	48.5	51	53.5	187.5	17	17
15	60.5	48.5	56	52.5	217.5	6	9
16	53.5	40.5	46.5	47.5	188	16	18
17	46	40.5	41	50.5	178	19	19
18	56.5	51.5	48	52	199.5	11	5
19	46	45.5	39.5	52.5	190.5	13	10

TEST 1 - SHOOTING FOR ACCURACY

TEST 2 - SPEED TEST

TEST 3 - SKATING AGILITY

TEST 4 - STICK HANDLING ABILITY



HOCKEY SKILL TEST

RATING FORM

SCHOOL

B

COACH

B

NAME	TEST 1 T-SCORE	TEST 2 T-SCORE	TEST 3 T-SCORE	TEST 4 T-SCORE	TOTAL T-SCORES	AUTHORS' RATING	COACH'S RATING
1	43	48.5	43	47.5	182	8	4
2	65	33.5	58	56.5	213	1	1
3	46	48.5	45	44	183	7	6
4	49.5	58	43	58	208.5	3	2
5	34.5	51.5	61	40.5	187.5	5	7
6	53.5	37	43	34	167.5	14	11
7	34.5	33.5	46.5	37	151.5	16	13
8	39	45.5	37.5	52	174	10	15
9	46	54.5	43	41.5	185	6	10
10	46	45.5	38	41.5	171	12	3
11	39	48.5	45.5	36.5	169.5	13	14
12	56.5	45.5	41	30.5	173.5	11	16
13	60.5	54.5	45.5	50.5	211	2	5
14	53.5	45.5	43	49	191	4	9
15	49.5	37	34.5	31.5	152.5	15	12
16	46	37	47.5	49	179.5	9	8

TEST 1 - SHOOTING FOR ACCURACY

TEST 2 - SPEED TEST

TEST 3 - SKATING AGILITY

TEST 4 - STICK HANDLING ABILITY

HOCKEY SKATING TEST

RATING FORM

SCHOOL

C

COACH

C

NAME	TEST 1 T-SCORE	TEST 2 T-SCORE	TEST 3 T-SCORE	TEST 4 T-SCORE	TOTAL T-SCORES	AUTHORS' RATING	COACH'S RATING
1	39	66.5	53	50.5	209	5	9
2	53.5	48.5	48	42.5	192.5	10	4
3	49.5	58	51	44	202.5	8	5
4	46	61.5	45.5	52.5	205.5	6	8
5	49.5	66.5	33	49	198	9	10
6	56.5	58	43	47.5	205	7	11
7	60.5	66.5	61	59.5	247.5	2	7
8	39	54.5	51	44	188.5	11	3
9	53.5	61.5	30	67	212	4	1
10	49.5	77	67	56.5	250	1	2
11	56.5	58	51	54.5	220	3	6

TEST 1 - SHOOTING FOR ACCURACY

TEST 2 - SPIED TEST

TEST 3 - SKATING AGILITY

TEST 4 - STICK HANDLING ABILITY

HOCKEY SKILL TEST

RATING FORM

SCHOOL

D

COACH

D

NAME	TEST 1 T-SCORE	TEST 2 T-SCORE	TEST 3 T-SCORE	TEST 4 T-SCORE	TOTAL T-SCORES	AUTHORS' RATING	COACH'S RATING
1	46	66.5	51	65	228.5	2	1
2	71.5	51.5	43	46	212.0	4	8
3	49.5	58	67	55	229.5	1	6
4	39	25.5	39.5	41.5	145.5	12	12
5	34.5	61.5	51	49	196.0	8	2
6	65	54.5	41	49	209.5	6	10
7	28.5	58	30	52.5	169.0	11	7
8	56.5	37	45.5	44	183.0	10	11
9	43	51.5	62.5	51.5	208.5	7	4
10	49.5	61.5	41	38	190.0	9	9
11	60.5	58	56	51	225.5	3	5
12	43	54.5	54.5	58	210.0	5	3

TEST 1 - SHOOTING FOR ACCURACY  
 TEST 3 - SKATING AGILITY

TEST 2 - SPI ED TEST  
 TEST 4 - STICK HANDLING ABILITY

HOCKEY SKILL TEST

RATING FORM

SCHOOL \_\_\_\_\_

E \_\_\_\_\_

COACH \_\_\_\_\_

E \_\_\_\_\_

NAME	TEST 1 T-SCORE	TEST 2 T-SCORE	TEST 3 T-SCORE	TEST 4 T-SCORE	TOTAL T-SCORES	AUTHORS' RATING	COACH'S RATING
1	43	48.5	47.5	52	191	2	2
2	34.5	37	39.5	47.5	158.5	8	3
3	65	40.5	36.5	41.5	183.5	4	7
4	34.5	43	23	27	127.5	10	10
5	49.5	48.5	37.5	37	172.5	5	5
6	53.5	33.5	38	37.5	162.5	6	9
7	49.5	25.5	39.5	44.5	159	7	8
8	43	51.5	51	39.5	185	3	4
9	39	40.5	41	32.5	153	9	6
10	53.5	48.5	49	51	202	1	1

