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ABSTRACT

The National Association for Girls and Women in Sport (NAGWS) publishes ten biennial and two annual guides for 22 sports. Guides contain information on NAGWS or NAGWS-approved playing rules; officials' ratings in most sports; articles on coaching techniques and organization; regulations governing AIAW national championships in applicable sports; bibliographies; and special features related to specific sports. A section of each guide presents information about NAGWS and the services it offers teachers, coaches, administrators, and players. This NAGWS guide for archery and golf is one of the biennial publications and follows the standard organization described above. It contains 15 articles on aspects of archery from analysis to teaching. The portion addressed to golfing contains nine articles addressing a range of aspects including weight training for golfers in and out of season. Special features in the archery section are: (1) an archery spelling race and (2) a crossword puzzle. (DMT)

NAGWS guide

National Association for Girls & Women in Sport

GWS

Archery — Golf

JUNE 1976 — JUNE 1978

Sports Library for Girls and Women

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NAGWS Guides are available for 22 sports. *Guides* contain information on

- NAGWS or NAGWS-approved playing rules
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- Regulations governing AIAW national championships in applicable sports
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- Special features related to specific sports

A section in each *Guide* presents information about NAGWS and the services it offers to teachers, coaches, administrators and players.

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See inside back cover for a listing of additional NAGWS/AAHPER publications.

NAGWS guide

Archery — Golf

JUNE 1976 – JUNE 1978

Guide Coordinator, HELEN KNIERIM
Slippery Rock State College

Editors
JUDITH A. JENKINS, Archery
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NATIONAL ASSOCIATION FOR GIRLS & WOMEN IN SPORT
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CONTENTS

GOLF

NATIONAL ASSOCIATION FOR GIRLS AND WOMEN IN SPORT

The National Association for Girls and Women in Sport is a non-profit, educational organization designed to serve the needs of participants, teachers, coaches, leaders and administrators in sports programs for girls and women. It is one of seven associations of the American Alliance for Health, Physical Education, and Recreation.

PURPOSE

The purpose of the National Association for Girls and Women in Sport is to foster the development of sports programs for the enrichment of the life of the participant.

BELIEFS

The National Association for Girls and Women in Sport believes that:

Sports are an integral part of the culture in which we live.

Sports programs are a part of the total educational experience of the participant when conducted in educational institutions.

Opportunities for instruction and participation in sports appropriate to her skill level should be included in the experience of every girl.

Sports skills and sports participation are valuable social and recreational tools which may be used to enrich the lives of women in our society.

Competition and cooperation may be demonstrated in all sports programs although the type and intensity of the competition and cooperation will vary with the degree or level of skill of the participants.

An understanding of the relationship between competition and cooperation and the utilization of both within the accepted framework of our society is one of the desirable outcomes of sports participation.

Physical activity is important in the maintenance of the general health of the participant.

Participation in sports contributes to the development of self-confidence and to the establishment of desirable interpersonal relationships.

FUNCTIONS

The National Association for Girls and Women in Sport promotes desirable sports programs through:

1. Formulating and publicizing guiding principles and standards for the administrator, leader, official, and player.
2. Publishing and interpreting rules governing sports for girls and women.
3. Providing the means for training, evaluating, and rating officials.
4. Disseminating information on the conduct of girls and women's sports.
5. Stimulating, evaluating, and disseminating research in the field of girls and women's sports.
6. Cooperating with allied groups interested in girls and women's sports in order to formulate policies and rules that affect the conduct of women's sports.
7. Providing opportunities for the development of leadership among girls and women for the conduct of their sports programs.

STANDARDS IN SPORTS FOR GIRLS AND WOMEN

Standards in sports activities for girls and women should be based upon the following

1. Sports activities for girls and women should be taught, coached, and officiated by qualified women whenever and wherever possible.
2. Programs should provide every girl with a wide variety of activities.
3. The results of competition should be judged in terms of *benefits to the participants* rather than by the winning of championships or the athletic or commercial advantage to schools or organizations.

Health and Safety Standards for Players

Careful supervision of the health of all players must be provided by

1. An examination by a qualified physician
2. Written permission by a qualified physician after serious illness or injury
3. Removal of players when they are injured or overfatigued or show signs of emotional instability
4. A healthful, safe, and sanitary environment for sports activity
5. Limitation of competition to a geographical area which will permit players to return at reasonable hours; provision of safe transportation

General Policies

1. Select the members of all teams so that they play against those of approximately the same ability and maturity.
2. Arrange the schedule of games and practices so as not to place demands on the team or player which would jeopardize the educational objectives of the comprehensive sports program.
3. Discourage any girl from practicing with, or playing with, a team for more than one group while competing in that sport during the same sport season.
4. Promote social events in connection with all forms of competition.

SOURCES OF INFORMATION AND SERVICE

All requests for information about services should be addressed to: Executive Secretary, National Association for Girls and Women in Sport (NAGWS), AAHPER, 1201 16th Street, N.W., Washington, D.C. 20036

NATIONAL COACHES COUNCIL

The National Coaches Council was formed by the NAGWS to:

(1) provide a channel of direct communication among coaches at all educational levels
(2) assist in the formulation and dissemination of guiding principles, standards and policies for conducting competitive sports programs for girls and women
(3) keep members informed of current coaching techniques and trends
(4) sponsor clinics and conferences in sports and coaching skills
(5) provide input from coaches to USCSC sports committees and representative assembly
(6) promote cooperative efforts with other sports-centered organizations
(7) provide a united body for positive political action in the realm of girls' and women's athletics

Academies for 11 sports have been established. (Note the application blank for specific listings.) Membership in each Academy is open to any coach of girls or women's sports or any interested person. Annual dues for AAHPER members are $10.00 per Academy. Non-AAHPER members pay $20.00 annually for membership in one sport Academy and $10.00 for each additional Academy membership desired. The $10.00 non-membership fee may be applied at any time toward AAHPER membership.

Get involved . . . JOIN NOW.

Sports Academies of the NATIONAL COACHES COUNCIL

National Association for Girls and Women in Sport: AAHPER
1201 16th St., NW, Washington, DC 20036

NAME _____
last first initial

ADDRESS _____
street

_____
city state zip

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☐ Golf ☐ Gymnastics ☐ Softball ☐ Swimming/Diving ☐ Synchronized Swimming
☐ Tennis ☐ Track & Field ☐ Volleyball

I am willing to serve on an Academy committee: ☐

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Please send AAHPER membership information: ___yes ___no

NAGWS SPORTS GUIDES COMMITTEES INTEREST INDICATOR

The Sport Guide Committee is endeavoring to broaden its base of personnel and to strengthen services to *Guide* readers. The purpose of this form is to offer readers an opportunity to join us in meeting this need. Please complete this form and send it to the Associate Guide Coordinator-elect: Geri Polvino, Eastern Kentucky Univ., Richmond, KY 40475.

Name _____

Professional Address _____

City _____ State _____ ZIP Code _____

1. Check four Sport Committee(s) which would be of interest to you:

____ Aquatics	____ Flag Football	____ Speedball
____ Archery	____ Golf	____ Squash
____ Badminton	____ Gymnastics	____ Synchronized Swimming
____ Basketball	____ Lacrosse	____ Team Handball
____ Bowling	____ Orienteering	____ Tennis
____ Lacrosse	____ Racquetball	____ Track and Field
____ Field Hockey	____ Soccer	____ Volleyball
	____ Softball	____ Water Polo

2. Would you like to serve as member of a Sports Guide Committee of your interest? ____ Yes ____ No
3. Would you consider submitting an article to a Guide Committee as a prospective author? ____ Yes ____ No
   Possible topic or title _____
4. Can you suggest topics for articles which you would like to have included in future *Guides*? (Please indicate sport.) _____
5. Are there others whom you would recommend for consideration as possible committee members or authors? Please indicate below. (Use additional paper, if necessary.)

Name _____ Sport(s) _____

Professional Address _____

City _____ State _____ Zip Code _____

Sports Committee Member ____ Prospective Author ____ (Check one)

You may serve on only one Sport Guide Committee at a time.

NAGWS ARCHERY COMMITTEES*
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1976-78

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*The current *Guide* was prepared by the 1974-76 committee; the 1978-1980 *Guide* will be prepared by the 1976-78 committee.

EDITORIAL COMMENT

The importance of youthful competitive archers is brought to mind as our attention becomes focused on the 1976 Olympics. Our concern as archery teachers, coaches and recreation leaders is to involve many persons in this challenging sport, and of course the best place to initiate an interest in archery is in our schools, colleges, camps and recreation programs. Many of the youth who have been introduced to archery will continue with a recreational or competitive interest in the sport. It is important to provide an interscholastic, intercollegiate and recreational competitive program for our youth, thus enabling each archer to enhance skills and abilities.

The archery section of this *Guide* begins with readings on interscholastic, intercollegiate and Olympic archery. Further materials are provided in the area of the teaching and coaching of archery. It is hoped that the selected articles will be of assistance and interest to all persons involved in promoting the sport of archery.

A special thanks is extended to all *Archery Guide* committee members, authors, and to the NAGWS Guide Coordinator, Helen Knierim. Good luck to Susan Hicks as she and her committee undertake the planning for the 1978-80 *Archery Guide*.

Judy Jenkins
Chairperson, 1974-76

Interscholastic Archery
The Challenge and the Growth

LURA R. WILSON

Lura Wilson received the B.S. degree from Syracuse University and has completed graduate work at several other New York universities. She is vice-president of the National Archery Association, and codirector of Teela Wooket Archery Camp. Lura is an instructor trainer for the NAA Instructor's Course and is a member of the Life Time Sports Hall of Fame. She has coached the Greene Central School archers, Greene, New York, and now has retired after 27 years of teaching physical education.

Archery, a participant's sport, is a very real challenge to the high school teacher. Unfortunately, publicity for the sport is hard to achieve because it is so individual and so personal. It is difficult to televise, action is limited, the goal which is the target is 90 or 70 meters away and few eyes can see where the arrow lands. All of these things tend to cause sportscasters to shy away from coverage. The media do not sell archery; hence, to promote archery as a part of a physical education program takes a real salesman and one who recognizes that the physical and achievement values are great enough to make the program worthwhile.

Few sports are dominated so completely by Americans in international competition as is archery. For the last 20 years the United States has placed at least four shooters in the top ranks in the World Championships. In 1972, both the men's and women's Gold Medalists in the Olympics were Americans—they received almost 10 seconds of television coverage! Both the men's and women's World Records are held by Americans. At any international competition it is the American technical know-how that the rest of the world seeks to copy. American made tackle is the envy of every country in the world. Four of the six members from the United States Team at the International Tournament held in Switzerland in June 1976 were 18 years old or younger, two girls and two fellows. Only one of them came from a high school archery program and she holds one of the world records! The other three begged all through high school for an archery program with which they would help, and they were denied. From the information available at the present time—of those people who have recorded the highest FITA Round scores in qualifying to try out for the Olympic Team in 1976 and from the number of high

scores shot by Intermediates (ages 15-17) at the National Tournament at Miami University in August 1976(where there were 91 shooters 17 years of age and younger of 310 shooters), it is very easy to predict that at least one third of the Olympic Team will be of high school age.

High school teachers, here is the challenge: *You* should be credited with starting these archers on their way to the top! *You* should be the salesman, the promoter, the instigator, the teacher, the coach and the friend of all these archers! There should *not* have been just two high school coaches from the opposite sides of the U.S.—Arizona and New York—who were on the lines at the National with their teams!

What is actually happening in interscholastic archery? Many exciting and interesting things that can be most helpful.

Inexpensive Quality Equipment

First, the manufacturers of archery equipment have finally recognized the wide open field for sales at the high school level. One of the largest archery manufacturers has produced a line of equipment that is high quality, at a reasonable price for schools. This equipment may either be purchased or leased on a three year contract and at the end of that time the equipment belongs to the school. This equipment is even shipped in a storage cabinet on wheels which make the whole cabinet of supplies transportable. Twelve bows—laminated, take-down, recurves no less—arrows (fiberglass), arm guards, finger tabs, quivers, extra bow strings and all the other necessary items! What a boon this is to the high school program. Another company makes transports for targets which may be used as target stands. Prices for this equipment are much better if orders are placed directly with the company than through a dealer.

Instructor's Courses

Second, the National Archery Association has recognized the need for properly qualified teachers to present archery in high school and college, so they set up Instructor's Courses throughout the United States similar to those given by the American Red Cross in Swimming, First Aid and Life Saving. Two of these courses are offered on the West Coast, three in Mid America, and four in the East. These are 9- or 10-day courses offered in June, July and August and the fee is nominal. For information write the National Archery Association, 1951 Geraldson Drive, Lancaster, Pa. 17601.

Junior Olympic Archery Development Program

Third, under the auspices of the U.S. Olympic Committee, a Junior Olympic Archery Development (JOAD) program has been set

up which is available to high schools. This program is an achievement oriented program which has grown tremendously in the last eight years. Two members of the U.S. International Team this year learned archery through the JOAD. Over 5,000 archers under the age of 18 years are involved in the program and local, state, regional and even National Tournaments are held. Information is available from George Helwig, 69 East Galbraith Road, Cincinnati, OH 45216.

Opportunities for Competition

Fourth, from what was originally a short two-week high school archery program for girls has grown a much stronger coed class program and an expanded intramural and varsity program. Regional and sectional tournaments are conducted now, and an occasional state sponsors a state high school tournament. The state level competition is being planned in several states. Mail tournaments on the national level have long been in existence but the number of boys teams and mixed teams has more than doubled in the last 10 years. Girls teams still dominate as more women will take time to teach archery than men. Perhaps the women have the "tiger by the tail" in archery - most of the college coaches are women.

Here is some food for thought and may it be a challenge!

1. Pennsylvania has more archers than any state in the U.S., yet only three high schools entered the National Mail Tournament.
2. Arizona high schools are not permitted to enter any competition out of state, even a mail tournament, and yet they have a shoulder to shoulder state high school tournament with 200 archers.
3. California has had the largest increase in the number of high schools competing in the National Mail Tournament.
4. New York leads the nation in the number of high schools competing in the National Mail Tournament.
5. Only eight states competed in this tournament last year - where are the rest?
6. At least five high school leagues in New York State had a varsity archery program last year where the teams competed once or twice a week against other schools in the league. Also, there were two regional tournaments.
7. Over 70 percent of the coaches of the teams who competed in the National Mail Tournament were graduates of the NAA Instructor's Course or had such an instructor in either high school or college.
8. Only 18 of the 91 competitors in the Intermediate and Junior Divisions at the National Tournament were from high schools with archery programs.

College Division of the National Archery Association

MARGARET L. KLANN

Margaret Klann is an associate professor of physical education at Arizona State University, Tempe. She was the first program director for the College Division of the National Archery Association. She has coached the Arizona State University women's and men's archery teams and was twice nominated for U.S. Olympic archery coach. She is a member of the NAA Board of Governors and the U.S. Olympic Archery Sport Committee. She has had a target archery book published and has a second one, for the competitive target archer, ready to go to press.

In 1955 collegiate archery in the United States was close to being extinct. DGWS (now NAGWS) and the National Archery Association each ran an annual postal meet and that was the extent of the competition. A few daring individuals decided to see what could be done to create interest. Arizona State University at Tempe led the way in those early years with San Bernardino Valley College (California) also being a major contributor.

A dual meet for these two colleges was held in 1955 in San Bernardino, and Lorraine Pszczola, archery coach at San Bernardino Valley College, also invited other nearby colleges to participate in this new idea of a shoulder-to-shoulder intercollegiate meet. As a result of the enjoyable experience that day, an idea was born—"let's encourage shoulder-to-shoulder archery competition in colleges all over the United States."

The two college instructors, Lorraine Pszczola and the author, talked over ideas and made decisions about the directions their schools would need to take to get more colleges involved. The next year each hosted several very small meets on their own campus and then got together again at San Bernardino for a "big" Spring meet. This became an annual pattern until 1963 when Arizona State University conceived the idea of hosting a Southwestern Regional Intercollegiate Meet. Nevada, New Mexico, California and Arizona colleges were invited, but financial problems and school travel rules kept most of the California colleges away, and interest was lacking among Nevada and New Mexico colleges. There were 24 contestants (7 women, 7 men) from two California schools and four Arizona

colleges in that first Southwest Regional Intercollegiate Meet; Fred Ricks, San Fernando Valley College and Carol Hopkins, Arizona State University, became the first champions. Arizona State University hosted the annual SW Intercollegiate until 1969 when San Bernardino Valley College felt ready to take it over. Since 1969 it has rotated around the Southwestern region.

Beginnings of the NAA College Division

In 1966, Arizona State University asked for and received permission from the National Archery Association to host a United States Intercollegiate Championship for both men and women. At the same meeting the NAA gave approval to the tentative written plans which had been projected for the organization of a college division within the NAA. A College Committee was appointed which consisted of Lucille Schneider, Drexel University, Philadelphia and the author. Lucille Schneider took over the NAA Intercollegiate Postal Meet and the author worked on launching the proposed college division. Collegiate archery coaches then volunteered for committee and regional positions and the college division was suddenly alive and functioning! The NAA recognition of the intercollegiate archery program acted as a catalyst, and the intercollegiate program was organized very informally on a national level, with much of the work being done by correspondence.

The purposes of this collegiate group were, and still are:

1. To help improve collegiate target archery instructional programs.
2. To provide more competitive opportunities for all levels of skill among men and women collegiate archers.
3. To establish and rotate a United States Intercollegiate Archery Championship for men and women.
4. To establish and rotate 10 regional and 50 state intercollegiate archery championship meets for men and women.
5. To better prepare collegiate archers in the United States for international competition.
6. To assist archers and coaches in learning how to conduct target archery tournaments.
7. To establish and control the selection of annual All-American archery teams for men and women.
8. To establish channels of communication and action between the NAA and persons who represent the College Division.

Since 1967 when Lois Ruby, Michigan State University, and John Culver, Fresno State University (California), became the first champions, the College Division has conducted an annual United States Intercollegiate Championship Tournament for men and women. Men's, women's and mixed team championships were added

in 1969. The first five championship meets were held in the Southwest, three were at Arizona State University and two at San Bernardino Valley College. The 1973 meet at East Stroudsburg State College (Pa.) gave collegiate archery a boost in the Eastern part of the United States and the 1974 meet at Stetson University, DeLand, Florida, was the biggest ever. Thirty-nine colleges from 15 states entered 100 men and 72 women; there were 22 men's teams, 14 women's teams and 14 mixed teams. The 1975 meet was held at Cerritos College, Norwalk, California, and the champions were:

Men: Don Rabska – San Bernardino Valley College, Ca.
Women: Debbie Green – Riverside City College, Ca.
Men's Team: San Bernardino Valley College, Ca.
Women's Team: Arizona State University
Mixed Team: East Stroudsburg State College, Pa.

The first All-American archery teams were selected in July 1969 and each year since then a full team of six men and six women have been named. In recent years, the number of qualified nominees has become so large that an Alternate Team has also been named. The 1975 rosters with archers being listed alphabetically, were:

Men's All American Archery Team

1. Glenn Daily – East Stroudsburg State College, Pa.
2. Joel Lecker – East Stroudsburg State College, Pa.
3. Don Rabska – San Bernardino Valley College, Ca.
4. Gary Riley – San Bernardino Valley College, Ca.
5. John Smith – San Bernardino Valley College, Ca.
6. Richard Stonebraker – Pennsylvania State University

Men's Alternate Team

1. Charles Eby – Ohio State University
2. Rand Green – San Bernardino Valley College, Ca.
3. Robert Joyce – Atlantic Community College, N.J.
4. Scott Page – Palomar College, Ca.
5. Peter B. Privateer – University of Florida
6. Raymond N. Stone – Madison College, Va.

Women's All American Archery Team

1. Debbie Green – Riverside City College, Ca.
2. Deborah Ann Hammer – San Bernardino Valley College, Ca.
3. Janet Kemmerer – East Stroudsburg State College, Pa.
4. Luann Ryon – Riverside City College, Ca.
5. Jean Stephenson – Arizona State University
6. Wendy Vance – Arizona State University

Women's Alternate Team

1. Jane Burkheimer – Mt. San Antonio College, Ca.
2. Ann Kilby – University of Arizona

3. Bonnie Lindsley — Citrus College, Ca.
4. Wendy McLean — Arizona State University.
5. Diane Tone — Arizona State University.
6. Sheri L. Torrence — Arizona State University.

The NAA officially adopted the collegiate group in 1972 when it recognized it as its College Division, approved its operating Policies and Procedures and gave it limited financial backing. The NAA-CD membership in 1972 was 22 colleges, and by January 1, 1975, it had climbed to 69!

Beginning in 1975, colleges wanting to enter the United States Intercollegiate Archery Championships had first to qualify in their state or regional meets. This step became necessary because the tournament became so large that none of the colleges felt they could host it. It was also felt that the "Big One" should find only the most highly skilled archers entered.

Initiating an NAA College Division

But, one asks, "How do I get involved in the program of the College Division of the NAA?"

1. Write to the Program Director, Miss Lorraine Pszezola, San Bernardino Valley College, San Bernardino, CA 92403 and ask for the names of your state and regional intercollegiate directors. These directors can tell you who the nearby CD members are and what meets are scheduled in your area.

2. Join the College Division. This puts your college on the mailing list for a twice-a-year "CD Newsletter" and it brings your college a year's subscription to *Archery World* magazine, the official publication of the NAA.

Your college will receive a copy of the Policies and Procedures of the College Division which will tell you how the CD is organized and how it operates. It makes your collegiate archers eligible for All-American honors and it assures them that they will have the opportunity to qualify to go to the United States Intercollegiate Championships. It puts instructors and coaches in touch with a group of men and women who care enough about archers and archery that they are willing to work to provide a program and opportunities for collegiate archery to become better and better every year. It's the world's best archery bargain for $10 a year!

COLLEGE DIVISION MEMBERSHIP APPLICATION

Mail, with a $10 check made out to National Archery Association, to 1951 Geraldson Drive, Lancaster, PA 17603.

College _____ Location _____

Name of person to whom mail should be addressed: _____

_____

Social Security Number _____

Address to which mail should be sent _____

_____

City, State and Zip _____

Our Female Olympic Gold Medal Winner

JACQUELINE SHICK

Jacqueline Shick received her B.S. and M.S. degrees from Drake University, Des Moines, Iowa, and her Ph.D. from the University of Minnesota, Minneapolis, where she is currently an associate professor of physical education. She is past chairman of the NAGWS Archery Committee.

The following article was excerpted from a personal interview with Doreen Wilber, female winner of the Olympic Gold Medal in 1972.

JS: When did you first become interested in archery?

DW: About 15 years ago a friend gave my husband an old bow. It wasn't worth much, but he suggested that we take it and play with it. When we started, neither of us knew anything about archery. We read books and anything we could pick up on the sport. Then, we found out that there was an archery range in a town about 25 miles from here, so we joined the club. I hated archery but joined the club because my husband enjoyed it. A year or two later, I went to the state tournament and won it.

JS: How does your husband feel about your competing?

DW: I know he is proud of me, but he feels that, since the pressures of competition will be on me, the decision must be mine. For example, this spring I was getting ready to go to the trials for the competition to be held in Switzerland. It was so early in the year that I hadn't been able to practice, and I didn't really want to go because I had many things to do around my home. I had purchased my plane ticket, had packed my suitcases, and was ready to go, but I was unhappy. I said to my husband, "I don't want to go," and he said, "You don't have to, you know." That was all it took. I didn't go. I just wasn't mentally ready for it. Even if the weather had permitted my practicing, I would have been irritated because I had to be out there practicing when I wanted to plant my garden.

JS: You said you shot your first target in 1965, and the Olympics were in 1972, so you hadn't been shooting target very long before you competed in the Olympics.

DW: That's right, because all there was around here was field archery. But, in 1965, the Target Nationals were in Indiana, which was not too far to drive, so I thought I'd go just for fun. I came in third, but I guess I wasn't very interested and I went back to shooting field. I didn't shoot target again until 1968. I

went to the Nationals and came in second. Then, I went to Seattle to shoot against the Canadians and won. I shot the highest score I had ever shot and tied the world's record. Following that, I gained a spot on the team for the World Championship and came in second. Next, I won the Nationals and have been shooting target every year since that.

JS: What type of training program do you have?

DW: None, really. I practice once a week during the summer. If I'm going to go to a tournament, I'll shoot a few days each week but not very long, maybe a couple hours at a time. Before the Olympics, I practiced quite religiously, for me, which was about 10 hours a week. Most people will practice 5-6 hours a day, but I don't shoot well if I practice a lot. Everyone must know his or her own limitations and none can practice the same.

JS: When you practice, do you shoot a set number of arrows?

DW: Sometimes I'll shoot a half a FITA each day. I can shoot that in a couple of hours and the next day I'll shoot the rest. My husband practices with me once in a while and we shoot a 900 round, which is 40, 50 and 60 yards. When I'm going to a tournament, we shoot the FITA round which is 70, 60, 50 and 30 meters and then I usually practice that by myself. If I'm just going to practice, I'll go out and shoot 40 yards or 60 meters, which are two of my favorite practice distances.

JS: Do you engage in mental practice at all?

DW: Yes, when I'm shooting. Most archers stand there for just a minute before each shot; I think it's to get their minds where they belong. I have to prepare myself *first mentally* and *then physically*.

JS: Is it easy to be distracted?

DW: Yes, and some people never get over it. To aid the archer during competition, there is a rule that spectators can only get so close to the shooters. You know someone coming up close taking pictures would bother a lot of people unless they've trained themselves not to let it. When we were in Russia, the boy who at the time was the world champion, was trying to shoot when they started taking pictures of him, and they went right up to his face just as close as they could get. That's very distracting, especially if you're using a clicker and hear the camera clicking. You're not sure if it's the clicker or the camera.

JS: Is boredom ever a problem during your training?

DW: If you have to travel and go 15-20 miles, you feel you have to shoot and then I think it could be monotonous. If I get bored with shooting, I just bring my equipment in the house and quit.

JS: Do you do that even if competition is coming up?

DW: Yes. If I don't want to shoot, I'm not practicing; I'm not thinking; I'm just shooting, and I may as well just sit in the house. If you can't learn something while you're shooting, you may just as well not be there.

JS: You emphasized learning; do you do anything specific with regard to an attempt to get an analysis of your errors?

DW: No, if you've shot for some time, I think that if you shoot an arrow and it goes high left, for example, you, yourself, should know several things you could have done that would cause that arrow to go there and you have to be quick enough to figure out which one it was. When you stand up there and practice, you analyze every shot as to *where it went* and *why it went there.*

JS: Which anchor, the high or the low, is used more by the international competitors?

DW: Both men and women use the low anchor because, when shooting sights, the low anchor gives you more yardage and will permit the men to be on the sight for 90 meters and the women on for 70 meters.

JS: Do you have any difficulties even if your sight is marked, if, for example, there is a wind factor? How do you make your adjustments on the sight then?

DW: You just make a guess on how much the wind is blowing and how much to allow for it. If it's raining, you know the rain is going to be hitting on your arrows so you'll have to allow on your sight for a little longer distance because you know the arrow is going to drop a little bit. This you learn with experience shooting in the wind and rain.

JS: Do they shoot quite a bit in the rain?

DW: Yes, if it rains all day and there's a tournament scheduled, you shoot in the rain all day. We only stop the tournament for lightning and severe weather. I shot in 45-50 mph crosswinds for four days in France. I had never seen wind blow that hard for that long. I was the only archer who had the distinction of keeping all my arrows on target. One fellow said, "I aimed at the target on the right thinking I would hit my target, but the arrow hit the target on the left."

