UNITED STATES ARMY MARKSMANSHIP TRAINING UNIT

THE ADVANCED PISTOL MARKSMANSHIP MANUAL

VOLUME I

1965 EDITION

We are the guardians of a great endeavor. We have achieved much and we have erred often. We are willing in all humility to make way for those who will follow. We seek perfection with the best that is in us. May the heritage we have sustained impel our champions into the tempest invested with unassailable fortitude.

The Pistol Coach-Instructor-Shooter

FOREWORD

The "Advanced Pistol Marksmanship Manual" has been compiled with a determination to improve pistol marksmanship. It is a compilation of data gathered from many years of personal experience of proven US Army Pistol Champions and coaches condensed into two volumes for ready reference and covering the most advanced and proven techniques known to date. The marksmen and coaches who contributed ideas gained from championship competitive experience did so with a firm desire to impart the knowledge gained for the promotion of pistol marksmanship training. The data, published in two volumes, represents a comprehensive effort covering many facets of pistol marksmanship and related subjects gained from the research of authoritative articles, personal interviews, observation of foreign competition and contributions from personnel closely associated with pistol activities.

The wealth of experience and knowledge accumulated in the pistol marksmanship field has become so voluminous that it has become necessary to separate it into two volumes.

Volume I is devoted to fundamentals, techniques, mental discipline, coaching and competitive physical fitness. It is intended for use as a standard reference for pistol marksmen at any stage of development and is dedicated to the individual marksman who is seriously interested in attainment of maximum performance in the art of pistol competition. Volume II is designed to aid the instructor, the coach, and the person in charge of developing marksmen and organizing a competitive team. Volume II will receive a more limited distribution than Volume I.

Both volumes are prepared in conjunction with that portion of the mission of the United States Army Marksmanship Training Unit which requires it to advance the techniques of pistol marksmanship and training. Suggestions for improvements are solicited and may be directed to the Commanding Officer, USAMTU, Fort Benning, Georgia.

JOS. J. PEOT
Col. Signal Corps
Commanding

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SECTION ONE
FUNDAMENTALS OF ADVANCED PISTOL MARKSMANSHIP

FUNDAMENTALS OF ADVANCED PISTOL MARKSMANSHIP

The fundamentals of advanced pistol marksmanship embrace all of those physical factors deemed essential to the control necessary for the pistol shooter to fire an accurate shot. Full control of accuracy, in this sense, assumes that the weapon is zeroed, that a high degree of inherent accuracy exists in the weapon and ammunition, and that the firing is taking place under ideal conditions. Mental control is essential; moreover, it is the prime, indispensible element that controls the execution of the techniques.

In order for a shot to be accurate, it is first necessary to make sure that the pistol will be as motionless as possible during the time that the shot is being fired. The stance assumed by the shooter must solve the task of giving the greatest stability and immobility to the entire system, consisting of the shooter's body and the weapon. Since the very essence of accurate shooting consists in placing a shot in a target which is small in diameter, it is obvious that the shooter must give the pistol a definite stability of direction. Proper positioning points the pistol directly toward the target with no tendency to drifting or inclination to either side. Likewise, the vertical movement of the pistol is confined to the aiming area. It is generally known that breathing is accompanied by the rhythmic movement of the chest and stomach. In order to keep the pistol as immobile as possible, as well as maintaining the direction that has already been achieved, the shooter must hold his breath. Naturally, the breath must be held for the length of time required to steady the hold and deliver an accurate shot. In order to fire a shot, the shooter must press the trigger with his index finger. To prevent the shifting of sight alignment, it is necessary for the shooter to grip the pistol in a manner which guarantees that the trigger pull is straight to the rear. The delicate balance of sight alignment and minimum arc of movement can be easily disturbed if the trigger is activated in any other manner. However, since the shooter cannot achieve complete immobility when assuming the stance and position, the trigger has to be pressed under conditions of greater or lesser movements of the pistol. Therefore, in order to deliver an accurate shot, within his ability to hold, the shooter must not only control the trigger evenly, but he must also, of necessity, do so in strict coordination with correct sight alignment. The size of the shot group will, therefore, not exceed the dimensions of the arc of movement, providing that the shot breaks unexpectedly, and no reflex action of the muscles of the hand, arm or shoulder disturbs the delivery of the shot.

To help the shooter acquire the necessary knowledge to master all the factors that control his shooting, we shall analyze in greater detail each separate element of accurate shooting.... assuming the stance, position and grip, holding the breath, sight alignment, and control of the trigger. Also included will be certain methods of training that will accelerate the shooter's development into a champion pistol shot. This status is achieved only after the shooter has mastered the technique of controlling the employment of the fundamentals.

CHAPTER 1

ATTAINING A MINIMUM ARC OF MOVEMENT

Taking into consideration the direct relationship between accuracy of shooting and the degree of immobility of the pistol, when the shot is being delivered, the marksman must devote the most serious attention to the selection of a stance, a position, a grip, and a means of breath control which will guarantee the greatest stability and immobility of the system created by the pistol and the body. The movement thus obtained provides a stable foundation, permitting the most efficient use of the other fundamentals.

A. THE STANCE.

The excellence of the assumed stance is a major factor in the creation of the maximum control, which in turn creates the conditions necessary for the delivery of an accurate shot. Every shooter possesses certain individualities and characteristics that are peculiar to him alone. Among these are height, weight, proportion of body, development of muscle system, etc. It follows, then, that there cannot be any definite, all-purpose stance which applies equally to all shooters. Therefore, the shooter himself, on the basis of his own particular configurations, must find the variation of stance which provides the most stability for his body.

1. The main requirements of the stance.

The assumed stance is the somewhat, mildly uncomfortable positioning of the human body which is created by the necessity of supporting a pistol aimed at a target. Despite the great number of variations and physical differences encountered in any cross-section of shooter, the stance must provide for:

a. The greatest possible degree of equilibrium and stability in the body-weapon system, commensurate with the least possible strain on the shooter's muscles.

b. The greatest possible degree of immobility, i.e., the smallest arc of movement possible within the shooting arm and pistol.

c. A head position which will allow for the most efficient use of the shooter's eyes throughout the sighting and aiming process.

Throughout the process of training it is necessary, therefore, for the shooter to exercise special care in the selection of a stance. The development of an incorrect stance should be detected and corrected early in any training program.

2. The human motor apparatus.

Considering the role played by the muscular and ligamental system in the creation of stability in the shooter's stance, it is necessary for the shooter to have at least a passing knowledge of the human motor apparatus.

The human motor apparatus is subdivided into two parts: active and passive.

The passive apparatus includes the bones and ligaments, both of which exert resistence as a result of their physical properties. The active apparatus includes the system of muscles which, by their relaxation and contraction, move individual portions of the body into different positions relative to one another, or which keep them in a fixed position.

a. The passive apparatus.

(1) The bones and their joints constitute the firm basis of the human body which is called the skeleton. The skeleton serves as the support for the soft tissues, particularly for the muscles attached to it.

Since the majority of bones have movable joints, they are able to change their position with respect to one another. The muscles attached to the bones, by contracting, keep individual portions of the skeleton steady, or conversely, put them in motion. Thus, the system of bones and muscles provides for various positions of the body in space, as well as for all kinds of movements which a person has to make constantly.

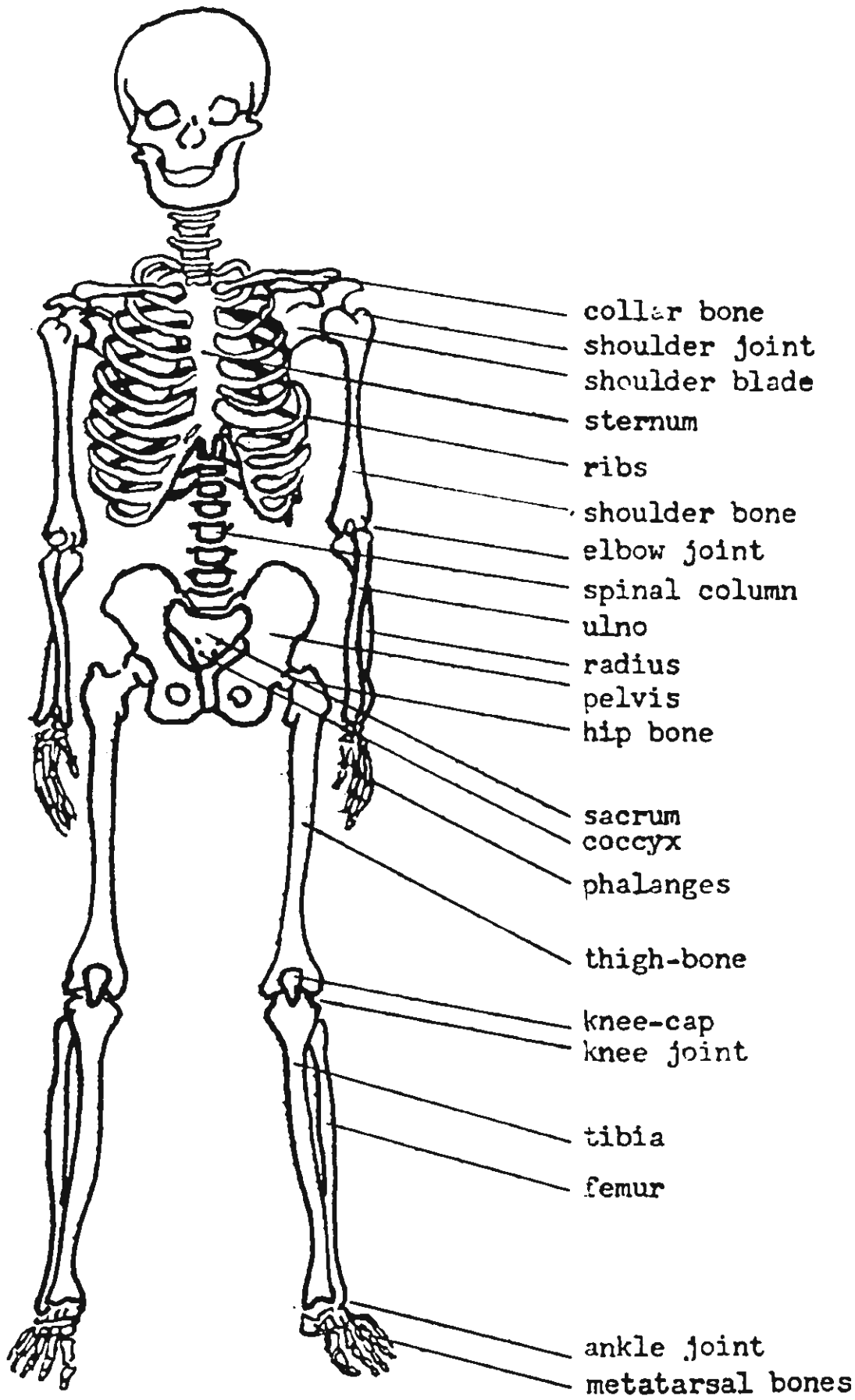


Figure 1. General View of the Human Skeleton.

The human body contains more than 200 bones which are joined to one another in various ways. The basis of the skeleton is the spinal column, consisting of individual vertebrae. The human spinal column has curves at the chest, small of the back, and sacrum (pectoral, lumbar, and sacral curves, respectively), which make it resilient and supple.

Two flat bones -- the shoulder blades -- are situated in the upper portion of the spine. They are attached to the spinal column and to the ribs only by means of muscles. Each shoulder blade is joined to the collar-bone, or clavicle, the other end of which is joined to the breast-bone, or sternum. The shoulder blades and collar-bones, encircling the upper portion of the torso, form the zone of upper extremities, or the shoulder, or humeral, zone.

The zone of the lower extremities is the pelvic zone, or the pelvis. It consists of the sacrum and the two pelvic bones which are joined immobilely to it. The pelvic bones have round sockets into which fit the ends of the thigh bones (femur).

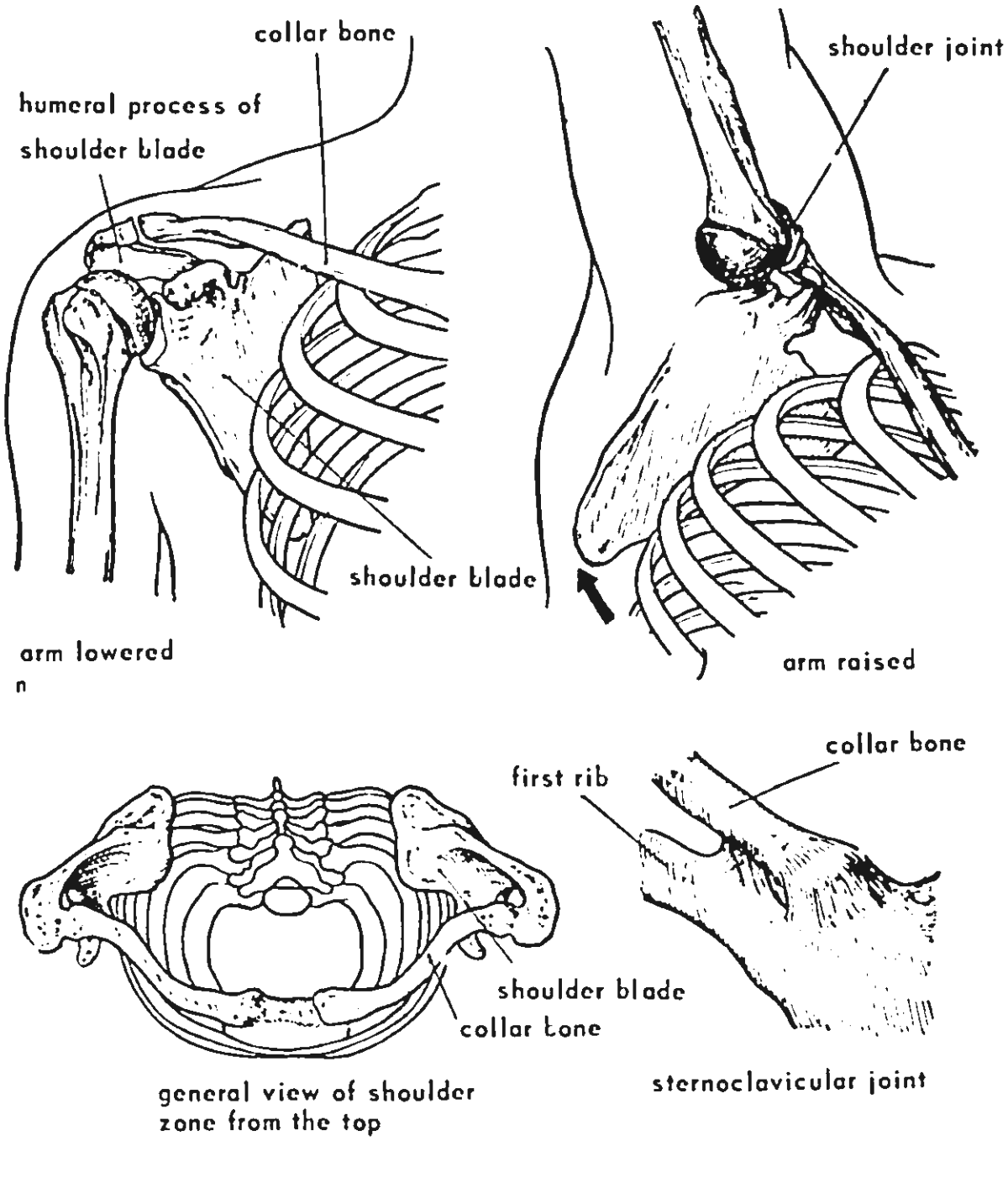


Figure 2. Bones of the Shoulder Zone.

The junctures between the bones are either immobile, of relatively low mobility, or mobile (joints). The majority of bones are joined mobilely to one another.

The low mobility of some bone junctures is achieved by the layers of resilient cartilage between them. Such layers of cartilage are found, for example, between the individual vertebrae. When the muscles contract, these layers of cartilage squeeze together and the vertebrae almost touch one another (Figure 3).

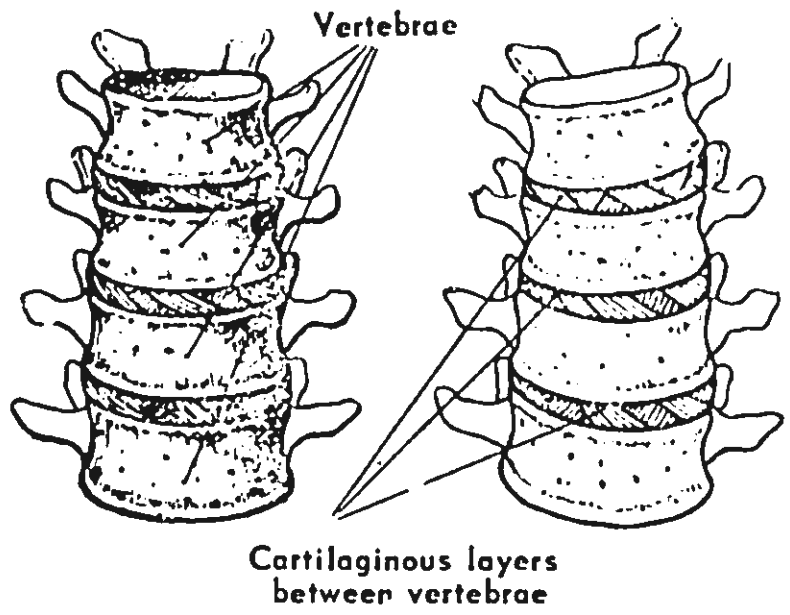


Figure 3. Relatively Immobile Junctures of Bones (With the Aid of Cartilage).

Thus, the vertebrae, especially in the lumbar and neck areas, can be rather sharply inclined, relative to one another. As a whole, the entire spinal column will tolerate considerable movement, and will allow bending well forward, back, and to the sides. In addition to this suppleness, the spinal column has great durability, especially when functioning under the pressure of added weight. Considering the peculiarity of the skeletal structure, and the fact that the humeral zone is connected to the thorax and the spinal column principally by means of muscles, it becomes obvious that when shooting from a standing position, the shooter finds it difficult to support the weight of the pistol (up to 3 pounds suspended at the end of the arm) solely by means of these same muscles of the humeral (shoulder) zone. Consequently, the shooter must strive to give his body a stance which enables him to transfer some of the weight of the extended pistol arm onto the spinal column. In so doing, the shooter provides for a far greater percentage of bone support than is possible with a stance that relies solely on muscular tension.

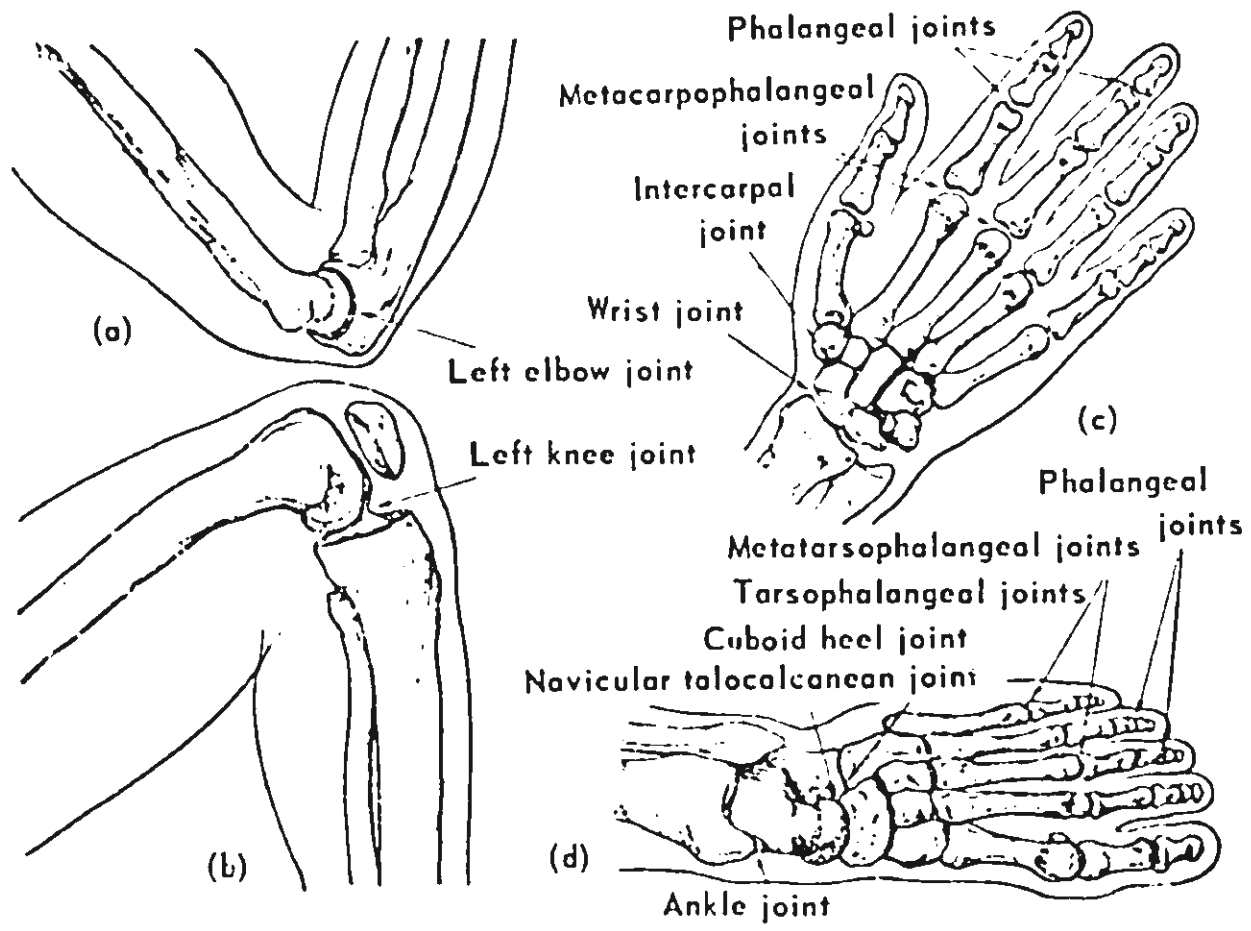


Figure 4. Movable Bone Junctures -- Joints: a. Left Elbow Joint; b. Left Knee Joint; c. Left Hand Joints; d. Left Foot Joints.

The most mobile bone junctures are the joints. The pouch of the joint consists of very compact connective tissue. In and around the layer of the pouch are strong, resilient tendinous ligaments. The edges of the pouch, together with the ligaments, are attached to the bones at a slight distance from their contiguous surfaces and form a tight seal over this joint cavity.

The movements are not identical in the various joints. Some joints permit movements only in two planes which are perpendicular to one another (bending and unbending as well as turning to the side, for instance). Still others provide for movement in any direction (bending and unbending, turning to the side, and rotation). The extent and direction of movement depend upon the form of the joint's surfaces.

(2) Ligaments.

Since each joint contains tendinous ligaments, the shooter must strive to find himself a stance in which the joints will be held fast not only by means of muscular tension, but also by means of tension upon the stable and resilient tendinous ligaments, the greatest application of which in operation will best provide for holding the joints fast, as is necessary for giving the maximum immobility to his body, and consequently to the gun.

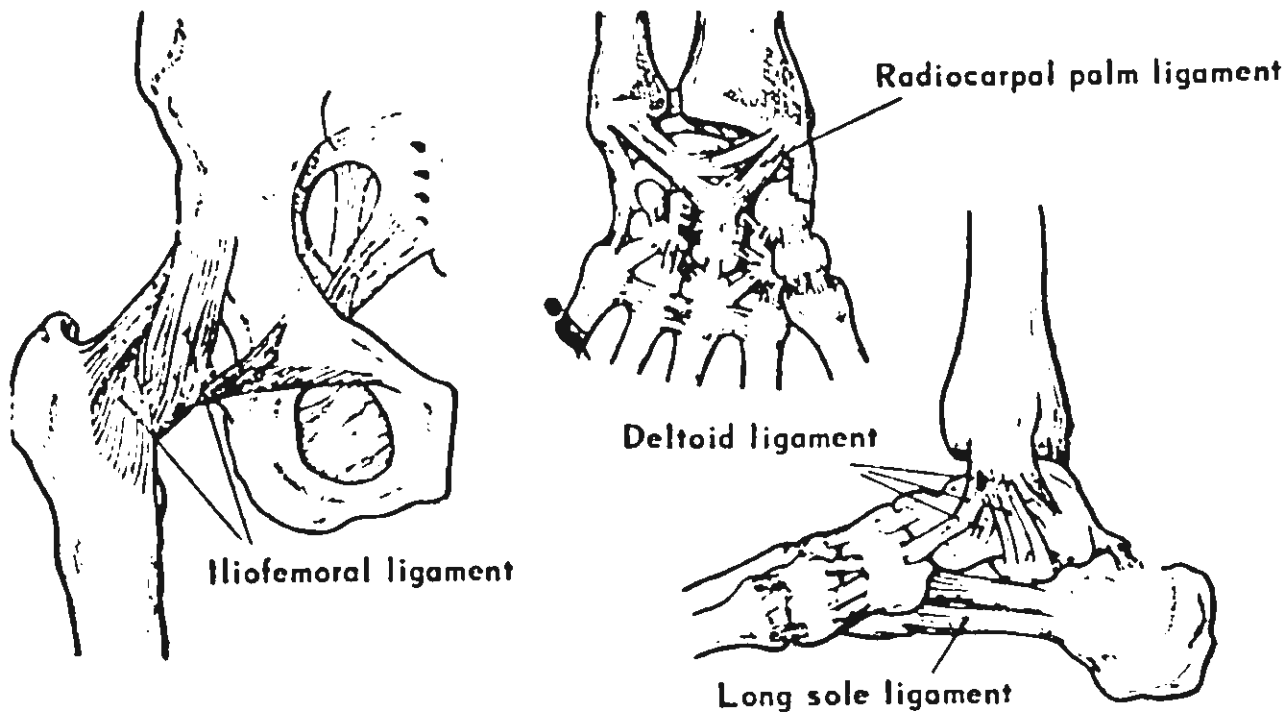


Figure 5. Diagram Showing Placement of Ligament Apparatus: a. Hip Joint; b. Left Hand (Palm Surface); c. Right Foot (View From the Inside).

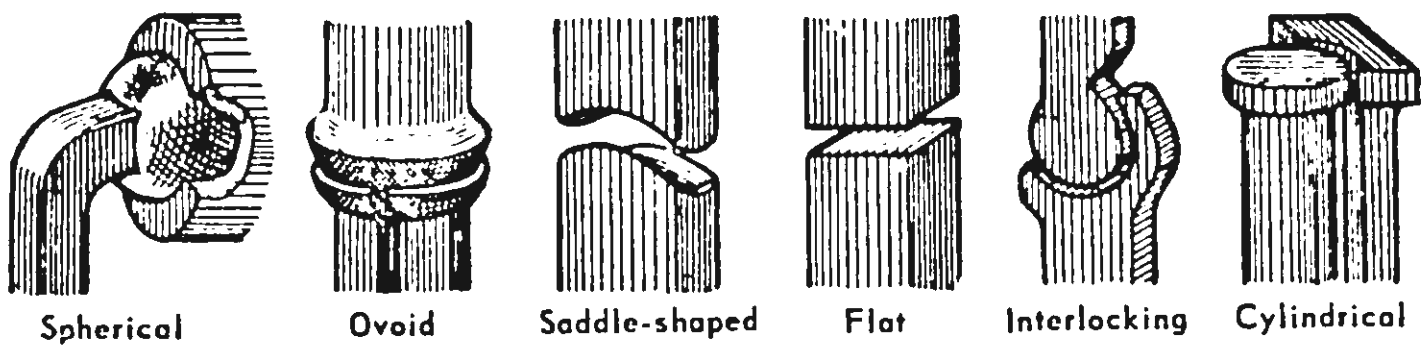


Figure 6. Diagram of Basic Types of Joints (After Kahn).

b. The active apparatus is composed of the muscular, central nervous and vestibular systems.

The maintenance of equilibrium and the correct stance or posture of the body demands a very complicated, coordinated control system to govern the action of the entire skeletal musculature.

(1) Skeletal muscular system.

Let us now dwell briefly on the structure and properties of the skeletal muscles. Muscles having their ends attached to the bones of the skeleton are called skeletal muscles.

Muscular tissue is distinguished by its ability to contract, that is, to change its form by shortening itself in length and by increasing in width.

A distinction is made between smooth, cardiac, and cross-striped muscular tissue.

(a) Cross-striped muscles. (Voluntary)

The entire skeletal musculature is formed of cross-striped muscular tissue, the fibers of which consist of evenly alternating areas, some of which appear light-colored under the microscope, and the others of which appear dark, as a result of which the entire fiber appears to have transverse stripes. The contraction of the muscles is achieved by the shortening of the dark areas of its fibers.

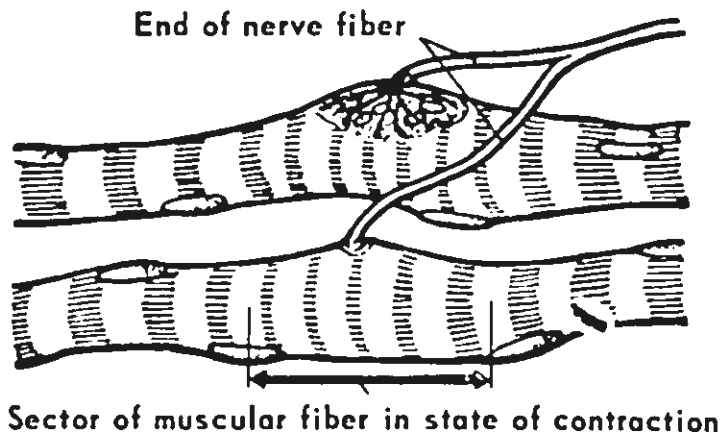


Figure 7. Fibers of Cross-Striped Muscle.

As a result of the contraction of the muscles, the places where the muscles begin and are fastened to other parts of the skeleton are brought closer together and this results either in the movement of the body and the extremities or the maintaining of them in a definite position.

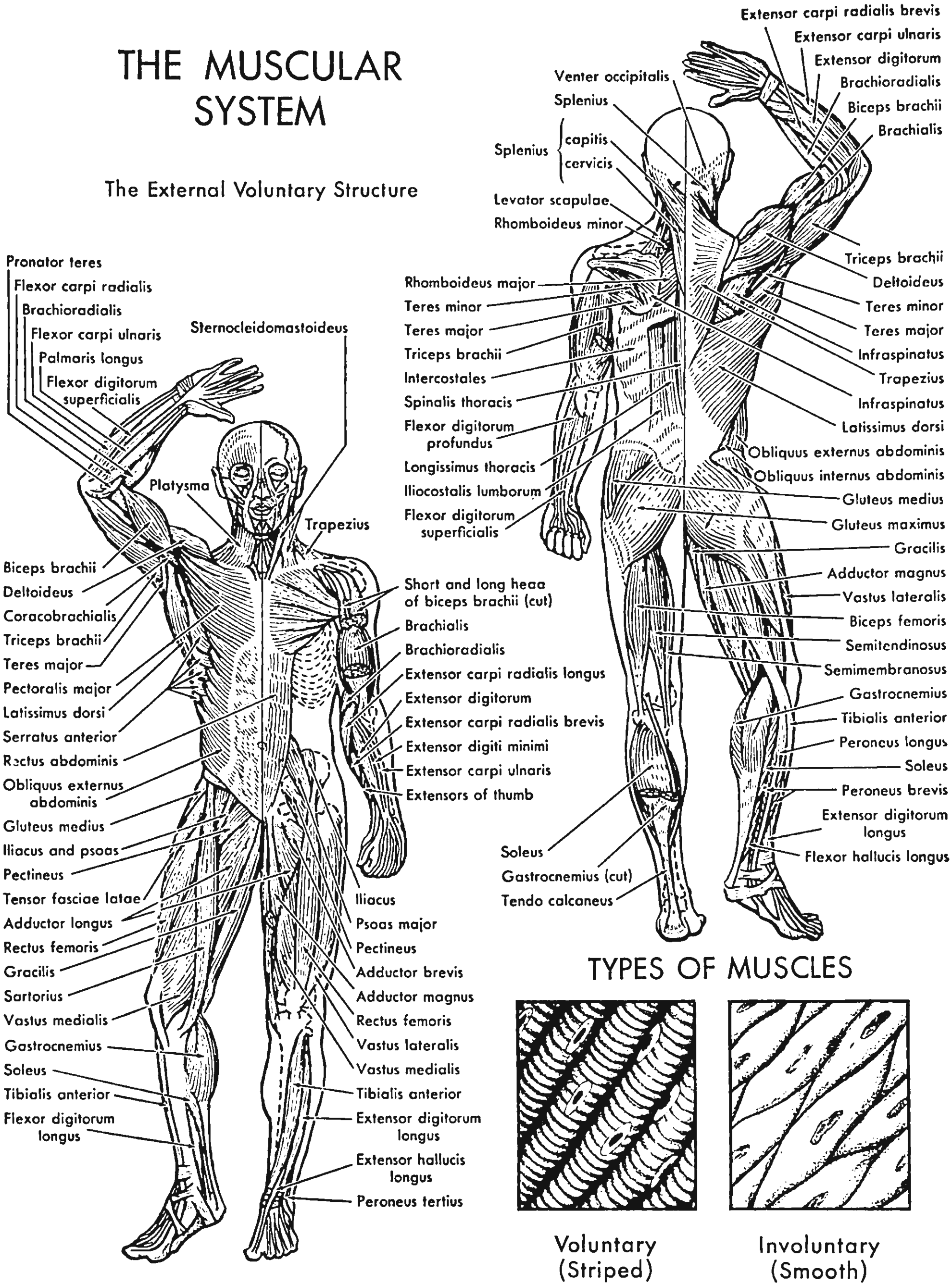
The entire skeletal musculature which keeps the human body in various positions and puts it in motion has more than 600 muscles.

The skeletal muscles are covered by a thin, resilient covering called the muscle fascia. At the ends of the muscle it changes into extremely tough white cords -- which fuse with the periosteum. Most frequently both ends of the muscle are fastened to two adjacent bones which are joined mobilely to one another; sometimes the tendons stretch very far, going past two or several joints. In portions of the arm there are many other such muscles. When they contract, to carry out their work, they can exert a certain overall movement not only upon the hand, but also upon the forearm, and, in its turn, this can have an adverse effect upon shooting. It must be said that the possibility of the isolated movement of one muscle without the participation of neighboring muscles depends in many instances upon training. It is possible, by means of training, to develop the ability to contract only those muscles which must carry out the particular movement and to weaken the effect of other muscles hindering the carrying out of that movement. It is extremely important for a shooter to achieve so-called isolated muscular contraction so that he will be able, for example, while shooting, to isolate that group of muscles in the arm which exerts the pressure on the trigger without at the same time changing the overall position assumed by the hand, that is, without putting it in motion.

The work done by the muscle when it contracts can be of either of two types: static or dynamic.

THE MUSCULAR SYSTEM

The External Voluntary Structure



TYPES OF MUSCLES

Voluntary (Striped)

Involuntary (Smooth)

Figure 8. General View of the Human Muscular System.

1. Static work of the muscles is carried out when the joints are in a certain position. During static work the muscles are capable of remaining in a strained position for only a relatively short period of time without fatigue.

2. Dynamic work of the muscles is carried out when the individual portions of the body are to be moved; during such work, muscular tension alternates with relaxation, and contraction alternates with elongation.

During the period when the muscle is at work, a decomposition of certain substances which are part of the muscular fibers occurs in the muscle and lactic acid is formed. During the intervals between individual contractions, the muscle momentarily rests. This relaxation contributes to the restoration of the state which had existed prior to the contraction, and the muscle proves to be completely capable of operating again. However, if any muscle is in the contracted state continuously, fatigue developes rapidly; protracted contraction of a muscle can soon reduce it to the state of complete debility.

Figure 9. Muscles of Forward Surface of the Left Forearm and Hand.

When assuming the firing stance, at which time the shooter must achieve the greatest immobility of his body, the muscles perform static work, that is, that work which is least favorable from the point of view of muscle fatigue. Taking this into consideration, the shooter must, especially when shooting for long periods of time, devote a great deal of attention to devising a system that allows alternating breaks between periods of assuming the firing position that will make it possible for the muscles to regain their working ability to the greatest possible extent.

Muscles with identical action are called synergists. Muscles with opposing action are called antagonists. For example, the muscles used to close the hand are antagonists with respect to the muscles used to open the hand.

It must be noted that the performing of smooth movements is possible only when antagonist muscles operate in concord. When they are in operation, the muscles of one group perform the action of a surmounting nature, and those of another group perform the action of a yielding nature. Without the participation of antagonist muscles, some synergist muscles would be able to carry out only jerky movements. The performing of physical exercises and training contribute not only to a situation in which the muscles become thicker, but also more elastic.

(b) Smooth muscles. (Involuntary)

The smooth muscles are encountered chiefly within the walls of the internal organs and are subject to comparatively weak excitability. These muscles have no bearing on assuming or maintaining a stance or posture.

(c) Cardiac muscles. (Combination)

The human heart is composed of muscles that are a combination of both voluntary and involuntary types. It is constructed of smooth (involuntary) muscle tissue but acts as the cross-striped or voluntary type muscle.

(2) Nervous system.

When any movement of the living organism is carried out, the nervous system necessarily takes part in the operation of any muscle. The stream of impulses coming from the central nervous system is the cause of the muscular contraction. The central nervous system determines the tone of the muscles, that is, their tense state, without which it would be impossible to keep the body in equilibrium in any position. Since a shooter must be very interested in the problem pertaining to muscular work directed at the maintaining of equilibrium and the achieving of the greatest immobility of the body when he assumes firing position, let us acquaint ourselves briefly in general outlines, with the arrangement of the human nervous system.

In all vertebrates, inclusing man, distinction is made between the central nervous system and the peripheral nervous system.

(a) The central nervous system represents a large accumulation of nerve tissue and consists of the spinal cord, situated within the spinal column, and the brain, situated within the cranial cavity.

(b) The peripheral nervous system.

The numerous nerves leading away from the spinal cord and the brain represent the peripheral nervous system. The principal property of the nerve tissue is that it conveys excitation.

The nerve consists of a large number of nerve fibers which are distinguished from one another chiefly by the thickness of the white covering. Not far from the place where it ends, the nerve fiber loses its white covering and breaks down into several small branches.

Thus, the nerves approaching the muscles consist of a large number of nerve fibers. Within the muscle, each fiber branches off sharply, providing with nerve ends an entire group of individual muscle fibers. The impulses from the ends of the centrifugal (see below) nerve fibers are transferred to the muscle fibers.

Whereas, smooth muscles, which are encountered chiefly within the walls of internal organs, possess comparatively weak excitability and contract very slowly, the cross-striped muscles, conversely, the easily excited and the process of contraction in them occurs with great rapidity.

In accomplishing the work of immobile support of weapon and body, excitatory impulses coming from the central nervous system to the muscles always follow one another with great frequency, as a result of which the muscles do not have time to relax after each contraction. This leads to a fusing of separate contractions into one protracted contraction. Such are the ordinary contractions of the skeletal muscles which we observe in the joints when there are extremely limited movements of the body or when the movable portions of the body are kept fast.

Excitatory impulses entering the muscles and causing them to contract are a response of the living organism to some irritation.

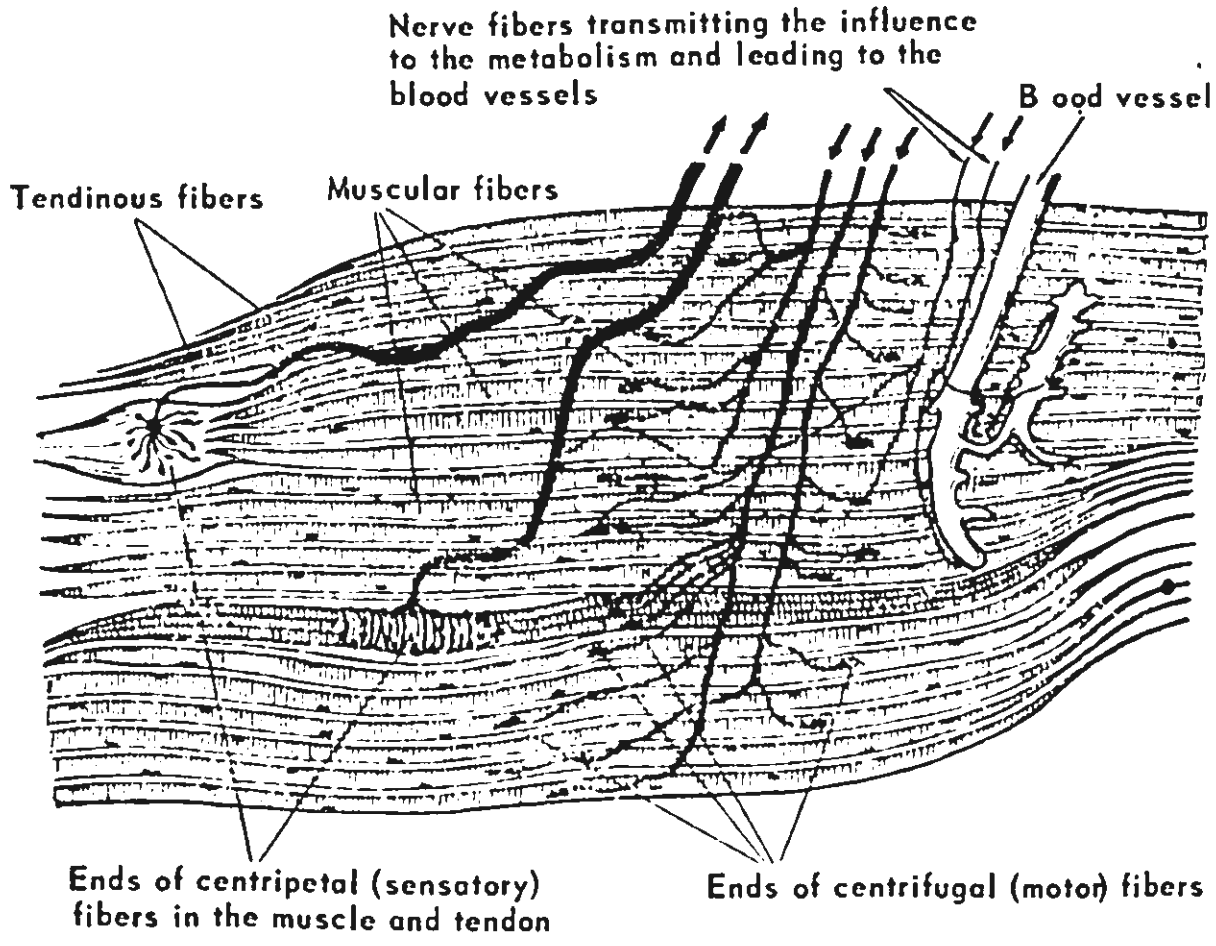


Figure 10. Nerve Ends in a Skeletal Muscle.

It is necessary to know that the nervous system carries out its work on the principle of the so-called reflex (reflex is a reflected action). Each action of an organism in response to an irritation coming from the outside or inside environment and occurring with the participation of the nervous system is called a reflex. The path taken by the excitatory impulses causing the reflex actions is called the reflex arc.

In any reflex arc it is possible to isolate a number of distinct areas. The first area of the reflex arc is made up of the receiving nerve ends--the receivers--which are situated in the sensory organs and in all other organs of the body--the muscles, lungs, etc.; the second is made up of the centripetal nerve carrying the excitation from the periphery (from the receiver) to the central nervous system; the third is made up of the central nervous system, where the excitation undergoes complex change; the fourth is the centrifugal nerve carrying the excitation from the central nervous system to a particular nerve or organ; and the fifth is the termination of the centrifugal nerve in the organ giving the response action--the skeletal muscle, heart, glands, or smoother musculature.

Thus, all organs have receiving nerve ends, or receivers, which transmit the excitation to the central nervous system. Some receivers are situated within the body and receive stimuli arising in the internal organs; other are located near the surface of the body and receive external stimuli. As a result of the peculiarities of their structure, the receivers prove to be specialized, adapted to excitation only by definite stimuli; some receive stimuli from light, others from sound, etc. The specialized receivers also include muscular-motor receivers, which are excited by a change in the body's stance , thus contributing, in the final analysis, to maintaining it in equilibrium. Therefore we shall dwell in somewhat more detail on the sensation of bodily stance and the observance and maintenance of bodily equilibrium as a basis which predetermines stability when assuming a stance for shooting.

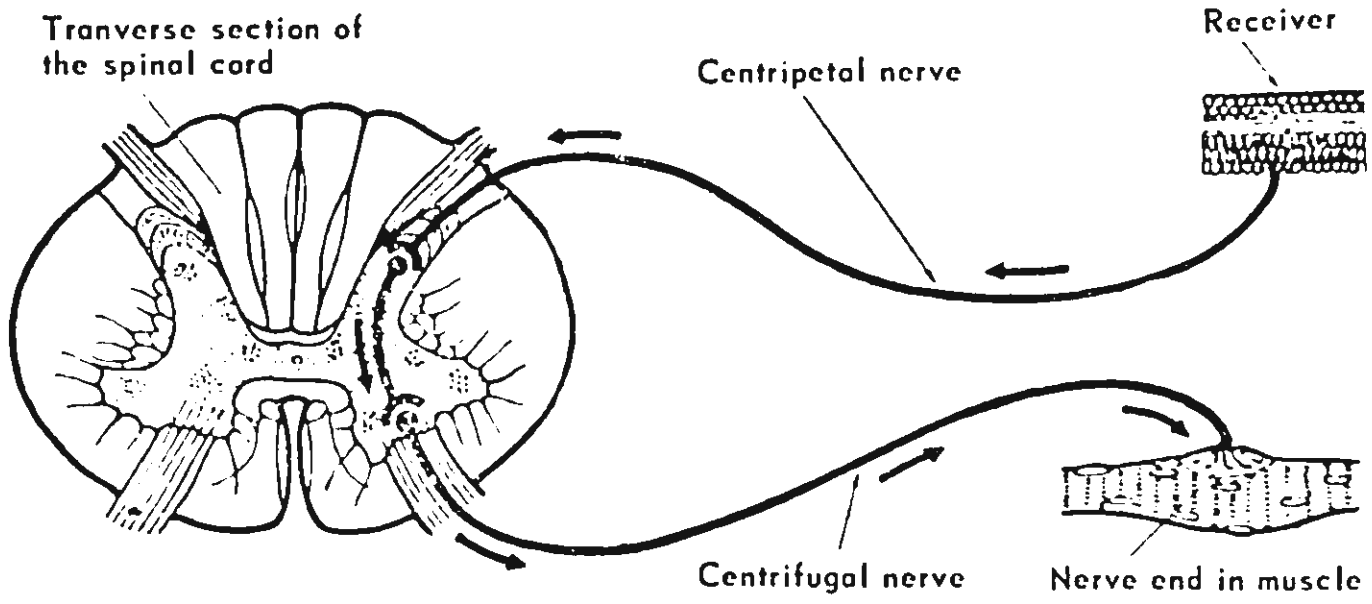


Figure 11. Diagram of a Reflector Arc.

The effecting of a normal stance of a living organism is provided for by the fact that the skeletal muscles are always somewhat in a state of tension. This phenomenon has been given the name of muscular tone. As a result of the existence of muscular tone, a definite interrelationship of various parts of the body of animals or man is maintained. The holding of the head and the body in normal position in space provides for the correct orientation of the organism with respect to the immediate environment and creates the necessary prerequisites for the organism's motor activity.

Muscular tone is a reflex phenomenon. The maintenance of the normal position of the body and of its equilibrium is provided for by a stream of impulses proceeding from the muscle and tendon receivers, the receivers of the skin, the vestibular apparatus (see below) and the retinas of the eyes, which impulses are transmitted along centripetal nerves to the central nervous system, causing a tonic-reflex activity of the skeletal muscles. In the process of gradual development, there arose and became fixed in the human organism a group of tonic reflexes aimed at maintaining equilibrium when there is a threat that it will be violated or at restoring the normal stance in instances when the equilibrium had already been violated. This group of reactions was named the regulating tonic reflexes. They include: the posture reflexes, which arise when there is a change in the position of the head in space and with respect to the torso, and the straightening reflexes, which arise when the organism's normal position is altered. These reflexes lie in the redistribution of the tone of the muscles in the extremities, neck, and torso. It is by this means that the skeletal musculature provides for the maintaining of equilibrium in the human body.

However, as a result of the redistribution in the tension of the muscles by means of the continuous action and counteraction of bending muscles and unbending muscles, the human body cannot be in a state of absolute equilibrium, cannot be completely immobile; it constantly shifts

back and forth somewhat. Naturally, the shooter is interested in those conditions under which these shifts of the body under the action and counteraction of muscles are as small as possible.

(3) Vestibular apparatus. (Equilibrium control)

In preserving the equilibrium of the body and, consequently, in the extent to which it shifts back and forth, great importance attaches to the impulses proceeding from the vestibular apparatus.

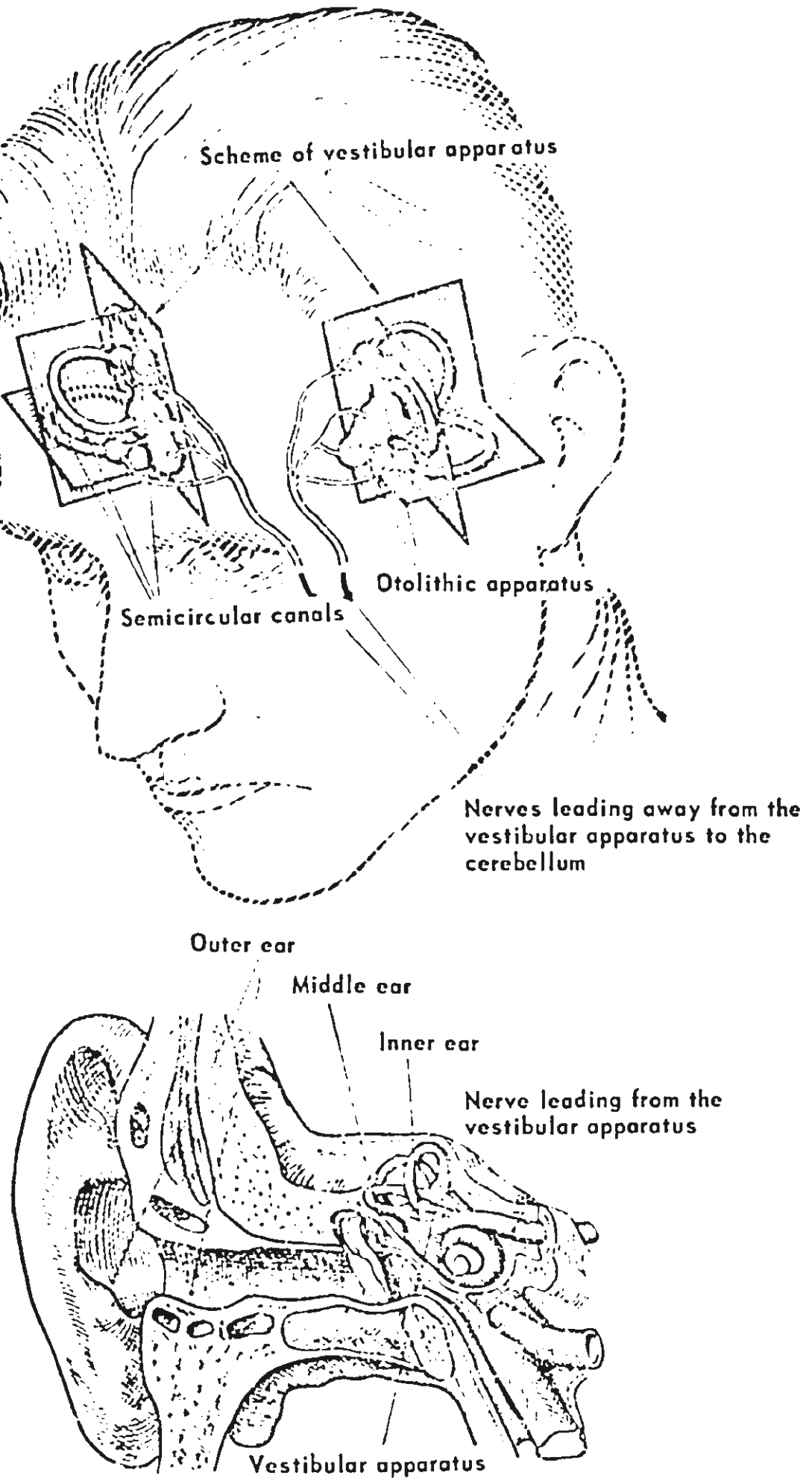


Figure 12. Diagram of Vestibular Apparatus.

The vestibular apparatus, the organ of equilibrium, is situated in the temporal portion of the head, in the inner portion of the right and left ear (Figure 12). It consists of the otolithic apparatus and the semicircle canals. The otolithic apparatus consists of two small pockets on the inner surface of which there are sensitive cells equipped with fine hairs. Small nodules of lime crystals--otoliths--are located on the hairs. Any change in head position changes the tension on the hairs and thus excites the ends of nerve fibers, receivers, connected to the hairs. The tolerance for distinguishing between inclinations of the body to the side is 1°, and forward and back is $1.5\text{-}2^{\circ}$. The impulses coming from the otolithic apparatus cause reflex reactions contributing to maintaining the body in equilibrium. Three semicircular channels, which represent very fine tubes filled with a liquid--endolymph--lead away from one of the pockets of the otolithic apparatus in three planes perpendicular to one another when the head makes a movement the liquid contained in the channels, by moving back and forth, produces pressure upon the sensory cells connected to the ends of the nerve fibers. The impulses thus created cause reflex actions leading to the preservation of the body's equilibrium during movements.

Consequently, when there is a change in the angle of the head or torso, there arise a number of reflexes directed at restoring their initial position. As soon as a person inclines his head, even if he does not change the position of his torso, impulses begin immediately to proceed from the vestibular apparatus. These impulses have an effect upon the change in muscle tone, that is, the tension of definite groups of muslces.

It is completely natural that the vestibular apparatus will "work" with the greatest accuracy when the person's head is situated in its normal, natural position, without any inclination.

It is possible to make from this the extremely important conclusion that the body of a shooter as he is assuming firing position will undergo the least amount of shifting if his head is held in a normal position, without inclining it to either side. In this narrow tolerance of differentiation of body inclination, the "sensitivity" of the vestibular apparatus, will be the greatest.

The importance of the vestibular apparatus in providing for the stability of the stance when shooting is very great. The greater the extent to which the organ of equilibrium is developed and trained, the better its interrelation with the work of the skeletal musculature which is aimed at preserving the balance of the body.

The reflexes of stance equilibrium are carried out not only from the receivers of the vestibular apparatus, but also from the receivers in the muscles and tendons of the neck, and from the receivers in the skin in the neck area, which have been named the neck-tendon tonic reflexes of balance.

From this the shooter must also make an appropriate conclusion for himself: when assuming a stance for shooting, it is not necessary to extend the head excessively toward the target, to throw the head back, that is, not to strain the neck muscles and tendons excessively, since this causes strong stimulation of the receivers situated in them and thus creates a stream of impulses which lead to the redistribution of the tone of the skeletal musculature and to an increase in the number of times the body rocks, or moves back and forth.

Finally, it is necessary to mention that the maintenance of muscular tone, and consequently the preservation of bodily equilibirum in a particular stance, is achieved by a stream of centripetal impulses, among which the impulses proceeding from the muscles and joints are of especial importance. The muscles are not only an organ of movement; thanks to the existence of special nerve ends which transmit impulses to the nervous system, the muscles simultaneously are also an organ which perceives the varying degree of their tensions and contractions. By constantly sending signals concerning the position of the body in space, the muscles

and joints cause the corresponding reflex reactions, which lead to the preservation of the particular bodily balance. Therefore, when assuming firing stance the shooter must strive to achieve a position in which he does not exert too much tension on the powerful centripetal impulses which, so to speak, can drown out the weaker impulses proceeding from the other, less contracted muscles, and, in the final analysis, can have an over-all influence upon the redistribution of muscular tone, thus exerting an adverse effect upon the stability of the entire system consisting of the shooter's body and weapon.

The adverse action of head inclination, the strain upon the neck muscles and tendons, and the strain upon individual groups of skeletal muscles manifests itself in the redistribution of muscular tone, which increases the movements of the entire system; the powerful streams of centripetal impulses thus created, proceeding uninterruptedly and for a long period of time from the receivers to the central nervous system and then from it to the skeletal muscles, lead to strong and comparatively rapid fatigue as a whole, both of the nervous system and of the muscular apparatus of the shooter, and this has an adverse effect upon the quality of shooting.

(4) Types of equilibrium.

Two basic types of equilibrium are distinguished in the statics of the human body: stable and unstable. These two types are determined by the location of the body's center of gravity relative to the support area.

(a) Stable equilibrium is that in which the body, brought out of position of equilibrium and then left to itself, returns to the original position. This type of equilibrium occurs in instances when the body's center of gravity is located below the support area, for example, in the form shown in Figure 13.

(b) Unstable equilibrium is that in which the body's center of gravity is located above the support area (Figure 14). In this instance the body which has been brought out of the state of equilibrium does not return to its original position.

Consequently, a person's body in position for shooting is in a state of unstable equilibrium, since the body's center of gravity is located above the support area.

The principal condition for preserving any type of body equilibrium is that the line of gravity (the vertical line dropped from the body's center of gravity) must run through the support area. If the line of gravity goes beyond the confines of the support area, a body which was in a state of unstable equilibrium will not return to the original position, but will fall.

Being in a state of unstable equilibrium, the body can have a varying degree of stability, depending upon the position in which it is located, since the degree of the body's stability is determined by the height of its center of gravity above the support area, the size of the support itself, and by the passage of the line of gravity with respect to the borders of the support area.

Since equilibrium is upset at the moment when the body's line of gravity goes beyond the limits of the support area (Figure 14), it is completely obvious that when the support area is unchanged, the body will lose its stability in proportion to the height of the center of gravity above the support area. But with an increase in support area, the body's stability increases when the height of the center of gravity remains unchanged. Another essential factor determining the degree of the body's stability is the position of the line of gravity with respect to the borders of the support area; the closer the body's line of gravity approaches the edge of the support area, the fewer the possibilities of shifting it in that direction without risking the chance of upsetting the body's equilibrium. The least stable position is standing; the small degree of stability of that position is caused by the fact that, with a small support area, the

body's center of gravity is located comparatively high above it; with identical height of the center of gravity and identical support area, the standing position will have varying degrees of stability depending upon how the shooter places the weight of his body--whether he throws the body back, standing on his heels, or stands erect, placing his weight upon the middle portion of each foot and thus bringing the line of gravity closer to the center of the support area, or leans the body forward, placing the principal part of his weight on the front portion of the feet and forcing the line of gravity to approach the forward edge of the support area.

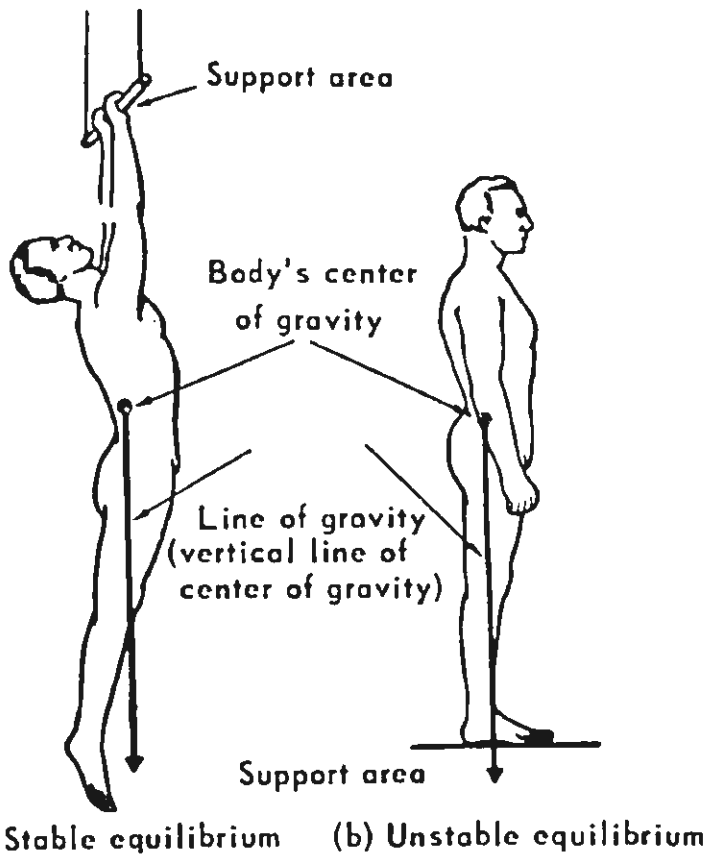


Figure 13. Types of Equilibrium of the Human Body.

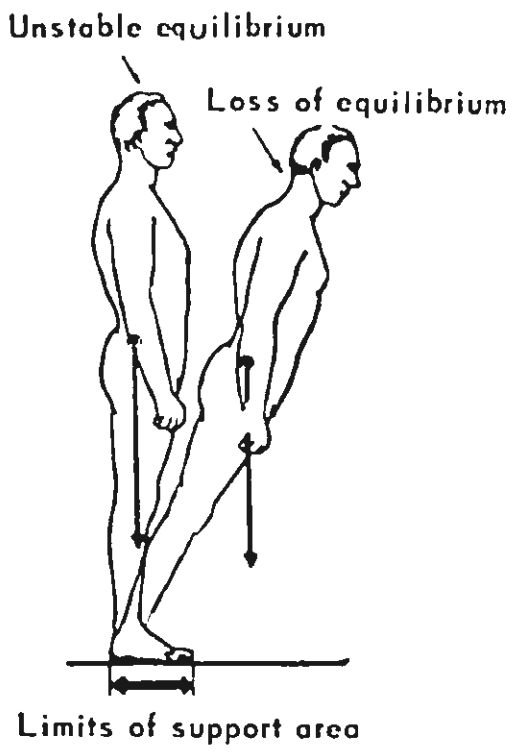


Figure 14. Unstable Equilibrium and Loss of Equilibrium.

Thus, the location of the body's center of gravity above the support area, the size of the support area, and the location of the line of gravity with respect to the borders of the support area are the external factors which determine the degree of bodily stability.

Let us examine first of all the question of the center of gravity of the human body. Since our body consists of separate parts, its over-all center of gravity is defined as the center of gravity of a system of bodies. Insofar as the separate parts of the human body are joined mobilely to one another, the over-all center of gravity does not have a fixed position, but shifts with every change in position of its separate parts. Therefore each posture or position of the body located in a state of equilibrium has, correspondingly, a different location of the body's over-all center of gravity (Figure 15).

The over-all center of gravity of the human body shifts even when the body remains in one and the same posture, as a result of breathing, blood circulation, and the filling up of the organs in the abdominal cavity; therefore, it is very difficult to achieve absolute accuracy in determining the location of the over-all center of gravity of a living organism. As applicable to the separate postures of the body it can be said, for example, that when the body is in its ordinary symmetrical stance, the over-all center of gravity of a person's body is located at a point representing 0.555-0.565 of his height.

Properly speaking, in practice the shooter does not have to know or to determine accurately the location of the over-all center of gravity in his body; but by knowing about the influence which a shift in the center of gravity has upon the degree of stability of a particular stance, the shooter must strive only to achieve a posture in which the weight of the body is distributed evenly onto his support surfaces--both feet.

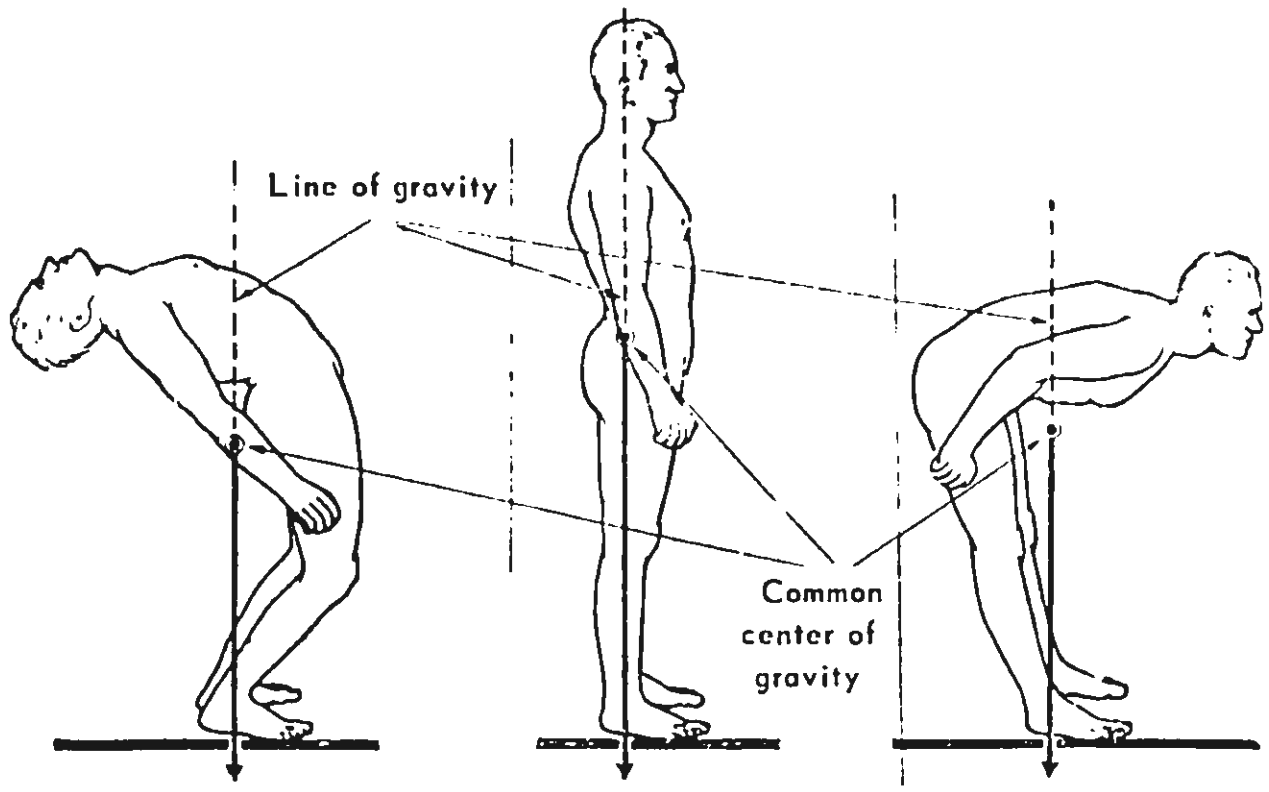


Figure 15. Location of Common Center of Gravity of the Human Body in Various Poses.

The situation is completely different with the support area. The support area is made up not only of the body's support surfaces--the feet--but is also the area lying between them. The shooter can, for example, when in a standing position, place his feet differently, decrease or increase the support area, and thus substantially change stability conditions of his body (Figure 16).

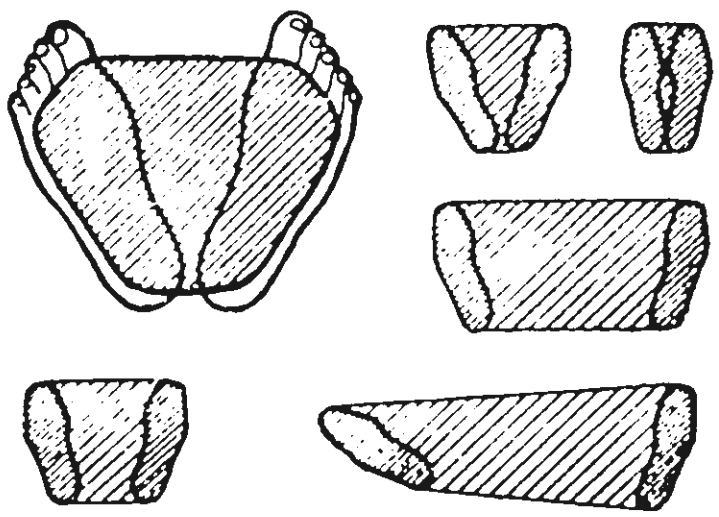


Figure 16. Change in the Body's Support Area Depending upon the Placement of the Feet.

As a result, let us examine first of all the structure of the foot, as well as its operation, and, at that, in the least favorable conditions for it, that is, when the person's body is in a standing position, in which the foot muscles are carrying out the greatest amount of static work.

The foot is an arched structure with inner, outer, and transverse arches (Figure 17). The arches are of importance for distributing the weight of the body onto a large surface when the person is standing, and also for reducing the shocks occurring when a person moves.

Taking into consideration the structure of the foot, and the location and development of its muscles, it can be felt that the support points of the arches are: in the back, the protuberance of the heel-bone, and in the front, the large ends of the first and fifth metatarsal bones, which form the so-called support triangle (Figure 18).

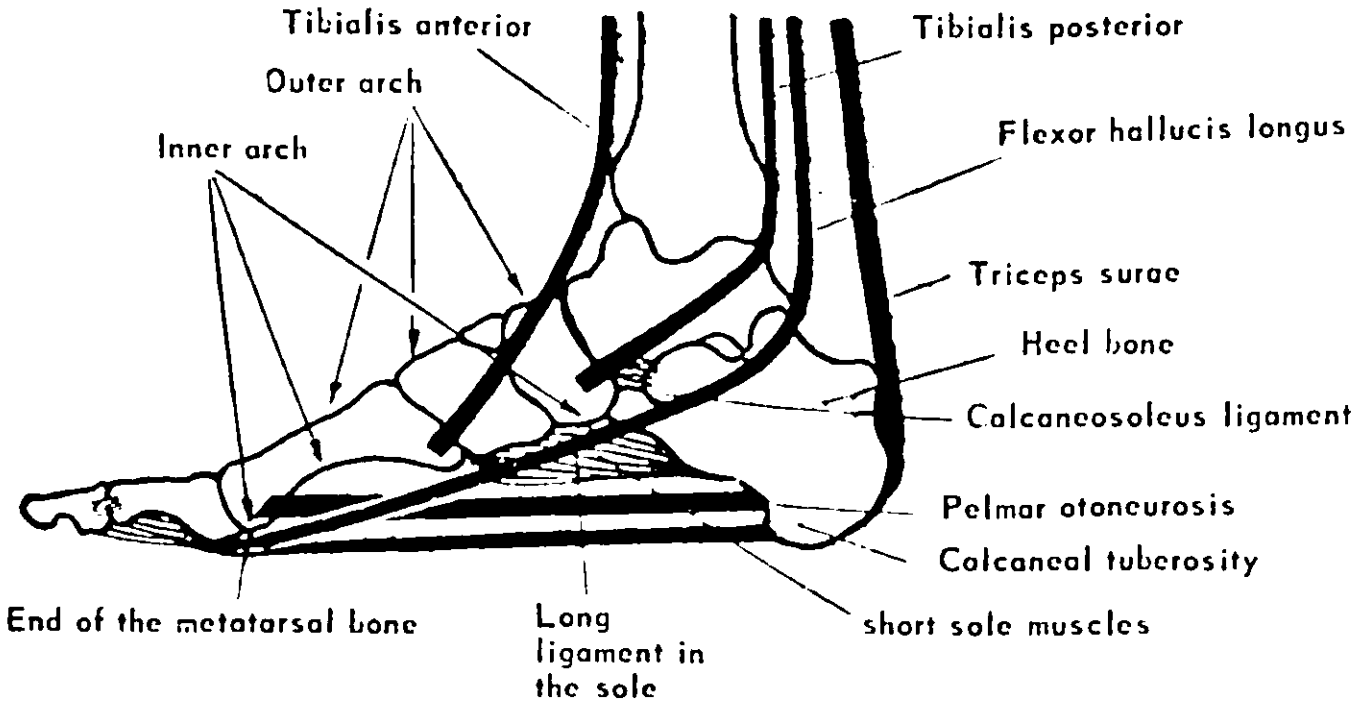


Figure 17. Diagram of the Structure of the Foot.

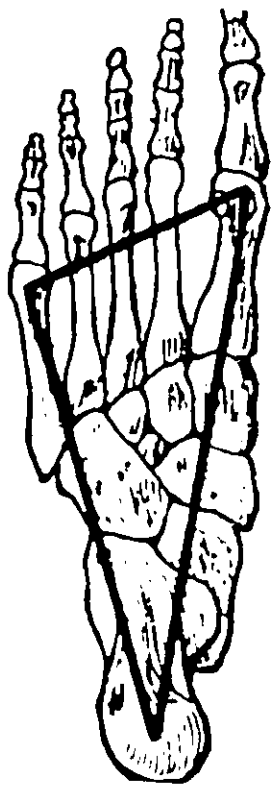


Figure 18. Support Triangle of the Foot.

Distinction is made between the complete surface and the "active" support surface of the foot. The former, which is visible in an impression of the foot, is larger than the "active" surface, since its soft portions do not take direct participation in supporting the weight of the body. If the person wears a boot, the "active" support surface increases considerable. Apropos this point it is fitting here to mention that the shooter must devote a considerable amount of attention to his footwear, making sure that the heels of his boots are not worn down, the soles are not warped, and that the toes are not turned up.