TEST 1 - SHOOTING FOR ACCURACY

TEST 2 - SPEED TEST

TEST 3 - SKATING AGILITY

TEST 4 - STICK HANDLING ABILITY

HOCKEY SKILL TEST

RATING FORM

SCHOOL

F

COACH

F

NAME	TEST 1 T-SCORE	TEST 2 T-SCORE	TEST 3 T-SCORE	TEST 4 T-SCORE	TOTAL T-SCORES	AUTHORS' RATING	COACH'S RATING
1	43	66.5	46.5	54.5	210.5	2	2.5
2	46	33.5	45	49	173.5	10	14
3	65	33.5	38	58	194.5	5	12
4	34.5	40.5	35.5	23	133.5	14	13
5	46	33.5	48	56.5	184	9	6.5
6	46	40.5	30	43	159.5	12	11
7	39	40.5	49	35.5	164	11	5
8	60.5	40.5	53.5	38.5	193	7	10
9	53.5	40.5	45.5	54.5	194	6	2.5
10	46	45.5	53.5	61.5	206.5	4	1
11	60.5	40.5	62.5	46.5	210	3	8
12	56.5	40.5	56	69.5	222.5	1	4
13	39	33.5	44.5	38	157	13	9
14	60.5	40.5	51	35.5	187.5	8	6.5

TEST 1 - SHOOTING FOR ACCURACY

TEST 2 - SPIED TEST

TEST 3 - SKATING AGILITY

TEST 4 - STICK HANDLING ABILITY

HOCKEY SKILL TEST

RATING FORM

SCHOOL G

COACH G

NAME	TEST 1 T-SCORE	TEST 2 T-SCORE	TEST 3 T-SCORE	TEST 4 T-SCORE	TOTAL T-SCORES	AUTHORS' RATING	COACH'S RATING
1	68.5	58	44.5	33.5	204.5	4	2
2	43	48.5	51	44.5	187	8	7
3	56.5	73	64.5	62.5	256.5	1	4
4	49.5	66.5	67	55	238	2	3
5	28.5	45.5	46.5	46	166.5	9	5
6	46	33	34.5	45.5	159.5	10	6
7	53.5	51.5	43	52.5	200.5	5	1
8	60.5	54.5	51	39.5	205.5	3	10
9	49.5	54.5	44.5	47.5	196	6	9
10	60.5	51.5	41	42.5	195.5	7	8
11	39	61.5	27	29	156.5	11	11

TEST 1 - SHOOTING FOR ACCURACY  
TEST 3 - SKATING AGILITY

TEST 2 - SPI ED TEST  
TEST 4 - STICK HANDLING ABILITY

HOCKEY SKILL TEST

RATING FORM

SCHOOL

H

COACH

H

NAME	TEST 1 T-SCORE	TEST 2 T-SCORE	TEST 3 T-SCORE	TEST 4 T-SCORE	TOTAL T-SCORES	AUTHORS' RATING	COACH'S RATING
1	43	45.5	48	56.5	193	13	12
2	53.5	45.5	56	62.5	217.5	9	3
3	56.5	54.5	53	62.5	226.5	6.5	6
4	43.5	66.5	70.5	56.5	236.5	3	10
5	60.5	54.5	56	58	229	4	4
6	28.5	48.5	56	62.5	195.5	12	11
7	60.5	61.5	74.5	56.5	253	1	1
8	71.5	54.5	58	67	251	2	2
9	43	54.5	51	59.5	208	11	8
10	65	54.5	53.5	50.5	223.5	8	9
11	53.5	54.5	58	62.5	228.5	5	7
12	43	51.5	59.5	59.5	213.5	10	5
13	60.5	45.5	61	59.5	226.5	6.5	13