JS: Do you warm up when you arrive at a place of competition?

DW: None of us really do. We can't shoot before a tournament, but we can shoot the day before. You're allowed only six arrows per day as practice in a tournament.

JS: What weight bow do you use?

DW: My bow is about 30 lbs. When you get to the point where you have what you feel you can handle, you just don't want any

more. I tried two pounds lighter but I couldn't do that either, so I feel I must have the right weight for me.

JS: Are there any features of your equipment that you feel are absolutely indispensable?

DW: No, I don't think so. I could take everything brand new and within a week I could be shooting it well; however, I don't mean changing brand of bows.

JS: What feelings do you have about new equipment features and the regulations governing their use in competition?

DW: Well, FITA is very strict in their rules of what you can and can't shoot in international competition. They keep things on an even keel, and you feel that nobody is shooting anything far superior to what you're shooting. I like that. Regarding new equipment, the take-down bows, where the limbs fasten on in three pieces, are really great because you can take them apart and fit the pieces in a small case for travel. I think the stabilizers are a must. They add weight when you're going to aim and they stabilize the bow. I wouldn't want to shoot without them.

JS: What are the most important things to consider before deciding to be a competitive archer?

DW: Do you enjoy it? You have to enjoy it well enough to sacrifice a few things. I think if you do enjoy it enough or are determined enough, you will find a way to give up things.

JS: Would you say there's a need to compete often and keep your edge?

DW: I think it's such an individual thing. Some people have to compete a lot to get used to competition and the nerves that go with it. I don't feel that way myself. Usually, I don't go to over two or three tournaments a year. In the first place, living in Iowa makes it difficult. The big tournaments are in Pennsylvania, Washington, California, Arizona, and some in St. Louis. So in order to compete in them, you have to drive or fly and it becomes quite expensive. It's hard for an amateur to be able to afford to compete. I think that's one reason it's hard for the United States to get some of our top people in international competition because they can't afford to go to the qualifying meet, which I think is quite necessary.

JS: When you go to tournaments, such as the World, are at least your transportation and expenses covered?

DW: Yes, the National Archery Association is a strong organization, and they take care of all of our expenses. They send both a field and target team to the World Championship, and they send to the Championship of the Americas which includes such other countries as Canada, Puerto Rico, Costa Rica,

Mexico and Brazil. It takes quite a lot of money to send out teams like that. But we seem to be fortunate to raise enough money. A lot of the money comes from donations from manufacturers. We get out and earn the rest by selling archery buttons and T-shirts.

JS: You mentioned one of the things about competing is to get used to the competitive setting. Is it quite competitive or is it really within yourself?

DW: When I go to a tournament (you're going to find out that I'm quite different from most other archers), I set what I want to shoot and I don't care what the other person has done, even to the point if they're going to beat me, that's fine. I don't care if I get beat if I shoot well. I enjoy the people I shoot with and we are really good friends.

JS: Do people who compete in archery stay in archery, at least on a club basis, so that it is a worthwhile lifetime sport to teach?

DW: Yes, but it is rather a strange thing. We have young people who come to shoot and shoot very well for a year or two and then all of a sudden, they can't hit anything and they disappear. This can happen no matter what age you are. People don't usually stay at the top for many years but they still enjoy it and keep coming to the Nationals. We have a man who won the 1957 World Championship who is still competing and enjoys it and shoots quite well. He's right up there in the top 10 in the Nationals.

JS: Do quite a few people compete in the Nationals?

DW: Yes, probably over 300 people. We have juniors and intermediates and also the Junior Olympics program which is bringing in a lot of good, young archers.

JS: What must one do to qualify for the Olympics?

DW: You must have four qualifiers in a year to be eligible to go to the Olympic trials. For women, a qualifying score of 1050 must be shot; for men, 1100. You can continue to shoot at qualifiers until you have your four. This can become expensive for the archer. However, a "qualifier" can be set up anywhere by sending $15 to the National Archery Association and then by running it according to the regulations specified by the NAA.

JS: How many people constitute an Olympic team?

DW: Last time they had three men and three women; now, they've cut it down. They've cut all sports, but now archery is going to have two men and two women, so it's not really going to be easy to make the team.

JS: How is it determined when you shoot at the Olympics? Do all the competitors shoot at the same time?

DW: Yes, everybody is competing at the same time. There are three on each target but each person shoots by himself at the target. You shoot three arrows, you sit down; the next person shoots three arrows, etc., until each has shot three. Then you each shoot three arrows again. After you've all shot six arrows, you go get them and score them. The order of shooting is A, B, C; then C, A, B; then B, C, A. It works quite well. Everybody is shooting at the same time and has the same wind to compete against.

JS: Does the competition generally go on all day?

DW: Yes, for four days. In the Olympics, I think the pressure is greater for the archers because you have the competition and pressure for four days, and you don't dare lose it for these four full days. For instance, your swimmers and runners have very short periods of competition. It's quick, and they don't have to keep this tension built up for long, but we do. I think we are overly tired when it's done.

JS: What are generally good scores in these kinds of competitions?

DW: They get higher all the time. The equipment keeps improving, and I think the instruction and the training get better all the time. The equipment over the past two years has improved just unbelievably. For scores, a woman has to shoot in the 1220's and the men have to shoot about 1250-60's. Johnny Williams, in the Olympics, set the world record at 1268 which was really great, but last summer, our boy who won the World this year shot 1291. So there we are; it goes up higher all the time.

JS: What was your score in the Olympics?

DW: I shot 1226 and 1198, which averaged 1212. That wouldn't be good enough now.

JS: Do you plan to try to make the next Olympic team?

DW: I don't know. Since I did not go the trials and the World shoot this year, I do not have the four qualifiers I need. And, after the last Olympics, I said I would never do it again. I just didn't enjoy it because I was away from home for six weeks; we were in Germany for two weeks before our event took place. But, Montreal isn't so far away and I might be able to come home home between times. Also, my husband indicated that he might go since it's close, and he suggested I go ahead and get my four qualifiers. It would be a shame to be shooting well at the time of the trials and not be eligible because I didn't have the qualifiers. So, I think I'll get my qualifiers and then make my decision when tryout time comes.

Figure 1. Doreen Wilbur.

An Approach to the Teaching of Archery

JOAN A. BOEHMER

Joan Boehmer received her B.S. degree from Wisconsin State University, LaCrosse, and her M.S. degree from Indiana State University, Terre Haute, where she teaches and coaches archery. She has also taught archery in the Blair Public Schools, Wisconsin. John has been Indiana GWS archery chairman and has been an advanced archery instructor with the American Archery Council.

Since archery is a lifetime sport, we, as teachers, should incorporate as many people into the sport as possible. Some students will want to hunt, others may wish to use it merely as relaxation, while others may choose competition. Therefore, the teacher can introduce different methods so that the students can make their own choices.

When teaching the methods, the teacher should strive for three objectives: immediate participation, immediate success and immediate satisfaction. The above can be gained by having the class bows already strung, with the equipment ready to go; starting at a close distance (20 feet) where the archer cannot miss; and choosing a method that seems quite natural to anyone picking up a bow for the first time. The use of large colored target faces will add to the student's interest, success and satisfaction.

Three methods will be taught: (1) the instinctive method which is used for hunting and which will establish strong basic patterns; (2) the point-of-arm method which is used as a transition; and (3) the bow sight method.

Instinctive Method

Check eye dominance by outstretching the arms and forming a triangle with the hands. Sight through the triangle at a specific target. Close the left eye; if the object through the triangular opening remains stationary, the archer is right-eyed and should be shooting right-handed. Check the left eye, using the same process as for the right eye. The eye that views the image in the same place as viewed by both eyes is the dominant eye, and this determines whether the person should be shooting right-handed or left-handed. The eye determines where the arrow goes to a greater extent than the arm which holds the bow or the hand which releases the arrow. If an archer shoots consistently off target to one side or the other, the cause may well be eye dominance.

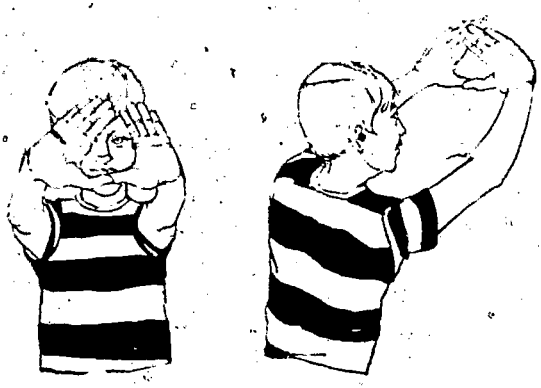

Figure 1. Determining eye dominance.

Arrange the class according to eye and hand dominance with the left-handed, left-eyed shooters on the right and the right-handed, right-eyed shooters on the left as they face the target. Students will shoot with partners to help one another point out errors. Students take their places, forming two lines with the instructor positioned between the students and targets. Safety and equipment are taught as the class unit progresses. All arrows are left in the quivers when anyone is in front of the group. The instructor talks and demonstrates through the following:

A. The students align their target shoulders with the target at which they are shooting and take their stance by spreading their feet as wide as the outside width of the shoulders, pointing the target foot slightly towards the target, until comfortable. The shoulders are squared and face the side, while just the head turns towards the target. The knees are relaxed, not locked. The forward foot is up to the shooting line.

B. The students are holding the bow with the bow arm, using the index finger and thumb on the grip. The palm is kept away from the handle grip by using a flat straight wrist, placing the pressure on the "V" formed by the index finger and thumb.

C. The hook is set by placing the index finger of the string hand above the nocking point and the middle two fingers below the nocking point up to the first joint. For the time being, place the little finger on the thumb as the finger is too short to fit on the string and the thumb needs to be busy so it doesn't push the arrow off the string. The hand is in the same position as the boy scout salute.

D. The bow is held down at the side. The student sets the hook by drawing the string out about an inch and releasing it by relaxing just the fingers and keeping the hand in the same place. This is done several times. The students are told not to dry shoot (release the string at full draw without an arrow on the string) because the bow can shatter due to the vibration.

E. Put the bow on the floor. Hook the fingers of both hands down to the first or second joint and then pull against one another, keeping the hands in front of and touching the mouth where the draw will be. It is good to do this exercise several times a day to pick up the correct movement and to strengthen the muscles for drawing.

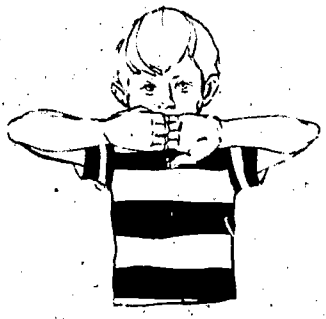

Figure 2. Hooking the fingers of both hands.

F. Now extend the bow arm toward the target and place the string hand in the anchor position with the index finger at the corner of the mouth on the eye tooth. The thumb forms a "V" underneath the jawbone and tongue with the entire "V" laying on the jawbone. Keep the string arm slightly up.

G. Point out that gripping the bow with the palm on the grip will rotate the elbow into a position where the elbow may get hit. *Demonstrate* to the students the correct position (see B) as well as the incorrect position. Go back to the exercise (see E), pointing out that this is the proper drawing position to develop the strongest amount of pull.

H. Pick up the bow and, starting your draw at the hip, draw the bow into the anchor position with the elbow ending in the position in which you did the exercise. Come down easy from the full draw and repeat this several times.

I. The instructor demonstrates how to nock an arrow and draws to the anchor. (Pinching the arrow will cause it to fall off the rest; however, if you pinch it off, you can pinch it back on again. If the bow falls to the floor, let it lay and go on to the next.) Talk

through the commands demonstrating as you go, doing all but the release

a. Take your stance.
b. Nock your arrow with the cock feather up.
c. Set your hook.
d. Place the index finger and thumb around the grip with the palm away from the grip; the pressure should be on the "V" (formed by the thumb and index finger.). (*Repeat over and over.*)
e. Rotate the elbow of the bow arm out away from the string. (*Repeat over and over.*)
f. Look at your target.
g. Relax your knees and raise your unit drawing to anchor. (To attain a *full* draw may take many lessons. With beginners do not be too concerned if a full draw cannot be attained at first.)
h. Is the arrow long enough and is the bow arm out of the way? (Partner check each time when shooting stop the shooter if not correct.)
i. Aim hold (with both eyes open).
j. Release hold hold hold (let the hand relax and recoil along side of the face, following through on the shot, holding the position for five seconds).

Talk through the above starting with *b* for several lessons until good habits have been acquired.

J. Step behind the shooting line and have the first group of students do *a* through *e*. Their partners lay the bow down and are asked to observe the shooters to see *only* if the arrow is long enough and if the bow arm is out of the way. The instructor then checks *each* shooter for correct grip and correct nocking of the arrow. When all shooters are ready to draw, talk through *d* to *j*. When the end is finished, the partners will follow the same procedure. Talking the shooters through several lessons will help them with their concentration as well as set a consistent pattern.

K. Pulling the arrows is taught upon retrieving the arrows.

L. Unstringing and stringing the bow are taught about the third or fourth lesson.

After the student can release the arrow easily, certain basic skills are stressed, such as: nocking the arrow in the same place, keeping a straight line from the tip of the arrow to the under part of the elbow, tilting the body from the pelvis while maintaining the straight line to get on target, keeping the wrists straight when drawing, coming to a full draw, and others which may be needed.

Partners help get the shooter in line with the gold until the shooter gets a feel of where she will be when aiming. The instinctive method of aiming is explained as follows: The instinctive method is like pitching a ball; you are looking at the smallest part of the

catcher's glove; you throw the ball and with enough practice you finally get the feel of when to release. This is also true with the instinctive shooting method, in that you look at the smallest part of the gold with both eyes open and through trial and error you will get a feel of where to release. This method is taught first because the teacher wishes to get the basics set through using the most natural shooting pattern and moving from the least accurate to the most accurate method of shooting.

M. Spend approximately two or three lessons trying to get a grouping of arrows, then move back to the 10-yard distance. Continue to move back.

N. Scoring is taught after the basics have been learned and success has been attained.

O. Start at the longest distance and move forward as the round is scored to give students insight as to how a tournament is conducted.

Point-of-Aim Method

The teacher returns to the 10-yard line to teach this method. The point-of-aim method is used *only as a transition* into the sight method and is used for setting the basics for the sight method of shooting. An oblique stance is taught and the shooting line is straddled. If the shooter is shooting right-handed, the right eye is kept open and if left-handed, the left eye is kept open. Close the other eye, trying not to squint. Photographs of the methods are used as visual aids so students can see what they are trying to accomplish for string alignment on the face.

The shooter holds the bow upright, and with one eye, aligns the string with the bow so the bow is straight. The draw will be done with the bow in the upright position. The archer sights the tip of the arrow at the gold, then draws to the low anchor. With the low anchor, the chin is raised and set down on top of the index finger. Make sure that the string bisects and touches the nose, lips and chin with the same amount of pressure each time you draw. Remind the student that the tip of the arrow is the front sight and the rear sight is the anchor point. The shooter tilts her body from the pelvis until she is in line with the target. The partner tries to help the shooter by telling her when she is in line with the gold. At the short distance (10-yard line), the tip of the arrow will be spotted somewhere below the gold. The shooter releases the string once she has found where the tip of the arrow is aimed. If she is on target, she tries to get another arrow in the same spot.

Once a cluster of arrows is obtained, the archer moves her point-of-aim opposite her error and shoots while aiming at this spot. For example, if she is hitting high to the left she needs to *move the point at which she aims* lower to the right, or if she is hitting low to

the right she needs to *move the point at which she aims* higher to the left. It is better to shoot several ends at each distance, *noting* that at the shorter distances the archer is aiming below the gold and eventually she moves back far enough to be aiming at the gold and hitting the gold (point blank distance). If she moves farther back she will place her aim above the gold, possibly way off target above the gold. *Only* if you *started* by aiming at the *gold* and are hitting at 11:00 o'clock in the red (with the target viewed as the face of a clock), then you should aim and shoot opposite the error into 5:00 o'clock red and this should bring you in on the gold.

Try to be consistent with everything from the stance to the follow-through. If anything changes, the arrows will go in different places. After the shooter accomplishes this change in shooting, the arrow length is re-examined to make sure it is the proper length.

The point-of-aim method is used for several reasons. Most shooters, who have not had instruction, think you aim directly at the gold for all distances. This method points out draw variations, as any movement can be seen on the arrow tip. The length of the arrow can also be clearly seen by the archer. Many archers, using the lighter bows, cannot use the sight method at the longer distances and thus need to fall back on something which has some degree of accuracy. The point-of-aim method can also help the sight-shooter be more accurate.

Bow Sight Method

This is the most accurate method and has several advantages over the other methods but may not suit the needs of the hunter. (One can improvise and use masking tape or weather stripping with one or two pins for sights.) Always start at the shortest distance (about 10 yards) to teach each new method.

A. Draw to the low anchor and find the point-of-aim or have your partner tell you when the arrow is in line with the gold of the target. (The bow is calibrated with the same markings as a ruler.) At the close distance, set the pin approximately four inches above the arrow rest on the same side of the bow that the arrow rests.

B. Sight across the calibrations on the bow and adjust the pin so that the first pin lines up with the gold.

C. Shoot a *group* of arrows: if the arrows are *off* the target high, set the pin high, if right set the pin right, if low set the pin low, and if left set the pin to the left. After setting the pin, aim it in on the gold.

D. All those shooters who have hit on the target matt will shoot three more arrows, trying to hit the nock off the arrow they have on the target. If you are not on the target matt, make the adjustment following letter C above. Strive to group four arrows and then explain the adjustment of the sight.

E. Adjusting the sight: Draw the bowstring back, sighting the pin sight on the gold; then look for your cluster of arrows and set the second pin sight where the cluster or error is, i.e., the first pin is on the gold, the second pin is in line with the cluster at 11:00 o'clock in the red. Recheck the above at full draw length. If this checks, pull out the original sight or the first sight that was set, now aim the second sight that you set in the gold and this should bring your arrows into the gold. The sight setting must be made at full draw length to be accurate. If using one pin as the sight, go back to letter C and set the sight accordingly. Shoot the last two arrows and check the sight setting.

F. Shoot at the different distances, moving from the short to the long distance and writing down the setting for each distance. As you move to the longer distances, the pin sight will move down closer to the grip of the bow.

Keep in mind that your anchor point is your rear sight. If the anchor or pressure on the nose, lips or chin is not exactly the same, you have, in essence, changed your rear sight.

Finally, teaching the three methods in this order provides the archer with a better understanding of all the methods. The archer can then choose from the methods she has learned. The archer has gone from the least accurate to the most accurate method, thus gaining success and satisfaction as she progresses.

An excellent instruction manual for teachers which does not include the point-of-aim method is *Archery—A Planning Guide for Group and Individual Instruction*, revised edition (Washington, DC: American Alliance for Health, Physical Education, and Recreation, 1975).

Basic Shooting Problems

SHIG HONDA

Shig Honda is a member of the Professional Archers Association and has been shooting professionally for 14 years. He has coached the Pierce Community College (California) archery team and is currently an archery clinic specialist for the Bear Archery Company. The following article is an excerpt from his book, Archery, published by Allyn and Bacon in the series, "Basic Concepts of Physical Activity."

Before discussing shooting problems, we might pause to examine the relationship of proper form to high score shooting. If you have ever watched the smooth perfection of top-notch shooters, you will have witnessed the result of many long, tedious hours of practice. Not just plinking away at the target but hours dedicated to minute adjustments of errors of form. Consequently, they arrive at the shooting line as finely tuned as their bow. They shoot effortlessly with the precision of a machine. It will benefit the novice if he approaches the practice of form with the same analytical point of view. As you develop, you may form little quirks of habit. Get to the root of these matters. Find out why.

It was once said that "the man who could control himself could control the world." This is particularly true in archery. Many of the problems contributing to a slump are mental. The relaxing of muscles under stress requires mental effort. The methods used by contestants to get themselves up for competitive ordeal are mainly mental. Concentration is an art that can be learned. It would be well to train yourself in this along with your practice on form.

While we recommended change where needed, don't become an experimenter just for the sake of experimenting. If your tackle is adequate, don't lose faith in it if you have an off day. The trouble usually lies much deeper and you will be giving up a basic starting point for self-criticism if you start experimenting. It is only when you become comfortable with your equipment and yourself that you will learn to know that intuitive moment and the arrow flies straight and true.

Problems are as many and varied as there are individuals. The following list of common errors will be helpful.

Note: Shig Honda and Ralph Newson. *Archery* (Boston: Allyn & Bacon, Copyright © 1975 and 1972). Used with permission.

Arrangements for this article were completed by Martha Kipp Barber, Los Angeles Schools.

1. Proper Bow Weight

A bow that is too heavy in pull weight will cause trembling, snap shooting, arrow creep, etc. Overstraining is the worst enemy for the beginner. Choose a bow that can be comfortably drawn to a fixed anchor and held for about six seconds without too much shaking. As the muscles develop, you will be able to hold without shaking. Remember, the first few arrows may feel easy. You should feel the same way after shooting many arrows.

2 Arrow Falling Off Rest While Nocking

A. When the arrow is placed on the rest, hold it in place with the forefinger of the bow hand. Proceed to insert the nock on to the string. The nock should fit the string just enough to prevent it from slipping off.

B. Grip the string lightly without pinching the nock.

C. A clicker is a helpful instrument to keep the arrow on the rest while moving to the string and bow grip.

3. Arrow Falling Off Rest During Draw

A. Caused by tightening the fingers rather than relaxing the tension and letting the string roll gently as you draw. This slight rolling action of the string will hold the arrow against the arrow plate.

4. Arrow Falling Off The Rest at Full Draw

A. Caused by involuntary squeezing of the fingers in order to hold tension of the draw. Maintain just enough tension in the fingers to hold the string. Draw and hold with the arm and back muscles. Firm the anchor by locking in at the shoulder blade. *Never* tighten at the fingers.

5. "Hanging" (Plucking) the Release

A. The eyes may see the target, but the mind is on the release fingers. Don't think release. This must be a subconscious movement.

Example: A novice learning to play the piano will learn to read the notes, but must think about where to place the fingers on the keys. An accomplished pianist needs only to concentrate on the music and instinctively the fingers will move along to the right keys. If he hesitates momentarily to think about where a certain key is, he will "hang" the note or miss the rhythm. So it is with the release. It takes long practice to acquire smooth performance.

B. Practice keeping the release hand against the face or neck, depending on the style of anchor, during follow-through until it becomes a natural thing to do.

C. Anchor lightly against the face and firmly with the back muscles.

6. High and Low Arrows in Target

A. Inconsistent finger pressure on string with each draw. Place each finger exactly in the same place on the string every time and use exact finger pressure either high or low. Too much pressure on top fingers will cause high arrows and pressure on lower fingers will cause low arrows.

B. "Rocking" bow hand back and forth in the grip, changing pressure point in the handle.

C. Maintain firm forward tension of the bow arm to avoid raising or dropping bow at release.

D. Inconsistent elevation of draw arm at full draw will change tension of fingers on the string.

E. Draw to the same anchor point each time. Any vertical shift of the anchor will change the aim of the point of the arrow. Only if a stationary string peep sight is used will "floating" the anchor be permissible because the aiming eye will sight from an exact reference point on the string.

7. Left and Right Arrows in Target

A. Watch for horizontal shift of pressure point in bow grip.

B. Be consistent in regards to exact draw length.

C. Do not fluctuate the forward tension of bow arm.

D. Do not push and pull on release. It's a lot easier to control one movement than two in coordination.

E. Do not overextend the draw to the point where there is nothing left for the forward push of the bow arm and a smooth follow-through.

F. Some reference point should be established between the aiming eye and the string at full draw. Any variation to this distance will result in a horizontal pattern. A string peep sight is an excellent aid.

G. The arrow will follow whichever way the bow is canted. To the left or right. Mounting a bubble level on the bow or the sight will greatly aid in perpendicular alignment of the bow.

8. Lower Hen Feather Fraying

A. Check nocking point. A "porpoising" arrow will cause fraying.

B. Stiff arrow. Insufficient "give" or bend will cause feather to strike arrow rest. Use a flip rest or a flexible rest such as a nylon brush or feather.

C. Improper bow grip.

9. String Slap on Bow Arm

A. Refer to bow grip. This is the major cause of excessive string slap.
B. Rolling the bow arm shoulder in too close to the line of string travel.
C. Keep the lower inside elbow joint away from the line of string travel by twisting the elbow out.
D. Opening the stance will help also.
E. Excessive thumb pressure against the side of the bow.

10. Misnocked an Arrow?

At full draw and just prior to release, the arrow nock slips out of the string and the bow is "dry fired." Also, if the nock is cracked but not completely broken, you will be unaware of this. The force of the string will complete the break and the misnock will occur. This can be a very painful experience such as a welt on the lower part of the elbow joint. Other causes of misnocking besides a cracked nock are:

A. Moving the draw fingers back and forth while at full draw.
B. Loose fitting nock on the string.
C. Nock fitting too tightly between two nocking points. The nock will pop out of the string if you use a lot of string pressure on the top finger or bottom fingers, causing the string to angle within the slot. The two nocking points, if snug against the nock, will force it out of the string. If two nocking points are used, position the lower point one-sixteenth of an inch below the nock so there is enough play to compensate for any string angle.

11. The Nock

The arrow nock is vitally important to precision shooting. The simple problem of the crooked nock is often overlooked. If you have an arrow that is consistently erratic, check for a bad nock. The effect of errors or combination of errors of form will be compounded if the nock fit is too tight. It should be just enough to allow the arrow to cling to the string without falling off.

12. String Grazing Clothing

A. Leaning away from the target too much. Stand straighter and, if need be, lean forward slightly.
B. Too much forward tension or push of the bow arm will cause the bow arm shoulder to move into the line of string travel.

13. Canting the Bow

The best cure for bow cant is to use a bowsight with a level or bubble. Bow cant causes the arrows to scatter horizontally in the target; canting right causes the arrow to go to the right; and canting left causes the arrow to go to the left. The failure to hold the bow in a straight vertical line will lead to extreme error in field shoots where angles of terrain are involved.

Archery Instruction Starts with the Dominant Eye

FRED J. SCHUETTE

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Eye Dominance Factors

The dominant eye theory and its impact on archery students and archery instruction has become an important factor in the good archery instruction programs.

From the beginning, the archery student should be taught to shoot according to eye dominance. This is imperative, whether the student is using one or both eyes. Eye dominance usually corresponds to hand dominance in about 75 percent of the population. However, the other 25 percent will have cross-eye dominance and should be taught to shoot according to eye dominance, not hand dominance. Cross-eye dominance means that for the right-handed person, the left eye is dominant. As long as the beginner closes one eye while shooting, eye dominance is not a factor. It becomes important to have previously determined eye dominance as soon as the archer tries shooting with both eyes open, whether with a sight or instinctively, or at a target or while hunting. The right-handed shooter with left eye dominance, when both eyes are kept open, will usually shoot to the left of the target and will also slowly align the left eye with the correct sight. "The dominant eye is the one used in lining up two objects; gunsight and bullseye, for example. A complex relationship between muscles and nerves and brain determine whether or not it is on the same side as the dominant hand."[1]

Another annoying part of keeping both eyes open and focused on a specific object, is that objects at other distances are blurred or doubled. The archer must learn to ignore these double images. This simply requires concentration on what the eye is focused on.

[1] James R. Gregg, *The Sportsman's Eye* (New York: Winchester Press, 1971), p. 131.

Determining Eye Dominance

The beginning archer should be taught how to shoot with both eyes open and with one eye closed. The archer should then be allowed to choose which method is best for him/her. Some archers will continue to use both methods, e.g., one eye while target shooting and both eyes when hunting.