The support area when standing with heels together is the largest when the feet are placed at a slight angle to one another. When the feet are spread apart, the largest support area is achieved by keeping them parallel to one another. However, the following must be kept in mind: from the point of view of the arch structure of the foot and the method of supporting the arches, it is extremely disadvantageous when standing to put the load on the inner arch, which is the more easily subject to depression, since, first, the internal arch contains more bones and consequently more joints, and, second, it is supported almost exclusively by muscles.

Investigations have shown that with an increase in the angle between the toes of the shoes, or when the feet are spread to the sides, there is an increase in the load upon the inner arch.

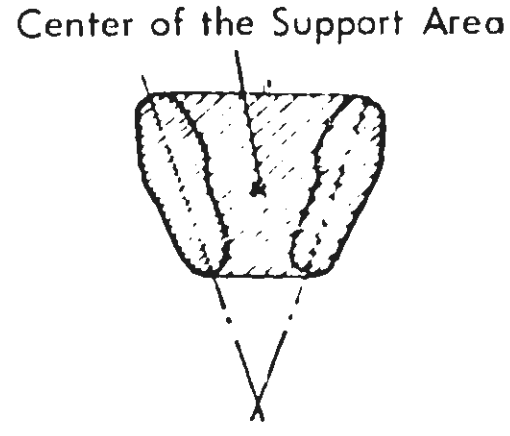


Figure 19. Most Convenient Placement of the Feet When Assuming Position for Firing.

Therefore, the pistol shooter, when preparing to fire must in no instance place his feet very far apart or place his feet at a wide angle relative to one another. As shown by practice, it is most advantageous, when preparing to fire from a standing position, to place the feet and to distribute the weight of the body over the support area as shown in Figure 19.

When considering the problem of the stability of the human body in a particular position, one must not limit oneself to the application to it of just the general laws of mechanics which determine in general the equilibrium of physical bodies; under different conditions--identical support area, identical location of the over-all center of gravity, and one and the same line of gravity--a person's body can occupy completely different positions and can actually have varying degrees of stability (Figure 20). As can be seen from the drawing, the distinguishing feature of these two positions of the body is the fact that the preservation of their equilibrium is achieved by completely different work by the inner forces of the organism.

If the muscles are relaxed, the equilibrium of the parts of the person's body is upset. Each part shifts downward toward its center of gravity and consequently the over-all center of gravity of the body also shifts as the line of the center of gravity moves outside the limits of the support area and the body falls.

The peculiarity of the statics of the human body may be explained by the fact that equilibrium may be achieved and maintained only if certain bodily functions are allowed to operate. When the muscular apparatus functions efficiently, the tension of the various muscles counteracts the weight of the separate parts of the body.

The effects of gravity, and the counteraction on the part of the muscles, cannot create an absolute equilibrium of the body. As a result, the body rocks to a greater or lesser extent.

The shooter is always confronted by the task of selecting a stance in which the balancing of the body requires the least expenditure of muscular effort. Under such conditions the body will be less subject to back and forth rocking movements.

(5) Types of standing positions.

Let us examine the state of the body's equilibrium in the standing position. In general, the body may be held in such a position that a large number of the parts of the human body, that are mobile with respect to one another, may be maintained in a fixed state by means of muscles and ligaments (Figure 21). The entire operation of the muscles during this process is of a static nature. The ligaments also play a substantial role in maintaining the body in a standing position.

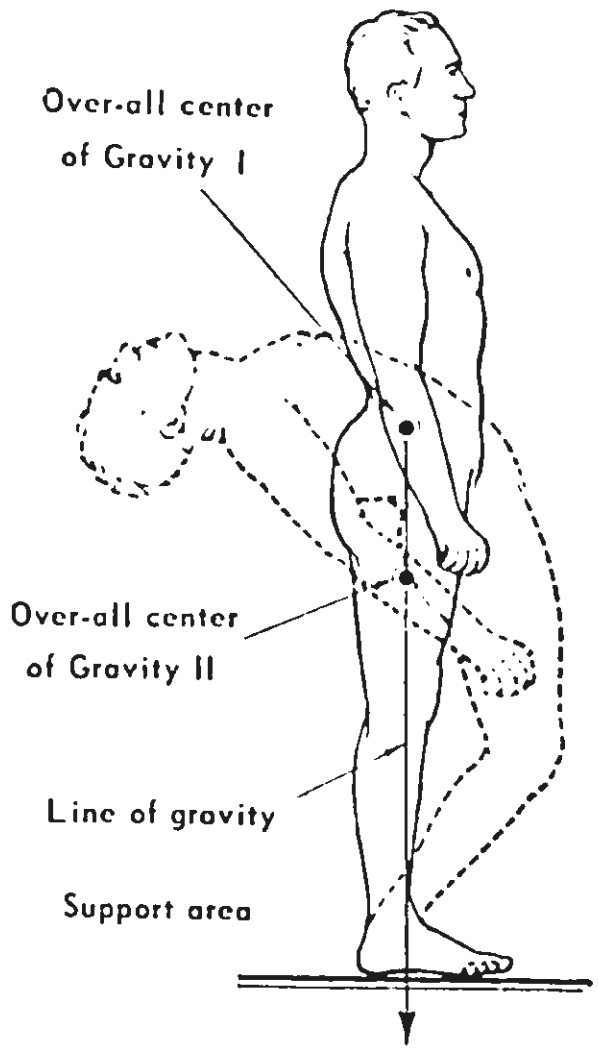


Figure 20. Example of the Different Positions of the Body with Identical Support Area, an Almost Identical Location of the Over-all Center of Gravity, and with the Line of the Body's Center of Gravity Running Identically.

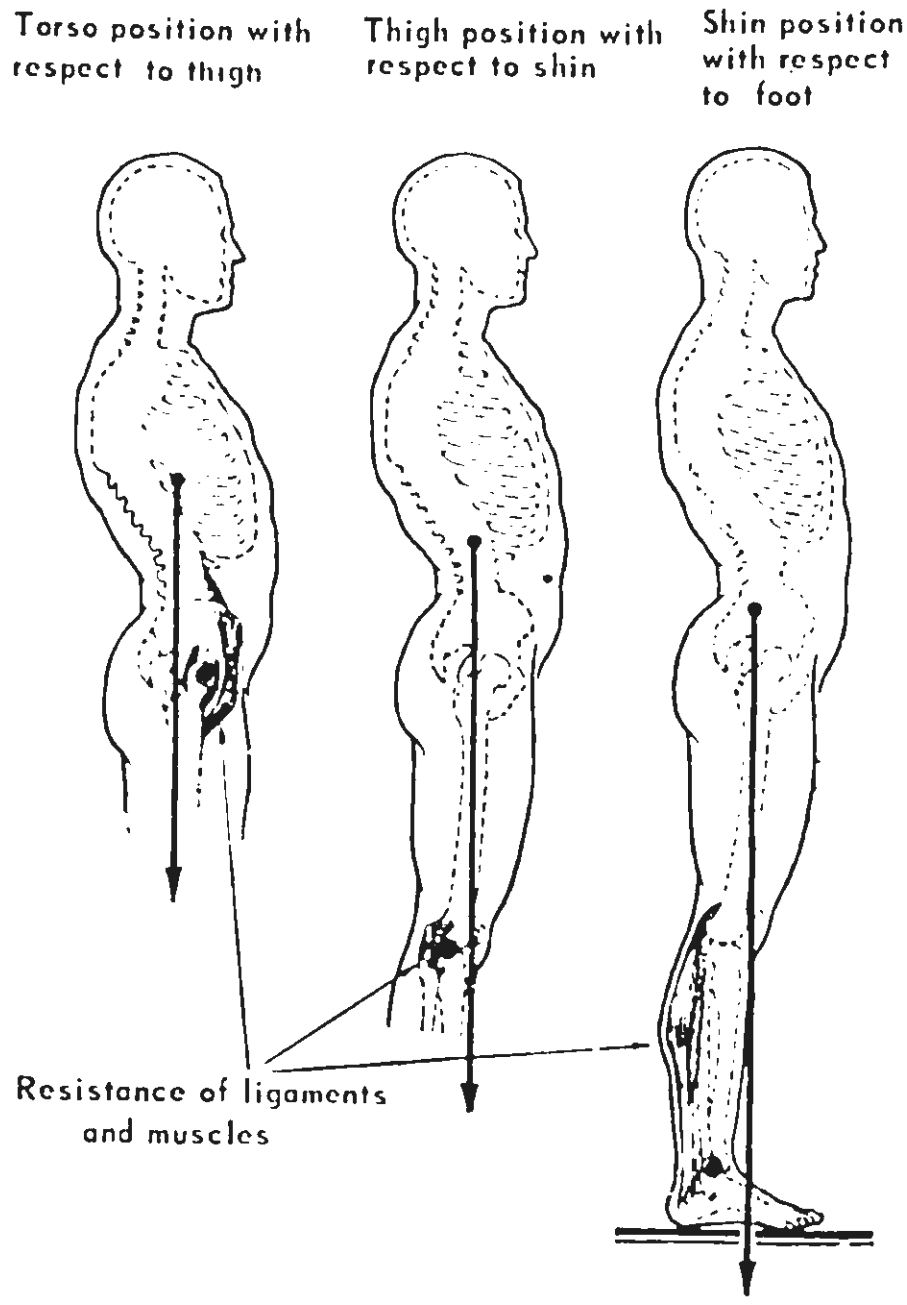


Figure 21. Equilibrium of the Various Parts of the Body When Standing.

Let us now examine, in general outlines, the three basic types of standing positions: anthropometric ("normal posture"), rest ("comfortable posture"), and strained ("military"). (Figure 22).

(a) In the anthropometric position where body weight is carried evenly distributed between toe and heel (Figure 22a), the vertical line of the center of gravity coincides with the transverse axes of the hip, knee, and ankle joints. In this instance the ligament apparatus plays a considerably lesser role in reinforcing the joints than the muscles do. In this position the parts of the body--the pelvis, hip, shin, and foot--are in a state of somewhat unstable equilibrium, and this leads to an inevitable, and rather considerable, rocking of these parts back and forth; the muscles reinforcing the joints thus prove to be strained alternately from the front and from the back. In this standing position, when the mobile parts of the body are kept rigid at the joints chiefly by means of the work of the muscles, the rocking is more perceptible than in other standing positions.

(b) In the rest position, slightly forward (Figure 22b), the vertical line of the center of gravity runs in back of the transverse axes of the hip joints, and in front of the knee and ankle joints. The reinforcement of the position of the pelvis relative to the femur is contributed to the muscles and ligaments; a special role is played by the iliofemoral ligament (see Figure 5), which is so strong that, when it is tense, it can support the weight of the torso even without the participation of the muscles. The reinforcement of the knee joints is carried out by the ligaments and muscles located in back of those joints. The reinforcement of the ankle joints (with the shin inclined forward) contributes to the arrangement of the joints themselves, the lower end of the tibia (shin) and the ankle bone (astragalus).

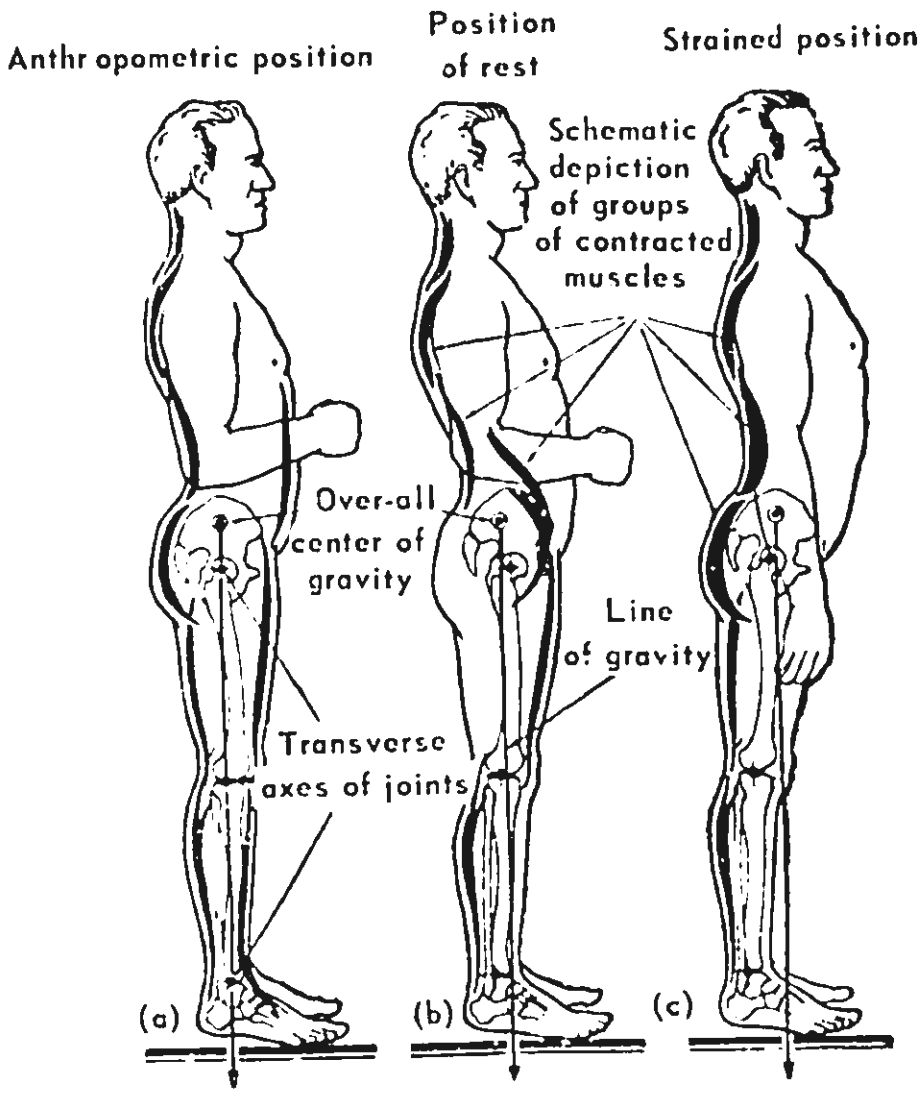


Figure 22. Basic Types of Body Position Standing.

(c) In the strained position, too far forward (Figure 22c), the vertical line of the center of gravity runs in front of the transverse axes of the hip, knee, and ankle joints. Therefore, in order to prevent the body from falling, the muscles located on the back surfaces of those joints must constantly be in a greatly contracted state.

Comparing the work of the muscles in the different forms of standing positions, it can be said that the rest position corresponds to the specifications for the least expenditure of muscular effort on the part of the organism to preserve equilibrium. Consequently, the variation of the bodily standing position in which the vertical line of the center of gravity runs in back of the transverse axes of the hip joints and in front of the knee and ankle joints, that is, when the torso is bent slightly backward and the pelvis is moved imperceptibly forward, must be the basis for assuming a stance when firing. The shooter must inevitably come to this conclusion because the reinforcement of the basic joints of the body is achieved not so much by the work of the muscles, as by the inclusion of the ligament apparatus into the work, thus contributing to the mutual reinforcement of the mobile parts of the body in the joints, and consequently to the achievement of the best rigidity of the shooter's entire body, together with the least expenditure of muscular effort.

Such is the over-all, elementary, and far from complete information on human motor apparatus which the present-day shooter must have. Otherwise, it will be very difficult, if not impossible, for him to find a stance which is correct and advantageous for him.

3. Assuming the Stance.

Remember, the stance must provide for: first, equilibrium and stability of the body and weapon commensurate with the least tension upon the shooter's muscular apparatus; further, the ability of the shooter's body to remain immobile for an extended time in one and the same stance during shooting; and lastly, a head position which will create the most favorable conditions for the operation of the eyes during aiming (see Sight Alignment, Chapter II).

When assuming the firing stance, the head must be held as straight as possible, so that the shooter can see the target directly in line with the arm and thru the sights and thus be able to create the most favorable conditions for the operation of the eye when aiming; it is necessary to take all steps to eliminate the tilting of the head to the right or left or an excessive tilting downward, so that it will not be necessary to look sideways or to look at the sights from beneath the eyebrows. The creation of conditions for identical aiming also demands that the position of the head be sufficiently fixed and identical. The head should not be pulled forward closer to the rear sight; neither should the head be thrown back excessively; the excessive tension upon the neck muscles and, as a consequence, the possible slight movements of the head from fatigue may appear to disturb the stability of the gun, and hinder the maintenance of perfect sight alignment.

Also, when assuming a firing stance, the shooter has to support an extended arm holding a weapon, the muscular apparatus undergoes considerably greater strain, since it must not only maintain the shooter's body in a definite position but must also exert a counteraction to the rather large weight of the gun suspended a yard or so away from the torso. We are concerned here not only with the increase simply of the total weight of the shooter's body with and by a gun, but also with the fact that the weapon's weight is vastly displaced and substantially changes the entire scheme of the load upon the muscular apparatus.

A shooter supporting a weapon, that is, a load, constitutes with that load a single system with a common center of gravity (Figure 23). Since the entire system is in equilibrium only in the event that its line of gravity runs through the support area, the holding of the weapon inevitably causes a change in the posture of the individual parts of the body. It causes a compensating displacement of them which is brought about by the necessity of creating a certain counterbalance to the pistol and supporting arm. This compensating displacement of the parts of the body changes the shooter's entire posture, as a result of which when he assumes a firing stance his torso takes on a slight unsymmetrical pose which is also somewhat unnatural. The preservation of the body's equilibrium in this unnatural posture requires, in its turn, an unusual, considerably greater load upon the muscles and ligaments reinforcing the mobile portions of the body in the joints.

That is why the shooter has the task of finding for himself a well-planned stance, in order to achieve the immobility in which he will not have to put an excessive load upon the muscular apparatus.

The difficulties of selecting a stance for oneself lies first of all in the fact that the shooter, being in an unstable standing position, which in and of itself requires considerable muscular efforts, is forced to support a pistol. This load, which increases still more the straining of the muscles, has to be held suspended out and away from the body so that its center of gravity is located a great distance away from the central line of the shooter's body (see Figure 23). As is well known, the preservation of the equilibrium of the entire system consisting of the body and the pistol requires a compensating deviation of the torso to create a counterbalance. This deviation of the torso (provided that the over-all center of gravity is kept over the center of the support area) changes the entire pose, making the posture of the body assume asymmetrical departures from normal which alters the equilibrium and the degree of load upon various muscular apparatus.

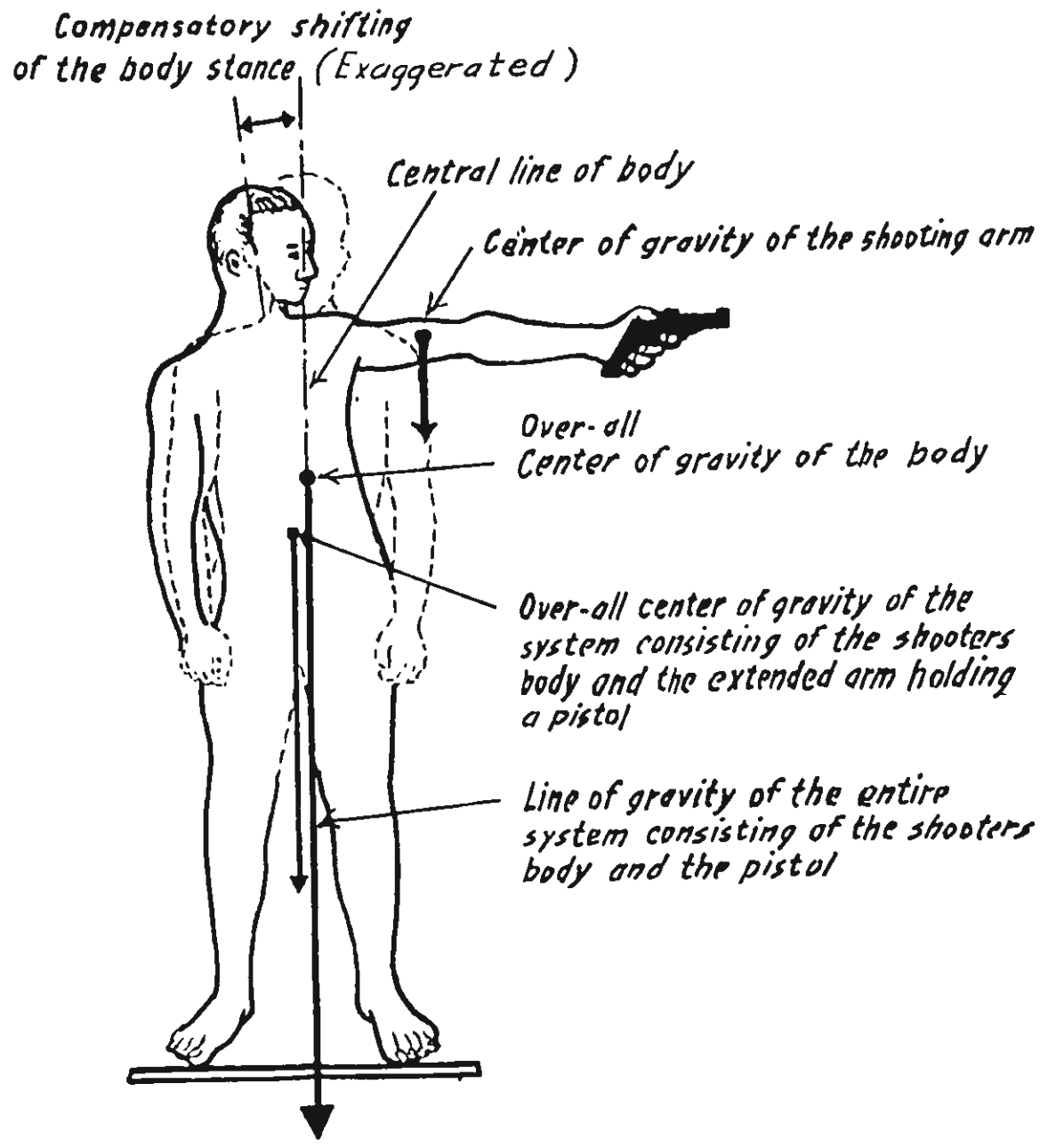


Figure 23. Situation of the Over-all Center of Gravity of the Entire System Consisting of the Shooter's Body and Weapon.

Let us thus assume that the shooter takes a stance for firing that will preserve, insofar as possible, the natural posture of the body, that is, he will strive to keep it erect with the smallest compensating deviation of the torso. The supporting of the load--the arm holding a pistol--demands of the shooter a very great tension of the muscles in the shoulder zone and the back muscles keeping the torso rigid in the small of the back, so as to counteract the great factor of the load's force of gravity, which attempts to tip the torso to the side. In addition, if one examines the shooter's figure from the side, it will become obvious that when the shooter's body is kept erect, the torso will be, with respect to the hips, in a state of slight, unstable equilibrium and the keeping of it rigid in the hip joints will be achieved for the most part by the operation of the back muscles. As a result the torso and the firing arm undergo early fatigue, resulting in considerable oscillation.

From this it is clear that the stance assumed for firing, in which the shooter holds his body excessively erect, with the absence of compensating displacement, cannot be considered acceptable, since in this position the keeping of the movable parts of the body rigid in the joints (primarily the torso in the hip joints) is based chiefly upon the work of the muscles. As a result, this posture cannot create conditions providing for the greatest immobility of the entire mass consisting of the shooter's body and the pistol.

But what posture should be given to his body by a pistol shooter when assuming a stance for firing in order to best support the weapon with the least expenditure of muscular effort?

Obviously, the closer a suspended weight is held to oneself, the easier it is to support it. However, this action will be greatly hindered by the linear dimensions of the load--the extended arm and the pistol (the great distance between its center of gravity and the shoulder). The bringing of the center of gravity closer to the body (leaning slightly) will inevitably cause a shifting of the shooter's torso to the side. As a result the shooter's body will take on an asymmetrical posture. But neverthless, despite this unnatural pose, the shooter will gain in that, in addition to bringing the center of gravity closer to himself, he reduces the factor of the force of gravity on the firing arm and consequently also reduces the straining of the muscles in the shoulder zone and in the back which counteract the tipping of the torso to one side.

The shooter then who holds his body something less than erect, with a slight bend in the back, has the torso shifted back and the pelvis is brought slightly forward, has the vertical line of the over-all center of gravity of the entire system running back of the transverse axes of the hip joints. In such a pose the torso is kept rigid in the hip joints not so much by the work of the muscles, but the inclusion of strong ligaments in the work. The rigidity of the torso is contributed to by counterbalancing the weight of the torso against the extended firing arm and the pistol. Moreover all of the weight is transferred to the spinal column, that is, to the skeleton.

As shown by practice, the shooter has absolutely nothing to fear about giving his body a slight asymmetrical pose. The selection for himself of the most stable position must be made precisely in the direction of giving his body a certain degree of bend. A slight bend provides for the shifting of the center of gravity of the firearm closer to the central line of the body and thus contributes to the decrease in the muscular tension required to hold the added weight. The minor bending of the body in the back makes it possible to bring into play the ligament apparatus and to shift the weight of the torso and the extended arm with pistol onto the spinal column,partially relaxing, and thus freeing to a considerable extent the necessity for the muscles to work to provide for keeping the torso unmoving in the small of the back and the hip joints.

The stability of the firing arm and weapon depend to a considerable extent upon the correct interrelationship of the body's basic support--the feet--which determines the support area for the shooter's body. The most stable and most comfortable stance will be the one in which the feet create a support area in the shape of a trapezoid formed by a placement of the feet in which the distance between them will be slightly less than the width of the shoulders, and the tips of toes of the feet will be spread apart slightly (Figure 24). This placement of the feet is more comfortable since it creates simultaneously not only a comparatively large support area, but also the most favorable conditions of use of the feet.

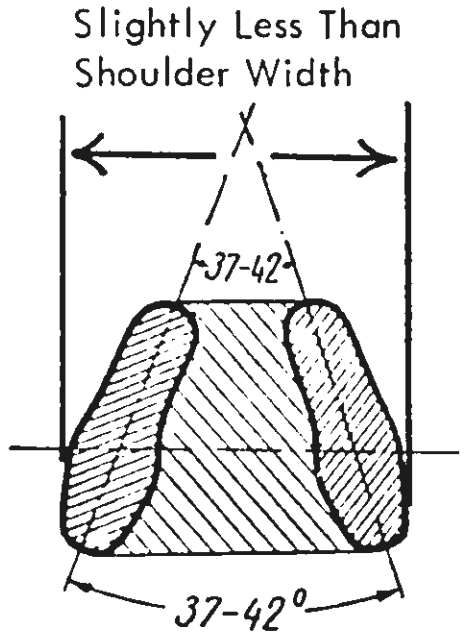


Figure 24. Placement of the Body's Support Surfaces--Both Feet--in Relation to One Another, Limiting the Support Area in the Position Assumed for Firing.

Therefore, when assuming stance for firing, one should not attempt to bring the legs excessively close to one another, since the narrow placement of the legs decreases the support area this will result in a certain loss of stability and, as a consequence, effects the arc of movement of the firing arm chiefly along the vertical. One should, however, not place the legs too far apart, since this creates undesirable conditions for the work of the inner arches of the feet and causes an extra straining of the leg muscles holding the hip joints rigid, and this inevitably leads to fatigue and an increase in the arc of movement not only along the vertical, but also along the horizontal.

The stability of the stance is also directly dependent upon the location of the over-all center of gravity of the entire system consisting of the shooter's body and the weapon above the support area. In order for the stance to be a stable one, the shooter must, first, distribute the weight of his body, the arm and pistol evenly onto both legs; second, the load placed onto each leg must pass through the middle of the foot or somewhat closer to the tips of the feet. When the weight of the body is distributed in this way onto the support surfaces (both feet), the body's line of gravity will run through the middle of the support area, as a result of which the stance will be the most stable one. The muscles of both legs will be carrying comparatively the same load and this will create the most favorable conditions for the well-coordinated work of the flexor and extensor muscles.

The degree of strain upon the muscles and ligaments keeping the knee joints rigid is of great importance for the stability of the stance assumed. One should not intentionally relax the muscles in the knee joints in order to stand on half-bent legs (expressing it in terms of over-exaggeration); nor should one create varying tensions in them by holding one leg straight and keeping the other one partially bent; the insufficiently rigid position of the knee joints will lead to an increase in the body's movement as a whole. On the other hand, one should not exert excessive tension on the leg muscles by rigidly straightening them in the knees with extra effort as far as possible, thus creating "locked knees", so to speak, since this straightening of the legs is accompanied by the great tension of the musculus rectus, calf, and tibialis anterior muscles and this, in the final analysis, leads to a loss in stability of the stance during protracted firings due to early fatigue. This disturbs the synchronized (well-coordinated) work of the muscles.

It is obvious that, irrespective of the shooter's desire, that is, whether he wants to or not, the maintaining of the body in the standing position requires a definite strain on many groups of muscles and the tension of ligaments, which provide for the holding of the movable portions of the body rigid in the joints. These include the groups of muscles in both legs, the stomach, small of the back, and partially the back, shoulder zone, right-hand portion of the chest, right arm, etc. Therefore, with respect to the operation of these muscles the shooter is confronted with the task of only partially reducing the strain upon them by means of the greatest possible inclusion of the ligaments reinforcing the joints, and also the creation of the conditions for the most favorable well-coordinated (synchronized) work of the flexor and extensor muscles, the action and counteraction of which provide for keeping the shooter's body immobile in a definite posture.

Therefore, a word here about the relaxation of the muscular system when firing. This must pertain only to the comparatively small group of muscles which do not directly participate in maintaining the shooter's body in the vertical position and the pistol aimed at the target. This group includes the muscles of the left arm, the left-hand portion of the chest, the neck muscles, etc. Those are the muscles which one must relax as much as possible.

In order to complete the discussion of the whole picture of the stance assumed for firing, it is necessary to dwell briefly on the position of the left or free arm and hand (for right-handed shooters). The free hand should be inserted into the left side pocket in a relaxed manner, or you may hook the left thumb over the waist belt. If the free arm is allowed to hang loose and dangling in the interest of relaxation of the left arm and shoulder, any wind movement or recoiling of the body during firing will cause the free arm to sway. Even the slightest movement of this arm will be transferred to the body as a whole and thus disturb its relative immobility.

The stance factor is so essential to the exercise of maximum control of shooting that a step by step summary of all of the points important to a proper stance is in order.

1. The assumed stance must provide for:

a. The greatest possible degree of equilibrium and stability of the shooter's body and weapon commensurate with the least possible strain on the shooter's muscular apparatus.

b. The greatest possible degree of immobility, that is, the smallest arc of movement possible of the shooting arm and the pistol.

c. A head position which will allow for the maintenance of the most favorable conditions for the operation of the eyes during aiming.

2. During training the shooter must take especial care that he is not developing an incorrect stance. In view of this, it is necessary for the shooter to be familiar with the human motor apparatus.

a. Passive apparatus.

(1) Bones and ligaments.

b. Active apparatus.

(1) Muscle system.

(a) Smooth.

(b) Cardiac.

(c) Cross striped.

c. Nervous system.

(1) Central.

(2) Peripheral.

d. Vestibular (Equilibrium) system.

(1) Stable equilibrium.

(2) Unstable equilibrium.

3. The shooter should become familiar with assuming his proper stance and practice getting the same stance each time it is assumed. The requirements are:

a. The feet are separated about the width of the shoulders or slightly less, toes pointed out slightly.

b. Stand up straight, erect and relaxed.

c. The legs should be straight, but not stiff, knees firmly straight but not rigidly locked.

d. The hips should be level and in a natural position. Let the abdomen relax.

e. The head and shoulders should be level. No humping over or with an unnatural tilt. Relaxed.

f. The non-shooting arm should be relaxed, the free hand in the side pocket or thumb hooked over belt, not handing loose.

g. The pistol arm should be extended with the wrist stiff and the elbow locked without strain. The arm must be straight, firmly outthrust with no unncessary tension on the muscles. This establishes solid arm control.

h. The body weight center of gravity should be brought forward slightly from the center of the support area, with a very slight pressure toward the tips of the feet to reduce the action of the balance correcting mechanism manifest in the alternate tensing and relaxing of the muscles of the legs, abdomen and lower back. This action to regain equilibrium is continuous as the body cannot remain motionless because the equilibrium or balance does not remain constant. The constant corrective process causes an almost imperceptible weaving or sway.

B. POSITION.

When preparing for accurate shooting, it is insufficient merely to assume a convenient and stable stance. You must be able to aim at your target in a natural, consistent manner. Improper position will affect your ability to establish or maintain the hold in the center of the aiming area. Before each shot or string of shots, it is necessary to check the correctness of the assumed position with respect to the target, in order to avoid excessive muscular tension which has an adverse effect upon the amount and nature of the movement of the shooting arm and weapon to one side or the other of the aiming area. In order to orient or align the position correctly, it is necessary to assume the normal position for the average shooter (facing approximately forty (40^{o}) to fifty (50^{o}) degrees away from the target) point aim the shooting arm with or without the weapon in the direction of the center of the target. Look at the alingment of the shooting arm with the target by turning only the head, not twisting the body, keeping the head level and turning it far enough toward the target to allow the eyes to look straight out of the head (see Sight Alignment, Chapter II). Then close the eyes and move the shooting arm vertically above the horizontal and allow it to settle back to approximately the original holding point. If, when opening the eyes, it is detected, when holding a pistol, that the centered front sight is located to one side or the other of the target center, the shooter must, without twisting or changing body stance, shift the whole body as a unit by sliding his rear foot slightly in the direction of the error. This action modifies minutely the angle of the shooter's body in relation to the target so that the centered front sight will be located in nearer proximity if not directly on the center of the area of aim. When not holding the weapon, the position check can be made by sighting through the base of the V formed by the raised thumb and forefinger. In no instance must the shooter correct errors in hold by moving his arm independently of the body proper. He must accomplish the necessary correction solely by shifting the whole body to the right or left. Otherwise, the position change is purely artificial, makes a change in the assumed stance and the body will revert to the original error after settling back from the recoil of the shot. Any variation of the assumed stance to implement correction of errors in holding directly in the center of aiming area will cause unnecessary muscular tension in the shoulder, back and chest. Match competition requires the shooter to fire a large number of shots for which the time set aside for only one day's shooting is measured, not in minutes but in hours. It is obvious that the necessity arises of finding for oneself the most effective stance and position which will allow the shooter's body to assume repeatedly an identical stance and position for use over a long period of time without causing undue strain upon the muscular system. A feeling of discomfort, fatigue, constraint or a continuing necessity to correct the orientation of the body to the target, in the final analysis, distracts the shooter's attention from the principal goal, the uniform, absolute control of an accurate shot. The finding and mastery of this most effective stance and position when firing will provide for the utmost stability of body, shooting arm and weapon and thus a free and unforced feeling of natural alignment with the target during the entire period of shooting.

The position factor is so important to the exercise of maximum control of shooting that a step by step summary of the actions taken to affect a proper position is in order.

1. The shooter must position himself naturally and align himself and his weapon so the bullet will strike the desired area without a tendency of the shooting arm to drift to either side of the target.

2. To orient or align yourself properly with the target, use the following method:

a. First face approximately 40 to 50 degrees from the target using the methods of stance and positioning previously mentioned.

b. Look at the target by turning only the head. Keep the head level and turn it far enough toward the target to allow the eyes to look straight out of the head.

c. Raise the arm to align with the target. Close your eyes, raise your pistol arm a foot or two above the horizontal and then allow it to settle back relaxed and naturally to the horizontal. Competely relax the arm and shoulder not being used. Repeat this procedure once or twice.

d. Open your eyes each time to check if your arm and pistol are aligned with the target. If the pistol has settled in the center of the target, you have your natural position.

e. If it settles to one side, move your rear foot in the direction of error maintaining the stance of the body axis as a unit from the feet to the shoulder unchanged until the arm and pistol are aligned on the center of the target again. Several tests such as this one will readily show you your natural position.

f. Recheck after each error is found until no error exists.

Therefore, during matches and training the shooter must devote serious attention to searching for and selecting for himself the most stable and at the same time the most unforced position and stance, and then perfecting and polishing it.

The shooter must always remember that the further improvement of the level of his marksmanship skill requires an unceasing search for an even better stance and position. The position and stance assumed must not be considered as something constant. As marksmanship develops, the views concerning the stance to be assumed also change. And if one looks at the recent past of marksmanship, it is possible to trace the changes which have occurred in some of the shooting postures assumed. Constant improvement is one of the factors providing for the steady rise of marksmanship results.

On the basis of those changes which the position and stance assumed for firing has undergone, it is possible to say with conviction that certain features of position and stance which are considered the best at the present time will also become obsolete with the passage of time and will be replaced by more perfect ones.

After one becomes familiarized with the material set forth above, a completely justifiable question may be asked: Why do some of the leading marksmen who have repeatedly established records use a position or stance in which, in addition to the predominantly desirable aspects, there also are certain shortcomings?

The reason is because many expert marksman, as a result of protracted and persistent training have completely developed their stance and position to the point of automation, sometimes not even noting its individual shortcomings. It sometimes happens that some experts, even though they know about their shortcomings, do not attach the proper importance to them or, by force of habit, continue to work in the old way; and only when the individual shortcomings in position or stance become a serious hindrance to their further progress, they begin to learn

Side View

Front View

Rear View

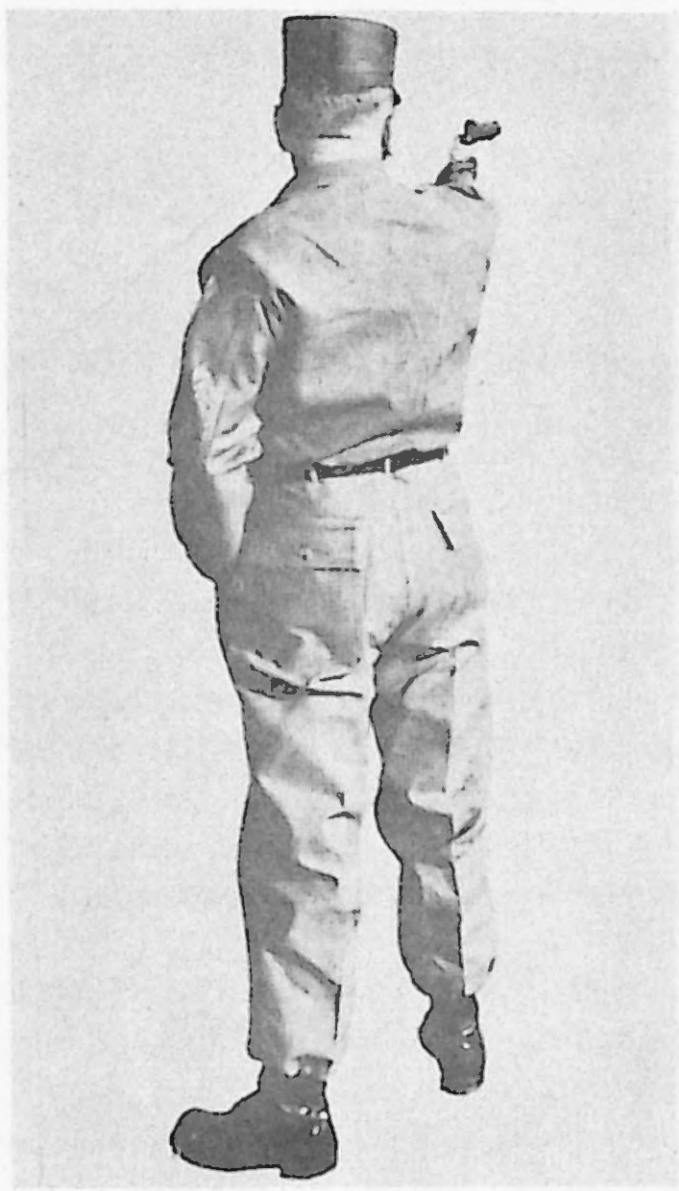


Figure 25. Examples of Stance and Position.

new methods and to change their approach. The overwhelming majority of the leading experts actually work seriously and creatively to improve themselves, unceasingly experimenting and improving their overall skill and thus blazing new paths of accomplishment, further raising competitive marksmanship standards to an ever higher level.

It is necessary here to draw the correct conclusion: young shooters must not blindly copy, and instructors and coaches must not mechanically, without any analysis, instill in their pupils a particular variation of position or stance. It is necessary to learn critically, to make an intelligent approach to the problem of selecting the particular stance and position that is acceptable to oneself, taking over from the experts only their desirable aspects and decisively rejecting their undesirable ones. Here lies wide open, the broad avenue of competitive growth of each and all marksmen.

C. GRIP.

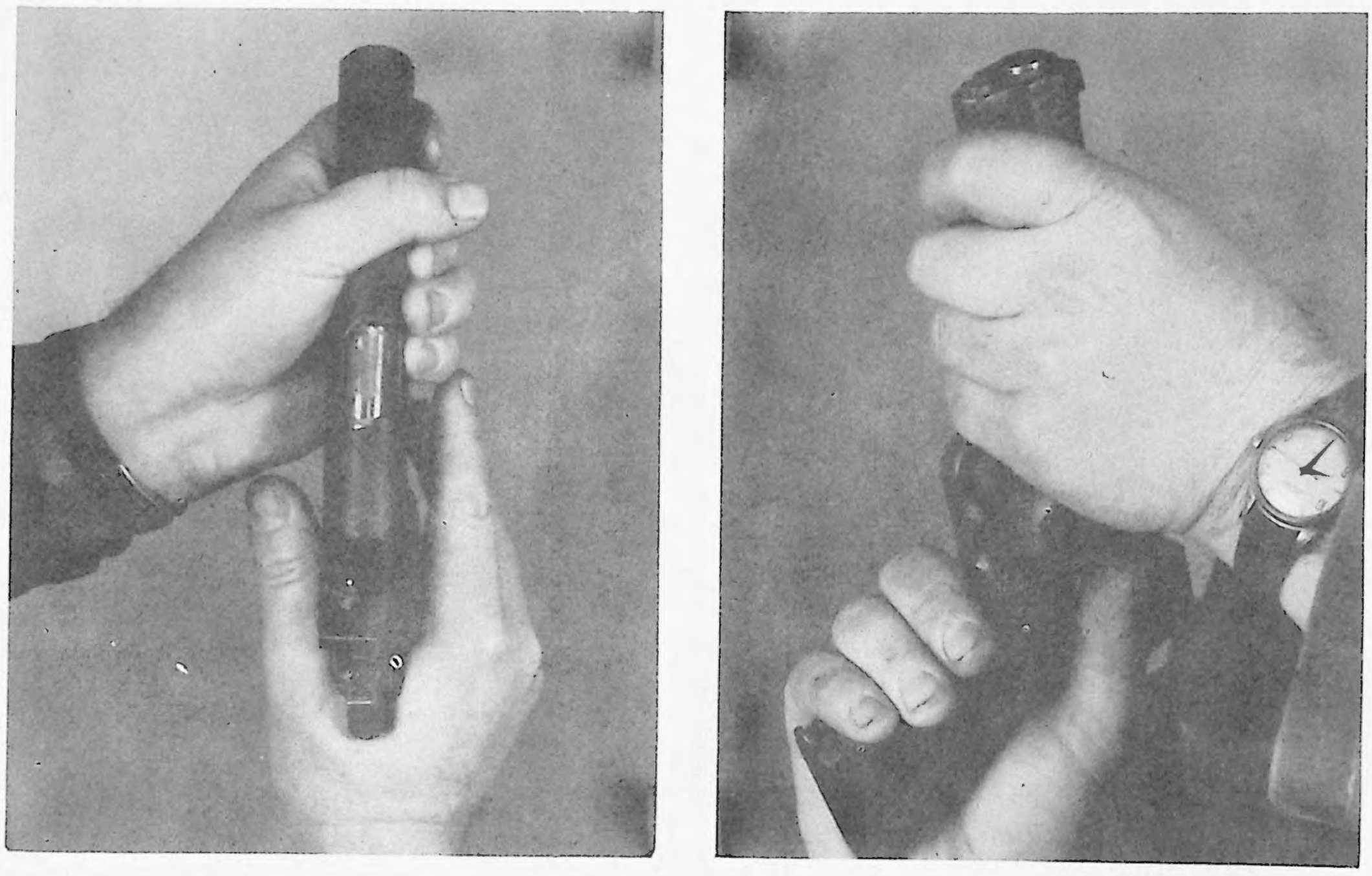
The proper grip is one that provides the shooter with the maximum degree of control over maintaining a natural sight alignment and being able to apply positive, straight to the rear pressure on the trigger that will not disturb that sight alignment.

A good grip is an invaluable aid to the shooter in that it makes a major contribution to the system of maximum control that creates conditions for firing an accurate shot.

1. Uniformity.

For the grip to contribute it's full effect on exercising maximum control, all of the requirements for a proper grip must be uniformly applied at all times. This quality, in the final analysis, is the most important feature of good grip.

GETTING THE GRIP



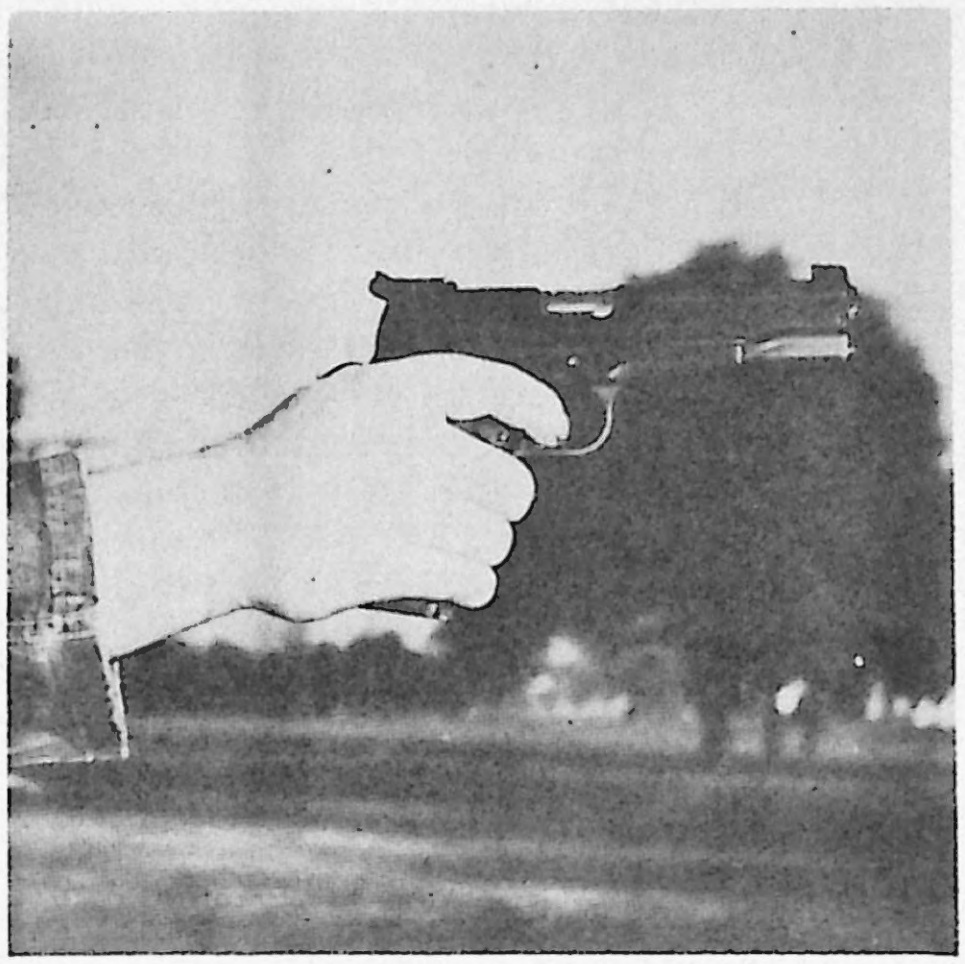
Rear View

Underside View

Figure 26. Getting the Grip.

Left Side

Right Side



Top View

Figure 27. The Grip.

2. Requirements. The proper grip on a pistol is one that meets the following requirements: first, the front and rear sights must stay in natural alignment without extra effort; second, grip the weapon firmly enough while firing a shot, to prevent shifting of the grip on the stock; third, no change in the tightness of the grip; fourth, allows independent movement of the trigger finger; fifth, no change in the character of the grip from one gripping to the next; sixth, the grip must be comfortable; seventh, the force of recoil must be controlled by being transmitted straight to the rear into the shooting arm; eighth, to avoid undue fatigue the grip should not be held for extended periods. Each of these requirements will be discussed in detail.

a. The grip should be such that the front and rear sights will stay in natural alignment without an extra effort being made to sustain the relationship. Without this feature, there will be a tendency for the front sight to block over to one side of the rear sight notch or to be projected above or depressed below the horizontal surface of the rear sight. Sight alignment, quickly regained after recoil without the need for correction, speeds up recovery and improves timed and rapid fire control. Maintaining sight alignment should be a relatively effortless action during the settling phase before the next shot. Positive trigger pressure can be applied without misgivings if the sight alignment is being maintained without effort. Sight alignment is easier to maintain if no artificial adjustments are necessary such as moving the wrist or head.

b. Grip the pistol firmly enough while firing a shot so that shifting or slipping of the grip will not cause loss of control of the grasp of the stock. Recovery from recoil for the next shot in sustained fire stages is seriously hampered by the loss of natural sight alignment. The applied trigger pressure under these conditions is reluctant and timid. Unless the proper grip can be renewed quickly, next to impossible in the middle of a timed or rapid fire string, maintaining sight alignment during the application of anything even resembling positive trigger pressure is at best a difficult operation. The tighter the grip; short, of course, of setting up a tremble, the better the control. The degree of pressure that should be exerted in gripping the pistol is determined by the condition of the muscles that do the gripping. Frequent practice, experience and certain exercises that promote a strong grip have a bearing on the level at which a tremble will begin.

c. There must be no change in the tightness of the grip mainly because a variation of pressure will adversely effect sight alignment. Any degree of tightening or loosening of the grip from the established normal tight grasp will cause the sights to move out of alignment. The pressure of the grip must remain constant. It cannot increase or decrease as trigger pressure is being applied because the sight alignment will be altered. The positive trigger pressure will then diminish or freeze and the whole system of smooth delivery of the shot breaks down.

d. The trigger finger should apply positive pressure on the trigger as an independent action, completely free of secondary flexing of the other muscles of the shooting hand. The trigger finger should not touch the stock or the frame of the pistol because of the added friction and drag on applying trigger pressure. Dry fire a few shots watching the front sight carefully. If the front sight moves at the instant of let off, reposition the trigger finger to the left or right, up or down on the face of the trigger. Repeat the dry firing and adjusting the position of the trigger finger until the release of the hammer causes no movement of the front sight in the rear sight notch.

e. There can be no variation in character of the grip from one shot to the next, from one series of shots to the next, from one day's shooting to the next, ad infinitum. In the final analysis there is only one correct grip per pistol for each shooter. Each type of pistol, 22 cal., 38 cal., 45 cal., etc. has it's peculiarities and the shooting hand must adapt itself to each. The proper grip can be discovered through trial and error, practice and analysis. It must become, by extensive use, a familiar operation that eventually can be assumed without too much difficulty. When the experienced shooter checks his grip out before shooting, it seldom

needs adjustment. One of the frequent variations of grip that plague most shooters is the taking of a renewed grasp with the hand slightly displaced around to the left on the stock from the normal. As a result the reach of the trigger finger is shortened and it is likely that the positioning of the finger on the trigger will be different, thereby jeopardizing the requirement that the trigger be pressed straight to the rear.

f. The grip must be as comfortable as possible. To delay fatigue, which causes trembling and alarm, the muscles of the hand and lower arm should, after sufficient time has passed to become accustomed, experience little discomfort from the way the pistol is placed in the hand. If the new grip is awkward and possibly cramping and the hand muscles continue to tire easily, look for another solution or use an exercise device to strengthen the hand. To reduce the formation of painful, irritated areas on the shooting hand that result in blisters, callouses and cracked tissue, and remove the tendency of tautly stretched skin to pull on the pistol stock in such a way as to cause sight alignment deviation, an equalization of the stresses and pressures on the skin and muscles of the gripping hand is paramount. Straight-in contact should exist between the skin of the fingers and palm and the plastic, wood and metal surfaces of the stock when the gripping pressures are brought to bear, not a sideward, sliding, grazing contact.

g. The force of recoil must be controlled by being transmitted straight to the rear into the shooting arm. This feature reduces side effects such as recoil against the base of the thumb which causes the weapon to twist in the hand, allowing a probable shift of grip and/or a bending of the wrist. Either event jeopardizes quick recovery from recoil in timed and rapid fire. The pistol should be held by being gripped at specific pressure points, not by a choking grasp that endeavors to press on the stock in an all enveloping grab. The best points of pressure to hold the sight in alignment would be the semi-flat surfaces on each side of the stock. However, the gripping hand cannot exert equal pressure on each of these surfaces simultaneously while firing and such pressures would not overcome the effect of recoil. Therefore, the obvious pressure points of the shooting hand that will channel the effect of recoil straight to the rear and allow relative ease in maintaining sight alignment are: the middle bones of the three lower fingers, the base of the thumb high on the stock, the depression on the center of the heel of the hand and last, the base joints of the four fingers along the upper palm. The primary pressure points on the .45 caliber pistol are the front surface of the stock or grip and the mainspring housing-grip safety surfaces. The secondary points; one is high on the left side of the stock near the slide lock and the other, the forward curve of the right side grip, each of which have to have equalized pressure applied to prevent loosening of the over all grip and to maintain sight alignment.

h. Holding the grip too long without an occasional relaxation will result in early fatigue. Fatigue destroys the control so conscientiously sought while carefully getting a proper grip that meets all the requirements. The force of gripping required for control of the pistol assures that this condition will exist in short order. Undue fatigue in the muscles of the hand and forearm causes erratic application of trigger pressure, twitchings of anticipation and a general lowering of the tremble level to a state of inability to hold the pistol still even for a few seconds while trigger pressure is being applied.

3. Method of getting the proper grip.

The proper grip must conform to all of the foregoing requirements plus it must be a hard grip and it must be meticulously adapted to the hand of the individual shooter. NOTE: For this instruction in obtaining the proper grip, the .45 caliber service pistol is the indicated weapon.

The following step by step sequence will provide the proper grip: first, pick up the pistol by the barrel with the non-shooting hand; second, spread the index finger and thumb of the shooting hand to form a "V"; third, bend the wrist down; fourth, fit the grip safety into the "V"; fifth,

push the mainspring housing against the depression in the center of the palm; sixth, stretch the trigger finger forward; seventh, extend the lower three fingers around the front strap; eighth, the joint of the thumb should rest high on the stock; ninth, primary pressure is exerted by the three lower fingers on the front strap, straight to the rear pushing the mainspring housing and grip safety against the center of the heel of the palm; tenth, the non-shooting hand should adjust the "fit" of the pistol into the shooting hand; eleventh, the grip should be increased to the point of tremor and let off until the tremor disappears. Each of these steps will be explained in detail.

a. With the non-shooting hand, pick up the pistol by the barrel end of the slide, being careful not to mar the sight blackening job, and keeping muzzle down range.

b. Spread the index finger and thumb of the shooting hand apart to form a "V", with the thumb held slightly lower than the index finger.

c. Bend the wrist slightly downward to obtain proper angle of contact.

d. Fit the pistol into the "V" of the thumb and index finger by seating the grip safety straight and firmly into the loose "web" of skin in the "V".

e. Press downward on the barrel to pivot and push the mainspring housing firmly against the inside of the bulge of flesh at the base of the thumb and into the depression in the approximate center of the heel of the palm.

f. Stretch the fingers forward, letting the trigger finger come to rest flat against the pistol frame just above the trigger guard. Safety dictates this precaution.

g. The reach of the lower three fingers should come to rest closely touching each other, with the center bone of each finger resting on the curved front surface or "front strap" of the stock. Little or no pressure should be exerted on the finger tips now extending around the front of the stock to the semiflat surface of the left handgrip. Pressure exerted on the front strap by the little finger should be relatively lighter than than brought to bear by the middle and ring fingers. Too much pressure with the little finger may cause the muzzle to depress slightly, resulting in a tendency for the front sight to align low in the rear sight notch.

h. The thumb should be raised to a higher level than the index or trigger finger and only the joint of the middle of the thumb placed to rest high against the stock in the vicinity of the slide safety. The end of the thumb is turned up and away from the stock as it has no function in the grip. Pressure exerted on the side of the pistol by the end of the thumb might possibly be increased as a sympathetic action during positive trigger pressure and this sideward force has a tendency to disturb sight alignment. The thumb should not exert great pressure on the side of the pistol as early fatigue would obviously result. A substantial, rigid, supporting force only should be exerted, sufficient to hold the weapon in place.

i. A substantial, controlling grip can be affected by primary pressure on the front strap with the three lower fingers directed straight to the rear, pressing the mainspring housing and grip safety firmly against the side of the center depression and the heel of the palm at the base of the thumb and the loose flesh in the "V" of the thumb and index finger, respectively. This can be compared to a vise with the inner surfaces of the palm as the stationary jaw of the vise and the three lower fingers pressing on the front strap of the pistol as the moving jaws.

j. The non-shooting hand should adjust the "fit" of the pistol into the shooting hand by a parallel rotation of the weapon in the gripping hand which is gripping and partially releasing to allow equalizing of the stresses generated by a forceful grasp. The gripping hand must reach

around to the right far enough to allow the trigger finger to reach into the trigger guard and position itself on the trigger at the exact required bisecting point at which the trigger pressure can be applied straight to the rear so as not to disturb sight alignment. According to the size of the hand, the trigger finger will apply pressure with the tip, ball of the finger's first section or the crook of the first joint or elsewhere. The primary concern is not what portion or spot along the finger is the standard point of contact but at what spot on the finger can you bisect the trigger, press straight to the rear and not disturb sight alignment.

k. When the "fit" is satisfactory, remove the trigger finger from the trigger, free the pistol from the non-shooting hand and tighten the grip with great force until a tremor is noticed. Release a small percentage of this gripping pressure immediately, enough so that the tremor disappears and leaves the shooter with a hard, solid grasp that will furnish absolute control. The tighter the grip, the better the control. The shooter is now exerting correct pressure for maximum recoil control.

4. Checking for proper grip.

The proper grip is a natural grip that will meet all the requirements in paragraph 2, above. To check it out, it is proper to check it against the requirements. A deciding factor in knowing whether your grip is proper is one of familiarity. Use the same proper grip constantly, innumerable times and a flaw immediately creates an awkward sensing.

a. To check if the sights will stay in alignment the following test is used: extend the shooting arm and observe the sight alignment. If the front and rear sights are out of alignment, grasp the barrel with the non-shooting hand, loosen the grip sufficiently to slide the pistol in the hand and rotate it slightly away from the direction of error in sight alignment. Regrasp the pistol firmly and extend the arm. Check the alignment without an effort being made to artificially align them by wrist or head movement. If the alignment is natural, you may check for stability. With the arm extended, close the eyes, raise and lower the arm and settle. Open the eyes and observe. If the alignment has deviated, reposition pistol in shooting hand as above and repeat closed eye test until natural alignment of the front and rear sights is achieved and maintained. During shooting a constant check of tendency of the sights to naturally align themselves should be carried on. The grip obtained at the beginning and checked out will not necessarily remain proper in view of the jolting recoil and the normal build-up of fatigue.

b. To check for a grip firm enough to prevent shifting, have the coach bump the pistol rather forcefully, up or to the side with the heel of his hand or if the pistol is unloaded, grasp the pistol by the barrel and make an effort to tear it from your grasp.

c. To check for variations in tightness or character of grip it is best to dry fire a few shots before the live shooting starts and watch for slight variations in natural sight alignment.

d. Checking for independent trigger action should be accomplished before shooting by a visual check of the trigger finger position and by dry firing to become conscious of any drag or undue friction noticed in the trigger control or a sympathetic tightening of the gripping muscles of the hand.

e. The comparatively rapid onset of fatigue and soreness of the shooting hand is the result of an uncomfortable grip.

f. Checking for a straight back recoil directly into the shooting arm and shoulder can best be done in unloaded practice by having a coach or team mate stand in front of you, forcefully and abruptly push against the muzzle of your tightly gripped pistol and drive it straight back toward your shoulder in a simulation of recoil action.

5. Aids to developing a good grip.

The great pistol shooters have: strong hands and a hard grip; they have a method of gripping and they don't change it except when analysis dictates a change that will improve it; they remember the different grips they must master for each shape of stock on different type of pistols, .22 caliber, .38 caliber, .45 caliber, etc.; if they use molded, shaped or custom grips, they fit perfectly; if they use rosin or a like substance, they use it everytime they get a grip.

a. The top guns have a grip like a vise. Initially, exerciser devices such as rubber balls, spring grip builders, etc., will develope a hard grip. However, it is not easy to develope a hard grip. Exerciser devices require constant use. Another approach, to reduce reliance on artificial exercisers, is to engage in work or a sport that places strenuous demands on your manual strength and dexterity, for example; chopping wood, digging in the garden, hand clippers on the hedge, tennis, baseball practice, ping pong, etc. Wide use of the hands also developes an exacting touch and coordination that is invaluable to the pistol shooter.

b. Never thoughtlessly change your grip. A good and proper grip is a precious commodity. It evolves from much hard work, thinking and planning, and painstaking analysis. Each satisfactory grip found among the better shooters comes from trial and error many times over. The good grip that is the end product of much sweat and almost tears, should not be changed except when sharply critical analysis dictates a change that will improve it. The shooter who is desperately changing his grip in the random hope that he will chance upon the right solution will generally lower his scores. In the event that a better score is fired, it comes on an occasional basis with no tangible reason for the erratic improvement. Analysis and trial in a never ending desire to improve your over-all marksmanship potential is the answer.

c. A modification of the shooter's proper grip is necessary on certain types of pistols of different calibers. The firmness of the grip remains the same for all calibers and types of pistols and revolvers but nature of the grasp must correspond to the shape and size of the stock in meeting all the requirements of the proper grip. For example, the .22 caliber grip is sometimes found to be smaller in circumference that a .45 caliber pistol. In this instance, the reach of the lower three fingers may extend farther around the stock, resulting in one of the primary pressure points (the middle bones of each of the three lower fingers) coming to rest beyond and partially around to the left side of the front strap. Pressure exerted thusly would not be straight to the rear and as it is fully applied as in the normal grip, would no doubt effect the natural alignment of the sights. Also, shooters with small hands have trouble with stocks of varying sizes. One example is having to compensate between a straight to the rear trigger pressure, due to a short trigger finger which can reach on with the finger tip, and the best position of the pistol in the shooting hand that tends to give natural sight alignment.

d. Shaped, molded or tailored custom grips are required to fit perfectly, otherwise, these expensive items become as white elephants. Fitted grips are primarily used to help the shooter who can't consistently duplicate the proper grip when using standard factory grips. Custom grips are not an adornment for a $250 accuracy job. The individual shooter must first decide what features and characteristics of a shaped grip suit his hand. Stocks can be made to fit exactly but it is a difficult job. That is why they are expensive. An experienced shooter only, is capable of knowing what he needs in a custom grip because only he knows what his proper grip looks and feels like.

e. Rosin can help to maintain a solid, controlling grip but it is not absolutely necessary. Normally, a strong hand and the checkering and stripping on the stocks and metal surfaces is sufficient. In hot weather when the hand may perspire or a hand that becomes wet in the rain may cause a minor slippage, rosin or a like substance, that will temporarily dry the skin of the palm and fingers, is justified.

In the final analysis, there is only one correct grip for you. It is one that affords the individual shooter the maximum degree of control over maintaining a natural sight alignment and applying positive straight to the rear pressure on the trigger without disturbing that sight alignment. Develope it to perfection and polish it.

D. BREATH CONTROL.

The correct method of breathing or rather the proper method of holding the breath is an essential part of the shooter's system of maximum control. Most pistol shooters seem to know less about the proper method of breath control than of any of the other fundamentals.

The object of proper breath control is to enable the pistol shooter to hold his breath with a comfortable feeling long enough to fire one shot slow fire; five shots in twenty seconds timed fire; or five shots in ten seconds rapid fire, without disturbing the ability to hold.

1. To be effective, breath control must be employed systematically and uniformly. The ability to concentrate and maintain rhythm is aided.

a. Promote a steady hold.

It is generally known that one must not breathe during aiming; breathing is accompanied by the rhythmical movement of the chest, the stomach; and the entire shoulder zone, thus causing the pistol to move back and forth excessively, making it impossible to produce an accurate shot. Therefore, one must not simultaneously breathe and try to fire a shot; but must endeavor to hold the breath easily and comfortably for a short period of time.

b. The physiological processes involved in breathing.

At the same time, the shooter must not view the breathing process solely from the point of view of the movement of the chest and the oscillation of the gun produced by it; he must not forget the very process of breathing, which consists of a combination of physiological processes which occur constantly in the organism and which are linked with blood circulation and gas exchange, metabolism, and complex phenomena involving the nervous system, determine in general the condition and viability of the entire human organism. Therefore, breathing is of very great importance, especially in protracted shooting exercises which last several hours; incorrect breathing has an adverse effect upon the over-all state of the shooter's organism and this, in its turn, has an effect upon the results of the shooting.

During the process of breathing, there is an alternating increase and decrease in the volume of the chest, as a result of which the person inhales and exhales. A person inhales when the dimensions of the chest increase as a result of the simultaneous contraction of several groups of muscles, chiefly the intercostal muscles and the muscles of the diaphragm. When the chest expands, the lungs, being elastic, fill out and follow it. As a result, a rarefied space is formed in the chest cavity. Under the influence of atmospheric pressure, the air enters the lungs through the respiratory tract. Inside the lungs, the air provides oxygen to the blood and absorbs carbon dioxide and aqueous vapors. Then exhalation occures: all the muscles relax, the diaphragm presses upward, and, under the action of the weight of the chest and the elasticity of the lungs, the dimensions of the chest are decreased. The lungs begin to collapse, forcing the air out of the body in the process. In contradistinction to inhaling, exhaling does not require muscular effort; it occurs as the result of the resiliency of the ribs and the muscular tissues and the elasticity of the lungs.

The breathing process is regulated by a respiratory center situated in the brain. The carbon dioxide accumulating in the blood acts upon the respiratory center, which sends nerve impulses to the respiratory musculature, causing the muscular contraction necessary for inhaling.

This causes the lungs to fill with air. The expansion of the lungs causes the stimulation of the ends of the fibers of the stimulating nerve; this stimulation is also transmitted to the respiratory center, which sends a new nerve impulse, a kind of signal for the relaxing of the respiratory musculature, as a result of which the person exhales.

When breathing calmly a person produces an average of 12-18 respiratory cycles a minute. Consequently, one respiratory cycle lasts 4-5 seconds. If one attentively traces the respiratory cycle, it is not difficult to note that the strained position of inhalation is replaced very quickly by exhalation. The very next inhalation begins after a respiratory pause of 2 to 3 seconds. (Figure 28) during which the carbon dioxide accumulates in the lungs. The respiratory pause is determined by the fact that a definite quantity of air remains in the lungs.

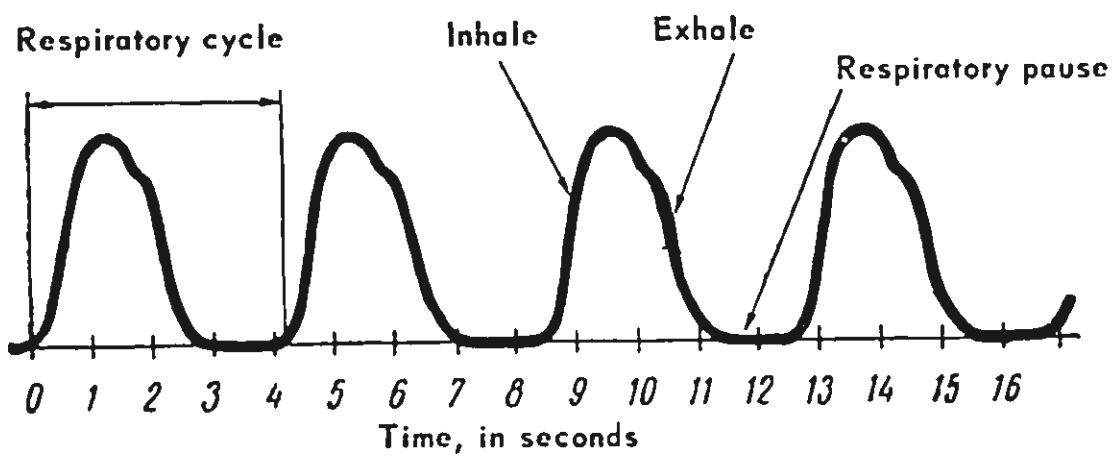


Figure 28. Scheme of Recording of A Person's Breathing.

Every time a person breathes in, approximately 500 cubic centimeters of air, which is called the respiratory air, enters his lungs. With a maximum inhalation, a person can breathe in 1500 cubic centimenters of so-called additional air, if, after a calm exhalation he makes an additional forced exhalation, about 1500 cubic centimeters of air, called reserve air, leave the lungs. However, even after forced exhaling, there still remain 100-150 cubic centimeters of so-called residual air in his lungs.

The natural respiratory pause and the problems of the ventilation of the lungs are of great practical importance to the shooter. It is completely obvious that during aiming and applying pressure on the trigger, the breath must be held only after the shooter has exhaled, timing it so that the breath is held at the moment of the natural respiratory pause. During that time the respiratory musculature is not strained and is in a relaxed state.

c. Comfortable and relaxed.

A person can prolong by several seconds his natural respiratory pause, that is, hold his breath comfortably for 15-20 seconds, without any special labor and without experiencing unpleasant sensations. This time is more than adequate to produce a shot or shots. Experienced shooters usually take a deep breath before firing and then, exhaling slowly, hold their breath gradually, relax and concentrate their entire attention upon sight alignment and the smooth application of pressure on the trigger (Figure 29).

2. Recommended method.

a. Prior to fire commands.

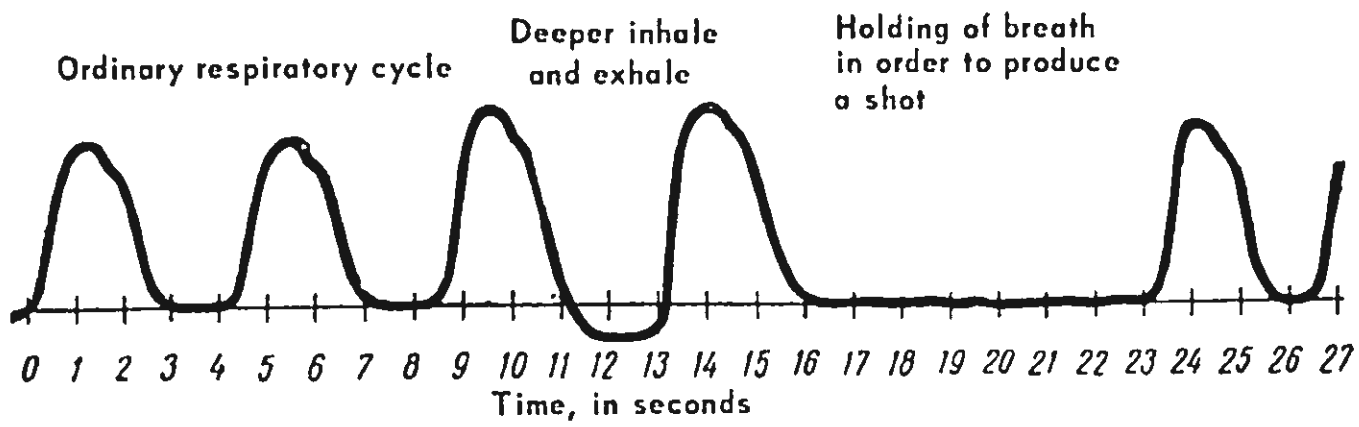


Figure 29. Scheme of the Manner In Which A Person Holds His Breath In Order To Produce A Shot.

When expelling the air from the lungs before aiming, no effort whatever must be exerted. The exhaling must be natural and free, as in ordinary breathing. The air must not be held artificially in the lungs; incomplete exhaling before aiming leads to the straining of the respiratory musculature and to the stimulation of the nerve centers regulating the breathing and the shooter's concentration on aiming receives a measurable distraction.

In order to make sure that during prolonged firings the interruption of the rhythm of breathing does not have a strong influence upon the general state of the shooter's organism, the breath must not be held for a long time when trying to fire a slow fire shot. If the shooter does not have time to produce a shot in 8-10 seconds, he must stop aiming and take another breath. Then before holding his breath the next time, he must ventilate his lungs well, taking several deep breaths; the same should also be done between all shots and strings of shots throughout the firing. This considerably facilitates the lengthening of the respiratory pause before aiming and provides for regular rest between shots and strings. This practice as a whole, protects the organism from excessive and premature fatigue. As a result the shooter is relaxed and comfortable during all shooting.

b. During the fire commands.

Take a deeper than normal breath at the command "Read on the Right", take another at "Ready on the Left", extend your pistol and take the final breath and exhale to the point of comfort and "Ready on the Firing Line."