TEST 1 - SHOOTING FOR ACCURACY

TEST 2 - SPEED TEST

TEST 3 - SKATING AGILITY

TEST 4 - STICK HANDLING ABILITY

HOCKEY SKILL TEST

RATING FORM

SCHOOL \_\_\_\_\_

I

COACH \_\_\_\_\_

I

NAME	TEST 1 T-SCORE	TEST 2 T-SCORE	TEST 3 T-SCORE	TEST 4 T-SCORE	TOTAL T-SCORES	AUTHORS' RATING	COACH'S RATING
1	60.5	51.5	58	65	235	3	2
2	49.5	54.5	64.5	77	245.5	2	1
3	53.5	45.5	45	59.5	203.5	8	8
4	49.5	58	61	59.5	228	5	5
5	43	51.5	49	55	198.5	9	3
6	39	61.5	59.5	58	218	6	6
7	53.5	58	74.5	71.5	257.5	1	7
8	28.5	45.5	53	50.5	177.5	10	4
9	56.5	51.5	62.5	58	228.5	4	10
10	53.5	51.5	54.5	54.5	214	7	9

TEST 1 - SHOOTING FOR ACCURACY

TEST 2 - SPEED TEST

TEST 3 - SKATING AGILITY

TEST 4 - STICK HANDLING ABILITY



HOCKEY SKILL TEST

RATING FORM

SCHOOL J

COACH J

NAME	TEST 1 T-SCORE	TEST 2 T-SCORE	TEST 3 T-SCORE	TEST 4 T-SCORE	TOTAL T-SCORES	AUTHORS' RATING	COACH'S RATING
1	39	61.5	68.5	62.5	231.5	2	3
2	43	54.5	49	49	195.5	11	9
3	43	54.5	64.5	59.5	221.5	4	1
4	49.5	66.5	70.5	71.5	258	1	2
5	46	54.5	59.5	52	212	7	4
6	49.5	61.5	53.5	58	212.5	6	5
7	53.5	51.5	43	54.5	202.5	9	10
8	56.5	58	51	65	230.5	3	11
9	53.5	48.5	61	53.5	216.5	5	8
10	53.5	48.5	54.5	53.5	210	8	9
11	65	43	44.5	40.5	193	12	6
12	46	48.5	54.5	47.5	196.5	10	13
13	43	48.5	53	46.5	191	13	12

TEST 1 - SHOOTING FOR ACCURACY

TEST 2 - SPEED TEST

TEST 3 - SKATING AGILITY

TEST 4 - STICK HANDLING ABILITY

BIBLIOGRAPHY

1. Bedecki, Thomas, "Hockey Fundamentals," Journal of Health, Physical Education, and Recreation, Vol. 27, No. 1, January, 1956.
2. Bovard, John F., Cozens, Frederick W., and Hagman E. Patricia, Tests and Measurement in Physical Education, Third Edition, W. B. Saunders Company, Philadelphia, London, 1949.
3. Brown, Harriet M., "The Game of Ice Hockey," Journal of Health Physical Education, Vol. VI, No. 1, January, 1935.
4. Brown, Harry J., "Putting the Puck in the Net," Athletic Journal, Vol. XL, No. 4, December, 1959.
5. Coswell, D. B., "Ice Hockey Fundamentals," Athletic Journal, Vol. XXX, No. 5, January, 1950.
6. Creiger, John Thomas, "A Possible Battery of Tests to Predict Potential Ability in Baseball in Secondary Schools," Unpublished Master's Thesis, Boston University, 1951.
7. Garrett, Henry E., Elementary Statistics, Longmans, Green and Company, New York, London, Toronto, 1956.
8. Jeremiah, Edward, "Dartmouth's Seven Basic Hockey Plays," Athletic Journal, Vol XXXVII, No. 4, December, 1956.
9. Larson, Leonard A., and Yocom, Rachael Dunaven, Measurement and Evaluation in Physical, Health, and Recreation Education, C. V. Mosby Company, St. Louis,
10. McCloy, Charles Harold, and Young, Norma Dorothy, Tests and Measurement in Health and Physical Education, Appleton-Century-Crofts, Inc., New York, 1942.
11. National Research Council of the Research Section, Measurement and Evaluation Materials in Health, Physical Education, and Recreation, 1950.
12. Peatman, John Gray, Descriptive and Sampling Statistics, Harper and Brothers Company, New York and London, 1947.
13. Percival, Lloyd, The Hockey Handbook, The Copp Clark Company Limited, Toronto, 1951.

14. Preston, Richard Woodhull, "The Development of Tentative Norms for Soccer Skill Tests on the College Level," Unpublished Master's Thesis, Boston University, 1952.
15. Scott, M. Gladys, Research Methods in Health, Physical Education, Recreation, Second Edition, American Association for Health, Physical Education, and Recreation, Washington, D. C., 1959.
16. Vaughan, Richard F., Hockey, McGraw-Hill Company, Inc., New York and London, 1939.