Before equipment is even issued, eye dominance should be checked. There are several methods to determine eye dominance and one method is explained in an AAHPER publication:

> One of the simplest ways to determine this in a group is to have the students face an object, such as their target, their arms extended with open palms toward the target. Their two hands and thumbs should overlap so that there is a small opening between the two hands. With both eyes open, have the students center the bullseye in the opening made by their hands. Then have them close their left eye. Those who do not see the object in the opening with the left eye closed, should shoot left handed . . . the reason for this test is that the dominant eye will automatically align any lineal object projected in front of it. Therefore, if the left eye is dominant and the student shoots right handed, he will tend to shoot to the left.[2]

This would require the instinctive archer to aim to the right and the sight shooter to move the sight pin to the extreme left.

Another test is to place the index finger from extended arm on the center of the target. Keep both eyes open while positioning the finger. Now try closing each eye, re-positioning the finger on the target with both eyes open after each test. The test during which the finger remained on the target (when one eye was closed) was when the dominant eye was open.

For younger children, these tests are sometimes difficult for the teacher to explain or for the child to understand. In such cases, take a 3" by 5" card and poke a small hole in the center. Have the student hold the card in both hands with arms extended and place the hole over the target center, and then slowly move the card to his/her eyes while keeping the hole on the target center. He/she will bring the card hole to their dominant eye. You then can tell the student which eye is dominant and how he/she should shoot.

Who Should Abide by the Eye Dominance Test?

Often the question arises as to who should abide by the eye dominance test once dominance is established. Only those with

[2] American Alliance for Health, Physical Education, and Recreation, *Archery: A Planning Guide for Group and Individual Instruction* (Washington, D.C.: AAHPER, 1972), p. 20.

crossed dominance will be confronted with this decision but there are exceptions, such as a handicapped person or a person with poor vision in the dominant eye. Most archers, however, should be encouraged to shoot according to the dominant eye.

For an individual to suddenly find that his/her eye dominance is opposite the dominant hand, and that he/she must change the bowhand and drawing hand to the opposite side, can be a traumatic adjustment. The archer may be hesitant and unsure of performing a skill with the opposite hand.

Two factors are in the favor of the cross dominant eyed archer. First, the bow will be held in the dominant hand. This is normally the stronger of the two hands and this should be helpful in supporting the bow weight while shooting. Second, the drawing action, a push-pull action, is accomplished by using the back and shoulder muscles, not the arms, and consequently the strength required to draw the bow is not affected by the change in shooting to the opposite side.

The author has found that many of the best beginners have been cross-eye dominant shooters. Shooting according to eye dominance should pose little problem to the archery student. Understanding the effect that eye dominance has on shooting is an important part of the basic knowledge of every archery student and archery instructor.

Archery Form Analysis

PAULA PRITCHARD

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Concentration on Physical Cues

To perform correctly, the beginning archer must exhibit a high degree of concentration for there are many physical cues to which the learner must attend. For example, she needs to maintain a relaxed bow grip, a consistent draw length and continuous back tension. She also needs to be concerned about the location of her bow arm elbow, anchor point, shoulders, draw arm elbow, stance, and numerous other factors. Because these physical cues must occur either simultaneously or in close succession to one another, the beginner frequently becomes confused and somewhat frustrated. If she remembers to rotate her bow arm elbow, then she forgets to move the bow shoulder down and back. Or if she concentrates on a smooth release, then she forgets to stabilize the bow arm. The instructor should continually emphasize and reemphasize the many physical cues necessary for correct performance in an effort to develop successful, consistent archers. At times the instructor may feel that this emphasis is redundant but it is a vital part of effective instruction.

Consistent Performance

The sport of archery occurs in essentially a fixed environment, especially for the beginner, and can be classified as a closed skill. The target is stable, there are no objects moving in space to be intercepted, and the bow and arrow are the same for each shot. Since the environmental regulations are fixed in space and time, the only thing that changes from performance to performance is the actual physical movement of the archer herself. It is immediately apparent, then, that the instructor's primary goal is to encourage and facilitate steady, consistent physical performance on the part of the archer. The more quickly the beginner identifies the physical cues necessary for success and learns to reproduce them with consistency, the more rapidly she will progress toward the advanced stage of skill.

Form Analysis Worksheet

One method of helping the beginner progress toward consistent performance is through the use of a form analysis worksheet. (A

sample worksheet is provided at the end of this article). The form analysis approach provides the student with pertinent archery cues to aid learning and helps the student and teacher identify specific areas of concern. Implementation of this approach is as follows:

When should the worksheet be introduced? After most of the initial instruction has been completed (five to six lessons or two to three weeks), the worksheet should be given to the class.

How is the worksheet used? The author has found the use of a buddy system quite successful. The students work in partners and although they have their own measured arrows they share the same bow. Consequently, only one archer can shoot at a time which leaves the partner free to observe the shooter and complete the worksheet. The partners alternate shooting and evaluating each other during every end. Standing *close* to the shooter is emphasized so that the appropriate physical cues can be observed.

How long does it take to complete the worksheet? Students will need a class to a class and a half to complete it correctly.

The use of the form analysis approach promotes learning and adds variety to the class. Instead of the teacher being the sole provider of instruction and feedback, the student also becomes actively involved in the process. By observing her partner's errors, the student learns to identify those in her own performance. At the other end of the continuum, observation of her partner's correct performance acts as a form of mental practice and improves the evaluator's performance level.

Another benefit of this approach is its assistance to the instructor in identifying shooters with major problems. By inspecting the completed worksheets the teacher can easily determine which students need individualized instruction because of gross errors and arrange to provide this instruction for them.

As mentioned earlier, there must be constant emphasis by the instructor on the physical cues necessary for correct consistent performance. Both the instructor and the student may find this essential, repetitive process monotonous and boring. Use of the form analysis approach provides another way to present the same information and thus alleviate the possible monotony.

The author has used this approach for several years now and has been most satisfied with the results. Actively involving students in the learning process seems to accelerate their own individual skill as well as provide other advantages which stimulate interest and provide variety in the class. The form analysis worksheet is an excellent instructional aid which will help to create interesting, challenging and effective archery classes.

ARCHERY
Form Analysis

Name _____ Evaluator _____

	Good	Fair	Needs Work
Stance			
1. Feet straddle shooting line			
2. Side toward target			
3. Straight line across toes to target center			
4. Body erect, good posture			
5. Weight evenly distributed on both feet			
6. Knees not hyperextended			
Bow Arm and Grip			
1. Bow handle along inner side of thumb muscle			
2. Heel of hand in contact with bow			
3. Bow, held with index finger and thumb			
4. Remaining fingers relaxed around handle			
5. Archer does not squeeze bow			
6. Bow arm straight with elbow rotated away from body			
7. Shoulder down, back, and extended toward bow			
Nocking			
1. Index feather facing away from bow			
2. Arrow nocked under nock locator			
3. String in contact with first three fingers of draw hand at the first joint (from nail)			
4. Index finger above arrow nock			
5. Lack of arrow pinch between 1st and 2nd fingers			

Draw and Draw Arm

1. String pulled evenly with first three fingers
2. Draw hand relaxed and flat
3. Thumb of draw hand against palm
4. Back muscles used (shoulder blades forced together)
5. Steady, continuous draw to anchor point

Anchor

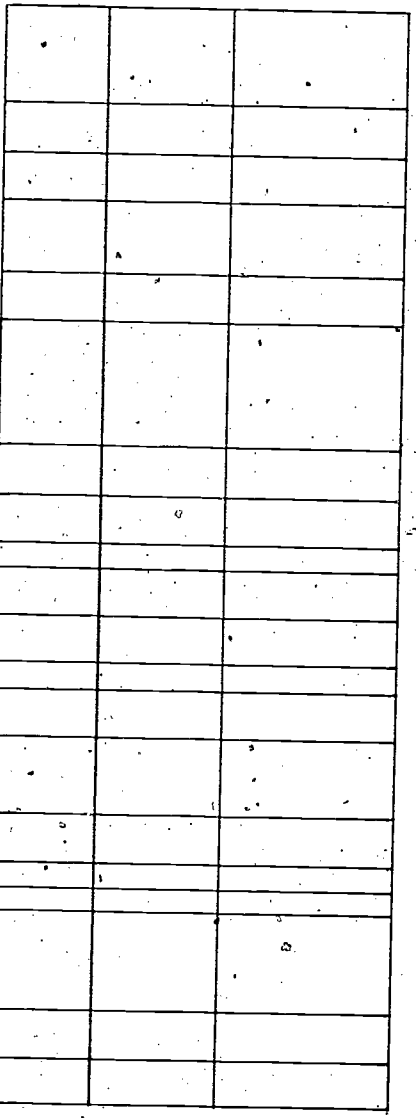
1. Index finger of draw hand contacting underside of jawbone
2. String touches center of chin, nose and lips
3. Straight line from draw fingers to elbow
4. Shoulders down and back
5. Tension and tightening in upper back
6. Mouth closed and teeth together
7. Body alignment is vertical
8. Anchor maintained till time of release

Aiming

1. Bow is vertical to ground
2. Eye closest to target is closed
3. Breath held to steady bow
4. Sight pin on gold

Release

1. Draw hand does not creep on release
2. Archer does not torque string or bow
3. Draw fingers relax simultaneously



4. Draw hand does not pluck string
5. Draw hand brushes back against neck after release
6. Bow arm held level
7. Bow rocks forward toward target
8. Archer does not peek

Afterhold

1. Bow remains at same height
2. Arms hold position until arrow hits target
3. Archer can still see sight pin on gold

Finer Points of Shooting

MARGARET F. HORN
C. R. BUD FOWKES

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Bud Fowkes was the 1972 Olympic Coach in archery when both John Williams and Doreen Wilbur won Gold Medals. He is on the NAA Board of Directors, and an NAA Instructor and Trainer.

After group instruction has been given and a degree of success attained, the archer looks to the coach or teacher for coaching on tackle and technique. This article is devoted to some tips for the advanced archer and the coach of the advanced archer.

Natural Stance

There is a natural stance for each individual archer. To find this stance, the archer should assume the stance to which she is most accustomed. Then the archer should draw, nock and aim. She should then close her eyes, keeping the body steady. After about three seconds, the archer should open the eyes and see where the sight has floated in relation to the center of the target. The archer then should move the right foot in the direction that the pin moved in relation to the center. Then the archer should repeat the operation until the pin maintains a consistent alignment with the gold.

Bow Position

In establishing the bow in the pre-draw, the archer needs to learn to set up properly so that minimal movement of the bow is necessary. The bow shoulder, arm and hand should be moved so that the pin raises up or lowers down into the gold. There should be little or no adjustment to the left or right, only vertical.

Clicker

Many archers use the clicker as an essential part of shooting tackle and technique. Instructions for learning to use the clicker can be found in the *NAA Instructor's Manual.* If the clicker is already in

use, be certain that it is positioned correctly so that it is an asset to shooting and not a deterrent. In setting up the shot, the archer should watch the arrow until the clicker moves onto the arrow point. Anchor, aim and continue drawing with the back muscles until the arrow is pulled through the clicker. The draw should be smooth and continuous all the way through the clicker until the release is accomplished.

Timing

The timing of the aim and release are important to establish. If the focus of the pin on the gold is too long, the archer tends to tense up and allow fatigue to set in. Six to eight seconds is about the extent that the eye can focus; after that, the eye needs to refocus. Most archers develop a timing for themselves with six to eight seconds being the average.

Finger Position

Theoretically, the string fingers should be placed on the string so that the "V" of the string sits on the middle finger. Problems will result if the index or ring finger pulls more than the middle finger. If either of these gets sore, a layer of adhesive tape added to the middle finger will relieve the lower or upper finger pull and help eliminate pain.

Bow Selection

A bow needs to be selected to fit the individual. A long bow being drawn by a short person will not produce the greatest potential of the bow. The energy of a bow is stored in the recurve; therefore, it is necessary to release the shot from full draw to use the stored energy. The shorter the bow, the more energy stored in the recurve, therefore the faster the shot. The longer the bow, the less energy stored in the recurve, therefore the slower and smoother the shot.

Tiller

Tiller is the distance from the bow string to where the wood tapers in the limbs. The standard tiller is usually ¼" to 3/8" less in the lower limb. Tiller needs to be checked to determine how the bow should be shot to produce the best results. If the tiller is the same in both limbs, a high wrist is used because that is the pivot point of the bow. The wrist is lower when there is less tiller in the lower limb. This applies pressure at the pivotal point of the bow.

Weight

A bow should not be heavier than the draw weight that an archer can pull and hold easily. Another consideration is mass weight. If the bow weight is too heavy other problems will creep in, such as pressuring the bow to keep it extended. This causes muscle soreness in the top of the bow shoulder.

Change

Many archers do not try any new techniques because they feel they will do worse. An archer needs to try different techniques to advance and become even better. If a new technique does not work, the archer can return to her original method. The champion is always the person who is totally aware of her goal and is willing to do what must be done to reach it.

Mental Preparation

After the archer has become adept at using her equipment and is ready for top notch competition, she must turn her attention to becoming mentally prepared. Goals need to be set; an archer can be no better than she wants to be. Any doubts about her success will produce less than her optimum best results.

The archer must practice under tournament conditions with realistic goals in mind. By recording scores, an average can be established which will give the archer an idea of her capabilities as she enters a tournament. The archer cannot expect to do better than her average even though it is possible to achieve a higher score.

Frequently an archer will tense up while shooting and try to force the bow. A bow only does what an archer does with it. She cannot force the shot but must relax and allow the bow to function naturally.

Confidence is the key to success—it is the archer's biggest asset. This applies to equipment, set-up, technique and aiming. Total concentration and confidence in herself will produce the security and relaxation needed for success.

Resources

There are several good books that can be recommended to the coach and serious archer. Margaret Klann's *Target Archery* and Lorraine Pszczola's *Archery*. A new book just released by the National Archery Association is the *NAA Instructor's Manual*. It contains much material and information helpful to the beginning coach or advanced archer. It is indeed a must for all serious archers. coaches. Others recommended books are:

Klann, Margaret. *Target Archery*. Addison Wesley Publishing Co. Reading, Mass. 01867

Pszczola, Lorraine. *Archery*. W. B. Saunders Co., West Washington Square Philadelphia, Pa. 19105

Baier, Bowers, Fowkes, Schoch. *Instructor's Manual*. National Archery Association, 1951 Geraldson, Dr. Lancaster, Pa. 17601

Three-Part Harmony

SUSAN E. HICKS
LEN CARDINALE

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This article is a composite of information gathered from Len Cardinale of Belleville, New Jersey. Mr. Cardinale is an advanced coaching instructor for the Professional Archery Association and has for several years coached Ann Butz, the U.S. women's professional champion. He is also a technical editor for the Pro Archer and Archery World magazines as well as teacher and coach of archery at Trenton (New Jersey) State College.

The tuning of your equipment in archery is actually the blending of the bow, the arrow and the archer into the most efficient unit possible. The most important ingredient in tuning is you, the archer. Your consistency of form in shooting is what allows you to take advantage of finely tuned equipment. Without consistent shooting form, the best tuning possible will still add only a minimum of points to your score. This article will present many ways to keep your bow and arrows tuned to each other and to you—it is up to you, the archer, to develop the consistency of form necessary to have good scores.

Tuning the Arrow

Arrow Length By using a training bow and measuring arrow, the proper length of arrow for the individual archer can be determined. By transferring that draw length to a bow scale, you may determine exactly how much weight the archer is actually pulling with her own bow drawn to the correct arrow length. This actual full-draw bow weight will tell the archer the correct spine of the arrow she should use.

Arrow Spine The spine of an arrow is its flexibility in relation to the push of the bow. While arrows may be made of wood, fiberglass or aluminum, only aluminum arrows allow adjustment of spine by changing either the diameter of the arrow or the thickness of the shaft walls. Another plus for aluminum arrows is that they are

made with only one pound of variance in a dozen where fiberglass arrows may have three pounds and wooden arrows, five pounds of variance. (i.e., the amount of pressure in pounds, necessary to deflect an aluminum arrow the correct amount for its given spine will be the same, or one pound more or less, in any dozen aluminum arrows while with fiberglass arrows the pressure could vary three pounds and with the wooden ones, five pounds).

When an arrow is released, the source of power for the push is the bow. Because the archer (source of the pull and initiator of the push) is not directly behind the string (pushing agent), we have what is known as the "archer's paradox." In this phenomenon, the arrow simply bends around the bow on release and straightens out on its way to the target. An arrow which is too stiffly spined for the archer's bow and draw will slap into the arrow plate when shot, causing the back end of the arrow to drift to the right (for the right-handed archer). An arrow which is too weakly spined for the archer's bow and draw will not contact the arrow plate with sufficient force and will drift to the target with the nock end to the left.

To test the spine; have the archer shoot several bare shafts at a solid target from a distance of five to seven yards. If the arrow nocks are to the right of the point of impact, you know the arrows are too stiffly spined; if they are to the left, they are too weakly spined. Be sure to use a bare shaft as the fletching will act to stabilize the shot and may cover up an incorrect spine.

An arrow which is too weakly spined for the archer can be shortened, provided this is safe, to give it some added spine. If the arrow is too stiffly spined the addition of weighted points can decrease the spine slightly. The arrows are adjusted to the correct spine when a bare shaft can be shot and the nock is in direct line with the point of entry.

Tuning the Bow

Bowstring. The number of strands in the archer's bowstring is determined in relation to the weight of the bow. The chart below indicates the appropriate number of strands in the string for the given weights of bow.

Weight of Bow		# of Strands
20-30		8
30-38		10
38-45	(Dacron V-48	12
45-55	string)	14
55-80		16

The bow may be tuned to give faster arrow flight by decreasing the number of strands in the string, but be sure you do not decrease the string so many strands that it cannot handle the power of the bow because this will result in string breakage. Conversely, using a string with more strands than necessary will result in a slower shot that will be much more smooth and stable.

Bracing Height — Bow manufacturers recommend strings of a certain length (usually 4" shorter than bow length) for their bows, giving the archer automatically the proper bracing height for her equipment. The archer should follow the manufacturer's recommended bracing height, which is usually 7½" - 9½". If the archer needs to buy a replacement or extra string, she should remember that all string packages are now marked by the length of the bow. Therefore, if you have a 66" bow, when you buy a new string, get a package marked 66"; the string inside is the correct length to fit your 66" bow.

The archer who wishes to make her bow shoot faster may lower her bow's bracing height by using a slightly longer string or untwisting the string slightly. While this speeds the shot, it also lessens the stability of the shot. For the archer who wants a slower, more stable shot, raise the bracing height slightly by twisting the string 10-15 times (no more).

Nocking Point — Using a bow square, the initial nocking point should be fixed on the string with adhesive tape perpendicular to and 1/8" to above the arrow rest. To adjust this nocking point, shoot several arrows, using a bare shaft, at 5-7 yards. The vertical position of the arrow nock will help you adjust the height of the nocking point. If the nock is above the point of arrow entry, then the nocking point is too high and should be adjusted slightly downward on the string. On the other hand, if the nock is below the point of entry, the nocking point is too low and must be raised. Adjustments should be made until the nock is even with the entry point of the arrow.

Adjustable Side Pressure Points — These are designed to give a cushioning effect to the arrow when it pushes against the arrow plate. This concept has been brought to light throughout the archery world by the almost universal use of the "Berger button" for tuning. This adjustable side pressure point literally removes some of the bend from the arrow, enabling it to fly straighter. It provides a surface of contact for the arrow backed by a spring which gives when the arrow pushes against it. Just as the rebound of a ball is softened when it is thrown against foam rubber rather than stone, so the bend in the arrow is modified by the "give" in the side pressure point. For the archer having release problems, this device can be very helpful, and for any archer who seeks adjustability in his equipment,

using the adjustable side pressure point is a vital necessity. The point can be adjusted to give more or less resistance to the arrow, making it possible to tune the bow to different sets of arrows the archer may have.

Stabilizers — The stabilizer's function, as the name implies, is to make the bow more stable during shooting. It accomplishes this by adding mass weight to the bow and therefore reducing movement. The added weight, however, requires the archer to have more strength to control the movement of the sight. An archer must experiment with various weights and positions for stabilizers until she finds the combination giving the most stability while enabling good sight control. Generally, the stabilizer is placed out in front of the bow, but stabilizers on the back of the bow are also common. The archer's personal preference should determine weight and location of stabilizers.

While a stabilizer with a solid base will take some of the movement out of the bow, a stabilizer with a flexible base will remove even more motion, but, as was previously stated, it will make it harder for the archer to control the sight.

The Archer

Consistency of form by the archer is the key to effective tuning. Equipment can be more finely tuned to the archer whose style and shooting techniques are as consistent as possible. While an inconsistent archer would probably improve scores with well-tuned equipment, it is no panacea to bring her within range of the highly skilled and consistent archer. And what is the key to tuning an archer? Practice, patience, willingness to learn, and more practice to attain the consistency necessary to use fine tuning to her best advantage.

Fletching: An Interview with Charles E. Pierson

MARY BUSSER

Mary Busser has taught physical education in elementary, junior high and senior high school. She is presently at Western Hills High School in Cincinnati and is on the staff of Teela Wooket.

Charles E. Pierson is a former flight champion and hunter. He is a director of the Teela Wooket Archery Camp and owns Pierson's Archery Shop and Lanes in Cincinnati, Ohio.

Have you ever wondered about the feathers on an arrow? From the day I bought my first set of arrows I have wondered why there are four feathers on each shaft instead of the normal three. When I had the opportunity, I asked Charlie Pierson some questions and the following article was formulated from his explanations.

Fletching can be defined as a drag which provides the guidance necessary for true flight. If an arrow is shot perfectly, no guidance system is necessary. With modern tournament equipment, a bare shaft can be shot true to the bullseye; but since a perfect arrow rarely is shot, a guidance system becomes necessary.

A guidance system on an arrow is the attachment of any material that will produce drag on the rear of the arrow. These materials are feathers, plastic and formed plastic. When plastics are used, they can be solid or feather-like. The number of guiding surfaces can vary from one to six.

There are three factors that determine the amount of fletching: the weight of the bow, the length of the arrow, and the distance shot. Therefore the heavier the bow, the longer the arrow, the shorter the distance determine the amount of drag that is necessary.

For an arrow to use all of its energy properly it must fly absolutely straight. But since the arrow rarely leaves the bow in a straight line, some drag is necessary to produce good flight.

Hunting arrows are genetally shot from heavy bows and have 15 to 18 inches of total feathers (fletching). The most popular fletching for hunting arrows is three feathers 5 to 5½ inches long. Four fletching is becoming more popular because the arrow can be nocked either direction, whereas with three fletch the cock feather must be placed out to insure good flight.

For the fletching to perform properly the arrow must be able to pass the bow without interference, as interference would cause deflection from the arrow's true course. Also to be taken into

consideration is the nocking point on the string. High speed movies have shown that when the arrow is released from full draw, the nock end of the arrow will fall ¼ to ½ inch because of gravitational forces. Therefore when the arrow is placed on the string, it should always be nocked about ¼ inch higher than horizontal. Also, if the bow being used does not have an arrow rest and the arrow rests on the shooter's hand, the nocking point must be higher so the arrow will pass completely free of the hand.

As stated before, the number of fletchings on an arrow can vary from one to six. It is possible to use one feather if the spiral completes 360 degrees. Many American Indians used two feathers with a high degree of spiral (wraparound). Most arrows have three have 3-inch feathers because lighter weight bows are used, but four, five and six feathers can be used. The maximum number is limited only by the diameter of the shaft. As the number of fletchings increase, the length of the fletch decreases, but the total amount of fletch on the arrow will remain about the same.

Types of Fletching

Feathers are the most popular type of fletching used today. Turkey pointer feathers (flight feathers) are the most common. Since the bird has both right and left wings there are right and left fletchings. Feathers naturally grow in a curve not flat, and the curve produces a natural rotation when the arrow is shot. The amount of desirable rotation is determined by the shooter. The more spiraled the fletching, the more rotation is produced and this places more drag on the arrow. With more drag, the arrow will travel less distance but will return faster to a straight flight pattern. By creating higher rotation, the arrow will straighten more quickly and shorter distances can be shot accurately. (In big game hunting, the arrow must be flying straight to be able to strike with its full energy force.) The tournament archer shooting 50-70 meters has a greater distance in which the arrow can recover. Thus, the fletching (drag) can be much smaller.

Plastic While feathers are the most widely used fletching material in archery today it is only because they are cheap and easy to apply. When plastic feathers are used, a thin sheet of plastic is substituted for the feathers. This smoother surface reduces the air resistance and produces less arrow drag which causes a higher flying arrow. When you reduce the drag, you reduce the guiding power. It should be noted that if the hand is contacted by the forward moving plastic fletch (vane), the hand will be cut by the vane. A special arrow rest must be used that permits unhibited passage of the fletching.

There are also corrugated types of plastic fletchings which try to mulate the texture of a feather. These types are more suitable for

hunting and situations that need a higher drag ratio. The newest form of plastic fletching is a pre-shaped, thin, mylar sheet which is shaped to create an aerodynamic function that produces a more stable and accurate flight of the arrow. This vane requires a special arrow rest so that there is no interference on release.

Plastic fletching is not recommended for physical education classes. If you have competitive shooters, plastic should be considered. Feathers are affected far more by wind, and plastic has proved more stable in the wind. Drift is reduced by using plastic when shooting outdoors.

Repair of Arrows

Repair of arrows is very important in that the same type of adhesive must be used as the finish on the arrow. Household cement has a nitro-cellulose base and is used on all arrows with a lacquer finish. A nitro-cellulose finish is not completely waterproof but is very brilliant in color and has been widely used in the past. Today many manufacturers are changing to vinyl finishes which are completely waterproof but lack the brilliance of a lacquer. One way of identifying a lacquer finish is by its brilliance. Look for chips in its finish, as lacquer becomes brittle with age. Vinyl is tough and does not flake off. If you are in doubt as to what kind of glue to use place a droplet on the finish, let it dry and then test its ability to stick.

There are two standard fletching shapes:

1. Parabolic cut which is a continuous curve.
2. Shield cut which is relatively straight up and down.

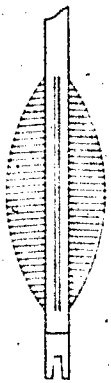


Figure 1. Parabolic fletching.

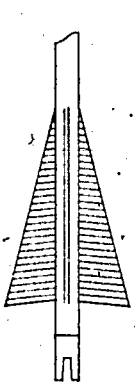


Figure 2. Shield fletching.

A feather with more area creates more drag, thus the shape design determines the amount of drag.

When fletching, it is important that the leading edge of the feather be blended into the arrow shaft. If there is a blunt edge present, when the edge comes into contact with the archer's hand the feather can cut. The loss of the leading edge of the feather is relatively unimportant because 80 percent of the guidance is performed by the last third of the feather. Therefore, it is not necessary to refletch an arrow until the feather loss causes it to fly out of the group (inaccurate). The life of a feather can be prolonged if a coating of glue is applied to the feather's leading edge to prevent it from lifting away from the shaft.

If you do your own refletching consider these things:

1. Natural colored feathers have a longer life than dyed feathers. Feathers dyed black have the poorest durability.
2. Costs can be cut by buying feathers in amounts of 100's rather than by dozens.
3. If nocks must be replaced, try the new Bjorn arrow nock. The Bjorn nock clips tightly on to the string and holds the arrow in this nocked position until released. These nocks are stronger, thus safer.