It should be noted here that as the shooter gains more experience in proper breath control, he will find that he will hold his breath or more properly will extend his normal respiratory pause without being too conscious of the action. As a result, the degree of intense concentration necessary is devoted to controlling sight alignment and trigger pressure.

CHAPTER II

SIGHT ALIGNMENT

Sight alignment makes the most important contribution to the shooter's system of maximum control, which, in turn, creates the conditions for the firing of an accurate shot.

The essence of accurate shooting lies in accurately hitting the center of a target which is comparatively small in dimension.

In order for the bullet to hit the center of the target, the shooter must aim the pistol and give the barrel a definite direction, relative to the target.

In theory, accurate aiming is achieved when the shooter places in exact alignment, the rear sight, the top and sides of the front sight, and holds them in alignment in the aiming area. These steps place the barrel of the pistol in a definite direction relative to the target.

An indispensible prerequisite for correct aiming is the ability to maintain control of the relationship between the rear sight and the already centered front sight.

When aiming, the front sight is positioned in the middle of the rear sight notch with an equal light space on each side. The horizontal top surface of the front sight is on the same level as the upper horizontal surface of the rear sight notch. (Figure 30)

A. RELATIONSHIP OF SIGHTS. The relationship of the rear sight to the clearly defined front sight is one of acute awareness. The depth of field of normal vision is such that the rear sight of the pistol will be as clearly in focus as the front sight. Some shooters may be able to see only the notch of the rear sight in sharp focus; the outer extremities may tend to become slightly blurred.

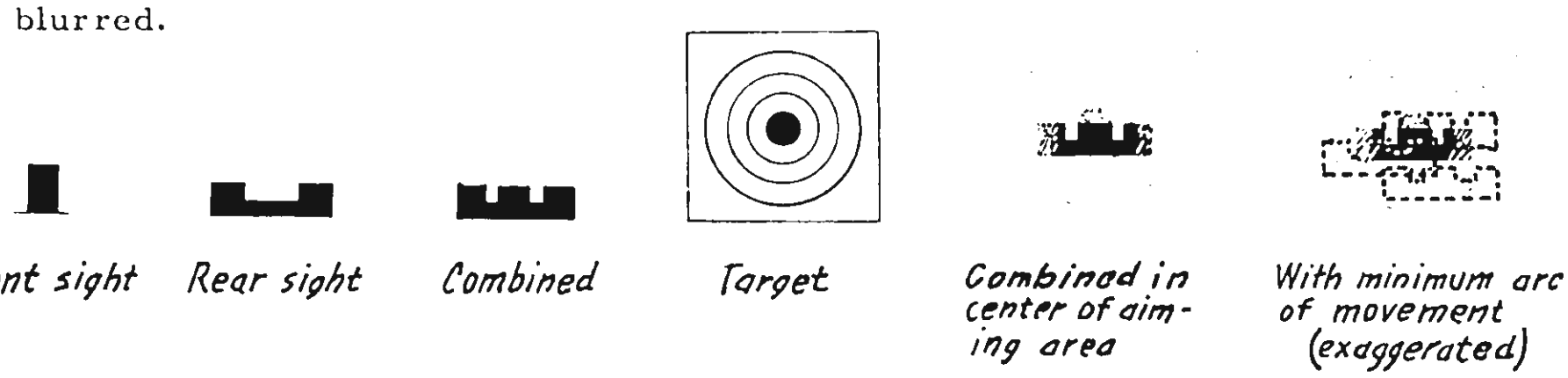


Figure 30

1. <u>The angular shift error.</u>

If the shooter does not observe the essential prerequisites of correct aiming (maintaining the top surface of the centered front sight on a level with the rear sight), there will be few accurate shots. Most often, the shooter errs by misaligning the front sight. In so doing he locates the front sight in a different position in the rear sight notch. This accounts for a greater dispersion of shots on the target, since the bullets will always deviate in the direction in which the front sight is positioned in the notch. (Figure 31) This phenomenon is known as the angular shift error.

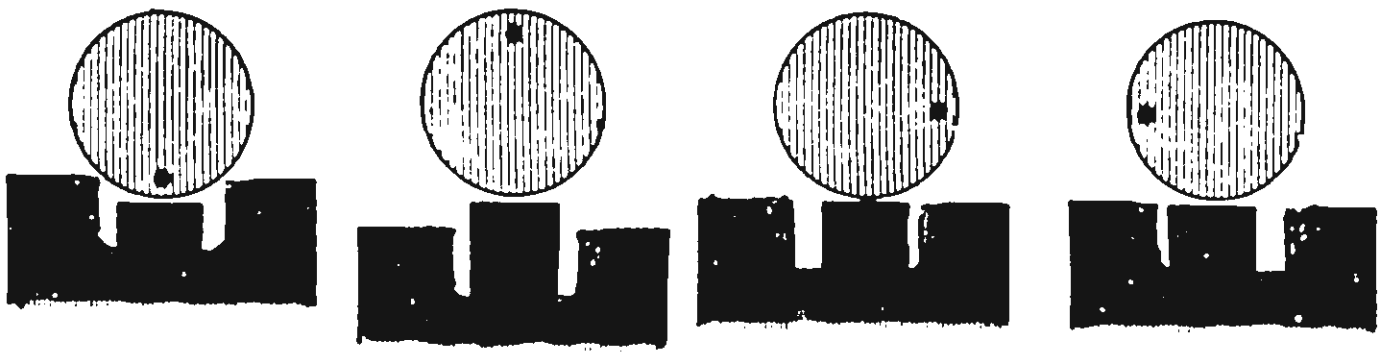


Figure 31. Deflection of the Bullet When There Is Angular Shift Error In the Alignment of the Front Sight.

2. Near parallel shift error.

If the eye distinguishes that the hold (arc of movement) is deviating (in a near parallel shift error) from the center of the aiming area, the shooter should know that these deflections will not lower the final score results of the firing to the extent of the comparative damage done by faulty sight alignment (angular shift error).

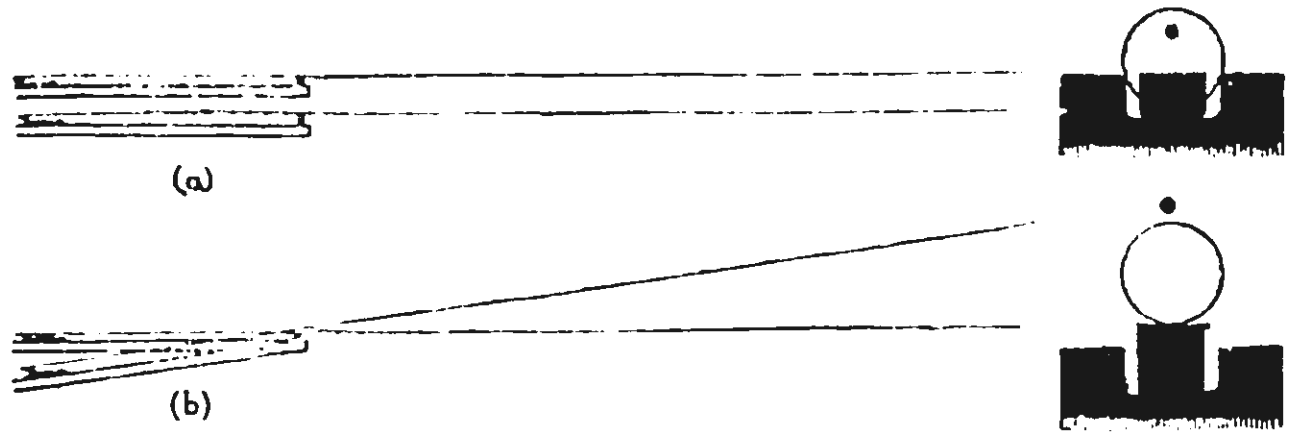


Figure 32. Deflection of Bullet When the Pistol Is Shifted:
(a) Near Parallel, (b) Angular.

Below is a description of the difference:

If you had a 49 yard pole, absolutely straight, holding it perpendicular to the target, moving your shooting hand in a 1/100 of an inch circle (or a near parallel shift error in hold) pivoting from the shoulder (shoulder to hand approximately 1 yard) the other end of the pole would describe a 5/10 inch circle on a 50 yard target. Here's how;

Fifty, 1 yard arm lengths in fifty yards equals 50 radii. 50 x .01 inch error equals .5 inch total error.

Now apply this same formula to a 1/100 inch error in sight alignment (or an angular shift error):

Approximate 6 inch sight radius with rear sight directly over pivot point in wrist. Fifty (50) yards equals 150 feet x 1/2 foot equals 300 sight radii. 300 x .01 inch error equals 3 inches of total error on a 50 yard target.

Sight alignment definitely has less margin for error than an error in hold by a ratio of approximately 6 to 1. Therefore, the sight alignment (angular shift error) is the most critical of the two. Thus, the accuracy of a shot depends mainly upon the shooter's ability to consistently maintain correct sight alignment. The main effort then should be toward keeping your sights aligned. Holding the pistol perfectly still is certainly a commendable action but it is not the primary objective.

At first glance, the aiming prerequisite and the deviations described above seem to be simple and understandable ones. But when the shooter wants to carry it out in practice, it will prove to be considerably more complex, since he will encounter many difficulties during firing.

B. POINT OF FOCUS.

Correct sight alignment must be thoroughly understood and practiced. It appears on the surface as a simple thing - this lining up of two objects, front and rear sights. The problem lies in the tremendous difficulty in maintaining these two objects in precise alignment.

The solution resides partly in the necessity of focusing the eye with unceasing attention on the front sight during the delivery of the shot.

It is imperative to maintain "front sight point of focus" throughout the sighting and aiming of the pistol. If the shooter does not concentrate on maintaining the correct relationship between front and rear sight, the degree of control required to deliver an accurate shot is reduced proportionately. The point of focus must be unwavering during the short period required to deliver the shot. Needless to say, if the focus is displaced forward, and the target is momentarily in clear focus, the ability of the shooter to achieve correct sight alignment is jeopardized for that moment, fleeting as it may be. With disturbing frequency, this is usually the moment that the pistol fires. A controlled, accurate shot is impossible under these conditions.

A shooter who is looking at the target instead of the front sight is sometimes alarmed at the erratic movement of the shooting arm. When the focus is misplaced, usually on a distant object, the relatively small movement of the arm is magnified. However, if the eye is correctly focused on the front sight, and the sights are properly aligned, the once alarming movement of the shooting arm seems to have been arrested. Consequently, the readiness of the confident shooter to apply positive pressure to the trigger, and to deliver a good shot, is aided immeasurably.

C. CONCENTRATION.

If the sights are incorrectly aligned, through inability or carelessness, the net result is an inaccurate shot. Carelessness in obtaining correct sight alignment can usually be traced to the shooter's failure to realize its importance. Many shooters will, in the initial phase of holding, line up the sights in a perfect manner. However, as the hold progresses, and the shooter is concentrating on delivering the shot, he often forgets about maintaining the correct sight alignment which he attained in the initial phase of his hold. Initially, correct sight alignment was upper-most in the shooter's mind, but when the shooter perceives his inability to maintain a pin-point hold, his concentration wavers and the hope for an accurate shot is lost, as the perfection of the sight alignment deteriorates.

Still another factor which aids in the deterioration of correct sight alignment is the feeling of anxiety which arises over the apparantly stationary pressure on the trigger. An impulse is generated to get more pressure on the trigger, so that it will deliver the shot. When the shooter starts thinking about his aiming point and the need to increase trigger pressure, the concentration required to maintain correct sight alignment is diverted. Even if the trigger control and hold are good, the net result will probably be a poor shot. Sight alignment must remain uppermost in the shooter's mind throughout the firing of the shot. Accurate shots are produced only if the shooter maintains intense concentration on sight alignment during the application of trigger pressure, while experiencing a minimum arc of movement. Control is lessened in direct proportion to the loss of concentration on sight alignment.

A genius can concentrate on only one thing, to the exclusion of all else, for about 8-10 seconds. The average, advanced shooter, then, is probably limited in sustained concentration to a period of 3 to 6 seconds. This short space of time is the optimum period in which a controlled shot can be delivered. This time interval should be attained simultaneously with the acquiring of a point of focus on a satisfactory sight alignment, and the starting of positive pressure on the trigger. If the exact sight alignment is maintained, and the trigger pressure remains positive, the shot will break during the time the shooter is able to exert maximum control by virtue of the intensity of his uninterrupted concentration.

The principal difficulties which confront the shooter during aiming are determined by the inherent characteristics of the structure of the organ of vision--the eye--and its work as an optical apparatus during the aiming process.

1. Optical properties of the eye.

As in well known the aiming process makes very exacting demands upon the vision, since consistency and degree of accuracy are directly dependent upon the sharpness of vision and the conditions determining them. Therefore, it is necessary for the shooter to make a good analysis of certain of the optical properties of the eye, in order to know the degree to which, and

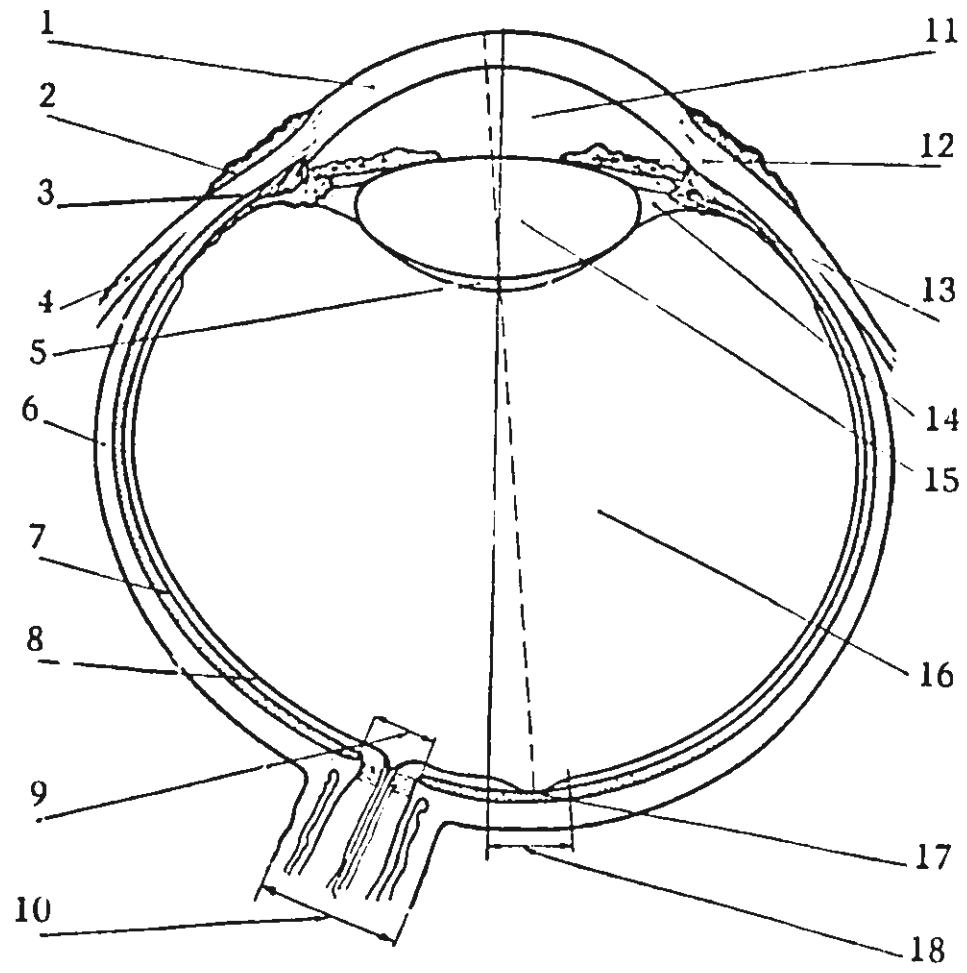


Figure 33. Horizontal Cross Section of the Human Eye (Right Eye).

1. Cornea (transparent, glasslike portion of coat of eyeball
2. Conjunctiva (mucous membrane which lines eyelids and is reflected onto eyeball
3. Ciliary muscle (smooth muscles, controlling alteration of crystalline lens)
4. Muscle of eyeball
5. Space posterior to crystalline lens
6. Sclera (toughest of the three membranes, forming the outer protective and supporting layer of the eyeball)
7. Choroid (vascular coat of the eye)
8. Retina (innermost tunic of the eye, containing receptors, rods and cones)
9. Optic disk (blind spot of retina)
10. Optic nerve (transfers images from retina to visual nerve centers located in the brain)
11. Anterior chamber (filled with aqueous humor)
12. Iris (opening in center is called the pupil, contains groups of smooth muscles that dilate and contract pupil)
13. Posterior chamber (filled with aqueous humor)
14. Suspensory ligaments (zonule of Zinn)
15. Crystalline lens (transparent biconvex body enclosed in transparent sheath, suspended from ciliary body by suspensory ligaments)
16. Vitreous (transparent jelly-like substance contained within transparent membrane close to retina)
17. Fovea centralis (a pit in the middle of the macula lutea)
18. Macula lutea (point of clearest vision, contains greatest number of cones)

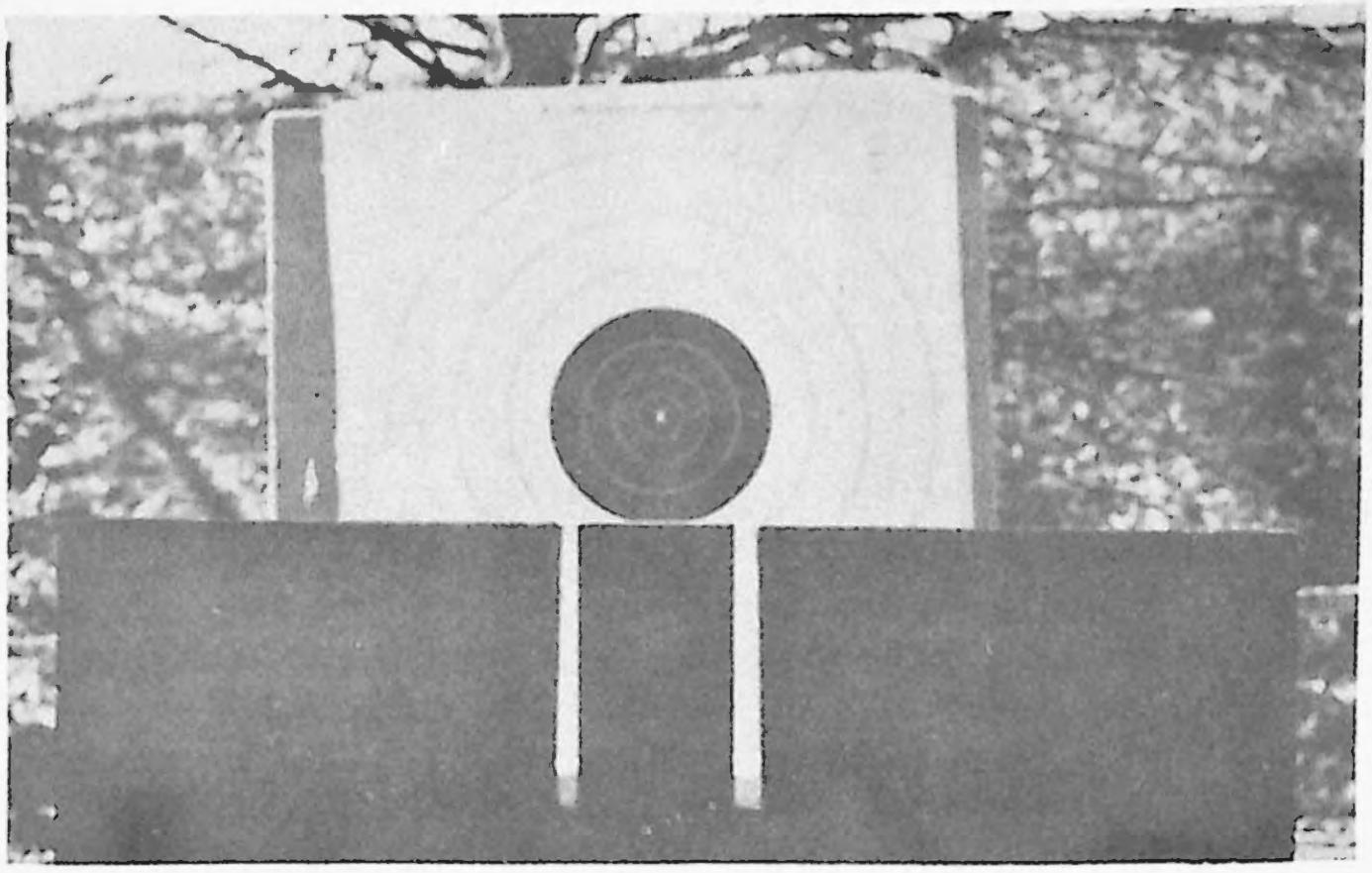


Figure 34a. Impossible! The Human Eye Cannot Focus On A Close-Up Object and A Distant Object Simultaneously.

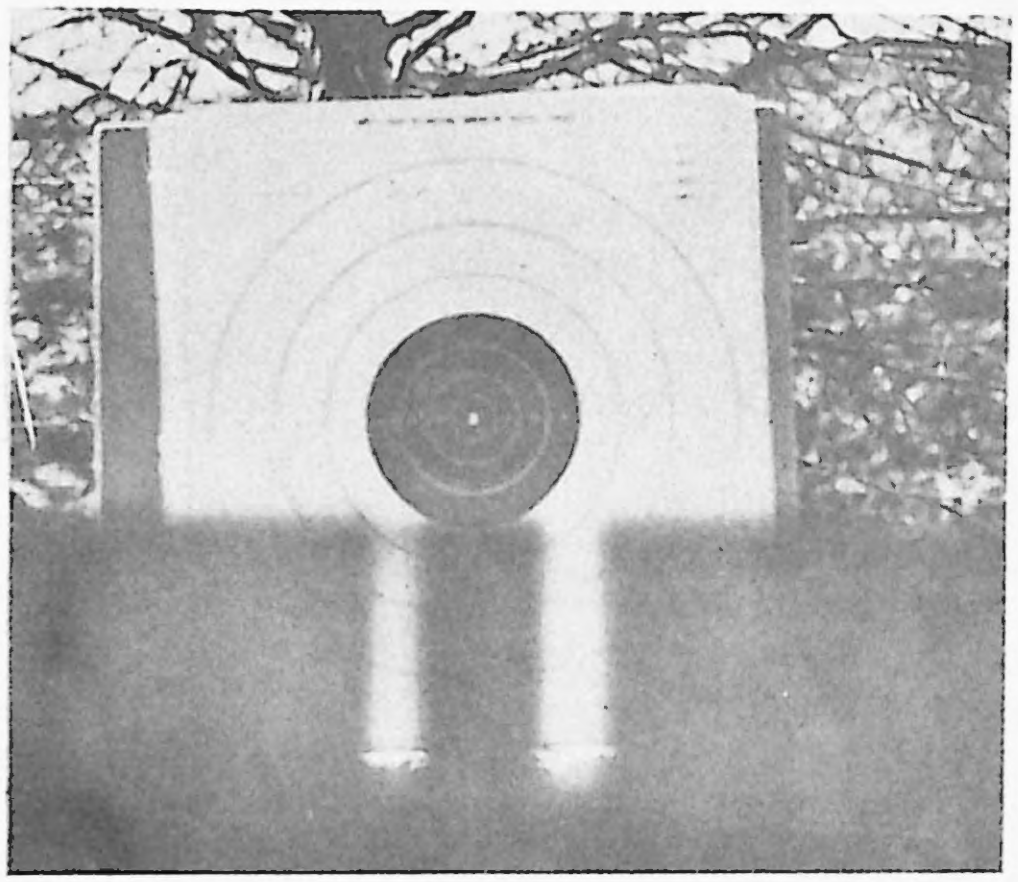


Figure 34b. Improper. Control of sight alignment is not precise. Distinct focus on target renders sight indistinct. Error incorporated here is the same as Figs 34a and 34c and is not as readily apparent.

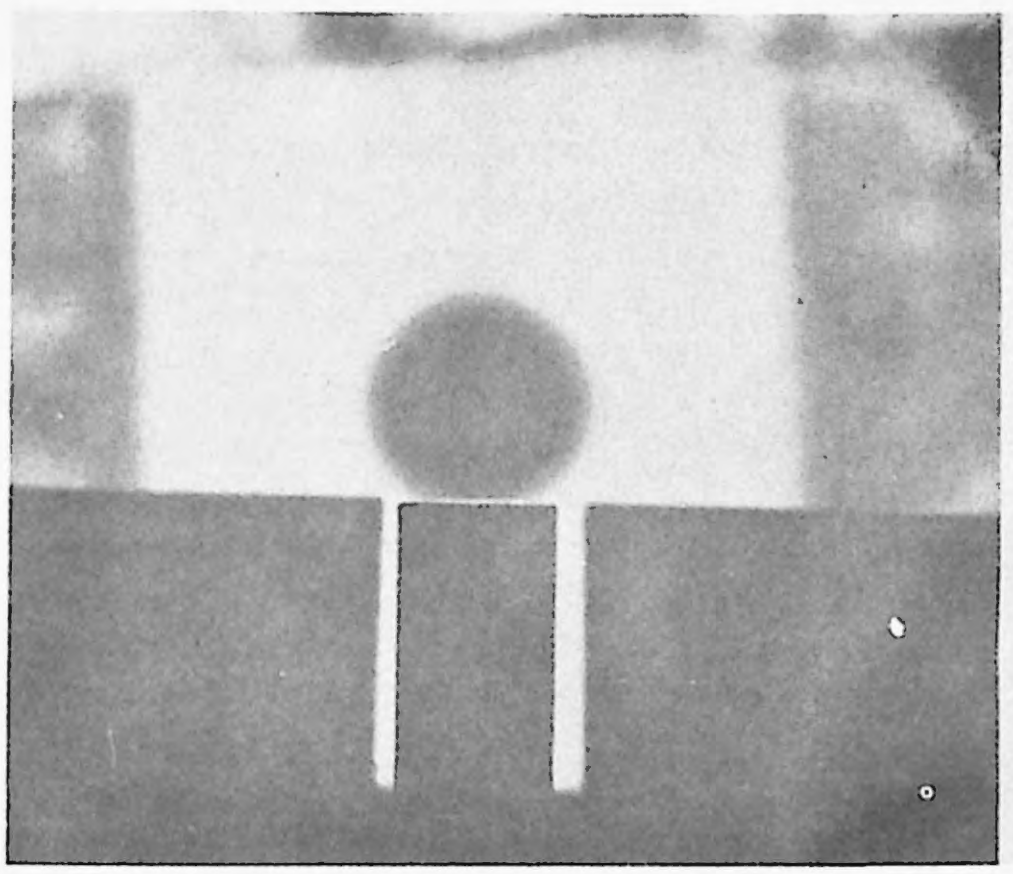


Figure 34c. Proper. Control of sight alignment is precise. Focus limited to front sight only, renders the sights distinct and target indistinct and relationship can be controlled constantly.

the conditions under which, the optical imperfections of the eye can affect the accuracy of aiming to the smallest extent.

a. The human eye as a visual analyzer makes it possible to distinguish rather accurately between colors, forms, dimensions, degree of illumination, and the location of objects in the immediate environment (Figure 33).

The forward portion of the eye, which is turned toward the light, contains a light-refracting apparatus which transmits the image to a light-sensitive membrane--the retina; this apparatus consists of a system of refracting media and surfaces--the cornea, the crystalline lens, the aqueous humor, and the vitreous humor filling the optical cavity. (The light-refracting apparatus also includes the ciliar humor and the iris, which has an opening--the pupil--in the center of it).

The degree of illumination, the form and location of the objects surrounding us are perceived by the internal light-sensitive membrance--the retina--which is linked by means of the optic nerve to the cerebral cortex. In order to obtain the correct visual perception of any object, the image of it upon the retina must be sharp. This is achieved as a result of the eye's ability to adapt its light-refracting system and thus to obtain on the retina a sharp image of objects located at varying distances from it.

In our eye, the role of a photographic lens is played by the crystalline lens, which is a transparent, biconvex body similar in form to an ordinary lens. When the eye observes objects located at varying distances, the curvature of the crystalline lens changes, as a result of which the eye's optical system adapts by reflex and very rapidly to the perceiving of objects located at varying distances from us; as a result, the image produced on the retina is a sharp one and this makes it possible to perceive correctly and sharply the form and outlines of the objects surrounding us. This ability of the eye to adapt to the viewing of variously located objects by means of changing the curvature of the crystalline lens (changing the refraction) is called accomodation.

Consequently, the human eye is constructed in such a way that it is not able to see sharply, simultaneously, objects located at varying distances from it. Therefore, it is completely obvious that, when aiming, it is not possible to see with identical sharpness, simultaneously, the sight alignment and the target which are located at varying distances from the shooter's eye. Understanding this, one must not, when aiming, strain the vision excessively in vain attempts to see everything sharply at the same time.

The normal eye in the state of rest is set up to perceive distant objects, that is, it is set to infinity. In order to switch vision to perceive objects located close by, it is necessary to exert a definite muscular effort. The mechanism of accommodation lies in the fact that the ciliary muscle contracts, as a result of which the crystalline lens takes on a convex form, thus increasing its refraction.

As a result, when aiming, one must not abuse the eye by shifting the glance with excessively frequency, from one point of clear vision to another--from the rear notch and the front sight to the target, and back again. The protracted muscular efforts under such conditions leads to the rapid and considerable fatiguing of the oculo-motor muscles. For the same reason the shoot shooter must not aim for long sustained periods, and must make sure that in the intervals between sequences of aiming he does not concentrate his glance on some object, but looks into the distance "with an absent-minded stare" in order to rest his eye muscles.

When there is a change in the force of natural illumination the level of the eye's light-sensitivity changes and the eye adapts to the different amount of light entering it. A role similar to that played by the diaphragm in a camera is played in the eye by the opening--pupil--in the

middle of the iris. Under the action of muscles, the diameter of the pupil can be made narrower or wider; it is this action which regulates the amount of light entering the eye and which improves the depth of focusing of the image of the object upon the retina when the pupil becomes narrower. The question of the speed at which the pupil reacts to a change in illumination is also deserving of attention. It turns out that when the eye changes over to greater brilliance the pupil contracts much more rapidly than it expands once more after finding itself in conditions of lesser brilliance. For example, the contraction of the pupil to the stable level lasts for about 5 seconds, but the process of its reverse dilation after the stimulus created by the light requires about 3 minutes. From this the shooter must also make the corresponding conclusions: in order to preserve the eye's working efficiency without reducing the accuracy of aiming, before or during aiming, one must not look at brightly illuminated objects or, moreover, subject the eye to the action of sharp transitions from light to shadow; in the intervals between shots one must not rest the eyes by closing them. Between shots it is necessary to rest the eyes, but the best way is to look at distant dull surfaces having even tones of gray, green, or blue.

b. Function of the habits of the normal eye. All shooters should make a conscious effort to improve the condition of their eyes in the intervals when they are not actually aiming by allowing the habits of normal sight of function. The following will give an idea of how this should be done. There are three things that every healthy eye does: Blink, center its attention (called Central Fixation) and shift.

(1) Blinking, the first habit of normal sight an involuntary action. The blink is the quick, light, easy closing and opening of the eye, and it is done intermittently by every normal eye. The rate of blinking varies with people and also varies with the use an eye is put to. You blink more, for instance, when you look at something brilliant than you do when you look at something soft in tone.

Frequently the dividing point between a normal and abnormal pair of eyes is its impulse to blink under a given situation. If the eyes are perfectly normal, they will blink; suppression of the act of blinking shows a tendency to become abnormal.

The action of the eyelids in blinking is most essential to normal eyes and sight. The fluid that keeps the eyes moist is produced by a small gland called the lacrimal gland under the outer portion of the upper lid. When one blinks, this fluid is washed down and over the eyeball and keeps the eye moist.

This moisture has several functions:

(a) There is a definite antiseptic and cleansing action of the fluid.

(b) The brilliance of the eyes and their ability to reflect light are largely due to the fluid on their surface.

(c) The fluid is essential to the cornea, which is the small translucent front part of the eye. Since the cornea has no blood vessels, it needs this fluid to keep it moist or it may have corneal ulcers.

(d) When particles of foreign matter get into the eye, the lacrimal fluid tends to float them off, while on an eye that is dry, the particles stick and imbed themselves.

(e) In cold weather, frequent blinking tends to keep the eye warm. An eye can be very uncomfortable in the cold.

(f) In strong wind or when the weather is very dry, blinking comforts and protects the eye. Under these conditions, one should blink frequently, almost continuously, because the fluid is lost so rapidly.

(g) In the short interval of blinking, the muscles of the pupil have a chance momentarily to relax their tension.

(h) Blinking also enables the eye to move slightly and thus allows the recti muscles to make the small amount of movement essential to their well-being, since motion is necessary to the health of any muscle.

(i) The circulation of the lymphatic fluid around the eye is aided by blinking, and the eye is strengthened by this good circulation, just as any body is benefited by keeping the circulation of the blood active around it.

Blinking is not an interruption of continuous vision. Continuous vision is the illusion that a normal eye produces, authentic in effect but nevertheless an illusion. When an image falls on the retina, there is another or an after image produced; or, in other words, the image remains on the retina for a short period longer than the image is kept before the eye. It is as if your image, in the mirror, stayed there a moment after you had gone away.

Thus, it is not necessary for the eye to be seeing actively all the time in order to produce the illusion of seeing constantly. In fact, nothing in the body works more than half time or so much as half time. More than half of the time of every organ is consumed in the repair of and replacement of its own tissue and the excretion of its waste products.

The frequency of the visual impressions the eye makes is between thirty and forty images per second in the average person. So you can readily see that blink does not interfere with vision. It is possible for the eye to blink so frequently that the eye is closed one-half of the time and yet it will see as much as if it were open all the time.

In fact, blinking increases the actual amount of time you may actively see, since failing to blink constitutes strain and may reduce the number of images from thirty or forty to twenty or fewer images per second. There is not a single instance where blinking interferes with sight. It is a fine, natural, constructive performance and improves the eye, if it has not been blinking normally, and at the same time improves its vision.

Do not confuse a wink or a spasm of the eyelid with blinking. A spasm of the eyelid is a forceful, involuntary constriction of the lid and usually involves the muscles around the eye as well as the muscles of the eyelid and is frequently associated with some nervous disease. A blink is a light, easy, smooth, scarcely noticeable movement of the eyelid.

If you have formed a habit of looking too fixedly at things, begin to blink. Blink consciously and often until you have caught again the unconscious blink.

(2) Central fixation.

The second habit of normal sight is to have the eye and the mind so coordinated that they fix on a small area at one and the same time. In other words, when you look at an object you should localize your attention, fasten it on one small area, not scatter it.

For example, when you look at a page of print, you cannot see the whole page clearly. If you fix your eyes on the upper right-hand corner of the page, you can see that clearly, but the

remainder of the page, although it is within your field of vision, is much less clear. To see the last word on the page clearly, you will have to shift your eyes so that they are directed straight at that word.

The same is true if you take words quite close to each other. To see the first word of a line clearly you must look directly at it, and to see the last word on that line it is necessary to shift the eye. The same is true if you want to see the second word on the line clearly; you can see it well enough to read it, but you do not see it perfectly clearly when you are looking at the first, and a definite strain is involved if you try to see it that way. This is true down to the very smallest degree of space.

There is a basic, structural reason for this. The only part of the eye that sees perfectly clearly is in the center of the retina and is no larger than the head of an ordinary steel pin. This dot of perfect sight is placed in the eye like a point at the bottom center of a bowl whose sides slope gently - like an arena. This one tiny point has clear, strong vision. Immediately that you depart from that point, there is a tremendous reduction in clarity of sight. There is, instead, blurred, collateral vision. And this is increasingly blurred as you continue out from the center until near the outside edge there is only perception of general shape, color and motion. You no longer have direct vision but blurred, collateral vision.

Since only this point, called the Macula Lutea, has perfectly clear vision, only a very small area can be seen clearly at one time. But the movement of shifting is so swift that the illusion of seeing a large area is given. The images falling on the Macula Lutea are carried swiftly into the visual brain centers, one succeeding another with such rapidity that there are thirty or forty and sometimes more images a second, thus making a whole picture there in the brain.

This ability of the brain to carry successive images and so produce the illusion of clearly seeing the whole object or a considerable area is an impressive and beautiful fact, but it is also the cause of a great deal of trouble. One comes to believe that the eye itself can see a large area clearly, and so misuse slips in because any attempt to do this is to use the eye without focusing.

"Large area" means trying to see two words or more at a time. The healthy, normal eye habitually sees only a small area at a time, the mind and the eye coordinating perfectly on each word or point of observation with no effort or impulse to see more, just as it does when one is writing.

If the practice of seeing a large area at one time persists over a sufficient length of time, the ability to focus perfectly is lost and the blurred vision natural to the collateral area is the only vision possible; then it is necessary to retrain the eye and mind to look at only a small area in order to again have central fixation without which no vision can be clear and normal.

One can read indefinitely without undue tiring or harming the eyes in any way if the eyes are relaxed and the vision is localized. But, if the seeing power of the collateral field of vision is used, the eye is straining and there is a resulting fatigue and loss of efficiency.

The fact that the eye sees clearly only a very small area at any one time cannot be overstressed. In the awareness of this fact rests the coordinating of the mind with the structural limitations of the eye, without which there cannot be normal vision.

If you grasp this fact of focused vision and mentally close your sight to a large area, you will attain this valuable habit of central fixation and find increased efficiency in your eyes.

(3) Shifting.

The third beneficient habit of normal eyes is to shift. This seems to quarrel with the second habit which is to localize your gaze but in reality it does not. You must point your gaze, but you must, too, constantly shift your point of vision.

If you do not shift it, you will stare, and staring, as I have said, is one of the worst and commonest forms of straining.

Shifting is a normal function and is normally done unconsciously. The frequency with which your eyes shift varies with the type of demand upon the eyes; for instance, looking at a book or watching a tennis match. The book is stationary and the eyes do not tend to move, while the tennis balls and players are constantly in motion so the eyes must move continually in order to follow them.

But, in any event, shifting should be as frequent as possible. The time required for an image to register on the retina, about 1/50 of a second, allows for a great frequency of shifting with no loss or interruption of vision.

People who are inclined to look at one area too long, and every abnormal eye does this, would benefit both in vision and in eye comfort if frequent shifting of the point regarded is consciously practiced. Without your glasses, look at a word, then look at a word three words beyond it, then back, and so on. Do this until both words become clear. Be relaxed while you practice.

Or, if your vision is good, look at the moon and, blinking frequently, shift your vision from one point to another on the moon. Do this a number of times and the moon will stand out much more clearly and appear in its true form as a solid spherical body instead of a flat disc.

Shifting is both voluntary and involuntary in character. The voluntary shift is continuous, automatic and very slight. This movement is not visible and is believed to correspond in frequency with the rate of image production in the retina.

There is always in every muscle a faint tremor, since muscle tone is not a constant factor but is a rapid succession of contractions producing a relatively steady muscle pull. And, since the eyes are held in position by muscles and all focusing is produced by these muscles, the eyes are naturally subject to all conditions that muscles produce incidental to their normal functioning.

When the eye is relaxed, the voluntary shifting is frequent and the movement is short in scope; the tensest eye can make a large movement, but it requires relaxation and normality for an eye to keep shifting in relaxed condition on a very small area. This is true of all muscles--the finer the movement, the better trained and the more relaxed must be the muscle. When an eye is strained and the vision is abnormal, practice in shifting frequently will invariably give relief from the strain and produce improvement in the vision.

(4) Exercise.

An exercise that accomplishes this is to focus definitely on each word and consciously shift to the next one. A few minute's practice each day will make this an unconscious habit.

Normal shifting is absolutely essential to normal sight. Loss of vision is frequently in direct proportion to the loss of motion.

In addition to acquiring the three habits described above, a shooter may find it desirable to strengthen his tolerance for light. This may be done as described in the following paragraphs:

Sunlight is very beneficial to the eyes. It both relaxes and stimulates. But it is necessary to know how to use the sunshine to get the most out of it. Abuse of the sun on the eyes may cause great damage. The eye can be strengthened in its light tolerance by judicious exposure to light. One of the most effective and simple ways of strengthening the eyes is to expose them to the sun's rays, in the following manner:

Close the eyes lightly as the face is turned directly toward the sun. Keeping the eyes closed, slowly turn the head from side to side. Keep this up for four or five minutes. Then, when the eyes are relaxed from the heat of the sun and the motion of the head, they may be opened, but only momentarily, and when the head is turned to the side. The eyes must not look directly at the sun but may look near it. Make no effort to see, and open the eyes only in flashes. As this exercise is continued, and the eyes become accustomed to the increased light, the glance may be directed closer and closer to the sun.

By doing this with regularity on successive days and for a gradually increasing length of time, any eye will be strengthened and its vision improved.

The eye is admirably equipped to protect itself and function under widely varying light conditions. When the natural protective mechanism is used, as just outlined, light will produce pleasure for the eye.

2. Optical imperfections of the eye.

As a result of optical imperfections of the eye, the images of objects on the retina have edges which are not completely sharp, but which are somewhat fuzzy; as a consequence, there exists a certain limit of varying sensitivity of our eye which determines the sharpness of vision. It must be said that sharpness of vision, in and of itself, is inconstant and is certain variable value which depends upon the degree to which, and the conditions under which, the optical imperfections of the eye have a telling effect. Therefore, the shooter must know, at least in overall features, the conditions which influence the sharpness of vision and thus the degree of accuracy of aiming.

As an optical instrument, the eye has inherent in it, the phenomena of aberration and diffraction of light.

a. Spherical aberration consists of the fact that the rays of light falling upon the crystalline lens, which, as it is, is a spherical lens, is refracted differently and is not focused at a single point, since the extreme rays are refracted more strongly than the central ones (Figure 35). As a result of spherical abberration, a beam of parallel rays entering the eye is focused on the retina not in the form of a sharp image, but in the form of a circle of light diffusion. The size of the circle of light diffusion resulting from spherical aberration is in direct proportion to the size of the pupillary opening. It is completely obvious that the sharpness of the image is increased if one eliminates extreme rays. Consequently, as the pupillary opening contracts, the sharpness of the image of the object upon the retina increases.

The degree to which spherical aberration can hinder the seeing of objects sharply, and to which the sharpness of the image depends upon the size of the pupillary opening, can be convincingly shown to the shooter by means of a simple example. Small orienting marks and objects which can be distinguished only with difficulty during overcast weather become incomparably more easily discernible if one looks at them through a small peep hole which, in this instance, fulfills the role of an artificial pupil.

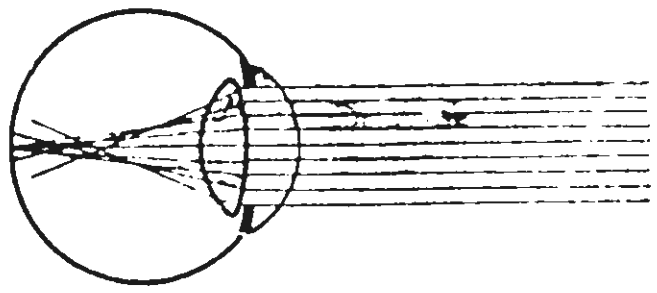


Figure 35. Phenomenon of Spherical Aberration.

b. The phenomenon of light diffraction lies in the fact that light rays passing through small openings, particularly through the crystalline lens; seem to bend (Figure 36) and produce on the retina an image not in the form of a single sharp point, but in the form of a circle surrounded by a number of concentric light rings of decreasing sharpness. This occurs as a result of the wave nature of light. As the pupillary opening decreases, the diameter of the diffraction ring of light diffusion increases. The diffraction rings around the images have a noticeably telling effect only when there are extremely small dimensions of the pupil, and this, as we can see, is a certain opposite of the phenomenon of spherical aberration. The phenomenon of diffraction makes itself felt when there is solar illumination from the front and the sun in shining into the eyes; when there are bright patches of sunlight on the horizontal surfaces of the front and rear sights; when they case a sharp reflection; etc.

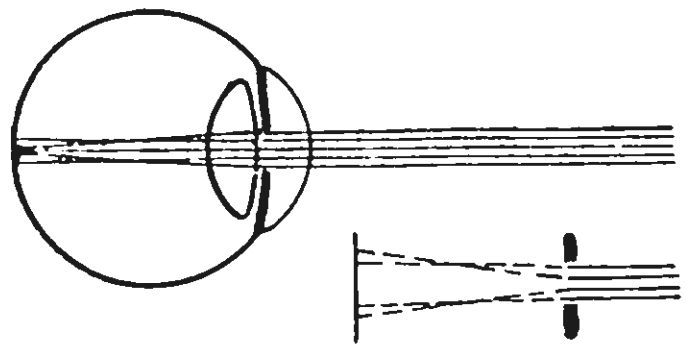


Figure 36. Phenomenon of Diffraction of Light On the Pupil.

The operation of the eye as an optical apparatus is also harmed to a certain degree by the light diffusion occurring in it, which is especially discernible when one views brightly illuminated objects located against a dark background. The effect of light diffusion in the form of a more or less noticeable radiation, covering the field of vision, is caused by media which do not possess absolute transparency--the crystalline lens and the vitreous humor. The light diffusion in the optical media is responsible for the halos of light are especially noticeable where the targets are strongly illuminated by sunlight; in such an instance, the white background of the target cast a sharp reflection and causes a considerable light diffusion in the optical media, causing a blinding effect, as a result of which both the bull's-eye, perceived by the eye in the form of a gray spot with indistinct edges, and the front and rear sights are perceived with unclear outlines.

It is obvious from what has been said that the amount of light diffusion from spherical aberration is in direct proportion to the size of the opening of the pupil, and the amount of light diffusion from diffraction is in inverse proportion to the size of the opening of the pupil, and thus it is not possible to eliminate these types of diffusion completely. As a result of this inverse dependence of the effects of aberration and diffraction upon the size of the pupil, the best conditions of sharp vision correspond to a certain average size of the pupillary opening--a diameter of approximately 3mm.

Taking this into consideration, depending upon the conditions of illumination which influence the size of the pupillary opening, the shooter must strive, insofar as he can, to create the most favorable conditions for the operation of the eye, protecting it from the action of light by using visors, filter type shooting glasses, or by possibly using an artificial pupil--peep holes attached to the shooting glasses with adjustment for varying diameters. He must also make sure that the sights do not shine and thus produce a blinding effect upon the eye: They must be carefully and evenly blackened.

c. Brilliant sources of light harm the eye chiefly by means of the violet sector of the visible and invisible portions of the spectrum. The most complete elimination of the violet sector of the spectrum is achieved by yellow, yellow-green, and yellow-orange light filters. Such light filters not only do not reduce the acuity of visibility, but, on the contrary, increase it. Types of darker glass protecting the eyes from brilliant sources of light somewhat reduce the acuity of vision; however, by having an assortment of shooting glasses of varying shades, it is possible to select and use them in such a way that the shooter's eye perceives the correct sight alignment under the brightest illumination in almost the same way that he does during overcast weather.

The optical imperfections of the eye also include nearsightedness, farsightedness, and astigmatism, the existence of which also hinders the correct focusing of the optical system of the eye and the obtaining of sharp images of objects upon the retina.

If the eye is constructed in such a way that rays of light entering it in a parallel beam are focused exactly on the retina without any effort at accommodation, we say that the eye is a normal one (Figuer 37a).

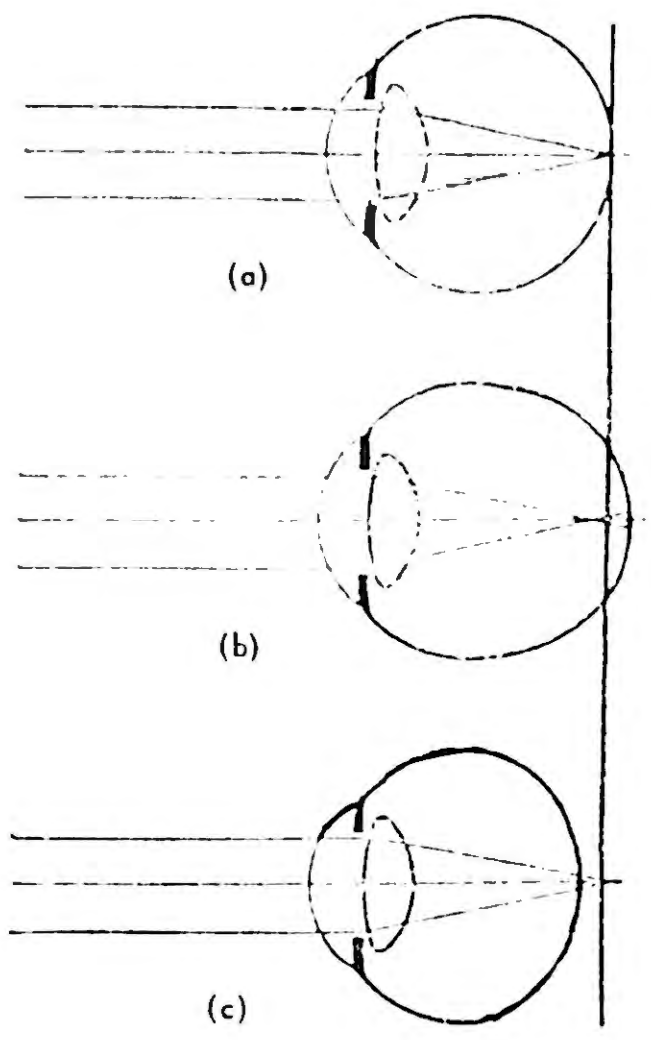


Figure 37. Scheme howing the Refraction Rays In the Eye: (a) Normal, (b) Nearsighted, (c) Farsighted.

d. The eye is nearsighted if the rays entering it in a parallel beam are focused in front of the retina (Figure 37b). Nearsightedness is caused either by the fact that the eyeball is excessively long from front to back or by the fact that the eye has great refracting force, or by a combination of both factors. Nearsightedness can be corrected comparatively easily by means of eyeglasses. Many pistol shooters suffer from nearsightedness, but this defect of vision, after being corrected by the proper choice of eyeglasses; does not prevent them from achieving record-making competitive results.

e. The eye is farsighted if the rays entering it are focused in back of the retina (Figure 37c). This can occur either as a result of the fact that the eye has weak refracting force, or the fact that the eye is too short from front to back or by a combination of both factors. In such an instance, in order for the rays to focus upon the retina they must enter the eye in a converging beam, and therefore a farsighted eye sees near objects worst of all. This type of eye is harder to correct but eyeglasses help it overcome the difficulty. Shooter's suffering from farsightedness will see the sights very poorly; the characteristic complaint of farsighted persons is that the rear notch seems to fuse with the front sight.

f. An indistinct, hazy image of objects on the retina can also result from astigmatism of the eye.

An eye in which the refracting surfaces of the cornea and crystalline lens do not have a perfectly spherical form is called astigmatic. When an eye is astigmatic, parallel rays entering the eye cannot produce an exact focused image on the retina, since the refraction of the light rays at various meridians in the eyeball occurs at different angles. As a result, the eye possesses not a single principal focus, but several foci, which are located at various distances from the retina; that is why the image on it is indistinct and uneven (Figure 38). It must be said that "strange" phenomena frequently observed under practical conditions of marksmanship (when two shooters are firing one and the same pistol, with an identical sight setting, and the centers of impact differ sharply from one another) are, in all probability, connected with astigmatism of the eye.

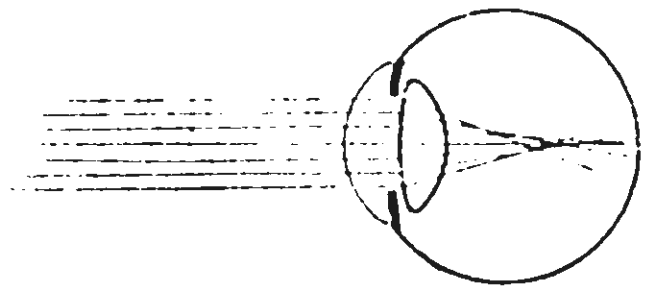


Figure 38. Scheme showing the Refraction of Rays In An Astigmatic Eye.

One can easily be convinced of the existence or absence of astigmatism by making use of the chart on the following page (Figure 39). For this purpose it is necessary to look with one eye from the distance of best vision (approximately 10 feet) at a disk on which concentric circles are drawn. If the person has astigmatism, only certain areas of the disk will be clearly visible and the remaining areas will seem hazy.

3. Correction of defects.

If even insignificant defects in vision are discovered, it is necessary to wear corrective eyeglasses when firing, since the excessive accommodation of the eye resulting from aiming will greatly fatigue vision and this can lead to a still greater decrease in its accuracy. It must also be kept in mind that when eyeglasses for firing are chosen by the ordinary method, that is,

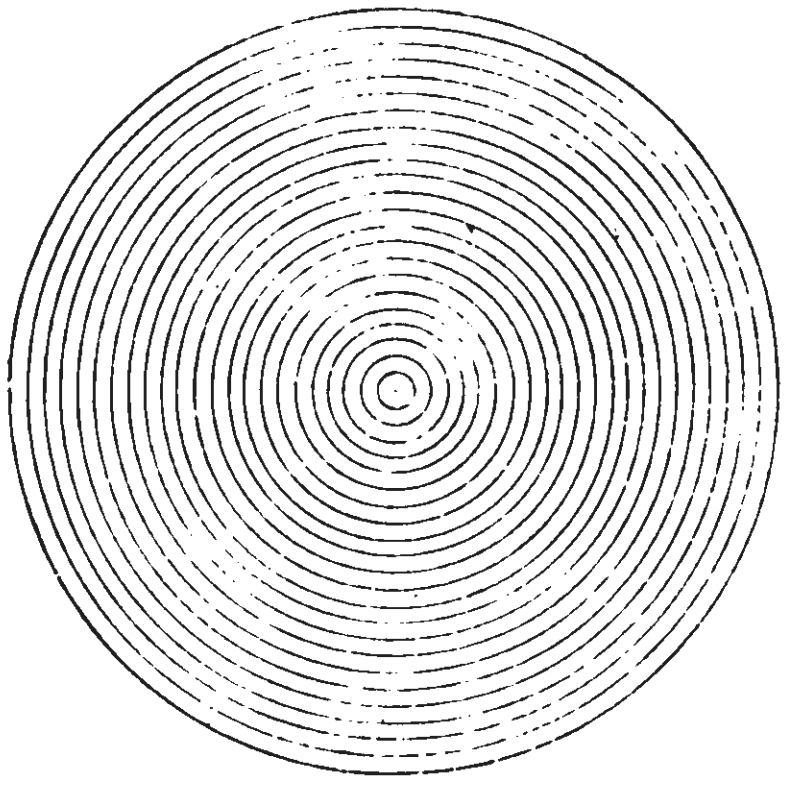


Figure 39. Chart for Discovering Astigmatism.

in an optometrist's office, the choice is not completely satisfactory; it is very desirable when selecting the lenses to check them immediately on the pistol range, to make sure that one can see well the sight alignment located at arm's length distance away from the eye. This selection is linked not so much with the determination of the lens dioptry, as with the determination of the quality of their grinding, since all defects will make themselves known quickly during such a check.

When wearing shooting glasses (including those with filter lenses) it is necessary to make sure that the line of sight runs perpendicular to the surface of the lens and through its center, since the central portion of the lens is usually ground considerably better and therefore less distortion of the vision. To hold the lenses perpendicular to the line of sight requires no change in the ordinary level placement of the head when assuming the firing position.

4. Monocular and binocular vision.

It is necessary to dwell on one more peculiarity of our eyes which has tremendous importance in aiming--the existence of monocular and binocular vision.

Vision with one eye is call monocular and vision with two is called binocular. The fact that a person has two eyes does not always mean that he also has binocular vision. There are instances when the eye which the poorest vision is not included in the act of vision and the person actually uses just one eye, the better one. The dominance of one eye over the other also occurs when both eyes possess identical sharpness of vision. The eye that the person prefers to use is called the dominant, or directing eye. There exists a very simple method by which one can determine whether both eyes are equally strong.

In order to determine which is the dominant eye the shooter must hold his hand out slightly make a ring out of the fingers and thumb, and look through it in such a way that some small object can be seen by both eyes (Figure 40). Then, by alternately closing one eye then the other, it is necessary to see whether the object stays within the ring or leaves it. The dominant eye is the one with which the shooter sees the object as unshifted, remaining in the ring. In most people the dominant eye is the right one.

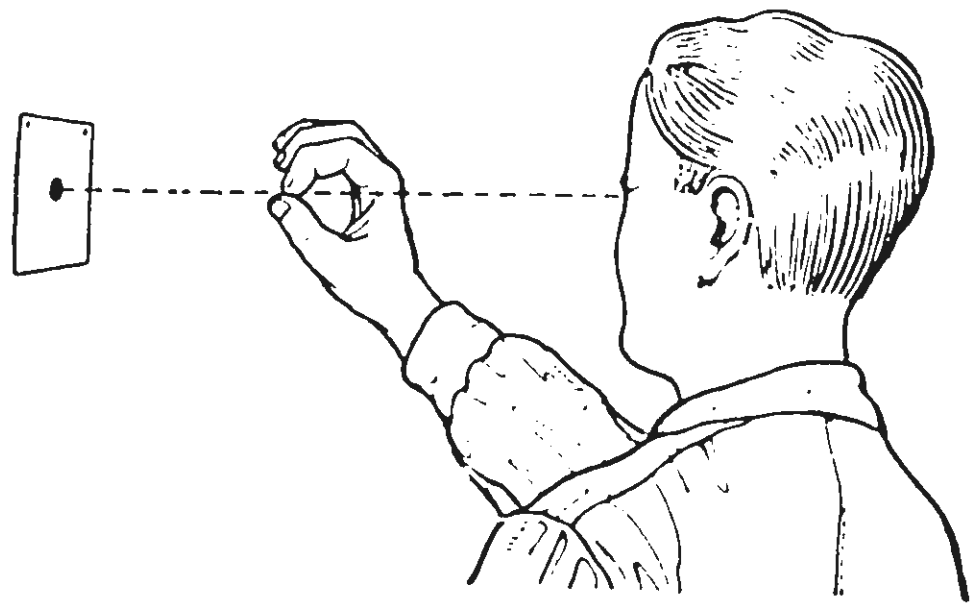


Figure 40. Determining which eye is dominant.

The protracted work of one eye (for example, by laboratory assistants, microscopists) contributes to the fact that the eye used becomes the dominant one. This naturally pertains also to shooters, who, when aiming, use one eye, the right one--which is, in the overwhelming majority of cases, their dominant one.

The shooter is usually instructed when aiming to squint his left eye and aim the pistol at the target with his right eye. During subsequent instruction it is no longer necessary to continue this device of closing the eye, since it has its major shortcomings, which are attested to by numerous instances of medical research.

The first shortcoming is the strain which is involved in squinting the eye and which is hard for many people to endure. Another undesirable aspect is the fact that the squinting of one eye is almost always accompanies by the greater or lesser tension and pressure of the lids of the aiming eye onto the eyeball; this pressure of the eyelid upon the eyeball affects the refraction and thus has an adverse influence upon the sharpness of vision. The third factor having an adverse effect upon the accuracy of fire is the involuntary sympathetic dilation of the pupil of the open eye in response to the closing or squinting of the other. Thus, when excluding the second eye from work it is best not to use a physical method--squinting--but the psychological suppression of the visual impressions of the open left eye which is not aiming.

With binocular aiming, that is, with both eyes open, the line of sight still is achieved with one eye. Consequently, this method does not involve anything new in principle and therefore the shooter is not required either to learn something from the outset or to relearn something, but must simply stop closing one eye when aiming.

Binocular aiming has a number of major advantages: the shooter does not have to expend the additional effort involved in squinting the eye, and this is very important when he is engaged in prolonged firings; the binocular acuity of vision is usually better than the monocular, since the visual perception of one eye intensifies the total stimulus sent to the central nervous system from the visual perception of the other eye; in such aiming the stimuli sent by two eyes are more natural than those sent by a single one.

All the movements of the eyeball, or rather, its rotation, as well as its fixed position at moments when the glance is fixed on some object, are effected by the work of three pairs of eye muscles. As a result of the definite straining of these groups of muscles, during the time when

they are at work the eye always, including the times when the eye is aiming, is in a state of indiscernible, slight vibration or quivering. When aiming a pistol and the shooter turns his head for example, somewhat down and to the right; the eyeball turns respectively upward and inward and is held in the least desirable position--that requiring the combined and intensified work of all three groups of muscles (Figure 41). When the eye muscles become fatigued, the involuntary quivering of the eyeball increases considerably and this lessens the accuracy of aiming. Therefore, the shooter must devote major attention to the position of the head when firing, the selection of that firing stance in which the head position is the most natural one, with the least amount of tilt, so that the shooter does not look at the target from under his eyebrows or sideways, since this results in the rapid fatigue of the eye muscles and, hence, the lessening in the accuracy of aiming.

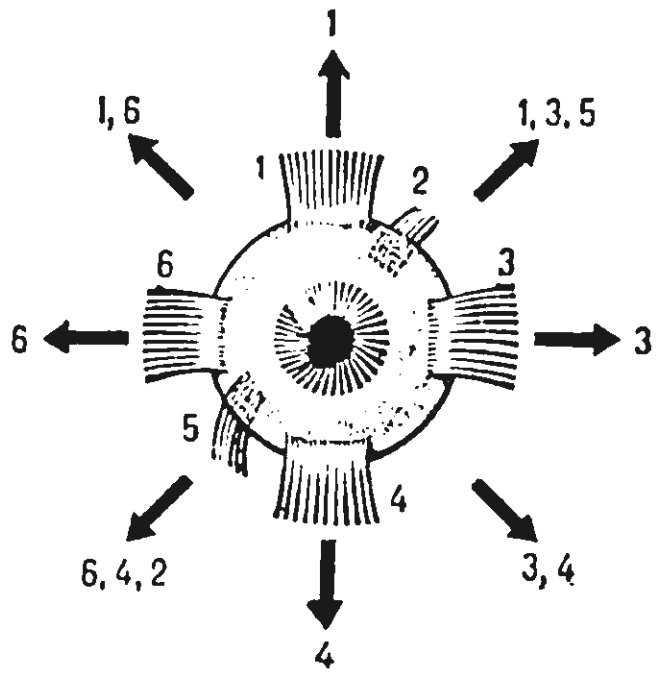


Figure 41. Muscles of the Right Eye. (Arrows Show the Direction In Which the Eyeball Turns When the Muscles Designated By the Numbers Are Contracted.)

5. The sharpness of vision.

The shooter is interested chiefly in the degree of the eye's differentiating sensitivity and its resultant sharpness of vision, as well as the degree of accuracy of aiming which the eye can guarantee.

Basically, sharpness of vision depends not only upon physical conditions, but also upon anatomical and physiological ones. The physical conditions determine primarily the greater or lesser accuracy of the image of the object upon the retina, as was mentioned above. The anatomical and physiological conditions determine whether or not we can see the object at all, in conformity with the sharpness of its image upon the retina.

Sharpness of vision is usually determined by the minimum space that we are able to see between two objects. In order for this space to be visible, it is necessary for at least one retinal element lying between the images of these two points to be stimulated. Thus, the normal sharpness of vision is generally considered to be that at which the eye can distinguish between two visible points at an angle of one minute.

However, the anatomical dimensions of the retinal elements (the rods and cones) do not completely determine the limit of visual acuity. Therefore, the visual acuity of the normal eye actually can be considerably greater than the medical norm. Research works have shown that the maximum visual acuity of the normal human eye, at one hundred yards under normal

illumination, can distinguish distance between objects separated from one another within the limits of 40 angular minutes. This means that the normal eye can distinguish sufficiently clear, for example, a space of .1 of an inch between the side of the front sight and vertical inside surface of the rear sight notch at a distance of one yard (the approximate distance to the muzzle and front sight.) But the eye of an experienced shooter can distinguish a considerably smaller space between two objects. A number of experiments carried out by specialists attest to the greater accuracy of our sharpness of vision. For example, the dark vertical lines between front and rear sight against a white background, can be discerned down to the minute width of .01 of an inch.

Many experiments confirm that the sharpness of vision can be considerably increased by means of exercises. This increase in the sharpness of vision is achieved by searching for new signs, new criteria for recognizing the form of objects. Such a sign for shooters is undoubtedly their highly-developed sense of symmetry and visual memory. Therefore, in order to achieve great accuracy of aiming, the shooter must try in every way to develope not only his sense of symmetry, but also his visual memory of correct sight alignment, its symmetrical form, and the interrelationship of the front and rear sights, mainly, the amount of space between each side of the front and rear sights and the levelness of their horizontal surfaces. All these factors, together with an existing greater or lesser sharpness of vision, will provide for accurate and consistent aiming and the accurate calling of the shot.

6. Calling of the shot. (Visual Memory)

Accurate calling of a shot is dependent upon exact recall of the mental image of the sight alignment at the instant of firing. As demonstrated, the presence of 1/100th of an inch error in sight alignment will result in approximately a 3 inch error from target center at 50 yards. Acute awareness of the slightest degree of error in alignment is an absolute requirement of accurate shot calls from a clear visual memory. Any approach to sight alignment other than maximum concentration on maintaining this exact relationship between front and rear sight is a saluatory bid for disaster.

7. Changing degrees of accuracy.

When the eye performs intensified work, not only the motor apparatus of the eye, but also its light-sensory apparatus have reduced efficiency. In order to fix the glance steadily upon some object, the eye possesses its greatest sharpness of vision for several seconds, after which the sharpness of the image on the retina, that is, the clear seeing of it, gradually decreases. Consequently, the shooter must not be captivated by excessively prolonged aiming, since, after the elapse of 12-16 seconds, his eye ceases to notice certain inaccuracies in aiming and, by relying on the false assumption that the rear sight and front sight are in correct relationship to one another, the shooter makes grievous errors without noticing and therefore, does not know why they were committed.

Therefore, one must in no instance become excessively engrossed in aiming. If one calculates the time between the moment when the visual attention is concentrated on obtaining the precise alignment of the front and rear sights and the moment when the shooter makes the decision to positively press the trigger, the aiming process must not exceed 6-8 seconds.

When aiming, some shooters run their eye from the front sight to the rear sight notch and then to the third object, the target, doing this quickly several times, until these three points are all located on the same line. It must be said that this method of aiming causes rapid fatiguing of the muscular apparatus of the eye and fails to provide a constant objective for the formation of a visual memory. With this method of aiming it is very difficult for the shooter, for example, to conduct rapid fire, in which he is very limited in time, and simply does not have

time to run his eye in this manner back and forth between objects located at varying distances. The shots may be fired when he is focused on any of the three objects. Consistently accurate shot calls are impossible. Therefore, when aiming, the shooter must strive to see only the front sight sharply and distinctly.

Relying upon practice, the overwhelming majority of shooters try to see the front sight sharply, and thus are forced to accept the blurring of the bull's-eye. It is necessary once and for all to remember the proper positioning of the front sight in the rear sight notch and to place the top of the front sight on the level with the horizontal top surface of the rear-sight notch. The main thing is to achieve uniformity in aiming.

With the passage of time and with regular practice, the eye develops the ability to obtain the identical space relationship between the front sight and the rear sight and with increasing frequency and to position the front sight uniformly in the aiming area which is hazily perceived by the eye.

Eventually, the shooter develops his visual memory to such an extent that the eye will consistently perform the act of aiming automatically and can call his shots without error.

CHAPTER III

TRIGGER CONTROL

Correct trigger control must be employed in conjunction with the other fundamentals of shooting. The physical act of applying enough pressure on the trigger to deliver an accurate shot may vary from individual to individual. Proper trigger control for each individual gradually assumes uniformity when the techniques of proper application are mastered. Many shooters, for example, maintain a high degree of trigger control with a relatively light grip, where another shooter may use a very tight grip. Some shooters prefer to apply consistent trigger pressure at a rapid rate, while maintaining correct, undisturbed sight alignment. For another shooter, a slower, deliberate application may achieve the same, positive results. An ever increasing number of shooters use the positive approach to trigger control - that is to say, uninterrupted, constantly increasing pressure.

Trigger control is of very great, and sometimes even decisive, importance in producing an accurate shot. When the shooter exerts pressure on the trigger, he must do so in a manner that does not alter the sight alignment, or in any other way change the position of the pistol. Consequently, the shooter must be able to exert smooth, even pressure to the trigger. Furthermore, the trigger must be pressed in conjunction with peak visual perception, breath control, steady hold, and maximum concentration.

In order to produce an accurate shot, the shooter must carry out many diverse, but related, actions. While smooth pressure is applied to the trigger, these actions function, not in isolation from one another, but in strict concord.

The complexity of fulfilling this coordinated action is compounded by the fact that the pistol is in constant, varying motion throughout the period of sighting and aiming. The movement varies according to the degree of stability of the shooter's stance. Consequently, the sight alignment combination deviates, to a greater or lesser degree, from the aiming area. Most often it will move through the aiming area, pausing only for shot periods of time in perfect alignment with the target. Needless to say, the movements of the pistol are of an involuntary, disordered nature. It is impossible to determine when, and for how long the properly aligned sights will hover in the vicinity of the center of the aiming area. Thus, the coordinated process of aiming and pressing on the trigger is fraught with great difficulties. These difficulties are aggravated still further by the fact that the shooter is called upon to execute coordinated actions when every instinct or reflex action seeks to contradict them. Such a situation requires the development of new conditioned reflexes, and the improvement of the coordination of movements.

Trigger control plays an exceptionally important role in the techniques required to produce an accurate shot. In theory, trigger control seems to require far less than actual experience demands. The coordinated action of correct aiming, timely pressure on the trigger, and the ultimate delivery of the shot is beset with difficulties that can be overcome only by overcoming former conditioned reflexes and by acquiring new ones. Only through constant training and attention can these new techniques be acquired.

A. NERVE PROCESSES.

All the movements of the human body are controlled by the nervous system. Under the influence of both external and internal stimuli, the nervous system enters a state of excitation. This excitation, arising at some center of stimulation, does not remain there, but extends along the corresponding nerve fibers, at a great rate of speed.

During shooting, the marksman has to execute various movements, each one of which is dictated by a set of external conditions. Ideally, each motion should be a conditioned reflex.

For example, the visual perception of the minimum arc of movement should produce the reflex action involved in pulling the trigger. This visual perception should act at all times in conjunction with other stimuli (e. g., correct sight alignment) to produce the conditioned reflex.

1. Rapidity of Reaction.

A reaction may be defined as the action taken by the individual in response to a certain stimulus. Despite the rapidity of one's reactions, there is, nevertheless, an interval of time between the stimulus and the response. For example, there is a time lapse of between 0.18 and 0.25 seconds between the time the shooter perceives the need for trigger action, as induced by the visual stimulus of correct sight picture, and the moment he initiates trigger control. This reaction time is determined in part by the fact that it takes a certain amount of time for the image formed by the correct sight alignment to be transmitted through the retina to the brain, from which the decision to put the trigger finger into motion must come.

2. Excitation-Stimulation and Inhibition.

The coordination of aiming and applying pressure to the trigger requires the shooter to be decisive in his actions. If his reaction time is too slow, his actions in response to visual perceptions will be delayed and will lose their efficiency. In this case, the shot would not be delivered under the optimum conditions, and the resulting hit on the target would suffer accordingly. The question naturally arises, then, of whether or not the shooter's reactions are fast enough, or whether or not they always remain the same. The answer is quite simple. The shooter's reactions are not fast enough, and they do not always remain the same. The explanation is also simple. In addition to the process of excitation, which has just been described, there exists also a process which is labelled inhibition. It has been demonstrated by scientists, that this phenomenon arises in the central nervous system in conjunction with the process of stimulation. Moreover, their actions are simultaneous. The state of inhibition must not be considered a state of rest or inactivity; it represents an active state of the nerve cells in which stimulation cannot pass through them. The simultaneous existence of the process of stimulation and inhibition is the only thing that permits the living organism to execute various movements. For example, in order to bend the index finger and thus produce the action of pressing on the trigger, it is necessary for the stimulating impulses to contract the finger flexors. If only the process of stimulation existed, the coordinated activity of the organism, all kinds of movements executed by it, would be impossible, since the process of stimulation in this instance would extend not only to the flexors, but also to the extensors; it would be completely impossible, with this joint work of antagonist muscles, to bend the finger or perform any other similar movement.

The shooter must know that the speed of reaction is directly dependent upon the mobility of the nervous processes of stimulation and inhibition. The more rapidly the nerve cells of the corresponding areas of the central nervous system change over from the state of inhibition to the state of stimulation, the more rapid the reaction.

The shooter's rapidity of reaction is influenced primarily by the degree of his experience, when, as a result of training, the perfection of the shooter's movements is achieved chiefly by means of improving the work of the nervous system. In order to analyze those complex phenomena which occur when the shooter is mastering the motor habits necessary to execute the coordinated action of aiming and pressing the trigger, let us turn to a theory of higher nervous activity.