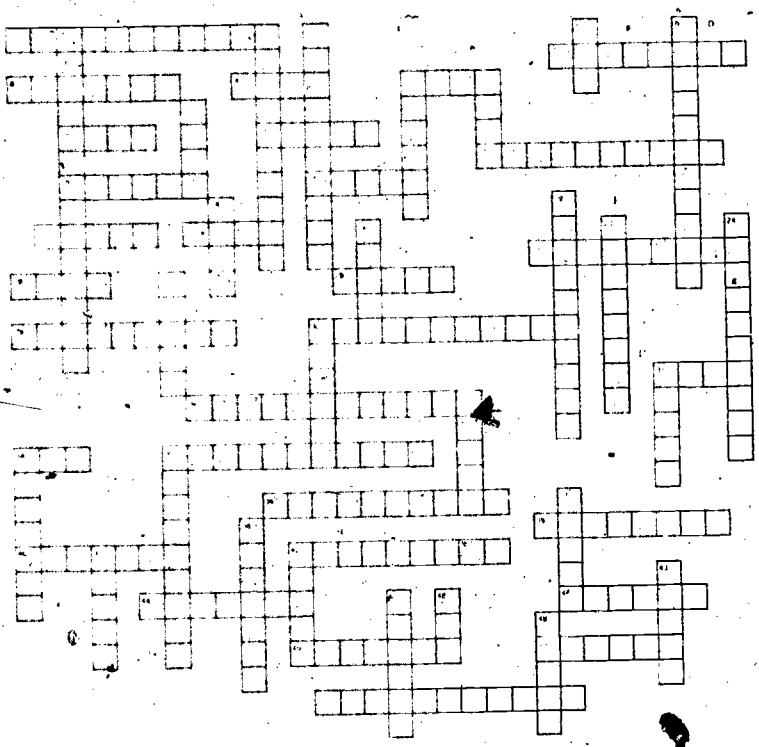
At this point I had to stop Mr. Pierson. I had writer's cramp but he could have gone on and on. It is fascinating talking to an expert. He answered my questions, and I hope we have answered some of yours.

Field Archery Crossword Puzzle

SUSAN E. HICKS

See page 54 for a brief biographical sketch.

Archers are unique people, and archery has always fostered its own unique terminology. The terms in this crossword puzzle come from field archery and the novelty kinds of archery which use field style shooting for their basic form. Good hunting!



ACROSS

1. The field archer's method of aiming after the draw (3 words)
7. _____ Field Archery Association
8. 20 points in one end!
9. The higher point value on a field target
10. An archery shooting step, after the string is released
13. Bjorn, mid, mycro
14. The lower point value on a field target
15. For an archer to_____ the_____, all his fingers are below the nocking point
16. Position of archer's feet during shooting
17. One color on a field archery target
20. The other color on a field archery target!
21. One possible position for the archer's feet.
25. Device used to hold arrows at waist level (2 words)
26. To tilt your bow
28. The shooting of a set number of arrows at various distances
29. The stabilizing feathers or vanes attached to an arrow between the nock and crest
30. Hand position at full draw (2 words)
31. The speed a bow gives to the arrow
32. ___ ___ under, another name for 15 across (2 words)
34. Straight limb, recurved, semi-recurved
35. This device keeps vines, trees, etc. off bow limbs (2 words)
36. Disguise for a hunter
39. Inability to shoot upon sighting a target
40. A flying cardboard target
42. An archer using a bowsight is classified as what kind of shooter?
44. The tips on this bow bend away from the archer
47. In this end, arrows are shot from distances progressively closer to the target (2 words)
49. Groups of hunters use this technique to flush out game
50. _____ is to the archer as "fore" is to the golfer
51. An archery game from tee to green! (2 words)

DOWN

2. This device keeps the bowhunter's string quiet (2 words)
3. At this distance, if the archer aims the point of the arrow into the center of the target, that's where the arrow goes! (2 words)
4. The field archer's method of aiming before drawing (3 words)
5. Finger protection device
6. An aiming method relying solely on the archer's judgment
10. A type of field round, and a type of target face
11. To pull the bowstring back to anchor point

12. The point of the arrow
18. Alternate term for target center
19. A modified indoor hunting round (2 words)
22. Another finger protection device
23. A short distance calling device for small game
24. The path of the arrow in flight
27. Hiding place for an archer – hunter
30. The type of arrow shot at 40 across (2 words)
31. Markings which identify your arrows
33. This keeps you from dropping your bow after release
34. Shooting without a sight on your bow
35. A sharpened, bladed arrow used in hunting
37. "I shot an _____ into the air"
38. This is an angled shot at a flying object
41. A dull-tipped arrow used for small game
42. This puzzle is about _____ archery!
43. Protection for your bow arm
45. A type of shooting done for distance only
46. An Irish dance, or a device used to put feathers on arrows
48. To track game

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ANSWERS TO CROSSWORD PUZZLE

Across

1. Post Draw Gap
7. National
8. Perfect
9. Five
10. Hold
13. Nock
14. Three
15. Walk, String
16. Stance
17. White
20. Black
21. Open
25. Hip Quiver
26. Cant
28. Round
29. Fletching
30. Field Anchor
31. Cast
32. Three Fingers Under
34. Bow
35. Brush Button
36. Camouflage
39. Freezing
40. Bowbird
42. Freestyle
44. Recurve
47. Walk-up
49. Driving
50. Timber
51. Archery-Golf

Down

2. String Silencer
3. Point Blank
4. Pre Draw Gap
5. Tab
6. Instinctive
10. Hunter
11. Draw
12. Pile
18. Spot
19. Flint Round
22. Glove
23. Squeaker
24. Trajectory
27. Blind
30. Flu Flu
31. Crest
33. Sling
34. Barebow
35. Broadhead
37. Arrow
38. Quarter
41. Blunt
42. Field
43. Guard
45. Flight
46. Jig
48. Stalk

Importance of Body/Target Alignment and Aiming to Archery Accuracy

Two Self-testing Activities

JOYCE GRAENING

Joyce Graening is an instructor of physical education at the University of Arkansas, Fayetteville. She holds B.S., M.S., and E.D.S. degrees from Eastern Kentucky University, Richmond, and an instructor's rating from the American Archery Council. Currently she is teaching archery in the basic instruction program.

The basic techniques of bow shooting have been itemized as stance, nock, draw, anchor, aim, release, and follow-through. The first essential for success in archery is the maintenance of an erect, well-balanced stance. A critical factor in the stance appears to be proper body alignment in relation to the target. Duplicating this position for every shot at the same distance enhances consistency and accuracy. The second essential for success in archery is definite aiming—the ability to perceive and establish an exact target—which enables an archer to be more accurate and consistent in arrow placement.

The following two self-testing activities are fun for a change of pace in any archery class after the basic skills of aiming and shooting have been mastered. They also allow the student a different method of practicing body/target alignment and aiming.

Aiming Self-Test

This activity enables the student to practice his aiming techniques through changing the point of aim. Each student shoots consecutively at two targets and the bullseye, which are aligned vertically with the bullseye one above and one below on a 48-inch target (Figure 1). The two supplementary targets are placed on the black scoring ring, their base on the line dividing the black and white rings. Green metallic wrapping paper can be used for the small targets because it shows up well on the target face. These targets are the same size as the bullseye and measure 9-3/5 inches.

Rules of the Game. Each student begins shooting in vertical order, from top to bottom (from the 15-yard line). Shooting continues on a given target until it is hit, before students are permitted to progress

in order to the next target. The score is the sum of arrows required to hit the three target areas in order.

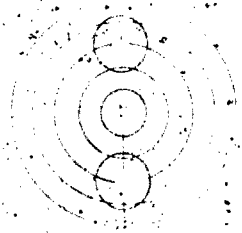

Figure 1. Floor plan for the aiming self-test.

Body/Target Alignment Self-Test

This activity requires that a person change his body alignment each time an arrow is shot to maintain proper body/target alignment. Initial starting floor position does not change, but rather body alignment with the target is shifted with each shot.

Rules of the Game. Each student shoots six consecutive arrows alternately at three 48-inch targets arranged in a semicircular pattern

(Figure 2). Targets 1 and 3 are separated by a distance of 11 feet from target-center to target-center on either side of Target 2. The student shoots from a static position directly in front of Target 2 and 15 yards away from each of the three targets. The targets are numbered 1, 2 and 3 beginning with the target on the left when facing the range at the shooting line. The first arrow is shot at Target 1, the second at Target 2, and the third at Target 3. The same shooting pattern is repeated for arrows four, five and six. Total scores for the six arrows are then tabulated. The author uses the average of two trials as the recorded score.

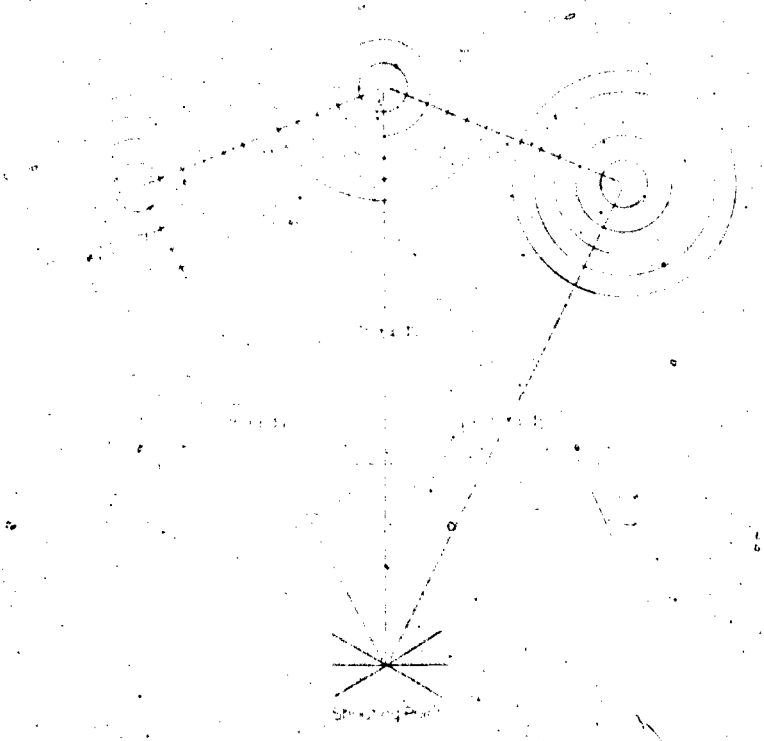

Figure 2. Floor plan for the aiming self-test.

Archery Spelling Race

JENNIE G. AZHDERIAN

Jennie Azhderian received the B.S. degree from Northwestern University, Evanston, Illinois, and the M.A. degree from the University of Maryland, College Park. She has taught health and physical education in the following schools in Maryland: Indian Head Junior High School, Lackey Senior High School, Poolesville High School, Wheaton High School, and Julius West Junior High School. Jennie is presently chairperson of the physical education department at William Farquhar Middle School in Olney, Maryland.

1. *Objective:* To have students demonstrate accuracy in spelling words related to archery through game experience.
2. *Equipment:* Minimum of two sets of alphabet (Flash) cards are used. Approximate size of cards is 4" x 5". The following letters are one (1) card each: B, C, D, F, G, H, I, M, N, O, Q, S, U, V, W, Y. Letters with two cards each are: A, E, R, T.
   List of terminology is: archery, arm guard, target, quiver, finger tab, bow, arrow, and string. (Many other archery terms can be added. If so, other letter cards will have to be included.)
3. *Participants:* Number is flexible approximately seven participants in each team. Difficulty of the terms used would depend upon the grade level of participants.
4. *Organization:* Each team is given a set of cards. The order of "racers" for each team is designated by the teacher. Each team sits in a circle on the floor at a given point and assembles all the cards before everyone in the group. When the teacher requests a word, everyone helps gather the cards and hands them to the "racer", who then runs to a point in front of the teacher and spells the word correctly before the opponent does. The team that spells the word correctly first receives one point. When another word is announced, another "racer" receives the cards and runs to spell the word, etc. All words are spelled or the game ends as time for play runs out. The team with the highest number of points is the winner. No set time is suggested; it will vary with each situation.
   This game can be applied to any subject or sport.

Annotated Archery Bibliography

RUTH LOUISE LESTER

Ruth Louise Lester received her B.S. degree from the University of Louisville (Kentucky), her Master of Education degree from Temple University, Philadelphia, and her doctorate in physical education from Indiana University, Bloomington. She is currently teaching and coaching at DePauw University, Greencastle, Indiana.

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Archery Visual Aids

MARGARET F. HORN

Margaret Horn is an assistant professor and coach at Madison College, Harrisonburg, Virginia. In the NAA College Division she is state chairman, chairman of the Eligibility Committee, and a past member of the Collegiate All-American Nomination Committee.

Prices listed are subject to change. Numbers in parentheses refer to film distributors listed.

Archery. 8mm, set of 4 color loop films. Sale $24.95 each, set $90.80. Basic skills: nock, anchor, release, aiming pre-gap method, aiming sight method. (3)

Archery Fundamentals. 16mm, sound, color. Sale $120, rent $6.50. Basic knowledge about shooting equipment, proper methods of choosing and using it, and safety measures together with tips that will increase enjoyment and achievement on the archery field. (3)

Archery Right On. 12 min., 16mm, sound, color. Rent $5, free to schools. Introductory look at archery from caveman days up to 1972 Olympics where the U.S. won both men's and women's gold medals. Covers target, field, and bow hunting. (4)

Archery Today. 22 min., 16 mm, sound, color. Rent $10. A hunting safety film showing all factors of archery and hunting safety including proper equipment, how to build blinds, climbing to a tree stand, and shooting at deer. (4)

Fins, Feather and Fur. 25 min., 16mm, sound, color. Rent $10. Fast paced film of off-season sports for adventurous bowmen. Winter bow fishing for stingrays off the Florida Keys and alligator gar in southern rivers, hunting pheasants in the fall harvest and hunting bobcat in a Northern winter. (4)

Men's Archery or *Women's Archery*. 8mm, set of 3 loop films, color. Sale $22.95 each. Hardy, Ward and Doreen Wilbur demonstrate stance, nocking, draw, aim, hold, release and follow-through. (2)

Return to the Olympics. 16mm, sound, sale $200, rent $5. Graphic display how both fledgling and veteran archers prepare themselves to compete in the Olympic Games, the U.S. Intercollegiate Championships or the U.S. team tryouts. (1)

Steps to Gold. 16mm, sound, color. Rent $5. Demonstration by John Williams, 1972 Olympic Gold Medal Winner, of the seven basic steps to archery success which give pointers in both freestyle and instinctive methods of shooting. (5)

Film Distributors

(1) American Archery Council, 618 Chalmers St., Flint, MI 48503.
(2) Athletic Institute, 705 Merchandise Mart, Audio Visual Dept., Chicago, IL 60654.
(3) BFA Educational Media, 2211 Michigan Ave., Santa Monica CA 90404.
(4) Grayling Film Service, Rural Route 1, Grayling, MI 49738.
(5) Wing Archery Division, Route 1, Jacksonville, TX 75766.

OFFICIAL RULES FOR ARCHERY TOURNAMENTS

RULE 1. TARGET ARCHERY ROUNDS

Target competition can be based on either individual or team scores. Any one of the rounds may be used for individual or team competition. The rounds are

Men's FITA Round	*Ladies FITA Round*
36 arrows at 90 Meters	36 arrows at 70 Meters
36 arrows at 70 Meters	36 arrows at 60 Meters
36 arrows at 50 Meters	36 arrows at 50 Meters
36 arrows at 30 Meters	36 arrows at 30 Meters

The size of target faces used at 90, 70 and 60 meters is 122 centimeters in diameter (48 inches).

The size of target faces used at 50 and 30 meters is 80 centimeters (31.5 in.)

Junior Metric Round	*Cadet Metric Round*
36 arrows at 60 Meters	36 arrows at 45 Meters
36 arrows at 50 Meters	36 arrows at 35 Meters
36 arrows at 40 Meters	36 arrows at 25 Meters
36 arrows at 30 Meters	36 arrows at 15 Meters

The size of the target faces used at 60 and 50 meters in the Jr. Metric Round is 122 centimeters (48 inches).

The size of the target faces used at 40 and 30 meters in the Jr. Metric Round is 80 centimeters (31½ inches).

The size of the target faces used at 45 and 35 meters in the Cadet Metric Round is 122 centimeters (48 inches).

The size of the target faces used at 25 and 15 meters in the Cadet Metric Round is 80 centimeters (31½ inches).

The target faces (122 and 80 cm) are divided into 5 color zones of equal width. The colors from the center out are yellow, red, blue, black and white. Each color zone is divided into 2 scoring zones of equal size. The number of points scored for each zone from the center out is 10, 9, 8, 7, 6, 5, 4, 3, 2, 1.

Arrows are scored in groups of 6. A perfect score for 144 arrows is 1440.

Conversion Table

90 meters equal 98 yards, 1 foot, 3 inches.
70 meters equal 76 yards, 1 foot, 8 inches.
60 meters equal 65 yards, 1 foot, 10 inches.
55 meters equal 60 yards, 5 inches.

Official Tournament Rules and Regulations for the International Archery Federation and the National Archery Association of the USA are available at $3.50 each from the NAA office, 1951 Geraldson Drive, Lancaster, PA 17601.

50 meters equal 54 yards, 2 feet.
45 meters equal 49 yards, 7.7 inches.
35 meters equal 38 yards, 9.9 inches.
30 meters equal 32 yards, 2 feet, 5 inches.
25 meters equal 27 yards, 2 feet, 7.4 inches.
15 meters equal 16 yards, 1 foot, 2 inches.

3. *900 Round — Men and Women*
30 arrows at 60 yards, 30 arrows at 50 yards, 30 arrows at 40 yards. Arrows are scored in groups of 6. A perfect score for 90 arrows is 900.

The target face is 48 inches (122 centimeters), divided into 5 color zones of equal width. The colors from the center out are yellow, red, blue, black and white. Each color zone is divided into 2 scoring areas of equal size. The number of points scored for each zone from the center out is 10, 9, 8, 7, 6, 5, 4, 3, 2, 1.

4. *Junior 900 Round*
30 arrows at 50 yards, 30 arrows at 40 yards, 30 arrows at 30 yards. Arrows are scored in groups of 6. A perfect score for 90 arrows is 900.

5. *Cadet 900 Round*
30 arrows at 40 yards, 30 arrows at 30 yards, 30 arrows at 20 yards. Arrows are scored in groups of 6. A perfect score for 90 arrows is 900.

6. *James Douglas Easton Round*
20 arrows each at 60 yards, 50 yards, 40 yards. The size of the target face is 48 inches (122 cm) in diameter divided into 5 color zones of equal width. The colors from the center out are yellow, red, blue, black and white. Each color zone is divided into 2 scoring zones of equal size. The number of points scored for each zone from the center out is 10, 9, 8, 7, 6, 5, 4, 3, 2, 1.

Arrows are scored in groups of 4. A perfect score for 60 arrows is 600 points.

7. *Junior Columbia Round*[1]
24 arrows at 40 yards, 24 arrows at 30 yards, 24 arrows at 20 yards. Arrows are scored in groups of 6. A perfect score for 72 arrows is 648.

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[1]Not official rounds of NAA

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8. *Columbia Round*[1]
24 arrows at 50 yards, 24 arrows at 40 yards, 24 arrows at 30 yards. Arrows are scored in groups of 6. A perfect score for 72 arrows is 648.

9. *Scholastic Round*[1]
24 arrows from 40 yards and 30 yards respectively.

10. *Junior Scholastic Round*[1]
24 arrows from 30 yards and 20 yards respectively.

11. *Range Round*[1]
60 arrows from a single distance — either 50 yards, 40 yards, 30 yards or 20 yards on regulation targets.

12. *Miniature Round*[1]
60 arrows from 15 yards on a 2-foot target scaled to the same proportions as the regulation target.

RULE 2. EQUIPMENT

Section 1. Targets shall be
a. In sufficiently good condition so that arrows will not pass through them.
b. Set on standards of soft wood.
Note: Targets of baled straw may be built up from the ground and not placed on a standard.
c. Placed on a straight line parallel to the shooting line and set so that the centers of the golds are 51 inches from the ground.[2]
d. Slightly tilted back at the top.
e. Securely anchored so that they will not be blown or pushed over.
f. Numbered or lettered.
g. Covered with a face in sufficiently good condition so that there will be no question as to the value of hits.
h. Separated by at least 10 feet, center to center, preferably 15 feet.

Section 2. The outdoor range shall be —
a. Level and sodded with grass closely cut; there must be sufficient

[2] This rule must be complied with in championship events. For events other than championship, two centers of the golds need not be within the stated tolerances.

area back of the targets for arrows that miss the targets to land safely.
b. Free from obstruction in line with the flight of the arrow.
c. Clearly marked with lines showing accurate distances from the target at which archers are to shoot. These lines must be parallel to the targets.
d. Roped off at least 10 yards back of the shooting line and at the sides to keep spectators from the shooting area.
e. Clear of obstructions on the shooting line. *Note.* Archers may use a ground quiver while they are shooting.

Section 3. The indoor range shall have a backdrop to protect the arrows that miss the target. (See also Section 2b, c, d and e of Rule 2 above.)

Section 4. Archers Equipment (See Target Archery Rules of Shooting, Article 703.)

RULE 3. OFFICIALS AND THEIR DUTIES

Section 1. Field Captain (See Target Archery Rules of Shooting, Article 704.)

Section 2. The Field Captain is the official presiding over the archers on one targets. The Captain is selected by that particular group of archers and normally is the first in the order of assignment. Duties are:
a. To see that each archer shoots in turn.
b. To settle all local questions. *Note:* Appeals concerning decisions may be made to the Field Captain, whose decision is final.
c. To draw the arrows from the target and announce their values to the scorers. (See Rule 6.)
d. To call Field Captain who shall (1) witness perfect ends and (2) make decisions on debatable questions.
e. To take an archer's place on the shooting line in the event of an unavoidable delay such as may occur when a bowstring breaks or other accident to equipment occurs. (See Rule 5.)

RULE 4. DEFINITIONS OF TERMS

Section 1. An end shall represent six arrows shot consecutively by an archer. (A perfect end is an end of six consecutive shots that hit gold.)

Section 2. A range is a term which applies to shooting a given number of ends from any one of the given distances in a round. Range score is the score for that range (or distance).

Section 3. A round is a term which applies to shooting a given number of consecutive ends (a range) from more than one given distance.

Section 4. Gold — the highest scoring area on the target face located in the center.

Section 5. Double scoring system — a system requiring two people to record the same scores on one target; they check with each other, ensuring accurate scoring.

Section 6. Double round — shooting the same round twice.

RULE 5. TOURNAMENT REGULATIONS

Section 1. The hostess club shall —

a. Notify guest archers and teams of (1) the rounds to be shot, (2) date registrations are due and (3) the date and time of the tournament. *Note:* If the match is a telegraphic or mail meet, the hostess club must announce the date scores are due.
b. Make target assignments in the order registrations are received. (See Rule 5, Section 2.)
c. Prepare the shooting field as described in Rule 2, Sections 1, 2 and 3; provide a whistle, scorepads and pencils.
d. Engage the official.
e. Send results of the tournament to all clubs participating in mail or telegraphic meets.

Section 2. Order of shooting

a. It is recommended that no more than two people shall shoot at the same time on one target, in which case each stands on the shooting line one pace to either side of a perpendicular from the gold.
b. Where the archers on a target are shooting in turn, it is customary for each archer to shoot three arrows and then yield her place to her target mates, and then in her turn shoot the other three arrows. If in the opinion of the field officials there is good reason, they may request archers to shoot six arrows at a time.

2. Archers shall shoot in the order their names appear on the score-card.

Section 3. An archer shall stand so that she has one foot on each side of the shooting line. She shall also stand a minimum of 18 inches from the center of the target lane or a minimum of 18 inches from the boundaries.

Section 4. Shooting for each end begins at the signal from the field captain's whistle. At the completion of each end, the whistle is the signal to go to the targets to score.

Section 5. When not shooting, archers must stay at least five yards back of the shooting line.

Section 6. A round which required shooting from more than one distance is started from the greatest distance, after which archers move toward the targets to shoot from the next distance.

Section 7. Any attempt to annoy or confuse another archer is unsportsmanlike. If after a warning from the field captain the archer persists in being annoying, she may be disqualified by the field captain.

Section 8. An arrow leaving the bow shall be deemed shot if the archer, while standing where she has been shooting, cannot reach it with her bow.

Section 9. If for any reason an archer cannot take her place on the shooting line, and she has some arrows yet to shoot for that end, the target captain shall stand in her place to aid the field captain in determining when to blow the whistle.

Section 10. Shooting shall be stopped at any time upon four or more blasts from the field captain's whistle.

Section 11. The whole round must be shot in no more than two sessions to be counted as an official score. (It is to be understood that there is to be no practice between sessions or before the second part of a round.)

Section 12. In case an arrow hits the target and hangs down across the face, thus being in danger of getting hit by another shot, the field captain shall sound four blasts on the whistle to stop all shooting and will see that the arrow is placed securely into the target where it hit.

Section 13. While an archer is on the shooting line, she shall receive no assistance or information, by word or otherwise, from anyone.

Field glasses, telescopes and other visual aids may be used between shots for spotting arrows.

Section 14. Foot markers may be used and left on the shooting line during the round provided they are embedded in the turf and do not extend more than ½ inch above the ground.

RULE 6. SCORING

Section 1. The double scoring system shall be used. A sample score-sheet is shown on page 81.

Section 2. Arrows in the official standard NAA five-colored target face shall be evaluated from the center out as follows: 10, 9, 8, 7, 6, 5, 4, 3, 2, 1 points.

Section 3. An arrow that cuts through two colors is given the higher value.

Note: An exception occurs when the target face or arrow has been touched before a decision has been made, in which case the arrow shall receive the lower value.

Section 4. Unless all arrow holes are suitably marked on each occasion when arrows are scored and drawn from the target faces, arrows rebounding or passing through the target face when witnessed by another competitor or a tournament official shall count 7 points when the scoring is 10, 9, 8, 7, 6, 5, 4, 3, 2, and 1; 4 points when the scoring is 5, 4, 3, 2, and 1.

Section 5. An arrow embedded in another arrow on the scoring face shall score the same as the arrow in which it is embedded.

Section 6. Arrows must remain untouched until withdrawn by the target captain or her deputy in the presence of the scorers. Arrows withdrawn otherwise shall not be counted.

Section 7. Scoring and drawing shall be witnessed by all archers shooting on the target.

Section 8. In case a target falls over during an end, the archers on that target shall shoot the end over again.

RULE 7. SAFETY RULES

Section 1. Always remember that the bow and arrow is a deadly weapon and conduct yourself accordingly at all times.

Name	Audrey Bullett	Mary McEwen	Joan Lord	Nancy Hoag
Round	Jr. Col. Round	Jr. Col. Round	Jr. Col. Round	Jr. Col. Round
Date	May 20, 1974	May 20, 1974	May 20, 1974	May 20, 1974

Audrey Bullett

At	Hits	Score
40 yds		
9 7 7 7 5	5	35
9 7 7 7 7 5	6	42
9 7 7 7 7	5	37
9 9 7 7 7 7	6	46
30 yds.		
9 7 7 7 7 5	6	42
7 7 7 7 7 5	6	40
9 9 9 9 5 5	6	46
7 7 7 5 5 5	6	36
20 yds.		
4 9 9 9 7 7	6	50
9 9 9 9 9 9	6	54
9 9 9 9 9 7	6	52
9 9 9 9 7 7	6	50
	24	206
Total Score	70	530

Mary McEwen

At	Hits	Score
40 yds		
9 5 5 5 3	5	25
7 5 5 5 3 1	6	26
5 5 1 1	4	12
9 5 3	3	17
30 yds.	18	80
9 9 7 5 5 3	6	38
9 7 7 5 5 5	6	38
7 7 7 7 3 3	6	34
7 7 5 5 5 3	6	32
20 yds.	24	142
9 7 7 7 5 3	6	38
7 7 7 7 5 3	6	36
9 7 7 7 5 5	6	40
9 7 7 5 5 5	6	36
	24	150
Total Score	66	372

Joan Lord

At	Hits	Score
40 yds		
9 9 7 7 5 5	6	40
7 7 7 5 5 5	6	36
7 7 7 5 3 1	6	30
9 9 7 5 5 5	6	40
30 yds	24	146
9 9 9 9 9 7	6	52
9 9 9 9 9 7	6	52
9 9 7 7 7 5	6	44
9 9 9 9 9 7	6	52
20 yds.	24	200
9 9 9 7 7 6	6	42
9 9 9 9 9 7	6	52
9 9 9 9 9 7	6	52
9 9 9 9 7 7	6	50
	24	196
Total Score	72	542

Nancy Hoag

At	Hits	Score
40 yds		
7 7 7 5 5	5	31
7 7 5 5 1 1	6	24
7 7 7 7 5 5	6	38
9 9 9 7 7 5	6	44
30 yds.	23	137
7 7 7 7 5 5	6	36
9 9 7 7 7 5	6	44
9 9 9 7 7 5	6	46
9 9 7 7 7 7	6	46
20 yds.	24	172
9 7 7 7 7 7	6	44
9 7 7 7 7 5	6	42
9 9 9 7 5 5	6	44
9 9 9 9 7 7	6	50
	24	180
Total Score	71	489

Team Score 279 - 1933

Sample scoresheet.

Rule 7. Safety Rules

Section 2. Arrows should be nocked only on the shooting line, and only pointed in the direction of the targets when nocked.

Section 3. Never practice except under organized practice rules unless you are absolutely sure there is not even a remote chance of an accident.*

Note: Archers may not shoot at varying distances from different shooting lines nor engage in unauthorized practice unless separated by the width of four target lanes.

Section 4. Be alert for unexpected children or even adults who may, through ignorance or thoughtlessness, suddenly be on the field.

Section 5. Do not hesitate to call attention to actions of other archers which you know are dangerous either to the archer or others.

Section 6. The part of the range in front of the shooting line is forbidden territory while others are on the shooting line.

Section 7. In drawing arrows from the target, be sure no individuals are behind you where they may be injured by sudden removal of an arrow. Stand at one side of the target when others are drawing.

Section 8. Inspect arrows to see that they are not cracked or damaged. Arrows that are cracked should be broken so they cannot safely be repaired.

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*[illegible] of NAA Rules are available from Clayton B. [illegible] National Archery Association, 19[illegible] Geraldson [illegible] PA [illegible]

INTERNATIONAL ARCHERY FEDERATION

INDOOR ARCHERY
RULES OF SHOOTING

THE INDOOR FITA ROUNDS

There are two Indoor FITA Rounds

Round I	30 arrows shot from 18 metres
Round II	30 arrows shot from 25 metres
	for both Ladies and Gentlemen.

TARGET FACES

Description

a. There are for indoor archery two Standard circular FITA Target Faces 60 cm and 40 cm diameters. Both these faces are divided by a thin line into five concentric colour zones arranged from the centre outwards as follows
Gold (Yellow), Red, Light Blue, Black and White. Each colour is in turn divided by a thin line into two zones of equal width thus making in all ten scoring zones of equal width measured from the centre of the Gold

6 cm on the 60 cm target face
4 cm on the 40 cm target face

Such dividing lines, and any dividing lines which may be used between colours, shall be made entirely within the higher scoring zone in each case. Any line marking the outermost edge of the White shall be made entirely within the scoring zone. The width of the thin dividing lines as well as the outermost line shall not exceed 2 mm on both the 60 cm and the 40 cm target faces.
The centre of the target face is termed the pinhole, and shall be indicated by a small cross the lines of which shall not exceed 2 mm.

b. Scoring Values and Colour Specifications:
These are according to Article 7 of (b).

c. Tolerance of Measurements:
The permissible variations in dimensions of the targets face in each of the ten zones shall be measured by the diameters of each separate circle enclosing each of the 10 zones. The tolerance of each such diameter shall not exceed plus/minus 1 mm on both the 60 cm and the 40 cm target face, i.e., measured through the centres outwards.

d. Size of Target Faces at each Round:
For the 18 metres Indoor FITA Round I the target face of 40 cm

for the 25 metres Indoor FITA Round II the target face of 60 cm shall be used.

	Diameters 60 cm Face	Tolerance plus/minus	Diameters 40 cm Face	Tolerance plus/minus
Zone 10	6 cm	1 mm	4 cm	1 mm
9	12	1	8	1
8	18	1	12	1
7	24	1	16	1
6	30	1	20	1
5	36	1	24	1
4	42	1	28	1
3	48	1	32	1
2	54	1	36	1
1	60	1	40	1

TARGET SET UP

The Centre of the Gold shall be 130 cm above the ground. If the 40 cm target faces are in two lines one above the other, the centre of the Gold shall be 100 cm respectively 160 cm above the ground.

SHOOTING & SCORING

a. Each archer shall shoot his arrows in end of three arrows each.
b. Scoring shall take place after each end of 3 arrows.

OTHER RULES & REGULATIONS

In all other aspects the Target Archery Rules of Shooting will apply with the exception of Article 704 (b) (i.e., the two and a half minute Time Limit for shooting three arrows may not be extended at Indoor Shooting).

If space does not permit a Waiting line then Article 702 (b) may be waived.

Notes
1. Safety precautions behind the targets call for special attention.
2. Source of light where natural or artificial and its effect on the target faces is important and should be considered.

INTERNATIONAL ARCHERY FEDERATION

TARGET ARCHERY
RULES OF SHOOTING*

Article 700. THE FITA ROUND

The FITA Round consists of 36 arrows shot from each of the four standard distances:

90, 70, 50 & 30 metres for Gentlemen.
70, 60, 50 & 30 metres for Ladies.

Shooting shall be in one direction only, and will commence at the longest distance and finish at the shortest distance in the order set out above.

A Round may be shot in one day or over two successive days. If a Round is shot over two days, the two longer distances shall be shot on the first day and the two shorter distances shall be shot on the second day. Two ends of three sighter arrows are permitted preceding the commencement of shooting each day. These are to be shot under the control of the Field Captain and shall not be scored.

In the event of a Programme including a FITA Round as well as one other Rounds to be wholly or partly shot during the same day, the FITA Round shall always be shot first.

Article 701. TARGET FACES (See Illustration on page 86.)

Description:

(1) There are two Standard circular F.I.T.A. Target Faces 122 cm and 80 cm diameters.

Both these faces are divided into five concentric colour zones arranged from the centre outwards as follows:
Gold (Yellow), Red, Light Blue, Black and White.

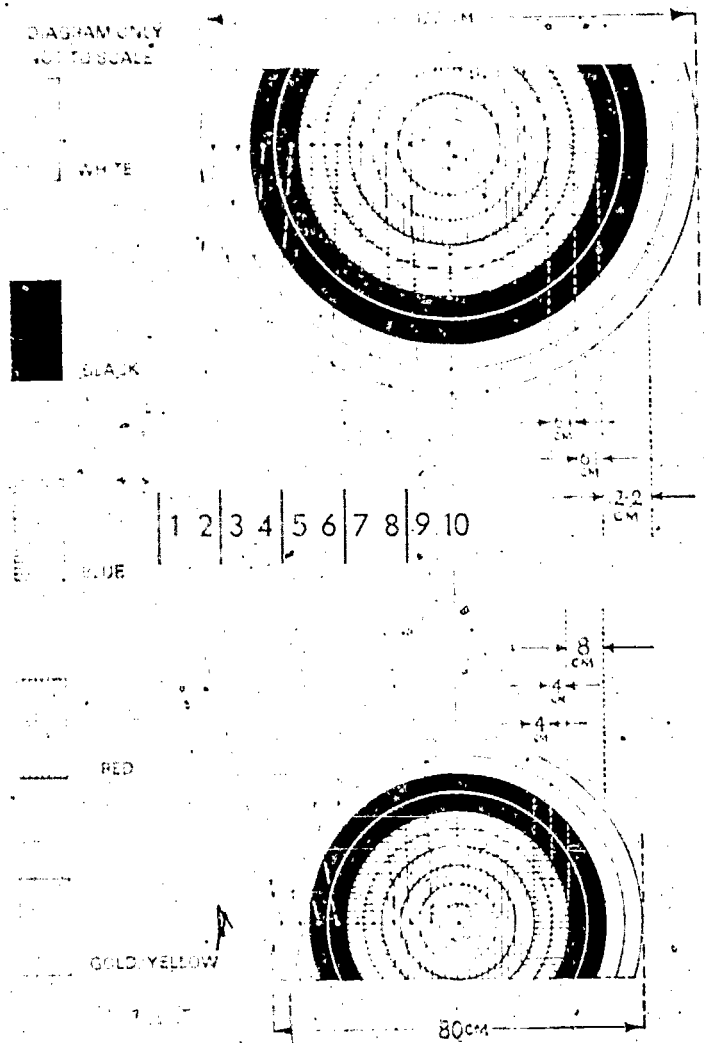
Each colour is in turn divided by a thin line into two zones of equal width measured in all ten scoring zones of equal width measured from the centre of the Gold:

6.1 cm on the 122 cm target face.
4 cm on the 80 cm target face.

Such dividing lines, and any dividing lines which may be used between colours, shall be made entirely within the higher scoring zone in each case.

*With the permission of the NAA.

Article 701. Target Faces



Any line between the outermost edge of the White shall be made entirely within the scoring zone.

The width of the thin dividing lines as well as the innermost line shall not exceed 2 mm on both the 122 cm and the 80 cm target faces.

The centre of the target face is termed the "pinhole" and shall be indicated by a small "X" (cross) the lines of which shall not exceed 2 mm.
See Notes 1 and 2 after this Article.

Scoring Values and Colour Specifications

Scoring Values	Colours	Munsell Colour Scale Notations	
Zone Inner 10	GOLD YELLOW	5 Y	8/12
Outer 9			
Inner 8	RED	8.3 R	3.9/13.5
Outer 7			
Inner 6	LIGHT BLUE	5 B	6/8
Outer 5			
Inner 4	BLACK	N 2	
Outer 3			
Inner 2	WHITE	N 9	
Outer 1			

See Notes 1 and 2 after this Article

Tolerance of Measurements

The permissible variations in dimensions of the target face in each of the 10 zones shall be measured by the diameters of each separate circle enclosing each of the 10 zones. The tolerance of each such diameter shall not exceed plus minus 3 mm on the 122 cm target face and plus minus 2 mm on the 80 cm target face; i.e., measured through the centre outwards.

	Diameters 122 cm Face	Tolerance plus minus	Diameters 80 cm Face	Tolerance plus minus
Zone 10	12.2 cm	3 mm	8 cm	2 mm
9	24.4	3	16	2
8	36.6	3	24	2
7	48.8	3	32	2
6	61.0	3	40	2
5	73.2	3	48	2
4	85.4	3	56	2
3	97.6	3	64	2
2	109.8	3	72	2
1	122	3	80	2

(See Notes (1) and (2) after this Article).

(d) Size of Target Faces at Different Distances

For distances of 90, 70 and 60 metres, the Target Face of 122 cm shall be used.

For distances of 50 and 30 metres, the Target Face of 80 cm shall be used.

The size of the buttress, whether round or square, must be not less than 124 cm in any direction to ensure that any arrow hitting the buttress and touching the outermost edge of the target face remain in the buttress.

Notes:

1. Specifications for Colour, Tolerance of Measurements and thin dividing lines in Article 701 above will become obligatory by 1st January, 1980, but will apply in respect of the Olympic Games as from the XXth Olympiad 1972.

   Such target faces may be used as new stocks become available at any time before such date.

2. *Before* 1st January, 1980 the following old Rules may apply to target faces:

   (a) The *thin* dividing lines and any line marking the outermost edge of the white without specification of width of the thin lines.

On Target Faces of 122 cm on a tolerance of measurement shall not exceed 3 mm in any one zone and 4 mm on the full 12... cm diameter.
On Target Faces of 80 cm a tolerance of measurement shall not exceed 2 mm in any one zone and 3 mm on the full 80 cm diameter.
The centre of the target face need not necessarily be marked.

Article 702 RANGE LAYOUT

The Ranges shall be staked out and each distance accurately marked both at a point vertically beneath the Gold of each Target and the Shooting line.

A safety line shall be indicated at least five metres behind the shooting line.

Each Butress shall be set up at an angle of about 15 degrees.

The centre of the Gold shall be 130 cm above the ground. A ... measurement shall not exceed plus minus 5 cm.

The height of the centres of the Golds in a line of buttresses on the Field shall at all times look straight.

Conversion Table Metres

Yards	Feet	Inches
		3.37
		4.88
		5.10
		0.50
		10.20
		7.90
		3.30

Article 703 ARCHERS EQUIPMENT

This Article lays down the type of Equipment archers are permitted to use when shooting for F.I.T.A. purposes.
Pieces of Equipment not mentioned or covered in this Article are consequently not allowed to be used without prior approval of F.I.T.A. 90 Congress. Further it will be necessary to place before Congress any Equipment or part thereof for which approval is sought.

Article 703. Archers Equipment

(a) A Bow of any type may be used provided it subscribes to the accepted principle and meaning of the word Bow as used in Target Archery e.g. an instrument consisting of a handle (grip), riser and two flexible limbs each ending in a tip with a string nock.

The Bow is braced for use by a single bowstring attached directly between the two string nocks only, and in operation is held in one hand by its handle (grip) while the fingers of the other hand draw, hold back and release the string.

(b) A Bow String may be made up of any number of strands of the material chosen for the purpose, with a centre serving to accommodate the drawing fingers, a nocking point to which may be added serving(s) to fit the arrow nock as necessary, and to locate this point one or two nock locators may be positioned, and in each of the two ends of the Bow String a loop to be placed in the string nocks of the Bow when braced. In addition one attachment, which may not exceed a diameter of one centimetre in any direction, is permitted on the String to serve as lip or nose mark.

The serving on the String must not reach above the point of the archer's nose.

A Bow String must not in any way offer aid in aiming through peephole marking or any other means.

(c) An Arrowrest which can be adjustable, any moveable Pressure Button, Pressure Point or Arrowplate and Draw Check Indicator may all be used on the Bow provided they are not electric or electronic and do not offer any additional aid in aiming.

(d) A Bowsight, a Bowmark or a Point of Aim on the ground for aiming are permitted but at no time may more than one such device be used.

(i) A Bowsight as attached to the Bow for the purpose of aiming may allow for windage adjustment as well as elevation setting for aiming, but it is subject to the following provisions:

It shall not incorporate a prism or lens or other magnifying device, leveling or electric devices nor shall it provide for more than one sighting point.

(ii) A Bowmark is a single mark made on the Bow for the purpose of aiming. Such mark may be made in pencil, tape or any other suitable marking material.

A plate or tape with distance marking may be mounted on the Bow as a guide for marking, but must not in any way offer any additional aid.

(iii) A Point of Aim on the ground is a marker placed in the shooting lane between the shooting line and the target. Such marker may not exceed a diameter of 7.5 cm and must not protrude above the ground more than 15 cm.

(e) Stabilisers on the Bow are permitted provided they do not:-
(i) serve as a string guide
(ii) touch anything but the Bow.
(iii) represent any obstacle to other archers as far as place on the shooting line is concered.
The numbers mounted shall not exceed four.
Torque Flight Compensators may also be mounted.

(f) Arrows of any type may be used provided they subscribe to the accepted principle and meaning of the word Arrow as used in Target Archery, and that such Arrows do not cause undue damage to target faces and buttresses.
An Arrow consists of a nock, shaft and arrow head (point) with fletching and, if desired, cresting.
The Arrows of each archer shall be marked with the archer's name, initials or insignia and shall have the same colour(s) in fletching. If crested all Arrows shall carry the same pattern and colour(s).

(g) Finger Protections in the form of finger stalls or tips, gloves, shooting tab or tape (plaster) to draw, hold back and release the String are permitted, provided they are smooth with no device to help to hold and or release the String.
A Separator between the fingers to prevent pinching the arrow may be used.
On the bow hand an ordinary glove, mitten or similar article may be worn.

(h) Field Glasses, Telescopes and other visual aids may be used between shots for spotting arrows.
Ordinary Spectacles as necessary or Shooting Spectacles provided they are fitted with the same lenses normally used by the archer, and Sun Glasses. None must be fitted with microhole lenses, glasses or similar nor marked in any way, which can assist in aiming.

Accessories are permitted such as bracers, dress shield,

bow sling, belt or ground quiver, tassel, foot markers not protruding above the ground more than one centimetre.

Article 704. RANGE CONTROL AND SAFETY

(a) A Field Captain shall be appointed to control the shooting and to ensure the observance of the 2½ minute Time Limit for shooting an end of three arrows and be responsible for safety precautions.
The Field Captain shall control the shooting with a whistle.
One blast on the whistle will be the signal for shooting to start.
Two blasts on the whistle will be the signal for archers to move forward to score and collect arrows.
A series of blasts on the whistle will be the signal for all shooting to cease.
If shooting is suspended during an end for any reason, one blast on the whistle will be the signal for shooting to recommence.

(b) At Tournaments, at least two Field officers shall be appointed. These Field officers shall work under the direction of the Field Captain, and their responsibilities will include:
(i) Inspecting Archers' Equipment before the Tournament is due to start and at any time thereafter during the Tournament.
(ii) Observing that the shooting is conducted in accordance with these rules.
(iii) Resolving disputes and queries in connection with the shooting and scoring.

(c) Under the control of the Field Captain, two ends of three sighter arrows are permitted preceding the commencement of shooting each day. No other trial shots are allowed, in any direction, on the shooting field during the days of any competition.

(d) No archer may draw his bow, with or without an arrow, except when standing on the Shooting Line.
If an arrow is used, the archer shall aim towards the Targets but only after being satisfied that the field is clear both in front of and behind the Targets. If an archer, while drawing his bow with an arrow before the shooting starts or during breaks between distances, looses an arrow, intentionally or otherwise, such an arrow shall count as part of the next end to be shot. The Scorer shall make a note to this effect on the archer's

scoresheet and enter the values of all hits for that end (3 or 6 arrows as the case may be), but the highest scoring arrow will be forfeited. Such action must be initialled by the Field Captain or member of Technical Commission and the archer concerned.

(e) While shooting is in progress, only those archers whose turn it is to shoot may be on the shooting line. All other archers with their tackle shall remain behind the waiting line. After an archer has shot his arrows, he shall retire behind the waiting line.

(f) No archer may touch the tackle of another without the latter's consent.

(g) An archer who arrives after shooting has started, shall forfeit the number of arrows already shot, unless the Field Captain is satisfied that he was delayed by circumstances beyond his control, in which case he may be allowed to make up the arrows lost after the distance then being shot has been completed.

(h) The Field Captain has authority to extend the 2½ minute Time Limit in exceptional circumstances. At Tournaments the Field Captain shall consult the Field Officers beforehand. Any such special ruling introduced must be announced to the competitors before having effect. Final Result Lists to be endorsed to this effect giving reason.

When Visual Time controls are in use the 2 minutes section will be prolonged and the 30 seconds section remain unchanged.

(i) For Visual Time Control at Olympic Games, World and Regional Championships see *Articles 313 and 320 (a).*

Either of these methods by lights or plates may be used under the control of the Field Captains at any Tournament at the Organiser's discretion as may a flag or other simple device.

(j) When Time Control is in use archers may not raise the bow arm until the signal for shooting to begin is given (i.e. when the light changes to Green and/or the whistle signal is given starting the 2½ minutes Time Limit).

Article 705. SHOOTING

(a) Each archer shall shoot his arrows in ends of three arrows each.

(b) The maximum time permitted for an archer to shoot an end of three arrows shall be two and a half minutes. Any arrow shot

either before the signal or after the signal indicating such Time Limit of two and a half minutes will forfeit the highest scoring arrow for that end (3 or 6 arrows as the case may be). *(See Art. 704(d)).*

However if it becomes necessary to change a string or make essential adjustment to equipment the Field Captain must be informed and extra time may be given.

(c) Excepting for persons who are permanently disabled, archers shall shoot from a standing position and without support, with one foot on each side of the shooting line.

(d) An arrow shall not be deemed to have been shot if:

(i) the archer can touch it with his bow without moving his feet from their position in relation to the shooting line.

(ii) the target face or buttress blow over (in spite of having been fixed and pegged down to the satisfaction of the Field Officers). The Field Officers will take whatever measure they deem necessary and compensate the adequate time for shooting the relevant number of arrows.

(e) While an archer is on the shooting line, he shall receive no assistance or information, by word or otherwise, from anyone, other than for the purpose of making essential changes in equipment.

Article 706. SCORING

(a) One Scorer shall be appointed for each target.

(b) At 90, 70, and 60 metres, scoring shall take place after every second end (6 arrows) at World Championship Tournaments, but at other Tournaments scoring may take place after each of three arrows or after every second end (six arrows).

At 50 and 30 metres, scoring shall always take place after each end of 3 arrows.

(c) Scorers shall enter the value of each arrow on Score Sheets as called out by the archer to whom the arrows belong. Other archers on that target shall check the value of each arrow called out.

Only arrows scoring Ten points shall be referred to as "Golds".

(d) Neither the arrows nor the face shall be touched until all the arrows on the target have been recorded.

(e) An arrow shall be scored according to the position of the shaft in the target face.

If more than three arrows (or six as the case may be),

belonging to the same archer should be found in the target or on the ground in the shooting lanes, only the three lowest (or six lowest, as the case may be) in value shall be scored.
Should an archer be found to repeat this, she may be disqualified.

(g) Should the shaft of an arrow touch two colours, or touch any dividing line between scoring zones, that arrow shall score the higher value of the zones affected. *(See Part X, I.2).*

(h) Unless all arrow holes are suitably marked on each occasion when arrows are scored and drawn from the target, arrows rebounding from the target face shall not be scored.

(i) An arrow hitting:

(a) The target and rebounding, shall score according to its impact on the target, provided that all arrow holes have been marked and an unmarked hole or mark can be identified.
When a rebound occurs:

(a) with archers shooting one at a time on each target, the archer concerned will after shooting his end of three arrows, remain on the shooting line with his bow held above the head as a signal to the Field Officers.

(b) with more than one archer shooting at a time on each target, the archer concerned will finish his end of three arrows and remain on the shooting line, while the other archer on that target will when the rebound occurs stop shooting but remain on the shooting line with the bow held above the head.

When all archers on the shooting line for that end have finished shooting their three arrows or the two and a half minutes time limit has expired, whichever is appropriate, the Field Captain will interrupt the shooting. The archer with the rebound arrow will advance to the target together with a Field Officer, who will judge the point of impact, take down the value and mark the hole and later participate in scoring of that end. The rebound arrow to be left behind the target until that end has been scored. When the Field is again clear the Field Captain will given the signal for shooting to recommence.
In case of (b) above with more than one archer shooting together, the other archer on the same target who

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remained on the shooting line while the rebound arrow was judged, will first complete his end of 3 arrows with the time being adjusted according to the number of arrows to be shot – no other archer is to occupy the shooting line meanwhile.

(ii) Another arrow in the nock and remaining embedded therein, shall score according to the value of the arrow struck.

(iii) Another arrow, and then hitting the target face after deflection, shall score as it lies in the target.

(iv) Another arrow, and then rebounding from the target, shall score the value of the struck arrow, provided the damaged arrow can be identified.

(v) The target face after rebounding off the ground, shall not score.

(vi) A target other than an archer's own target, shall not score.

(vii) And passing through the target shall, provided all arrow holes have been marked and provided an unmarked hole can be identified, score according to the value of the hole in the target face.

(j) The Field Captain will ensure that, after scoring, no arrows are left in the targets before any signal is given for shooting to recommence. If this inadvertently happens, the shooting shall not be interrupted.

An archer may shoot that end with other arrows, or make up the arrows lost after shooting over that distance has been completed.

In such circumstances, the Field Captain shall participate in the scoring after that end, making sure that the arrows which remained in the target, are checked back to the archer's score sheet before any arrows are withdrawn from the target.

(k) In the event of an archer leaving arrows, e.g., on the ground in the target area, he may use others provided he informs the Field Captain before shooting. The Field Captain shall exercise such checks as he deems fit in each circumstance.

(l) An archer may delegate authority to score and collect his arrows to his Team Captain or to another archer on his own target.

(m) Score sheets shall be signed by the Scorer and the Archer, denoting that the Archer agrees with the score and thereafter he may make no claim for any alteration of the score.

If the scorer is participating in the shooting, his score sheet shall be signed by some other archer on the same target.

(n) In the event of a tie in score, the results shall be determined as follows:

(i) **For Individuals:**

The Archer, of those tying, with the greatest number of scoring hits. If this is also a tie, then the Archer of those so tying with the greatest number of Golds (Hits scoring 10 points).

If this is also a tie, then the Archer of those so tying with the greatest number of hits scoring 9 points.

If this is also a tie, then the Archers so tying shall be declared equal.

(ii) **For Teams:**

The Team, of those tying, having the Archer making the highest individual score.

If this is also a tie, then the Team of those so tying having the Archer making the second highest individual score.

If this is also a tie, then the Teams so tying, shall be declared equal.

NATIONAL FIELD ARCHERY ASSOCIATION OFFICIAL RULES

OFFICIAL NFAA ROUNDS

A. FIELD ROUND

1. Standard Unit

A Standard Unit shall consist of the following 14 shots:
15, 20, 25 and 30 yards at a 12-inch face
(4 arrows at each distance)
40, 45 and 50 yards at an 18-inch face
(4 arrows at each distance)
55, 60 and 65 yards at a 24-inch face
(4 arrows at each distance)

And the following four position shots; each arrow to be shot from a different position or at a different target:
35 yards at an 18-inch target, all from the same distance, but from different positions or different targets.
30, 35, 40 and 45 yards at an 18-inch target.
50, 60, 70 and 80 yards at a 24-inch target.
20, 25, 30 and 35 feet at a 6-inch target.

2. Targets

a. Four face sizes shall be used:
(1) A 24-inch face with 12-inch center bull and a 4-inch spot.
(2) An 18-inch face with a 9-inch bull and a 3-inch spot.
(3) A 12-inch face with a 6-inch bull and a 2-inch spot.
(4) A 6-inch face with a 3-inch bull and a 1-inch spot.
The outside ring shall be black. The bull shall be white and the spot shall be black.

Animal targets bearing these official round faces may be used, in which case the faces need not be painted, only outlined, but the aiming center or spot must be plainly visible. The spot must be painted some color sharply contrasting with the target color. This same spot and ring target is official without animal silhouette.

3. Shooting Positions

The prescribed distance in subsection 1 of this By-Law is to be adhered to without variation. Each NFAA Chartered Club with an approved Field Course shall have the option of mark-

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See Constitution, By-Laws and Policy of the National Field Archery Association, 1974 ed., NFAA, Route 2, Box 514, Redlands, CA 92373. (*Note*: is revised each year and available on April 1 for $1.00.)

... stakes of the following ... Animal, Park and Fixed ... the course any order may be ... on any four-position shot.

... at each of the 14 target lay- ... shall begin shooting the four ... of a single face. In the other four it ... from each of four stakes ... all four arrows from a ...

a. ... for a bullseye, including spot, and 3 ... the outer circle.

b. An arrow shaft ... two rings shall be scored as being in the ... of the greater value. The outer line of the Field Archery target is outside the scoring field. For that reason the arrow shaft must cut the line so that no color of the line can be seen between the arrow shaft and scoring field ... may be counted. The same is true for the inner line between the two circles.