When the shooter is just beginning to train himself in the correct control of the trigger action, the muscular activity at first causes a predominance of the process of stimulation in the cerebral cortex. During the initial phase of training, the process of stimulation spreads within the cerebral cortex, encompassing considerable areas of it. The process of stimulation arising at one place in the motor area of the cortex of the large hemispheres spreads over a consider-

able area of the cortex, leading to a situation in which muscular groups which do not take direct participation in an action are drawn into it. Properly speaking, this is a definite reason why beginners, instead of pressing on the trigger by merely moving the trigger finger, accompany its movement by the work of many groups of skeletal muscles, thus spoiling the aim of the pistol at the most critical moment of producing the shot.

Subsequently, as the shooter practices and his habits become ingrained, he learns to limit excessive movements. Soon afterwards he is able to develop a certain restraint of movements. Because the shooter, by means of concentrated practice, has intensified the process of inhibition, the widespread predominance of stimulation in the cerebral cortex is followed by a constriction of stimulation in limited areas. Frequently, during this period of training, the shooter notices that he does not always press the trigger at exactly the right moment. Many shooters are aware of the rather unpleasant sensation that arises from the many times that the trigger seems to come to a complete stop, and refuses to fire the pistol. Many a shooter has been heard to wail "the pistol just stays there, but the finger won't mash!" After an interval, the pistol begins to describe an enlarged arc of movement, and the shooter, even as he realizes that the best moment for producing the shot has been lost, continues pressure, nevertheless, on the trigger. Subsequently, after systematic training, the shooter improves further the interactions between the processes of stimulation and inhibition, and as a result, his movements and timing improve, and are accompanied by the coordinated work of only the necessary groups of muscles.

3. Coordination.

As he masters and strengthens his motor habits, the shooter soon learns to make automatic certain appropriate, voluntary movements. He learns to coordinate the timely and smooth movement of the trigger finger with correct sight alignment and minimum arc of movement.

It must be said that even highly trained shooters who, as a result of prolonged training, have achieved the strengthening of the corresponding work habits and the automation of the movements in controlling the trigger action, are unable, under certain circumstances, to maintain the equilibrium of the process of stimulation and inhibition, and this, naturally, has an effect upon the speed of reaction and the coordination of the movement. For example, when changing over from prolonged rest to the state of action, the organism is not drawn immediately into the work; if, shortly after waking up, a shooter begins to shoot immediately, without taking a stretch, the results of his shooting will, as a rule, not be as good, since the process of inhibition will predominate in the interactions between the process of stimulation and inhibition, as a result of which the reaction will prove to be delayed and the movements will not be sufficiently prompt or accurate.

The shooters speed of reaction and the coordination of his movements are greatly influenced by: the duration of the interval between periods of training; preliminary stretching before each firing; the shooter's mood and emotional state (emotions are psychological processes involved in the experiencing of satisfaction and dissatisfaction), especially under competitive conditions about which more will be said.

It follows from all this that the difficulties confronting the shooter when controlling the trigger action lie primarily in the fact that the shooter's speed of reaction to the external stimulus (the centered front sight coinciding with the rear-sight notch) is inconstant and depends upon the degree of equilibrium of the processes of stimulation and inhibition, and it is this which, in the final analysis, determines the rapidity and coordination of the shooter's movements.

4. Reflexes.

However, there are difficulties of another nature which the shooter encounters when pressing the trigger and producing a shot. These difficulties evolve from the fact that the shot itself

is accompanied by a loud sound and the recoil of the pistol; these difficulties are linked with the necessity of changing the process of certain reflex reactions in the organism of the shooter.

As is well known all actions performed by a person proceed according to the type of reflexes (A reflex is the organism's reaction, carried out with the participation of the central nervous system, in response to a stimulus). Depending upon the peculiarities of the reactions, all reflexes of the living organism are divided into two classes: unconditioned and conditioned.

a. Unconditioned reflexes. Unconditioned reflexes are innate, constant reactions of the organism in response to definite external stimuli. They do not have to be developed specially and they always manifest themselves under strictly definite conditions. However, despite the fact that unconditioned reflexes are innate, in case of necessity the cerebral cortex can influence them and change their course.

b. Conditioned reflexes. Conditioned reflexes are temporary reactions of the organisms which are individually acquired during the life of the organism, which are developed under the action of the immediate environment, and which depend upon many conditions. Conditioned reflexes are always carried out with the participation of the cerebral cortex. During the course of a person's life, he constantly encounters the external world. In order to live, he must adapt, react to the influence of the environment, and make it over in the direction that he requires. This link between the organism and the external environment is realized partially by simple, unconditioned reflexes, but chiefly by means of creating new conditioned reflexes.

Conditioned reflexes which have been developed can be retained for a long time only in the event that they are reinforced, at least now and then, by corresponding stimuli. Consequently, conditioned reflexes are temporary. From this it follows that conditioned reflexes, as a result of the fact that they are temporary, that is, are inhibited comparatively easily and disappear when the necessity for them no longer exists, require constant reinforcement.

The situation is considerably more complicated with a change in innate, unconditioned reflexes, and it is precisely certain unconditioned reflexes which marksmanship requires a person to change, especially when he is learning to control the trigger action and produce the shot.

It is in this light that we shall attempt to analyze some of the reflex reactions occurring in the shooter's organism in response to the external stimulus--the shot, accompanied by a strong auditory effect, and the recoil of the pistol.

(1) Prevent development of detrimental conditioned reflexes. Everyone knows that a person reacts to an unexpected sharp sound--a shot, cry, etc. --by an involuntary sharp flinch, which is an unconditioned reflex to the auditory stimulus. Naturally, if the shooter reacts in that way to his own shot or to that of his neighbor on the firing line, it will be impossible to have accurate shooting. Therefore, the shooter must train himself to remain indifferent to such external stimuli and thus to stifle the innate, unconditioned reflex.

If someone waves something threateningly at another person, or say, claps his hands in front of his face or fires a shot unexpectely, the person will involuntarily, unconsciously close his eyes, that is, blink. This reaction of the person is a manifestation of an innate, unconditioned defensive reflex. However, despite this fact, shooting requires a person, during aiming and firing (his own or that of neighbor), to keep his eyes open, otherwise his aiming will be inaccurate and, in addition, he will not be able to call the shot, that is, establish the interrelation of the centered front sight and the rear-sight notch at the moment of fire. Consequently, the shooter must learn to suppress this defensive unconditioned reflex.

To each action causing painful sensations a person responds with an involuntary sharp movement accompanied by a contraction of muscular groups. This represents an unconditioned re-

flex. Now let us imagine that a beginner who previously has never fired a pistol has gone out onto the firing line. If he is given practice cartridges, he will calmly load the pistol with them, aim, and press the trigger. But as soon as he produces one or two shots with a live cartridge and feels the blow in the hand from the recoil, which, in addition, is accompanied by an auditory effect, he will subsequently act completely differently. Knowing that the shot is accompanied by a blow in the hand, the beginner, in addition to pressing on the trigger, will involuntarily strain his muscles, stiffen his arm and press his shoulder forward in order to counteract the expected blow. Thus, a conditioned reflex to the expected blow has already appeared on the base of the beginner's unconditioned reflex. If steps are not taken in time, this conditioned reflex which has manifested itself will become stronger and become a harmful habit for the shooter. Consequently, the shooter must learn not only to suppress certain unconditioned reflexes, but also to prevent the development and reinforcement of conditioned reflexes which are detrimental to shooting--in this instance, the expectation of the blow from the pistol recoil--and when the blow itself occurs, to learn how to keep unchanged the pose of the body and the degree of muscular tension, so as not to spoil the aim.

As we can see, the process of the coordinated action of the timely pressure on the trigger and correct aiming under the conditions of a shot accompanied by recoil and an auditory effect makes very great demands upon the person's nervous system. The necessity of achieving equilibrium in the processes of stimulation and inhibition, the necessity of suppressing certain innate, unconditioned reflexes, and finally, the necessity of preventing the development of conditioned reflexes which are detrimental to shooting create very great difficulties which are not so simple for the shooter to overcome.

It is these difficulties which lead to the arising of very serious errors and the acquiring of detrimental habits when controlling the trigger action, and which have an adverse effect upon the accuracy of fire.

5. Errors Made When Controlling the Trigger and Means of Combatting Them.

a. The most serious and most dangerous error made by the shooter when producing a shot is jerking - that is, the abrupt application of pressure on the trigger.

If jerking were limited only to abrupt pressure on the trigger, and the rapid displacement of it along the axis of the bore, it would cause only part of the resulting troubles.

More importantly jerking is usually accompanied by:

(1) The sharp straining of all the muscles.

(2) The abrupt tightening of the hand on the stock (grip).

(3) A failure to press the trigger directly to the rear, but somehow to the side.

All of these factors, taken together, lead to such a great shifting of the pistol to the side that there can be no thought of an accurate shot.

Most frequently, jerking is observed in shooters who are short in experience and have little training. Usually, because of an insufficiently stable stance, the inexperienced shooter will hold the pistol in a manner that produces a large arc of movement, during which the favorable moments for producing a shot are of very short duration.

The cause of trigger-jerking, first, is the practice of "snatching a ten-pointer", as the expression goes. The shooter tries to seize the moment when the centered front sight, as it moves back and forth, passes under the lower edge of the bull's eye, or comes to a stop, for a brief time, near the center of the aiming area. Since these moments are fleeting, at best,

the inexperienced shooter strives to exert all the necessary pressure on the trigger during that short time. But this rapid and abrupt trigger pressure is accompanied not only by the work of the flexor muscles in the index finger, but also by the sympathetic interplay of a number of other muscles. The involuntary action of these muscles produces the so-called jerk, and the inaccurate shot that results. Still another cause of jerking is the reaction of the shooter's organisms to the shot. The young shooter, in anticipation of the recoil of the pistol and its loud noise, strains his muscles by flinching. He spoils his aim by pressing sharply on the trigger, straining as he does so to counteract the anticipated recoil.

Practice has shown that a young shooter must be warned sufficiently early in his training about the dangers of jerking the trigger. If effective steps are not taken immediately to detect that very serious mistake, a large amount of labor will be subsequently spent in ridding him of these unwanted reflex actions, all of which are detrimental to accurate shooting.

The difficulty in detecting errors in trigger control is compounded by the fact that the pistol shifts considerably during recoil and many mistakes are not easily perceived. The shooter himself has a more difficult time in evaluating his actions, and often does not realize that he is jerking the trigger, blinking his eyes, or straining his arm and shoulder muscles.

The easiest way to correct jerking in the young shooter is the patient coaching by an older, more experienced shooter. Such an individual can more readily detect errors and correct habits that produce poor trigger control. It is considerably worse if, during independent training, the shooter makes these mistakes either because of the fact that he had never paid any attention to them, or because the habits of smooth pressure on the trigger were acquired sufficiently firmly and the shooter has become accustomed to jerking without noticing it himself. And not infrequently such shooters do not even guess, or sometimes do not even consider it necessary to prove conclusively for themselves, whether or not they are jerking on the trigger. For the most part this situation is encountered among shooters who have a certain amount of "match experience", but who shoot with average and uneven results. It is necessary to remember well that if he does not get rid of the detrimental habit of jerking on the trigger, the shooter will never succeed in achieving high and steady competitive results. Therefore, it is necessary for him, irrespective of whether he has just recently engaged in marksmanship or has many years of shooting experience behind him, to check himself systematically and, in the event that he detects any signs indicating that he jerks the trigger, to take urgent steps to get rid of the serious error that he is committing in controlling the trigger action.

Signs of jerking are an increase of the size of the area of the grouping of shots, shots off to the side which are not called accurately, chiefly to the left and down (for right handers). If such a situation is detected, the shooter must make a sharp change in the nature of his training exercises, but in no instance must he stop them. When carrying out the training exercises the shooter must, first, stop firing cartridges, in order to enable the nervous system to rest somewhat from the shot--that is, from the blows in the hand and the sound of the shot; in this process some of the acquired conditioned reflexes which are detrimental to firing (tensing of the arm in order to counteract the recoil, the straining of the muscles in expectation of the shot, blinking at the auditory effect of the shot), by not receiving reinforcement, begin to decrease and then completely disappear. Second, the shooter must continue regular training, but without firing, that is, he must practice "dry". This training is necessary in order not to lose the stability of the assumed position, as well as the useful conditioned reflexes which the shooter had developed during the process of previous firings.

By aiming carefully and noting attentively everything that happens to the pistol when he presses on the trigger, the shooter must discover his errors and eliminate them. This training by means of dry firing is of great benefit since it contributes to the acquiring of muscular habits in controlling the trigger, and makes possible to develop correctly and carefully the technique of pressing the trigger, in which the gun does not shift to the side or jerk up sharply when the trigger is squeezed.

When beginning to use dry firing to practice controlling the trigger release, the shooter must first carry out a decisive struggle against the desire to "grab" for a shot the favorable moment when the centered front sight is under the bull's-eye. Despite the arc of movement which actually is not so great, the shooter must teach himself only to press smoothly on the trigger, that is, to use the method of the uninterrupted positive control of the trigger action. And when the smooth control of the trigger again becomes habitual and he no longer has to devote special attention to it, he can again begin shooting live cartridges. It is still better if at first, after starting again to shoot live cartridges, the first training exercises involve firing at a piece of blank white paper, rather than at a target with a black aiming area. Simultaneously, when starting again to fire cartridges, the shooter must devote an especially large amount of attention to himself, to his sensations, counteracting the desire to jerk on the trigger by his will power and the consciousness of the inacceptability of reacting incorrectly to the shot.

b. Let us now consider another error committed by a shooter when controlling the trigger--"holding too long", that is, the excessively protracted action of pressing the trigger.

A consequence of holding too long is the fact that the shooter does not have enough air to hold his breath, his eye becomes fatigued, and his visual acuity decreases; in addition, as a result of the fatiguing of the muscles, his assumed stance loses its stability. Consequently, when he holds too long the shooter presses on the trigger under unfavorable conditions, when the arc of movement increases and the eye is not completely able to note all the errors in sight alignment.

Holding too long is, first, a consequence of excessively slow and cautious pressure on the trigger. This is caused, in turn, by the shooter's fear of producing a bad shot. Such indecisiveness and overcaution may be regarded as the opposite of jerking. Moreover, holding too long stems from the lack of coordination of movement, which frequently occurs during those stages of training when the process of inhibition outweighs the process of stimulation. Simply stated, the shooter cannot force himself to exert positive pressure on the trigger at the proper time. One favorable moment after another goes past, and soon the chances for an accurate shot have been diminished. Naturally, the trigger control phase has been extended far beyond its effective duration. This situation frequently occurs after a period of dry-fire training exercises. The shooter loses the sense of the trigger's true weight when he fires for extended periods of time without a round in the chamber. When the trigger is released in a dry shot, the trigger seems to be rather light, but when the shooter switches to live rounds, the trigger weight seems to be considerably greater. He feels that he must exert greater effort to overcome this seemingly greater weight. Frequently, the shooter will blame his subsequent troubles on faulty adjustment of the trigger mechanism. Nothing is gained from such incorrect accusations. More times than not, the shooter returns to his normal method of trigger control without having achieved any substantial benefit, since the root of evil in this instance may be traced to lack of coordinated control, and not to trigger adjustment.

The restoration of coordination of movement, and the return to the correct balance between stimulation and inhibition is brought about primarily through systematic training and dry-fire exercises. It is precisely this method of training which develops the necessary coordination of the shooter's actions. When the shooter's movements become automatic, the trigger finger may operate in an unstrained manner, and the shot will break at the proper moments. Despite the differences which the shooter will perceive in the trigger's weight as he changes to live rounds, it is important that each training session begin with a few dry-fire exercises. It has been demonstrated that such exercises are necessary for the development of that vital coordination of action which is such an integral part of accurate shooting. Such exercises may also be repeated after record shooting, due to the manner in which they seem to restore the necessary equilibrium in the nervous processes.

Frequently, a shooter, when firing for record, is unable to fire a shot. After several unsuccessful tries, a dangerous situation could arise. Rather than risk a wild shot on the next try, the shooter should unload the pistol and dry-fire a few shots. After restoring coordination of movement, and regaining his confidence, the shooter is far better prepared, both physically and mentally, for the delivery of an accurate shot. Firing the shot during the first few seconds, assuming a good hold, will guarantee sufficient visual acuity and stability of position to produce a good shot.

c. We have considered the fundamental errors, both physiological and physchological, that arise in trigger control. Let us now consider a problem that is also closely related to trigger control.

The firing of an accurate shot depends to a great extent on the quality of the trigger-action adjustment. An incorrectly adjusted trigger aggravates the errors committed by the shooter as he physically exerts pressure on the trigger. Such incorrect adjustments include:

(1) excessive tension, i.e., heavy trigger action.

(2) excessively long working action, sometimes called "creep".

(3) too light trigger action, which may cause accidental discharges.

(4) gaps, or ill-fitted trigger action.

The shooter should not try to overcome these difficulties with modifications in his trigger control but take the problem and pistol to the armorer for solution.

B. FACTORS PROVIDING FOR THE CORRECT CONTROL OF THE TRIGGER.

The word squeeze is used erroneously in connection with trigger control. When we think of the action of squeezing, we usually close all four fingers and thumb together at the same time. This is definitely not proper trigger control. The pressure put on the trigger must come from independent movement of the trigger finger only. The gripping fingers and the thumb do not move or tighten. Keep the grip pressure constant. Align the sight, settle into your normal aiming area and exert positive, uninterrupted, constantly increasing pressure, straight to the rear, until the hammer falls. You must not look for a perfect sight picture of rear sight-front sight-bull's-eye. Instead, focus your eye upon the front sight, keeping it perfectly aligned with the rear sight. The blur of the out-of-focus target may move about slightly, but this movement is relatively unimportant. Any time the weapon is fired with good sight alignment within the normal arc of movement and it is a surprise shot, the shot will be a good one and will hit the target within your ability to hold.

Trigger control has a series of required actions that take place if a smooth release of the firing mechanism is accomplished.

1. Slack and initial pressure.

Any free movement of the trigger, known as slack, has to be taken up prior to a light initial pressure. This action assures that the tolerances in the firing mechanism linkage are taken up and are in firm contact before positive trigger pressure is applied.

Initial pressure is an automatic, lightly applied pressure, approximately one-fourth or less of the total required to fire the weapon. This careful action is an aid in the proposed positive pressure that will release the hammer quickly and smoothly.

2. Smooth trigger control on the part of the shooter.

Independent of the trigger control used by the shooter, it is important for him to observe the principal requirement evolving from the fact that the pressing of the trigger is the completion of the combined actions required to produce an accurate shot; therefore, the trigger must be pressed in such a way as not to disturb any of the established circumstances set up to create conditions for absolute control of the shot.

In order to fire a controlled shot the shooter must learn to increase the pressure on the trigger positively, smoothly, gradually, and evenly. This does not mean, however, that the trigger must be pressed slowly. It must be pressed smoothly, without interruption, but the release of the trigger must take no more than 2 to 5 seconds.

Smooth trigger action makes special demands upon the work of the right index finger when pressing upon the trigger; its correct work determines to a great extent the quality of the shot since the most carefully attained perfect sight alignment will be spoiled by the slightest inconsistency in the movement of the trigger finger.

3. Function of proper grip.

In order for the index finger to be able to carry out its work without spoiling the aim, it is first of all necessary to have the right hand grasp the stock correctly and thus create the proper support permitting the index finger to overcome the trigger-action tension. The stock must be grasped tightly but without any tremor, since muscular tension in the hand can lead to undesirable movement of the pistol. It is also necessary to find a position for the hand that will provide for a space between the index finger and right side of the stock. Then the movement of the index finger as it presses on the trigger will not cause any lateral movement of the sight alignment.

4. Proper placement of the trigger finger.

It is generally necessary to control the trigger finger with either the first bone of the index finger, or with the first joint. So placed, little motion of the trigger finger is required to fire the shot. The trigger must be pressed straight back, so that the index finger moves along parallel to the axis of the bore. If the finger presses the trigger somewhat to the side, several undesirable things may happen. Tension in the trigger action may increase; side pressure on the trigger may also cause additional friction on certain parts of the trigger mechanism. One of the prime causes of exerting pressure to the side, is improper placement of the trigger finger, most often squeezing with the very tip of the finger. Still another consideration is the effect that side pressure has on sight alignment. Only very slight pressure to the side is required to bring about a significant error in sight alignment.

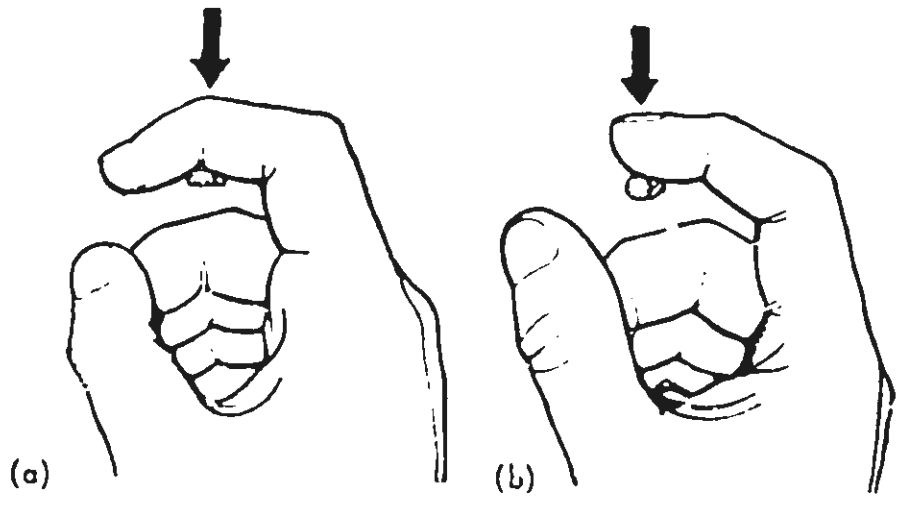


Figure 42. Correct Placement of the Average Index Finger on the Trigger.

5. Coordination.

Ability to control the trigger smoothly is not sufficient alone to produce an accurate shot. An additional requirement is the necessity for the coordination of trigger control with visual perception. The trigger must be activated in conjunction with correct sight alignment, minimum arc of movement, and peak, undisturbed concentration. Put into other words these actions might be called cadence, rhythm and exact timing. Under any name, this factor of reacting with precision comes only to those who practice constantly. Occasional ability to time one's actions precisely is not the answer to championship shooting. A three-gun aggregate requires this to occur 270 times for successful results. Consecutive, exacting performance is enhanced by an ability to compensate automatically for errors, and to maintain the conditions for an accurate shot without disturbing trigger control.

6. The function of minimum arc of movement.

It is necessary during firing to press the trigger under varying conditions of pistol movement. In order to apply coordinated pressure on the trigger, in conjunction with correct sight alignment, the shooter must wait for definite times when all conditions become favorable. Such times will be characterized by the optimum opportunity for maximum control to operate. The shooter must never attempt to fire until he has completely settled into a minimum arc of movement.

In order to learn how to fire a shot at the proper time, that is, to wait for the favorable moments when the pistol has a minimum arc of movement, the shooter must make analysis of the time needed to settle and the duration of the minimum arc of movement.

The entire system consisting of the shooter's body and the pistol always undergoes an erratic arc of movement during the time required to aim and produce a shot. The cause of this movement is the action and counteraction of the muscles doing the work which they do to maintain the shooter's body is a definite pose; such as the blood pulsation, which causes rhythmical oscillations of individual parts of the shooter's body and the pistol. The nature and extent of the arc of movement changes within the course of various intervals of time. For example, at first, when the shooter is first getting his sight alignment and has not yet had time to settle the weight of his body and the pistol to the greatest degree, the extent of the movement is great. As the entire system becomes balanced and the aiming is more precise, the arc of movement minimizes, and then, after a certain length of time, when the muscles begin to get fatigued and the shooter does not have enough air to hold his breath, the minimum arc of movement begins to increase. If we record the arc of movement, we see a wavelike line with varying amplitude of oscillations (Figure 43).

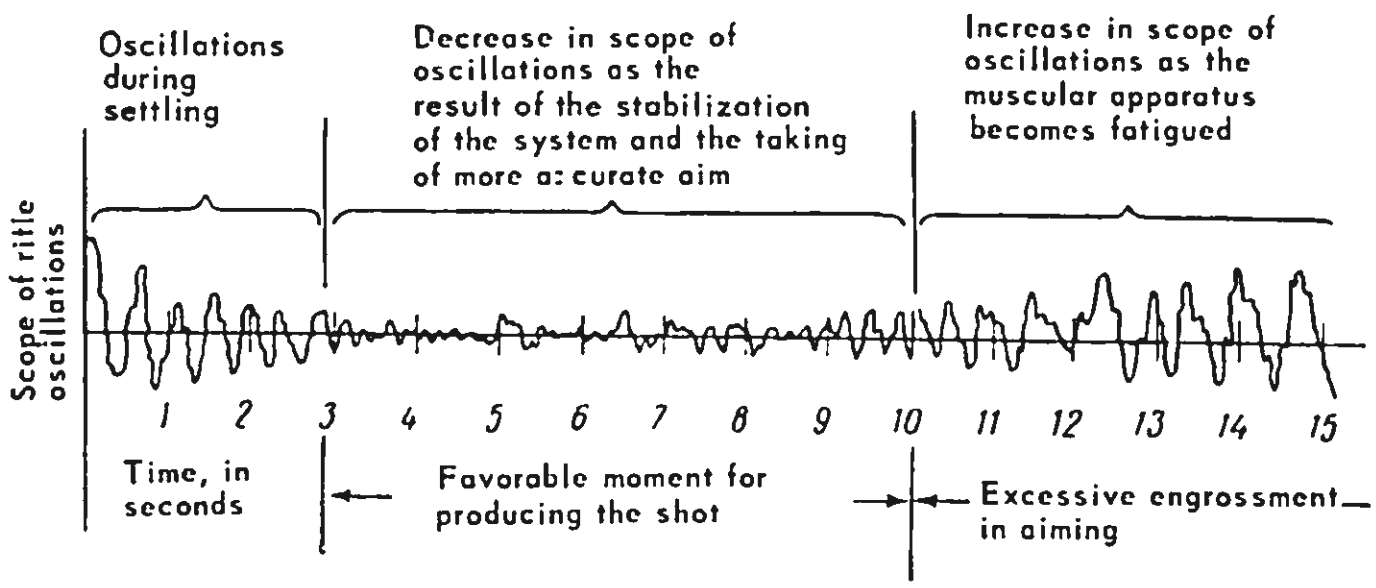


Figure 43. Basic Scheme of Minimum Arc of Movement.

It is obvious that under such circumstances the shooter must begin his smooth pressure on the trigger not devoting much attention to the arc of movement but continue to apply pressure on the trigger during that time when the arc of movement is at a minimum. That 5-7 second period is the most favorable time for producing an accurate shot.

C. APPLICATION OF POSITIVE TRIGGER PRESSURE.

1. Positive uninterrupted trigger pressure is primarily the act of committing the shooter to complete the firing of the shot once he has started the application of trigger pressure. He is committed to an unchanging rate of pressure, no speed up, no slowdown or stopping. The trigger pressure is of an uninterrupted nature because it is not applied initially unless conditions are settled and as near perfect as the shooter can set them up. If the perfect conditions should deteriorate, the shooter chooses not to fire then the weapon is benched. Relax, replan, and try again.

a. Trigger release without warning (surprise break of the shot).

In instances when the pistol is more stable and steady, the periods of smallest arc of movement are of longer duration, it is completely immaterial, from the point of view of quality of the shot, whether the release of the trigger is completed a second early or a second late. Anytime that the shot is fired with minimum arc of movement and the sights are in alignment, it will be a good shot. Therefore after settling, when the shooter has established stable minimum arc of movement and sight alignment, he must immediately begin to press positively on the trigger smoothly, constantly increasing and straight to the rear without stopping, until a shot is produced. This method of controlling the trigger action will give the shooter a surprise break of the shot and the shot will leave the pistol before any muscular reflex can disturb sight alignment.

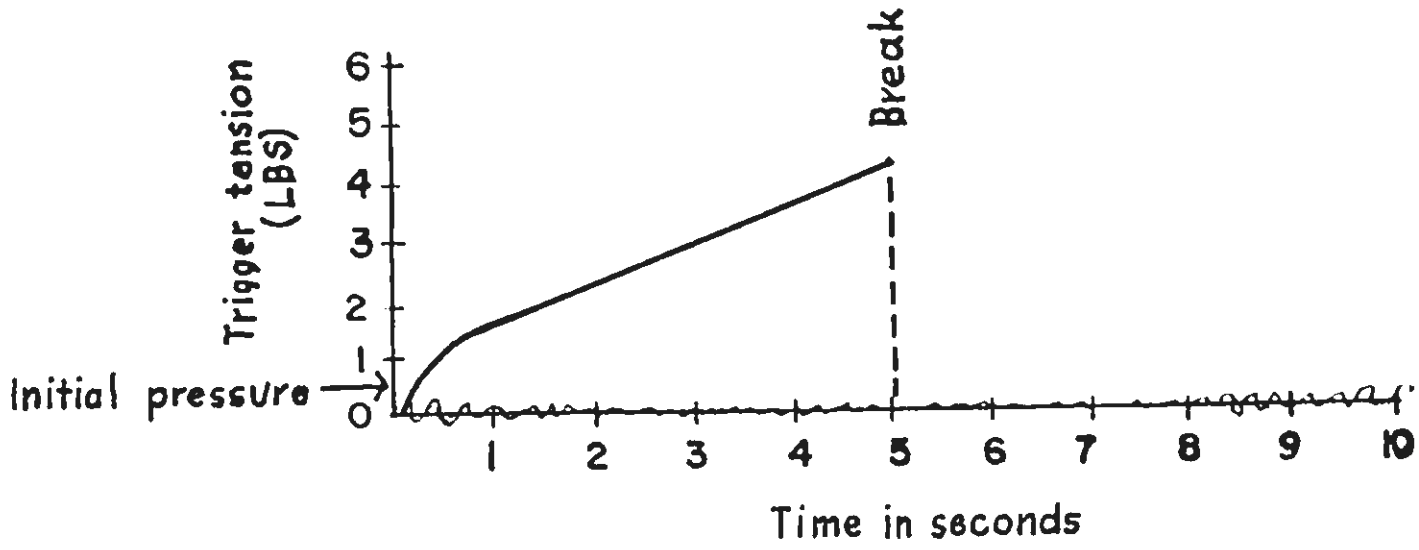


Figure 44. Basic Scheme of Controlling Trigger Release Without Warning .45 Caliber.
(Surprise shot with positive uninterrupted trigger pressure)
(Constantly increasing pressure)

2. Interrupted Application of Trigger Pressure.

There is a method of trigger control used by some shooters that causes a loss of control of the trigger action. It is the interruption of positive trigger pressure. Through years of training and experience some shooters will have developed a degree of trigger control and the ability to hold steadily and they think they can pick the trigger release time. The shooter will align the sights and exert initial pressure on the trigger. He then makes every effort to hold the weapon motionless. Experience and practice will enable the shooter to hold the weapon almost absolutely motionless momentarily. It is during these moments of apparent motionlessness that are of extremely short duration, while the sights are perfectly aligned, that pressure is applied directly to the rear on the trigger. If the sight alignment changes and is not perfect or arc of movement of the weapon increases, the increasing pressure on the trigger is halted and maintained and not further increased. When sight alignment is again perfect and movement diminishes, pressure on the trigger is continued until the shot breaks.

a. While applying positive trigger pressure straight to the rear so as not to disturb sight alignment, if any thought enters the shooter's mind to speed up or slow down this trigger pressure, it will result in the concentration on sight alignment being diluted or broken down completely. Trigger pressure should be applied involuntarily. If conditions for a controlled shot deteriorate, bench the weapon and start over.

b. The decision to increase the trigger pressure may result in a reflex action commonly known as anticipation and usually results in heeling the shot. (Strikes target at approximately one o'clock) The recoil becomes more imminent and the brain sends an uncontrollable signal for the arm and hand muscles to compensate for the coming jolt. This action invariably

takes place a split second before the shot is fired. The value of a surprise break of the shot that results from constantly increasing, uninterrupted positive trigger pressure is obvious.

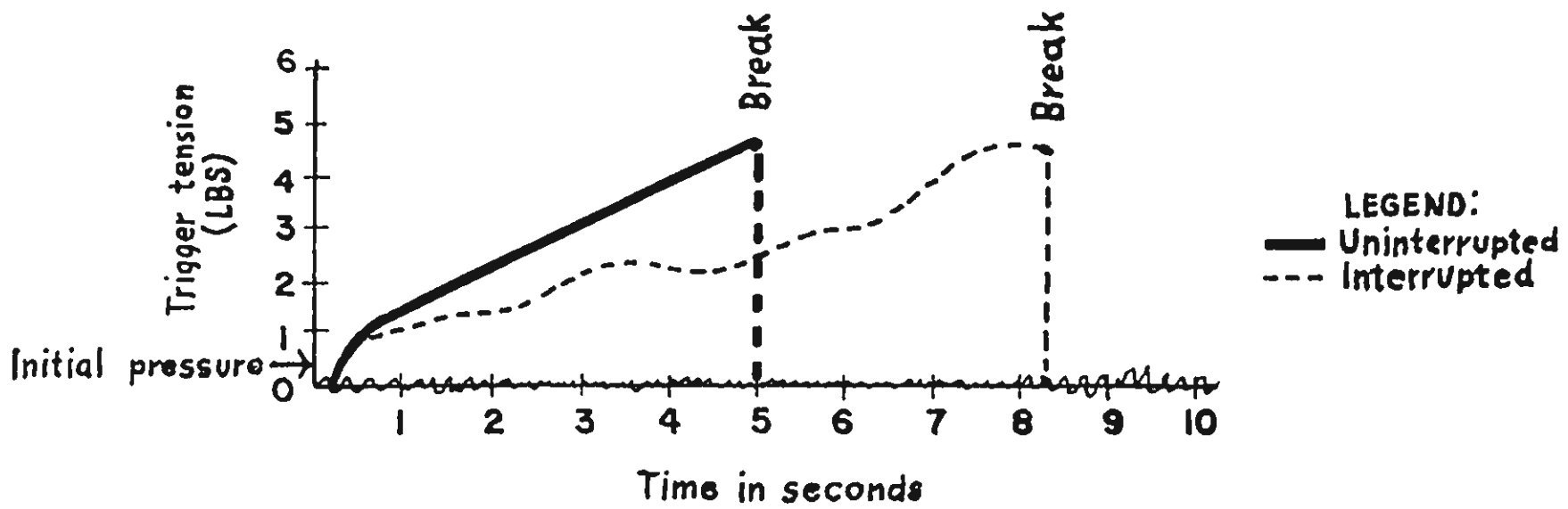


Figure 45. Basic Scheme of Controlling Trigger Release Without Warning .45 Cal. (Surprise shot with interrupted positive trigger pressure compared to uninterrupted positive trigger control) (Variable increase of trigger pressure)

c. The series of interruptions experienced during this type of control, contribute to overextending the optimum holding period, delivering the shot after the minimum arc of movement has begun to increase due to fatigue.

d. Competitive marksmanship is pointed ultimately toward making a shooter proficient under the conditions of combat. Defending his life with a trigger control that involves indecisive trigger pressure-let up and hold it- apply the pressure again-hold it up, ad infinitum, would not be an asset under combat conditions. Rather, align your sights, keep holding steady on the target and press positively on the trigger and the bullet is delivered immediately where it does the most good.

SECTION TWO

TECHNIQUES OF FIRE
(EMPLOYMENT OF THE FUNDAMENTALS)

CHAPTER IV

ESTABLISHING A SYSTEM

The general requirement that a minimum of 120 record shots be fired in one day of match shooting demands a great expenditure of physical and nervous energy on the part of the pistol shooter. For this reason he must think out his actions with special care in order to use his energy intelligently and conserve his physical and mental strength for the duration of shooting.

The most expeditious manner in which the shooter can impart every ounce of his shooting skill to his shooting is by careful organization of his approach to the problem of exerting maximum control. For this, a system is needed.

As an example, generally, most of the points lost in an aggregate score are slow fire points. It is therefore imperative that this stage of fire become the subject of painstaking, exact control. One shot in one minute gives the shooter sufficient time to organize the delivery of each shot. The successful delivery is assured when control of the following cycle of action and thought is uniformly established: Prepare, plan, relax, deliver, analyze and correct.

A. PREPARATION.

Complete preparation and prior planning is essential so that the firer is both mentally and physically ready. He cannot completely control his shooting unless he has physically checked range conditions, equipment, zero of weapons, range commands, ammunition, etc. This will free his mind so that he can concentrate on performance.

1. Zeroing.

As a competitive shooter you must know how to zero your weapon in order to place the strike of the bullet in the center of the target.

There is no excuse for losing points in competition due to an improperly zeroed pistol. This is a demonstration of lack of preparation generally attributed to a beginner. Hoping or expecting the weapon to be exactly zeroed, without having carefully checked it, is insanity when you are firing for championship honors.

a. There are two types of sights, fixed and adjustable.

(1) You may have at one time or another fired a pistol with fixed sights. It could be that you are using a pistol with fixed sights now. The fixed sights found on the .45 caliber service pistol are somewhat difficult to adjust and therefore not primarily used for competitive shooting. For elevation correction you must use the trial and error method with a file or, if a good armorer is available, he will be able to cut off the exact amount from the sights. Windage must be corrected by moving the rear sight with either a sight mover or a hammer and punch. You cannot have both a 25 yard and 50 yard zero in elevation with fixed sights. Your point of aim at 50 yards will be higher than 25 yards. An example would be to use a center hold at 50 yards and 6 o'clock at 25 yards. Correcting for windage with a fixed sight is very difficult due to constant change, and it is recommended that you move your sight (or zero) only prior to match shooting, except for general determination of normal zero for ideal conditions.

(2) Most pistols that are used in competition today are equipped with adjustable sights which are easily moved by a screw-driver or coin.

(a) There are many makes of adjustable sights available on the market today, namely, the Eliason, Colt, Micro, Smith and Wesson, Hi Standard and Giles, etc. Each one is

designed and made by a different manufacturer, therefore you will note the sight adjustment screws do not all move in the same direction for a given adjustment. Clockwise will move one sight to the right and another sight to the left. This applies also for the elevation adjustment. Another difference is that each sight does not move the strike of the bullet the same distance per click and the movement of some is more positive. Some of these sights are more durable than others, that is, the amount of use before a break down or the loss of accuracy in the uniform distance moved per click.

(b) Although many of these sights move different distances and in different directions, this is not the primary consideration when you are using adjustable sights; what is most important is that you know the capabilities of your sights.

b. Use the shot group method to properly and quickly zero your pistol.

(1) You have just received a new pistol and proudly take it out of the box. You wish to shoot in the match this weekend. Most likely the weapon has been test fired at the factory, but it is not zeroed for you. How do you go about zeroing this new weapon? Complying with the basic fundamentals of stance, position, grip, sight alignment and trigger control, we recommend that you start your zeroing at twenty-five (25) yards. The reason for this is that at this range you have a lesser degree of dispersion of probable shooting errors. Fire at least three rounds in a slow fire cadence before moving the sights. Check your group in relation to the center of the target and if necessary, make a bold sight change. Do not creep toward the target center one click at a time. Repeat the shot group method to establish a 50-yd zero. Don't try to zero by moving your sights after you have fired only one round. One round can easily be off center because of errors committed by the shooter and no sight change is warranted.

(2) DO NOT LOSE UNNECESSARY POINTS CREEPING TO CENTER OF TARGET.

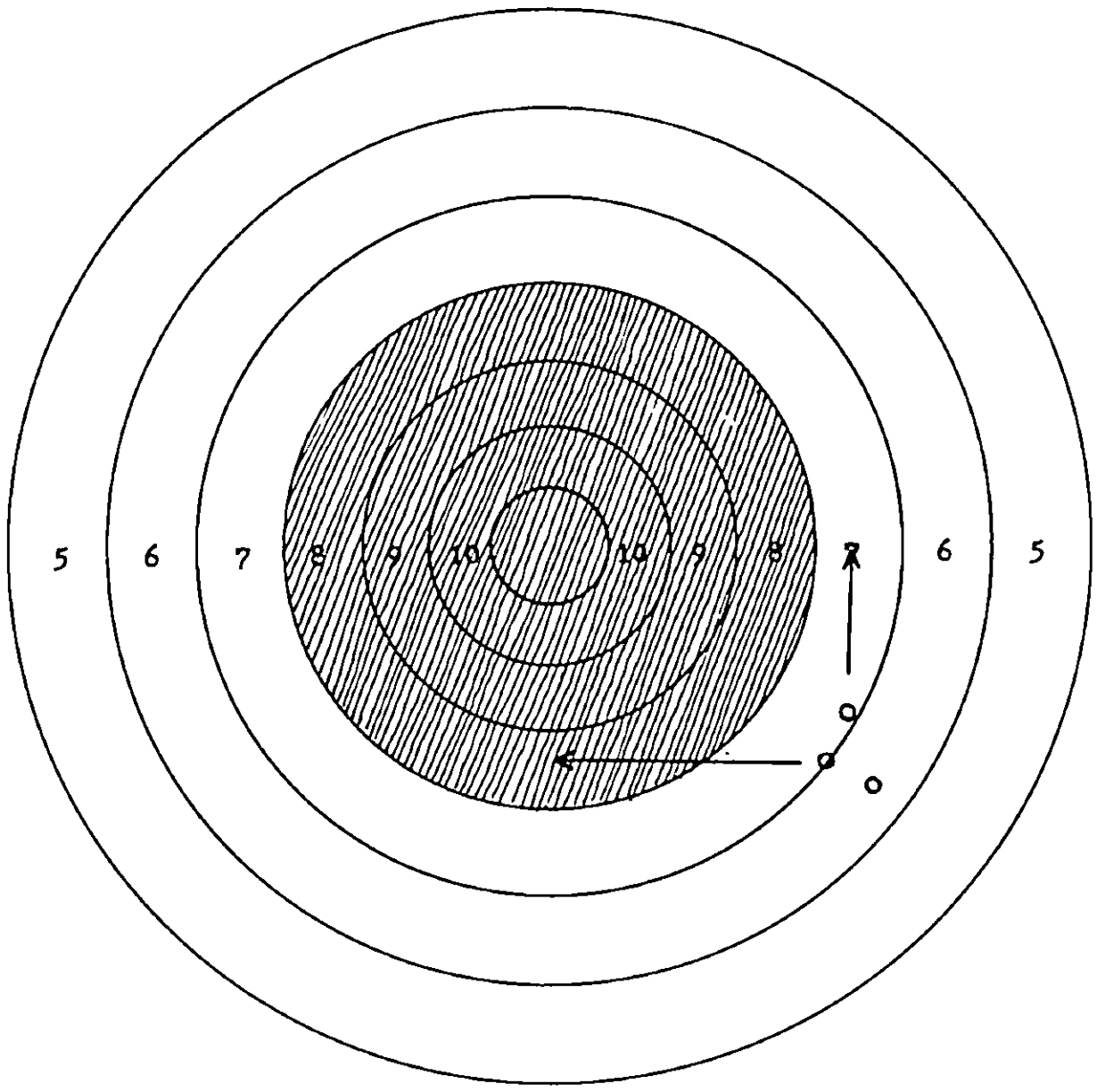
Exception to this rule may be made when with extensive experience, you are in a match and have called your first shot good, but the shot was not located on the target in relation to your call. Analyze your shooting performance first. You may determine that an immediate sight change is necessary. Don't be in too great a hurry to move your sights as the chance for error caused by faulty application of control technique is infinite.

(3) When the group is centered you may wish to fire a timed fire string to confirm the zero at 25 yards. There may be a sight change when shooting at an accelerated rate of fire.

(4) Never "Hold Off" or use "Kentucky Windage" with either fixed or adjustable sights. This is adding a factor that is not consistent with proper trigger control. The shooter forces the shot to break at a specific spot and time instead of allowing the normal arc of movement and waiting for the surprise break of the shot. Do not chase the zero around the target by holding off. If you are grouping away from the center of the target, adjust the sights to compensate for the error.

c. Mark Sights. We have zeroed the weapon, but how will we be sure that we have the same zero next time we shoot. Can we remember the zero of several weapons? Mark sights at the 25 yd setting after effecting the zero.

(1) It is a good idea to mark the sight adjustment screw with a small drop of nail polish or airplane dope to indicate the position of the 25 yd and 50 yd zero.



Shot group is equivalent to 8 ring or a four (4) inch error at 6 o'clock in elevation - Eliason sight moves strike one-half (1/2) inch at 50 yds - approximately eight (8) clicks of increase in elevation needed. Group is equivalent to 7 ring or five and one half (5 1/2) inch error in windage at 3 o'clock - Eliason sight moves strike one-half (1/2) inch at 50 yds - approximately eleven (11) clicks of left windage needed. (Refer to scoring ring dimensions in Sight Adjustment Card on page 75.)

Figure 1. Demonstration of A Bold Sight Change.

(2) You may also set the elevation screw down to its lowest point, counting the clicks as you do and record the number of clicks for both settings. This way you record the number of clicks from the base of the sight up to your 25 yard and 50 yard zero. (This method is used only for elevation.)

(3) You may also make a sight adjustment card, example below, showing the position of the windage and elevation screw for all weapons. At times of different ranges, and under various weather and light conditions, you may find your zero changes slightly.

(4) You have a scorebook which has provisions for you to write in your sight settings for specific ranges, light and weather conditions. Use this information. You will shoot on many ranges and under varying conditions and it is hard to remember the data about each range. (Example of scorebook page is found in Chapter XI "Evaluation", par c.)

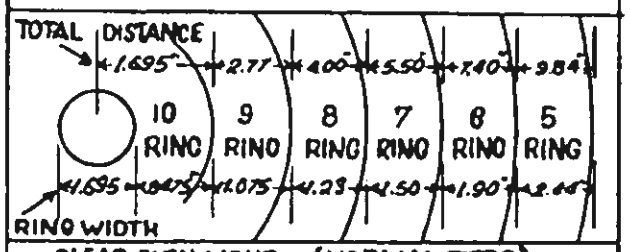
d. Unusual Zero Changes sometimes appear on the surface to be without rhyme or reason. A methodical approach toward checking out the trouble will, by process of elimination, reveal the cause.

(1) Check Scope: You may be scoping the adjacent target. Adjusting your zero to compensate for another shooter's grouping will crush even the stalwart.

(Example)

SIGHT ADJUSTMENT CARD

STANDARD AMERICAN TARGET



CLEAR EVEN LIGHT (NORMAL ZERO)

25 YARDS EL	25 YARDS WIND	50 YARDS EL	50 YARDS WIND
— ○	○	— ○	○
— ○	○	— ○	○
— ○	○	— ○	○
— ○	○	— ○	○

BRIGHT AND SUNNY

— ○	○	— ○	○
— ○	○	— ○	○

SIGHT CAPABILITIES

CLOCKWISE MOVES

S & W	R/D	Giles	L/D
Elliason	R/D	Micro	L/D
Hi Std New	R/D	Hi Std Old	L/U

CLOCKWISE MOVES	ONE CLICK AT 50 YDS MOVES	BASIC SETTING ELEVATION FR BASE	BASIC SETTING WIND FR RIGHT
_____	_____IN	_____CL	_____CL
_____	_____IN	_____CL	_____CL
_____	_____IN	_____CL	_____CL
_____	_____IN	_____CL	_____CL

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(2) Check the external parts of your front and rear sight assemblies. The sights may have become loosened from the recoil or bent or blunted from contact with other weapons, or the weapon itself may have been dropped. The rear sight may have worn notches in the adjustment graduations. This would allow recoil to move the sight, and when an adjustment is attempted, the sight would not move in the desired direction.

(3) Errors in position and grip cause the hold and sight alignment, respectively, to drift toward an error, even though the shooter may have made an artificial correction. Artificial corrections are those made to compensate for errors by independent movement of the arm - at the shoulder to affect the hold; at the wrist to affect the grip. Instead, an integral shift in body position should be made by moving the rear foot in the direction of the error in the hold. The grip should be shifted by sliding the grasp of the hand on the stock of the weapon toward the error. If a natural position and grip are attained, the result will move the tendency to point at other than the center of the target. Moreover, the shooter will achieve a sight alignment that tends not to block out to the right or left.

(4) Positive action is urgently needed when any of the forementioned situations are present. Make a quick check of the scope, position, and the grip, and keep firing until it is apparent that the difficulty was not remedied. A radical change in sight setting is now warranted. A low six is just as bad as a high six.

In the case of a damaged sight, ask the range officer to permit you to declare the weapon disabled.

(5) By checking the scorebook, there may be a record of a large change in sight adjustment for the pistol range on which you are now firing. Large changes in light angle or light intensity may affect the normal setting that you use on the home range.

(6) After completing firing, a consultation with your armorer or gunsmigh might uncover certain changes in the fitting of components, wear, burrs, foreign matter that can alter the mating of finely fitted parts. This so-called "settling" of the gun may cause a change in zero.

AN OUTLINE SUMMARY OF THE COMPLETE SEQUENCE OF FIRING ONE ACCURATE SHOT

1. Preparation: In assembly area and on firing line
   a. Physical
      (1) Personal preparation.
      (2) Limbering up. Arrive early.
      (3) Check out firing line.
         (a) Protection from wind and bright or changing sunlight.
         (b) Smooth and even horizontal surface.
      (4) Fit of clothing and shoes (boots)
      (5) Make final check in assembly area of all necessary equipment and become aware of firing conditions both weatherwise and in range operation.
      (6) Move to firing line and place equipment on your firing point.
      (7) Set telescope up on your target.
      (8) Make final check of weapon. Check sight black. Should be Zeroed.
      (9) Check for proper caliber and amount of ammunition and load magazines.
      (10) Check out stance and position for natural pointing at target center.
      (11) Check out grip for natural alignment of sight when incorporating all requirements of a good grip.
      (12) Breathe Deeply for increased oxygen retention.
   b. Mental
      (1) Stimulate confidence.
      (2) Think only of shooting and expel all stray thoughts.
      (3) Let the coach worry about any distractions or interruptions on the firing line.
      (4) Mentally review shot sequence:
         (a) Think of the act of extending arm and breathing deeply.
         (b) Think of how your minimum arc of movement looks and feels.
         (c) Picture properly aligned sights with point focus on front sight.
         (d) Decide at what point in sequence you are going to take up slack in trigger and apply initial pressure.
         (e) Here you take final deep breath, exhale and hold only part of it.
         (f) Remind yourself to maintain sight alignment and a minimum arc of movement while;
         (g) Positive, uninterrupted trigger pressure is being applied.
         (h) Concentration must shift to and remain unbroken on sight alignment while positive trigger pressure is being applied.
         (i) The pistol will seem to almost fire itself because positive trigger pressure is almost involuntary.
         (j) The surprise shot is now a possibility because with the employment of positive trigger pressure, the normal reaction time suffices to delay anticipatory reflexes that could disturb sight alignment, until all the continuously applied control factors can bring about the delivery of the shot on the target. This is, in effect, follow through.

2. Plan the Shot
   a. Stance
      (1) Stable balance.
      (2) Immobility.
      (3) Head position.
      (4) Uniformity.
      (5) Position of feet.
      (6) Body erect.
      (7) Shoulders level.
      (8) Legs firmly straight.
      (9) Hips level.
      (10) Head level.
      (11) Rest not-shooting arm and hand.
      (12) Solid firm shooting arm and hand.
      (13) Center of gravity slightly forward.
   b. Natural Position Orientation.
      (1) Start at 45 degree angle.
      (2) Turn only head to target.
      (3) Extend arm.
      (4) Close eyes.
      (5) Raise arm and settle.
      (6) Open eyes.
      (7) Shift trail foot in direction of error if necessary.
      (8) Recheck.
   c. Grip.
      (1) Natural sight alignment.
      (2) Firm to prevent shift.
      (3) Unchanging tightness.
      (4) Independent trigger finger.
      (5) Uniformity.
      (6) Comfortable.
      (7) Recoil straight to rear.
      (8) Avoid fatigue of hand.
   d. Breath Control.
      (1) Systematic.
      (2) Oxygen retention.
      (3) Minimize movement.
      (4) Respiratory pause.
      (5) Comfortable.
      (6) Concentration aided.
      (7) Prior to and during fire commands.
   e. Sight Alignment (Relationship of Front and Rear Sights not Sights to Target).
      (1) Front sight point focus.
      (2) Rear sight awareness.
      (3) Exclusive concentration.
      (4) 6 to 8 Seconds Duration.
      (5) Coordination with other control factors.
   f. Trigger Control.
      (1) Positive uninterrupted trigger pressure.
      (2) 2 to 5 second duration.
      (3) Based on perfect sight alignment.
      (4) Undisturbed sight alignment.
      (5) Coordinate with optimum perception and minimum arc of movement.
   g. Shot Sequence.
      (1) Extend arm and breathe.
      (2) Settle into minimum arc of movement.
      (3) Pick up sight alignment in the aiming area.
      (4) Take up trigger slack and apply initial pressure.
      (5) Take final breath and hold part of it.
      (6) Maintain sight alignment and minimum arc of movement.
      (7) Start positive uninterrupted trigger pressure.
      (8) Concentrate point of focus on front sight.

3. Relaxation
   a. No unnecessary muscular tension.
   b. Relax each major portion of body:
      (1) Neck
      (2) Shoulders
      (3) Non-shooting arm
      (4) Abdomen
      (5) Back
      (6) Buttocks
      (7) Upper legs.

4. Deliver Shot
   a. As planned - Do not compromise. Apply all control factors.
   b. Follow through - continue to apply all control factors.
   c. Shot will fire as a surprise - no reflex action.

5. Shot Analysis
   (Use a target center to plot shot calls)
   a. Follow through check.
   b. Call shot - Describe sight alignment.
   c. Compare hit location with call.
   d. If shot or call is bad, determine cause.
   e. Watch for error pattern to form.
   f. If analysis is vague or unsure, ask yourself some or all of the following questions:
      (1) Did shot break in minimum arc of movement?
      (2) Hold too long?
      (3) Positive trigger pressure?
      (4) If shot could not be fired & shooter benched weapon, what was wrong?
      (5) Lost concentration?
      (6) Surprise shot break?
      (7) Worried about results?

6. Positive Correction, (If Necessary)
   a. Promptly applied.
   b. Agreement between coach and shooter.
   c. Incorporate into plan for next shot.

2. Preparation in the Assembly Area: You have zeroed that new gun. Today is the day of the match. You are firing the National Match Course and have a good score at the completion of the slow fire stage. Now you are on the line for time fire....."Ready on the right"..... "Ready on the left"....."Ready on the firing line".... Now you have approximately three seconds to get your sight aligned, take up the slack, and break the first shot as the target appears. But no!!! Wheels start clicking in your head and you begin to wonder "Have I got my 25 yard setting on my sight?"

For want of a nail the shoe was lost, for want of a shoe the horse was lost, etc. It can be said that this will hold true for the shooter who comes to the line in a lax, head-in-the-clouds attitude. Try to fire a rapid fire match without a magazine; or better still, with caliber .38 ammunition in a .45 match. Then there is the shooter who just forgot his ammunition completely. You have heard and seen him running around the range area looking for something to shoot with. Can you afford to forfeit 50 points? Will you have all of the necessary equipment in your gun box?

Before you can employ a systematic technique of shooting, a preparation phase must be established. Actually the shooter's over-all preparation starts the first time he attempts to improve his shooting ability. However, important steps can be taken during the period immediately before shooting that will favorably affect control and coordination.

a. Physical: The shooter must first complete his physical preparation in order to free his mind to concentrate on the shot delivery technique.

The important thing is to remember to perform all these operations and checks before the record firing, otherwise the shooting will be handicapped, since the shooter will have to alter his system of control to compensate for the time lost in searching for an emergency solution.

(1) Before planning a definite system for shooting, a shooter must have given prior attention to preparing himself for shooting. One should eat light but nourishing food so that there will be no feeling of hunger before shooting nor a sensation of being stuffed. One should avoid drinking a lot of water before and especially while shooting. Heavy food and too great a consumption of liquid raises the pulse beat and induces excessive perspiration thus weakening the body during shooting.

(2) Before shooting the shooter should do mild limbering up exercises: a definite set of static tension exercises, walking, aiming dry, etc., in order to revive blood circulation after sleep and establish a proper balance in the stimulating and inhibiting processes of the nervous system. If a shooter decides to start shooting shortly after awakening without limbering up, he will not be steady enough; his reactions are too slow, and his movements will lack coordination.

(3) Arrive early: The shooter should report to the range at least 15-30 minutes prior to firing time. This is necessary if the Team Captain wishes to have a meeting, and the shooter also has a chance to relax and become settled during this period. Carrying a heavy gun box puts a strain on the heart and muscles of the shooter and no effort should be made to shoot for a suitable period after an exertion.

(4) The checking out of the firing line point from which a shooter will shoot must be given due attention.

(a) In spite of the fact that the firing line may have been constructed to prevent sunlight and wind from adversely affecting shooting accuracy, it does not keep out wind coming from some angles and from head on, nor does it keep the sun's rays from glaring at the

end of the barrel or the front sight, nor, which is still worse, does it keep out light shining directly into the eyes. Therefore, at certain times during the day, when the direction of the sun's rays changes and creates unfavorable conditions for aiming, the shooter must choose, having anticipated all this earlier, a place to shoot from. It should be slightly back, to allow shooting from shadow, or he must place himself in the rear of his gun kit so as to be in it's shadow in such a way that it will not be necessary to change his location and disturb his ready position once the shooting begins. The proper shooting glasses to prevent the direct rays of the sun from shining into the eyes should be considered.

(b) The rules of competition do not require that the surface of the firing line be horizontal and smooth. In practice it often happens that there are bumps and cavities in it, and sometimes it even slopes. In order that there be no uneveness on the firing line to interfere with a proper ready position, a shooter should level his area, scraping smooth the bumps or filling with loose dirt or gravel before shooting starts.

(5) Making Clothing and Shoes Fit Comfortably Before Starting to Shoot. Before arriving at the firing line a shooter must have previously inspected his clothing and shoes carefully for comfortable fit. In doing this, he should see to it that his clothing does not give him a feeling of discomfort, that it does not bind, and also that it does not restrict the circulation of blood. Before starting to shoot he should not forget to unbutton his collar, loosen his belt and so forth.

(6) Before your relay is called you should move your equipment to a location directly behind your firing point. Make a final check to be sure you have the proper weapon, magazines and ammunition. Black your sights with the carbide lamp and make sure the sight setting is correct. Clean your shooting glasses, check for a pencil, screw driver, ear plugs and stop watch. Listen to the range commands and observe the range operation. Be keenly aware of conditions and adapt your performance to take advantage of knowing beforehand the conditions under which you will have to fire. For example: rapidly spoken fire commands, evaluation of wind and light by observing the effect on previous relays, etc. As soon as you are satisfied that you understand the rhythm of range operation, you should mentally review each step you must go through in delivering a good shot.

b. Mental:

At the beginning of a shooting day, when a shooter's energies are fresh, it is a good idea to concentrate intently on planning each shot as a prelude to actual firing. This will generate a mental course that will gain momentum and aid control, because full mental stimulation comes slowly. Experienced shooters as a rule, take into account their feelings, energy and fitness and plan a definite method for themselves before performing each subsequent shot. Uniform planning helps to avoid the frequency of emotional upheaval that results from a bad shot. This permits them to use up their energies evenly throughout the whole course of fire for the day.

(1) Stimulate your confidence by developing a conviction that a controlled, uniform and exacting performance will produce good scores. Accept shot values that are within your ability to hold. Confidence is the deciding factor. You will achieve a flawless performance if you are convinced you are capable of winning the match. Understand that you are the determining factor in your performance. Luck is too undependable. Good shooters are not lucky, they obtain good results by making themselves apply the fundamentals on each shot fired. Attempt not only to win each match but to set a new record by controlling each shot.

(2) Expect to work hard and Think! Think! Think!

(3) Prior planning, in careful detail, of your actions in the delivery of each shot will minimize the destructive effect of tension and pressure.

(4) Delays and irregularities in range operation upset some shooters. Use this factor to your advantage by remaining relaxed and exercising patience. If the shooter resolves in advance that everytime he sees exact sight alignment within his aiming area he will apply positive trigger pressure straight to the rear until the weapon fires, he can concentrate exclusively on sight alignment. Sufficient trigger pressure to fire the shot will be applied involuntarily.

(5) When you are shooting, you must think shooting, and only shooting, if you expect to excel in this keen, competitive game. Therefore, be mentally alert and expell all stray thoughts from your mind. Condition your mind to shoot this match.

(6) Mentally review the entire shot sequence, with emphasis on how you are going to perform each act.

(a) Picture the muscle action necessary to extend the arm.

(b) Decide how much breath you intend to hold comfortably in your lungs. Remember, you must make a determined effort to establish a minimum arc of movement.

(c) Visualize how properly aligned sights look when you achieve a point of focus on the front sight. Plan how you are going to control your eyes to insure an unwavering, sharp focus on the front sight only.

(d) Make a firm decision as to when you are going to take up trigger slack and apply initial pressure.

(e) Take a final breath and hold only part of it.

(f) Remind yourself that you must maintain sight alignment and minimum arc of movement while starting the positive, steadily increasing trigger pressure. This pressure must discharge the weapon in a surprise shot without disturbing the alignment of the sights.

(g) Determine that the time when the other control factors are optimum is the time for the positive trigger pressure to be applied. Encourage an aggressive attitude that will brook no vacillation in continuing the steady, constant increase of trigger pressure.

(h) Make up your mind to accept the fact that once positive trigger pressure has started, all your mental concentration must be directed toward controlling and perfecting sight alignment.

(i) You must be absolutely sure that the weapon will fire almost by itself once positive trigger pressure is started. This will free your mind to concentrate on the relationship of the front and rear sights until after the shot is fired.

(j) Uninterrupted positive pressure, constantly increasing against the trigger until the hammer falls, will give you a surprise shot. The normal delay in reaction time will be sufficient to prevent anticipatory muscle reactions from disturbing sight alignment prior to the discharge of the weapon.

3. Preparation on the firing line: Having made sure that we have fully prepared to shoot the forthcoming match, we are confident when called to the firing line. After being called

to the firing line, the shooter finds his firing point, sets up his gun box and scope and makes a final check of his weapon, equipment, and of himself. (Refer to "Three Minute Preparation on the Firing Line Checklist" - in this chapter.)

a. Place your shooting box on the correct firing point and check squadding ticket to insure correct target number. This eliminates the unnecessary shuffle when another competitor informs you that you are on his firing point. Make sure you are correct and let him do the walking.

b. Set your scope on your target. Why scope the catastrophe of the shooter next to you? How can you change the location of a group when you are not shooting it?

c. Scope your target and inspect for holes. Should there be any doubt of whether the target is clean, then move to the target line for a closer inspection.

d. Adjust ear protectors for maximum sound dampening effect.

e. Load magazines with proper caliber ammunition.

f. Make a final check of your weapon to see that the sights are still blackened. If the blacking has been rubbed off, then reblacken at this time.

g. Locate all of your accessory shooting equipment in box and on bench for immediate use.

h. Take a few deep breaths to sustain the oxygen level in the bloodstream.

i. Assume a stance that gives you a balance with sufficient stability to overcome the dislocating effects of recoil, with a minimum disturbance of the basic stance. We believe that all shooters should start with their feet approximately shoulder-width apart and with the center of balance between the forward half of the feet. This means leaning slightly toward the target. Through experimentation and adjustment the shooter will settle into the stance most effective for himself. We must caution however against some of unorthodox and strained stances and positions sometimes observed on the firing lines at pistol matches around the nation.

j. Next, the shooter should position himself so as to be able to hold the weapon in a minimum arc of movement in the center of his aiming area. We do this by extending our shooting arm and locating that position that causes the least muscle strain across the chest and back. Then we shift our rear foot in the direction of error until the extending arm points naturally at the aiming area. Close the eyes for a few seconds, then open them and see if the shooting arm remains pointed naturally at the center of the aiming area.

k. At this point we must consider our grip on the weapon. Remember exactly what this grip is required to do. The weapon must become an extension of the massive bone structure of the shooting arm, with the sights naturally in proper alignment. To have this alignment occur naturally, both the grip and head position must be uniform from shot to shot and string to string. Any change in head position will require a corresponding change in grip in order to have the sights in natural alignment. Artificial correction by bending the wrist is only a temporary expedient, because after settling back to normal hold after the next shot, the original error will reappear, needing correction again before another shot is fired.

WARNING: Do not attempt to gain your grip with the shooting hand alone. Place the weapon between the extended thumb and index finger of the shooting hand with your nonshooting hand. Wrap the gripping fingers firmly around the front of the grip, pressing the

safety hard against the web between the base of the thumb and the forefinger. At the same time the main spring housing at the lower rear should be pressed hard against the heel of the hand.

l. To prevent misalignment of the sights, from the pressure being applied to the trigger, pressure must be straight to the rear and the trigger finger must operate independently of the gripping tensions being applied by the lower three fingers and the fatty part of the heel of the hand at the base of thumb.

m. Most top shooters use approximately three minutes to carefully check out stance, position, and grip. Simultaneously, with this checking process, the shooter should be very careful not to shorten the depth of his breathing and at the end of the preparation sequence, should breathe deeply two or three times.

4. Physical preparations completed after the command "Load" has been given.

a. Upon the command to "Load", assume the stance position and grip that you previously checked to be correct. Verify this by extending the arm to check for a natural center hold and sight alignment with the target.

b. Load your weapon: Pay particular attention to see that the magazine catch has engaged the magazine. Failure of the weapon to load, caused by the magazine partially placed in the weapon is not a valid reson for alibi.

c. Do not place the safety in the "on" position. You have reached the stage where you are proficient with this weapon. Keep the weapon pointed downrange and with reasonable care it is as safe as with the safety on.

d. Grasp the weapon by the barrel or slide with the non-shooting hand. Recheck for a good comfortable grip on the weapon. Check the position of your trigger finger. Extend the shooting arm briefly again to check if the center hold and sight alignment is naturally obtained without an arm, wrist or head movement.

e. Check again that you are lined up on proper target.

f. Relax with pistol at bench rest.

g. Continue the mental process to condition your mind to shoot this match. Confidence comes from knowing that you are able to do all phases of a job well. A good way to retain this confidence is to again mentally review the sequence of events necessary to deliver a correct shot or string. Concentrate on shot sequence. Visualize perfect sight alignment.

You now will be able to concentrate on shooting with the best degree of control of which you are capable. Careful preliminary preparation will in time become routine and will eliminate the dilemma of the thoughtless shooter.

An example follows of a checklist that can be stapled in the lid of your gun box.

PRELIMINARY PREPARATION CHECK SHEET

ASSEMBLY AREA PREPARATION	FIRING LINE 3 MINUTE PREPARATION
(a) Check Squadding for Relay and Target. (b) Have the Proper Gun & Ammunition. (c) Check the Sight Settings. (d) Carbide Light WITH CARBIDE. (e) Blacken the Sights. (f) Position Ear Plugs or Protectors. (g) Oil Can - check Lubrication. (h) Screw Driver for Sight Change. (i) Stop Watch for Timing. (j) Scorebook. BE READY For Relay to be Called. Look to the Weather. Time Range Commands. Concentrate on Fundamentals. Rehearse Mentally.	DO NOT HANDLE Weapons Until the Range Officer Gives Clearance to do so. (a) Set Up Scope ON TARGET. (b) Check Target For Holes. (c) Adjust Ear Plugs. (d) Load Magazines. (e) Recheck Sight Blackening. (f) Check Grip & Position. (g) Locate all Shooting Equipment. (h) Breath Control. RELAX PHYSICALLY Continue Mental Processing THINK POSITIVELY Act Aggresively YOU - ARE - READY!!!

5. The following is an explanation of the items that are important aids to the shooter and should be present and operative prior to shooting.

a. Carbide Lamp with Carbide: Needless to say, this small, inexpensive item may be termed one of the most important accessories in the shooter's kit. Its use is terminated without the all-important carbide. So open the top of the lamp and see how much carbide is in it. Is the carbide fresh and active?

b. Spare Parts: In the previous instruction you were told that no first person repairs would be made on team-issued weapons. This statement still holds true. An extra magazine and extractor will be the only spare parts necessary in this unit. On other teams, be governed by the support given to you and guide you as to the spare parts necessary.

c. Ammunition: Have the correct amount of ammunition for the match being fired, for the proper weapon. Do not forget the correct amount includes the possibility of refire due to malfunctions, range alibies, etc.

d. Pencil and Score Book: All should have pencil or pen. In a match you will most likely be called upon to score. Your score book should be kept up-to-date whether in practice or in a match.

e. Ear Plugs: The ear-shattering blast that drums through your head during the string of caliber .45 ball timed fire match makes you open your eyes to the fact that ear plugs do help deaden the noise. Well--maybe you did close your eyes a little because there is either a fly or a big, fat seven on your target. Most likely your thoughts were of whether you would come out of this string with your eardrums intact. Were you able to concentrate on how to shoot? Protect your ears at all times.

f. Glasses with Cleaning Tissue: A shooter with 20/40 vision is somewhat at a disadvantage when he finds he has left his glasses in the glove compartment of his car. Another aspect of using glasses is that they shield the eye from ejected shells, unburnt powder, or that old six-shooter next to you that shaves lead in all directions. Colored lenses afford glare protection and are designed to let in the maximum amount of glare free light. Use them to best advantage by keeping them clean. Have lens tissues in your kit.

g. Screwdriver and Tools: Sights were made to be moved. It is a moment of disaster and comedy to watch when the shooter roots through his gun box in search of a screwdriver to change sights in between rapid fire strings. Will you have one in your gun kit and will you be able to find it? Other tools that will prove useful are cleaning rods, barrel bushing wrench and an allen wrench set.

h. Weapons and Magazines: The right weapon for the right match. This will eliminate much heart palpitation as for example you find out that today they are shooting the caliber .45 match and all you have in your caliber .22. A properly cleaned and lubricated weapon will have a much less chance of producing a malfunction. Look and see if you have the proper (and clean) magazine for the proper weapon.

i. Squadding Tickets: "Match 14, Relay 2, to the firing." Unless you have a photographic memory, it is better to rely on your squadding ticket to inform you of your firing point and correct relay. Also, in some matches, the squadding ticket is also the score card. Keep them on your person or in your gun box at all times. Take your equipment to the vicinity of the firing point before your relay is called. Eliminate the heavy laden 100 yard dash to the firing line.

j. Stop Watch: Time is a unit that once passed by cannot be brought back. A stop watch is an efficient means to pace your shooting during slow fire.

k. Sight Setting: Check to see if you have the sights set for the range at which this match will be fired. Yesterday your last firing may have been the rapid fire stage. What is the first match you will fire today?

l. Lubrication: Have a can of light grade machine oil available.

As a competent, skilled craftsman of the complex art of Advanced Pistol Marksmanship, there should never arise any circumstances under which the results of your efforts are jeopardized by your failure to make a complete, painstaking preparation.

B. PLAN SHOT SEQUENCE.

There must be a systematic approach to obtaining shooting control. Unfortunately, mere knowledge of the fundamentals and being physically ready will not give the shooter the ability to deliver a flawless performance on the firing line. To successfully employ the fundamentals under pressure the shooter must develop a plan of action and fix it so firmly in the mind that external distractions do not interfere with his ability to follow the planned sequence. Simply giving oneself the order to watch the sights, hold, and squeeze is not sufficient.

A shooter with a tremendous amount of natural talent may find it possible to occasionally fire good strings without having a firm plan of action. But regardless of his talent and until he has started using a comprehensive plan, his performance is going to be erratic.

The shooter must realize that his ability to consistently perform well under pressure is directly related to the uniformity of this stage of his preparation. A planned sequence of

thinking that will guide his physical actions through the complete string of fire is absolutely necessary. The exact system you use can be developed by you.

You must gain control of your mind and stop the disconcerting thoughts of the possibility of failure. Review in your mind the many successful strings you have fired - not from the standpoint of score, alone, but also from the marked degree of control you exhibited during the strings. Picture yourself as you felt and thought while firing the good strings and then ask yourself what technique you were using that enabled you to employ the fundamentals so successfully. The difference between champions and also-rans lies in the shooter's ability to control his thinking and plan his actions from this point on. Prior planning of the delivery of the shot is the shooter's only insurance that the delivery will be consistently controlled. Knowledge of a successful shot sequence is the basis of the plan. The best assurance that a good performance can be duplicated is that the action follow a uniform, unchanging sequence. An occasional good shot that cannot be repeated consecutively, should indicate to the shooter that he does not know how the good performance came about.

1. Remind yourself that when you consistently controlled your shooting in the past you were using a shot sequence. You thereby proved conclusively that it will work successfully for you. You must recreate precisely those same conditions if you expect to get the same results.

The course of fire may have a successful conclusion only if the shooter, in setting-up each shot, goes through all the stages - getting completely ready, planning, relaxing, and delivering the shot, analyzing and correcting in the same manner each time. The shot sequence for slow fire should also be followed identically each time for uniform performance.