B. HUNTERS ROUND

1. *Standard Unit*

The 14 ... Twice around the unit makes a round, or ... make a round.

2. *Targets*

The Hunter's Round target has an all-black background with a white aiming spot in the exact center. The bullseye for all targets ... half the diameter of the scoring area. The following ... shows the distances, target face sizes and aiming spot sizes.

... Target size 24" on 28" Paper 3" White Spot

...

... Target size 18" on 28" Paper 3" White Spot

...

40

36-...

...-32-32-32 Target size 12" on 28" Paper 3" White Spot

28-28-28-28 Target size 12" on 1... Paper 2" White Spot

...

1 [illegible]

18 11

11 11 Target [illegible] on [illegible] Paper 1" White Spot

3. *Shooting Positions*

One feature of this round is that it takes a lot of stakes. Where one stake is used, a stake at least 18 inches above ground is recommended. On the two-stake shots, use stakes that extend 12 inches above ground and stakes that are not over 6 inches above ground for the four-stake shots. Such an arrangement will help eliminate a lot of confusion.

4. *Shooting Rules*

In shooting the Hunter's Round, the archer will observe the following shooting positions:

a. 1 stake shoot 4 arrows from the same stake
b. 2 stakes shoot 2 arrows from each stake
c. 4 stakes shoot 1 arrow from each stake

5. *Scoring*

Scoring is the same for the Field Round: 5 points for a bullseye including spot, and 3 for the outer circle. An arrow shaft cutting two rings must cut completely through the line to be counted in the area of next higher value.

C ANIMAL ROUND

1. *Standard Unit*

The 14 targets form a unit. Twice around the unit makes a round, or two such units laid out differently make a round. The one basic 14-target unit may be varied to make any number of courses that would all be different. It is simple and easy to lay out and change. Once the maximum and minimum distances are known, then the target distance can be laid out anywhere within these distances and be according to NFAA rules.

This round with its animal targets and its sliding scale system of scoring is more of a measure of the hunting archer's shooting skill than the standard Field Round.

2. *Targets*

a. The targets for this round are animal targets with the scoring area divided into two parts. The high-schoring area is oblong while the low scoring area is the area between the high schoring area and the "hide and hair" line or "feathers" as the case may be. The area between the "hide

and hair" line (including the line) to the outside of the colors is considered a non-scoring area.

b. The high scoring area of Group No. 1 is 9 inches wide by 14½ inches long with rounded ends. Targets in this group are the black bear, grizzly bear, deer, moose, elk and caribou.

c. The high scoring area of Group No. 2 is 7 inches wide by 10½ inches long with rounded ends. Targets in this group are the small black bear, antelope, small deer, wolf and mountain lion.

d. The high scoring area of Group No. 3 is 4½ inches wide by inches long with rounded ends. Targets in this group are the coyote, raccoon, javelina, turkey, fox, goose, wildcat and pheasant.

e. The high scoring area of Group No. 4 is 2½ inches wide by 3-5/8 inches long with rounded ends. Targets in this group are the turtle, duck, grouse, crow, skunk, woodchuck, jackrabbit and rockchuck.

f. In the above target groups, the animals mentioned are for a general description and not to be construed as confined to the particular species. Any animal or bird which is legal game and consistent in size with a particular group may be used.

3. Shooting Positions

a. The following chart gives distances and target groups:

			Maximum Distance (Yards)	Minimum Distance (Yards)	Spread (Yards)
1	3	3 walkup shots	60	40	20
2	3	3 walkup shots	45	30	15
3	4	4 one-position shots	35	20	15
4	4	4 one-position shots	20	10	10

b. The shooting distance shall be marked its exact distance but in the spread defined in (a.) above for National and Sectional level tournaments and may be marked at tournaments below that level.

c. Each target in Group 1 faces is a 5-yard walkup. There are three targets in the group. Select your distances between 60 and 40 yards for the first stake, move up 5 yards for the next stake and 5 more yards for the third stake.

d. Each target in Group No. 3 faces is a 3-yard walkup. There are three targets in Group No. 2. Select your distance between 45 and 30 yards for the first stake, move up 3 yards for the next stake and 3 more for the last stake.

e. Each target in Group 3 faces is one distance. There are four targets in this group. Shoot all arrows from each stake as selected between 35 and 20 yards.

f. Each target in Group No. 4 is one distance. There are four targets in Group No. 4. All arrows shall be shot from each of the four stakes from distances selected between 20 yards and 10 yards.

4. *Shooting Rules*

A maximum of three marked arrows may be shot in successive order, and the highest scoring arrow will count.

5. *Scoring*

a. 20 or 16 for the first arrow
14 or 10 for the second arrow
8 or 4 for the third arrow

b. The arrow shaft must cut through the line to score. If an arrow shaft touches the outside edge of an animal target it does not score. If it hits the target and cuts into, but not through, the "hair and hide" line, it does not score. It must cut through this line to score a shot of lower value. To score, an arrow shaft must cut through this line.

D. 15 Target "300" Field Round

An official classification game will consist of one 15-target round.

1. *Standard Unit*

A Standard Unit shall consist of the following 15 shots:

15, 20, 25 and 30 yards at a 12-inch face
(4 arrows at each distance)

35, 35, 35, 35 yards at an 18-inch face
(4 position fan, 1 arrow each position)

40, 45 yards at an 18-inch face
(4 arrows at each distance)

45, 40, 35, 30 yards at an 18-inch face
(4 position walkup, 1 arrow each position)

50 yards at an 18-inch face
(4 arrows 1 position)

55, 60, 65 yards at a 24-inch face
(4 arrows at each distance)

65, 60, 55, 50 yards at a 24-inch face
(4 position walkup, 1 arrow each position)

30, 25, 20, 15 yards at a 12-inch face
(4 position walkup, 1 arrow each position)
35, 30, 25, 20 feet at a 9-inch face
(4 position walkup, 1 arrow each position)

Walkups and fans may be shot from different stakes at the same target or from the same stake at different targets.

2. *Targets*

Four face sizes shall be used:

a) A 24-inch face with 12-inch center bull and a 4-inch spot
b) An 18-inch face with a 9-inch center bull and a 3-inch spot
c) A 12-inch face with a 6-inch center bull and a 2-inch spot
d) A 6-inch face with a 3-inch center bull and a 1-inch spot

The outside ring shall be black. The bull shall be white and the spot shall be black. Animal targets bearing these official round faces may be used, in which case the faces need not be painted, only outlined, but the aiming center or spot must be plainly visible. The spot must be painted some color sharply contrasting with the target color. This same spot and ring target is official without animal silhouette.

3. *Shooting Positions*

The prescribed distances in subsection 1 of this By-Law are to be adhered to without variation. Each NFAA Chartered Club with an approved Field Course shall have the option of marking the distances on the shooting stakes of the following NFAA Rounds: Field, Hunters, Animal, Park and Fixed Distance Handicap. In laying out the course any order may be used as the official shooting order on any four position shot.

4. *Shooting Rules*

Each archer shall shoot 4 arrows at each of the 15-target layouts in a unit. In 10 cases this shall mean shooting the four arrows from a single stake at a single face. In the other five, it may mean either shooting one arrow from each of four arrows from a single stake but at four separate faces.

5. *Scoring*

a. The scoring is 5 points for a bullseye, including spot, and 3 for the outer circle.

b. An arrow shaft cutting two rings shall be scored as being in the ring of the value. The outer line of the Field Archery target is outside the scoring field. For that reason the arrow shaft must cut the line so that no color of the line can be seen between the arrow shaft and scoring field before a hit

may be counted. The same is true for the inner line between the two circles.

E. 15 TARGET "300" HUNTER ROUND

An official classification game will consist of one 15 target round.

1. Standard Unit

The 15 targets form a unit. Twice around the unit makes a round, or two such units laid out make a round.

2. Targets

The Hunter's Round target has an all-black background with a white aiming spot in the exact center. The bullseye for all targets is one-half the diameter of the scoring area. The following chart shows the distances, target face size, and aiming spot sizes.

64, 59, 55, 52 yards at 24-inch face 25½" paper
(4 position walkup, 1 arrow each position)
58, 53, 48, 45 yards at 24-inch face 25½" paper
(4 position walkup, 1 arrow each position)
58 yards at 24-inch face on 25½" paper
(1 position, 4 arrows)
53, 48, 44, 41 yards at 18-inch face 25½" paper
(4 position walkup, 1 arrow each position)
36, 36, 36, 36 yards at 18-inch face on 25½" paper
(4 position fan, 1 arrow each position)
48 yards at an 18-inch face on 25½" paper
(1 position, 4 arrows)
44 yards at an 18-inch face on 25½" paper
(1 position, 4 arrows)
40 yards at an 18-inch face on 25½" paper
(1 position, 4 arrows)
32, 32, 32, 32 yards at 12-inch face on 25½" paper
(4 position fan, 1 arrow each position)
32, 28, 24, 20 yards at 12-inch face on 13½" paper
(4 position walkup, 1 arrow each position)
28, 28, 28, 28 yards at 12-inch face on 13½" paper
(4 position fan, 1 arrow each position)
23, 20 yards at 12-inch face on 13½" paper
(2 position walkup, 2 arrows each position)
19, 17 yards at 12-inch face on 13½" paper
(2 position walkup, 2 arrows each position)
15, 14 yards at 12-inch face on 13½" paper
(2 position walkup, 2 arrows each position)
11, 11 yards at 6-inch face on 7½" paper
(2 position fan, 2 arrows each position)

3. *Shooting Positions*

One feature of this round is that it takes a lot of stakes. Where one stake is used, a stake at least 18 inches above ground is recommended. On the two-stake shots, use stakes that extend 12 inches above ground and stakes that are not over 6 inches above ground for the four-stake shots. Such an arrangement will help eliminate a lot of confusion.

4. *Shooting Rules*

In shooting the Hunter's Round, the archer will observe the following shooting positions:

a. 1 stake — shoot 4 arrows from the same stake.
b. 2 stakes — shoot 2 arrows from each stake.
c. 4 stakes — shoot 1 arrow from each stake.

5. *Scoring*

Scoring is the same as for the Field Round; 5 points for a bullseye, including spot, and 3 for the outer circle. An arrow shaft cutting two rings must cut completely through the line to be counted in the area of next higher value.

F. 15 TARGET "300" ANIMAL ROUND

No classification can be made on the Heavy Tackle Round or the regular Animal Round except under the condition specified in the Heavy Tackle Division Regulations.

1. *Standard Unit*

The 15 targets form a unit. Twice around the unit makes a round, or two such units laid out differently make a round. The one basic 15-target unit may be varied to make any number of courses that would all be different. It is simple and easy to lay out and change. Once the maximum and minimum distances are known then the target distance can be laid out anywhere within these distances and be according to the NFAA rules.

This round with its animal targets and its sliding scale system of scoring is more of a measure of the hunting archer's shooting skill than the standard Field Round.

2. *Targets*

a. The targets for this round are animal targets with the scoring area divided into two parts. The high scoring area is oblong while the low scoring area is the area between the high scoring area and the "hide and hair" line or "feathers" as the case may be. The area between the "hide and hair" line (including the line) to the outside of the carcass is considered a non-scoring area.

b. The high scoring area of Group No. 1 is 9" wide by 14½" long with rounded ends. Targets in this group are the black bear, grizzly bear, deer, moose, elk and caribou.

c. The high scoring area of Group No. 2 is 7" wide by 10½" long with rounded ends. Targets in this group are the small black bear, antelope, small deer, wolf and mountain lion.

d. The high scoring area of Group No. 3 is 4½" wide by 7" long with rounded ends. Targets in this group are the coyote, raccoon, javelina, turkey, fox, goose, wildcat and pheasant.

e. The high scoring area of Group No. 4 is 2½" wide by 3.5 8" long with rounded ends. Targets in this group are the turtle, duck, grouse, crow, skunk, woodchuck, jackrabbit and rockchuck.

f. In the above target groups the animals mentioned are for a general description and not to be construed as confined to the particular species. Any animal or bird which is legal game and consistent in size with a particular group may be used.

3. Shooting Positions

a. The following chart gives distances and target groups:

Group	Targets	
1	3	3 walkup shots, 1 arrow each position Maximum yards 60, Minimum 40 yards
2	3	3 walkup shots, 1 arrow each position Maximum yards 45, Minimum 30 yards
3	4	1 position Maximum yards 35, Minimum 20 yards
4	5	1 position Maximum yards 20, Minimum 10 yards

b. The shooting distance shall be marked its exact distance but in the spread defined in (a.) above for National and Sectional level tournaments and may be marked at tournaments below that level.

c. Each target in Group No. 1 faces is a 5-yard walkup. There are three targets in the group. Select your distances between 60 and 40 yards for the first stake, move up 5 yards for the next stake and 5 more yards for the third stake.

d. Each target in Group No. 2 faces is a 3-yard walkup. There are three targets in Group No. 2. Select your distance between 45 and 30 yards for the first stake, move up 3 yards for the next stake and 3 more for the last stake.

e. Each target in Group No. 3 faces is one distance. There are 4 targets in this group. Shoot all arrows from each stake as selected between 30 and 20 yards.

f. Each target in Group No. 4 is one distance. There are four targets in Group No. 4. All arrows shall be shot from each of the four stakes from distances selected between 20 yards and 10 yards.

4. Shooting Rules

A maximum of three marked arrows may be shot in successive order, and the highest scoring arrow will count.

5. Scoring

a. 20 or 10 for the first arrow
14 or 10 for the second arrow
8 or 4 for the third arrow

b. The arrow shaft must cut through the line to score. If an arrow shaft touches the outside edge of an animal target, it does not score. If it hits the target and cuts into, but not through, the "hair and hide" line, it does not score. It must cut through this line to score a shot of lower value. To score, an arrow shaft must cut through this line.

G. NFAA INTERNATIONAL OUTDOOR ROUND

1. Standard Unit

a. The NFAA International Round is a 20-target (10 targets per unit) variable distance round designed for use in areas where the availability of land is restricted or limited. The round is ideally suited for public parks and recreational facilities. The NFAA International Round course requires a minimum of space and can be readily constructed on any level or gently rolling plot of ground. A 20-target course will adequately handle up to 80 participants at one time. The International Round may be laid out on a roving type range or on an established "Field Round" course; however, whenever possible it is recommended that it be laid out in a progressive order, 20 yards through 65 yards.

b. Permanent type roving ranges are subject to course approval by the NFAA Director. Non-permanent park type ranges shall not be subject to approval by the NFAA Director.

2. Targets

a. Target faces shall conform to the specifications of the PAA Outdoor Rounds.

b. Each target position shall have one target butt.

1) There shall be not less than 4 target faces per distance when 14-inch target faces are used.

2) There shall be one or more target faces when 22-inch or 30-inch faces are used.

3) In the use of the International Outdoor Round, the required number of faces used for camps and school shall be left to the discretion of the coaches or teachers.

3. Distances

a) The distances and corresponding target sizes for the International Round are as follows:

Distances Yards	Target Size Inches
20	14
25	14
30	14
35	22
40	22
45	22
50	22
55	30
60	30
9[illegible]	30

2) All distances must be measured to the exact yardages.

3. Shooting Positions

a. Each target shall have two shooting positions.

b. The two shooting positions shall be parallel to the target face.

c. The two shooting positions shall be the same distance from the target and shall be separated by not less than 4 feet.

d. The distances shall be written on markers which are visible to the archer.

e. Each distance marker shall show the number of the target and the distance to be shot.

f. If more than one unit is needed, the shooting positions for the targets shall be numbered from 1 to 20.

4. Shooting Rules

a. The shooter must stand behind the shooting line.

b. Three arrows are shot at each distance.

c. All other rules for shooting the Official Field Round shall apply to the International Round.

d. The maximum distance for youth in the International Round shall be 50 yards.

5. *Scoring*
   a. The scoring on the targets shall be:
      1) 5 points for each arrow striking the center circle.
      2) 4 points for each arrow striking the inner ring.
      3) 3 points for each arrow striking the outer ring.
      4) No points for arrows striking the background.
   b. If any part of the arrow touches more than one scoring area, the arrow is counted as striking the highest scoring area it touches.

H. NFAA INDOOR ROUND

1. Standard Unit
   The standard unit shall consist of 60 arrows, shot as 3 games, at a distance of 20 yards. Each game shall consist of 4 ends of 5 arrows per end.

2. *Targets*
   a. The target face shall be 16 inches in diameter and shall be of a dull blue color. The bullseye and enscribed scoring rings shall be white.
   b. The bullseye shall be 3.2 inches in diameter.
   c. There shall be one scoring ring 8.9 inches in diameter and not to exceed 1/32 inch in width.

3. *Shooting Positions*
   Shooting positions will provide sufficient area to enable two archers to shoot simultaneously at one target butt.

4. *Shooting Rules*
   a. An archer shall stand so that he has one foot on either side of the shooting line.
   b. All other shooting rules shall apply as listed in Article IX, The NFAA Indoor League Program.

5. *Scoring*
   a. The scoring is 5 points for a bullseye, 4 points for the 8.9 inch diameter area and 3 points for the outer area.
   b. All arrows will be scored and recorded before touching or drawing any arrows from the target.
   c. An arrow cutting two rings shall be scored in the ring of greater value. Scoring is determined by the position of the shaft. The shaft must cut through the line and touch the area of higher value in order to be scored as the higher value.

d. Witnessed bounce-outs or arrows passing completely through the target will be re-shot.
e. Hits on the wrong target will be scored as misses.
f. When an arrow is dropped while the archer is in the act of shooting, he may shoot another arrow in place of the dropped arrow if he can touch the arrow with his bow from his position on the shooting line.
g. If an archer shoots more than 5 arrows in an end, only the 5 arrows of lower value may be scored.
h. If an archer shoots less than 5 arrows in one end he may shoot his remaining arrows if the omission is discovered before the end is officially completed; otherwise they shall be scored as misses.

I. NFAA FREEMAN ROUND

1. Standard Unit

The Standard Unit shall consist of 60 arrows, shot as 3 games at distances of 10, 15 and 20 yards. Each game will include 4 ends of 5 arrows per end.

a. The first game shall be 3 ends at 10 yards and 1 end at 15 yards.
b. The second game shall be 3 ends at 15 yards and 1 end at 20 yards.
c. The third game shall be 4 ends at 20 yards.

2. Targets

Shooting rules and scoring shall be the same as listed for the NFAA Indoor Round, Section H, of this Article.

J. FLINT BOWMAN INDOOR ROUND

1. Standard Unit

Target Number	Distance	Number of Arrows	Target Size
1	25 yards	4	12"
2	20 feet	4	6"
3	30 yards	4	12"
4	15 yards	4	6"
5	20 yards	4	12"
6	10 yards	4	6"
7	30, 25, 20, 15 yards	1 arrow each	12"

a. 56 arrows shall be considered one round.

b. Top row target centers shall be spaced 48 inches from the floor. Bottom row target center shall be spaced 30 inches from the floor.

2. *Targets*
The targets are standard 6-inch and 12-inch field target faces placed in two rows on each boss. The center of the upper row shall be 48 inches from the floor. The center of the lower row shall be 30 inches from the floor and directly below the upper targets.

3. *Shooting Positions*
a. This round is to be shot on a 30-yard range with shooting lines marked parallel to the target line at distances of 20 feet, 10, 15, 20, 25 and 30 yards.
b. Starting at the 30-yard line, and proceeding toward the target line, the shooting lines are to be numbered 3, 1, 5, 4, 6 and 2.
c. There shall be a separate lane for each boss and the archer shall go from one shooting line to his next shooting line in the lane for the boss for which his two targets are placed.
d. The targets on the boss in the second lane shall be reversed from those in the first lane. Those in the third lane shall be exactly as those in the first. Those in the fourth lane shall be exactly as those in the second lane.

4. *Shooting Rules*
If an archer starts out on a high target, as in lane one, he shoots his second end of the low target in the same lane. The archer continues to shoot at the targets in this lane until he has shot at seven targets. For the second seven-target score, the archer should go to another lane in which the targets are in reverse from the one he started out on.

5. *Scoring*
Scoring shall be the same as the Field Round.

6. *20-Yard Flint Round*
a. Because of the inability of many clubs to obtain the necessary space for a 30-yard indoor round, the NFAA has provided rules for a 20-yard round as follows:

Target Number	Distance	Number of Arrows	Target Size
1	50 feet	4	8"
2	20 feet	4	6"

3	60 feet	4	8"
4	45 feet	4	6"
5	40 feet	4	8"
6	30 feet	4	6"
7	60, 50, 40, 30 feet	1 arrow each	8"

b. Rules

Rules for the 20-yard round are the same as for the Flint Indoor Round.

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1974-76

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e current *Guide* was prepared by the 1974-76 committee; the 1978-80 *le* will be prepared by the 1976-78 committee.

EDITORIAL COMMENT

I would like to extend my deepest gratitude to the Golf Guide Committee for its help in soliciting and editing articles which every teacher and/or coach of golf should find most resourceful. Few words can express the thanks I owe to Helen Knierim, our NAGWS Guide Coordinator, for her prodding and patience in making this *Guide* possible.

Best wishes to Margaret Cummins, the next *Guide* chairperson, for a term filled with lots of articles and material.

G. Jean Cerra
Chairperson, 1974-76

Weight Training for Golfers

DEDE OWENS

DeDe Owens received her B.S. degree from Winthrop College, Rock Hill, South Carolina, and her M.S. degree from the University of North Carolina at Greensboro. A former LPGA tour professional; she is currently a physical education instructor and golf coach at Illinois State University, Normal, and a National Golf Foundation area consultant.

The increased emphasis on women's competitive sports in the last 10 years has placed a greater responsibility on the coaches to have better, more highly conditioned teams. This necessitates some type of conditioning program. The program should be used not only during the season, but implemented before the season begins and encouraged throughout the year.

Our golf students should be made aware of the importance of total body fitness. In this age of motorized golf, the game has taken on more of a recreational and socialization nature with the fitness aspect almost forgotten.

In competition, however, the participant must draw on every ounce of strength that she has, for it can be an extremely tense and exhausting game. Therefore, the participant must condition herself beyond the level normally needed.

Conditioning Program

A conditioning program for golf should include work toward total body fitness as well as exercises designed specifically toward strengthening certain muscle groups used in golf.

The following weight training program, which utilizes the Universal Gym, was developed by Linda Herman at Illinois State University and is used by basketball, volleyball, swimming and golf team members. Participants are encouraged to begin the program during the pre-season and continue through the first third of the sport season, starting again after the season.

Women's Weight Training Program

Basic Principles

1. The heavier the weight, the deeper the muscles that are used.
2. It is better to start light than too heavy.
3. To avoid becoming "tight" or losing flexibility, stretching and warm-up periods should precede and follow weight training periods.

4. A halfhearted or nonregular workout session will produce very little result.
5. Breathing should be exhale during lift, inhale during recovery.
6. Weight training should be done every other day.
7. Long distance running (1-3) miles can be done daily, but wind sprints should be done on alternate days (days on which weights are not used).

Example:

Mon.	stretch, run 2 miles, stretch
Tue.	stretch, run 1 mile, weights, stretch
Wed.	stretch, run 3 miles, stretch
Thur.	stretch, run 1 mile, weights, stretch
Fri.	stretch, run 2 miles, stretch
Sat.	stretch, run 1 mile, weights, stretch
Sun.	rest

(Repeat: Mon. – Sat.)

How To Use Weights

1. Determine your *maximum* weight for a *single* repetition for each exercise (trial and error method).
2. Determine 50% of your maximum (step #1).
3. Follow the progression below as an *example:*

Maximum pounds for an exercise	/week	Workout Wt. Upper Body and Lower Body	Reptitions Lower	Upper
100 lbs. (Leg press)	1st week-50%	50 lbs.	20	12
	2nd week-70%	70 lbs.	15	10
	3rd week-90%	90 lbs.	10	8
	4th week-80%	80 lbs.	15	10
	5th week-70%	70 lbs.	20	12
	6th week-105%	105 lbs.	3-5	3-5
	7th week-???	???	20	12

4. Redetermine your maximum weight for a single repetition for each exercise to begin the seventh week.
5. Begin a new six-week progression (weeks 7-12).

Stations on the Universal Gym

The idea is to alternate arm-leg or upper body–lower body exercises.

1. Bench press (wide grip).
2. Single leg lifts (right and left alternate – quads)
3. Double-leg lifts (quads)

4. Double leg lifts (hamstrings)
5. Sitting – upper arm press
6. Leg presses – low (hip extensors–quads)
7. Triceps (extensors)
8. Leg presses – high (hip extensors–quads)
9. Biceps (flexors)

The above program combines cardiovascular fitness with muscular development. There are many programs that can be used. This is but one that has been developed and adapted as a result of studies at the University of Illinois Exercise Psysiology Laboratory by Bob Gajda.

Strengthening Certain Muscles

The second emphasis in a conditioning program is the strengthening of certain muscle groups specific to a skill. In golf, leg and arm strength are crucial for attaining distance and developing consistency in the swing. One must have muscular endurance to perform a repetitive swing consistently and muscular strength to accelerate the clubhead with control and accuracy.

The following program, designed to strengthen the arm muscles, was given to me by Don Fauls, former athletic trainer at Florida State University, Tallahassee. It was originally developed for use by baseball pitchers. However he had received good results adapting it to golf. One golfer gained 15 yards on his drives after several months of using the exercises.

Arm Exercises

The following program can be carried out with a barbell or any 7- to 15-pound weight that is easy to control. Start with a lighter weight and increase each week until fifteen pounds is reached, then continue to add repetitions per week.

1. To strengthen the anterior arm muscles, above the elbow, stand with the arm hanging at the side in full extension, weight in hand, palm up. Flex or bend the elbow slowly to full flexion. Return slowly to full extension. Repeat 10 times.
2. With the arm in the same basic position but with the lower arm in the midway position thumb pointing up, repeat exercise #1 10 times. This exercise also strengthens arm muscles above the elbow.
3. To strengthen the *tricep* muscles in the back of the arm, above the elbow, raise the arm above the shoulder with the elbow bent or flexed, weight in the hand, straightening the arm. In doing this exercise, make certain that the tricep muscle does the work, not the shoulder. Repeat 10 times.

4. To strengthen the *anterior* muscles of the arm, below the elbow, rest the elbow and lower arm on the table with the wrist extending over the edge of the table, palm up. Place the weight in the fingers and roll it into the palm of the hand as the wrist is bent or flexed. Repeat 20 times.
5. To strengthen the *rotator* muscles of the wrist and elbow, rest the elbow and the lower arm on the table with the palm up and the wrist extending over the edge. Hold the weight firmly in the palm of the hand. Turn the hand over so that the palm faces the floor. Return to the starting position. Repeat 20 times.
6. To strengthen the *extensor* muscles or the *posterior* muscles of the arm, below the elbow, rest the elbow and lower arm on the table with the weight in the hand, wrist extended over the edge with the palm facing the floor and the wrist bent toward the floor. Extend or straighten the wrist. Repeat 10 times.

These exercises should be done only three times a week. Do two sets of each exercise with each arm. Every week one additional repetition should be added to each exercise until 20 repetitions of each set have been reached. For example during the fifth week, do two sets of each exercise, 14 repetitions per set, for each arm three times a week.

An observer probably doesn't see the necessity for a golfer to be highly conditioned. Yet, within a competitive five-hour round, the mental fatigue can, in itself, drain one's energies. Then there is the five-mile walk carrying a bag weighing close to 15 pounds, and the actual swing, though lasting less than a few seconds, utilizes the entire body with close to 13 moving parts and with the clubhead capable of being accelerated in excess of 95 mph.