2. The shooter-instructors presently assigned to the U.S. Army Marksmanship Training Unit use the following shot sequence for slow fire with only minor modifications:

a. Extend arm and breathe.

b. Settle into a minimum arc of movement.

c. Pick up sight alignment in the aiming area.

d. Take up trigger slack - apply initial pressure.

e. Hold breath.

f. Maintain sight alignment and minimum arc of movement.

g. Start positive trigger pressure.

h. Concentrate point focus on front sight.

i. Follow through. (Occurs with surprise shot only) (No reflex action)

3. The shooter-instructors presently assigned to the U.S. Army Marksmanship Training Unit use the following sequence for sustained firing stages with only minor modifications:

a. Extend shooting arm and breathe.

b. Find sight alignment.

c. Find aiming area on edge of target frame (final deep breath).

d. Settle into minimum arc of movement.

e. Point focus on front sight (partly release breath).

f. Take up slack - apply initial trigger pressure.

g. Maintain sight alignment (target faces).

h. Start positive trigger pressure.

i. Concentrate on sight alignment (first shot is fired).

4. When a shooter has a system to follow it relieves his mind so that he can concentrate on performance and not be worried about results. Care should be taken during early stages of instructional practice to comply with each of the items on the shooter's worksheet. As the shooter becomes more capable, the key items of shot sequence, shot analysis and positive correction become highly important. Methodical repetition of these essential steps will instill in the shooter good shooting habits that will enable him to repeat consecutively a good shooting performance. Further, the worksheet will help the shooter form the habit of not overlooking any factor that will help his shooting. Winning scores are produced by being ready, confident, performing uniformly and being in complete control of your shooting.

C. RELAXATION.

1. Relaxation is best achieved by methodically bringing about a loosening of the muscular masses of the body. Think of the neck muscles, the shoulders, back, abdomen, buttocks and upper legs. Systematically reduce the tension of these members to one of support of an upright stance only, before each shot or string.

2. A relaxed muscle does not become tired as quickly as the tense one. It is important also to rest and relax after two or three shots have been fired.

3. Remember that in slow fire you do not have to shoot before bringing your gun down to rest. When you fatigue, run short of breath, experience difficulty in maintaining concentration on sight alignment or cannot maintain a suitable arc of movement, by all means lower the arm and weapon to the bench and relax. Replan the delivery of the shot, breathe deeply and try again. Some excellent slow fire shooters try two or three times before being able to deliver a controlled shot. Full control of the application of the fundamentals insures the control of a shot.

D. DELIVER SHOT OR STRING OF SHOTS ON TARGET.

The successful delivery of an accurate shot on the target, within the shooter's ability to hold embraces the proper employment of all the fundamentals as planned. Do not compromise. Follow through and continue to apply all control factors. If the shot is fired as a surprise, there will be no reflex action. When you are absolutely sure you have set up conditions for a controlled shot, put your plan into action. Confidently and aggressively follow each mental step with physical action until the sequence is complete and the shot is delivered under control on the target.

1. Example of a system delivering rapid fire strings with fire commands: As the range officer starts his commands, he will announce:

a. "ON THE FIRING LINE FOR YOUR FIRST STRING OF RAPID FIRE. WITH FIVE ROUNDS LOAD."

(1) You should load at this time and assume your grip as planned.

b. "IS THE LINE READY?"

(1) Eliminate all thoughts of stance, position and grip. They should be as perfect as you can make them at this period.

c. "THE LINE IS READY."

(1) Continue your rhythmic breathing and extend your shooting arm.

d. "READY ON THE RIGHT."

(1) Extend arm, stiff wrist and locked elbow.

(2) Find sight alignment.

(3) Breathe deeply.

e. "READY ON THE LEFT."

(1) Find aiming area on edge of target frame.

(2) Final deep breath.

(3) Settle into minimum arc of movement.

f. "READY ON THE FIRING LINE."

(1) Partly release breath and hold remainder.

(2) Point focus on front sight.

(3) Take up slack - apply initial trigger pressure.

(4) Maintain sight alignment - all conditions right.

g. Target faces toward shooter - commence firing.

(1) Start positive trigger pressure.

(2) Shift concentration to perfecting sight alignment.

h. First shot is fired (Surprise Shot).

(1) Maintain eye focus (Follow Thru).

(2) Quick recovery with sights approximately in alignment, and hold approximately in center of aiming area.

(3) Renew positive trigger pressure.

(4) Strive to correct errors in sight alignment, but do not delay positive trigger pressure.

i. Follow through with four more surprise shots.

(1) Good rhythm indicates a coordinated control of the application of the fundamentals.

E. MAKE AN ANALYSIS.

Complete and instantaneous shot analysis is a mandatory prerequisite for any improvement in your performance or scores. It is a complete waste of time and ammunition to stand on the line and fire haphazardly without any comprehensive attempt to improve. A mental impression of where each shot went and why, should come at the instant the shot breaks. Much has been written about why we shoot poorly; however, be reminded that it is just as advantageous to analyze why you are shooting well on a particular day. Some shooters have a tendency to ignore their good scores when very little went wrong. It is equally important to analyze the good shot strings so the combination of factors that produce these good strings can be remembered and repeated. In making the analysis, the first point to remember is to be honest with yourself and your coach. By admitting mistakes the shooter can probably correct them. The coach can help you find a solution to mistakes of which he was not aware when he observed your performance, if you reveal everything you saw, heard or thought of during the shot or string.

If any shooter critically re-examines and analyzes his performance and his technique of shooting, he will definitely find a number of "minor points," which to a certain extent hinder him from improving his competitive results. It is the elimination of individual shortcomings and poor methods in shooting, which is one of the potential sources that the shooter has at his disposal to further increase his competitive stature.

1. Single Shot.

a. Steps.

(1) You must call each shot. Base your shot call primarily on the relationship of the front and rear sight. You should also consider any unusual occurrences in the arc of movement and whether or not concentration on sight alignment was maintained.

(2) When you have decided where your shot should be located on the target, verify your call with the spotting scope.

(3) If shot or call is bad, determine cause. Generally one of the following situations will occur:

(a) Shot call and shot location coincide and you have a good shot.

1. You have proved that your plan works.

a. Repeat the shot sequence exactly.

(b) Shot call and shot location coincide, but shot is bad.

1. You have observed the error that occurred.

a. Analyze and identify the error.

b. Apply positive correction techniques in the planning stage for next shot.

(c) Shot call and shot location do not coincide.

1. Weapon is not zeroed.

a. Apply hold sight change to center group.

2. You have failed to observe error.

a. Make sure you're maintaining a point focus on the front sight.

b. Be sure concentration is unbroken and a surprise shot is obtained by applying steadily increasing pressure to the trigger.

NOTE: Any time you fail to observe the error, you must examine your plan to make sure you have not neglected the coordination of a fundamental.

(4) Evaluation: Now consider the question - Did you or did you not follow the planned sequence? If your answer is yes and you had an acceptable shot, this should stimulate your confidence. Review the technique you used to deliver the successful shot. Make every effort to reestablish the same conditions that existed for the first controlled shot and repeat the entire sequence for each succeeding shot.

If your answer was no, you must identify the specific point where control was lost. The following examples cover only a few of the errors that may have occurred:

(a) Failure to establish a minimum arc of movement.

1. Review the fundamentals of stance, position, grip and breath control.

a. Determination to hold the weapon as still as possible is vitally important.

(b) Inability to maintain point focus on sight alignment.

1. Unacceptable arc of movement causes you to look at target.

a. Sight Picture (relationship of the sight assembly to the target) becomes more important than sight alignment. Keep front sight in clear point focus and be acutely aware of its relationship to the rear sight notch.

2. Poor light conditions that may cause distortion of the relationship of the front and rear sights.

a. Be sure glasses are clean.

b. Try amber lens shooting glasses instead of the gray-green or clear lens.

3. Inability of the eye perception apparatus to maintain focus for protracted period due to holding too long in effort to deliver one shot.

a. Eye perception at maximum for only 6 - 8 seconds.

(c) Concentration drifts from sight alignment to trigger control.

1. Trigger pressure not positive, causing over-extending holding time.

a. Review paragraphs on positive, steadily increasing pressure on trigger.

(d) Trigger pressure intermittent and uncertain. Considerable effort required to fire weapon.

1. Lack of aggressive, determined attitude and confidence in technique.

a. More effort needed in maintaining focus on front sight. Do not look at target in an effort to achieve a perfect sight picture.

b. Be sure trigger finger is properly placed for straight to rear pressure and develop determined, aggressive attitude toward steady, positive, increasing trigger pressure. Any time that the shot breaks it will be a good shot if arc of movement is minimum, sight alignment is perfect and positive trigger pressure does not disturb sight alignment.

NOTE: After each identified error, a positive correction is listed. The negative approach of saying - "Do not jerk!" or "Don't look at the target!" is ineffective.

b. The shooter's slow fire work sheet lists the following steps as a guide to complete shot analysis:

(1) Follow through check.

(2) Call shot (Describe sight alignment).

(3) Compare target hit location with shot call.

(4) If shot or call is bad, determine cause.

(5) Watch for error pattern to form. (Same error on more than one shot)

(6) Did shot break in normal minimum arc of movement?

(7) Did you hold too long?

(8) Did you apply positive trigger pressure?

(9) If you benched weapon on a shot effort, why?

(10) Did you lose concentration? (What did you think about other than sight alignment?)

(11) Did you get a surprise shot break?

(12) Were you worried about results?

2. Strings of Five Shots.

After each five shot string, the shooter should remember each shot as one of five individual sight alignments that enables him to accurately call the shot group. If the call and the group

are not together it is necessary to determine the cause and apply positive correction. If the group is not centered then the weapon isn't zeroed, the position was bad or the grip incorrect. If the shooter is sure of the zero of his weapon then quickly check out the position and grip before firing the next five shot string. Look for one of the five following situations to occur. (It is possible however for two or more of the situations to occur in one string.)

a. Shots on call and within hold area, well-centered on target.

(1) Indicates comprehensive and effective plan based on fundamentals.

(a) No correction required.

b. Shots off call and grouped within ability to hold, but not centered on target.

(1) Probably indicates unzeroed weapon.

(a) Adjust sights to center groups. Be bold, apply full correction required at once. Don't creep into center, one click at a time.

c. Shots on call but group larger than normal hold area and may or may not be centered on target.

(1) Indicates insufficient attention to fundamentals of stance, position and grip.

(a) Detailed investigation of method used to gain stance, position and grip with emphasis on correction of observed errors and maintaining uniformity.

d. Shots off call, group larger than hold area and may or may not be centered on target.

(1) Indicates failure to maintain point focus on front sight and points out failure of preliminary preparation to provide comprehensive plan enabling shooter to apply fundamentals.

(a) Examine concept of method of firing sustained fire strings. Present method obviously unsatisfactory. Develop plan based on fundamentals and tailored to your physical and mental attributes giving you the ability to deliver the strings properly and under control.

e. Shots on call grouped within ability to hold, but off center on target.

(1) Indicates improper position.

(a) More care required in ascertaining proper position with minimum muscle tension when aligned properly with target.

(2) Improper zero of pistol.

(a) Make a bold enough sight change to move group to target center in one adjustment.

f. The shooter's rapid fire worksheet lists the following steps as a guide to complete shot group analysis.

(1) Follow through and proper recovery check.

(2) Shot group call (describe five individual sight alignments).

(3) Compare group location with call.

(4) If shot group or call is bad, determine cause.

(5) Did you get a surprise break on each of five shots?

(6) Was the first shot fired on time?

(7) Was rhythm maintained throughout string including last shot?

(8) Did all shots break in normal arc of movement?

(9) Did you apply positive trigger pressure on each of five shots?

(10) Did you lose concentration during string? (What were you thinking of?)

(11) Did you ignore minor errors?

(12) Were you worried about results?

F. POSITIVE CORRECTION: (If Necessary)

1. After a shot analysis, the imperative factor remains that corrective measures have to be incorporated into the shooter's performance if the error is to be avoided on the next shot. Slipshod analysis, if any, is usually compounded by the absence of corrective action. A very positive and insurmountable block is placed in the path of the shooter's progress. Without analysis and corrective measures, improvement is at an end and a ceiling closes in over the hapless marksman which may persist for years. Vocabularies cannot express the chagrin and hopelessness of the shooter who has not learned what he is doing wrong or what to do about it if the trouble is found.

2. Corrective measures prevent the recurrence of a poor performance and must be immediately applied. Much has been written why we shoot poorly; however, be reminded that it is just as advantageous to analyze why you are shooting well on a particular day. It is more helpful to know the right way to perform than to have your mind cluttered with a multitude of "don'ts". Coaches in particular should concentrate on and emphasize the positive factors.

3. A shooter may despair of ever becoming a champion if he does not analyze and correct mistakes every time a shot is fired.

Due to the great number of essential functions necessary for the shooter to grasp and apply in exercising a high degree of control of his shooting, a worksheet for both slow and rapid fire is furnished for guidance.

The slow fire worksheet provides the shooter with a guide to the organization and application of a system for the control of a single shot of slow fire. The rapid fire worksheet provides a guide for the control of a five shot string of sustained fire.

The slow fire worksheet provides the shooter with a guide to the organization and application of a system for the control of a single shot of slow fire.

SLOW FIRE WORKSHEET

SLOW FIRE WORKSHEET

PREPARATORY (In assembly area)

1. Squadding-Proper Relay & Target
2. Using clean weapons - Proper Caliber
3. Proper sight setting (Zeroed)
4. Blacken sights
5. Ammunition, Ear Plugs & Screwdriver

PREPARATORY (On firing line)

6. Focus scope on proper target
7. Dry Fire for natural Position & Grip
8. Adjust ear plugs
9. Ammunition loaded into magazine
10. Mental Stimulation of Confidence

PLAN DELIVERY OF SHOT (Review Shot Sequence)

11. Extend arm & breathe deeply
12. Settle into minimum arc of movement
13. Pick up sight alignment in aiming area
14. Take up trigger slack - apply initial pressure (take final breath and hold part of it)
15. Maintain sight alignment and minimum arc of movement
16. Start positive trigger pressure
17. Concentrate point focus on front sight

RELAXATION

18. No unnecessary muscular tension (Relax each major portion of body)

DELIVER SHOT (Follow Plan - No Compromise)

19. Follow Through (Continue all control factors)
20. Shot fired as a surprise - No reflex action

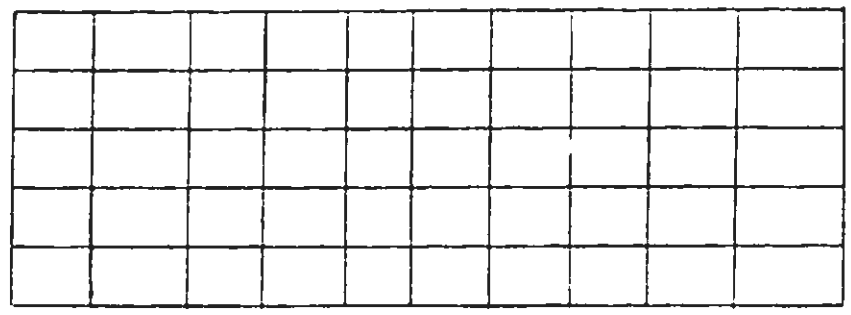
SHOT ANALYSIS

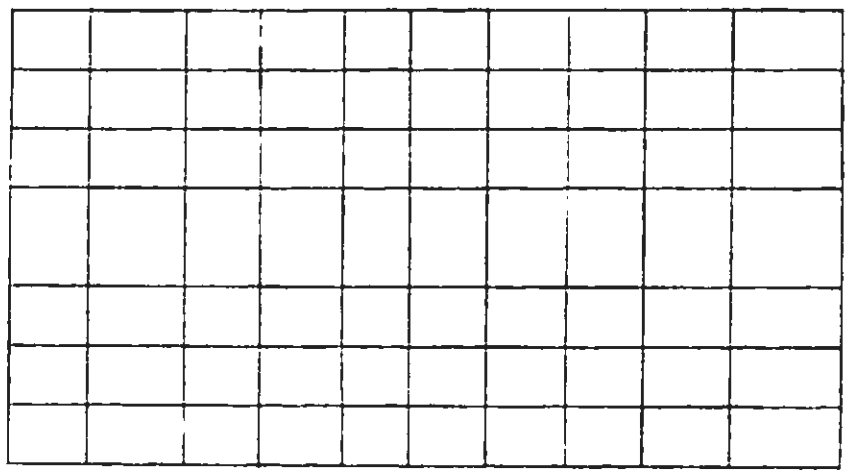
21. Call Shot - describe sight alignment
22. Compare hit location with call
23. If shot or call is bad, determine cause
24. Watch for formation of error pattern
25. Did shot break in minimum arc of movement?
26. Hold too long?
27. Positive trigger pressure?
28. Benched weapon, why?
29. Lost concentration?
30. Surprise shot break?
31. Worried about results?

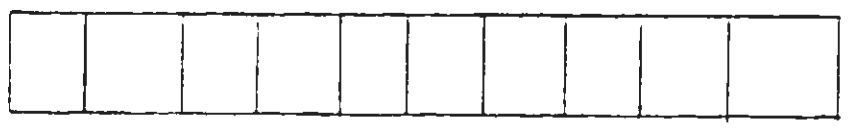
POSITIVE CORRECTION (Prompt Application)

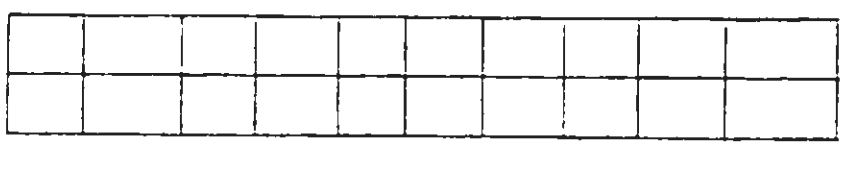
32. Include in plan of delivery of next shot.

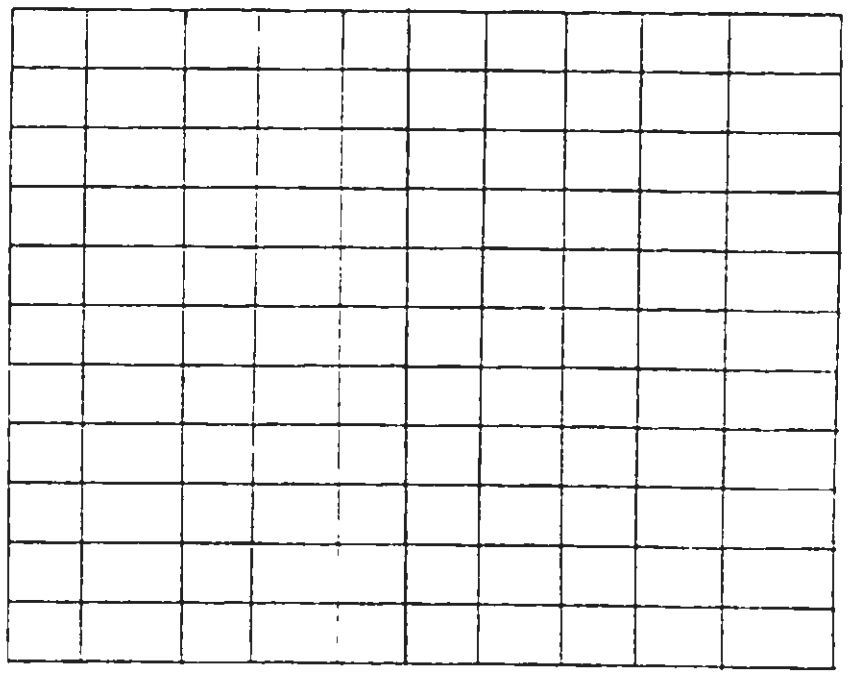
1	2	3	4	5	6	7	8	9	10

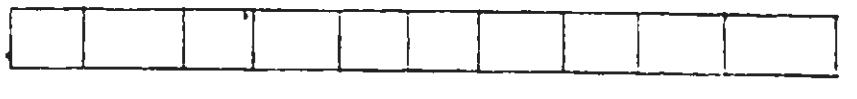












THE TIMED AND RAPID FIRE WORKSHEET PROVIDES THE SHOOTER WITH A GUIDE TO THE ORGANIZATION AND APPLICATION OF A SYSTEM FOR THE CONTROL OF A FIVE (5) SHOT STRING OF TIMED OR RAPID FIRE.

RAPID FIRE WORKSHEET

PREPARATORY (In assembly area)

1. Squadding - Proper Relay and Target
2. Using clean weapons - Proper Caliber
3. Proper sight setting (Zeroed)
4. Blacken Sights
5. Ammunition, Ear Plugs & Screwdriver

PREPARATORY (On Firing Line)

6. Focus scope on proper target
7. Dry fire for natural position & grip
8. Adjust ear plugs
9. Ammunition loaded into magazine
10. Mental Stimulation of Confidence

PLAN DELIVERY OF STRING (Review Sequence)

11. Extend arm & breathe deeply
12. Find sight alignment
13. Find aiming area on edge of target frame (Final deep breath)
14. Settle into minimum arc of movement
15. Point focus on front sight (partly release breath)
16. Take up slack - Initial pressure
17. Maintain sight alignment & minimum arc of movement (Target faces)
18. Start positive trigger pressure
19. Concentrate on sight alignment (First shot is fired)

RELAXATION

20. No Unnecessary Muscular Tension (Relax each major portion of body)

DELIVER STRING OF FIVE SHOTS

21. Follow through and recover with good sight alignment and central hold on each shot of string

SHOT GROUP ANALYSIS

22. Group call. Describe five individual sight alignments
23. Compare group location with calls
24. If group or call is bad, determine cause
25. Surprise break on each of five shots?
26. First shot on time & rhythm maintained?
27. Did shots break in minimum arc of movement?
28. Positive trigger pressure?
29. Lost concentration?
30. Ignored minor errors?
31. Worried about results?

POSITIVE CORRECTION (Prompt Application)

32. Include in plan of delivery of next five shots.

1	2	3	4

CONCLUSION. The champion team shooter must have the ability to intensely concentrate, the sheer guts and determination to adhere to the application of fundamentals in spite of match pressure, adverse weather conditions, discouragement, gun trouble and possible sickness. The driving force sustaining a good performance is the confidence that the fundamentals can be applied.

To shoot well, do more of the little things right. You have an imperceptable superiority. The competition may have some individuals who demonstrate superior proficiency at times, but taken as an aggregation, overall superiority rests with your team. The knowledge of a systematic approach to controlled shooting is more thoroughly ingrained in the minds of more of our shooters. The edge, so to speak, lies with the team with the system, disagreements not withstanding.

Your brain can be compared to the electronic computer. It co-relates all factors for delivering a controlled accurate shot on the target. When all factors are in coordination or in optimum relationship, action is taken to deliver the shot. The information factors that we must systematically feed into the computer-brain are the fundamentals of shooting, the individual techniques we have trained ourselves to use and the actions we have to take to compensate for the conditions under which we fire.

It should be added that any system will be worthless to a shooter who has indifferent attitudes toward training and who turns the training sessions into a learning-by-rote exercise and who repeats in robot-like fashion the prescribed shooting requirements. Training is one of the most important aspects of a competitive shooter's activity, and it requires not simply systematic and painstaking work, but a thoughtful analysis of his work, continuous striving for the new and better, a bold search for the best, and an unwavering strengthening of his will. Only such work on his own shooting methods will turn a shooter's training into a reliable means of assuring his further development and make it possible for him to win.

CHAPTER V

COORDINATION OF CONTROL FACTORS

A. MENTAL CONTROL OF COORDINATION.

The capacity for intense concentration and coordination of all the essential factors necessary for the delivery of an accurate shot is a quality the champion pistol shot has acquired through years of deliberate pursuit of excellence. All the qualities necessary for successful shooting must be developed and cultivated. Physical endurance, quick reflexes, coordination, control of reaction time and correct employment of the fundamentals are among these qualities.

The continuously repeated, successful execution of a step by step, complete planned approach to the firing of each shot results in the gradual development of a conditioned mental state that limits thoughts and actions during shooting to an established pattern.

1. Training Process.

a. In the training process, during which various stages of fire are repeated over and over, the functional state of a shooter's central nervous system becomes accustomed to habit. He should strive to achieve a state of training in which systematic practices are automatic and in which he has the best control over his body. His movements will then be better coordinated, and this will assure, in the final analysis, the most important thing - uniformity in the correct execution of every shot.

b. When he enters upon training, he should always bear in mind that training will have its effect on the body and develop a proper conditioning of the central nervous system - which is all-important in acquiring coordination - only if it is intensive enough and if the shooter will work at it in a systematic manner.

c. In this connection, it should be pointed out that training should not be limited only to acquiring that state of being physically able to repeat a manual act as far as the technique of shooting is concerned. It very frequently happens that the best physically coordinated shooter on a pistol team, as far as shooting technique is concerned, sometimes loses too many points in competition. This is because he is unable to deal with psychological stresses which may agitate him under circumstances which he has not accustomed himself mentally to cope with. Therefore training must include the development and strengthening of the mental discipline of a shooter and his psychological preparation for coordinated control in pistol competition.

B. COORDINATED CONTROL.

1. Proper coordination will bring all control factors to bear at their optimum period. The area shooting method: Employing the fundamentals of stance, position, grip and breath control, hold the weapon within as small an arc of movement as possible within the aiming area. Then perfect sight alignment and start a positive, uninterrupted, steadily increasing pressure against the trigger. As soon as the trigger pressure increase becomes constant, the shooter switches his concentration exclusively to maintaining sight alignment. The arc of movement or hold, focus, trigger pressure and concentration on sight alignment must be such that the weapon fires as a surprise shot with all these factors in coordination while each control factor is at or near a peak or optimum condition.

a. The factors of control have a strictly defined optimum period in which they can be used with the most effectiveness.

(1) Trigger pressure should be applied and the action completed in 2 to 5 seconds. A shorter period would probably be so abrupt as to disturb sight alignment. A longer period would extend beyond the optimum interval at which the other control factors can be employed most effectively.

(2) Visual perception - the ability of the human eye to maintain the point focus with maximum clarity - is limited to a period of 6 to 8 seconds. In the early seconds of point focus, the acuity is apt to be intermittent, and a positive hold of focus is slightly hampered. A longer period of intense point focus fatigues the crystaline lens control muscles of the eye and the focus tends to return to infinity, the normal state of the focus. A blurring of the sight alignment results. It can be regained quickly but then it is too late for coordination with other control factors.

(3) Intense mental concentration of the degree necessary to maintain the front and rear sights in exact alignment will function at the optimum level for 3 to 6 seconds. All of the other control factors must be coordinated to be at or very near their optimum during the period of peak mental intensity. For example, the cue or prompting to start the application of positive trigger pressure is the achievement of exact sight alignment at the beginning of the period of greatest intensity of concentration. It definitely should not be the attainment of only a momentary decrease in the minimum arc of movement that furnishes the signal to apply trigger pressure.

(4) The minimum arc of movement or the ability to hold is most stable for an optimum interval of approximately 5 or 6 seconds, if it starts to enlarge, it will immediately resettle and becomes stable for another short period but always of less duration than the period immediately preceding, unless the arm is lowered, the body allowed to shed its fatigue and reestablish its stability. Any reestablishment of a minimum arc of movement with the arm extended will not be in coordination with the other control factors because most will have passed beyond their optimum. The minimum arc of movement is based primarily on four interrelated factors, stance, position, grip and breath control. None of these factors are in themselves critical in elapsed time of optimum efficiency as are trigger pressure, visual acuity and mental intensity of concentration. Stance, approximately 60 seconds of maximum stability; position, almost indefinite; grip, approximately 60 seconds without undue fatigue; breath control is relatively dormant and negative for approximately 15 seconds. However, in combination, they constitute a minimum arc of movement that is critical in the rapid elapse of an optimum period in which the other control factors can be coordinated with it.

(5) The following illustration graphically depicts the probable relationship of the control factors while firing a .45 Cal service pistol with a four pound trigger pull. When the trigger pressure has reached four pounds or slightly more, the shot breaks. Follow a line down from the four pound release point and you find that concentration is still at the optimum level of intensity, that visual perception is remaining acute for a clear point focus, that the minimum arc of movement is such that the ability to hold is at the zenith. Also notice that all of the control factors are still in an optimum state and the passage of time since the shooting arm was extended has not exceeded nine seconds.

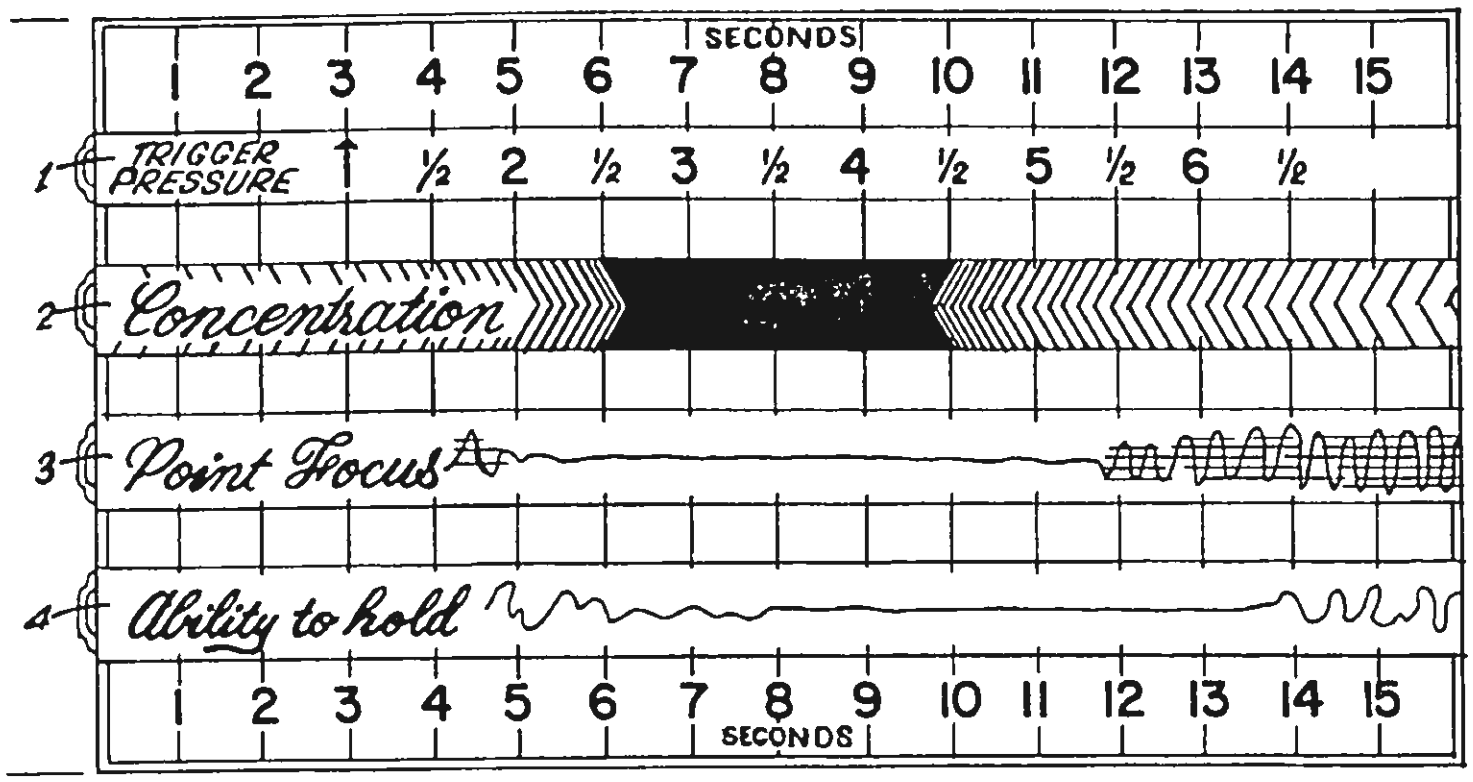
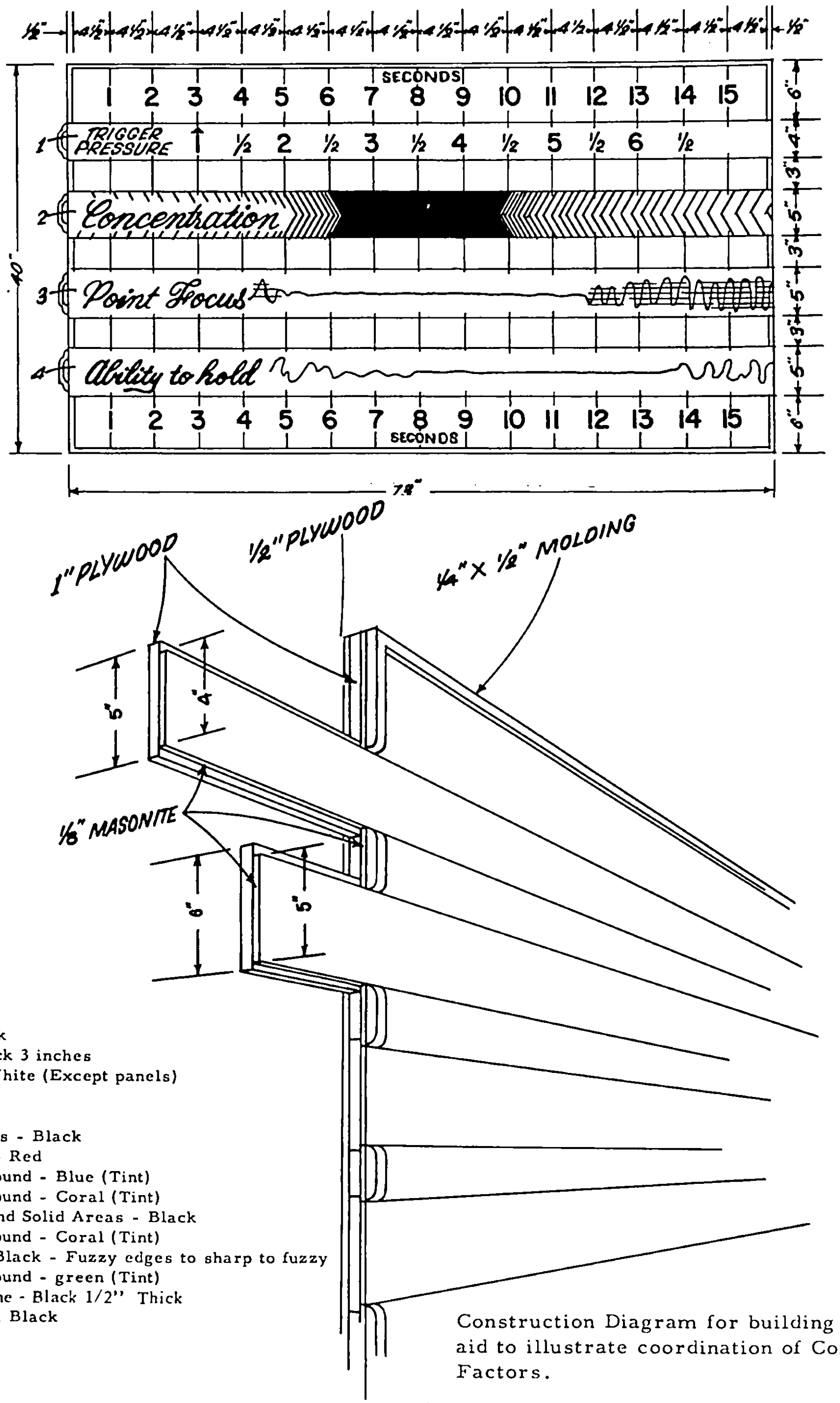


Figure 1.

2. Consecutive Rejection Until Attaining Perfect Hold and Sight Picture or Point Shooting Method.

This is a method of shooting employed by some shooters. Through years of training and experience they have developed a degree of trigger control and the ability to hold steadily and they think they are able to pick the exact time that the trigger release should take place. The shooter will align the sights and exert initial pressure on the trigger. He then makes every effort to hold the weapon motionless. Experience and practice will enable the shooter to hold the weapon almost motionless, momentarily. It is during the extremely short moments of comparative motionlessness, while sights are perfectly aligned, that pressure is applied with something less than positive pressure, on the trigger. If the sight alignment is not perfect or movement of the weapon increases, the pressure on the trigger is maintained but not increased. The shooter continues to hold the arm extended, subject to early fatigue. When the sight alignment is perfect again and the hold is better, the movement having diminished momentarily, a positive pressure on the trigger is resumed. If the weapon fails to fire within the limited time the shooter can hold the minimum arc of movement, trigger pressure is released again and he continues to try again, for a perfect sight picture. It must be reemphasized that match shooting is successful only when all the control factors are in coordination. The continued extension of the shooting arm leads to undue fatigue, loss of control of the arc of movement, eye perception diminishes, the shooting hand is tired, ability to concentrate intensely is hampered, breath control becomes a shambles and the nervous system becomes susceptible to reflexes of anticipation that will disturb sight alignment at the critical instant - the release of the hammer.

There is no attempt here to obtain general coordination. All other control factors are subordinated to a minimum arc of movement that achieves a brief and fleeting perfect sight picture and instantly all other control factors are brought into action regardless of whether they are at the optimum or not.



Legends - Black
Numbers - Black 3 inches
Background - White (Except panels)
Panels:

No. 1: Numbers - Black
Arrow - Red
Background - Blue (Tint)
No. 2: Background - Coral (Tint)
Lines and Solid Areas - Black
No. 3: Background - Coral (Tint)
Line - Black - Fuzzy edges to sharp to fuzzy
No. 4: Background - green (Tint)
Wavy Line - Black 1/2" Thick
Molding Trim Black

Construction Diagram for building training aid to illustrate coordination of Control Factors.

Figure 2.

3. Coordination of all control factors, contributing or essential to the delivery of a controlled slow fire shot.

CONTRIBUTING FACTORS

A. Intelligence
   1. Resourceful
   2. Dynamic

B. Physical Condition
   1. Maintained or:
   2. Jeopardized by:
      a. Diet
      b. Alcohol
      c. Coffee and Tea
      d. Tobacco
      e. Drugs
      f. Hazardous Activities
      g. Insufficient Rest
      h. Lack of exercise

C. Emotional Balance
   1. Motivation
   2. Determination
   3. Even Temperament
   4. Confidence
   5. Persistence
   6. Imperturbable

D. Behavior Characteristics
   1. Compatible
   2. Good Sportsmanship
   3. Neat Personal Appearance
   4. Restrained and Stable in Off-Duty Status
   5. Fiscally responsible
   6. Honest

E. Team Spirit

F. Condition and Care of Equipment

G. Confidence in Inherent Accuracy of Weapons and Ammunition

H. Adaptation to Weather Conditions
   1. Wind
   2. Rain
   3. Cold
   4. Hot
   5. Ideal

I. Coaching Technique
   1. Motivated
   2. Coach Qualified
   3. Organized Training
   4. Organized Guidance of Shooter During Match Firing
   5. Progressive

COORDINATED EMPLOYMENT OF THE FUNDAMENTALS

J. Optimum Periods of Application
   1. Minimum Arc of Movement (Five to Six Seconds)
      a. Stance and Position
      b. Grip
      c. Breath Control
      d. All shooter have some degree of movement
      e. Represents ability to hold
      f. Anticipatory reflexes change characteristics of movement
      g. Tension causes over-correction of errors.
      h. Temporary freezing of movement affects trigger control adversely.
   2. Sight Alignment-Visual Perception (Six to Eight Seconds)
      a. Point focus on spot on front sight.
      b. Constant correction of errors.
      c. Target out of focus-indistinct
   3. Positive Trigger Control (Two to Five Seconds)
      a. Area shooting vs point shooting
      b. Trigger release weight reached almost involuntarily.
      c. Timing and coordination of factors necessary to attain rhythm of firing.
      d. Unchanging rate of application of trigger pressure for surprise break of shot.
   4. Time Interval of Maximum Concentration (Three to Six Seconds)
      a. Channeled Mental Effort
      b. Uninterrupted by disturbances
      c. Shot must be fired during this period.

K. Organization of a System of Slow Fire Control.
   1. Preparation
      a. Physical
      b. Mental
   2. Planning
      a. Shot Sequence
   3. Relaxation
      a. No unnecessary muscular tension
   4. Shot Delivery
      a. Follow through sequence Do Not Compromise
   5. Shot Analysis
      a. Based on Sight Alignment, Not on Sight Picture
      b. Consider everything seen, heard or thought of during delivery of shot
   6. Positive Correction
      a. Incorporate into plan for next shot

4. Coordination of control factors contributing or essential to the delivery of a controlled string of sustained fire.

CONTRIBUTING FACTORS

A. Intelligence
   1. Resourceful
   2. Dynamic

B. Physical Condition
   1. Maintained
   2. Jeopardized by:
      a. Diet
      b. Alcohol
      c. Coffee and Tea
      d. Tobacco
      e. Drugs
      f. Hazardous Activities
      g. Insufficient Rest
      h. Lack of Exercise

C. Emotional Balance
   1. Motivation
   2. Determination
   3. Even Temperament
   4. Confidence
   5. Persistence
   6. Imperturbable

D. Behavior Characteristics
   1. Compatible
   2. Good Sportsmanship
   3. Neat Personal Appearance
   4. Restrained and Stable in Off-Duty Status
   5. Fiscally responsible
   6. Honest

E. Team Spirit

F. Condition in Inherent Accuracy of Weapons and Ammunition

H. Adaptation to Weather Conditions
   1. Wind
   2. Rain
   3. Cold
   4. Hot
   5. Ideal

I. Coaching Technique
   1. Motivated
   2. Coach Qualified
   3. Organized Training
   4. Organized Guidance of Shooter During Match Firing
   5. Progressive

COORDINATED EMPLOYMENT OF THE FUNDAMENTALS

J. Optimum Periods of Application
   1. Minimum Arc of Movement (five or six seconds)
      a. Stance and Position
      b. Grip
      c. Breath Control
      d. All shooters have some degree of movement
      e. Represents ability to hold
      f. Anticipator reflexes change characteristic of movement
      g. Tension causes over-correction
      h. Temporary freezing of movement affects trigger control adversely
   2. Sight Alignment-Visual Perception (Six to Eight Seconds)
      a. Point focus on spot on front sight
      b. Constant correction of errors
      c. Target out of focus-indistinct
   3. Positive Trigger Control (Two to Five Seconds)
      a. Area shooting vs point shooting
      b. Trigger release weight reached almost involuntarily
      c. Timing and coordination of factors necessary to attain rhythm of firing
      d. Unchanging rate of application of positive trigger pressure for surprise breach of each shot
   4. Time Interval of Maximum Concentration (Three to Six Seconds)
      a. Channeled mental effort extends this time.
      b. Uninterrupted by disturbances
      c. Shot must be fired during this period
      d. Near perfect recovery enhances sustained concentration
      e. Good rhythm removes anxiety over passage of time.

K. Organization of a system of Timed and Rapid Fire control.
   1. Preparation
      a. Physical
      b. Mental
   2. Planning
      a. String Sequence of firing actions
   3. Relaxation
      a. No unnecessary muscular tension
   4. Delivery of five shot string
      a. Follow through each shot sequence as planned--Do not compromise
   5. Shot Analysis
      a. Based on Sight Alignment <u>Not</u> sight picture
      b. Consider everything seen, heard or thought of during delivery of string.
   6. Positive Correction
      a. Incorporate into plan for next string

CHAPTER VI

TECHNIQUE OF SLOW FIRE

A technique is a highly specialized method of performing a specific, complex operation.

A technique of slow fire that will permit a pistol shooter to compete successfully at the present day's level of competition must invariably include:

1. Painstaking preparation.

2. Thorough planning.

3. Capacity for intense concentration.

4. Coordination of all the fundamental factors implemented in the delivery of an accurate shot.

5. Analysis and correction of errors committed.

6. A strict uniformity of execution that will insure the ability to duplicate a performance time after time.

The general factors regarding the technique of slow fire shooting should not be regarded as hard and fast instructions which demand strict and unvarying execution of each point. In competitive shooting, as in any other competitive sport, there are no pat rules on technique.

The shooter should approach the material put forth in this manual in a critical manner, using it as a guide in finding his own style of shooting - a style that fits his character, temperament, and individual abilities.

A. EMPLOYMENT OF THE FUNDAMENTALS: The proper employment of the fundamentals will result in a perfection of performance equal to that necessary to win in today's competition.

Developing the ability to apply these fundamentals of pistol shooting is a tedious, painstaking process.

1. The Ability to Hold, or Minimum Arc of Movement.

The fundamentals of stance, position, grip, and breath control, when properly employed, will give the shooter the ability to hold the weapon almost motionless within the aiming area of the target. This is the minimum arc of movement.

The minimum arc of movement has a different dimension for various shooters. The shooter's goal in establishing a minimum arc of movement is absolute steadiness of hold. Unfortunately, the human body is incapable of absolute stillness, so the shooter must accept some oscillation about the aiming area. Although it might not be apparent to the shooter at certain times when the hold seems to be unusually steady, there is actually a minute degree of movement present.

a. Determining the Basic Size of the Shot Group.

With good sight alignment and proper trigger control, you can shoot groups within your minimum arc of movement, or your ability to hold. If you can hold within the ten

ring, all your shots will be tens, regardless of when the shot broke during the arc of movement. This assumes that proper sight alignment has been maintained during the time when pressure was applied to the trigger, and other factors such as weather and light did not affect the sight alignment. With experience and practice your ability to hold will improve, and your groups will become smaller.

b. Duration of Optimum Hold.

When a minimum arc of movement has been established within your aiming area, it can be expected to remain acceptable for about eight to ten seconds, and optimum for only five to six seconds. When the arc begins to enlarge, you should bench the weapon. Effort to reduce the movement with the arm extended should not be attempted beyond the optimum period of steady hold. Start over by reviewing your plan of employing the fundamentals; relax and try again to deliver a controlled shot. The smallest arc of movement which you are able to attain must be accepted as one of the control factors in the shooter's ability to group his shots in a small circle. Consequently, a major, distinct effort must be exerted toward holding as still as possible.

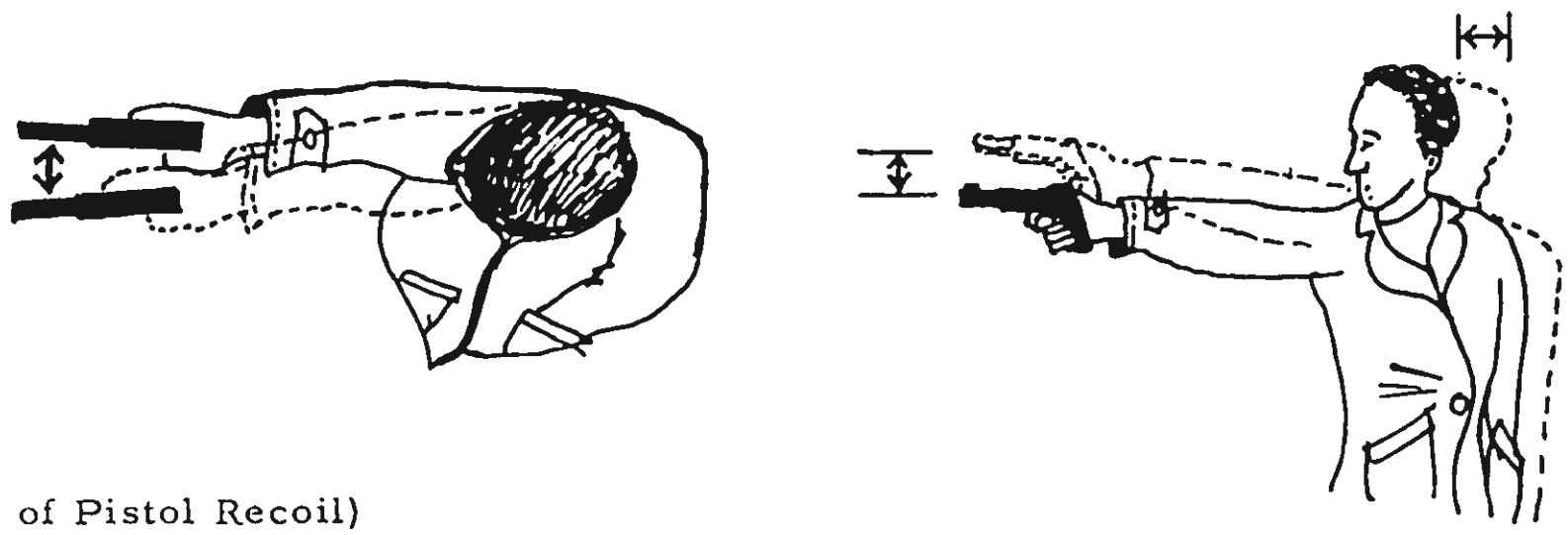
c. Effects of Recoil.

Recoil has a negative effect on accuracy. However, in addition to tiring the shooter and being one of the causes contributing to trigger jerking, recoil produces a considerable deflection of the barrel from the original direction in which it was pointed in aiming.

The pistol not only moves rearward under the action of recoil but also upward and to the side. In this connection the upward motion of the barrel commences when the bullet is still in the bore, the .45 Cal bullet having a travel time in the barrel of approximately .005 seconds. As a result, the axis of the bore is displaced by a certain angle at the instant of firing. The angle formed by the axis of the bore before firing and at the instant of firing is called the angle of recoil.

The angle of recoil is not a constant value. It depends on the shooter's stance, position and grip to a great extent. If the shooter holds the pistol securely in a tight grip and maintains a solid arm with a stiff wrist and a locked elbow, the angle of recoil is reduced. The amount of total recoil movement depends also to some extent on the angle of the gripped pistol in relation to the arm and the relative angle of the extended arm to the vertical central axis of the shoulder and the body mass. Faulty stance can create a lateral movement of recoil caused by the twisting of the wrist and body if the recoil is directed toward the side of the hand and/or shoulder - body mass rather than being directed toward the center of the Hand-Shoulder-Body mass. There should be an equalization of resistance by the hand, shoulder and body to the rearward movement of recoil which will confine the disturbance of the stance to a straight-to-the-rear push. The jolt should be absorbed by the hand-arm-shoulder-body as a solid unit rather than separate recoil attenuating movements of the hand, arm and/or shoulder.

All the muscles attempt to hold the body and the firing arm rigid against movement. This can be explained by means of an example as follows: if one pushes slightly a person who has not expected that push, he will rock greatly and may even lose his balance and fall; but if one warns the person about the push and he expects it, his muscular apparatus will, to a definite extent, react and will counteract that push, and the person will not rock greatly. The same thing happens when a shooter assumes the firing stance. The shooter subordinates his consciousness to the forceful desire to hold the pistol in the exact center of the aiming area, thereby compelling definite groups of muscles to work to eliminate any possible deviation of the weapon away from the center of aim. This is achieved chiefly by the operation of the leg and stomach muscles. As is well known, the equilibrium of the human body is achieved by the automatic, unconscious action and counteraction of muscles on the basis of signals received from the central nervous system to correct any imbalance detected or sensed by other parts of the nervous system.



(Drawing of Pistol Recoil)
Vertical & Lateral Side View & Overhead

A pistol in recoil not only moves rearward, but the muzzle also is thrown upward and to the side.

Figure 1.

It is obvious that incorrect assumption of the stance, position and grip, aside from a tendency to shoot to either side of the aiming area, results in the formation of different angles of recoil after each shot and, consequently, possible dispersion of bullets in the vertical and oblique directions.

d. Stance, Position and Grip Must be Uniform From Shot to Shot.

In order to attain and sustain accurate fire, it is necessary to develop the skill of assuming the stance, position and grip properly and uniformly. In addition, it is necessary to remember that a change in firing stance, position and/or grip is usually, accompanied by a change in the center of impact. For this reason, during the training period, the shooter must study the details of the manner in which he assumes the firing stance, position and grip in order to guarantee uniform duplication. This results in the minimum amount of displacement of the center of impact.

It follows then that in order to go through a slow fire match and shoot a large number of cartridges over an extended period of time, one must be able to maintain, from one shot to the next, not only a stable, but also an exact duplication of stance, position and grip. This means first of all that once having started to shoot through a match, a shooter must not deviate from the assumed stance, nor change the position of his body with relation to the target. He must try to work his muscles the same way each time, and use exactly the same grip. In other words, he must create the same conditions for every shot.

The proper grip will help to solve the formidable problems of control of recoil, allow the sights to naturally align themselves, allow positive trigger pressure straight to the rear, delay early fatigue and give the shooter an unchanging tightness of grip that will not disturb the natural sight alignment.

In practice, however, all this is not so easily achieved. After each shot (or an unsuccessful attempt) a shooter may upset his position, stance, and grip in order to reload his weapon, or give himself a rest. Therefore, considerable attention must be paid to the shooter's ability to re-establish his stance, position, and grip for the next shot. Experience has shown that the following procedure is necessary for the shooter to regain his steadiness of stance and position after a rest period: Slow, dry aiming of the pistol on the target, moving downward from above, or upward from below, to check for natural hold and grip, to relax the body, and to redistribute the load. These actions create the best support for the shooting arm, and establish the final position for shooting. By constant repetition, this whole series of movements can be done automatically, and must be done the same way every time.

e. Breathing.

The breath should be held when firing only after exhaling and prolonging the natural pause between breaths. Under no circumstances should the breath be held unnaturally in the lungs after inhaling, since this puts a strain on the breathing muscles. In order that the interruption in normal rhythmic breathing not react so strongly on the rest of the body during long shooting days, the shooter should hold his breath no more than ten to twelve seconds to make his shot. If he can't make a shot in this time he should stop aiming and take another breath.

2. Sight Alignment:

a. Sight alignment is the relationship of the front sight to the rear sight only, and must not be confused with the term sight picture which is the relationship of the sight assembly to the target.

RELATIONSHIP OF SIGHTS

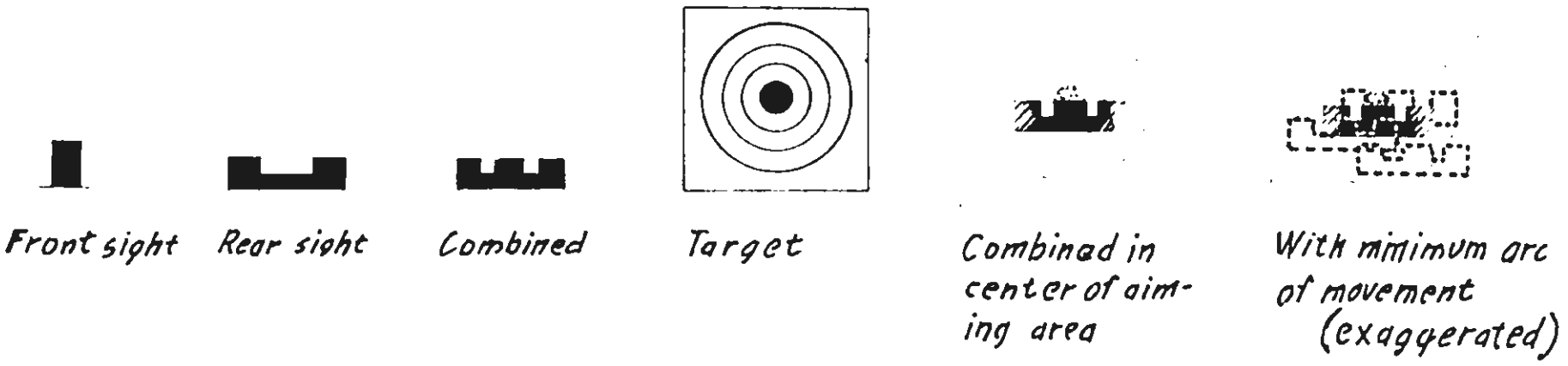


Figure 2.

b. Proper sight alignment is defined as the aligning of the top, horizontal surface of the front sight with the top, horizontal surfaces of each side of the notch of the rear sight to attain a flat, even line. The vertical sides of the front sight should be centered in the space between the vertical sides of the rear sight notch and results in an equal amount of light space on each side of the front sight.

c. When a shooter is picking up sight alignment, there are only three possible places that he can focus his eyes that will have a bearing on his control of the shot:

(1) Focus on the target is the first to be eliminated because of inability to precisely control alignment of indistinct sights. Errors in hold do not increase appreciably with increased range. Control of errors in hold is usually the reason for looking at the target.

(2) When a focus is placed on the rear sight, the target and probably the front sight becomes somewhat indistinct. Precisely controlled sight alignment becomes a rarity under this condition because of silhouetting effect that precludes point focus and depth perception.

(3) Only one logical point of focus remains: The front sight. The front sight, held in unwavering scrutiny of a point focus will remain distinct in perception. The shooter then is acutely aware of any error in horizontal or vertical relationship of the front sight and the rear sight notch.

d. The focus of the eye is pinpointed on as small a point on the front sight as it is possible to discern. The center point of the top surface of the front sight, the right or left top corner of the front sight or a fleck of dust that has settled on the front sight are points where focus may come to rest. The relationship of the rear sight to the clearly defined front sight is one of acute awareness. The depth of field of normal vision is such that the rear sight will be in acceptable focus also. The eye is capable of minute examination if the concentrated effort is expended. The sensitivity of the eye is such that the equalization of the light space on either side of the front sight can be in constant correction.

e. Front sight point of focus is imperative because with intense concentration on maintaining sight alignment, the degree of control in delivery of a good shot is reduced in proportion to the lessened degree of concentration on maintaining the correct relationship of front and rear sight. The point of focus must be unwavering during the short period of delivery of the shot. Needless to say, if the target is momentarily in clear focus, the ability of the shooter to achieve exact alignment is jeopardized for that moment, fleeting as it may be. With disturbing frequency, this is usually the instant that the pistol fires. An accurate shot call is utterly impossible under these conditions.

f. Accurate calling of a shot is dependent upon exact recall of the mental image of sight alignment at the instant of firing. As demonstrated, the presence of 1/100th of an inch error in sight alignment will result in a 3 inch error from target center at 50 Yards. Acute awareness of the slightest degree of error in alignment is an absolute requirement. Any approach to sight alighment other than maximum concentration on maintaining the exact relationship between front and rear sight is to possibly cancel out all the other fundamentals so painstakingly applied.

3. Trigger Control: Trigger control involves a series of required actions that must take place if a smooth release of the firing mechanism is to be accomplished.

a. Any free movement of the trigger, known as slack, has to be taken up prior to a light initial pressure. This action assures that the tolerances in the firing mechanism linkage are taken up and are in firm contact before positive trigger pressure is applied.

b. Initial pressure is an automatic, lightly applied pressure, approximately one fourth or less of the total required to fire the weapon. This careful action is an aid in the proposed positive trigger pressure which will release the hammer quickly and smoothly without disturbing sight alignment.

c. Positive trigger control is primarily the act of committing the shooter to complete the firing of the shot once he has started the application of positive trigger pressure, two to five seconds limit. He is also committed to an unchanging rate of pressure, without speed up, slowdown or stopping. The pressure can be of an uninterrupted nature because it is not applied initially unless conditions are settled and as near perfect as the shooter can set them up. On the other hand, in order that the shot not be dragged out, the trigger must be pressed no longer than six seconds. When the most advantageous moment begins to pass, when the aligned sights begin to move too much in relation to the center of the aiming area, the shooter should not press further on the trigger. In doing this, it is very important to train oneself to stop pressure on the trigger in time. If the shot cannot be made under full control, one must resolutely stop further trigger pressure, lower the pistol to the bench, take another breath, replan, relax and try again.

d. The word "squeeze" is used erroneously in connection with trigger control. When we think of the action of squeezing, we usually close all four fingers and thumb together

at the same time. This is definitely not applicable to proper trigger control. The pressure put on the trigger must come from independent movement of the trigger finger. The gripping fingers and the thumb do not move to tighten the grip further. Keep the grip pressure constant, align the sights. Apply positive, uninterrupted, constantly increasing, positive pressure, straight to the rear, until the hammer falls.

e. Correct trigger control is employed in coordination with other fundamentals of pistol shooting, minimum arc of movement and sight alignment. The physical act of applying enough pressure on the trigger to fire a controlled shot is a somewhat variable technique. Proper trigger control for each individual gradually assumes a relative uniformity as the techniques of proper application are mastered. The right combination of factors for precise trigger control varies from one individual to another. Some shooters, for example, maintain a high degree of trigger control with a relatively loose grip where another may use a very tight grip. Another shooter may consistently apply trigger pressure at a rapid rate, maintaining an undisturbed sight alignment, while a somewhat slower deliberate application of pressure achieves positive results for yet another. An ever increasing number of extraordinary shooters (Champions) use the uninterrupted, positive approach to trigger control, known as area shooting.

f. Applying steadily increasing pressure to the trigger is only a simple muscle contraction. Any manual operation, if simple enough, and practiced regularly, can become habit. Shooters who struggle to apply four pounds to the Hard Ball .45 Pistol, while aiming at the target, are making a mistake in trigger control that can be corrected. During dry fire practice, when the weapon is not loaded, no great effort is required to release the hammer because no anxiety exists. This ease of release is caused by the absence of the shooter's fear of getting a bad shot. Applying positive pressure against the trigger, pulling straight to the rear, while concentrating exclusively on sight alignment, will eliminate these anxieties, and the heavy trigger problem with them.

B. TECHNIQUES IN SLOW FIRE CONTROL.

The best technique of control in slow fire, for each individual shooter, is an unknown quantity. The proper technique for you is a combination of many specific items that will contribute toward attainment of a satisfactory performance.

1. Dry Firing Before Shooting. A shooter should rarely shoot the first time he settles to aim. Avoid dragging out a shot, however, which results in increasing arc of movement and in dulling of the vision. A shooter, after a five or six second try, should stop dryfiring, take his finger from the trigger and rest. If unsuccessful he should make another attempt to dryfire a satisfactory shot. A shooter would not be wise to do this too many times, however. He should not forget that a long day's shooting makes heavy demands on the muscles and eyes.

2. Carefulness.

Great care is one of the mainstays of the control of slow fire shooting. Every shooter will get a certain percentage of good shots, the rest will be of various degrees of mediocre to poor. The poor shots result from carelessness in some respect. Compromise or accepting conditions set up for a shot as being almost good enough is a form of carelessness. There are no shooters of consequence who are absolutely without some compromise. However, devil-may-care abandon is not the pitfall here. It is the shooter who is not willing to devote himself fully, that is careless in one or two percent of his total performance and fails to garner the tie breaking point, that loses the team match. The principal damage carelessness causes to controlled performance strikes at the point where it can be least afforded, uniformity. The neglect to regrip exactly for each new attempt exactly as for previous accurate shots, violates the stipulation that if a good performance is to be repeated, you must uniformly duplicate the employment of all the fundamentals.

3. Patience.

Patience is of great importance to slow fire control in that without it, the shooter may disrupt an otherwise good performance an instant from successful completion. When the creation of conditions for a controlled, accurate shot are met, the problem facing the shooter is reduced to one of patiently allowing proposed events to follow their normal course. The syncronization of the factors of technique require a certain time for completion. Any impatience that would cause one control factor to be disrupted will reduce the whole to a shambles. Improvised, desperate measures to reconstitute a lapse cannot possibly succeed. As an example, we have a shooter on the firing line, making a concerted effort to maintain conditions that have been set up to control an accurate shot. His sights are aligned, the arc of movement is settling and he is pressing positively on the trigger, straight to the rear and he must wait, momentarily. At this juncture in his technique of employing the fundamentals, he will succeed or fail, depending upon his ability to allow the necessary time to pass for the smooth, undisturbed release of the hammer.

4. Over Sighting.

A shooter must always remember that his scores cannot be improved by long, protracted sighting. On the contrary, "over-sighting" sharply reduces accuracy. In order to achieve the highest accuracy, sighting should be accomplished within six or eight seconds. After about ten or twelve seconds of sighting, vision becomes gradually blunted and the shooter's eye ceases to observe some minute errors. The result is a deceptive, apparently sharp aim, and the shooter without noticing his error in sighting makes an inaccurate shot. Therefore, when shooting, and especially during long aggregates, it is best to sight each shot for a short time and dry fire only occasionally before shooting. This system of sighting, moreover, is good because a shooter who does not over-sight and strain his eyes permits them to recover rapidly and to keep their sharpness for the duration of the whole match.

5. Establish a System.

A system of operation must be devised by each shooter individually without which he is not capable of attaining a sustained high performance standard. Consult chapter IV, "Establishing a System". The shooter's guide to comprehensive organization of control of a slow fire shot, "The Slow Fire Worksheet" is included in Chapter IV.

Completing the day's schedule of shooting successfully requires the shooter to go through all the stages of shooting for every shot in exactly the same way. This is possible only if the shooter can conserve sufficient physical energy, sharpness of vision, quickness of reaction, etc., while he is shooting. Therefore, the ability to repeat everything the same way requires an intelligent and economic use of ones energies.

6. The Tempo of Shooting: Experience has shown that the most intelligent way to shoot, from this point of view, is to shoot each shot rapidly, within six seconds after settling. The time spent between each shot, preparing and planning is limited only by the total time allowed for the string.

Many questions however, concerned with conserving energy while shooting are not limited merely to the fact that a shooter should spend very little time on the shot itself. In order that one not only expend one's energies with care, but actually build them up during the course of shooting, adequate breaks should be taken both between shots and between series of shots, that is, shooting be done at a definite tempo and with a definite rhythm.

From the point of view of conserving one's energy throughout a match, it is best to shoot at regular intervals, using all the time allotted for a particular match. In actual practice in

slow fire, circumstances rarely permit unbroken rhythmical shooting. Therefore, the shooter must take a particular situation and his own daily capabilities into account and shoot sometimes at an accelerated, sometimes at a reduced rate, thereby operating at a tempo that will delay fatigue and permit maximum performance.

Before beginning to shoot for record, it is recommended that he shoot "dry shots" in order to make himself ready for work. If he feels after the very first shots that his shooting is going easily, he should proceed to shoot after taking "dry" aim only once or twice, then shoot at a fast pace, making no attempt to slow down, so that he will not upset the established coordination of his movements.

When a shooter finds it difficult to shoot, he should not speed up his shooting. He must replan, relax, wait a short time until he has the "feel" of his pistol, shoot some "dry shots," patiently reestablish harmony of movement in control of the trigger, aim with unusual care before each shot, and then begin shooting with assurance at a quickened tempo in order to make up for lost time.

However, no matter how well the shooting is going, a shooter should always be careful to show no lack of concern while he is shooting and to control his movements at all times so as not to cause a performance failure because of negligence. There is no such thing, of course, as shooting for a long period of time without some loss of control. However, one must be constantly on guard against becoming nervous, losing further control, and rushing as a result of a bad shot as if one has to compensate in as short a time as possible with good shooting for the poor hits. It usually happens that rushing leads to the repetition of the same mistakes, to the same failures. Under such circumstances, one must take onself in hand, analyze, correct errors, shoot without haste, and develop successive shots with more care.

The regular tempo of the shooting applies, for the most part, when a shooter is shooting under favorable conditions in good shooting weather. If, on the other hand, the weather is not favorable, the shooter should use a quite different tempo and another approach, depending on the conditions prevailing.

7. Resting During The Breaks Between Shots. During the rest period between shots, a shooter ought to see to it that the uniformity in assuming body stance and positions not be destroyed. The angle at which the body is turned and the relative position of points of support (feet) should not change. In order that the rest interval be most effective, it is a good idea to assume a posture which will make it possible to permit the muscles to relax as much as possible and so rebuild their strength. The best way is to put the pistol down on the table and take a rest between shots. It is necessary at times to rest with the pistol in a slightly relaxed grip when shooting in gusty winds. The shooter must be prepared to assume the firing position quickly so as to shoot between gusts, i.e., at the best periods for firing.

Bearing in mind that a pistol barrel is continually heating up when live ammunition is used, during the rest period between one shot and the next, if a longer rest than usual is planned, draw back the slide and clear the chamber. When a round of ammunition stays in a hot chamber for a long time, it can cause the bullet to go slightly higher.

C. COMMON POINTS OF DEFICIENCY IN CONTROL: There are obviously a multitude of causes for bad shots. We have listed below those most frequently found. It is not intended to be a completed list nor is it intended to provide the shooter with a convenient list of bad habits. It is, however, intended to assist the shooter in finding the source of his trouble.

1 & 2. Jerk or Heel. The abrupt application of pressure either with the trigger finger alone or in the case of heeling, pushing with the heel of the hand at the same time. Apply pressure to the trigger straight to the rear and wait for the shot to break. Anticipation can cause muscular reflexes of an instant nature that so closely coincide with recoil that extreme difficulty is experienced in making an accurate shot call. Anticipation is the same as flinching.

3. Vacillation: Lack of know-how and skill causes constant changing of the technique. The minor imperfections in your performance could be corrected if you worked out a definite and complete plan of action. The end result is usually that you hope to get a good shot. The method of correcting this fault is that after you have developed a comprehensive plan follow it without deviation until you can make improvements in it based on careful analysis.

4. Anxiety: You work and work on a shot, meanwhile building up in your mind a doubt about the shot being good. Impatience sets in. Finally you shoot just to get rid of that particular round so you may work on others. Napoleon arrived at Waterloo traveling the same bumpy road.

5. Not looking at the sights: This quite frequently is listed as "looking at the target." A shooter may be focusing his eye on neither the sights nor the target, but since he does not see the target in clear focus he assumes he is looking at the sights. You must concentrate on sight alignment. The most efficient method of doing this is to point focus on a spot on the front sight and be acutely aware of the vertical and horizontal relationship with the rear sight notch.

6. Loss of Concentration: If the shooter fails in his attempt to apply positive, uninterrupted pressure on the trigger while concentrating the focus on the front sight it is because his prior determination to apply positive trigger pressure needs to be increased and reemphasized. The bogey of trigger timidity usually is a result of too much attention to attaining a perfect sight picture rather than perfect sight alignment. Perfect sight alignment is by far the easiest to obtain and maintain. The concentration will shift between sight alignment and the relative position of the target if good sight picture is the objective. Concentrate on sight alignment alone and the trigger pressure is almost involuntary.

7. Holding Too Long: Any adverse conditions that disturb a shooter's ability to "hold" will cause him to delay his positive application of trigger pressure waiting for conditions to become better. The disturbing factor about this is that you will do it sometimes when you have your normal minimum arc of movement, therefore, you must continuously ask yourself, "Am I trying to freeze all arc of movement momentarily so I can get off a perfect shot quickly before any movement is resumed?"

8. Overcorrection: Maintaining control of your shooting is a continuous battle. The battle builds tension. Tension tightens the muscles and finally the abrupt motions made in compensation for errors cause the shooter to go beyond the desired area and deliver shots in exactly the opposite place from where the error was causing him to shoot originally. Smoothly coordinated actions are best assured by the relaxed, confident and carefully planned approach.

9. Lack of Follow Through: Follow through is the subconscious attempt to keep everything just as it was at the time the shot broke. In other words you are continuing to maintain concentration on sight alignment even after the shot is on the way. This is accomplished by having a surprise shot break and no reflexes of anticipation to disturb sight alignment. Follow through is not to be confused with recovery. Merely recovering from recoil and reestablishing the hold on the target after the shot is fired is no indication that you are following through.

10. Match Pressure: (See Chapter VIII - Mental Discipline) If there are 200 competitors in a match, rest assured that there are 200 shooters suffering from match pressure. What makes you think you are so different? You should exert all your mental energy toward planning and executing the fundamentals correctly. Your shooting match pressure will become controllable and your competitors will congratulate you on your fine performance.

D. WIND SHOOTING AND ADVERSE CONDITIONS:

1. In a long day the weather is apt to change considerably. This means that a shooter must be able to react quickly to all changes taking place around him and to change his method of shooting accordingly.

a. First of all, a shooter ought to be guided by the rule that shooting should not be rushed when the weather conditions are changing appreciably. He should be particularly attentive, wait, and carefully analyze any new weather condition. After making a decision to shoot at a certain time, adopt appropriate method, and shoot under the new condition resolutely.

b. The wind not only pulls a bullet off to one side while shooting, but makes shooting very difficult by increasing the sway of both the shooter and his pistol, causing them to swing back and forth and reduces accuracy. The shooter should try to anticipate a compensating sight change if there is a side wind and, if there is a head wind, take care that the wind is deflected away from the eyes by shooting glasses. Powder fragments and acrid fumes blown back into the face cause smarting and watering of the eyes. The sway can be minimized by concerted effort to resist pressure exerted by wind. A slight increase in general muscular tension is necessary

c. Wind shooting is conducive to jerking the trigger. This is true because as the arc of movement increases, the shooter develops a tendency to relax his positive trigger pressure.

d. Usually the shooter is waiting for a more stable sight picture. His concentration on sight alignment will diminish and he will make an effort to set the shot off on the move as the sights pass the vicinity of the target center.

e. The obvious answer is to, first wait for a lull in the wind; next, concentrate as one normally does on sight alignment when and if the smallest arc of movement that is possible to obtain under existing conditions, is achieved.

f. Then start a constantly increasing, positive pressure on the trigger until the shot is fired. Do not continue the hold during extreme gusts. Always take advantage of a chance to rest. Each subsequent attempt to fire a shot should be made with a firm resolve to align the sights and to apply constantly increasing trigger pressure until the shot is fired.

g. The surprise shot continues to be the indicator, even under these conditions, of whether you are applying the fundamentals. Your shot group will be somewhat larger as a result of wind disturbance increasing the arc of movement but the wild shots resulting from faulty sight alignment, flinching, jerking and over correction will be minimized.

h. Extensive practice under wind conditions is not recommended but enough firing should be conducted under those conditions to prevent a stampede to the nearest wind shelter when a wisp of air movement stirs the pine tops.

i. Changing of Wind: When shooting at 50 yards and with the whole air mass is moving approximately in the same direction and speed, fairly accurate corrections can be made for wind in the sight setting. When doing this, however, it is not wise to start shooting automatically on the assumption that in setting the sight, all-purpose correction has been made.

The changing nature of the wind must be taken into account. The grass and weeds, etc., should be watched attentively while shooting to determine the force and direction of the wind, and a shot should be made only when exterior condition have been accurately determined for the period immediately ahead.

j. Sometimes the necessity to shoot when the wind is gusty requires a shooter to shoot accurately in a very short time, say within two seconds. The successful firing of an accurate shot under such conditions will be achieved only if a shooter has assumed the firing position in the short intervals between gusts and fires an aimed shot. When shooting under such conditions, he should figure out the most advantageous posture for himself in which he must rest and wait for the gusts of wind, so that as soon as there is a lull he will be able to take aim quickly and fire his shot.

k. To aid accurate shooting when a gusty wind is blowing and when the wind is changing, a shooter alters his tempo of shooting, sometimes shooting rapidly, sometimes once or twice when the wind is quiet or when the lighting is right, sometimes taking fairly long breaks, waiting out the unfavorable conditions for making a shot.

l. In order to manage the difficulties arising during prolonged shooting, a shooter should be prepared for them beforehand, so that he will be able whenever necessary to change both the tempo of his shooting and the many elements which make up his system of control as the situation in which he finds himself changes.

2. Adverse weather conditions such as cold, hot or rainy weather or extreme light conditions pose problems that can be solved in much the manner as in wind shooting. Be determined to adhere to the fundamentals and ignore as much as possible the distractions that are demoralizing to the competition. Compensate for the disagreeable conditions.

a. It is advisable to carry a raincoat with you at all times and possibly a plastic cover for your gun box to keep your equipment dry. Most ranges except for those at the National Matches have covered firing points that help to keep the competitor dry during rainy weather.

The folds and loose ends of a raincoat or overcoat flapping in the wind will cause body movement. A rain suit or short heavy coat are better garments for shooting in rain or cold windy weather.

b. During cold weather the shooter must obviously wear warm clothing to include insulated underwear. When the shooter becomes shivering cold it is difficult to hold the sights in perfect alignment or retain sensitive trigger control, thereby reducing his score considerably. Hand warmers are very good and are small enough to keep in the gun box or pocket. Light oil must be used in cold weather to prevent malfunction of weapons.

c. During hot weather, perspiration becomes a problem. A sponge sweat band keeps the sweat out of the eyes and it is recommended that a small can of powdered rosin be carried in the gun box to dry the palms of the hands. When not on the firing line the shooter should relax in the shade. Here again covered firing points provide protection from the sun. Salt tablets prevent heat prostration. Eat lightly.

3. Changes in lighting have a great influence on the accuracy of aiming. Under these conditions, the eye does not see the relationship of the front and rear sights to each other consistently, so that there is a considerable change in the point of impact. Experienced shooters usually settle on one lighting condition when the cloud cover is changing, aiming only when the sun is shining brightly or shooting only when the targets are in the shade, when the sun is behind a cloud. The choice of a lighting condition must be made depending on the length of time that the targets are well lighted or shaded.

Light condition varies from extemely bright to very dim and the shooter must keep a record of the light conditions on every range fired on in his score book. Some competitors are affected more by changes in light than others. A note should be made as to how much his zero changes in the different light conditions. Sights should be blackened with care on bright days. As a part of shooting accessories you should have both amber and green shooting glasses not only for light conditions but for protection against oil, powder fragments, fumes, wind and empty brass. Firing from an uncovered firing line usually requires different sight settings than the firing from under a shed. Ammunition should be kept out of the sun as its accuracy is affected if it is exposed to the direct rays of the sun.

A shooter must also be able to complete an entire match rapidly. The necessity for rapid shooting arises when, for example, twilight sets in. There are times on any range when a shooter must either accept an interruption during a match (which is sometimes very undesirable) or shoot at a stepped-up pace, as, for example, when the light on the targets shifts and he must finish shooting before the target begins to be lighted by the sun's rays coming through it from the rear, causing it to appear blotched and making accurate sighting and shooting impossible.

4. The major portion of our accomplishments on the firing line stems from our mental capacity to face up to the out of the ordinary and parlay these conditions into a winning margin. Poor conditions must never become an excuse to quit or compromise and consequently deliver a poor performance. Good scores are produced by hard work in the application of the fundamentals regardless of the conditions. Proper control of the application of the fundamentals is the most important factor in shooting winning scores under adverse conditions.

E. TRAINING METHODS:

1. Competition: Any top competitive shooter will give this one word of advice: Shoot every match you can afford. The special conditions created by shoulder to shoulder competition can best be controlled by lessons learned in match experience. To learn how to apply this control to your slow fire technique is the net result of continuous match competition.

If many matches are not available, try to make your practice sessions approximate match conditions as nearly as possible.

2. Dry Firing: Developing the ability to apply the fundamentals to your shooting is a tedious painstaking process. If the effort is confined to range practice and competitive matches, years of hard work and great expense for ammunition are involved. The use of dry fire practice can reduce the cost in both respects.

Dry firing develops the ability to control your shooting in all the primary factors: Coordination, eyesight, arc of movement, uniformity of applying fundamentals, analysis and correction, etc. Most shooters however, only dry fire when they are in trouble. A great assist in accelerating their development is cast aside.

Achieving the ability to control your body in its job of delivering a good shot is one of repetition of good shooting habits. Dry firing is a definite aid in this stage of development. Also maintaining the fine edge, so to speak, is a necessary training requirement for the champion.

To get the most out of your dry firing, use the appropriate work sheet to guide your work. Prepare and plan each shot as if it were a live round. Relax when you are ready and give yourself fire commands. Deliver the shot with the same amount of effort as in live practice. Have a target face on the bench to mark your shot calls on. If the shot call embraced a detectable error, analyze and determine why the error was in your performance. You may notice errors

in your performance that have been hidden in the recoil and report of the weapon as it is fired. Precise identification of these errors can be made only during dry fire sessions. A positive correction is necessary before proceeding to the next shot. A normal bulls eye, a blank wall or the open sky may be used to conduct dry firing.

Dry fire practice can be overdone. Initially, the new shooter should limit himself to ten minutes of sustained effort. Later, as performance improves, maximum time should be about thirty minutes. Sore, tired and aching arms and hands will reduce your scores and an idea may arise that dry firing is detrimental.

3. Ball and Dummy: Ball and Dummy exercise is another important aid in a accelerating your improvement. It is most effective when another person loads the weapon and observes the shooter as he attempts to fire.

The coach loads either a live or dummy round in a random sequence. The shooter must never know whether he has a live or dummy round in the chamber.

If the shooter is disturbing the weapon with anticipation muscle reactions in any way, the coach will be able to identify the error immediately.

After identifying the error pattern the coach and the shooter must agree on a positive correction to apply to the shooter's technique. Ideally, the correction will prevent reoccurrence of the error pattern. In most cases however, the coach and shooter must be satisfied with the errors occurring less frequently.

CHAPTER VII

TECHNIQUE OF SUSTAINED FIRE

Can you consistently shoot good timed and rapid fire scores? Have you ever had a chance to win a match and then blown up in Rapid Fire? Timed and rapid fire stages can be stumbling blocks, especially if attempted in a haphazard manner. However, through the development of proper techniques and careful planning, you can improve and become more consistent in your performance.

A recent development in the thinking of MTU shooters is the concept of sustained fire techniques instead of the more generally accepted idea of a separate method for each of the timed fire and rapid fire stages.

Many shooters of the caliber that have attained national and world rank, find a distinct problem of tension build-up caused by time limitation of rapid fire. It has been found that the best method is to practice the technique developed for rapid fire by employing it during the timed fire phase as well, with its more generous time allowance. We can then approach the rapid fire event with the confidence generated by having just proven the validity of the technique.

A further advantage is gained in that should an error pattern become apparent during timed fire, the shooter has ample opportunity to take corrective action. He can then test the effectiveness of the correction before being forced to employ it under the more strenuous conditions of the ten second time limitation of rapid fire.

A. EMPLOYMENT OF THE FUNDAMENTALS.

1. Before a shooter can entertain any hopes of becoming a champion he must have attained a complete understanding of the fundamentals of advanced pistol marksmanship.

a. To hold the weapon as still as possible to attain a minimum arc of movement.

b. Achieving and maintaining perfect sight alignment.

c. Apply constantly increasing positive pressure on the trigger until the weapon is fired. The shooter must employ a technique tailored to his physical and mental attributes that gives him the ability to control the employment of the fundamentals under all conditions of competitive stress.

When a shooter makes his plan on the firing line to shoot timed and rapid fire, usually a number of things have already taken place. Normally, his slow fire has already been fired and the same fundamentals apply to the shooting of timed and rapid fire. Turn to SECTION ONE and review the fundamentals. Chapter V contains the information on coordination of factors in controlling an accurate shot. In addition to these fundamentals, there are two more factors necessary in controlling timed and rapid fire. They are Recovery and Rhythm.

2. Recovery is the return of the weapon to the original holding position in the center of the aiming area that the shooter had when he started the string. If the shooter has a good solid stance, correct natural position, a firm grip, wrist stiff and elbow locked, the recovery is more natural and uniform. In the preliminary check out, if the weapon recovers to the right or to the left it may be corrected by simply moving the rear foot in the direction of the error. If the sight alignment deviates, a compensating shift in grip must be made. Recovery must be accomplished as quickly as possible to allow more time for precise alignment of the sights and applying positive trigger pressure. The instant that the weapon was fired, the shooter must immediately start the step by step task of applying the fundamentals for the next shot. A distinct rhythm will develop that enables him to deliver his string on the target under control and within the time allowed.

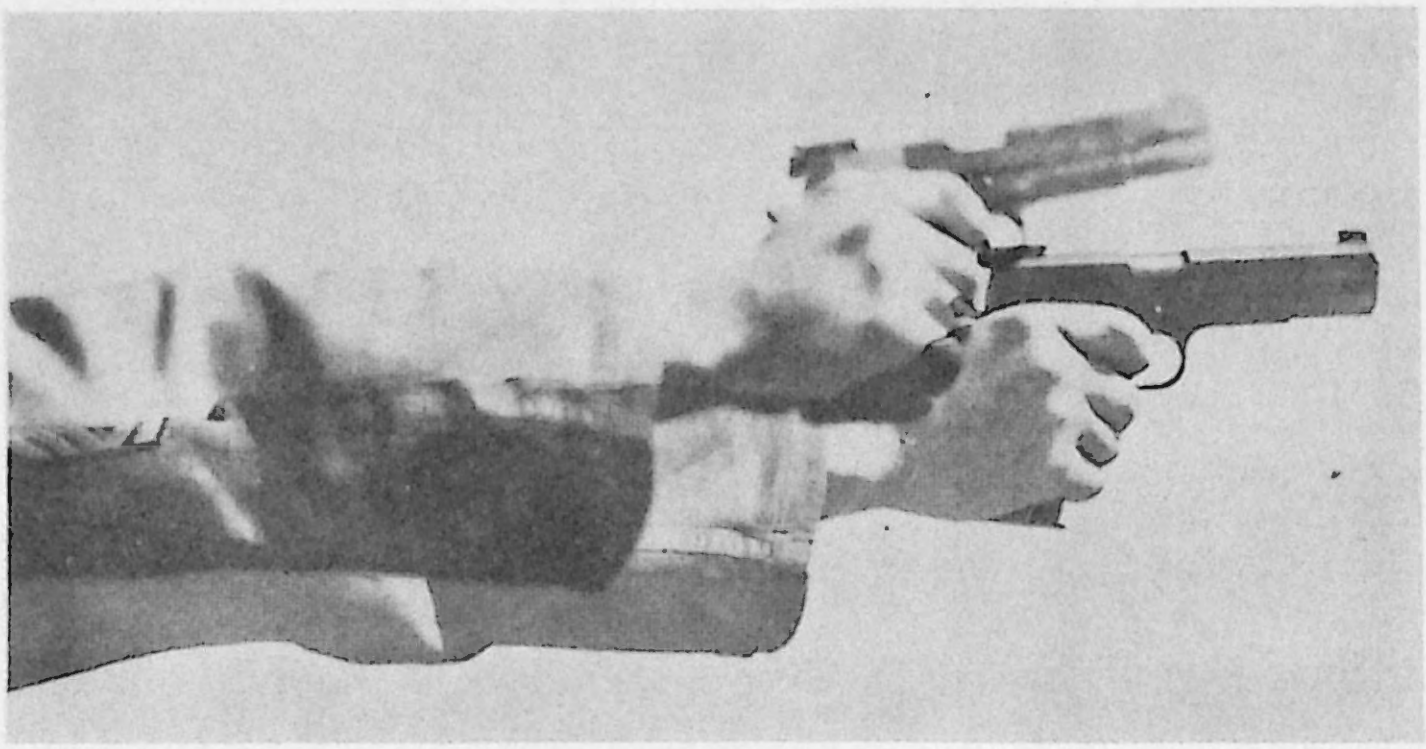


Figure 1. The stance, position, and grip must be firm enough to absorb the shock of recoil without causing bending of wrist or elbow. . . . . .

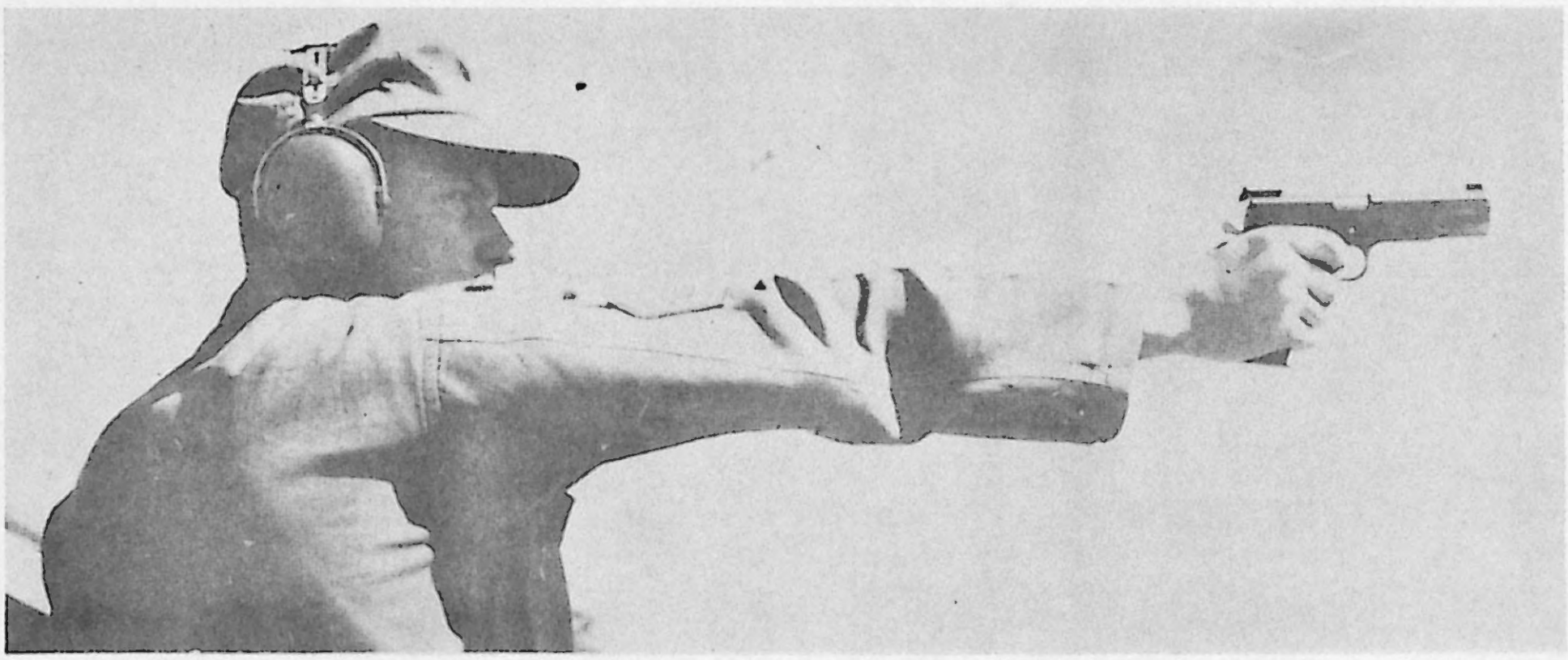


Figure 2. . . . . And correct enough so that your recovery will return the weapon to your aiming area quickly and precisely with a center hold and a natural alignment of sights.

3. Developing a good rhythm is very difficult but is absolutely necessary for good, consistent timed and rapid fire. By using a uniform technique, executing a planned sequence of actions correctly and applying careful timining for each shot, we achieve good rhythm. Concentrate on sight alignment and through practice make positive trigger control instinctive. In rapid fire the first shot should break soon after the target turns. It is not necessary to try to get the first shot to break while the target is turning but it should break within one second. Positive trigger pressure is applied as movement of the target is sensed by the shooter. Again you must recover as quickly as possible after each shot breaks so as to allow more time to reestablish the sight alignment and apply positive trigger pressure. It is particularly true during rapid fire that you do not have time to correct minor errors in hold. Any attempt to correct errors in hold results in loss of rhythm. This attempted correction causes a hesitation while the correction is being made and results in a speed-up of trigger pressure for the remaining shots of the string.

The lack of rhythm causes more bad rapid fire strings than any other factor. As explained previously the first shot must be fired within one second after the target turns in rapid fire. A common error is to try to make the first shot an X thereby losing valuable time in getting the string started. When this happens, usually the shooter becomes worried about the time, loses his concentration, speeds up his delivery rate, and as a result has poor rhythm and a bad string. Another common error in this vein, is to shoot the first four rounds with good rhythm then knowing there is a lot of time left, hesitates and tries to shoot an X on the last shot. Usually this last shot will be bad because the shooter does not apply trigger pressure properly. He invariably becomes worried about the time, loses his concentration and forces the shot to fire. In doing so he disturbs the sight alignment by either jerking the trigger or heeling the shot. In timed and rapid fire, a rhythm or cadence of firing must be acquired. This rhythm is needed for coordination and also for assuring the shooter, in a subconscious manner, that an equal amount of time is being allotted for each shot, and that he is abreast of the time schedule. Any mechanical operation has a certain rhythm and timed and rapid fire is a definite mechanical operation.

B. TECHNIQUE OF SUSTAINED FIRE. The shooter must consider all known factors having a bearing on the control of a five shot string of timed or rapid fire.

1. Find your aiming area on the edge of the target frame. Look directly at the faced target with your head in shooting position. Determine precisely where your aiming area is going to be when the target turns away. Relate this area to a spot on the edge of the frame nearest you. Once the targets turn edgewise you can't again check to see that you are holding on the proper area. The time limitation precludes the luxury of looking at the target as it turns toward you so you can adjust your hold to target center before applying positive trigger pressure for the first shot.

2. Stiffen your shooting arm as it should be as it extends the weapons toward the target and settles into the aiming area. Remember the degree of muscle tension required to give you solid arm control and a minimum arc of movement.

3. Decide how you are going to shift and maintain the focus of your eyes after settling into the aiming area. These changes in focus are to gain control of the eye muscles, to flex them by small movements, and to be sure they are focused on the front sight properly before the turning of the target. Many of our shooters look at the aiming area as related to a spot on the target frame one last time as they settle into their minimum arc of movement to reaffirm their knowledge of its exact location, then they shift their point of focus back to the rear sight before making a final point of focus on the front sight. This system is used to make absolutely sure the eyes are not focused somewhere between the front sight and the target.

4. The shooter must never forget that once he attains final point focus on the front sight he never again allows a focus shift until all five shots of the string have been fired. To look at the target at any time during the string is inviting disaster. Trust your stance, position and grip to give you precise recovery and to maintain a minimum arc of movement within your aiming area.

5. We advise using the first motion of the target while turning as the signal to apply positive, steadily increasing pressure on the trigger. The target's turning may sometimes produce a feeling of surprise and is accompanied by a momentary hesitation. This can cause a break in the shooter's composure and the firing of the first shot is delayed. By assuming a more determined attitude and stimulating your basic competitive aggressiveness you can overcome this problem. We suggest this approach: "When that target moves I'm going to punch the 10 ring full of holes!" You'll be surprised at the effect this action has of eliminating any remaining doubts and at the resulting surge of confidence that it incurs.

6. Reestablish sight alignment during recovery without a focus shift. This action is important because a focus shift during recovery will delay the reestablishment of sight alignment. Approximately one-half second is the extra time needed between shots for this ill-advised operation and this could total two full seconds of lost time. Successful rapid fire requires the use of ten full seconds for proper coordination and full control.

7. If you allow your eyes to follow the pistol during recoil, you may inadvertently move your head out of its original position. Any head movement during firing may disrupt the relationship between the aiming eye and the front and rear sight alignment. Correction will require a wrist movement which only artificially corrects the error. Upon recovery from recoil of the succeeding shot, the same error is once again apparent and likewise needs correction.

8. Reaffirm your determination to shift your concentration to sight alignment the instant the positive trigger pressure is resumed. Maintain your trigger concentration on sight alignment until the pistol fires again.

9. At this point the weapon will be moved out of the normal hold area by the recoil of firing and must recover instantly to the position it occupied prior to the dislocating effects of recoil. Recovery must be natural, uniform and quick.

10. As quickly as is possible you must reestablish a positive, steadily increasing pressure upon the trigger. This should occur shortly before recovery is complete and minimum arc of movement is reestablished. The increasing pressure should neither be stopped nor varied in rate until the weapon has again been discharged.

As soon as the positive, constantly increasing trigger pressure has been reapplied, shift your attention from thoughts of trigger control to the problem of sight alignment, just as you did on the first shot of the string.

If the grip you achieved in preparation is correct, firm arm control achieved and head position maintained, the sights will be in near perfect alignment at the end of recovery. However, this ideal situation occurs only intermittently.

12. Remind yourself that this technique, repeated for each shot, insures that continuity is established from one shot to the next, yet each shot has had a major effort expended to attain perfect sight alignment. Assure yourself that you can deliver a successful string on the target with an absolute minimum of wasted thought and time by following this system.

13. Good rhythm indicates coordinated control of the application of the fundamentals of pistol marksmanship.

C. COMMON DEFICIENCIES IN CONTROL: A number of common deficiencies are peculiar to timed and rapid fire.

1. Follow through applies to slow, timed and rapid fire. This is not to be confused with recovery. Recovery is bringing the pistol back to the original hold in the center of the aiming area after recoil. Follow through is the attempt by the shooter to keep everything exactly as it was until after the round is on its way to the target without any reflex of anticipation that disturbs sight alignment and spoils the surprise break of the shot. Lack of follow through is a breakdown of one or more of the factors set up by the shooter to control a good shot. For example, lack of follow through might be caused by a speed up of trigger pressure resulting in anticipation and a heeled shot at one o'clock.

2. Recovery must be made quickly to allow time for aligning sights and positive trigger pressure. Recovering too slowly takes up excess time, alters the shooter's rhythm when he realizes that he has very little time left and he then speeds up his delivery rate. Each shot of a five shot string must be fired individually, each one treated as a single shot. The shooter must see five distinct sight alignments. To make this easier, the shooter has to have the correct stance, position and grip so that the hold and the sights will recover into natural alignment with the target after each shot is fired. An incorrect grip will cause misalignment of the sights on recovery after each round is fired. This is corrected by carefully shifting the grip before the next string. Any tilting or turning movement of the head from its normal level position will cause the weapon to appear to recover either to the right or left of the bull's-eye. Both of these errors may cause a delay in firing on the shooter's part in an effort to correct them, breaking his concentration on sight alignment, losing valuable time and causing a loss of rhythm. All these factors add up to a poor string of five shots. Check out and dryfire the position and grip during the three minute preparation period just prior to the range officer's command "LOAD"!

3. Calling the shot group: After each five shot string, many shooters fail to remember each shot on the basis of five individual sight alignments and cannot call the shot group accurately. If the shot group call is made and the call and the group are not together, it is necessary to determine the cause and apply positive correction. If the shots are called good and group is not centered, then the weapon probably isn't zeroed, the position was bad or the grip incorrect. If the shooter is sure of the zero of his weapon, then dry fire the position and grip before firing the next five shot string.

4. Rhythm is absolutely essential and probably the lack of rhythm causes more bad strings than any other factor. As explained previously the first shot must be fired within one second after the target turns in rapid fire. A common error is to try to make the first shot an X and thereby lose valuable time in getting the string started. When this happens, usually the shooter becomes worried about time, loses his concentration, speeds up his delivery rate, and as a result has poor rhythm and a bad string. Another common error in this vein is to shoot the first four rounds with good rhythm then knowing there is a lot of time left, hesitate and try to shoot an X on the last shot. Usually, this last shot will be bad because the shooter does not apply trigger pressure properly, becomes worried about the time, loses his concentration and forces the shot to fire. In doing so he disturbs the sight alignment by either jerking the trigger or heeling the shot.

5. In shooting rapid fire the shooter does not have time to correct minor errors in hold. Trigger pressure is applied on the basis of sight alignment and not sight picture. The shooter should make every effort to keep his arc of movement at a minimum, continue positive trigger pressure, maintaining sight alignment, and shoot with a definite rhythm.

6. Lack of a system: When a shooter has a system to follow it relieves his mind so that he can concentrate on performance and not be worried about results. Care should be taken during the early stages of instructional practice to comply with each of the items on the shooter's worksheet. As the shooter becomes more capable, only the key items of preparation, shot sequence, shot analysis and positive correction are relevant. Methodical repetition of these essential steps will instill in the shooter good shooting habits that will enable him to repeat consecutively a good shooting performance. Further, the rapid fire worksheet will help the shooter form the habit of not overlooking any factor that will help his shooting. Winning scores are produced by being ready, confident, performing uniformly and being in complete control of your shooting.

7. Complete and instantaneous shot analysis is a mandatory prerequisite for any improvement in your performance or scores. It is a complete waste of time and ammunition to stand on the line and fire haphazardly without any comprehensive attempt to improve. A mental impression of where each shot went and why, should come at the instant the shot breaks.

8. Corrective measures to prevent the recurrence of a poor performance must be immediately applied.

9. Much has been written about why we shoot poorly; however, be reminded that it is just as advantageous to analyze why you are shooting well on a particular day. It is more helpful to know the right way to perform than to have your mind cluttered with a multitude of "don'ts." Coaches in particular should concentrate on and emphasize the positive factors.

10. Overeating at meals consumed during the shooting day has lowered many aggregates. The delicate edge that a shooter attains in the diligent training period before a match can be completely shattered by one hearty repast. The minimum arc of movement is greatly increased by the fitful pulsations of a heartbeat imprisoned between an overloaded stomach and a suet incased ribcage.

11. Inability to control mental processes while range commands are being given.

a. Indicates fear of failure or lack of motivation to do your best.

(1) Develop more effective method of stimulating confidence.

(2) Review the reasons why you are here as a shooter who came to win the match and encourage your competitive instincts by setting a goal just as high as you can possibly reach.

12. Concentration breaks as target turns.

a. Indicates lack of continuity between developing and applying plan of action.

(1) More attention required on developing a determined attitude and mental alertness.

(2) Review the system you use in starting positive trigger pressure and shifting and maintaining point of focus on front sight. Apply any correction needed.

(3) Remove all doubts as to location of center of aiming area of target in relation to the edge of target frame during the preparation stage.

D. TRAINING METHODS:

1. Frequent shoulder-to-shoulder competition and regularly scheduled record practice on the firing range with shooters who approach the problem of improving their shooting with enthusiasm and a serious and determined attitude, is the most effective method of accelerating your development as a top competitive shooter.

2. To be most effective, each practice session must have a goal. You should approach the training period with the idea that you are going to distinctly improve one aspect of your shooting technique and at the same time continue the general improvement of your ability to employ the fundamentals more effectively.

3. To improve your ability to deliver your first shot quickly and accurately, we advise a practice session of about ten rounds delivered in the following manner. Adjust the target turning mechanism to face the target and turn it away after one and one-half seconds. Use your normal preliminary preparation with maximum attention on delivering the first shot without hesitation as the target turns. Fire one shot only. Repeat the exercise ten times with sufficient time between shots to allow for mental reorganization and preparation. Fire two, five-shots strings with the proper ten second interval of the facing of the target to establish your rhythm and then shoot a rapid fire, twenty (20) shot match for record practice.

4. To improve your ability to achieve rhythm and maintain a point focus on the front sight, place a target face on the frame backwards so that no bull's-eye or aiming point is visible. Assume your stance, position and grip with meticulous attention to detail. Without a point to aim at, you will find that you must trust your stance and position to maintain an acceptable arc of movement. You will find it easier to apply the fundamentals and discover that you can deliver the string with amazing accuracy. Rhythm and sight alignment can be maintained with a startling degree of control and assurance. This is because the distracting effects of having an exact point of aim has been eliminated. You have no way of knowing when a perfect hold occurs. A perfect sight picture is not necessary. You simply accept minor errors and go ahead and follow your plan. After firing on the blank center you should immediately go into a rapid fire match with a normal target for record practice.

5. One word of advice: Avoid training and shooting alone. Use a training program that duplicates as near as possible the competitive atmosphere of a match. Develop and use a comprehensive plan that gives you the ability to employ the fundamentals most realiably under pressure and continually strive for improvement.

6. Dry firing practice should be conducted with the same careful attention to detail as live ammunition practice. The shooter's rapid fire worksheet (par C, "Establish a system"), this Chapter, is a guide to perfecting your system of shooting control.

E. WIND SHOOTING AND ADVERSE CONDITIONS: During timed and rapid fire, the shooter has to fire when the commands are given, wind or no wind. The means of overcoming this disturbing handicap are in the strenuous efforts to apply the fundamentals, but with less positive results, because the shooter cannot maintain his normal, minimum arc of movement. Concentration on sight alignment regardless of movement caused by wind, will result in groups only sightly larger than those fired under ideal conditions.

1. Wind shooting is conducive to jerking the trigger. This is true because as the arc of movement increases the shooter develops a tendency to relax his trigger pressure. He is waiting for a more stable sight picture. His concentration on sight alignment will diminish and he will make an effort to set the shot off on the move as the sights pass the vicinity of the target center. The obvious answer is to, first: concentrate as one normally does on sight alignment and maintain as small an arc of movement as possible; start a series of constantly increasing pressures on the trigger until all shots are fired. Each attempt to fire a string of shots should be made with a firm resolve to align the sights for each shot and to apply increasing trigger pressure in spite of the increased arc of movement due to the wind. Your shot group will be larger as a result of the increased arc of movement but the wild shots resulting from faulty sight alignment, flinching, jerking and overcorrection will be minimized.

Rhythm must be maintained throughout, with the uncompromising determination not to hesitate in applying positive trigger pressure despite the abnormal movement the shooter has in his extended shooting arm.

Extensive practice under windy conditions is not recommended but enough firing should be conducted under those conditions to prevent a stampede to the nearest wind shelter when a wisp of air movement stirs the pine tops.

One should not place too much reliance on indications of flags, if they are raised high above the line of targets and the firing line. In addition, one should not accept the indications of flags flying at the edge of a forest, steep precipices, ravines and depressions, since the wind speed, in various layers of the atmosphere and terrain irregularities, is different. It should be entirely clear from experience that the indications of flags flying on a high pole do not correspond to the true intensity of wind acting directly on the flight of the bullet. It is necessary to be guided by the indications of high grass, tall weeds, strips of paper, etc. in the vicinity, which are nearer the level of the weapon-target line.

It should also be kept in mind that wind can blow around terrain irregularities and create all kinds of turbulence. If flags were set up along the entire length of the range, they often would indicate a different, even opposite, wind direction. For this reason, the shooter should not always rely on one indication at the line of targets. Determine wind direction and intensity for the entire length of the range, by carefully observing the motion of grass and bushes located between the firing line and the target.

With time, the shooter develops a subconscious feeling and acquires experience that enables him to become rapidly oriented to wind conditions and to make the necessary corrections for carrying out accurate fire under adverse conditions.

2. Adverse weather conditions such as cold, hot or rainy weather or extreme light conditions pose problems that can be solved in much the same manner as in wind shooting. Be determined to adhere to the fundamentals and ignore as much as possible the distractions that are demoralizing to the competition.

a. It is advisable to carry a raincoat with you at all times and possibly a plastic cover for your gun box to keep your equipment dry. Most ranges except for those at the National Matches, have covered firing points that help to keep the competitors dry during rainy weather.

b. During cold weather the shooter must obviously wear warm clothing to include insulated underwear. When the shooter becomes shivering cold it is difficult to hold the sights in perfect alignment, or retain sensitive trigger control, thereby reducing his score considerably. Hand warmers are very good and are small enough to keep in the gun box or pocket. Light oil must be used in cold weather to prevent malfunction of weapons.

c. During hot weather perspiration becomes a problem. A sponge sweat band keeps the sweat out of the eyes and it is recommended that a small can of powdered rosin be carried in the gun box to dry the palms of the hands. When not on the firing line the shooter should relax in the shade. Here again covered firing points provide protection from the sun. Salt tablets prevent heat prostration. Eat lightly.

d. Effect of temperature on shot dispersion. The lower the air temperature, the greater the air density. A bullet travelling in denser air encounters a large number of air particles, with the result that it loses its initial velocity rapidly. Therefore, when shooting in cold weather, the bullet range decreases and the center of impact moves downward.

In addition, temperature also affects the combustion process of the propellant. It is known that the rate of burning of a propellant increases as temperature rises, since the amount of heat required to heat and ignite the powder grains is minutely reduced. Consequently, the lower the air temperature, the slower the buildup of gas pressure, with the result that the bullet muzzle velocity drops slightly.

Thus, it has been established by experiments that a change in air temperature of 1^{o} causes a change in muzzle velocity of approximately 3 foot/seconds.

In firing a large number of rounds for an extensive period of time, when the pistol barrel becomes hot, the shooter should not permit a round to lie in the chamber too long. The relatively high temperature of the barrel is transferred to the propellant by means of the cartridge case, and causes accelerated ignition of the charge, which, in the final analysis, can lead to a change in center of impact and to high shots, depending upon the length of time the round lies in the chamber.

3. Light varies from extremely bright to very dim and the shooter must keep a record of light conditions on every range fired on in his score book. Some competitors are affected more by changes in light than others. A note should be made as to how much his zero changes in the different light conditions. Sights should be blackened with care on bright days. As a part of the shooting accessories, you should have both amber and green shooting glasses not only for light conditions but for protection against oil, wind and empty brass. Firing from an uncovered firing line usually requires different sight settings than the firing from under a shed. Ammunition should be kept out of the sun as it's accuracy is affected if it is exposed to the direct rays of the sun.

4. The major portion of our accomplishments on the firing line stems from our mental capacity to face up to the out of the ordinary and parlay these conditions into a winning margin. Poor conditions must never become an excuse for a cursory and consequently poor performance. Good scores are produced by hard work in the application of the fundamentals regardless of the conditions. Proper application of the fundamentals is the most important factor in shooting winning scores under adverse conditions.

SECTION THREE

CONTROL OF EMPLOYMENT OF THE FUNDAMENTALS OF PISTOL MARKSMANSHIP

CHAPTER VIII

MENTAL DISCIPLINE

Mental discipline is the indispensible element governing the control of the technique of proper employment of the fundamentals. The distinguishing feature of successful competitive shooting is that it is associated with overcoming obstacles and difficulties which require great exertion of all a person's mental capacity in order to force himself to overcome these obstacles. Therefore a shooter must make determined efforts to acquire qualities of strong will: steadiness, resoluteness, endurance, and discipline. A shooter must learn to fight fatigue and hardship, and to bear up under stress for long periods of time, forcing himself to shoot on until the end without letting his score fall off, by the effort of the will. By determined effort, he must maintain his emotional equilibrium, if he makes poor shots, he must not give way to disgust and irritation but, to take himself in hand and bring up his performance by exertion of intestinal fortitude. The ability to keep control of oneself, to force oneself to overcome difficulties, and to maintain presence of mind in any difficult situation is a necessary quality. Without this resource, a shooter will not achieve good competitive form nor make high scores in a match. Along with mental discipline, a shooter must have high moral qualities: a sense of duty and responsibility to the group, a sense of loyalty to his teammates and a sense of honor. These honorable traits and high moral qualities are a source of inexhaustible will to victory. In difficult moments of a tense showdown, they help the shooter to mobilize all his resources for victory. That is why experienced coaches give so much attention to instilling high moral and disciplinary qualities in a pistol marksman.

No person is born with these moral and disciplinary qualities which are so necessary for overcoming the many difficulties with which he must contend in tournaments and matches. They are partly developed in the course of the shooter's life and the activities of daily living of each individual. Training therefore, should be conducted so as to provide not only for the technical improvement of a shooter, but should most certainly be conducted so as to provide for the strengthening of his willpower so that he may force himself to train with persistence and to keep himself under control during competition.

A. ESSENTIAL:

1. Mental control has become essential to advanced marksmanship because mastery of the physical skills alone does not provide the uniform, precise control of performance necessary to compete at the highest level. Too little emphasis is placed on how and what to think. The capacity for intense concentration will provide for exacting control of the coordination of the essential factors necessary for the delivery of an accurate shot on the target.

2. Mental discipline provides the grasp the shooter must have of his mental faculties to maintain his confidence, positive thinking, and thereby, the ability to duplicate a successful performance. It further provides continued interest which is stimulated by the desire to improve and the ability to channel sustained mental effort. It will help to control thought and action and avoid overconfidence, pessimism and exposure to conditions that will disrupt his mental tranquility.

3. Mental discipline provides the emotional stability so necessary to the development of the champion shooter. Confidence in his ability and mastery of the basic skills combine to produce a dependable performance under all degree of stress.

4. The self-control attained by the advanced pistol shooter pays off not only in better match scores, but also in combat situations, where by the calmness and resolution exhibited in using his weapon, he can kill with nearly every round fired.

B. DEVELOPING MENTAL DISCIPLINE AND CONFIDENCE: The continuously repeated, successful execution of a step-by-step, completely planned ppproach to the firing of each shot as pertains to the physical acts and certain elements of mental control involved, results in the gradual development of a mental discipline. The proper degree of mental discipline restricts the thoughts and actions during shooting to an established pattern from which there will be few deviations. Adopt the positive attitude and make up your mind how you are going to fire the shot. Psychologists have determined that there are four basic methods of responding to a problem. Two methods are positive and classified as either direct or indirect. Two methods are negative, classified as either retreat or evasion.

1. Positive response to a problem.

a. The direct, positive approach. This is the self-confident, self-sufficient, direct, positive attack that realistically faces the facts, analyzes them, identifies the obstacles to a successful solution and proceeds to grapple tenaciously with them until the solution is found. You know what you want to accomplish and you take direct steps to attain it.

b. The indirect, substitute or compromise approach. Small, diffident, tentative, indirect action in which sidestepping leads to seeking short-cuts and when the probable solution is tried, there is much feverent hoping that the fates are on your side. You are only hinting and probing instead of stating definitely what you need to do.

2. Negative response to a problem.

a. The negative retreat. The failure to give the honest try to see what you are capable of accomplishing. Surrendering without an honest attempt. The flight habit can become chronic. This is the man that cannot accept the responsibility for a mistake or failure. A bad shot produces excuses.

b. Evading the issue. Evasion is the lack of incentive. Why?, is the approach. Why do I have to do better than anybody else? If the desire to excel is not there, you will never aimlessly or otherwise achieve the degree of accomplishment that crowns the champions.

3. Analyze the problem.

Psychologists have discovered that one of the chief reasons for difficulty in the solution of problems is inability to soundly analyze the problem. Pose a clearcut plan of action in full array, facing the specific difficulties and where faced with a particular difficulty, make a determined effort to break it down. If it is identified, there is a solution for it because there are shooters on your team or some other team that are operating without this specific problem putting a brake on their performance. Air it out. A communal pondering session will break it wide open. There is a four-point system of analyzing and solving specific problems. It reduces the whole big problem to many specific small ones. Head four columns on a sheet of paper with the following titles: one, 'STEPS IN THE PLANNING' of control for firing an accurate shot; two, 'SPECIFIC DIFFICULTIES' in performing each step of the shot plan; three, 'SUCCESSFUL SOLUTIONS' to each of the steps that are being performed satisfactorily; four, 'DEGREES OF SUCCESS' with those difficult steps that aren't working out too well. Refer here to Chapter IV, "Establish a System" and follow the plan of firing a controlled shot.

The positive action approach requires that we be specific, that we have a definite plan, that we support the plan by consistent use of each step of the plan, that we be persistent in the face of difficulty in execution of any step of the plan, not rest until a solution is reached and finally that we be on guard against compromise and negative thoughts. The positive approach to overcoming obstacles in our ability to exert mental control over our actions can become automatic. The power of positive thinking leads to confidence. An example of four point system of analysis of shooting problems follows:

NAME _____ RANK _____

POSITIVE RESPONSE TO A SHOOTING PROBLEM

STEPS IN THE PLAN	SPECIFIC DIFFICULTIES	SUCCESSFUL SOLUTIONS	DOUBTFUL SOLUTIONS OR NO WORKABLE SOL.
1. PREPARATION			
a. PHYSICAL			
(1) PERSONAL			
(2) LIMBER UP			
(3) CHECK FIRING LINE			
(4) CLOTHES & SHOES			
(5) FIRING CONDITIONS			
(6) CORRECT FIRING POINT			
(7) SCOPE YOUR TARGET			
(8) CHECK WEAPON			
(9) AMMUNITION			
(10) NATURAL HOLD (STANCE & POSITION)			
(11) NATURAL SIGHT ALIGNMENT (GRIP AND HEAD POSITION)			
(12) BREATHE DEEPLY			
b. MENTAL			
(1) STIMULATE CONFIDENCE			
(2) THINK SHOOTING METHOD MENTALLY REVIEW:			
(3) EXTENDING ARM			
(4) BREATH CONTROL			
(5) SIGHT ALIGNMENT			
(6) TRIGGER SLACK & INITIAL PRESSURE			
(7) FINAL BREATH, MINIMUM ARC OF MOVEMENT			
(8) POSITIVE TRIGGER PRESSURE			
(9) COORDINATE ALL CONTROL FACTORS			
(10) CONCENTRATE ON SIGHT ALIGNMENT			
(11) TRIGGER PRESSURE INVOLUNTARY			
(12) CONTINUE APPLYING CONTROL FACTORS			
(13) SURPRISE SHOT-FOLLOW THRU			
2. PLAN THE SHOT			
a. STANCE			
(1) STABLE BALANCE			
(2) IMMOBILITY			
(3) HEAD POSITION			
(4) UNIFORMITY			
(5) POSITION OF FEET			
(6) BODY ERECT			
(7) SHOULDERS LEVEL			

STEPS IN THE PLAN	SPECIFIC DIFFICULTIES	SUCCESSFUL SOLUTIONS	DOUBTFUL SOLUTIONS OR NO WORKABLE SOL.
(8) LEGS FIRMLY STRAIGHT			
(9) HIPS LEVEL			
(10) HEAD LEVEL			
(11) NON-SHOOTING ARM & HAND			
(12) SHOOTING ARM			
(13) CENTER OF GRAVITY SLIGHTLY FORWARD			
b. NATURAL POSITION ORIENTATION			
(1) START AT 45 DEGREE ANGLE			
(2) TURN ONLY HEAD			
(3) EXTEND ARM			
(4) CLOSE EYES			
(5) RAISE ARM & SETTLE			
(6) OPEN EYES			
(7) SHIFT TRAIL FOOT IN DIRECTION OF ERROR IF NECESSARY			
(8) RECHECK			
c. GRIP			
(1) NATURAL SIGHT ALIGNMENT			
(2) FIRM TO PREVENT SHIFT			
(3) UNCHANGING TIGHTNESS			
(4) INDEPENDENT TRIGGER FINGER			
(5) UNCHANGING CHARACTER			
(6) COMFORTABLE			
(7) RECOIL STRAIGHT TO REAR			
(8) AVOID FATIGUE OF HAND			
d. BREATH CONTROL			
(1) SYSTEMATIC			
(2) OXYGEN RETENTION			
(3) MINIMIZE MOVEMENT			
(4) RESPIRATORY PAUSE			
(5) COMFORTABLE			
(6) CONCENTRATION AIDED			
(7) PRIOR & DURING FIRE COMMANDS			
e. SIGHT ALIGNMENT (RELATIONSHIP OF FRONT AND REAR SIGHTS)			
(1) FRONT SIGHT POINT FOCUS			
(2) REAR SIGHT AWARENESS			
(3) EXCLUSIVE CONCENTRATION			
(4) 6 TO 8 SEC. DURATION			
(5) COORDINATION WITH OTHER CONTROL FACTORS			

STEPS IN THE PLAN	SPECIFIC DIFFICULTIES	SUCCESSFUL SOLUTIONS	DOUBTFUL SOLUTIONS OR NO WORKABLE SOL.
f. TRIGGER CONTROL (1) POSITIVE TRIGGER PRESSURE (2) 2 TO 5 SECONDS (3) BASED ON PERFECT SIGHT ALIGNMENT (4) UNDISTURBED SIGHT ALIGNMENT (5) COORDINATE WITH OPTIMUM PERCEPTION, MINIMUM ARC OF MOVEMENT			
3. RELAX BEFORE SHOT a. NECK b. SHOULDERS c. NON-SHOOTING ARM d. ABDOMEN e. BACK f. BUTTOCKS g. UPPER LEGS			
4. DELIVER THE SHOT (SHOT SEQUENCE) a. EXTEND ARM & BREATHE b. MINIMUM ARC OF MOVEMENT c. PICK UP SIGHT ALIGNMENT d. TRIGGER SLACK & INITIAL PRESSURE e. FINAL BREATH f. MAINTAIN SIGHT ALIGNMENT g. MAINTAIN MINIMUM ARC OF MOVEMENT h. START POSITIVE TRIGGER PRESSURE i. CONCENTRATE POINT OF FOCUS ON FRONT SIGHT			
5. ANALYZE THE SHOT a. CALL b. CONFIRM c. EVALUATE (1) GOOD SHOT - BAD CALL GOOD SHOT OR CALL (2) BAD SHOT - GOOD CALL BAD SHOT OR CALL			

STEPS IN THE PLAN	SPECIFIC DIFFICULTIES	SUCCESSFUL SOLUTIONS	DOUBTFUL SOLUTION OR NO WORKABLE SOL.
d. WHY? (1) (2) (3) (4) (5) (6) (7)			
6. CORRECTION INCLUDED IN PLAN FOR NEXT SHOT a. STANCE b. POSITION c. GRIP d. BREATH CONTROL e. SIGHT ALIGNMENT f. TRIGGER CONTROL			

4. Confidence results also from repeatedly bringing under control all the factors that create conditions for an accurate shot. An accurate shot is one that hits the target within the shooter's ability to hold. People have been telling you for years that you must have confidence to shoot well. Confidence in what? How do you get it? How do we keep it once we put our hands on it?

a. First and foremost you must have confidence in the fundamentals of advanced pistol marksmanship that you use. You must be convinced that if you control their employment correctly, you will achieve excellent results.

Nothing can be more undermining than to attempt any task with wishy-washy ideas about how to accomplish it. You must believe, and preferably prove to yourself, for example, that sight alignment is vastly more important than sight picture. Believing in correct rhythm and your ability to execute the same, as the greatest deterrent to anxiety in rapid fire. The techniques of employment of the fundamentals that you have proven sound and dependable by experience are not going to change suddenly to unreliable factors because of match pressure.

b. Confidence in yourself and your ability to execute these proven fundamentals correctly. You have proven your degree of ability to do this in your practice sessions. Go ahead and do it in the big match. To the timid and hesitating, everything is impossible, because it seems so.

c. Think big! Think positive! "I will do it," and you will succeed. However, as soon as you admit the slightest possibility of failure, so long as there is an influence in your mind that is preventing you from putting all your energies into your task, your success is questionable.

d. It has been said innumerable times that a pistol shooter must have an open mind, implying that we must have the ability to accept new ideas. What we should also strive for is a mind that is open to positive thoughts and completely closed to those of negative vein. You have heard so many times, "don't jerk the trigger." True as this axiom may be, it is of no advantage to have this thought enter your mind when you are trying to get off a shot, for it is negative, it is implies failure, it continually occupies your efforts with something you don't want to do rather than something you should do. Would it not be more advantageous to think, "I must apply pressure firmly, evenly and straight to the rear so as not to disturb sight alignment, for when I do this, I will get a good shot." This is the positive side of the picture, it implies success, and gives you something that you should do rather than something you should not do.

e. Another big problem faced by the excitable pistol shooter is "getting them all off in rapid fire," and in spite of the necessity for doing this, his approach to it is negative. As has been stated previously, have confidence in your technique and your ability to apply the fundamentals properly. In this case specifically, confidence comes from assurance that if you employ rapid fire technique correctly, (you can, for you have accomplished this many times before) you will complete your string of rapid fire rhythmically and on time. As a result of thinking positively, your mental effort is directed toward executing the string as planned and with a proper rhythm. You have an indication of what we are driving at from the example cited. Sweep out your mind, rout out all of those negative and detrimental thoughts, and replace them with positive thoughts.

Our doubting mind didn't last too long did it? What we want is a mind so full of positive "do's" and "will's" that there is no room or necessity for those distracting "don't's" and "can't's". However, just thinking positively is not enough; we still must have definite ideas of how we are going to employ these positive thoughts. There is no room for vagueness or vacillation. This of course brings us right back to having confidence in our ability to apply the fundamentals.

A confident attitude adversely affects your competitors. A pistol match is generally conceded to a small number of confident individuals who expect to win. Confidence is contagious and favorably effects your teammates.

Smile. Give no comfort to your competition by revealing by word or act that anything is wrong that might affect the normal, favorable outcome of the match.

5. Channeled mental effort resists the tendency of the mind to drift during the period when intense concentration on sight alignment is essential.

a. Channel Mental Effort relentlessly toward the final act, as does the trigger pressure that releases the firing mechanism without disturbing sight alignment.

b. Complete Exclusion of Extraneous Thoughts for a brief period (three to six seconds) is necessary for controlled delivery of the shot.

c. Prior Planning of the Sequence of Action is necessary to deliver a controlled shot on the target and gradually enables the shooter to sustain concentration for a longer period.

d. Careful Planning of a Sequence of Events closes the mind to other thoughts. Example: If a prior plan is made to apply positive trigger pressure when sights are in alignment and the arc of movement is at the minimum, uninterrupted, positive trigger pressure becomes almost involuntary.

e. Coordination of Thought and Action is the result of experience obtained through extensive practice and match shooting where the same satisfactory plan of action is followed repeatedly.

f. Precise Coordination is absolutely necessary in controlling the delivery of a single shot or a string of shots in a limited time interval.

g. Split Second Coordination and Timing are Maintained by frequent practice and when the practice time is limited to less than sufficient, do not be overconfident and expect to be able to sustain your coordination completely through prelonged match shooting conditions. You must operate efficiently and save your energy.

C. WHY CAN'T YOU BE A WINNER? The danger of negative thinking.

1. Who won the last match in which you participated? If you didn't win, why? To achieve results on a level that will produce winning scores in today's competition, it is necessary to have a coordinated, exacting control of the technique of employment of the fundamentals based on the capability for intense concentration. Each properly executed sequence of actions that creates conditions for a good shot, contributes to the ease with which it can be repeated.

Why is it so difficult to shoot championship scores? It's not that most of us have not been taught the fundamentals of pistol shooting. The fault usually lies in that we open our minds up to thousands of negative reasons why we cannot shoot good scores.

a. Bad weather, rain, cold, sun, wind, etc.

b. Inefficient range operations.

c. Below standard equipment and ammunition.

d. Lack of incentive.

e. Competition too tough.

f. Afraid to win.

g. Carelessness.

h. Overconfidence.

i. Pessimism.

j. Exposure to distractions.

There are probably numerous other factors but these are a few that were pointed out by top level shooters. We know that we must exclude factors that detract from good performance and use those remaining factors to our advantage.

The following is a discussion of each of these reasons that induce poor performance, and what can be done about them:

a. When the weather is bad, it is simple to say "It's raining, snowing, the wind is blowing on everyone and all the scores are going to be bad." This may be a true assumption, you can follow this vein of thought throughout the match but you probably will continue to shoot just average scores as compared to your competition.

Why not think and convince yourself that good scores have been fired under the same bad conditions and that positive application of the fundamentals has produced good results in spite of the numerous difficulties? If your thoughts are directed strongly enough towards planning and executing a controlled performance, you will not have time to think of the weather.

b. Don't "Sunday-morning-quarterback" the operation of the range. In most instances, all it takes to change an inefficient situation is to have your coach bring the deficiency to the attention of the Chief Range Officer, Executive Officer, or Referee. If the condition continues to exist, then convince yourself that "As long as there is a target to shoot at and I have the proper amount of time to shoot, I will shoot good scores."

c. Have ever you asked yourself, "Why do I have to shoot exceptional scores?" The answer to this question will naturally vary with each shooter. You must be motivated to constantly improve your performance or else you should change to a less demanding endeavor. The most common excuse for not trying your best is lack of incentive because there is no competition. A tendency to drift aimlessly through a pistol match becomes a habit through constant repetition to the extent that you tolerate a substandard performance without becoming alarmed. The point here is: regardless of the competitive ability present for this particular match, you must be on guard against relaxation of your determination to employ the fundamentals to the utmost of your ability. You must retain the desire to win and set new records at all times. Failure in this area too often will cause a decline into a habit of treating your shooting as a weekend lark.

d. How often have you beaten yourself by allowing yourself to think that the cause of your poor performance was due to poor equipment? Or thought that the competitors who beat you had better equipment than you? How can we keep such thoughts as these from entering our mind? The main components necessary to shoot championship scores are an accurate gun, good ammunition and an individual with the ability (physical and mental) and desire to shoot. Whether you are civilian or military, find a gunsmith and have him accurize a gun and test it until it holds a ten ring group. You are now aware that this weapon is capable of shooting possible scores and you can ask yourself this question, "How many 2700 possible scores have been

fired?" Of course, the answer is "None." Therefore before every time you let the thought of inferior equipment enter your mind, STOP! Think: "This gun and ammunition will shoot possibles if I control it."

e. "The competition is too tough." "Nuts!" If you will look at these individuals who now seem to look like supermen, analyze a few of them and compare their attributes with yours. Here's what you'll find in the majority of the cases. They are built just like you, have approximately the same physical ability, hands about the same size, etc. What then, is their thought pattern? The potential winner is thinking, thinking about applying his plan of action as pertains to the job at hand, not about how he is going to beat you. He knows that most of the other competitors are beating themselves with their own uncontrolled thoughts. You can be one step ahead of all your competitors by directing your mental capability towards your plan of controlling each shot.

f. There's a first time for winning in shooting as in everything else. A first time for a national champion to be beaten, and a first time for you to become a national champion. You have never won a major championship before. Was it because you didn't have the ability or was it because you sought excuses and conceded your chance of winning? You have probably won individual matches but that's as far as you have allowed your mental capability to carry you. Now if you really want to win, you can. The best way, as previously discussed in other paragraphs, is to believe you are as qualified to win as anyone else. Make up your mind that you are going to shoot your next 2700 aggregate as one big match and let the individual stages and gun aggregates take care of themselves. A good performance on each individual shot and string is now your aim. Don't let the possibility of winning one little match shatter your composure.

g. Do you expect that you will inevitably commit a stupid act in every match you fire in, thereby forfeiting any chance of winning? Carelessness is a state of mind that overwhelms an individual who is aimless and haphazard in his approach to a challenging task. Organization of all the factors having a bearing on the task to be performed will in most instances assure that the action will be successfully executed.

h. Overconfidence dulls the normal responses of the individual to the impending development of unfavorable conditions that could upset the sensitive balance on which his optimum performance depends. Do not relax your determination to perform your best even if competition is not too keen or you are mad at the coach. Strive to reach a happy medium between overconfidence and negative thinking.

i. Pessimism detracts from the shooter's ability to channel his concentration. Anxiety of possible failure undermines the ability to control the shot. Impatience and uncontrolled actions are the results. A negative approach precludes the probability of repeating a uniform, satisfactory performance.

j. Avoid conditions which the shooter knows or should know will contribute to the disruption of his tranquility and mental control. Avoid emotional upset such as anger, worry, giving up under adverse conditions or unsatisfactory shots, boasts, rumors, misinformation, and side remarks. Ignore knowledge of other scores by scoping competitor's targets or haunting the scoreboard. Resist concern over your final results. Dismiss concern over the slight advantage of superior equipment. Avoid adding up individual shots as the buildup to the final score. Use the scope to confirm shot calls and control shot group.

D. MATCH PRESSURE: If you think that you and you alone have the problems of match pressure, look around; we all have it. The man who has never experienced match pressure has never been in a position to win a match. Where is the difference? Where is the dividing line between champion and duffer? Both may shoot comparable scores in practice, yet one is

invariably at the top of the bulletin and the other on the second page. The dividing line is clear and obvious; the ability or lack of control in their thinking. Mental discipline. Some have learned to control their emotions and anxieties and go right ahead and perform within their capabilities. Others, even with years of experience, and also with a wealth of doubts and negative thoughts, pressure themselves out of the competition every time they step up to the firing line.

1. First, in our treatment of match pressure, we must find what causes it, for without knowing the precipitating factors, we can never combat it. Match pressure is the direct result of the fear of failure and the loss of self esteem. Are we afraid of winning? If this were the real cause, we would have no desire to win, or to perform well, and there would be no pressure. No, it is not the actual winning we are afraid of. We are afraid of not winning. This factor generates our fear of performing poorly and having our fellow competitors see our poor performance.

2. What happens to us physically when we are subjected to all of these mental gymnastics that result from match pressure. First and most prominent, we shake, we drop our magazines, put our scope on the wrong target and some of us even shoot on the wrong target. In short we commit what seems a series of asinine mistakes that normally would never occur. Unfortunately, this problem has never been approached on a truly scientific basis. The main thing that will help a shooter is experience and practice in tournament participation against the best competition. The champions in spite of their nervousness in match competition, mobilize all their energies and resources and on occasion, do even better in a match than in practice.

All emotions and sense experiences which a shooter undergoes are essentially physiological nervous process arising in the cortex and in the subcortex of the brain.

When a shooter is experiencing nervousness, all the changes in his body take place as a result of the disruption of the interaction of the exciting and depressing processes in the cortex and the fact that one of them becomes dominant in the various parts of the brain. If the exciting processes are dominant, agitation in one's movements is observed, and a shooter walks about nervously before his relay is to shoot, unable to find a moment of relaxation for himself. Excessive excitation is obviously bothering him. Sometimes the reverse is true, the depressing nervous processes are dominant. This results in low spirits, sometimes in complete indifference, sluggishness, and sleepiness. This condition is known by doctors as "pre-tournament apathy." Both conditions, as has already been stated, are the result of a disruption of the normal working of the exciting and depressing processes, thereby causing an imbalance. When agitation is the result of the disruption of the nervous processes in the subcortex sections of the brain, certain changes take place in bodily activity. The vascular system and the heart undergo changes in the manner in which they perform, the pulse is faster and may at times reach 120 beats per minute. Because the blood pressure is up and the pulse is beating faster, a shooter experiences a throbbing which may increase the arc of movement to a considerable extent. As the breathing is faster and less deep, a shooter becomes hot and perspires. His nervousness is reflected in the tone of his muscles and in the manner in which he moves his body, which aggravates the situation still further because the shooter is aware that he has lost the steadiness of his hold. Along with the disruption of the interaction between the exciting and the depressing processes, the coordination is upset. This makes itself felt in the physiological order as indecisiveness, a feeling of fear and concern for one's score. Such a shooter presses on the trigger without assurance and decision because the front sight is not in steady alignment and the arc of movement has increased and the most propitious moment for making a shot has quickly passed. This indecisiveness and lethargy results in a shooter's inability to control the trigger smoothly. The movement of the trigger finger in applying trigger pressure becomes erratic. Sometimes a shooter is even under the delusion that the weight of the trigger has increased incredibly, and the trigger finger ceases to respond. Nervousness leads to a loss of the sense of time, and fear arises that there is not enough time for completing a stage of fire.

The emotional and physical upsets of competitive stress are experienced differently for various persons and the condition varies for every shooter both in its character and in its intensity. However, all shooters, regardless of their experience or of their self-discipline, are to some degree nervous in competition. It goes without saying, of course, that the better a shooter is trained, the more confidence he will have in himself and the less he is apt to experience a high degree of nervousness. Those shooters who have trained under conditions approximating match conditions and who have participated in many tournaments in the past are less nervous. At the beginning of a shooting season, even the experienced shooters are somewhat more nervous, but with the difference that they do not remain passive with respect to these disturbances, they do not let themselves become a victim of them, but resist them stubbornly and force themselves to shoot without being profoundly affected. If a shooter declares that nervousness in competition is unknown to him, either he is not telling the truth, or he is completely indifferent to the interests of the group or himself. He lacks an elementary understanding of pride in doing a job well and shows indifference to the strongest, natural excitement which competition stimulates in presenting a challenge to the human animal. We normal shooters add to our distress when we feel that everyone is witnessing our anxiety and stupidity. Yet with all this, our counterpart, the champion, appears to be calm and enjoying himself. Let's face it. He is.

3. Are we finished with the results of match pressure? Far from it, for we have not yet touched the positive side of the ledger. Yes, there are definite advantages to match pressure. Many of our senses are more acute. For our purposes, we see better, and our sense of touch is more exacting (that is why your trigger seems to become heavier in a match; actually it has not changed a bit, but we are more aware of it.) Our awareness of the passage of time becomes more vivid. Don't believe it? What about the anxiety you feel just before you shoot the last round of a rapid fire string? All of these added together should, if employed correctly, make us more exacting and consequently better our performances. However, all of this is not pure gold. As an example, there is no question that being able to see better is an advantage. But if we fail to recognize this for what it is and notice only that our sights are misaligned and the size of our arc of movement has increased, this will cause hesitation in your trigger control, making you hold too long, "dressing it up." Then the visual perception of the eye is overworked to the extent that you later fail to see all your errors clearly. This results in a shot that is fired with incorrect sight alignment which you call good, but was not. And this does what to your match pressure? It doesn't reduce it! The object, of course, is mental control which will coordinate all factors and turn all of this to our advantage.

4. How do we control match pressure? First, realize that it can be controlled and actually used to your advantage. If examples are necessary, try Joe Benner, William McMillan, Thomas Smith, Bill Blankenship, Franklin Green, Sgt Mertz, Ralph Thompson, and numerous others. These individuals have learned to control their shooting to the extent that their match and practice scores don't vary appreciably. Most of these fine shooters have shot better than 2650 or more at one time or another. If their match scores dropped off one percent from their practice scores, this would mean that they must shoot practice scores as high as 2676. A 2660 match would call for a practice score of 2687! How much do your practice and match scores vary? Those men listed above do not by any stretch of the imagination complete the list of shooters who have learned to control their thinking. So we have the first premise. "It can be controlled."

a. Prior Mental Determination. This is the greatest asset that we have available to us. By thinking through the correct procedure for firing each shot just before you shoot, and making up your mind to do it the correct way, you can virtually eliminate distractions in the actual execution. Be warned right now, that if you fail to do this and approach the shot without a preconceived plan of attack, or without the mental determination to be right come fire or flood, your results at best will be erratic. You readily appreciate the necessity for concentrating on and aligning your sights. A very effective way to assist in this is to sit down and

close your eyes and imagine front and rear sights including the blurred target. Try it right now. Most of us find that it is almost impossible to keep them aligned perfectly even in your mind's eye. However, by doing this, you are conditioning your mind to be able to focus the mental concentration where you want it to point. As a result, it becomes that much easier for you to do it on the range. This technique of mentally aligning the sights is every effective if practiced just before attempting to fire a controlled shot.

b. Channel Your Thinking to the More Important Fundamentals. You must continually think fundamentals and review them in your mind. Train yourself so that as many as possible of these fundamentals are executed automatically without any tedious effort on your part. When you do this, it leaves you with only the most prominent fundamentals to contend with in the actual firing, sight alignment and trigger control. This will enable you to, as an example, place all of your mental and physical efforts toward keeping the sights aligned and smoothly releasing the hammer while your position and arc of movement are so well ingrained as a result of training that you will employ them correctly automatically.

c. Establish a Routine. From routine comes boredom. What is boredom? The lack of excitement. What are we trying to do? Keep from becoming excited. In a more serious vein, however, in establishing a routine, you eliminate the possibility of forgetting some trivial item of preparation that may throw you off balance later if you neglect it.

d. Work on Each Shot Individually. Or, in the case of timed or rapid, each string of five shots. Each shot must be treated this way for in reality there is no reason to believe that because your first shot was an eight your next one will be the same. Nor is it logical that if your first three shots were tens, you have a guarantee that those to follow will also be tens. Each one is merely a representation of your immediate present ability to apply the fundamentals correctly or incorrectly. And your ability to do this will vary considerably if you let it. Do not connect the shot you are preparing to fire with the value of those already on the target. The performance requirement demanded of you to control this shot to be fired now is not dependent on the value of the previous shot or on the value of shot to be fired immediately after it.

e. Win The Aggregate Not Just One Match. Why should we become excited or worried when we have cleaned three of the four strings of the 45 times fire match. Go right ahead and clean the next string. Sure, if you do so, you may win the 45 timed fire match, but that is not your overall objective. You came here to win the aggregate, not just one match. Don't drop a couple of points here just because the possibility of winning one match has arisen.

f. Train Yourself To Think Performance Rather Than Score. Employing this technique, an eight or a seven becomes not a shot that subtracts two or three points from your aggregate, but a shot where you allowed yourself to deviate from proper employment of one of the fundamentals. Rest assured that if you do your part on the firing line, the score will take care of itself.

g. Who Said "Stay Out Of The Scope?" If you are shooting a slow fire match you must go down and score after ten shots, and if it's the National Match Course, you must score before you shoot at 25 yards. Do you think you are going to keep something from yourself? Why should a good score scare you? A good score is just exactly what you went up to the firing line to accomplish. Of what value is a 98 slow fire if you don't possess the fortitude to continue a good performance? Learn to use the scope for the purpose it was intended. A check on your performance and zero. Use your scope as an aid in your analytical procedure, not to score your target. We are not so pretentious that we believe we are going to go through a ten shot string slow fire with only three nines and not know what our score is. Our scope is, once again, to be used to evaluate the end product of our performance.

h. Relax Your Mind, right from the time you get up in the morning. Nothing will put you in a greater state of mental agitation than to have to rush through breakfast, rush to get to the range just in time to make your relay. If this happens, your slow fire is ruined at about the third red light you hit. Take it easy. Shooting is fun, enjoy it.

i. Practice Tranquility. Ever see the guy that loses his temper every time he has a bad shot? Who is he mad at? Those individuals who lose their temper are doing nothing more than exhibiting self-admonishment for their vacillation in the execution of a shot. They recognize that if they had worked a little harder on applying the control factors, the shot would have been better. On the other hand if we do everything within our power to make the shot good and for some reason or other it isn't good, we should have no cause for undue irritation. Although a good shooter must exert all of his mental and physical ability toward shooting a good score, infrequently he will fail to do this. Suffice to say that when this happens, if he chastises himself severely, or falls into a fit of complete depression because of a poor score, he will hurt greatly his chance for the rest of the match. It is not intended that you laugh off or treat lightly a poor performance; however, you must possess the presence of mind to accept the bitter with the sweet. Preparation, planning, relaxing, delivery of the shot, careful analysis and positive corrective measures, is the cycle of action you must force yourself to conform to without deviation. You can then be assured that the next shot can be delivered under the most precise control you are capable of exerting at the present moment.

j. Match Experience. Without question, competitive experience is one of the ingredients necessary in the making of an accomplished pistol competitor. However, experience alone is of no value. We must flavor our experience with an accurate and honest evaluation of our performance and the positive corrective measures that will raise our ability and eventually our scores. We must experience an increasing degree of mental control. It is not easy and is often left out of our training until our physical ability to shoot far outreaches our ability to exercise control when the chips are down. Perhaps when we first hand a youngster a pistol we should say "These sights are the two things that you must train your mind as well as your hand and eye to control", instead of pointing out the pretty cow horn stocks and shiny barrel.

k. Physical Conditioning. There is no doubt whatsoever that you can shoot better if you are in good physical condition. Your ability to hold, for example, is no better than the ability of the muscles of your arm to do this for you. Your ability to resist the stress and strain of match pressure and anxiety is directly in proportion to your physical condition.

l. Argue With Your Subconscious. Not only argue with it but win the argument. Even as we read this some of us are hearing that little voice in the back of our minds that keeps saying "Yes, this sort of thing may work for Joe, but I know damn well I'm going to goof up the next time I get close to a winning score." Who's voice is this? Where did all these ideas come from in the first place? Where did this little guy get all his knowledge. Let's be realistic. Our conscious mind puts these ideas into our subconscious, so don't ever believe that you can't overpower it. It's not easy. He's been saying what he pleased for years and now he isn't going to be routed easily. But don't give in to him and eventually you will find that the subconscious mind is not in conflict with your conscious efforts.

m. Now with all of this emphasis on the positive approach you are going to get two big "don'ts."

(1) Don't expect immediate results the first time you try mental discipline. There is a coordination of employment of the fundamentals to contend with and first, you must master the control of these. There are no hidden secrets. All that we gain is the direct result of hard work. If you find that you can exercise satisfactory control only for a short period of time, work on extending this period by practicing and perfecting your system. Remember that your returns are in proportion to your investments.

(2) Least there be any misconception, one way you cannot control match pressure and still shoot well is by the use of alcohol and drugs. True enough that either one or both of these may control some of the symptoms brought about by match pressure; however, in doing so they incapacitate you in other ways that will prohibit good performance. If drugs were the answer, undoubtedly our national champion would be a doctor or a pharmacist. There are occasional rumblings to the effect that you saw John Doe win a match when he was so tight he had to be led to the firing line. How did he do in the grand aggregate? If the drunk won it, his competition can go on record as having exhibited such a sickening display of lack of intestinal fortitude that they should all join with those noted, spineless denizens of the deep, the jellyfish, in the languid depths of the ocean floor. You and you alone are responsible for your performance and no man has the right to be a failure.

E. REDUCING TENSION AND ATTAINING RELAXATION: The fear of failure to perform up to your known capability will generate gradually increasing tension.

1. Types of Tension. Normal tension is a blessing to mankind. Without tension most problems could not be solved; the world's work would not get done and championship scores would not be fired. Normal tension is the prevailing condition of any organism when it is mustering its strength to cope with a difficult situation. All animals, including man, tense in situations which involve the security of themselves and their dependents. But there is a kind of tension that is bad for you: pathological tension. This is an exaggeration of normal tension, and thank heaven, fairly rare. The vast majority of people who worry about it have nothing more than normal tension. All they need is a technique for relaxing. We should know what tension really is and a few hints on how to terminate it.

Let's see what happens to you when you attack a challenging problem in shooting and become normally tense. Psychologically you become slightly anxious. This is a highly civilized counterpart of the "fight or flight" reaction of the primitive animal when it perceives danger. This reaction is not anxiety in the pathological sense.

Physiologically you undergo certain definite changes. Adrenalin pours into your bloodstream and your liver releases sugar, giving a plentiful supply of energy to your muscles. Your entire nervous system shifts into high gear. It causes your sense of smell, hearing and sight to become sharpened and all your mental faculties to become razor keen. Your stepped-up nervous system also causes the large voluntary muscles of your legs, arms and torso to contract, readying for action. Now the involuntary muscles of your digestive tract cause your digestion to slow down or stop for a while. Your chest and arterial muscles contract so that your breathing becomes shallower and your blood pressure increases. When all these things are happening, you are experiencing normal tension. Most of us experience this kind of tension one or more times a day. When the problem which caused you to be tense has been solved, your tension will subside and you will return to a normal state of relaxation. It may leave slowly but it will leave. For normal tension is self-limiting, it does not continue after you need it.

Pathological tension is not only hard to terminate, your whole body over-reacts, as if the difficulty confronting it were a life-or-death matter. It's the kind of reaction a normal person would have only in a really dangerous situation. In pathological tension, blood pressure, heartbeat and pulse go way up and stay up. Excessive adrenalin may result in jitteriness, flushing and trembling. The digestive actions of the stomach usually stop entirely and will not resume, causing loss of appetite or indigestion. Muscles tense for action but may end by cramping. Rapid shallow breathing continues to the point of dizziness. The inevitable, and often swift result is a sense of deadening fatigue. But normal tension may make you feel exhausted too, and sometimes it lingers. The simple, tension-ending techniques described below, work only for normal tension.

2. Tension Reducing Techniques:

a. Take a Breather. Breathe deeply, three times, very slowly. At the end of each exhalation hold your breath as long as possible. When you have finished you should feel noticeably relaxed and much calmer.