Yes, conditioning for competitive golf is necessary. In selecting a program for your team, be sure that the how's and why's are understood by yourself and the participants.

Why Are You Practicing?

MARGARET CUMMINS

Margaret Cummins received her B.S. degree from the University of Arizona, Tucson, and her M.S. degree from Smith College, Northampton, Massachusetts. She played competitive golf during high school and college, sponsors an annual intercollegiate golf tournament, and has coached the Indiana University women's golf team for the past eight years. She is an area consultant for the National Golf Foundation and Golf Guide chairperson-elect.

How many times have we all watched players with good swings on the practice range move to the course and execute a distinctly different swing? Players who consistently hit good drives during practice move to the first tee and top the ball. Pitch shots are sculled from looking up, while putts are jabbed and guided to the tune of three or four putts a hole.

For many players, it is speculated that the strokes executed in practice are not the strokes used when playing the course. Energy used in practice often is wasted. When one observes players hitting on the practice range, invariably they appear as robots hitting one ball after another until their supply runs out. Seldom is there any evidence of conscious direction or thought to their practice shots. And yet, those same players utilize conscious, deliberate thought when executing shots on the course. When two different thought patterns are used to trigger a swing, it is difficult to believe that they both would result in the same swing. Practice should always be done for a purpose.

Generally, practice hitting or putting time should be used to meet any one of the following three purposes: (1) warm-up, (2) swing correction and (3) playing strokes. Although each purpose will be briefly discussed, this author is primarily concerned with the purpose of practicing the swing used on the course.

Warm-up. Players should warm up before playing on the course and at the beginning of each practice session. When a player practices for the purpose of warming up, her main goal is swinging a club to determine the tempo of her swing and to determine any irregularities that may be present in her swing prior to playing the course. Hitting a maximum of 20 balls should be sufficient. During this time it is probably better for the player not to think about the mechanics of her swing. Warm-ups should always be followed by practicing playing strokes.

Swing correction. Swing correction is undoubtedly the most serious reason for hitting practice balls. The player should concen-

trate on a particular correction. Unlearning and learning a new motor response is often difficult and time consuming. It is suggested that players work on one correction at a time, and that work continue on the correction until the movement becomes an unconscious habit. Error correction may take several weeks of concentrated practice.

Playing strokes. Practice playing strokes is perhaps the most neglected purpose for practicing and the one most vital for good competitive golf. When golfers are playing competitive rounds, on each shot they usually give some thought to the line of direction of the ball and to the distance needed to reach their target. Quite frequently the awareness that each shot counts in the score creates tension in the player that permeates the swing and causes alterations. Through that process the player forms a swing habit triggered by tension prior to making the stroke. It does not take long for the player to acquire two different swings—one for the course which is triggered by tension and one for the practice tee which is triggered by a relaxed state of unconscious thought. It is believed if a common triggering stimulus were used for practice and for play then the two swings should merge into one.

Since tension on the course is difficult to eliminate and some tension is desirable to create a state of readiness, it is suggested that the hitting of practice balls be made as much like the procedure for hitting balls on the course as possible. For that purpose it is suggested that for each practice shot, the student should:

1. stand behind the ball and determine her line to the target
2. assume her address position
3. look from the ball to the target and back until she is sure of the distance and the line to the target
4. concentrate on the line of flight while swinging the club.

This procedure permits the student to address the ball each time using a familiar pattern and encourages her to concentrate on positive actions.

When this procedure is first implemented on the practice tee, undoubtedly some of the shots will be less successful than when the player just stood and repeatedly hit balls. But, that is the point of the exercise; she is now using the procedure and swing she uses on the course. With practice, her course swing will improve and her practice and course swing will become one. If the coach, teacher or players object to using the proposed procedure, another procedure can be planned. The important element is to use an identical procedure for both practice hitting and playing. If you want the same swing, you must use the same triggering stimuli. If you don't, why are you practicing?

Only *Perfect* Practice Makes Perfect

JACK D. ADLER

Jack Adler is an associate professor of physical education at the University of Oregon, Eugene, specializing in motor learning. He has 12 years of experience coaching golf; six at Whitman College, Walla Walla, Washington, and six at the University of Oregon. He is presently serving as Northwest Area consultant for the National Golf Foundation, and plays to a two handicap.

Motor learning literature makes it abundantly clear that the key variable in learning and performance of motor skills is practice. Golf, involving both fine and gross motor components in an ever changing environment, is a skill that obviates the axiom. There is no simple, easy route to good golf scores. They are the result of sound foundations, motivation and practice, practice, practice. The question is not really whether to practice, but how. Following are some ideas to make practice more effective than the traditional procedure of pounding out thousands of shots on the driving range—not that this is all bad, it just needs supplementation.

Knowledge of Performance

Whenever someone hits a golf shot there are two types of feedback—knowledge of results, which is what the ball did, and knowledge of performance, which is what the golfer did. I would like to contend that when changes in performance are desired (because some swing fundamentals are being violated), practice should be in an environment where knowledge of results is limited, as in an indoor or outdoor cage. The reason is that when a golfer is changing her swing, there is going to be a period when results will suffer. She won't hit the ball as well as she used to, and there is a real danger of regression to improper form to improve results.

When a golfer has a major form break, it has usually been compensated by another form break that tends to cancel it out and give acceptable performance. In the process of correcting performance, however, the golfer can effectively work on only one correction at a time. Until the point where this becomes automatic, there should be no attempt to cure the compensating error. At this stage, however, the compensating error still exists and is very detrimental to performance. That is, the learner works in a cage so there is no knowledge of results, and concentration is only on what she is doing, not where her shots are going.

A quick hint on procedure here. The way to determine when a correction has become automatic is to direct the person's attention to another part of the game while you attend to the correction. If the correction still appears when attention is on another part of the swing, the correction is now learned and you can move to the next stage, normally programming out the compensating error.

Goal Direction

Another way to improve on the "pound-the-ball-out" type of practice is to give goal direction instead of hitting balls just to see where they go and trying to hit them straighter. By giving a person goals to achieve, you are encouraging the very type of concentration necessary on the golf course. Away from how to do it and toward the result.

An example seems in order here. Let's take putting. Your golfer could be instructed to practice 4-foot putts with the goal of making 10 in a row. There are several advantages to this approach. First, attention is directed toward the goal and away from mechanics, as it must be on the golf course. Second, the people who need the practice most will get the most. If you are not good at making 4-footers it will take you a lot longer and a lot more putts to complete the requirement. The third, and possibly most important, result of this type of practice is the acquisition of a success syndrome. Anyone who has played golf knows the terror an important 4-foot putt can engender. However, if you have just made 10 in a row, you have to have some confidence you might not normally have. There is no single factor more important to successful performance than the belief that you can do it.

Other examples of practice goals could be:

1. Hitting tee shots till 10 in a row land in an area about the width of a fairway as identified by some kind of markers in the practice area.
2. Hitting 7-iron shots till 10 in a row end up within a designated number of feet of the target which should be a flagstick.
3. Hitting chip shots until at least 3 go in the cup. (Should trigger that old success syndrome again).
4. Hitting shots out of a greenside sand trap until 10 in a row end up within 20 feet of the pin.

I am sure you can think of other goals that will produce the kind of thinking and skills you would like to see on the golf course.

Teaching of Putting Through Drills

BRAD FOWLER

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Coaches in athletics have used drills to teach and develop skills for years with a particular object in mind in all sports. The drills presented here are used to teach putting to both beginning and advanced golfers.

Putting is a game within a game called golf. Putting is the rolling of the ball along the ground (green) while the rest of golf is played by stroking the ball into the air.

After teaching and re-teaching the grip, stance and stroke, the following drills are incorporated to teach and develop the art of putting. The order that the drills are used can be varied for the skill level of the student. The order presented here is used in teaching beginning golfers.

Playing Putter Drill

The purpose of the playing putter drill is to develop and demonstrate confidence in the putting stroke. The sense of sight is important in this drill. The eyes are so important because they adjust and control the motor system, nervous system and subconscious.

Concentrate on the ball with the eyes before and after stroking the ball, watching it from "behind" as it rolls along the line-of-the-putt until it goes into the cup or stops. Make sure that you see the ball stroked and "watch" it all the way as it rolls toward the hole turning the head by rotating the left eye above the right so that the eyes are vertical (Figure 1). Stay in this position until the end of the putt.

A "spectator" putter lacks confidence in her ability because she strokes the ball, looks to the hole with her eyes on a horizontal plane, back to the ball, then to the hole and back-and-forth hoping the ball will go to and into the hole (Figure 2). This is the same action followed by the spectator who is watching someone else putt.

Inaction Drill

The purpose of the inaction drill is to separate the backstroke and forward stroke completely. It develops a smooth putting stroke to

replace the jerk at the end of the backstroke where control to some degree is lost

The key to putting is stroking (striking) the ball solidly. This drill develops "flush contact" of the ball.

Inaction is the "pause-hesitation" where the putter head stops going one direction before starting in the other direction.

In this drill, take the putter blade back to the inaction position and hold it as you count "1–2–3" then "pull" the putter blade through the ball. *(Caution:* count "1–2–3" then "pull" the putter blade through smoothly in place of pulling it through on the count of "3" because the stroke will explode.)

Figure 1.

Figure 2.

Pull Drills

The purpose of the pull drills is to develop the sense of feel with a pendulum-like swing and to discourage the tendency to steer the ball, and develop the pulling action that breeds a "smooth" and "deliberate" stroke through the ball.

In the target-hand (left for a right-handed golfer) "down" pull drill (Figure 3), grip the putter down to the steel of the shaft with the target hand and hold the grip of the putter up along the inside of the left forearm. Place the first finger and thumb on the top, inside of the grip to support the putter. Take the putter blade back and

Figure 3.

Figure 4.

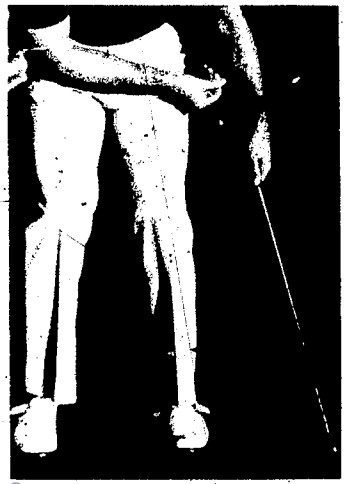

Figure 5.

Figure 6.

pull through with the target (left) side in a pulling action. With a pulling action, the putter blade will be kept straighter with no effort to steer the ball with a pushing stroke.

In the target-hand (left) "up" pull drill (Figure 4), place the target hand up and the first finger of the other hand on the bottom of the grip as a support. Take the putter blade back and pull through with the target-side. Keep the putter staff and left forearm in a straight line position back and through. Do not let this break down while the first finger performs its supporting role (Figures 5 and 6).

Dominant Eye Drill

The purpose of the dominant eye drill is to fine-tune your sense of vision by using your best eye. Close or cover the nondominant eye (Figure 7). Use only the dominant eye with this drill for lining up the putt and putting. Use your normal grip and putting stroke. Putt and follow the ball until the end of the putt as a "playing" putter.

Finger "Feel" Drill

The purpose of the finger "feel" drill is to develop the sense of feel through the exposure of the feel in the fingers only. The fingers will feel the putter head weight completely in the stroke and the feeling of the putter blade striking the ball as it moves through.

Figure 7.

Figure 8.

Use the normal putting grip and stroke but raise the thumbs off of the top of the grip a inch or so (Figure 8). The fingers will feel the putter head completely in the stroke, and the impact of the blade and ball through the ball.

Pendulum Putting Drill

The purpose of the pendulum putting drill is to utilize the sense of sight and feel in developing a putting stroke in which the hands work together as one unit. The primary concern is *sensitivity* and *feel*. The pendulum-like swing of the weight of the putter head is developed to roll the ball along the line-of-the-putt that the ball would roll "naturally", in place of trying to steer or guide the ball along a line not natural to the roll of the ball on the contour of the green.

Put two lead pencils equal distance from the ball perpendicular to the line of the putt but outside (Figure 9). Take the blade back and through smoothly with the back stroke and forward stroke the same length like a pendulum of a clock (Figures 10 and 11). Hold the blade at the completion of the stroke and check to see if it is square to the intended line after the ball has stopped.

Putt 3 balls in a row but not at a hole. The second and third putts should roll up and bump the preceding ball. This is measuring the putt distance-wise by the distance of the pendulum stroke and the roll distance of the ball.

Figure 9.

Figure 10.

Figure 11.

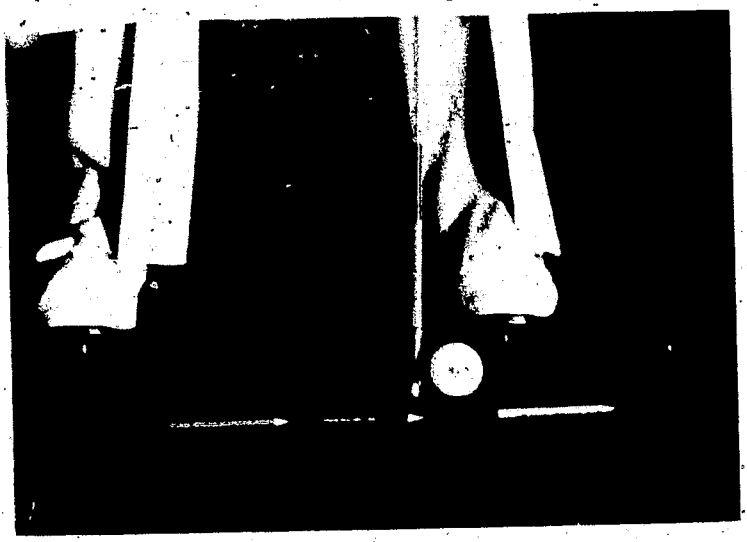

Figure 12.

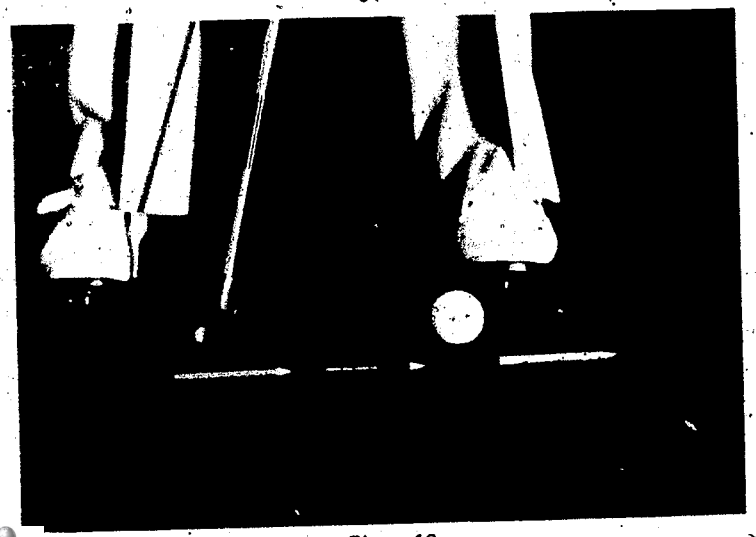

Figure 13.

Figure 14.

1/3's Putting Drill

The purpose of the 1/3's putting drill is to divide the complete putting stroke into 1/3's to develop feel for distance with a sense of good control. The blade of the putter is kept low with a pulling action that emphasizes acceleration of the putter blade through the ball. "Flush contact" is developed with this drill through stroking (striking) the ball solidly.

Place two golf or regular pencils parallel to the line-of-the-putt, from the ball back for measuring the back stroke and place one golf or regular pencil from the ball to the follow-through position (Figure 12). Move the putter blade back to the two pencils and pull through at the end of the one pencil (Figures 13 and 14).

Distance Putting Drill

The purpose of the distance putting drill is to roll the ball different distances in developing the sense of feel and sight for judging distances.

Lay a club, rope and/or ¼-inch dowel rod on the green 4 to 12 feet away. Stroke the ball so it rolls up to the clubshaft and just touches it, and so it rolls up just climbing over the rope or dowel rod. If the ball hits and rings the clubshaft, it was too hard. If it goes

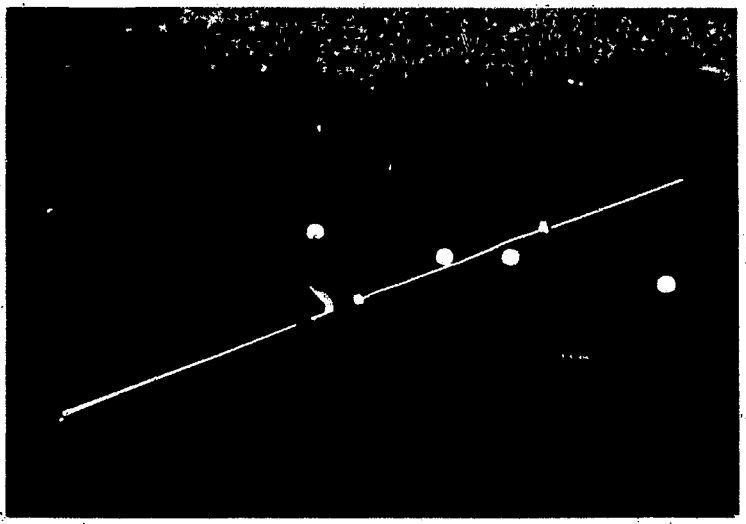

Figure 15.

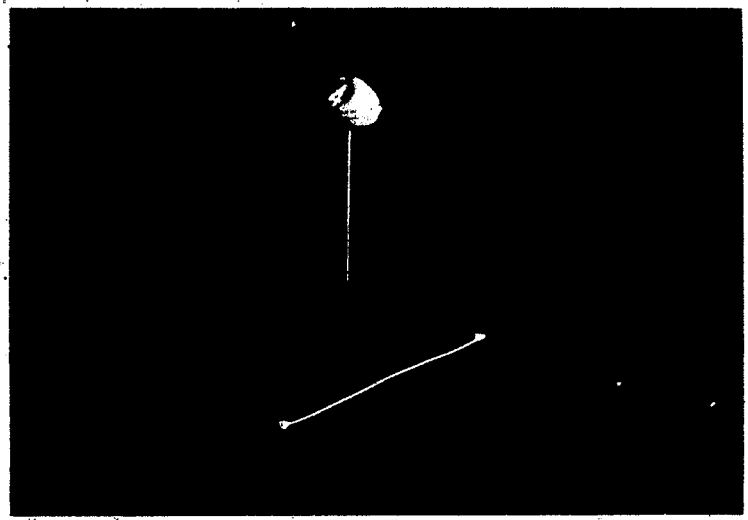

Figure 16.

over the rope 3 or more inches, the stroke was too hard. If it stops short of the shaft, rope and/or dowel rod, the putt is too short. The ball in the photograph with stripes depicts a putt that is too short, the second ball from the left is great, the third ball from the left is good, and the fourth ball from the left is too long (Figure 15). The next photo shows how to place a rope 2 to 3 inches short of the hole and then putt the ball so it just climbs over the rope and falls in the hole (Figure 16).

Fringe Putting Drill

The purpose of the fringe putting drill is to develop more accuracy distance-wise and line-wise by keeping the ball on the putter blade longer. The drill is used to correct a golfer coming off the putt by developing a good stroke with good results. Once the player has developed trust and confidence in this shot, it can be used from the fringe of the green.

Place the ball off the green at a distance as long as the grip on the putter (Figure 17). By stroking through the ball with a pulling action after "inaction", one can stroke the ball as if on the green to get it rolling the proper distance and line for the putt.

Figure 17.

Center Of The Cup Putting Drill

The purpose of the center of the cup putting drill is to develop the concept that the golfer must aim at the center of the cup rather than the whole cup.

Place the ball 12 to 20 inches from the cup with the end of a clubshaft laid across and in the center of the hole (Figure 18). Stroke the ball firmly so it hits the end of the clubshaft and drops in the hole.

If the ball is not stroked into the center of the cup at that firm rate of speed, it will lip out. The golfer will concentrate more and more on the center of the hole.

Another method is to put a second ball in place of the end of the clubshaft, just hanging over the edge of the hole (Figure 19). Stroke the ball firmly enough so it will strike the second-hanging ball and roll it away from the hole while the putted ball drops into the cup.

Figure 18.

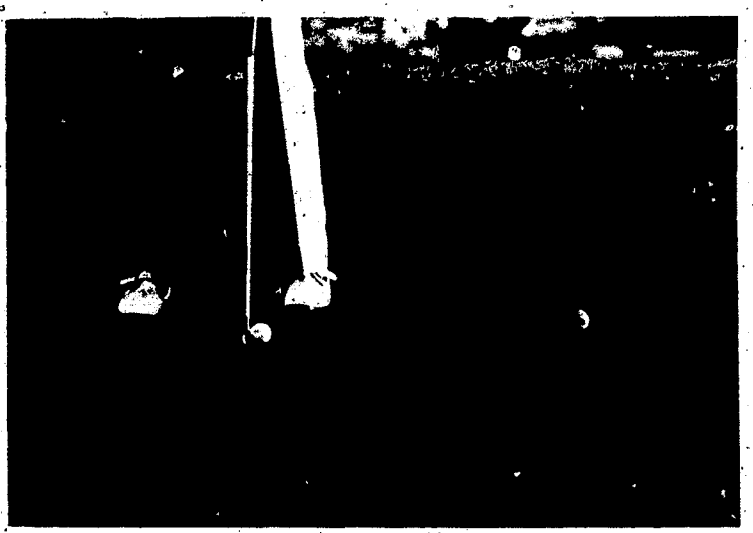

Figure 19

40 Putt Drill

The purpose of the 40 putt drill is to practice putting from various distances with two different goals involved and to score a number as near to 40 as possible. The two different goals are to get down in "one" from 2 to 10 feet and down in "two" from 10 to 20 feet (Figure 20).

Pro Putting Drill

The purpose of the pro putting drill is to practice putts from a distance of 4 to 8 feet in length to develop consistency and confidence. Making putts from this range will produce birdies and pars.

The drills can be employed in any order. Stations for each drill can be put on the practice green and the golfers rotated every 3 to 5 minutes. The golfer may use the drill that is most needed in developing a sound putting stroke.

A golfer who lacks the motivation to practice putting may use these drills to sharpen his concentration while improving his putting skills. Young golfers can use these drills to focus their concentration and increase their desire to practice putting. Accurate putting is an essential part of a consistent game of golf.

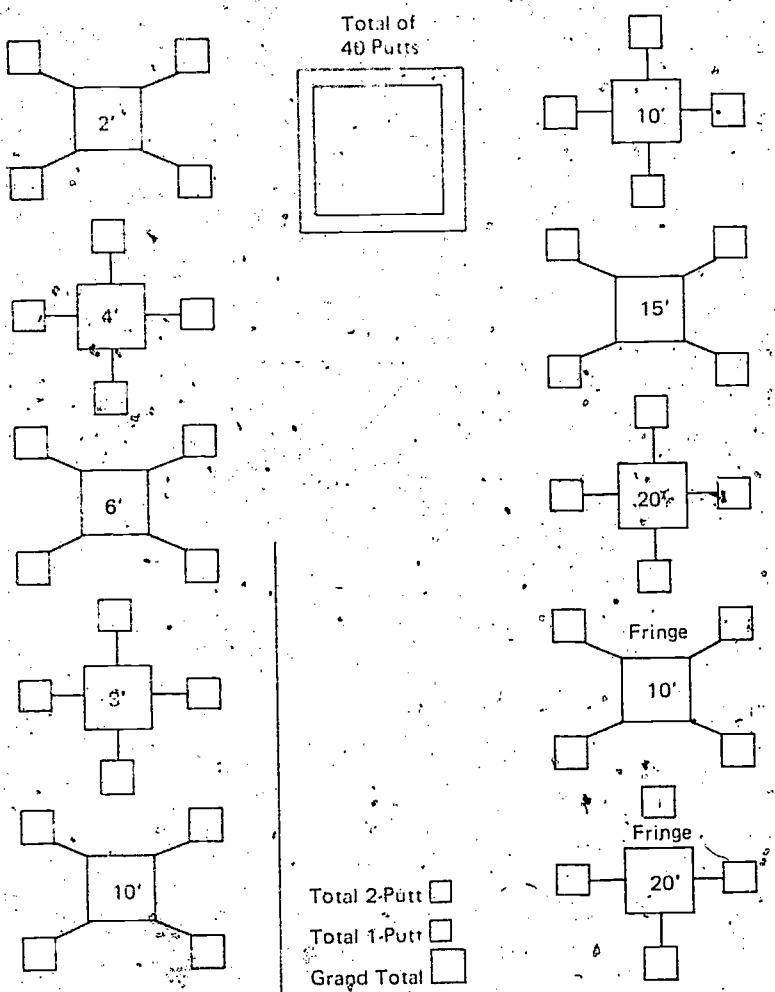

Figure 20. 40 Putt Drill.

Challenge Shots

CAROL CLARK JOHNSON
ANN CASEY JOHNSTONE

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Ann Johnstone received her B.S. degree from the University of Iowa, Iowa City. In 1966 she was elected LPGA Teacher of the Year. She is an instructor and golf coach at Stephens College, Columbia, Missouri and is also an area consultant for the National Golf Foundation.

Both Ann and Carol have competed as amateurs and professionals in tournament golf and have co-authored a book, Golf: A Positive Approach, available through Addison-Wesley Publishing Co., Reading, Massachusetts.

One of the most descriptive words about the game of golf is challenge. There is something about a challenge shot that sharpens your thinking and focuses your efforts on the specific point of aim or target. This acceptance of the challenges of the mental gymnastics really creates the fun of these shots.

The variety of challenge shots falls into specific categories. Think of the different shots as specific to a problem. The uneven lies are contour ground problems. Then, there are the specialty shots of specific heights or directions or off of unusual surfaces.

Uneven Lies

Uphill and Downhill

Let's start with the uneven lies. The uphill and downhill lies can be grouped together. One foot is higher or lower than the other. Some simple rules to follow are:

1. Use a normal grip.
2. Align the ball off the higher foot.
3. Use a square stance.
4. Lean into the hill.
5. Always take a practice swing to visualize your shot.
6. Shorten your swing to maintain balance.
7. Let your swing follow the contour of the ground.

In an uphill situation:

1. Generally use a less lofted club.
2. Aim to the right of the target since these shots are often hooked or pulled.

In a downhill situation:

1. Generally use a more lofted club.
2. Aim to the left of the target to avoid the common slice or push off of this lie.

Sidehill

Other uneven lies involve the ball position either higher or lower than your feet. Sidehill lies have these factors in common:

1. The grip is standard.
2. The ball is played in the center of the square stance.
3. The weight leans into the hill.
4. The swing is shortened to help maintain balance.

On the sidehill, when the ball is below your foot level, these specific suggestions should be followed:

1. Grip the club near the end.
2. Keep your weight toward the heels.
3. The ball will tend to go to the right of the target, so compensate by aiming to the left of the target.

On the sidehill lies, when the ball is above your foot level, try the following suggestions:

1. Shorten or choke down on the grip because the ground is closer to you.
2. The weight is forward, toward the toes.
3. The ball will tend to hook or pull to the left, so adjust by aiming to the right of the intended line.

Specialty Shots

Punch Shot

A punch shot is a low, line drive, low trajectory type of shot used to hit into the wind or under trees or branches.

1. Use your regular golf grip.
2. Use a less lofted club.
3. Play the ball closer to your back foot.
4. Choke down on the grip of the club.
5. Hold your club face by positioning your hands ahead of the ball.
6. Keep your back swing and follow-through low.