Here's what has happened. By forcing yourself to breath deeply you break the tension of your voluntary breathing muscles causing the involuntary muscles of the lungs, gastro-intestinal tract and heart to relax too. This is the simplest method for relaxing. For some, it can be used to end tension completely. It can be used by others for temporary relief when they do not wish to "let down" completely.

b. Let Go. Sit down and let your head droop forward. In about a minute raise one arm and drop it in your lap as if it were a limp rag. Do the same with the other. Now let your legs go completely limp; now your stomach muscles. Stay in this position for at least ten minutes. This technique, too, is aimed at first relaxing the voluntary muscles. It is especially effective when you've had to maintain normal tension for several hours on end.

c. Shift Into Low. When you have been overstimulated by highly demanding protracted mental exertion, taper off at the end of the day by becoming involved in a diverting activity. If you like handiwork, pick a kind which interests you but is not too creative. Soap sculpture, finger-painting, woodworking, and gardening all are excellent low-gear activities that will help you to simmer down. This kind of tension-remover is aimed at changing your mental set. It is helpful for those who have to operate at top capacity such as the better shooters and who are in enforced contact with others all day long. After stimulation, a part of you wishes to continue to be diverted. To slow you down when you're in this state of mind you require something which is engrossing but which demands nothing of you intellectually. Television suspense plots and simple handicrafts are ideal.

d. Take a Break. This is a "remote control" technique for dealing with normal tension. Simply take a break for ten full minutes every hour. You may find that this allows you to ease out of your working tension more quickly and easily when the day is over. The reason this works: since you have not allowed tension to develop fully, your organism doesn't, so to speak, have so far back to go on the road to normal relaxation.

e. Stop and Think. When the tension-making job allows a respite, sit down and calmly review the things in your life that you value highly. Think of the long range purpose of your life, of the people you love, the things you really want. In a few minutes you may notice that you have involuntarily taken a deep breath. This is a sign that tension is dropping away rapidly. When you tense to face a difficult situation, you tend to exaggerate its importance. Judgment and reason can quickly change this mental state when it's time to relax again.

These techniques are based on the fact that tension can be ended in two distinct ways: Through the relaxation of your voluntary and involuntary muscles; and by changing your mental "set". If you achieve either, you set off the other and hasten the process of normal relaxation.

CONCLUSION: The regenerative effects of a maximum physical effort are keenly felt after recuperation from the physical fatigue attendant to such an effort. Mental exertion at full capacity generates greater powers for hurling oneself head long into still greater challenges. The degree of physical and mental exhaustion felt after completing an exacting task, indicate somewhat the degree of effort expended.

1. The crushing effect of streamroller technique. The competition will sense the relentless approach of the doom of all their best efforts. To be a stone's throw from hell is a demoralizing experience.

2. A chance at greatness lies in each man's grasp. Performing at or beyond your potential will catapult you into the lead. Retain the lead by counting on your competitor's inevitable mistakes and gaps in his knowledge of controlling his shooting techniques. You must have confidence that you are capable of a performance exceeding any previous level of personal accomplishment.

3. Confidence furnished the alloy to stiffen the will to win and not give up or compromise. Confidence is based on a full grasp of the complete technique of controlling employment of the fundamentals. Confidence combined with knowledge, exacting skills, good physical condition and a seething, consuming determination to win, provide the shooter with an edge from which he can deliver a shattering blow to the composure of the competition. When your competitor realizes his maximum effort is falling short of that necessary to win, the result is no contest.

4. Be a hungry shooter. The slashing onslaught of a voracious appetite for victory, from the first shot onward, destroys the resolve of the lesser competition.

SECTION FOUR

COACHING

CHAPTER IX

ATTRIBUTES, RESPONSIBILITIES AND DUTIES OF A PISTOL TEAM COACH

A. PERSONAL ATTRIBUTES OF A COACH.

A coach's moral character and personal dignity must always serve as a model for those he is training. His high-mindedness and profound knowledge of the theory and practice of marksmanship, a serious attitude toward his training responsibilities, a love for the sport, respect for and sincere desire to help his shooters, the consistent demands that he makes of them as well as himself - these characteristics alone will inspire his shooters with respect for him.

A coach must be strict in his demands upon his shooters and consistent in what he requires. He must insist always on observing discipline and on adhering to the day's program. This together with the knowledge that lapses will not go unnoticed will spur his team members to conscientious work.

While there are no perfect pistol coaches, there are those who are outstanding because there is something in their makeup that induces excellence of performance from those who shoot under their guidance. Minor shortcomings do not impair the working loyalty of a progressing shooter who has found a coach with merit. To recognize merit in another person is in itself an essential of character. The coach or shooter who scorns all others for even their minor flaws and thinks no one is worth the effort of leading or following, parades his own inferiority before his team mates and competitors. There are attributes, moral and mental, that the pistol coach must have that will accelerate the shooter's progress and prevent a lapse into habits that may lead to a decline in performance.

1. Temperate: A coach must be temperate in all things. He must have the moral fiber to refrain from loose living. Intestinal fortitude and power of the will can allow him to deny himself things that are damaging to his character and may compromise the example he is to set. Nothing should preclude the attainment of what he knows to be his prime objective, Win!

2. Dedicated: Since shooting skill has somewhat less bearing on ability to coach than on being a top shooter, the search for a capable coach should not be directed necessarily toward the top pistol shooter, but toward the dedicated, observant, self-controlled man who possesses a wide knowledge of shooting technique. This does not imply that a Champion Shooter cannot have these desirable qualities. He can, but too often the top shot has time only for improving his own skill rather than in extensively coaching others. The attributes mentioned as desirable in a coach are contagious and will transmit themselves to the shooters.

3. Self Control and Patience: We feel that self control and an infinite amount of patience are the main attributes of a pistol coach. Many times during team matches, under pressure, things could be done and said which would have an adverse effect on the team. The ability to control himself and the other members of the team will affect greatly the outcome of the team match. Irreparable damage can be done if the coach loses his temper with a man on his team and calls him uncomplimentary names. From that time forward there will be a wall between the two. Patience, especially while coaching new shooters will help the shooter to improve more rapidly. You may be required to stand beside a new shooter or an old one, and watch him jerk shot after shot; you show him by use of ball and dummy that he is jerking, and still he continues. Do you finally give up? No! Keep trying, you must have patience and confidence in the man. Tomorrow may be the day that he begins to grasp the meaning of points the coaching has continued to stress.

4. Compatibility: This is simply a big word for getting along with the shooters on your team. There is no need to elaborate on this point. If the coach cannot get along with his shooters, he is worse than useless to the team.

5. Inspire Confidence: You, as a coach, must be able to inspire confidence in your shooters. First you must have confidence in yourself and show your team members that you have complete confidence in them and in their ability, both as individuals and as team shooters. Then, and only then, can you expect them to have confidence in their abilities and just as important, confidence in you.

6. Enthusiasm: Show enthusiasm, not just when the team is winning. If the team lost a match they must have desire to win and enthusiasm to be able to come back and shoot better in the next team match. Desire to win and enthusiasm are the things that keep us from giving up in disgust when everything seems to be going wrong.

7. Observant: The Pistol Coach will be observant of anything in his shooter's performance that can be improved to make his scores better. This applies primarily in practice, when the time can be taken to improve, but also should be observed in matches. He must be careful to see if the training schedule is achieving the required results. During a match he must be aware of any unusual conditions. Noise or movement near his team that could be distracting to his shooters. A close check of all phases of the match such as scoring, alibis, challenges, and block officer decisions must be made.

8. Wide Knowledge: The Pistol Coach must have a wide knowledge of the shooting fundamentals and coaching techniques. In addition he must have specific knowledge of match rules and range procedures. The good line coach does not necessarily have to be a top shooter but he should have sufficient match experience so that he will be familiar with the problems and most of the remedies faced and needed by his shooters. The coach must constantly keep in his mind the traits of each shooter. He must know how to handle each one in every shooting situation so that the utmost can be obtained.

9. Exacting Standards: We have mentioned confidence in your shooters. To excel in inspiring confidence you must set exacting standards for them to follow. Your actions, as a coach, and as a member of the team must be above reproach at all times. You must require that your team members act in such a way as to reflect credit upon themselves and the US Army. As always, when you are at a match, you are representing the Army. One step out of line will cause some persons to say, "Well, there is the Army making an Ass out of itself again." You must require your team to utilize practice sessions to improve their shooting and to try new ideas, not just as a chance to burn up ammunition. During the shooting, the coach should require a great amount of effort devoted by each man toward correcting his faults, and not allow him to accept an average performance. Strive for perfection in shooting, but at the same time retain exacting standards of personal and team conduct.

10. Open, Progressive Mind: Because a man has been shooting for 30 years does not necessarily mean that he knows more about shooting or has the best coaching techniques of anybody with less longevity. This business of "It was good enough 30 years ago, and it's good enough now," is not applicable anywhere today, least of all in pistol shooting and coaching. The good coach should accept, with proper frame of mind, constructive advice from anyone. He should continually strive to improve himself with better techniques. An open progressive mind applies also to his approach to the difference in personality and shooting ability in his shooters. No two individuals are alike. The coach who is flexible in his dealings with his shooters will in the long run have the best functioning team.

B. THE HEAD COACH RESPONSIBILITIES:

1. Selection of Needed Training Subjects: To determine training requirements, a coach should determine the shooting ability of each of his shooters. This ability of course varies greatly not only between the All Army level and the Post, Camp, or Station level but, of more interest to the coach, between the individual shooters on the same squad. This is a difficult but very important job. What the coach selects as the needed training subjects may well determine the later success of the team.

2. Scheduling and Supervising Training: Publication of a training schedule will not suffice to insure progress in training. Careful observation of individual members and correcting faults during the training is one of the primary duties of the coach. The coach will quite naturally use the scores fired in practice to assist in selecting team members and future scheduling of training. Watch for the morale and attitude shown by each shooter, on and off the range. A good coach can tell who is shooting for the team effort and those who are just shooting.

3. Weapons and Equipment Checks: The coach should periodically check the equipment of each of his shooters. This check serves a quadruple purpose.

a. Checking serves to assure the proper mechanical functioning of each weapon. Many times a shooter does not bring a weapon in for repair because it malfunctions very seldom. Every time a weapon malfunctions it should be brought to the attention of the coach and the armorer.

b. The inherent accuracy of each weapon should be checked periodically on static testing devices. Weapons in constant use tend to lose accuracy over varying periods of use. The handicap of a weapon that shoots groups larger than the shooter's ability to hold will undermine even the performance of a champion.

c. The coach should check on the cleanliness of the weapon. Most shooters get pretty lazy about cleaning their weapons, particularly if he fires them every day. Unfortunately, many shooters think that cleaning a dirty, though functioning weapon will somehow cause it to start malfunctioning, groups to widen, and generally lose accuracy.

d. The security of government issue weapons is paramount. Regular serial number checks of weapons issued to individual shooters and security storage inspection insures proper accountability and security of all weapons and equipment.

4. Periodic Written and Oral Tests: The coach should conduct periodic written or oral tests in order to check how much the shooters have learned. This means how much of the fundamentals, of the NRA Match Rules, of general match procedure and how well they have mastered techniques. The results of these tests should become part of the shooter's record.

5. Constantly Maintain a Current Evaluation of each shooter regularly assigned to the USAMTU Pistol Division. In addition, an evaluation and an estimate of potential should be exercised concerning outstanding shooters in major command level competition. An analysis of the rate or progress, individual morale and attitudes, the degree of team effort exercised, all of which should be current and decisive. (See Chapter VIII, "Evaluation.")

6. Propagate doctrine and performance standards by constant review of training, manuals, training materials and methods so as to reflect new ideas and methods proven to be sound and reliable and weed out unsound techniques.

7. Improve the team potential by conducting periodic, organized, group instruction.

8. Improve the individual shooter's potential by personal and private interview and conducting individual coaching sessions.

9. Supervise the team preparation for match participation.

10. Supervise the coaching technique of individual line coaches.

11. Assists in preparation of instructor courses.

12. Assists in rehearsal of instructors.

13. Participates in all registered competition. A shooting coach is a person who appreciates the great problems faced in competitive shooting and is not inclined to be arbitrary in his judgement.

14. Exercise a profound influence on the morale, attitudes and enthusiasm of the shooter's will to win by exhibiting individual consideration, stimulation of confidence and creation of an atmosphere of inevitable success. This influence can promote favorable response if the guidance in personal habits and activities results in measurable improvement in performance. During the shooting season certain limitations of personal nature that will help the individual build and maintain his excellence are necessary. There must be no use of tobacco, alcohol, coffee or unprescribed use of certain medical preparations that may affect the control of performance. Physical fitness is enhanced by avoiding late hours and overindulgence in rich or unaccustomed foods. The shooter must be encouraged not to change his normal living routine. The morale and enthusiasm of the various team members is fostered by scrupulous attention to military bearing and appearance. Pride and esprit de corps go hand in hand with an attitude that reflects the will to win.

15. Correction and Recommendation: During the match, the head coach should keep notes on any mistakes made by a team member, or the team. Then put into his training program the material necessary to bring about corrections. He should make recommendations to the team on anything that will cause the group to perform better in future team matches. The coach is the director of the team. If he fails; the team fails, if he is a success the team will be a success.

C. THE LINE COACH'S DUTIES:

1. Before the match.

a. Be available between individual matches: During the firing of the individual matches you should check the performance of your team members and, if they are falling below standard, talk to the shooter concerned and try to find out what the trouble is. Try to get his thinking channeled back in the right direction. Remember, we use the individual matches as zeroing matches for the team matches, any individual matches won are incidental this requirement. Make yourself available to your men to assist them in every way possible.

b. Supervise physical preparation: After the individual matches and prior to the team matches the coach should have a team meeting. During this meeting he should insure that all the team members have the right type and amount of ammunition. Are their weapons clean and in perfect working order? Check everything. (For details of this check-out, refer to the coach's worksheet, an Annex to this chapter.)

c. Assign Relay and Target Numbers: A point to be covered during the team meeting is the assignment of target and relay numbers. Be sure there is no misunderstanding on these numbers. Nothing is as demoralizing for a shooter as showing up behind target number 40 and finding none of his team mates there. By the time the range officer says "Load" the shooter discovers that the team is on target 4. Also at this time the coach assigns additional duties to members of his team such as scoring his team or the adjacent team in the event this requirement has been given by the range officer. This includes as well, posting of the score board, carrying flags, chairs, and scopes up to the firing line, and any other duties the coach feels necessary.

d. Supervise Mental Preparation: From the time the coach started working with his four shooters he should have been guiding their mental preparations for his team match. Now he must do his best to get their minds off all miscellaneous interests and get them thinking only about this all important team match. (For details of this check-out, refer to the coach's worksheet, an Annex to this chapter.)

2. During the match.

a. Make Decisions: Your team is on the firing line and the team match has started. What are your actions? Some of your shooters may be hesitant about making sight corrections. You, as the coach, must give positive directions; tell him what to do. This is not the time for a mutual head scratching session between the shooter and the coach as to whether the sight should be changed. Usually you will have two firers on the line at the same time. You must decide which two will fire together best. Remember, you are responsible for the team, you are the person who must decide what is to be done and how to do it.

b. Stresses Safety: The coach should be constantly aware of any breaches of safety.

c. Caters: The word may mean different things to different people but what we mean is the coach giving the shooter what he wants and needs, in the shooting line at least, and aiding him to achieve his best possible score. As has been mentioned previously the coach should know by the time of the matches just how each shooter likes to be coached and what the coach can do for him. If this means setting the shooter's gun box on the line and preparing his equipment for shooting then the coach should be glad to do it. It may also mean only for the coach to sit back and watch, and not say a word. The coach must always remember that he is there for the shooter's benefit and not the other way around.

d. Encourages: You must encourage the members of your team at all times. When they are shooting good you must encourage them to shoot better. Whe they don't do so well try to assist them in mental preparation for shooting of the next match. This assistance is in reality, encouragement. You are showing him that you believe he can do the job required and that you want to help him to correct any faults. Never say anything to discourage any member of your team. By the same token, don't use false praise.

e. Scoring Record: All scoring of record practice matches and of matches must be supervised by the coaches. This doesn't mean that every shot fired must be counted for score. The shooters must be given free practice to allow them to try new procedures such as different

positions, etc., however, when record scores are fired they must be made a part of the shooter's permanent record. From this record the head coach can ascertain whether the shooter is improving or not, and what weapons or stages he needs more work on. All of the oral and written tests, etc., still won't indicate how well the man can shoot. You can only find this out from watching the shooter's performance on the firing line.

f. Irregularities: Be a close observer of events and conditions during a pistol match and intercede by your good offices if an argument, protest or an infraction of the match rules concerns an Army team member.

3. After the Match.

a. Critique your team: There are several things a coach can do after a match. It does no good for him to stand in front of his shooters and rant and rave and tell them (if they didn't win) that they fired like a bunch of ringed tailed baboons. If they did actually shoot that way it does no good to remind them, they already know it. The proper technique at this point should be to:

(1) Discuss and Recommend: The coach and team should go over their performance and suggest ways to improve this shooter's rapid fire or that shooter's slow fire once they are back at their practice range. If there was a clash of personalities due to the gruelling stress of the competition, the ruffled feathers should be smoothed. The opinions and methods of the individual shooter revealed at this time are the building stones of this manual.

(2) Evaluation and Observation: Direct coaching of the shooter is only half of the coaches job. True, it might seem to be the most rewarding, but you must plan what to train him, how to train him, and evaluate his performance to find out if the training is effective. The evaluation of a shooter is achieved primarily from the line coach and from the results of practice and match scores. The line coach will evaluate the shooter's potential ability, since he will be in the best position to see how the shooter reacts to the problems confronted when trying to achieve a good score. From his observation he will accurately fill out "The Individual Information and Evaluation Sheet" on each shooter. This evaluation will show the training needed to make him a better shooter. It can serve as a guide when considering the shooter for future teams. (See Chapter XI, "Evaluation.")

CHAPTER X

TECHNIQUE OF COACHING A PISTOL TEAM

A. COACHING THE CHAMPIONS.

1. The champion is the cutting edge in penetrating beyond the frontier of human accomplishment. The coach helps to fashion this instrument and assists in guiding it true and steady toward its objective: a record breaking performance.

2. A pistol coach must give direction to the development of a shooter. The stability with which a shooter progresses and performs is to a great extent dependent on his determination to become a champion.

3. The shooter's ideas and techniques are greatly influenced by personal coaching. Research, experimentation, analysis and studying the advice of top shooters or his team mate's technique will aid him in avoiding the discouragements that affect developing shooters. Observing, evaluating and correcting his performance will broaden his basis of shooting knowledge and add skill of control in employing shooting techniques. From this knowledge and skill, he derives increased ability to control his shooting. From improved control comes confidence, the most valuable ingredient in the champion shooter's arsenal. Confidence gives him the power to win in competition.

4. The Delicate Ego.

The better the shooter, the more confident he seems. It is probable however that the confidence of the better shooter is the most vulnerable. Sometimes, on one uncontrolled shot, his ego will crumble. He is surprised and horrified that he could possibly fire a shot with apparently a complete loss of control. If this happens again within a day's workout, there is a possibility that his confidence may suffer further. If there is an absence of adept coaching at this point and the trend continues, even at infrequent intervals, the confidence may shatter. It is shattered by what the shooter thinks is confirmation of a nagging suspicion that his inherent ability is somewhat lacking. Shattered confidence is despair. The coach must be on his toes to spot the first symptom, the first vestige of flawing in a basicly good system of control.

5. Sustain Confidence and Remove Self-Doubt.

Top shooters are some of the most insecure people in the world. The important half of the coaches job is to give and maintain confidence to and in his shooters. The basic requirement here is that the coach be someone whose judgement and knowledge the shooter can trust and someone who can tell the shooter, "yes, that was done just right, we will accept that performance because it was your best for today." The coach, for his part, must be extremely careful during practice and competitive situations, not to allow the shooter any reason for self-doubt. The shooter needs to feel that his ideas and opinions are valued. He must never be given the impression that he has really failed - only that there is room for improvement. In correcting some small part of a faulty performance, never give orders, suggest. Suggest to the shooter, in an informal, man-to-man approach, that perhaps he could get a better result by trying it another way.

6. Self-Respect Needs Tender Care.

The good shooter's self-respect needs tender care. His self-esteem, precious and fragile, often benefits from the sincere expressions and attitudes of high regard from his coach. If the coach wants the shooter to feel confident that he can win, he has to tell him that, he, the coach, thinks you, the shooter, are championship material. If the shooter knows you hold him in high

regard, it makes it easier when the shooter is having trouble for the coach to influence him favorably when he needs a slight nudge back on to the track.

7. A Good Coach Can Improve Any Shooter's Performance.

Care, high regard, tact, a meeting of minds, not even all of these things combined can necessarily bring about the "greatest performance." Greatness in any endeavor requires strong talent. If the shooter doesn't have it, the coach can't give it to him. But a good coach can release the innate ability, to whatever degree it exists. A good coach can improve any shooter's performance. Jointly plan the course of action and the shooter will inject his ideas and force into the proceedings and the combination will generate superb accomplishment. If something wrong or flawed appears, make suggestions, always encouragingly. If you keep working at it together, when it turns out well, the coach will have been the prod that insisted on trying it over and over and as a result furnished the shooter with the spark of confidence to project himself forward to new heights.

8. The Formula.

What is the formula, what are the carefully couched words, that a coach should use to get the sterling response that brings forth the marvelous results? There was a noted coach in action at a match and one of his team shooters had just succeeded in putting together a performance that rescued his team from sure defeat. Even after a fair start, his team was behind. After leaving the firing line, one of the shooter's teammates asked how had he managed to complete the match without losing any more points. "The coach just told me the magic words; 'I want you to do better'."

B. FACTORS IN SYSTEMATIC COACHING TECHNIQUE.

1. Careful and complete preparation, both physical and mental.

2. Planning in great detail the sequence of events necessary to deliver a controlled shot in the target.

3. Achieve relaxation of mind and muscle in the face of stress.

4. Deliver the controlled shot in target as planned.

5. Make a comprehensive analysis of the flaws in the delivery of the shot.

6. Incorporation of positive corrective measures to prevent a recurrence of the error.

7. Systematic application of these factors in all line coaching will prevent the haphazard approach to influencing the shooter. Systematic guidance will result in the shooter organizing his thoughts and actions and thereby becoming more able to exert progressively better control over his shooting performance.

C. HEAD COACH TECHNIQUE.

Successful training and rapid and unbroken progress depend in large measure on the head coach. It is no accident that many leading shooters, in looking back over the path they travelled, say that they owe their achievements to their good luck in having a good coach from the very first time they began to shoot. And as a matter of fact, this is how it should be, because from the very beginning, from the very first days of training, a coach must start a shooter off correctly so that the latter may avoid forming harmful habits because, as everyone has known for a long time, it is much harder to reteach an incorrectly taught person than to start initially teaching him correctly.

1. Individual Approach.

When a coach is training a team, he should not adhere to unchanging standardized schedules as if they were applicable to all shooters. He should not forget that genuine coaching anticipates an individual approach to each shooter. Therefore, he should exercise special care to see to it that every shooter be expected to accomplish that which he can handle, one which corresponds to his technical capabilities and peculiarities. Special hours should be set aside for individual work during which time the shooters should concentrate on improving the weaknesses in their shooting. If a coach discovers signs of over-fatigue or signs that shooter is approaching a state of over-training, he should take a rest for a time. However, it should be borne in mind that signs of over-fatigue for one or two shooters are not necessarily cause for lightening the work load for the others.

2. Training Methods Should Be Flexible.

Training should be flexible enough to permit change in form and method, so that a shooter will, in some cases, be allowed to decide for himself what type of training is best for him. A coach should avoid tying a shooter down to static routine. He should teach his shooters to think and to experiment, and then unobtrusively bring them around to drawing their own conclusions as to what they should do, instead of setting his conclusions before them. He should remember that too much spoon feeding in the training period discourages a shooter's initiative and independence as well as other qualities associated with the development of will power.

3. Study Shooter's Behavior During Shooting.

In order that a coach may have the opportunity to study a shooter's shooting peculiarities and behavior during shooting, he should not try to correct a number of shooters at the same time. An experienced coach should check all targets periodically with binoculars while shooting is going on, accompanying his inspection with observations and instructions. However, a coach must from time to time give some attention to personal assistance, so that he will have a chance while he is correcting a shooter's shooting technique, to study him and to give him advice by turning his attention to his peculiarities, to his fundamentals, his technique, his temperament and to see to it that he takes enough rest and the right kind of rest between shots, and so forth. Along with this, as he is following a shooter's reaction to good and bad shots, a coach has the opportunity of studying his discipline, or lack of it, and the special peculiarities of his character.

4. Evaluation of the Shooter (See Chapter XI "EVALUATION OF THE TEAM SHOOTER").

A coach's evaluation of a shooter's work is very important. A shooter's successes and his conscientious work for himself should not go unobserved by his coach. Such things should be duly noticed and encouraged. At the same time, a coach should show some reserve in such matters lest some shooters become conceited with being praised too much, begin to think too highly of their abilities, and cease to work.

5. Instill Discipline.

Work should never stop during the training period, on acquiring the discipline which will be required of a shooter when he shoots for record and when he participates in tournaments. A coach ought to publicize the results of practice and record shooting, posting scores, bulletins, etc., so as to give the shooters a sense of responsibility for their own scores. An impartial totaling of the scores should be made in record shooting in conformance with the rules of competition. In posting these results, a coach ought to make his decisions concerning match results completely objectively, taking note of course, of all the reasons for lower scores. It is only after due account has been taken of all these observations that any conclusions ought to be reached regarding the degree of preparedness of a shooter.

6. Limit Record Shooting.

A coach should not overdo record shooting. Nor should any attempt be made to have too many record shooting sessions. The fact that these may be useful in putting together a team is no excuse. A coach should never forget that too-frequent record shooting is very exhausting for shooters and can result in a shooter's coming to a competition unable to force himself to do his best because of his previous nervous and physical exhaustion. Therefore, the wisest course to follow, for example, in a monthly cycle of training sessions is to have no more than half of them record shooting sessions.

7. Esprit De Corps.

In addition to his concern for a shooter's development and the strengthening of his willpower, a coach should devote the most serious attention to the state of mind of the shooters on a team, to bolstering their pride in themselves, and to removing at once any cause for worry or dejection. In implanting and fostering a healthy state of mind - a feeling of duty and obligation toward the group, a feeling of friendship and camaraderie - he should make a careful study of the character of each shooter from a psychological point of view, waging, meanwhile, an unrelenting war against any show of self-seeking. If a shooter starts to think only of a champion's laurels and enters a tournament with these thoughts in his head, he may prove to be a burden to his team. Such shooters, thinking of themselves instead of the team, generally become extremely nervous during a tournament and thus may bring their team performance down.

8. Fear of Failure.

However, the demand that a shooter show a sense of responsibility for his own scores to the team is a reasonable one. He should not be allowed to develop an overpowering, oppressive sense of his responsibility, and of course, threats should never be used. It should be borne in mind that a common cause of poor scores in a tournament is a lack of confidence resulting in fear lest one let his team down and shoot poorly.

9. Train For Each Match.

It is not a good idea for the shooter to experience a radical departure from the training pattern when he enters a match. The change-over may create psychological problems because of the necessity to alter complex habits of coordination and be faced anew with reflexes that affect control. This is the valuable "edge", so to speak, attained in meticulous training and can be destroyed or seriously disrupted.

10. Rest Period Before Each Match.

At least a full day before a tournament starts, a coach ought to stop all training and give the shooters an opportunity to have a good rest. Following such a rest, a shooter is more apt to shoot willingly and attentively, and thus he will give more to controlling each shot. However, it is certainly not out of place for a coach to advise the shooters to practice "dry firing" for short periods during this rest time, for this helps to keep them in condition.

D. LINE COACH TECHNIQUE.

One of the principal problems facing a line coach in a match is to maintain the shooter's shot group in the center of the target. However, the line coach's role is most certainly not limited to the technical aspects of shooting. If a shooter is nervous during a tournament, the line coach ought to have the effect on him of helping him to control his nervousness or, in any case, of reducing the effect of his nervousness on his accuracy.

1. The Shooter's Nervousness.

It should be borne in mind that a shooter's nervousness during a pistol match is not simply the result of the fact that, for example, his pulse beat is faster and that his coordination is upset. It is also the result of a change in his behavior and of those sides of his nature which ordinarily do not manifest themselves; a shooter becomes irritable, touchy, less restrained, etc.. Sometimes a shooter, who under ordinary circumstances, is very calm and complacent, becomes suddenly unpredictable because of his nervousness. Everything annoys him, a very hot day, his jacket is uncomfortable, someone laughs too loudly, someone else is staring at him and he is annoyed by the fact that, as it seems to him the line coach is displaying indifference to him and has no interest in how he is doing. Irritation, dissatisfaction, probably insults follow. Another shooter becomes exceedingly absent-minded. You say something to him, he nods his head to show he understands and does exactly the opposite. A line coach must be ready for all this, and he must display tact and the greatest patience toward this behavior so that he can keep his shooter, in spite of all diversions, shooting well and help him to raise his score.

In order to get a shooter to behave as calmly as possible the line coach must be a person in whom the shooter has trust, in whom he believes, and who he feels has his best interests at heart.

2. Unintentional Harm to Shooter's Performance.

However, the matter does not end with a complacent character and a benevolent attitude on the part of the line coach toward the shooter. Sometimes a line coach may make things difficult for a shooter without wishing to do so and without even knowing it. Therefore, the person who acts as line coach should have had considerable experience in tournaments and should be knowledgeable in shooting matters. He should understand the technical information about the weapons and ammunition; he should have practical experience and knowledge concerning the influence of weather conditions on shooting accuracy. He must understand the character of the shooter from the point of view of their habits, their disciplinary and psychological peculiarities, their competitive capabilities, and their method of operation.

3. Control Tempo of Shooting.

Part of the line coaches job is to keep close watch on the tempo and rhythm of shooting. If a shooter is shooting smoothly and doing well in a particular tempo, he should keep him on this rate of fire and not let him slow down. He should know what to do when a poor shot is fired. If, when a shooter is shooting well and shooting with assurance, a poor shot occurs, there is no need to suggest to the shooter that he stop or change his tempo. If two or three poor shots are made in a row, however, and the shooter is showing signs of losing his self-control, the line coach ought to take a decisive stand and insist that he take a short break so that he can regain his composure and check his stance, position, grip or any of the other fundamentals. Only then should he continue to shoot, attempting to do so at his former rate of fire. In doing this the line coach should observe the time closely and regulate the tempo according to the remaining time. If the shooting is at a fast pace, and well, the line coach should not take him off his rate of fire for the rest of the stage. But if the shooter is shooting with difficulty and if there is some danger that he may run out of time, the line coach should suggest to the shooter that he time his shots with a watch at exactly even intervals as a means of getting him to work with greater speed. It is especially important to watch the time if there is a gusty wind. Under such conditions, the line coach must insist on a somewhat stepped-up pace so that the shooter will be certain to have some time to spare in case the gusts are so strong that the shooter cannot shoot and is in danger of having his time run out before he has finished shooting.

4. Reestablish Coordination.

If a shooter loses his control and can't get back to a semblance of order, if he becomes nervous and shows signs of indecisiveness and fear of making a bad shot, the line coach must insist that he unload his pistol and make a few "dry fire" shots. This should reestablish his coordination, overcome his indecisiveness and bring his temporarily lost ability to sight accurately and press the trigger with coordination and smoothness.

5. Coping With the Changing Situation.

A line coach should understand that a shooter's nervousness and state of mind should not be thought of as fixed once it has changed. A shooter may be nervous at the start of shooting and later regain his composure. A shooter may be calm at the beginning of a match and later become nervous. The changing conditions of competitive shooting cause emotions to vary, one sometimes replacing its opposite. This means that a line coach should know his shooter, have some knowledge of his character, and what state of mind he is in at all times. Thus, if, after a poor start, a shooter regains mastery over himself and begins to shoot with boldness and assurance, there is no reason why the line coach should interfere for a while at least. If, however, the line coach feels that the shooter's control is slipping away and that the latter wants to keep on shooting even after he has shown obvious signs of disturbance - which usually results in some poor shots - the line coach must interfere before it is too late to prevent lost points and force him to take a short break. A shooter's state of mind changes very quickly when he is shooting poorly. What was a healthy frame of mind may disappear without a trace and be replaced by feelings of irritation and anger. A line coach must sense this sort of thing very clearly and his behavior should be governed by the character of his shooter. Pistol shooters react differently to bad shots. On some, they have a sobering effect, causing them to strive harder and to be more observant in making the next shot. The line coaches duty should be to inform the shooter in a businesslike manner concerning his poor hit and to be sure his attention is drawn to it. On another shooter, a poor shot may have the effect of urging him on to firing the next shot as soon as possible in order to compensate for it. This usually results in his doing the same thing over again. In this case, the line coaches duty is to stop the shooting and insist that the shooter take a short break and check his stance, position, etc. Still others may be rattled by poor shooting and lose their self-assurance. If the line coach thinks that the bad shots were unavoidable, he should mention it to the shooter in a casual way, without emphasis, and insist that shooting continue in the former manner. If, however, the shooter is unable to continue because he is fast losing his confidence in himself, the line coach should have him unload his pistol and shoot "dry."

6. Limitations of Dry Fire Practice.

However, it would be wrong to overestimate the value of dry fire training as compared to shooting with live ammunition. The two types of training complement each other. Nothing can replace the psychological and nervous processes that a shooter experiences during actual shooting. When practicing with "dry firing", when no loud noise accompanies a shot and there is no recoil, the nervous system, and one's reflexes in particular, are in an altogether different state: consequently, muscle tension is not changed as much as it is just before firing a real shot. Moreover, a shooter seldom feels as responsible for the quality of his shooting and may not work at it as carefully because there are no bullet holes and no regrets. As a result, there is not the same feeling that a mistake is irrevokable and that poor shots can't be redeemed in live practice. Every shooter should, therefore, find a suitable balance in his training for these two approaches without overestimating or underestimating the value of either one.

7. The Right Word at the Right Time.

The tremendous nervous tension which a shooter experiences in a pistol match and the will power which he must have to force himself to fire a large number of controlled shots with the greatest of care while at the same time trying to overcome his nervousness and using every means to take his mind off distractions, gives considerable significance to those words which can calm and those which can excite him. In the difficult conditions which demand great efforts of will from a shooter, overcoming some knotty problem is sometimes accomplished by the right word spoken at the right time: a word of encouragement, of assurance, of sympathy or guidance, because a person sees words as standing for real things, when he is under conditions of stress.

8. Cooperative Attitude.

Line coaches must remember that they can keep the shooter in a good frame of mind so that he will shoot with assurance and boldness. If they try as hard as possible to bring about such a situation during shooting and if the shooter senses in every word, every gesture, that their attitude toward him is friendly, that they are taking a vital interest in his effort, and that they understand the stresses and strains which a shooter undergoes during a match, he will have the incentive to excel.

9. Deciding the Order of Relays.

Considerable attention ought to be given to the matter of the order of relays for a team match. In a two relay team match, the relays should be made up of compatible pairs of shooters. In a four relay set-up, those shooters who have extensive experience in match shooting and who are less apt to be nervous are put on the first relay. Such stronger-willed shooters should also be put on the last relay when the competitive pressure is at its highest pitch and when the scores of the last relay may determine the outcome of the match for the whole team. In the relays which fall between are those of less experience and those about whose abilities the coach has some minor doubts. However, in deciding upon the order of the relays, a coach ought also to take into consideration the desires of his shooters to shoot on a particular relay. He should bear in mind that some shooters, because of their psychological nature, prefer to shoot first, when the scores of other teammates are not yet known. Other shooters, on the other hand, will want to shoot later, when the results of preceding relay are already known. Therefore, a coach must, on the one hand, pay attention to the desires of the shooter and do what he can to satisfy them. On the other hand, when there is two or more who want to shoot on the same relay, he must make his decision based on the best interests of the team.

10. Team Selections.

Sometimes, a coach who has studied a shooter both by the results of his shooting and by observing him in action, decides to place him among the alternates. Whether or not to put him on the team is a serious question because there is no way of knowing whether or not he would have done as well under the stresses and strains that go with record shooting on a team. The coach should not, under such circumstances, become perplexed or show any weakness of will. He should always be firm in his decision, stand by his principles, and remain cool and imperturbable. It should always be remembered that a coach is the heart of a team. The calmness and self-control of the individual shooter depends upon the manner in which the coach conducts himself as does the team's belief in their eventual victory.

11. Diligence.

The development of a shooter is helped immeasurably by creative and relentless work by the coach and himself during his training sessions. Without a concerted effort it is impossible to become a top contender.

12. Encourage Throughtful Analysis.

A shooter must by all means develop the ability to approach each shot thoughtfully and critically and by careful analysis find out what factors are affecting his accuracy. Without a careful study of his actions, without an analysis of his shooting, especially of his poor shots, it will be impossible to become a better shooter. It is necessary to impart to the coach an accurate report of what one sees, hears, and feels and to search out the reasons for poor performance. Some shooters have an excellent memory for their good training scores. They carry them about with them, and brag about them. But their poor scores - which most shooters have in greater supply - are tossed in the mental ash can, not being regarded worth the thought it takes to figure out why they are bad. In such cases, one may say without fear of contradiction that there will be no solid improvement because such a shooter cannot extract from his training what is useful to him, and since he does not find out the causes of mistakes, he will not progress.

E. SUGGESTIONS FOR IMPROVING COACHING TECHNIQUE.

1. Close communication must be maintained with the shooter. After each shot is fired, the coach and shooter should discuss the nature of the shot, good, bad or unknown. A good shot call is mandatory because if a shooter cannot call his shot accurately, he does not have control of his shooting. To arrive at comprehensive shot analysis, the coach and shooter must be in close liaison. Everything the shooter saw during the shot delivery must be revealed. Everything he heard, even the most insignificant distraction must be mentioned. The innermost thoughts that transpired in the shooter's mind, even fleetingly, are of tremendous importance to a coach when he is making a determined effort to pin-point the reasons for loss of control. When shot analysis and positive correction seem to fail in improving control, the coach should start asking leading questions. An example of some dilemma breaking questions appear on both the slow fire and rapid fire work sheets.

2. Improvement in performance may or may not be spectacular. Impress on the shooter that you are interested in his progress and will feel justly rewarded by even the smallest evidence of improvement or understanding. By reducing the frequency of error by one per cent, measurable progress is being made. Slow, steady progress is indicative of firm improvement of control. Flashy, fantastic performance followed by average results is of no consequence unless the shooter should happen to learn why and how his shooting suddenly improved.

3. Why some shooters DON'T SHOOT WELL.

a. Lack of know-how. A symptom is vacillation. Switching equipment and employing gadgets in a desperate attempt to offset this lack of knowledge.

b. Lack of incentive. Satisfied with level of proficiency. Indifferent to need to perform even up to actual ability level.

c. Lack of team spirit. Affected by derogatory attitudes, and sensitive to slighting remarks made in innocence

d. Lack of sense of responsibility-seeking excuses for bad performance.

e. Lack of ability to analyze and correct errors.

f. Lack of proper guidance. A minimum of intelligent coaching technique, know-how and inspiration.

g. Performance hurt by pessimism or overconfidence.

h. Closed mind. Usually will not try new approaches to improving control. When a new method is tried and spectacular results are not immediately forthcoming, the closed mind forthwith settles back and resumes the old habits without allowing time for conditioning.

4. Why some shooters DO SHOOT WELL.

a. Has that extra edge of confidence and is busy at planning a positive course of action.

b. Utilizes all available skills-assisted by confidence in good equipment.

c. Willing to sacrifice activities and practices that hurt his shooting.

d. Enthusiasm generated by taking part in the team effort.

e. Has the will to win by his own resources and determination.

f. Will to win is stimulated by inspiration of leadership.

g. Enjoys above average coordination and timing.

5. Though they are in a sense competing, each trying to perfect a team performance of a higher caliber than all other teams on the pistol squad, coaches must never forget that an important technique of successful organization is cooperation. What team coach "A" knows has helped his team or what he can do to assist team "B" or "C" becomes his official and moral obligation to transmit. Further, he must know the problem faced by the other coaches and how they resolved them. Achievement develops out of unity of action.

6. A good coach knows when it is important not to coach. He is obligated to do all for the shooter that he knows, but he must become less direct for periods to see if the shooter can control all the factors that add up to good shooting. The coach must not be a crutch.

7. Good results are achieved only after hard work on both the coach and shooter's part. The coach should be able to coach without alienating his shooters. Inspire confidence and enthusiasm and half the battle will be won. Learn as much about shooting fundamentals and techniques as you possibly can. A coach can teach only as much as he knows. Expect and get the best results and realize that nothing will replace hard work in the right direction.

8. Effective coaching is enhanced by certain attributes and leadership qualities. Often, however, the pistol coach may subjugate his prerogatives in what he thinks is the team's best interests. This situation can only create division and discord. The coach is in charge of the team and he must exert leadership if he is to be successful in fielding a winner.

9. If a coach tries to correct too many mistakes on the part of a shooter in one practice session, it serves only to confuse. He must correct each fault after full analysis and explanation to the shooter as to the nature of the fault. Shooters commit too many errors in performance without knowing why.

10. If team shooters desire to coach each other, all the established functions of coaching must be adhered to. It is not the perogative of individual shooters to dispense with certain functions of team preparation and control and include only those actions that come to mind at a particular time. It is mandatory than all coaching responsibility be superimposed upon the already considerable burden of responsibility presently governing the actions and thoughts of the successful individual competitors. An organized, systematic routine rather than the haphazard approach must be followed as in successful individual competition and combined with all the

added features peculiar to a team effort. The established responsibilities are in danger of not being carried out completely or reduced to a confused state when the responsibility is shared equally by four team members. This condition would automatically necessitate the chief responsibility for coordination to become the function of the ranking member of the team. This person then becomes a de facto coach and results in the watering down of his attention to his individual efforts. The team can't afford to have one team member performing at less than peak of current potential.

11. Coach/Shooter Relationship.

a. There are many characteristics and attributes of a good coach which contribute to the success of a firing team. The most important, however, is the coaches' ability to establish the proper "Coach - Shooter" relationship. This is nothing more than a mutual understanding which creates conditions that allow the coach and the shooter to produce the highest scores possible. If there is a conflict in personalities between the coach and shooter, the overall team effort is adversely affected. This has been and will continue to be a problem for all coaches.

b. Teaching and coaching in marksmanship must be logical and methodical. In order to receive the necessary response and results from the average shooter the coach must be able to analyze mistakes, dispel false notions, be sympathetic, be encouraging, and be honest. As each shooter is an individual, the coach must be quick to determine the individual characteristics that affect him, so that he may apply his coaching psychology to establish a satisfactory relationship. The initial contact between a coach and shooter will be the training period. During this time the coach will call upon his experience to impart knowledge and to correct shooting habits. This training period is of as much benefit to the coach as the shooter. As the training progresses so does the mutual confidence that is so necessary to their relationship.

c. Some of the requirements of a coach that will insure the establishment of a satisfactory coach-shooter relationship are listed below.

(1) The coach must be an experienced marksman. His qualifications broaden with coaching experience.

(2) He must approach his team assignment with a cheerful and understanding attitude.

(3) His experience level should be at least as high as that of his team.

(4) He must be honest with himself and his shooters. Errors during training should be discussed and the responsibility should be accepted by the individual who makes the error. However, it is important to remember that errors made in a team match are the result of the team effort and all members of the team should be mentally conditioned to this acceptance.

(4) He should insist on controlled, coordinated and proper application of fundamentals.

(5) He should be thoroughly grounded in the principles of analysis and correction of errors. His suggestions should be given with the attitude that it furnishes a probable solution.

(6) He must have the ability to react quickly to changes in wind conditions by recommending proper adjustments. This is an important aspect to maintaining the shooting zero for the firers. This ability increases with practice and experience.

(7) He must promote team spirit and the will to win.

(8) He must apply flexible coaching techniques adapted to the individual shooters.

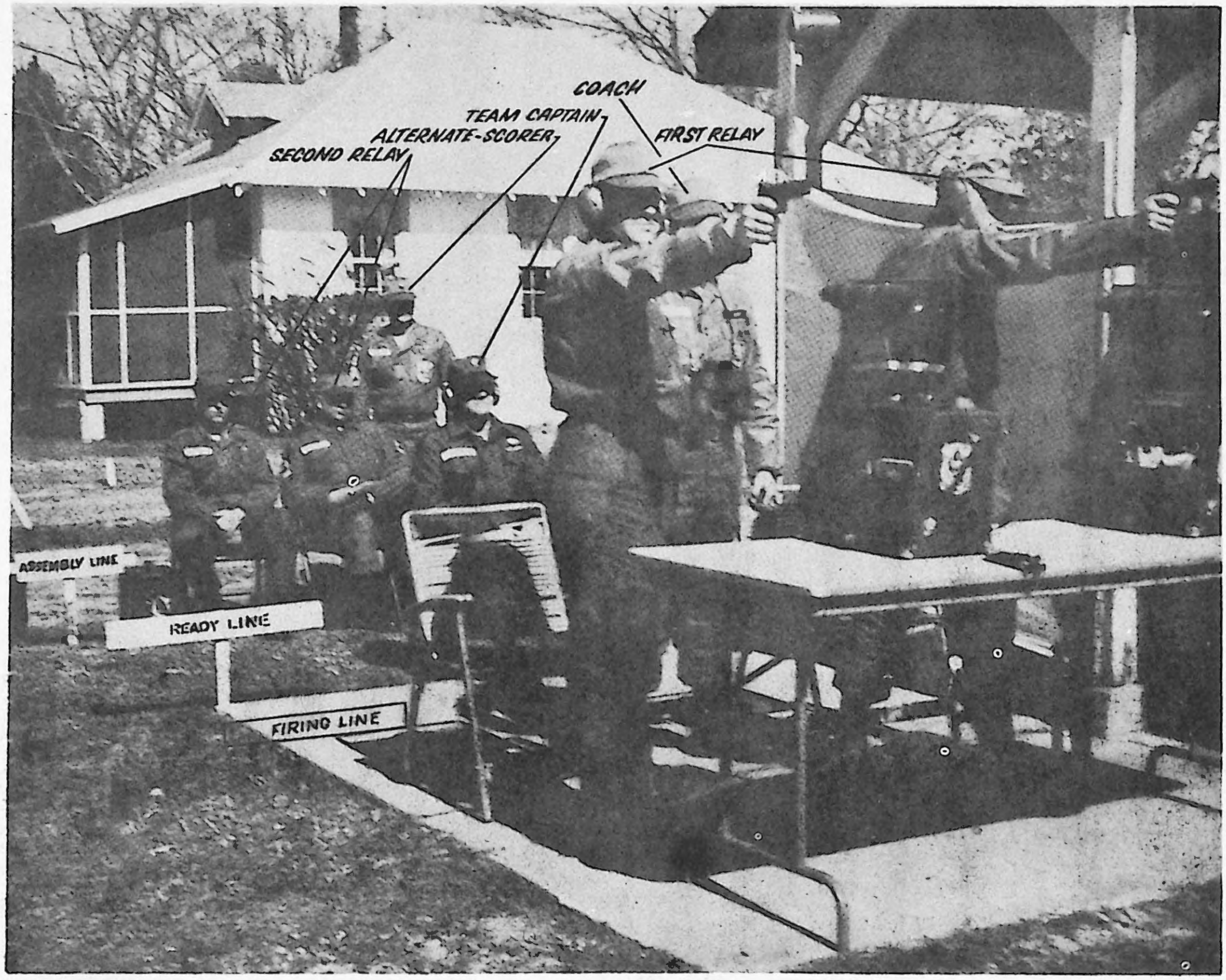
(9) He must insist on the highest standard of accuracy with no tendency toward compromise.

(10) He must never overlook the fact that each firer is an individual with a personality of his own.

(11) He should be instrumental in making certain that each member of his team is in possession of weapons of the highest degree of inherent accuracy and that each weapon is mechanically reliable. Each weapon should be functionally adapted to the particular desire of each individual shooter.

The advanced pistol marksmanship coach should endeavor to develop the shooter from the level he receives him and instill in him the desire to progress. The will to win and be a part of a winning team serves to place the shooter in a receptive attitude. Never let the shooter forget, slide by or detour around the fundamentals. In his enthusiasm and confidence in his ability the aspiring champion recognizes no peer.

F. A DEMONSTRATION OF PROPER PISTOL COACHING TECHNIQUE. Refer to Lesson Plan (P-10) "TECHNIQUE OF COACHING A PISTOL TEAM".



ORGANIZATION AND PLACEMENT OF PISTOL TEAM MEMBERS
(Distances are Compressed to Facilitate Illustration)

Figure 1

WORKSHEET FOR LINE COACHES

1. Coach is in charge of team.

2. Each shooter will follow the same complete procedure for each shot or string.

3. Coach has responsibility for assisting shooter between individual matches as well as in team matches.

4. Assemble Team Members on Ready line a sufficient time before match time or relay is called for complete preparation.

a. Physical Preparation.

(1) Designate relay and target number.

(2) Check for clean, proper functioning, and lubricated weapons.

(3) Check for sufficient proper caliber ammunition.

(4) Check for proper sight setting and weapon zeroed.

(5) Blacken sights.

(6) Use ear plugs and shooting glasses.

(7) Stop watch for time check.

(8) Score book and pencil.

(9) Chair.

(10) Obtain scorecard.

b. Mental Preparation:

(1) Review shot sequence (Slow, Timed and Rapid Fire).

(2) Encourage.

(3) Think and observe.

(4) "Maintain confidence that a controlled, uniform and exacting performance will produce good results."

(5) Talk shooter through relaxation.

(6) Let coach worry about irregularities.

(7) Review techniques of shot analysis and correction.

(8) Remind shooter to exercise care and safety.

(9) "Damage from mistakes is minimized by continuing to work hard."

(10) "Carefully planning the delivery of each shot will minimize the effect of tension and pressure."

(11) "Concentration maintaining sight alignment and holding the smallest possible sustained arc of movement while applying positive trigger pressure will result in a surprise shot break that will strike the target within the shooter's ability to hold."

5. Move to firing line with team member when relay is called with the following:

a. Coaching equipment:

(1) Ear plugs

(2) Pencil and scoresheets

(3) Scope and stand

(4) If practice, 22, 38, or 45 Cal scoring plugs

(5) Stop watch

(6) Shooting glasses

(7) If practice, shooter's worksheet

(8) Guidon

(9) Extra magazines of all caliber available

(10) Chairs or stools

(11) Staple gun and staples

b. Focus scope on proper target.

c. Assume stance.

d. Dry fire position.

e. Dry fire grip.

6. Plan shot sequence.

a. Coach and shooter will converse in low tones (coach will refrain from talking continuously during final preparatory stage or during actual shooting as this may disturb shooter's concentration).

7. Relaxation.

8. Deliver shot as planned.

9. Complete shot analysis after each shot or string.

10. Corrective measures taken on each shot or string.

11. Additional duties:

a. Time check after each shot.

b. Watch shooter or his weapon, not the target.

c. Have team captain or alternate available for scoring between stages of fire.

d. Have a non-shooting team member or alternate post score on team score board after each stage.

e. Check and validate team score card with signature if acting as team captain.

f. Police firing point at completion of firing.

CHAPTER XI

EVALUATION OF THE TEAM SHOOTER

Proper evaluation of a shooter's potential ability is based on knowledge of his personal traits, his understanding and retention of instruction, his ability to analyze his shooting faults, the trend of his shooting, his reaction to external conditions and the outstanding problems he has overcome and those he still faces as a challenge to his improvement. The evaluation of the shooter by the line coach, the team coach, and the officer in charge is made up of the following:

A. INDIVIDUAL INFORMATION AND EVALUATION SHEET WHICH INCLUDES:

1. Line coach evaluation.

2. Graphic progress record.

3. Individual aggregate and team aggregate record. (average for complete training period)

   a. Practice.

   b. Match.

B. EXAMINATION:

1. Oral.

2. Written.

C. SHOOTERS INDIVIDUAL SCORE BOOK.

NOTE: An example of each of these evaluation factors follows:

A. INDIVIDUAL INFORMATION AND EVALUATION SHEET:

1. Line Coach Evaluation:

PERIOD_____TO_____

NOTE: Information recorded here will by its very nature be considered confidential and will be only for the use of coaches and team officials. Each coach will make his remark in such a manner as to reflect his considered OPINION and what action he has taken to orient the shooter as to his particular problem if a problem is noted. Extreme care is indicated here and it is suggested that this portion of the file be filled in after the shooter has been under observation for at least a month or just prior to completion of training period.

NAME_____RANK_____SN_____ORG_____

a. Personal Traits:

(1) Mental Attitude:

(2) Behavior:

(3) Team Spirit:

(4) Physical Condition:

(5) Personal Appearance:

(6) Care of Equipment:

b. Specific Problems:

(1) Weapons:

(2) Slow Fire:

(3) Timed Fire:

(4) Rapid Fire:

(5) Other:

c. Reaction to Weather Conditions:

(1) Wind:

(2) Rain:

(3) Cold:

(4) Very Hot:

d. Response to Coaching:

(1) Preliminary Preparation:

(2) Position and Grip:

(3) Sight Alignment versus Sight Picture:

(4) Trigger Control:

(5) Mental Discipline:

(6) Use of Slow, Timed and Rapid Fire Technique:

(7) Shot Analysis:

(8) Use of Corrective Measures:

e. Individual Aggregate Average:

Competitive: .22_____ C.F._____ .45WC_____ AGG_____ .45HB_____

Practice: .22_____ C.F._____ .45WC_____ AGG_____ .45HB_____

f. Team Average:

Competitive: (NMC) .22_____C. F._____45WC_____.45HB_____

Practice: (NMC) .22_____C. F._____45WC_____.45HB_____

g. Test Grades: I_____II_____III_____IV_____V_____VI_____VII_____

h. Line Coach Evaluation: _____

_____
Signature of Line Coach

Head Coach Evaluation: _____

_____
Signature of Head Coach

Noted by _____
OIC Pistol Division

2. Graphic Progress Record:

The graphic record of an individual's shooting must furnish the following information: The level of individual performance as compared to team performance in practice shooting and in match shooting. It is well known that the hot individual shooter can maintain an aggregate that is equal to or better than a good team shooter who is unable to post equally high individual scores. The graph furnishes this important knowledge at a glance where a running aggregate has to be studied in detail. The graph also shows the all important trend of a shooter's performance. A hot starter and weak finisher can have the same total aggregate as a slow starter and a hot finisher. The best team member is the one who is firing the best scores now. One more important factor that the graph shows is consistency. The prospective performance of a shooter is somewhere between the peaks and valleys of the graph. The wider the span from best score to worst score, the less the accuracy of predicting the approximate score a certain shooter will get in the next team match. Are the peak performances attained during practice and a somewhat poorer performance attained during competition? This feature is immediately apparent on even a short term graph. What is John Doe's highest potential score?

(EXAMPLE)

Graphic Progress Record (Individual Average, Solid Line--Team Average, Dotted Line)

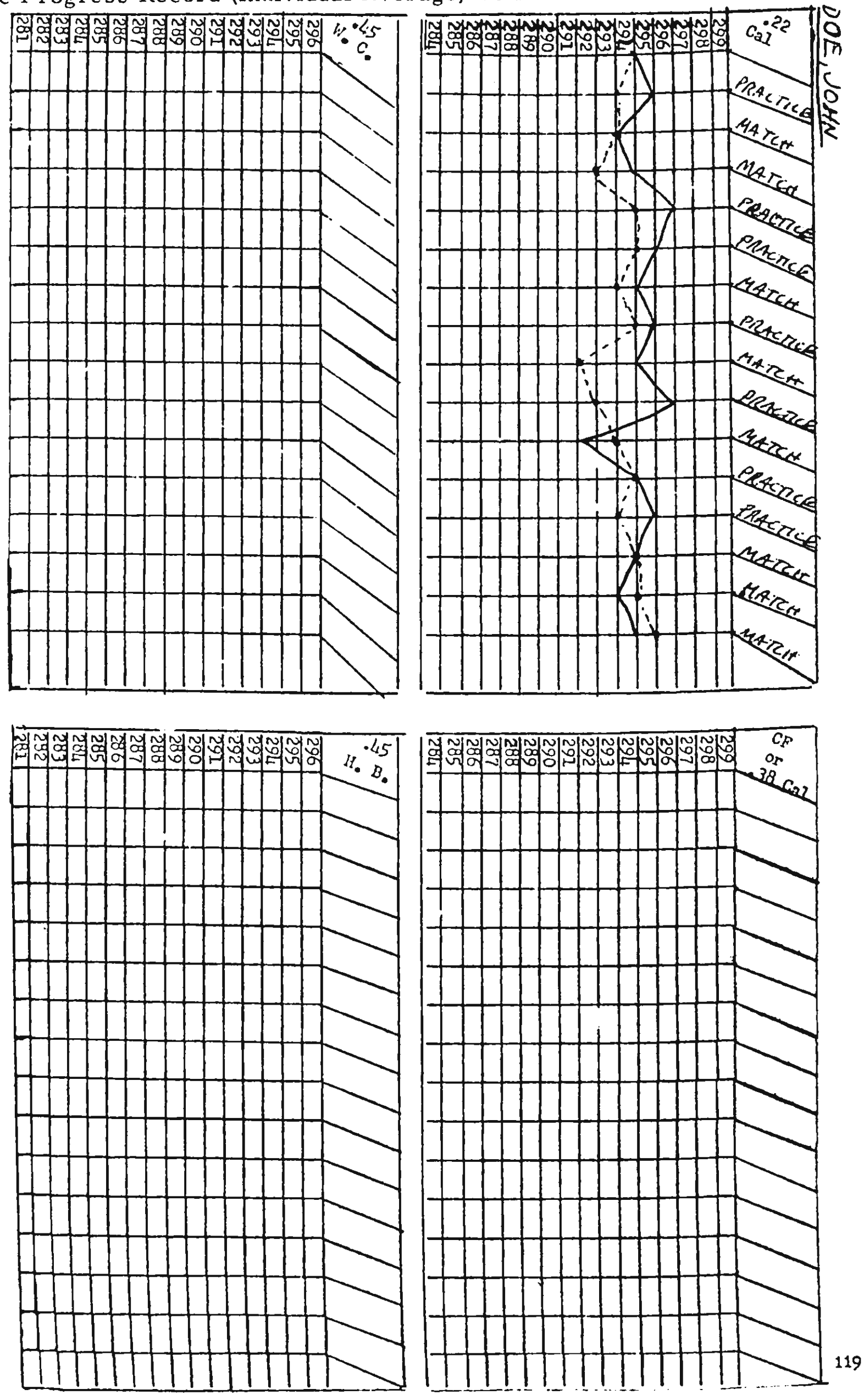


Figure 1

3. Aggregate Record.

EXAMPLE OF INDIVIDUAL AGGREGATE & TEAM AGGREGATE RECORD FOR ONE CALIBER WEAPON IN THREE MATCHES.

Ranking		Name	Indiv Agg	Tripled Team Agg	Grand Running Agg
1	SFC	SHOOTER	2610	2592	5202
2	"	"	2606	2589	5194
3	"	"	2582	2604	5186
4	"	"	2579	2607	5186
5	"	"	2589	3595	5184
6	"	"	2575	2604	5179
7	"	"	2592	2583	5175
8	"	"	2548	2622	5170
9	"	"	2576	2586	5162
10	"	"	2592	2568	5160
11	"	"	2561	2595	5156
12	"	"	2577	2568	5145
13	"	"	2579	2544	5123
14	"	"	2569	2547	5116
15	"	"	2552	2562	5114
16	"	"	2555	2541	5096
17	"	"	2533	2559	5092
18	"	"	2546	2526	5072
19	"	"	2539	2526	5065
20	"	"	2531	2526	5057

NOTE: 1st place individual aggregate score is average of 870 per match.
1st place team aggregate is average of 288 X 3 or 864 points per match.

a. The dependable team shooter is the primary objective in the US Army Pistol Division Training Program.

b. It is readily apparent in this system that team shooting has the ratio of 50-50 instead of 75-25. Also apparent is the immediate comparison of individual versus team performance. This arrangement placed the team effort in its proper focus. The hot shot individual shooter has a difficult time compiling a running aggregate that will cause him to be chosen over a team member who has higher team scores. Team member number 8 might possibly be selected as one member of best four-man team. Malfunction of a weapon may have caused low individual score.

c. Practice scores should not be combined with match scores in a running aggregate. Use match scores only. If a practice score aggregate is kept initially, it should be discarded when sufficient match scores are available for accurate evaluation.

d. There are other enormous handicaps in selection of the four best pistol shooters on your pistol squad. The four best .22 caliber shooters are not necessarily the best .38 caliber shots and vice versa. Total aggregates of all three weapons is of limited use. Base your selection on separate caliber aggregates and graphs. Consult the line coach's evaluation of each shooter on his performance and problems with each weapon. Further, direct consultation with the line coaches on the day of the team matches may reveal conditions such as mild illness, family problems, changes in normal living habits, depression or elation over current performance that have a profound effect on team scores. If the wind is blowing today, there are certain members of your pistol squad who will perform immeasureably better than others. (The line coach's evaluation sheet for each shooter should have a formidable list of pertinent information and other items critical to an intelligent decision filled in for ready reference. It is difficult to remember all these facts concerning a pistol squad of many shooters.)

e. To foster incentive and avoid activities and formation of habits that are detrimental to the team effort certain guidelines are necessary for instilling discipline among the individual shooters.

POINTS TO REMEMBER

No overeating during the shooting day.
No smoking during duty day or at matches.
No coffee during duty or at matches.
No alcohol or drugs (medicine) the period before or immediately prior to or during record or match firing.
Daily physical training (necessary for body tone).
No gambling (Creates nervous tension).
No late hours (2300 Hours is the latest bed time immediately prior to and during the days of match firing).
No night driving (Be off the highways between sun down and sun up).
Keep your weapons secure, clean, lubricated and periodicly tested for accuracy.
Keep a record of every round fired with each caliber weapon in your scorebook.
Never score yourself during record firing.
Par score for record practice 3 gun indiv aggregate - 2640 x 2700.
Par score for record practice 3 gun team aggregate - 2640 x 2700.
Par score for 3 gun indiv match aggregate - 2630 x 2700.
Par score for 3 gun team match aggregate - 2630 x 2700.
Par score for record practice 45 H. B. Indv. Agg. 876 x 900.
Par score for record practice 45 H. B. Team Agg. 876 x 900.
Par score for 45 H. B. Ind. match Aggregate 870 x 900.
Par score for 45 H. B. Team match Aggregate 870 x 900.
(Par scores will be modified as weather conditions dictate)

(1) Par Score Average 875 - Blue Team Member for one Aggregate
Par Score Average 7,000 - Blue Team Member for one Match (22, 38, 45WC & 45 HB)
Par Score Total 35,000 - Blue Team Member for five Matches

(2) 1964 Team Average: 865 - Cut Off Score for one Aggregate
1964 Team Average: 6,918 - Cut Off Score for one Match
1964 Team Average: 34,590 Cut Off Score for five Matches

(3) Example of 7200 Aggregate:

.22 Cal Individual Aggregate	882
.22 Cal Team Aggregate (NMC X 3)	891
.38 Cal Individual Aggregate	876
.38 Cal Team Aggregate (NMC X 3)	873
.45 Cal WC Individual Aggregate	878
.45 Cal WC Team Aggregate (NMC X 3)	867
.45 Cal H. B. Individual Aggregate	841
.45 Cal H. B. Team Aggregate (NMC X3)	858
TOTAL:	6966 x 7200 points

(4) Example of Team Members' Aggregates and Team Standings for the Last Five Matches.

	Memphis Aggregate	Carbon-Dale Aggregate	Ft Knox Aggregate	S. Bend Aggregate	Camp Perry Aggregate	Grand Aggregate	Place	Average 900 Agg.
SFC B	7014	7014	7026	7012	7013	35079	1	876
SFC T	7025	7025	7049	7022	6896	35017	2	875
SSgt A	6998	6998	7040	7034	6921	34991	3	874
Sgt J	7006	6968	7006	6968	6950	34898	4	872
MSgt S	6973	6998	6993	6950	6934	34848	5	871
SFC M	7012	6923	7012	6923	6950	34820	6	870
SFC L	6997	6934	6989	6913	6884	34717	7	867
SSgt M	6982	6920	6982	6920	6857	34661	8	866
MSgt S	6958	6916	6958	6916	6877	34625	9	865
Sgt H	6983	6913	6913	6945	6861	34615	10	865
Sgt C	6873	6977	6951	6989	6847	34587	11	864
SFC S	6918	6939	6918	6939	6863	34577	12	864
SFC O	6908	6905	6908	6905	6874	34500	13	862
SSgt W	6877	6949	6877	6949	6844	34496	14	862
SFC B	6887	6917	6887	6917	6836	34444	15	861
SFC C	6905	6883	6905	6883	6853	34429	16	860
SFC H	6857	6911	6909	6862	6828	34367	17	859
Sgt W	6801	6801	6798	6828	6779	34007	18	850

(EXAMPLE)

B. EXAMINATION:

U.S. ARMY PISTOL DIVISION WRITTEN TEST NUMBER 9.

GENERAL (True or False)

( ) 1. A pistol team is a group of shooters working toward establishment of a new national record team score.

( ) 2. Championship caliber pistol shooters should be excellent pistol marksmanship instructors.

( ) 3. Marksmanship proficiency is not an inherited trait.

( ) 4. The first comprehensive steps toward a permanent program of marksmanship training was taken by the U.S. Army in the first decade following the Civil War.

( ) 5. The National Rifle Association, founded in 1871, is the sponsor of the National Championship Pistol Matches each year.

( ) 6. The National Board for the Promotion of Rifle Practice founded in 1901, is the U.S. Government agency that authorizes the award of the Distinguished Pistol Shot Badge.

( ) 7. At the insistence of General John J. Pershing, a marksmanship instructor's school was established at Camp Perry, Ohio, during World War I.

( ) 8. The National Trophy Pistol Matches are sponsored by the N.B.P.R.P. each year at Camp Perry, Ohio.

TEAM ORGANIZATION AND ADMINISTRATION (True or False)

( ) 9. The head coach initiates shooting equipment checks that serve to pinpoint faulty mechanical functioning, cleanliness, proper lubrication, security and inherent accuracy of all weapons.

( ) 10. All weapons used in competition should be static tested for inherent accuracy before issue to shooters.

( ) 11. Match ammunition used in competition should be tested for uniform accuracy by lot numbers before issue to shooters.

( ) 12. Shooting equipment may be obtained from TA 60-18 and nonappropriated funds.

( ) 13. Ammunition is drawn under the authority of TA 23-100.

( ) 14. Coaches and support personnel take care of all administrative details so the shooter is free to concentrate on shooting.

( ) 15. A target pistol is similar to a machine in that it is tightly fitted and needs regular cleaning and lubrication to prevent malfunctions and undue wear.

( ) 16. More malfunctions are caused by faulty or dirty magazines than any other reason.

( ) 17. Armorers and Gunsmiths are a very important part of the team effort. The quality of work turned out is directly reflected in scores fired by the team.

NRA PISTOL MATCH RULES AND RANGE SAFETY: (True or False)

( ) 18. During a match weapons will be loaded only after the range officer has given the command "LOAD."

( ) 19. When the range officer commands "CLEAR AND BENCH WEAPONS" you should engage the safety lock on automatic pistol and/or open the cylinder of revolvers.

( ) 20. Only thoses hits on the target which are visible will be scored.

( ) 21. When you have an alibi and you attempt but fail to clear the malfunction, you forfeit your right to an alibi string.

( ) 22. Trigger may be weighed at anytime during a pistol match with official NRA trigger test weights.

( ) 23. The assignment of an official referee to a registered NRA match is made by the National Rifle Association.

( ) 24. The chief range officer has full charge of the range.

( ) 25. The score board at a range may serve as preliminary bulletin.

( ) 26. Normally you have three (3) minutes from the time your relay is called to the firing line and the range officer's command "LOAD."

( ) 27. When an error is made on the score card, an erasure will be made by the scorer to correct the error.

( ) 28. You must fire the same weapon all the way through a gun aggregate. (900 Points.)

(Multiple Choice)

( ) 29. If, during a timed fire string, your target is faced longer than 20 seconds, what must you do?

a. Protest to the referee about the timing.
b. Accept the score without seeing the target.
c. Refire.
d. Have the option to select either "b" or "c".

ZEROING AND PRELIMINARY PREPARATION (True or False)

( ) 30. Careful preliminary preparation before moving to the firing line will free the shooter's mind so he is able to plan and think clearly about accomplishing the task ahead.

( ) 31. A zeroed weapon is a weapon that will group all shots in the center of the target under normal conditions if the fundamentals of marksmanship are employed properly.

( ) 32. It is a good idea to hold off ("Kentucky Windage") instead of moving your sights when your shots are grouping slightly to the left of the ten ring.

( ) 33. If your shots are grouping to the left of the ten ring, you must move the rear sight to the left in order to center the group on the target.

( ) 34. Sight change other than normal should be noted in your score book for future reference.

( ) 35. To properly and quickly zero your pistol, use the shot group method.

(Multiple Choice)

( ) 36. If you have a four (4) inch error in elevation at six o'clock and the sight moves the strike of the bullet one-half inch per click, how many clicks up in elevation would you take on the first sight change.

a. 2 clicks
b. 4 clicks
c. 1 complete turn
d. 8 clicks

FUNDAMENTALS (True or False)

( ) 37. Proper stance gives a shooter stability and balance.

( ) 38. A shooter must attain a position that will cause his shooting arm and body to assume a natural alignment with the center of the target.

( ) 39. An essential feature of grip is uniformity.

( ) 40. In order to apply smooth trigger pressure you must squeeze with the whole hand.

( ) 41. Most of the gripping pressure is applied with the middle two fingers and the heel of the hand.

( ) 42. Breath control should be practiced in preparation for and delivery of each shot or string.

( ) 43. The extended shooting arm should have a firm grip on the pistol, a relaxed wrist and a tightly locked elbow.

( ) 44. Sight alignment is the relationship of the front sight and rear sight to the target.

( ) 45. Independent control of the trigger finger is necessary for efficient, positive application of trigger pressure straight to the rear.

(Multiple Choice)

( ) 46. What does uniform properly coordinated employment of the fundamentals achieve?

a. All x's
b. All 10's
c. consistently good shot groups
d. All 9's

( ) 47. Dry firing will aid you in which fundamental?

a. Sight alignment
b. Stance
c. Trigger control
d. All of the above

( ) 48. What is the best assurance that the next shot or string will be good after a a bad shot or string has just been fired.

a. Walk away from firing line, sit down and relax
b. Violent, abusive criticism of oneself
c. Look for your coach
d. Comprehensive shot analysis and application of positive corrective technique

( ) 49. Minimum arc of movement can best be described as:

a. The movement in sight alignment
b. The area on the target where the bullet strikes
c. The shooter's ability to hold
d. The spot where the sights are when the shot is fired

( ) 50. Try for a _____ on each shot fired

a. Surprise shot with no reflex action to disturb sight alignment
b. Shot fired as the target turns
c. Shot to fire within eight (8) seconds
d. Shot to break the first time you put the gun up

( ) 51. During slow fire, on any one shot, your concentration is broken and you are not convinced you have created conditions under which you can deliver a good shot; what should you do?

a. Think about sight picture then shoot
b. Bench the weapon, analyze the factors causing the doubt, then apply positive correction, replan, relax and try again
c. Squeeze faster
d. Break the shot if it still looks good

(True or False)

( ) 52. Sight alignment is the most important fundamental of pistol marksmanship.

( ) 53. Positive trigger control must be coordinated with a minimum arc of movement and perfect sight alignment for best results.

SLOW FIRE TECHNIQUE: (True or False)

( ) 54. It is necessary to prepare, plan, relax, deliver, analyze and correct each shot during slow fire for best results.

( ) 55. Follow through and recovery are one and the same thing.

( ) 56. Holding the weapon absolutely motionless while aiming is the most important objective in slow fire.

( ) 57. Follow through is the attempt to maintain all factors for controlling a good shot just as they were planned and set up all the way through the instant in time that the shot breaks without experiencing a reflex action that may disturb sight alignment and spoil the delivery of a surprise shot.

( ) 58. Proper trigger control allows the shooter to deliver a shot on the target without disturbing sight alignment.

( ) 59. An advanced pistol shooter must establish a system for control of slow fire and use it uniformly and completely on each slow fire shot.