When making shots from bare ground, roads or rocks or when hitting a ball lying in a divot on bare ground, in a road or in rocks, try the following:

1. Use your regular golf grip.

2. Play the ball nearer your back foot.
3. Have hands slightly ahead of ball.
4. Take a shorter, more upright backswing.
5. Pick the ball clean but the ball first so that the club will not bounce off the hard surface.

Let the Air Out of Your Tires

This type of shot is used when your ball lies under tree branches and you have to execute a very low, flat swing to hit the ball.

1. Use your regular golf grip.
2. Stance "let the air out of your tires" you stand as wide and as low as possible.
3. Swing is very low, depending on heights of branches; sometimes it isn't any higher than your knees.
4. The backswing and follow-through are low and flat.
5. Ball flies out very low and sometimes looks like a dubbed shot.

Backward Shot with Club Inverted

A backward shot with club inverted is used when the ball is lying near a tree, fence, hedge, or a place where a penalty would be incurred to move the ball in order to hit it in the standard direction.

1. Use your standard grip or a reverse grip can be used, the left-handed grip.
2. Choke down on the grip of the club.
3. Stance can be square to slightly open - face the fence, tree, etc.
4. Use a short iron as the inverted face will be rounder and a bigger hitting surface.
5. Play the ball center to back towards the back foot.
6. Turn the club so that the toe is pointing down and the hitting surface of the club is towards the ball.
7. Take a short, waist high backswing may be a little bit more upright.
8. Use a chop down, forward swing the ball will come out away from the trouble.

Sand Shots

These challenge shots are special to the sand and the following suggestions should help to meet some of the unusual situations that arise.

Explosion Shot

This shot can be used when a ball in a sand trap needs to be hit out near the green and has an embankment to clear.

1. Use a sand wedge.
2. Use your regular grip.

3. Wiggle your feet into the sand.
4. Play the ball center or towards your target foot.
5. Open your club face slightly.
6. Hit the sand first about one to two inches behind the ball.
7. Use a slightly more upright swing.
8. Spank the sand to get the explosion-type shot.

Chip Shot

The chip shot can be used in the sand when one has a good lie with a shallow lipped trap, wet sand, or hard sand.

1. Use your regular grip.
2. Use an 8 or 9 iron or pitching wedge.
3. Use a square or slightly open stance.
4. Use an open or square club face.
5. Play the ball center to off the back foot.
6. Pick the ball off the sand - hit the ball first, taking little or no sand.

Putting Out of Trap

The putter is used when the trap has a slight lip or no lip at all.

1. Use your regular grip or your putting grip.
2. The stance is square to slightly open.
3. Play the ball off or near your back foot.
4. Hit the ball first.
5. Hit the ball hard enough to get through the sand and over whatever ground necessary to reach the green.
6. The ball will leave the putter head with a low trajectory flight, so it will run more than an explosion shot.

The challenges of the course, the weather and the competition, are ever present, but the most important personal challenge is to handle the ever changing set of circumstances of each hole and shot. Your mental ability to handle these challenges, to adjust your swing and then execute the shot, can provide some of the most rewarding, memorable moments.

Hosting an Intercollegiate Golf Tournament

MARY JO CAMPBELL

Mary Jo Campbell received her B.S. degree from the University of New Mexico, Albuquerque, her M.S. degree from the University of California at Santa Barbara, and her Ph.D. degree from The Ohio State University, Columbus. She is presently teaching at the University of New Mexico. For four years she was the women's golf coach at Ohio State.

To host a well-organized, enjoyable intercollegiate golf tournament requires much work and foresight. Pre-planning is the main key for a successful experience. Once the participants have arrived in town, you, as the tournament director, should be free of responsibilities so you can tend to spur-of-the-moment problems and have time to be the "gracious hostess," which adds a special quality to a well-run tournament.

At most universities, it is necessary to reserve the course for the tournament and practice rounds one year in advance. If it is a national or regional tournament, you may wish to talk to the greenskeeper several months prior to the tournament regarding the depth of the rough and the width of the fairways. You should also communicate with him concerning placement of the tees. On many courses the women's tees are in poor condition, on a slope, etc. In this case, you may wish to use the men's tees on some holes. Another factor to be kept in mind are water hazards within driving distance. If most participants are not highly skilled, it will be necessary to use the women's tees so play will not be slowed down because of many players hitting into the water.

If you plan to have caddies, it will be necessary to talk to the professional several months before the tournament. In many areas of the country caddies have become scarce and the pro will need time to find enough. This brings up the point that having a good working relationship with the pro is probably the single most important aid for you as a tournament director. The pro can be of immeasurable help in the pre-planning stages and during the tournament.

Other schools should be aware of your tournament date one year in advance so they do not schedule another meet at the same time. Several months before the tournament you should mail out the following necessary information:

1. Type of tournament - medal or match
2. Number of players per team

3. List of special events—long drive, putting, closest to hole, etc.
4. List of awards
5. Number of flights and how they will be determined
6. Deadline date for entries
7. Amount of entry fee
8. Eligibility forms
9. Entry form that asks for each player's handicap or usual score
10. Publicity form—asks for information on players who have won past tournaments
11. Banquet reservation form
12. List of motels with addresses and rates
13. City map
14. Local rules, if any, for the tournament

Since hosting a tournament requires a great deal of work, you will need many helpers. Be sure to ask people who are dependable and conscientious—it will save you from many last minute problems. Following is a list of duties you should delegate to others.

1. Banquet committee (cost, where, when, menu, decorations, seating arrangement, program, speaker, toastmistress)
2. Registration committee (register entrants, get local address of each team and make up packets for players which include: tournament information, pairings for the first day, scorecard, local rules, list of events, rule book, city information supplies by the Chamber of Commerce)
3. Housing committee (get rates from motels)
4. Starter for first tee (should be a knowledgeable golfer)
5. Scoreboard committee
6. Fore caddies for blind holes (they can increase speed of play tremendously)
7. Rules committee
8. Women's golf group to supply snacks and drinks at the turn
9. Secretarial help for typing and mimeographing pairings for each day
10. Publicity committee (contact radio, TV, newspapers before and during the tournament)

Even with all the above help, there are still several things for you to do:

1. Order awards several months before the tournament.
2. Arrange for a photographer to take a group picture of the players.
3. Put awards on display during the tournament.
4. After entries have been received, send a receipt to each coach.

5. Make pairings with three players per group and approximately eight minutes between tee times. Pair golfers according to ability, but try to avoid putting teammates in the same group. Tee golfers off in an order so that the poorer players do not slow down play for the better golfers. Often this is accomplished by teeing off the first flight, then championship flight, then second flight, third flight, etc.
6. Make out scorecards according to pairings and give them to the starter.
7. After play on the first day, make the new pairings according to the scores shot on the first day and divide the field into flights. Hand out the pairings to the coaches. You will also need to make out scorecards for the next day.
8. Present awards at the conclusion of the tournament.
9. Gather needed equipment and supplies (loudspeaker for the starter, scorecards, scoreboard sheets, tables and chairs for the scoreboard committee and starter, magic markers, golf carts for the rules committee).
10. Send thank-you notes to the golf course personnel and all those who helped you.

If you plan ahead you will host a well-organized tournament which the participants will enjoy. One last word of advice—get plenty of rest the few days before the tournament so you can enjoy it, too.

Off-Season Conditioning Program

CAROL ISAACS

Carol Isaacs received her B.S. degree from the University of Minnesota, Minneapolis, where she is now the women's golf coach. She has taught golf at YWCAs and has been the master teacher at a few NAGWS workshops held in Minnesota.

The need for an off-season conditioning program for golfers will exist as long as people dream of green grass beneath the snowdrifts. A total conditioning program must include preparation for a new season as well as continuance of the "feel" of the golf swing.

The very best and easiest advice to give about conditioning, preparation and maintenance is, of course, "hit balls—all winter long." This is ideal and not as hard to carry out as one may think, but it will be dealt with later.

The first part of the program begins with the golfer's basic dissatisfaction with herself, her swing, her game. Not many golfers are happy with the way they are playing. If the putts are dropping, the drives are not going far enough. The fairway woods might be booming, but what happened to the chipping? Maybe one day everything will click and the round will be pleasing. To strive to be better, to hit farther, to hit closer—these elements are always there. The winter season is the time to work on actual physical conditioning to be in better shape for the spring season.

Physical Conditioning

The following discussion concerns general and specific conditioning, total body and specific muscle strengthening, and off-season activities helpful in preparation for a new season.

To understand the specific physical exercises that are beneficial, it is necessary to understand the mechanics of the golf swing. Briefly, the swing is initiated by the left hand, arm, shoulder and hip. The body coils around the head, which remains the stationary point. The weight shifts to the inside of the right foot, with the right knee and hip resisting total swaying of the body to the right. As the downswing begins, the weight shifts to the outside of the left foot with a lateral movement of the knees. The left side of the body sets up firm as the left shoulder, arm and wrist pull the shaft down toward the ball. The head remains fixed until the swing is completed, and the right knee and stomach are facing the green at the end of the swing.

Beginning with exercises for the upper body, two are suggested hands, wrists and forearms. The first consists of holding a 5-iron

in the left hand so that the club is parallel to the floor. The club is slowly spun or rotated in a counterclockwise direction using the last three fingers of the left hand. When in the right hand, the club is rotated counterclockwise with the two middle fingers and thumb. The second exercise is to squeeze a tennis ball in the left hand for two to three minutes, twice a day, throughout the winter. This not only strengthens fingers and wrists but is an excellent left forearm builder.

Conditioning exercises are not always muscle building or strengthening exercises. Neck, upper back and shoulder muscles that are overdeveloped may actually hinder a fluid golf swing, so conditioning of these areas should consist of developing suppleness by stretching and loosening. A golf club hooked in the elbows behind the back can serve as a turning aid in waist twisting. With the club behind shoulders, elbows bent, and hands at shoulder height, the club aids in turning as in a simulated golf swing. Without the club, an exercise called the "rib cage slide" or "upper torso reach," with the rib cage sliding to the right and left directly over the hips, is a great way to loosen the upper back, thereby increasing the turn on the backswing.

The best exercise for leg strengthening is running. All golfers should begin a daily program of running to prepare for a new season. Not only does it build leg muscles, but the exercise for heart and lungs is beneficial in building the endurance needed to walk 18 holes without tiring at the beginning of the season. Adding light weights to the ankles is another way to strengthen the legs at the same time. The type worn by cross-country runners is perfect. Another leg exercise consists of raising up on the toes and lowering again. This strengthens calf muscles and can be improved by adding a five-pound weight held on the shoulders.

Overall activities beneficial in preparing for golf include rope skipping (for leg muscles and footwork), skiing (again for leg muscles), and belly dancing (for leg muscles, upper torso, and concentration). Having taught belly dancing for two years, I find the exercises and coordination of mind and body to have excellent carry-over value for golf. A worthwhile sedentary activity is reading golf literature. Current books by Gary Player, Jack Nicklaus and Mickey Wright offer many insights into mechanics as well as game concentration.

Maintaining the Swing

Maintaining the "feel" of the golf swing is best done by swinging a club. Golfers are urged always to warm up before swinging or hitting balls with the stretching and loosening exercises for upper back and torso. Swinging a weighted club is helpful for timing as

well as strengthening arm muscles. Small lead strips of tape can be wound around the base of the club to weight it. Swinging with weights around wrists (similar to ankle weights for running) will also aid in timing, and both exercises help to increase clubhead speed.

Whenever possible, hitting real balls into a driving net is the best way to keep in shape during the winter. The University of Minnesota has a golf gym with a net permanently set up. The golfers stand on rubber gripper mats, hitting toward a wall approximately 10 feet away. The net stretches overhead, on either side and in front of the wall. There is room for 12 golfers to hit. If such space is not available, one can purchase the smaller free-standing driving nets. Golfers can rotate from this to a putting area and a chipping area. A heavy curtain on a stage can be used as a hitting net for easy pitching and chipping.

In extremely desperate situations one can use plastic balls for several activities. For a small amount of money, one can buy three-foot by five-foot masonite boards and remnant squares of carpeting. Good white glue attaches the squares to one end of the board. The student stands on the board, places the ball on the carpet square, and hits toward a wall. In a regular gymnasium there is no fear of anyone getting hit with plastic balls. The boards can also be used for chipping and pitching if a target is put on a wall at the appropriate height and distance. Again, rotation to different stations makes it more interesting, but the instructor or coach must always try out the station herself before letting students find out it may be impossible.

It has been found at the University of Minnesota that several short practices are better for the student than one or two long periods. For example, 20 minutes of hitting at a time, interspersed with putting and chipping, is better than hitting balls with a full swing for two hours.

Concentration

Concentration is hard to maintain during practice periods. It is therefore necessary to stress the need for concentration to golfers. Remind students to have a set routine before hitting each ball. They should imagine a target in front of them, check stance and clubhead alignment, and recheck the target, just as if they were on the course. The same sequence should be practiced when working on chipping and putting. When an indoor driving net is available, the tendency is to hit balls with the full swing but to neglect putting. This will only hinder the development of a well-rounded golfer. Putting must be practiced faithfully to build confidence and keep the "touch."

In short, golf must be practiced to be improved. The body needs to be in top shape to perform as expected early in the season. These

exercises can prepare the body, while reading about golf and concentration on the game can prepare the mind for the competitive season.

Playing the Circuit: A Move Toward Alternative Education

ELINOR NICKERSON

Elinor Nickerson has taught physical education in California for 25 years. She is presently completing her 18th year at San Ramon Valley High School in Danville, California. Past department chairperson, currently women's athletic director, she has held office at the local and sectional level in GWS and CIF. She is now member-at-large for the international organization, The Association for the Anthropological Study of Play (TASP). A free-lance writer, her book, Kayaks to the Arctic, is available through Howell-North Publishers, Berkeley, California.

Alternative education is a term now used by educators throughout our land. Teachers in all disciplines, including my own, physical education, are urged, even required, to come forward with alternate methods of teaching.

Instructors of academic subjects now attend to words long used by dedicated physical educators: the call for relevancy. For many years we have urged development of courses which carry over into lives beyond high school and college sports and games enjoyed both by women and men. We have begun to teach outside the tradition of team and individual sports, locked into gymnasiums and playing fields. Now the move toward alternative education at last gives approval to learning experiences in hiking, bicycling, skating, Alpine skiing, cross-country skiing, aerobic exercise, Yoga, moto-cross, skin diving, surfing, scuba, rock climbing, camping, canoeing, sailing, water skiing, fishing, dance (all forms), bowling, riding. The list requires only imagination to become almost endless. Doors are open now to areas once considered the reserve of the wealthy, the privileged. At last educational validity has been granted to the teaching of recreational activities, limited only by environment, financing, tradition and inertia.

"Playing the Circuit" is a golfer's approach to alternative education. Lightly fictionalized, it is an account of a 10-day circuit in which four high school girls experienced the thrill of playing a different golf course almost every day during the early summer of 1974. Along with their golf clubs they brought their enthusiasm and excitement: the sort of response which makes physical education one of the most relevant fields in education today. They emerged

from the course with units (credits) toward satisfying their school district's physical education requirement. But more important, they developed skills in a game they love and which they intend to play the rest of their lives.

This article is not intended as a blueprint, but rather as a point of departure from which an imaginative instructor can develop her own program to satisfy the needs of her own classes. This was a small experiment involving four students who were interested in the game of golf. They were required to possess more than beginners' skills. Each girl had her own full set of clubs, a knowledge of the rules and a good understanding of golf etiquette. All had played many rounds at local 18 hole courses. Their handicaps reflected scores in the high 90s as well as the low 100s.

The article is not concerned with the cost of the trip except in the most general sense. Suffice it to say that as playing chaperones, my husband and I assumed our own expenses, considering them contributions to the experiment. Green fees vary with course condition and location and are therefore difficult to quote, but all of us know the cost of gasoline, motel accommodations and meals. With knowledge of current costs, accurate estimates can be made.

We planned to play as many different golf courses as possible within the span of 10 days. We travelled by minibus through the states of (northern) California, Oregon and Nevada, staying in inexpensive motels, eating (for the most part) in our rooms, using supermarkets and take-out orders for breakfasts and dinners. Lunches were either eaten at the golf course snack bars after our rounds, or brown-bagged on the road. The daily schedule had us at the golf course near opening time so we could tee-off early. Each afternoon we drove to the next course, found our motel and settled in. When possible, we telephoned the course to make sure we could get on early next morning. In no case were we disappointed. The trip was planned to avoid weekend play. Plans were also made for recreation and fun beyond the golf course.

We started from the San Francisco Bay Area early on a Sunday afternoon, and drove up the Redwood Highway to Ukiah. First off the tee Monday morning we shot a fine initial round on a fascinating homegrown golf course. The Ukiah Golf Course has been built largely by contributions from individuals, merchants and social groups of the town. It wanders through an area that was probably once grazing land, straying into deep forest overlooking a beautiful little valley. Each hole appears as if it had been designed by the person or group of people who funded it. At every tee there is a plaque commemorating the person or people who were responsible for the hole. The fairways are exciting: many hills, sand traps, rested areas to hit through, over and around. As one student said,

"Robert Trent Jones it ain't, but challenging it is! I'd like to play here again."

"Have your folks drive up for a round some time," we suggested.

Early afternoon found us speeding for Oregon where we detoured to the Oregon Caves. We treated the girls to the guided tour, then drove the long way north to Salishan, a coastal golf resort which may well be called the Queen of Oregon's dozens of golf courses. Even though Salishan's gracious accommodations are expensive, the green fees are surprisingly modest, also true of most Oregon golf courses. We stayed in a small motel a mile or two north of Salishan, and reported sleepily at the starter's desk near 7:30 Tuesday morning.

By 8:00 we were on the first fairway of this marvelous place, rejoicing in the good fortune of perfect weather. Oregon summers are famous for what the residents call "Oregon mists." Tourists speak more accurately of "rain."

The course roams through forest land bordering the Pacific Ocean. Some of the fairways lie in deep woods, others are oceanside. There is a par-3 hole where you hit up a hill against an offshore wind, only a little over 100 yards. But because of the winds and the position of a hilltop pin, a woman almost needs a driver to reach the green from the tee.

We treated ourselves to a fine luncheon at the elegant Salishan resort. We sensed in the expressions of the girls that this is the place where they would like to spend a special holiday. One confided, "I'd like to honeymoon here." We answered, "Second honeymoons here are fun, too," and she caught the message.

On Wednesday we played the Eugene Municipal course. The girls exclaimed over the trees lining the fairways. "So this is what is called a 'mature' golf course," one commented after ricocheting her ball repeatedly from a particularly dense growth.

We laughed. "Same thing at Del Monte in Monterey or Pasa Tiempo in Santa Cruz" we informed our girls. These courses are only an hour or two from their homes.

Thursday we played Tokatee, a little known but delightful course near the village of Blue River. Privately developed, it is now being eyed by speculators who hope to build custom houses near the fairways.

Friday we played Black Butte near the lumber town of The Sisters. Black Butte's custom designed homes are tucked unobtrusively along the fairways. "Talk about gracious living," said one girl, "I'm going to talk my folks into moving up here!"

"Wait until you see Rancho Murietta," we responded, "that's much closer to home."

On Saturday we passed by Sun River, near Bend, Oregon, and passed through the elegant resort with its stately homes. We each hit a bucket of balls, practiced our putting and wandered through the public buildings. We had been on the circuit for five days now, and the girls were tiring. "I never knew golf could be so much work as well as so much fun. I wonder how the pros survive," were two comments.

On leaving Bend we took the backroads to Nevada, heading for the south shore of Lake Tahoe, Nevada side, and the area near Heavenly Valley. This famous winter resort keeps its ski tram running during the summer and features a fine steak and potato dinner in the restaurant at the top of the tram. We dined in style that night, discussing the scene as it would be in winter, then slept late Saturday morning.

Sunday afternoon was free time, in which we all went separate ways. In the evening we dined together in one of South Shore's many pizza parlours. Then my husband and I signed the girls into Harrah's "Youth Center" while we hit the gaming tables. The girls were pleased to go. The center has dancing, bowling, pinball machines, movies, teenagers and chaperones. It is designed to care for young people while parents gamble. Not only are the young people armed on, but they cannot leave until their parents or guardians sign them out and pay a "sitter's" fee.

Monday we left Tahoe and drove to Reno where we played the Washoe County Course. It is well maintained and well used but the most astute comment came from the girls, who noticed, "We don't mean to put this course down, but it doesn't seem to have been designed by a course architect. It reminds us of Ukiah."

We responded, "That's not a put-down, but a realistic appraisal. Golfers are everywhere, but few communities can pay the fees of a professional architect. Home built and designed courses are living testimonial to the game of golf."

We stayed in Sparks, treating the girls to dinner and a show at the Nugget where a famous rock singer and comedian headed a double bill.

Tuesday we played Lakeridge, a semi-private course near Reno, another development with fairway homes, truly an gem. The hole which stands out in all our minds is another Par 3 overlooking a lake. The tee is high on a hill, the green a patch on a tiny island. The women's tees are halfway down the hill, making the tee shot an easy one. But the men's drive must carry about 150 yards and settle on the green. Of course we all put down a water ball and had a go at it. (I do not choose to report success or failure here.)

By unanimous vote we all elected to spend another day at Sparks and play Lakeridge a second time.

We started toward home after our round on Wednesday, driving to Auburn, California. Thursday morning we played Alta Sierra, another charming semi-private course just 14 miles from Auburn. The fairways lie in the high foothills of the Sierra and present many challenges. The girls were pleased to realize it is slightly over a two-hour drive from their homes.

Our final play was on one of California's most beautiful new golf courses, Rancho Murietta, near Sacramento. Long wide fairways among magnificent stands of oak trees wind along this former gold rush country. Possibly some day this course will be private, but at present it is open to the public. Green fees are high, golf carts are required. But as a finale to their circuit we all enjoyed golfing in style. The maintenance of the course is a golfer's dream. And, having played municipal courses, these girls were now experiencing the qualities one sees in country club courses.

In evaluating their experiences there was unanimity in the challenge of playing a new course every day. The girls sensed something of what is required of a golf professional on tour. Encapsulated and miniaturized though their experience was, they remarked "A tour is fun, but work. I get tired living out of a suitcase. I'll bet even pros have trouble with mealtimes and sleep times. And they have to produce good golf scores. At least we didn't have to play to galleries."

They had discovered the challenge of a sport where the basic rules are identical at each course but where no two golf courses are the same. Climate, course layout, landscaping, scenery and maintenance all influenced their games and blended into a special appreciation for the uniqueness of golf. "It's never the same. It's different each time out. It will never get boring," they exclaimed in their discovery. Each girl had her own glimpse of future joys in a sport she can play for the rest of her life.

It is up to the instructor and her school district to determine the use of this kind of experience in providing physical education units under any alternative education plan. It should be obvious that this kind of touring can be made modestly done, or expanded, formalized and or made coeducational. Someone with vision and daring might combine 4 courses in outdoor living with golf. Students can bring sleeping bags and chart their journey near public lands where camping is allowed. Or a tour of recreational vehicles might be a less expensive way to go.

Finally there was the bonus, dear to the hearts of all golfers, duffers or pros, young or old. Swinging those clubs for 10 days on the circuit sharpened the skills of us all: we all took three or more strokes from our games.

Golf Visual Aids

MARGARET CUMMINS

Prices listed are subject to change. Numbers in parentheses refer to film distributors listed. A comprehensive listing of golf films may be acquired from the National Golf Foundation, Form AC-1.

Films

Come Golf With Me. 16mm, sound, color. Free loan. Laura Baugh playing Bermuda's golf courses. (9)

Great Moments in Golf. 28 min., 16mm, sound, b&w. Rental $10. Exhibits in "Golf House" USGA headquarters in New York. (10)

[illegible] 30 min., 16mm, sound, b&w. Sale $125. Women professionals demonstrating basic fundamentals on the course. (1)

Modern Golf Instruction Films. 6 units. 16mm, sound, color. Sale rental. Newest films for golf instruction. (5)

Unit I. *Golf . . . A Special Kind of Joy.* 16 min. Sale $160, rental 2 days $15. Introduction to game of golf, equipment and swing.

Unit II. *How to Build A Golf Swing.* Two 17 min., reels. Sale $340, rental 2 days $15 each reel. Understanding of swing movements emphasizing six major concepts.

Unit III. *The Short Approach Shots.* 10 min. Sale $100, rental 2 days $15. Pitch and chip with swing adaptation and course factors.

Unit IV. *The Special Challenge Shots.* 15 min. Sale $150, rental 2 days $15. Swing adaptations for weather, recovery, course design and topography.

Unit V. *Putting, Golf's End Game.* 13 min. Sale $130, rental 2 days $15. Geometric factors of putting, building stroke and confidence.

Unit VI. *Courtesy On The Course.* 18 min. Sale $120, rental 2 days $15. Golf course etiquette and playing procedures.

Play Them As They Lie. 16 min., 16mm, sound, color. Rental $10. USGA rules for fairway and rough are explained. (10)

Rules Of Golf: Hazards. 18 min., 16mm, sound, color. Rental $10. USGA rules for bunkers and water hazards. (10)

Shell's Wonderful World Of Golf. 60 min., 16mm, sound, color. Loan. List of matches and instructions for borrowing available from Shell Oil Company Film Library. (8)

Sweeten Your Swing. 26 min., 16mm, sound, color. Sale $275, rental $75. Features LPGA players giving detailed instruction on swing and special shots. (6)

The Kemper Open. 2[illegible] min., 16mm, sound, color. Free loan. Specify year desired 1968-1974. (4)

The Masters 1971-1974. 40 min., 16mm, sound, color. (4)
Their Game Is Golf. 28 min., 16mm, sound, color. Loan. History of women's professional golf and members of the LPGA. (7)

Loop Films

Fundamental Skills In Golf. Super 8mm, color. Sale $22.95 each, 6 for $137.70. Instructional guide accompanies each loop. (5)
Unit I. *The Grip. The Address Routine.*
Unit II. *The Full Swing. Woods And Irons.*
Unit III. *The Short Approach. Pitch and Run. Pitch.*
Unit IV. *The Putt.*
Unit V. *The Sand Explosion Shot.*
Unit VI. *Uneven Lies. Uphill, Downhill, Sidehill.*
Golf. 8mm, color. Sale set of four loops $62.50. High school boy and girl demonstrate techniques of putting, swinging and correct grip. (2)

Slides

Basic Golf Rules. 35mm, 140 color-coded slides. Sale $108 set. Appropriate for teaching rules to beginners or advanced players. Price includes carousel tray and index. (3)

Film Distributors

(1) Cameron Park Golf Academy, 3188 Royal Drive, Shingle Springs, CA 95682.
(2) Film Comm, Inc., 208 S. LaSalle Street, Chicago, IL 60604.
(3) Media Resources Center, 121 Pearson Hall, Iowa State University, Ames, IA 50010.
(4) Modern Talking Picture Service, Inc. 1212 Avenue of the Americas, New York, NY 10036.
(5) National Golf Foundation, 707 Merchandise Mart, Chicago, IL 60654.
(6) Pentagon Park Tower, 4940 Viking Drive, Minneapolis, MN 55435.
(7) Professional Golfer's Association of America, Box 12458, Lake Park, FL 33403.
(8) Shell Oil Company Film Library, 450 Meridian Street, Indianapolis, IN 46204.
(9) Sterling Movies Inc., 375 Park Avenue, New York, NY 10022.
(10) United States Golf Association, Film Library, Golf House, Liberty Corners Road, Far Hills, NJ 07931.

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