(Multiple Choice)

( ) 60. The system for delivery of a good shot in slow fire must include:

a. Physical and mental preparation
b. Planning delivery of shot and relaxation
c. Deliver shot, as planned, with no compromise
d. Shot analysis and positive correction
e. All of the above

( ) 61. With a .45 cal pistol, if you have a misalignment of front and rear sights of 1/100 inch, you will be off center of target at fifty (50) yards by approximately:

a. 1 inch
b. 3 inches
c. 6 inches
d. 10 inches

TIME AND RAPID FIRE TECHNIQUE: (Multiple Choice)

( ) 62. The most important factors in good timed and rapid fire performance are;

a. Rhythm and quick recovery
b. Positive trigger control
c. Shooting the first shot as the target faces
d. Five good sight alignments
e. All of the above

( ) 63. Focus your vision on the _____ during the timed and rapid fire

a. Combination of the front and rear sight
b. Target but be aware of the sights
c. Front sight but be aware of the rear sight
d. Rear sight but be aware of the front sight

( ) 64. After the command "Ready on the Firing Line", you are waiting for the target to face in rapid fire, the sights are aligned on

a. A point on the grass half way to the target
b. An out of focus area on the edge of the target frame in line with where your aiming area will be when the target is faced
c. A point on the pile of dirt in the impact area behind the target line
d. None of the above

( ) 65. Quick, precise recovery after recoil of a shot in rapid fire is best assured by;

a. A strong arm
b. No wind
c. Weak powder charge
d. A natural firm grip, a natural position and a stable stance

( ) 66. Which factor assures the best scores for rapid fire when the wind is blowing?

a. Proper application of fundamentals
b. Perfect sight picture
c. Enthusiasm
d. Get behind gun box

( ) 67. If your .45 cal pistol malfunctions and jams in the middle of a string of rapid fire, what would you do if this is the first jam of the match?

a. Yell for the block officer immediately
b. Attempt to clear it so you can get the shot off before the target turns away
c. Quietly raise my hand and come to the ready position with the jammed weapon and wait until the string is complete before asking the block officer to check the malfunction
d. Scope my target before the target turns away

ATTRIBUTES OF A TEAM SHOOTER: (Multiple Choice)

( ) 68. A good team shooter is:

a. The one with the highest potential
b. The one waiting for the coach to bring him some ammunition
c. Always ready to shoot but is using a pistol that malfunctions occasionally
d. Compatible, capable, eager to win and has consistent, high scores

(True or False)

( ) 69. Positive trigger control helps eliminate the necessity of being a good loser.

( ) 70. Compatibility is an attribute a shooter has when he knows the most good jokes.

( ) 71. Good team shooters know about their own scores and do not worry about those of their teammates or competitors.

TECHNIQUE OF COACHING A PISTOL TEAM (True of False)

( ) 72. Intelligent coaching does not help a champion team shooter.

( ) 73. A pistol team coach exercises control over his team members at all times during a team match.

( ) 74. The pistol team coach should tell the lowest scoring shooter on his team that his low scores was responsible for the loss of the team match.

( ) 75. The conduct of a good team coach must be beyond reproach at all times.

( ) 76. The coach need not be familiar with NRA pistol rules if his team members know them.

( ) 77. The coach has responsibility of assisting his team members between individual matches as well as team matches.

( ) 78. The coach should check on and obtain score cards, target numbers, chairs, how many relays per team match and have a scorer for the adjacent team designated.

WIND SHOOTING AND ADVERSE CONDITIONS: (True or False)

( ) 79. Adverse conditions on the firing line affect all shooters on the line with you.

( ) 80. When shooting slow fire and lulls in the wind are few and far between, it is advisable to shoot more than one shot during some of the lulls.

MENTAL DISCIPLINE: (Multiple Choice)

(1) 81. Mental Discipline is:

a. The ability to control your mental and physical actions
b. The ability to direct your thinking toward accomplishing certain mental and physical tasks
c. The ability to momentarily, concentrate on the performance of a given task to the exclusion of all disturbing factors
d. All of the above

( ) 82. To reduce tension the shooter must;

a. Think of the last blonde he dated
b. Think of nothing in particular
c. Think positively and plan course of action
d. Read a book on peace of mind

( ) 83. A team member should not worry about the results of a team match but

a. Think how nice is would be if he was the alternate
b. Think of the sequence of thoughts and action necessary to produce a good shot
c. Think of how best he can employ the fundamentals
d. Either "b" or "c" or both

( ) 84. Confidence in your ability to apply the fundamentals is a deciding factor in good shooting performance. How do you get confidence?

a. Repetition of a good performance
b. Fear of failure
c. Desire to improve
d. Interest in regular practice

EFFECT OF ALCOHOL, COFFEE, TOBACCO AND DRUGS: (Multiple Choice)

( ) 85. Alcohol affects the shooter by destroying his;

a. Coordination
b. Will to win
c. Ability to concentrate
d. All of the above

( ) 86. Alcohol will cause the shooter to;

a. Dehydrate
b. Win a match before he gets too drunk
c. Become compatible with the champions
d. Exercise superior judgment

( ) 87. Most pistol champions do not use alcohol because;

a. Of the depressing effect that dulls the senses
b. The hangover effects adversely their ability to concentrate
c. Alcohol and gun powder don't mix
d. All of the above

( ) 88. Smoking tobacco causes the shooter to have;

a. Larger than normal arc of movement
b. Faster heart beat
c. Shortness of breath
d. All of the above

(True or False)

( ) 89. Most drugs found in sleeping pills, pain relief tablets, diet pills, etc., are detrimental to good shooting.

( ) 90. Tranquilizers will help the shooter to avoid worrying about his sixes

( ) 91. The caffein in coffee and tea is a powerful stimulant. Five cups of coffee in a day can wreck your shooting efforts.

( ) 92. Pure nicotine is a deadly poison, a very small drop is enough to kill a horse.

( ) 93. Anti-Allergy pills, cold pills and nose drops (nasal decongestants) generally contain stimulants that will adversely affect the shooter's nervous system on the day of the big match.

( ) 94. Prescription shooting glasses will also protect the eyes from lead fragments, powder flash burns and other foreign objects.

PHYSICAL CONDITIONING: (Fill In Answers)

95. There are many types of exercises that a shooter can use to his advantage. Name four (4).

a.
b.
c.
d.

96. The energy a shooter needs is best supplied by;

a.
b.
c.
d.

GENERAL: (Fill in Answers)

97. Name five adverse conditions the shooter must learn to cope with;

a.
b.
c.
d.
e.

98. To clear a pistol properly, you must;

a. Remove _____
b. Pull _____ to rear
c. Inspect _____
d. Place weapon _____

(True or False)

( ) 99. It requires 120 controlled shots to win the National Trophy Team Match.

( ) 100. If a competitor on the firing line notices a condition existing in the firing area which he determines to be dangerous, he may give the command "CEASE FIRE" without consulting the range officer.

C. THE SHOOTERS SCORE BOOK

The Shooters Score Book is a valuable aid to the competitive pistol shooter. It is an individual shooters record of all firing by stage, such as slow, timed, and rapid fire, plus National Match Course and all shots fired should be recorded. Practice scores should be kept separate from Match Score.

The Score Book is valuable only if it is kept accurately and up to date. Record the bad scores as well as the good ones. By keeping the scorebook accurately it will be an aid in finding weak points in the shooters performance. The Score Book will show over a period of time a trend in the shooters overall progress. It will reflect progress in the different stages of fire. Averages may also be kept in the score book for each stage of fire. Record of ammunition used, sight adjustment, windage, and elevation, weather, light, wind, temperature, may be an aid to the shooter at a later day. There are many type score books that will do the job well, but choose the ones that are simple and will furnish the data you need quickly and enable you to start firing under existing conditions and eliminate the handicap of not knowning where to set your sights. An example of a Score Book page appears below:

DATE					LOCATION					
1	2	3	4	5	6	7	8	9	10	TOTAL
ELEV			WIND			SF TOTAL				
1	2	3	4	5	6	7	8	9	10	
ELEV			WIND			TF TOTAL				
1	2	3	4	5	6	7	8	9	10	
ELEV			WIND			RF TOTAL				

	AMMO	CALIBER				WIND		LIGHT		
	1	2	3	4	5	6	7	8	9	10	TOTAL
SL											
TM											
RP											
	NMC TOTAL										
	TOTAL AGGREGATE										
	NMC TEAM MATCH										
	1	2	3	4	5	6	7	8	9	10	TOTAL
SL											
TM											
RP											
	NMC TOTAL										

D. ATTRIBUTES OF A TEAM SHOOTER

A popular fallacy that good pistol scores are engendered by a blank or nerveless mind has been proven completely erroneous. A quick look at the nation's outstanding pistol marksmen will show you individuals of higher than average level of intelligence. The necessity for intense concentration and strict adherence to a multitude of sometimes unnatural but correct shooting fundamentals and techniques, quickly eliminates those of lower intellect.

A good team shooter needs to have many favorable attributes. However, if he lacks the ability for intense concentration and the intestinal fortitude to make up his mind to adhere to fundamentals regardless of match pressure, adverse weather conditions or any other conceivable distraction, he is useless to himself and the team.

1. CONSISTENCY: Consistency is a most useful and important attribute if it is coupled to performance at a high level of efficiency. If you, as a coach, can place four consistently high scoring shooters on the line for a team match, your probability of winning is considerably better than that of a less fortunate team. If you have a man who shoots 297 part of the time and 287 at other times, and a man who shoots scores ranging between 290 and 294, which of these shooters would you prefer to have on your team? Naturally, you would choose the 292 average shooter with the smallest score spread. An inconsistent or erratic shooter can ruin a good team in the long run. The other members never know whether he is going to hit it hard or have an "OFF" day.

2. COMPATABILITY: Compatability, as it pertains to team shooting, is the ability to get along with your teammates. You are working as a team, in the highest sense of the word. All of your long hours of practice and hard work can be ruined if one of your team members makes a remark which you dislike or which may cause you to form a lasting dislike for him. Your mind dwells on this remark instead of concentrating on your shooting. You must also be able to get along with shooters other than your teammates. If some of these fine competitors find that you can't stand a joke, they may antagonize you by making you the butt of a joke of a practical nature. It really helps to be an easy going person while shooting on a pistol team. There is enough pressure on during the team match, and the rest of the team doesn't need a grouch or a sore head among them to complicate things. Smile and the world smiles with you. Grouch and the worlds laughs at you.

3. EAGERNESS: Eagerness or love of shooting on the part of the team shooter will apply not only to competitive match shooting, but to the long and grueling periods of practice with no other goal except self-improvement. You have no doubt seen the avid shooters, when a lull in practice occurs, gather up their powder horns, shot measures and experiment with that old muzzle loader. Some of them may be shooting an old junker of a .22 rifle or pistol which was old when they were born. A good percentage of them are hunters, or outdoorsmen of other calibre. Many of our better pistol shooters are part time gun collectors of one degree of proficiency or another. In short, they enjoy guns and shooting. They know they are capable shooters and they look forward to matches with anticipation, knowing they are going to turn in a superb performance.

4. SURE-FOOTED AND DELIBERATE: The good shooters always seem to be standing around telling jokes when everyone else is hastily preparing to shoot. Why? The next time you go to a match, watch one of these top shooters, he does everything ahead of time and more or less by the numbers. When the range officer says "IS THE LINE READY," that shooter is ready. He is deliberate in everything he does, and he is thorough. Where does this sure-footed business come in? If our sure-footed shooter is shooting a group in the 9 or 10 ring at

3 o'clock, he immediately moves his sights, not relying on hope that the next shot will be an X. If he is sure and positive in his actions and has confidence in his ability, he will move his sights enough in one bold adjustment to put his next shot in the center of the X ring.

5. CONFIDENCE: It is impossible to shoot consistently good scores if you don't have confidence in your ability. A point concerning confidence in ability is the four minute mile. For years it was though that it was impossible to run a mile in four minutes, however, as soon as one man did it, several others also accomplished it. The mental block was removed and people knew it was possible and they were able to duplicate it. Where confidence really enters the picture is when the first relay has fired a good score in a team match. The thoughts in each team member's mind at that time is a good indication of a confident attitude or the lack of it. Either they will say "I know the second relay will shoot a good score so we have the match won," "I hope they don't goof up," "Good lord, what do I do now," or "We're bound to have a good score. I have been able to carry out my plan for control of each shot on a 97% basis and I expect to improve the average in this match."

6. GOOD EQUIPMENT: Good equipment being considered as an attribute of a team shooter may sound a little unusual, but upon careful consideration, it will mean a lot more. The team shooter builds confidence in good personal shooting equipment. This is of primary importance in a winning team performance. It is immaterial whether the equipment is issued to the shooter or whether it belongs to him, it should be the best that is possible to obtain. Not only is it necessary to have the best obtainable but it is important to have his equipment complete and checked out in good working order. A shooter can be just as easily upset by not having an accurate weapon or a malfunctioning weapon as by having buck fever.

7. GOOD HEALTH: Good health is another attribute of a team shooter that is easily perfected. If a team shooter is to give a good performance he must be in good physical condition in order to have the stamina on the firing line to make each shot or string of shots, the best he is capable of firing. Physical conditioning is imperative for the reason that it gives resiliency to the muscles and better nerve control. A shooter should strive to build better general health and he should keep himself in the best possible condition, prior to and during matches. This conditioning is aided by the knowledge of the effects that certain foods have on the system. In subsequent instruction, the effects of some of these foods and certain other detrimental items such as coffee, alcohol, drugs, and tobacco will be discussed.

8. OPEN MIND: Be always on the alert to help a teammate. Accept and give constructive criticism in the spirit of being helpful and of pulling for the common goal. Accepting the little peculiarities or personality quirks of his teammates as part of the days work, will greatly add to the shooter's ability to remain calm, serene and ready to concentrate on the job at hand: control each shot to the best of his ability. Your teammates have to have an open mind to be able to put up with you, you can at least return the favor.

9. SPORTSMANSHIP: There is no room on any team anywhere for a poor sport. This is especially true on an Army pistol team. Any time you wear the Army uniform to a match you are representing the US Army. Considering your rank and pay, you may think differently, but in the eyes of all the civilians at the match, YOU are the Army. What is more, each civilian will look at you with the idea that he alone, with his taxes, bought your weapons and equipment and even paid your entry fees. This behooves you to conduct yourself in a manner that will bring no criticism on the Army, the marksmanship program and finally, but most assuredly, YOU. Any complaining letter that is written or remark that is made, will, with the slow certain steps of death and taxes gradually flow down hill to YOU. BY YOUR CONDUCT make sure this is a letter of appreciation and not one of complaint. Our illustrious leader has said that there is no such thing as a good loser, however, you don't want to be a bad loser either.

10. MENTAL ATTITUDE: A philosopher once said, "You are what you think." What you tell yourself or what you convince yourself you can do, you more than likely can accomplish. How many pistol firers have ever stood on the firing line when all of a sudden a shooter slams his weapon down and says "D/#G*()&&%""""/@1/46$_#"", I just jerked a seven." It happens frequently and it may shake you up. The shooter that operates under such a thin emotional veneer that he easily loses his temper, is the victim of a monumental lack of self control. Such a lack is a serious handicap in an endeavor that places great importance on controlled concentration.

Your mental attitude governs your complete performance. How many have ever gone into the last string of rapid fire knowing exactly what you had to get for the NMC to beat the existing record. If you failed, you were probably saying to yourself the whole time "If I just don't goof this string up." Control is based on careful planning and the coordination that comes from extensive match experience. Hoping, praying or wishing, will not bring home championship records.

11. DEPENDABILITY: The team shooter that is on time for a team briefing before the Big Team Match, that shows up with all of his equipment and ammunition, that knows what target and relay he is assigned to, that voluntarily scores the adjacent team during his off relay without the necessity of having the coach look for him, sets up methodically and thoroughly on the firing point without undue supervision, is the kind of dependable man who can also do a better than average job of shooting. It is surprising how much can be accomplished when there is no worrying about who gets the credit.

12. HONESTY: It is sufficient to say that honesty, like virtue, is its own reward.

13. ABILITY TO SHOOT: Without the ability to shoot, the foregoing attributes are pointless unless you are planning to be a salesman. For example eagerness to participate in a sport you haven't mastered, possessing a compatible personality and bursting with good health, are obviously not the primary requirements necessary to produce winning teams. The ability to shoot is the foundation on which the other attributes are used to fashion a winning team shooter.

CONCLUSION:

Accurate evaluation of each shooting member of a pistol team is a requirement made necessary because guess work, intuition and hope will not bring about a grouping of the four best pistol shooters on your team except by accident. Accidents are inherently destructive and a pistol team coach should not willfully court disaster.

A dynamic system of operation engages all of the participating individuals, measures them against exacting standards, tests them for constant progress and relegates each of them to a level of potential commensurate with their assessed capabilities.

To be efficient, the system must evaluate unerringly. It must remove the veneer of less important attributes and penetrate deeply to the core. At the core is the inherent skill and intellect. Toughness, tenacity and initiative weld these essentials of character into a driving, creative force.

If a person is supine in the face of competitive stress, his category is with those who have abject natures. An unskilled person does an unskilled job. The audacious and the resourceful forge ahead over a path made soft by the unprotesting, yielding bodies of those who conveniently play dead.

SECTION FIVE

COMPETITIVE PHYSICAL FITNESS

CHAPTER XII

PHYSICAL CONDITIONING

The objective of physical training in a pistol marksmanship training program is to condition the shooter, mentally and physically, to better withstand the pressures of match conditions. An individual in good physical condition has better developed reactions, better control of his muscles and better endurance, all of which promote consistency of performance.

A. BASIS FOR A GOOD PHYSICAL CONDITION.

Physical training should be progressive, either in repetitions performed or in resistance used. Conditioning must remain short of the fine drawn condition sought by track athletes as this is generally considered detrimental to good pistol shooting. Violent and strenuous athletics which may result in injuries should be avoided.

The competition shooter must possess the following basic physical and psycho-physiological characteristics:

1. An adequately developed muscular system (this is especially true for the muscles of the abdomen, arms, and legs) and the endurance to fire many shots without perceptible worsening of results.

2. The ability to relax and to keep from exercising those muscles which are not required to hold the body in the ready position or applying pressure on the trigger.

3. Strong breathing muscles so that breathing deep is an easy function that will permit a sustained supply of oxygen.

4. Lungs must have a high oxygen assimilation factor so that long pauses between inhalations will not cause oxygen starvation.

5. Precision and coordination of bodily actions and thoughts.

6. Quick reactions.

7. A well developed sense of equilibrium.

The physical training of a pistol shooter must be directed to the development of these qualities. If one is mindful of the fact that the successful execution of employment of the fundamentals requires an allround physical development, such training will have a complex nature.

As a result, it is most important that physical training not have a haphazard character nor should it be timed to coincide with some particular period immediately before a pistol match. A shooter should perform physical exercises regularly both during the preparatory period between shooting seasons and during the principal training period when he is training directly for tournament participation. Morning limbering up exercises are very important in this connection, and they should become a part of a shooter's daily routine. A cold morning shower should be a part of the daily regimen.

Physical Conditioning must consist of enough exercises of a general nature directed toward strengthening the muscles, toward proper breathing, and toward developing body flexibility and precision of movement. The specific requirements of marksmanship are such that drills must consist of exercises which develop the muscles - the flexors of the arms and fingers, the muscles of the shoulders, and the muscles of the waist. Concerning dynamic exercises, a certain amount of static tension type exercise is valuable if it is not overdone.

Heavy exercises such as weight-lifting should be discouraged since they generally do more harm than good. Also, exercising during matches, except for light warm-up exercises, should be avoided. Whenever the shooter exercises, he must put the maximum effort into the exercise to get the desired results. Merely going through the motions of an exercise is of no advantage. Physical conditioning is a gradual process and results will not be apparent immediately. A good rule to follow in determining the number of repetitions to be conducted is to exercise until a feeling of exhilaration is obtained. As the shooter's physical condition improves, the number of repetitions may be gradually increased.

B. TYPES OF EXERCISES.

There are many different general types of exercises and activities that a shooter can use to his advantage.

1. Walking is a very good exercise. When walking, don't just take a slow window shopping walk. To get any good out of it, you must make the walk very brisk.

2. A series of mild-non-strenous exercises of the type that require body-bending, stretching, deep breathing and moderate muscular tension that will not cause a rapid build-up toward peak physical fitness are best suited toward obtaining a condition defined as good body tone and a feeling of well-being. Sore, aching muscles tend to fatigue quickly, and a nervous tremor is representative.

3. In swimming almost all of the muscles get a workout. Strenuous, regular swimming practice is not however a good conditioner for shooting due to the longer recovery time with its inherent nervousness and should not be done during training periods. Only between seasons.

4. A good exercise to build the wrist and arm muscles is the wrist and forearm developer, or roll up exercise. A mop handle, a short length of rope and a weight. Roll it up and let it down slowly.

5. A method of developing the grip is by using a sponge rubber ball about 3" in diameter, cut in half. Squeeze the ball with the shooting hand. You can take this aid with you in almost any place you go, and exercise any time that you are not using your shooting hand.

6. Any sport that encourages regular and normal physical activity is beneficial to a shooter. It is recommended that each shooter cultivate an interest in a sport that will insure sufficient exercises for all around physical fitness.

7. A muscle builds rapidly under tension applied vigorously.

8. The stronger the muscle structure is developed, the surer can movement be coordinated and positions held. Besides general conditioning practices, durable muscles tension exercises of the body trunk, shoulder and arm muscles make the most sense. Resistance exercises and grip exercises are in order. Physical training should take place daily for at least 15-30 minutes. Sunbathing is unfavorable for conditioning and should be avoided in the training period before a match.

9. Massage and sauna (steambath).

One to two massages and steambaths per week aid physical training in a valuable way. These aids are especially helpful for the recovery process of the muscles and raise the degree of agility and precision of movement. Steambaths are especially recommended when matches take place in warm months or countries in the high temperature zones in that they help in getting acclimated and raise body resistance against overheating.

10. Sleep.

During the training period the shooter needs plenty of sleep to give all the tired organs a chance of sufficient recovery. Eight to nine hours, as rule, should be obtained. Before matches, insomnia sometimes occurs due to excitement. Under such conditions no medication (sleeping pills) should be taken the night before a match for they work out unfavorably during the next day. Short walks in the evening, lukewarm to warm showers or a small snack sometimes induce sleep.

11. Detrimental habits.

Nicotine, caffeine and alcohol reduce the performance ability of the body and effect the ability to concentrate. For these reasons the shooter should desist completely of these during the training period, or at least reduce the use of them to a minimum. (See Chapter XIV, "Effects of Alcohol, Coffee, Tobacco and Drugs".)

12. Overall behavior.

Before a match the shooter should avoid all types of excitement. For example, he should not drive fast and, if possible, arrive at the range one-half hour before the beginning of the match. That will give him plenty of time for his last preparations and he can prepare himself inwardly for the test ahead. The individual feeling of well being is the best measure of whether or not your living habits and daily routine is in the best interest of your shooting.

C. THE PISTOL TEAM DAILY DOZEN EXERCISES.

The Pistol Team Daily Dozen was especially developed to develop those muscles used in pistol shooting. The attached diagrams will assist the instructor in understanding how these exercises are done.

1. Warm-up.

A four count exercise done in moderate cadence. This exercise is designed to get you ready for the forthcoming exercises. Starting position is feet spread approximately 12 inches apart, hands extended overhead. At the count of one, bend at the waist and knees, reaching between the legs as far back as possible. On the count of two, straighten body up, extending the hands over the head; at the count of three, perform same as number one; at the count of four, repeat number two (2).

2. Cat stretch.

The starting position is a modified leaning rest, the buttocks being higher. This is an eight count exercise. Count of 1-2-3 are upward, each count pushing the buttocks higher. Count of 4, back to starting position. The counts of 5-6-7 are downward, and on the count of 8, back to the starting position. This exercise uses the back and shoulder muscles.

3. Body twister.

The starting position is bent forward at the waist with arms extended parallel with ground, feet spread approximately twelve inches apart. This is a four count exercise. At the count of one, swing the right arm so as to touch the left toe. Keep the shoulders and arms rigid so the twisting movement is from the waist. On the count of two, touch the right toe with the left hand. At count of three, repeat count one; at count of four, repeat count two. This uses the muscles along the sides and back of legs.

4. Push-up.

The starting position is the leaning rest. This is a four count exercise. At the count of one, bend the arms at the elbows, allowing the body to move downward; keep the body straight at all times. At the count of two, recover to the raised position, count of three, same as number one; count of four, recover. This uses the arms and shoulder muscles.

5. Back bender.

The starting position is standing with the feet spread twelve inches apart, hands on small of back. On the count of one, bend at the waist, touching toes with the hands. On the count of two, recover, putting the hands in the small of the back; count of three, bend backward at the waist; count of four, recover. This uses the back, legs, and stomach muscles.

6. Hip and leg stretcher.

The starting position is with the hands and knees on the ground. This is a four count exercise. At the count of one bend at the elbows and touch the chin to the ground at the same time extending the left leg back and up as far as possible. Count two, recover. The counts of three and four are repetitions. This uses the arm and leg muscles.

7. Shoulder-builder.

Starting position is standing with the feet spread and hands and arms at the sides. This is a four count exercise. At the count of one, extend the arms sideward, parallel to the ground. Count of two, recover; count of three, extend the arms overhead, keeping the elbows locked; count of four, recover. This exercise is to be done with dumbbells if available. This uses the muscles of the arm and the shoulder muscles.

8. Abdominal kick.

The starting position is sitting with the arms extended to the rear, allowing your weight to rest on the hands. Legs straight together about 15 degrees off the ground. This is a four count exercise. At the count of one, pull the legs toward the chest. Count of two, extend the legs outward, keeping the feet off the ground. Count of three, same as number one; count of four, repeat number two. This uses the stomach and leg muscles.

9. Side bender.

The starting position is standing with the feet spread and with the arms extended overhead touching the palms of the hands. This is a four count exercise. On the count of one, bend at the waist to the right side, count of two, recover; count of three, bend to the left, count of four, recover. This uses the muscles along the side.

10. Flutter kick.

The starting position is flat on the back, arms to side, feet off ground. This is a four count exercise. At the count of one lift the right leg upward, count of two, drop the right leg and lift the left leg. 3 and 4 same as one and two. This is done in quick time. This uses the stomach and leg muscles.

11. Tricep builder.

The starting position is standing, bent forward at the waist, arms bent at the elbows along the side, triceps parallel with the body. This is a four count exercise. At the count of one extend the arm back and upward, count of two, recover, count of three, same as one, count of four, recover. This exercise is to be done with dumbbells if available. This uses the tricep muscles.

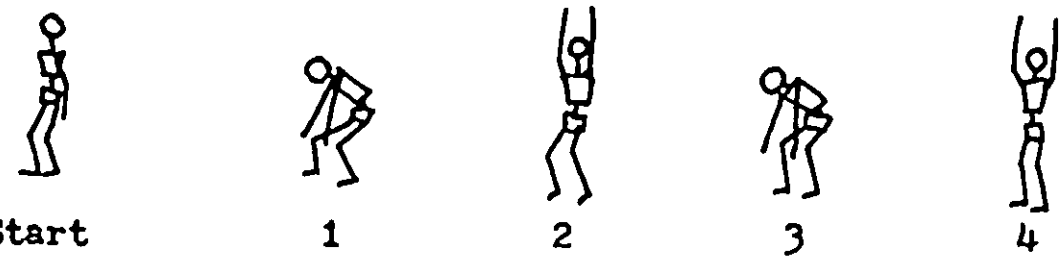
12. Leg spreader.

The starting position is standing with the feet spread as far as possible still keeping the body balanced. Hands on the hips. This is a four count exercise. At the count of one bend the left leg at the knee and extend the arms, parallel with the ground. Lean to the left as far as possible, still keeping balanced. Count of two, recover, count of three bend to the right, same as one, count of four, recover. This uses the leg muscles.

To be effective, physical training for the pistol shooter must be realistic and continuous. The objective is to so condition the body that the general health is excellent and that the muscular and nervous systems are fully capable of withstanding the grind of match conditions and enable the shooter to continue to assert his utmost skill.

PISTOL TEAM DAILY DOZEN

I. WARM UP

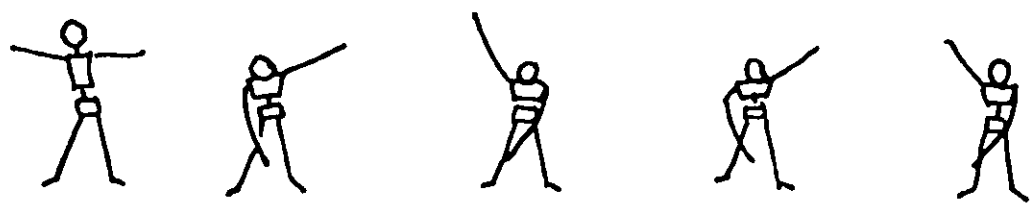


Start 1 2 3 4

II. CAT STRETCH

Start 1-2-3-4 5-6-7-8

III. TWISTER

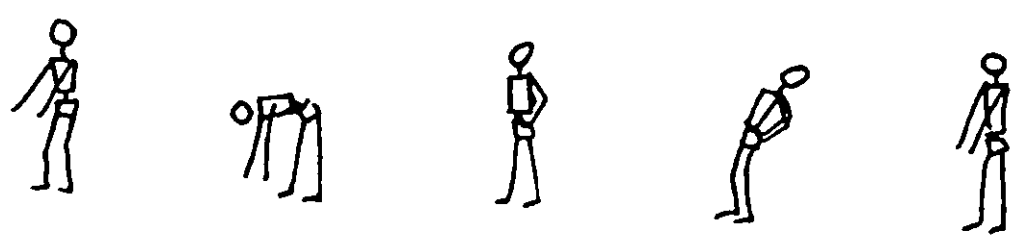


Start 1 2 3 4

IV. PUSH-UP

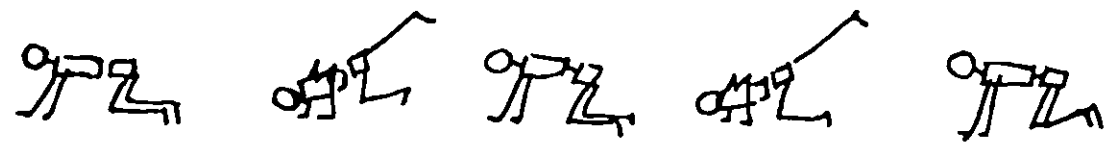
Start 1 2 3 4

V. BACK BENDER



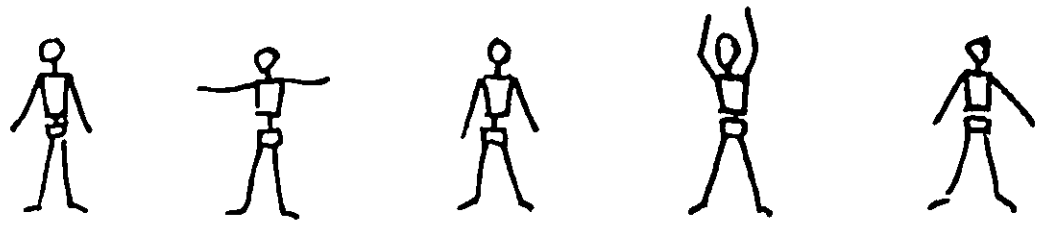
Start 1 2 3 4

VI. HIP & LEG SPREADER



Start 1 2 3 4

VII. SHOULDER BUILDER

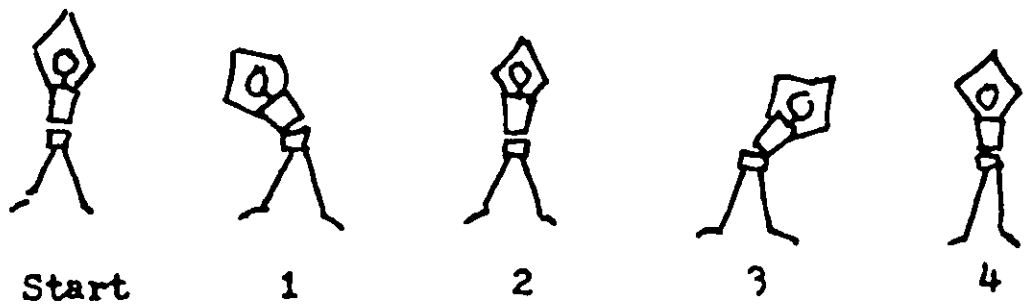


Start 1 2 3 4

VIII. ABDOMINAL KICK

Start 1 2 3 4

IX. SIDE BENDER



Start 1 2 3 4

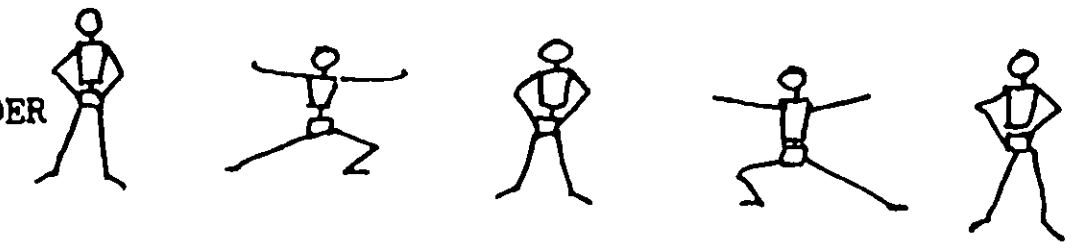
X. FLUTTER KICK

Start 1 2 3 4

XI. TRICEP BUILDER

Start 1 2 3 4

XII. LEG SPREADER



Start 1 2 3 4

D. STATIC TENSION EXERCISES.

Rapidly increasing in popularity are exercises referred to as static tension and isometric exercises. The popularity arises from the fact that these exercises can be done without special equipment at any time, any place and in only a few minutes. More important is the fact that one can develop muscular strength and power within a short period of time without physical exhaustion. Exercises 1 thru 12 are performed without aid of any equipment. Exercises 13 thru 22 are performed with the aid of an easily constructed exerciser. Instructions for making this exerciser and materials required are contained on page ____.

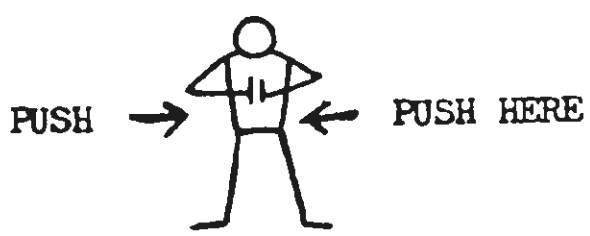
How to do them

The main effort is to exert pressure. Each exercise is performed to a count of one thousand - two thousand - three thousand - four thousand - five thousand - and six thousand. To exert pressure beyond this count would be to no avail. In fact, this interval of exercising represents the most that muscles require or can efficiently absorb. Doubling the exercise period will not double the benefits. By comparison, this period is equivalent to several hours of more violent exercises that frequently leaves the subject physically exhausted. Part of the theory is that a muscle builds more rapidly under tension applied vigorously for a short period than it can when put to use over a prolonged period. The latter results in a buildup of lactic acid (a product of muscular decomposition during exertion) which finally becomes accumulated to a degree within the fibers of the muscles that further movement is impossible until rest allows the acid to be dissipated by absorption into the system.

The Exercises

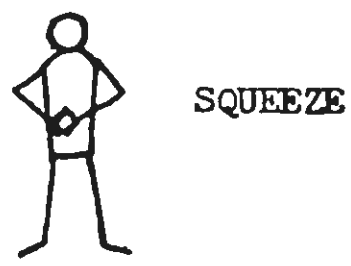
Ex #1

Hands held fingers up, finger tips in line with chin, elbows raised in line with shoulder. Hands pressed one against the other with as much effort as possible. This exercise will strengthen and develop the Brachioradialis (forearm), biceps, and Pectoralis (chest) muscles. Refer to illustration of (Figure 8) Human Muscular System in Chapter I, "Attaining a Minimum Arc of Movement".



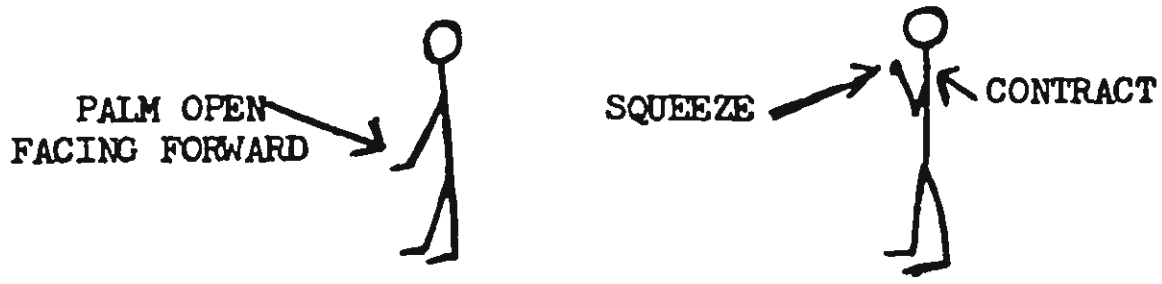
Ex #2

Both hands gripped at waist level, as much effort as possible exerted in squeezing hands together. This will strengthen and develop the grip.



Ex #3

Arms hanging loose slightly bent in front of body palm of hand facing forward. Suddenly and with as much squeeze as possible contract the bicep and clench the fists tight. A good developer of biceps and forearm muscles.

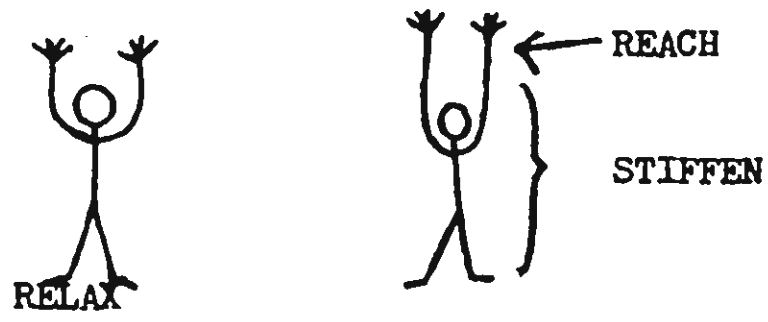


Ex #4

Arms loose at sides. Suddenly extend arms backward as high as possible finger stiff whole arm as tense as possible. This exercise aids in developing and strengthening the triceps (upper arm) and deltoids (shoulder) muscles.

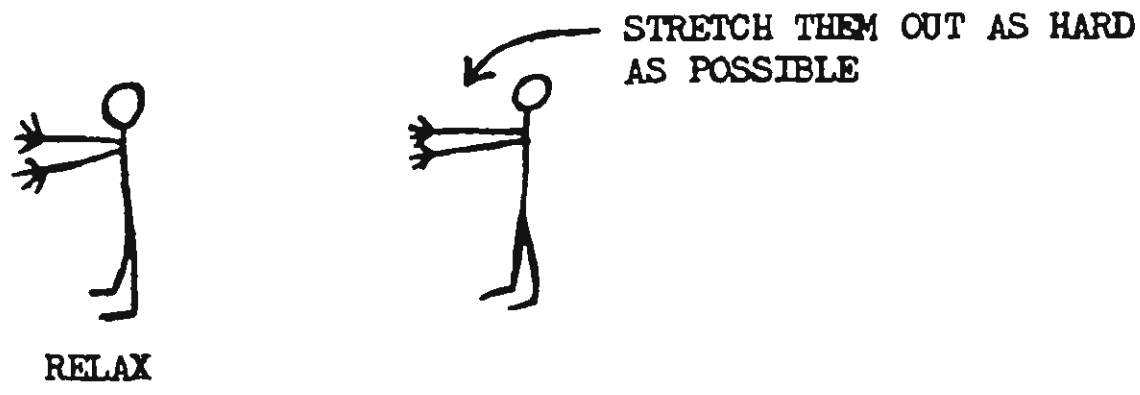
Ex #5

Arms extended over head in relaxed position. Suddenly make every effort to force finger-tips through ceiling. A prime developer of those muscles located under the armpits, extending from the rib cage around the sides to the lower back (Latissimus dorsi).



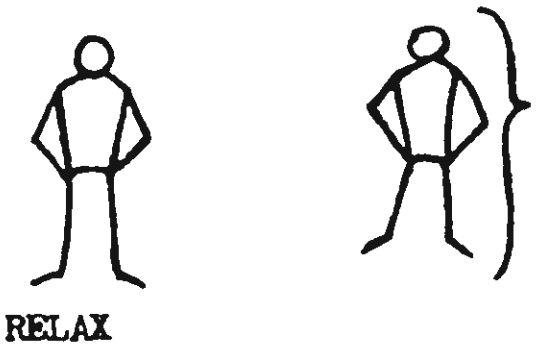
Ex #6

Arms extended in front of body. Suddenly try to force arms with out-stretched fingers through opposite wall. Another developer of arm and shoulder muscles.



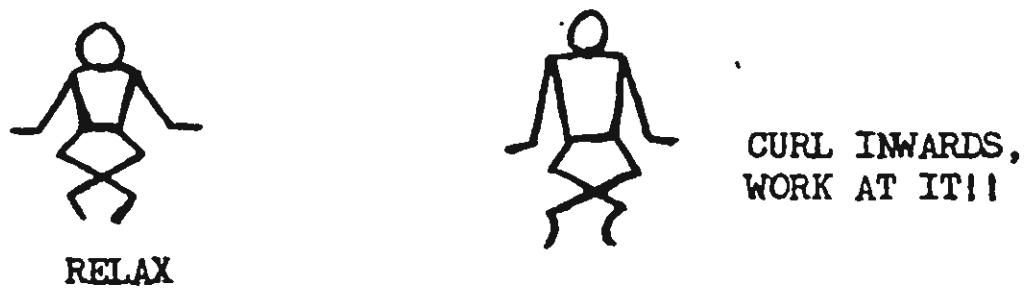
Ex #7

Hands on hips, weight normal on balls of feet. Suddenly tense arms, abdomen, and all leg muscles. An exercise designed to develop muscles in the lower body and those of the legs (thigh, calf, etc.).



Ex #8

Sit on floor legs crossed arm at sides. Suddenly bend toes inward toward heel, tense leg muscles. Excellent for all leg muscles, particularly the calves.



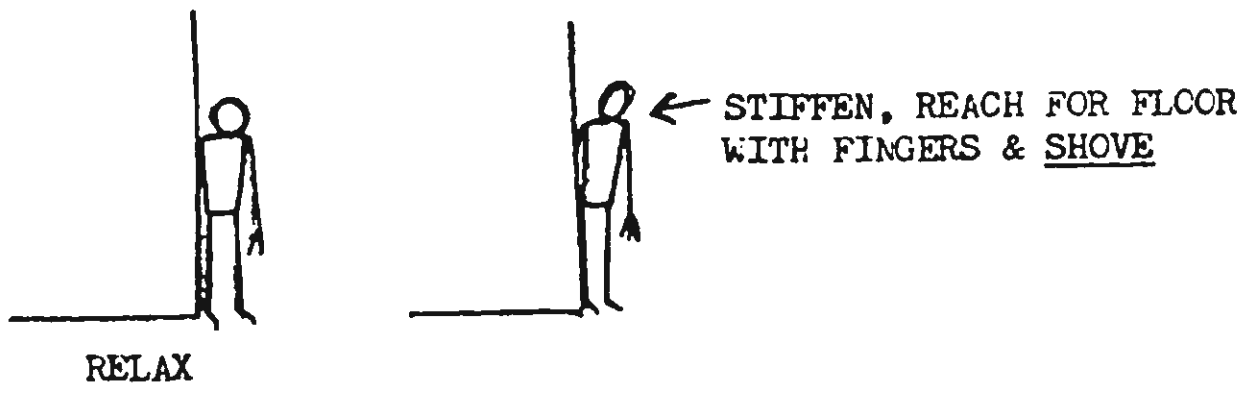
Ex #9

Lie on floor face down. Suddenly arch backward; try to touch head to heels. Arms extended backward and up. This exercise probably exerts pressure on more muscles of the body than any other, particularly good for back, hips, waist, and abdomen.

This is one that is guaranteed to reduce pant size from 38" to 28"!

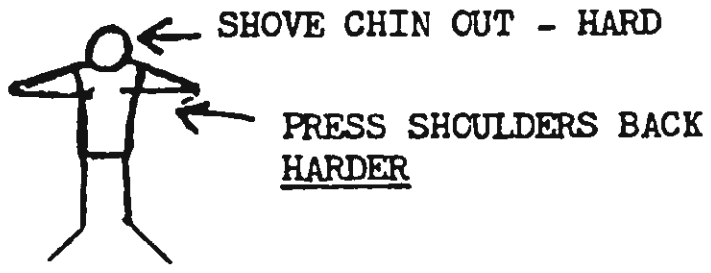
Ex #10

Place one side against a wall arms at sides. Suddenly stiffen side nearest wall and try to shove your way through it. Now try the other side. A developer of thigh and calf muscles.



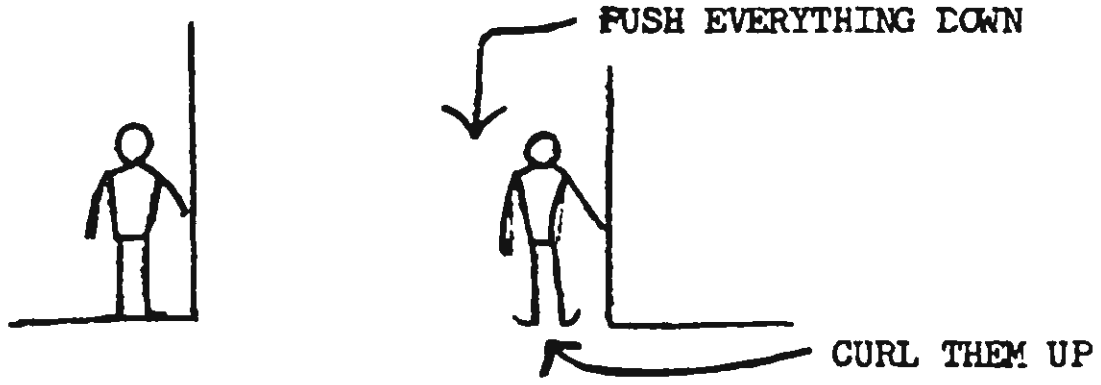
Ex #11

Back to wall, fingers on collarbone, elbows in line with shoulders. Suddenly, try to shove your chin through wall opposite, at same time try to flatten shoulders against the wall behind. A good upper torso developer, primarily the muscles of the shoulder and neck.



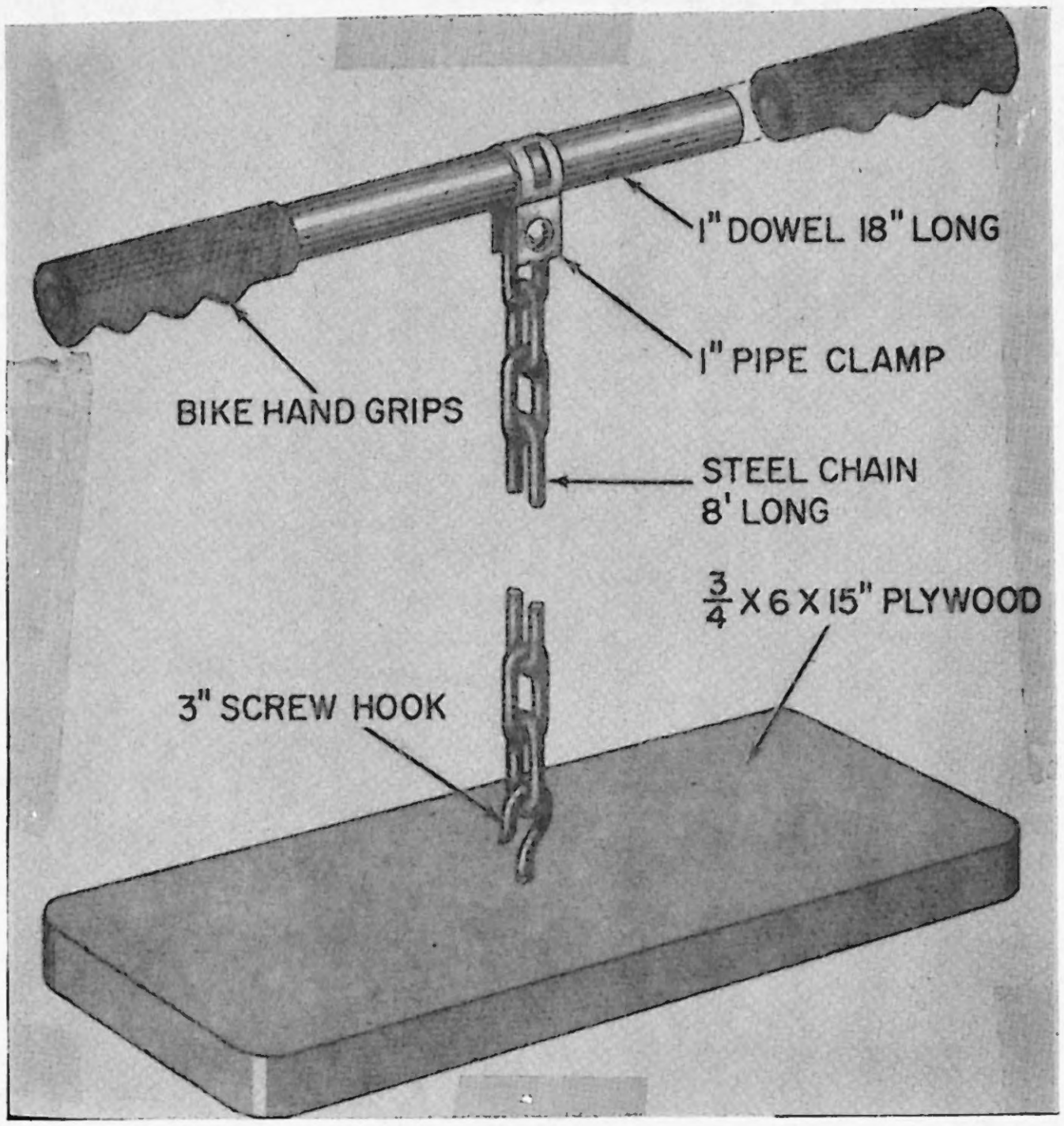
Ex #12

Stand about 18" from wall. Raise the toes stand on heels, place hand on wall for balance. Suddenly try to touch knees with toes and floor with your rear end. A strengthener of leg and feet muscles.

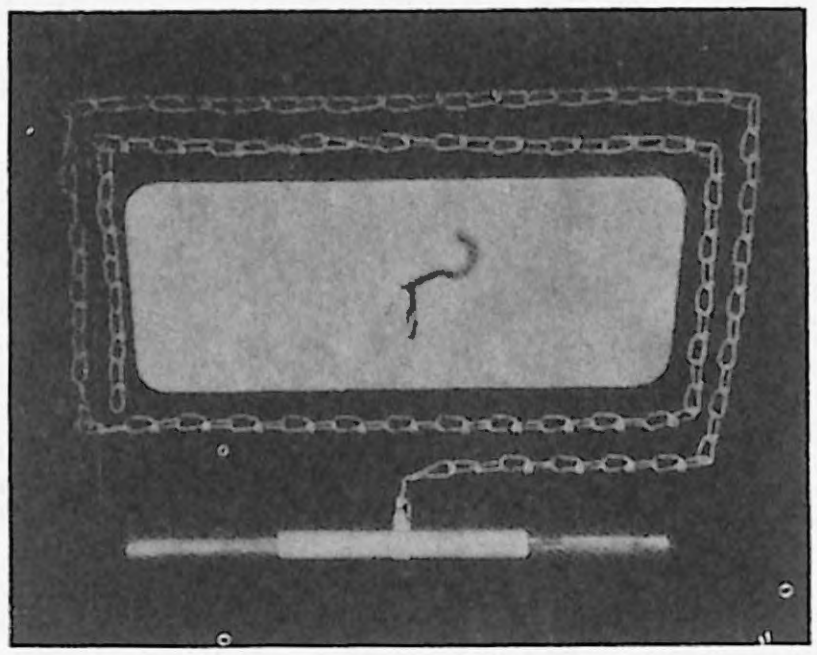


ISOMETRIC EXERCISER

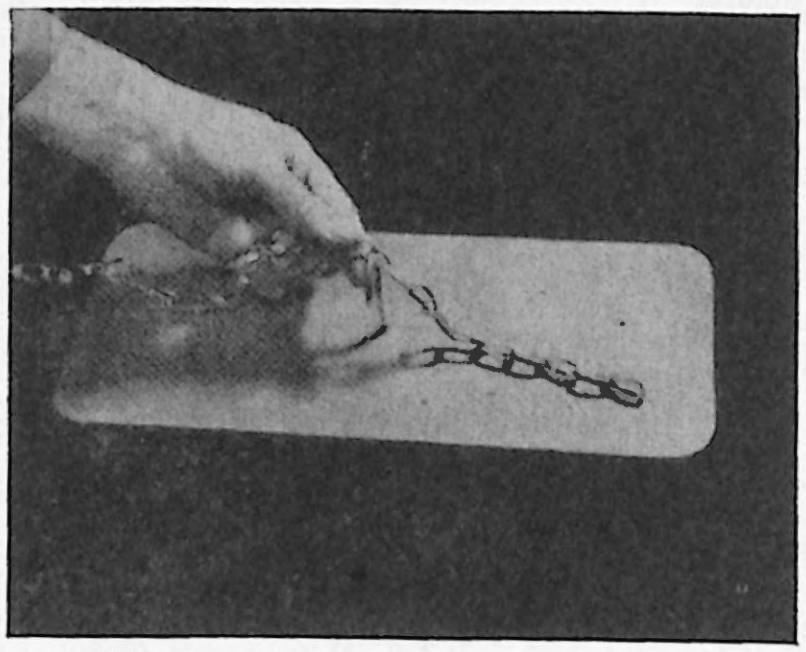
The isometric exerciser can be made from material available in and around the home. It is simply a device with a platform, a screw hook, eight foot chain, pipe clamp and a hardwood dowel. Bike hand grips may be added to the handle if desired. The following sketch outlines the materials and dimensions:



Although construction is simple, there are several points to remember when assembling the materials. (1) screw hook must be heavy and inserted deep into the base, (2) if you decide to use bike hand grips, fit them firmly so they won't turn during use. The completed exerciser is neat, portable, and easily stored in closet or desk drawer.



Before exercise, the chain is adjusted to desired length on base hook as shown here.



ISOMETRICS

Ex #13

Adjust chain so that bar is at mid-thigh position when knees are flexed. Bend from hips and hold elbows pointing outward. Exert pressure upward on bar. Fine for shoulder and arm muscles and for conditioning the back.

Ex #14

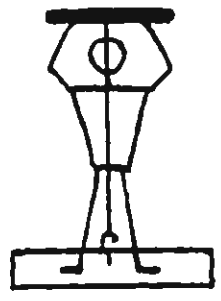
Adjust chain so that bar is at knee height and straddle it. Legs should be straight. Pull up on bar with shoulders, arms, upper torso. A good conditioner for shoulders and upper back.

Ex #15

Adjust bar to chest height, keeping your knees slightly flexed. Grip the bars with palms down and pull up as you attempt to straighten legs. This is excellent for thighs and biceps.

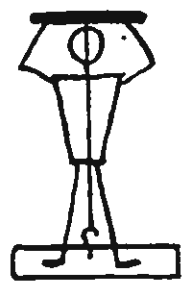
Ex #16

Raise bar to position over your head, chain in back of you. With legs straight, exert pressure upward with forearms and biceps. This also benefits shoulders and chest.



Ex #17

With bar adjusted slightly over your head, hold it out from your body and exert pressure upward. Muscles located in back of upper arms benefit from this.



Ex #18

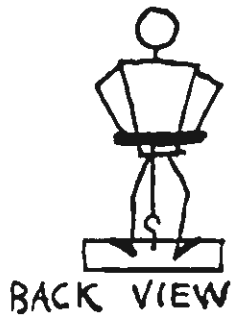
For an excellent over-all body conditioner, try this one; adjust bar to hip height. Hold body erect, your shoulder back. Pull up on bar with shoulders and torso.

Ex #19

This conditioner is similar to No 13 except that lifting is done by going up on your toes. This gives special benefit to the long muscles in the thighs and calves.

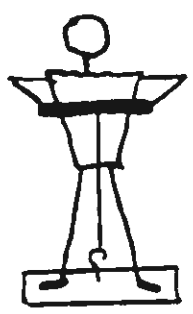
Ex #20

With knees slightly flexed, hold bar hip-high behind you. Palms should face outward. Pull upward and outward on bar. A fine conditioner for chest and shoulder muscles.



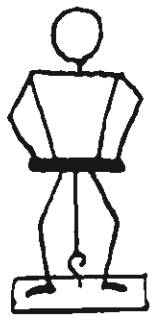
Ex #21

Adjust bar to chest height holding it well out in front of the body. Knuckles up. Pull up on bar with extended arms. Excellent for forearms and biceps.



Ex #22

Make sure palms face upward as you pull up on bar adjusted to hip height. Shoulders back and knees slightly flexed, elbows held into the body. This one is to improve posture.



CHAPTER XIII

DIET AND HEALTH OF THE COMPETITIVE PISTOL SHOOTER

A. GENERAL.

What is meant by good nutrition? Gayelord Hauser, America's famed Diet and Health specialist, answers as follows: "First, it is adequate nutrition, giving the individual cells of the body not only the quantity but also the quality of nourishment they require. Second, balanced nutrition, supplying the body cells with vital nutrients in the proper proportion. Scientists are unanimous in agreeing that over-nutrition, through excess calories stored as fat, can contribute materially to physical deterioration. As a simplified, perhaps crude illustration, think of your body as a motor car. It is made of protein, inside and out. Arteries, glands, colon, connective tissue; muscles, skin, bones, hair, teeth, eyes: all contain protein and are maintained and rebuilt with protein. Fats and carbohydrates are your body's oil and gasoline, they are burned together to produce energy. Vitamins and minerals are its spark plugs, essential to the utilization of food and its assimilation into the blood stream. It is a marvelously sturdy motor car, this body of yours - marvelous in its ability to maintain and rebuild itself. Given care, consideration, and respect, it will function smoothly. Neglected or abused and it will break down."

B. THE IMPORTANCE OF PROPER DIET AND NUTRITION.

The importance of proper diet and good nutrition was borne out at the 1964 Olympics held in Tokyo, Japan. US Olympic Coach Bob Hoffman, aware of the Soviets research into the needs for more essential nutrients, prepared a special report based on the scientific findings of over one hundred of the Soviet Unions' greatest scientists, conducted over a 25 year period. Although the report dealty primarily with proper nutrition of athletes engaged in exercises where great physical force is required, it also contained factual data on the importance of proteins, vitamins, and minerals in the maintenance of good body health.

From Mr. Hoffman's report is extracted those items deemed essential information for all individuals engaged in activities where speedy reaction time, coordination, and concentration are necessary for peak results: "Increased protein is vital to increased effort and endurance. Results of physiological studies showed that foods rich in protein increase the excitability of the nervous system, enhances reflex activity and increases the speed of reaction and the ability to concentrate with considerable effort for a brief period of time."

1. Up to 300 grams of protein daily. "The use of high protein and carbohydrate in the diet in this case (referring to athletes) must be followed for other reasons than in exercises of great intensity. The increase of grams per Kilo of body weight, (three times the amount listed by many authorities in this country, 300 grams of protein daily for hard training men of fairly large size) is dictated due to considerable losses of nitrogen as a result of prolonged muscular activity which under the usual protein norms may lead to a negative protein balance."

2. Carbohydrates.

"Since essentially all athletic exercises lead to various degrees of oxygen deficiency, the basic source of energy in muscular activity are carbohydrates. All of this indicates that for an athlete to reach his highest potential he should go on a high protein-carbohydrate diet and reduce fat consumption."

3. The Increased Need of Vitamins.

"The nutrition of athletes as compared to that of laborers should be more abundant in vitamins as well as in proteins. According to many tests, the requirements of an athlete's

body in vitamins rise consistently upon execution of physical exercises, apparently as a result of high metabolic intensity. If a body works harder it simply needs more fuel of every kind to keep up its accelerated pace."

4. Athletes Need More Protein - More Vitamins - More Minerals:

"Since 1951, we have been recommending 300 grams of a complete protein daily to hard working men and women and athletes. This shows how long we have been right. For all people we believe, need more protein, more vitamins and more minerals than many of the standards of M.A.D.R. (minimum adult daily requirement) which are being offered. We believe that in a rich country such as this, we should not try to exist on minimums, we should supply our bodies with enough, in fact more than enough of essential nutrients. There is no harm in too much of proteins, or any minerals and vitamins, but there is a great deal of harm to the body and its performance when there is a shortage of any important nutrient."

5. A Diet for Athletes, I Believe In:

"Meats - steak, liver, beef, chicken, fish, always broiled, baked or boiled. Eggs - anyway but raw or fried. Potatoes - boiled, baked, hash brown, au gratin or scalloped. Milk - no whole milk. Skim milk is excellent as is buttermilk and yogurt. Solid cheeses are ok, but no processed cheese; with powdered skim milk, generously fortified eggs, soups, milk and other dishes, it will supply considerable protein (37%), a lot of sugar energy (it is 49% lactose or milk sugar). Fruit - Very good, especially fresh fruits and fresh juices. Never use sweetening, except honey. Vegetables - Yellow and green. Double up on salads with plenty of salad oil, germ oils can be used for this purpose. Bread - whole wheat or rye. Drinks - use bottled spring water if possible, unsweetened fruit juices, skim milk, buttermilk, vegetables juices and thin soup. Desserts - custards made with honey and skim milk. Fruits and berries, unsalted nuts. Salt - salt tablets during competition sometimes create nausea. Vitamins - complete vitamin-mineral tablets, with extra vitamin C.

6. Suggested Dietary on Day of Competition:

"Breakfast - on the day of competition, should be a big meal, for it must provide energy for the competition. Fruit, two to four eggs, hot oatmeal, skim milk, honey, steak, lamp chops or fish. Before the competition - caution - Don't take extra sugar or dextrose before competing. This gives you a high rise in digestive sugar level which sets off an increased flow of body insulin which temporarily lowers your blood sugar level below normal. It can produce a sudden feeling of tiredness. You can undo a week of training in five minutes.

During the long contest-refresh yourself with oranges. Suck vitamins C tablets. No tobacco or alcohol. No tranquilizers or pep pills, unless prescribed by your doctor. Eight to ten hours of sleep is recommended, with regular hours.

This is an honest dietary which has been planned carefully, to build enduring athletes, winning athletes. It contains only natural foods, not refined, denatured, artificial foods, filled with pure white sugar, not canned, bottled, "pressure packed foods" it doesn't contain refined sugar, candy, sugar loaded drinks, coffee, white sugar in any form, or white flour." It doesn't contain "enriched bread," "restored cereals" or drinks made with chemicals to look and taste like orange, with synthetic vitamin C added. It stresses, pure water, fresh fruits and unsweetened juices."

Mr. Hoffman's recommendations for proper diet can be modified somewhat to the advantage of the pistol shooter. The degree of physical exertion experienced by a shooter is considerably less than that of an athlete and therefore would not require the amounts suggested;

however, the diet of the shooter should include the nutrients essential to the maintenance of a healthy body. Doctor E. Grandjean of Switzerland has written the following article entitled "Diet and Care of Health by the Match Shooter." He and Mr. Hoffman are in agreement as to diet and health for pistol shooters and athlete alike with perhaps only minor variances in the amounts required for each.

C. DIET AND CARE OF HEALTH BY THE MATCH SHOOTER: (by Dr. E. Grandjean of Switzerland).

1. Motivation: Match shooters are exposed to mental and physical strain during training and especially during matches. In order to withstand this strain successfully, a strong muscular system and the ability to concentrate most intensely over long periods of time are essential. High resistance capability of the entire organism is an absolute necessity in order to obtain and maintain highest results. These goals are reached through vigorous training, through proper diet and mode of conduct equal to strain.

2. Complete diet: During training the match shooter has a somewhat higher need for energy. This energy is supplied through proteins, fatty acids and carbohydrates found in foods.

a. Proteins: The proteins of especially high value to the body are obtained from eggs, milk and meat. A shooter of 140 lbs should obtain 100-120 grams of protein from his daily diet during the training period of which approximately one-half should be obtained from the animal protein sources mentioned above. Per day, these consist of approximately:

1 egg (5.6 g protein)
200 g meat (40 g protein)
1 liter milk (32 g protein)

....and the remaining amount of protein necessary is found in the usual portions of bread, cheese, rolls or biscuits and certain vegetables.

b. Fatty acids: The average shooter consumes too much fat. Even while training, the shooter should be moderate in consumption of fats, which is especially beneficial to the liver and digestion. During the training period a shooter of 140 lbs should consume 70 - 90 g fat daily. Half of these fats should be contained in milk, meat and eggs (animal fats) and the other half in vegetable oils. Among the last, corn oil, sunflower and peanut oil are to be preferred for their high content of protective ingredients.

c. Carbohydrates: Starches and sugar are contained, in different forms, in nearly all foods. In order to raise bodily resistance, it is important to give preference to such starch and sugar sources that are also high in protective ingredients. Such sources are: dark bread, fresh fruit, milk, oatmeal, vegetables and potatoes.

d. Protective ingredients: As already mentioned, the human being is not only in need of energy sources such as proteins, fats and sugar, but also a host of protective ingredients. An inadequate supply lowers resistance and the ability of performance. For competition in sports the following are especially important:

Vitamin C (abundant in oranges, lemons, some vegetables)
Vitamin B_1 (abundant in dark bread, liver, meat, nuts)
Calcium (abundant in cheese, milk, vegetables)
Phosphorus (abundant in cheese, eggs, meat, vegetables)

These explanations show that the shooter should favor the following foods during training periods:

Milk, eggs, vegetables, meat, liver, dark bread, cheese, and fresh vegetables. A varied diet is important so that the body obtains all necessary nutrients.

To insure an adequate supply of protective ingredients under all circumstances, it is recommended that the shooter take one tablet of diet supplement daily during training periods if it is more convenient than rigid control of diet. This tablet contains the most important vitamins and minerals.

3. Rations on the day of the match:

a. Rations: The energy reserves of the body are comparably large which makes it unnecessary to ingest large amounts of food on the day of the match. On the contrary, burdening the digestive system is much to one's disadvantage, for digestion is partly upset due to excitement and nervousness. The shooter should therefore be advised to limit his food intake drastically on the day of the match, and under no circumstances should he try strange foods. On the other hand, he should not take part in a match with a completely empty stomach either, for an empty stomach can cause untimely tiring and faintness. In short the following points should be considered for rationing on a match day.

(1) The interval between the last meal and the start of a match should be 2 to 3 hours.

(2) The last meal should be the size of a normal breakfast or small dinner and contain 500 to 800 calories.

(3) Recommendation for breakfast. Caffein free coffee with milk/cream, ovaltine, or weak sweetened tea, yogurt, 2 to 3 pieces of bread with butter, marmalade, and oatmeal or other rich cereal foods.

(4) If the last meal is taken at noon, a clear soup, or bouillon, an easily digestible piece of meat (calf or veal without fat), some potatoes or bread, rolls, etc., and cooked fruit. Vegetables, frankfurters, cheese or large amounts of fresh fruit are not recommended for this meal.

(5) The shooters are advised to choose foods that they are accustomed to. They should not pick match days to try out new cuisine.

If the matches last for more than 2 hours, intermediate snacks are necessary. For these one should adhere to the following guide:

(6) Lukewarm liquids such as weak sweetened tea or bouillon should be made available to the competitors. Cold milk or fruit juices are not recommended. Alcoholic beverages do not belong on the range.

(7) The competitor should not drink more than one cup of liquid per intermediate snack.

(8) Small rations of cookies, hard candy, or even cubed sugar are recommended for intermediate snacks.

In providing intermediate snacks the shooter's individual taste should be taken into consideration. Experienced competitors, as a rule, have a fine sense for what is good for them and what is not. While some will reach for sweetened liquids, others prefer bouillon for the salt content.

The end result of any physical training program is that it shapes the shooter into a good, all around, physical condition not necessarily that of a star athlete. Exercises which strengthen the muscles, develop the lungs and increase body flexibility are most desirable in the marksmanship physical training program.

CHAPTER XIV

THE EFFECTS OF ALCOHOL, COFFEE, TOBACCO AND DRUGS

A. GENERAL.

The habitual use of alcohol, coffee, tobacco and various drugs is harmful to the average person and in no way promotes better body action. We can be easily fooled by misleading advertisements into believing that such things are helpful. For example, an advertisement may tell us that cigarettes are an aid to digestion. Cigarette smoking after meals does cause the saliva to flow more freely and the heart to beat faster, aiding digestion. But, this may also result in overwork for the salivary glands and the heart. In like manner many people may believe that a highball or cocktail at the beginning of a meal promotes digestion because of the greater flow of the digestive juices that alcohol causes. And what about that change of pace drink, tea? It is no different in caffeine content than coffee but possesses increased amounts of tannic acid.

Inform yourself. Any drug which causes the body organs to perform their work at a greater rate than normal fatigues them sooner and causes them to age more rapidly. Stimulants and depressants overwork many vital organs, often when their best performance is needed for normal body activity. The effects of the use of such substances depend upon how much is used and whether or not the body is strong enough to repair the damage done.

In order to understand the discussion that follows there are certain terms whose specific meaning you should know. A stimulant is a chemical which, when taken into the body, excites the organs to greater effort. Depressants are chemicals which slow down body action but may also speed up body functions by reducing the influence of the nerves which slow down body action. For example, nicotine increases heart action by depressing the nerves that slow the heart beat, thus causing a faster pulse. Depressants deaden pain and lessen discomfort and thus make us feel better without removing the cause.

Much has been written and said both pro and con concerning the habitual use of alcohol, coffee, tobacco, and drugs, their temporary and permanent effects on the human body, both mental and physical. Material covering these subjects is available at any well stocked library. Much of the information that follows was derived from this source but the evidence against alcohol, coffee, tobacco and drugs that we are concerned with has been contributed by the shooters themselves. Although not all shooters are in agreement that complete abstinence by habitual users is the solution, all will agree that these agents will in no way help to improve shooting performance or scores. To learn the fundamentals of pistol shooting is no great achievement in itself. Anyone interested in becoming a pistol shooter can with persistency and training learn to shoot with some degree of proficiency. What then, is necessary to become a skilled shooter? The top shooters in the nation today unanimously agree that control is the most important factor toward becoming a top competitor. Control can best be explained as the coordination of mental and physical effort born in thought and culminating in a concentrated precise action. This effort must be natural, unstrained, and smooth flowing. Any habit or action that results in departure from perfect coordination will lessen the degree of control and reduce the effectiveness of the action. In shooting a lessening of control shows itself in lower scores and poor performance. What can you the shooter do about sustaining control? The same thing you would do when training for a match. When you find yourself having difficulty in maintaining your shot groups in the center of the target, you analyze and make corrections, be it position, grip or sight adjustment, etc. When control seems to be declining, analysis may in this instance, pinpoint some cause other than faulty technique in employment of the fundamentals. What did you have at breakfast? Coffee--two cups and two cigarettes. Enough to ruin anyones control. Perhaps a few too many last night and a loss of several hours of sleep. Whatever the reasons, they should be noted in

your score book just as you would enter unusual conditions at a match. In a short period of time, if you are honest with yourself you will be able to piece together enough information upon which to take remedial action. The most difficult person to convince is yourself. No one who habitually smokes or drinks coffee wants to admit that such habits have the effect of destroying control. So they remain slaves to habits which in affect they attempt to overpower by mental and physical exertion, often ending in frustration and exhaustion.

The ensuing article adequately covers the effects that alcohol, coffee, tobacco and drugs have on control of pistol shooting. If you have been plagued with a built-in error, it may be that the answer to your problems lies herein.

B. ALCOHOL:

The name alcohol is used for a number of organic substances some of which, like glycerin, are necessary to good health. The scientific name for the alcohol sold for drinking purposes is ethyl alcohol. Ethyl alcohol is generally considered to be a habit forming narcotic. However, in the strictest scientific sense it is an anesthetic or pain killer like ether, which is made from it. Contrary to popular belief, alcohol acts as a depressant rather than a stimulant. It dulls the senses, lessens the desire to win, destroys coordination and lessens the shooter's ability to concentrate. Alcohol taken at the proper time in the proper amount might possibly lessen the shooter's anxiety but by doing so other effects are released that are far more harmful to the body and detrimental to the shooter's score. No one can say what the right amount is or when it should be taken. Some shooters may shoot a good score with a hangover. Doctors say that a man's senses are keener than normal after a drink, however, sharper hearing and a dark brown taste do not help the shooter hit the X ring. The second day is when the after affects become noticeable and the shooter's control disintegrates on the firing line.

1. Effects of Alcohol on the Human Body. Alcohol taken into the body passes through the walls of the stomach and the small intestine and thence into the blood stream. It is rapidly distributed through the body and promptly affects the brain by decreasing its ability to take up oxygen. Inhibitions and the corresponding cautions are removed, reactions are slowed, coordination is impaired. The senses become less acute, particularly that of sight. Even a small percentage of alcohol in the blood may sometimes cause remarkable effects. The field of vision is reduced - ordinary objects become darker and indistinct - poorly lighted objects are lost entirely. Reactions are slowed down and concentration becomes difficult.

A peculiar property of ethyl alcohol is its ability to take up water. It is a valuable dehydrating and preserving agent. When used as a drink, alcohol produces a burning sensation as it takes up water from the delicate mucous membranes of the throat, stomach, and intestines, thus causing the drinker to become thirsty. Once alcohol becomes a part of the blood, its dehydrating properties are much reduced.

Although alcohol is a source of heat energy, its depressing effect upon the nerve centers that control the size of blood vessels causes the blood vessels of the skin to enlarge. So long as alcohol remains in the blood to affect the brain, extra heat loss by radiation will take place through the skin and prevent any benefit that might be derived from its oxidation and the resulting warmth. For this reason, in severely cold weather, the man who drinks whisky to keep warm is in much greater danger of freezing than the person who does not.

Experimental, research scientists, using delicate tests and sensitive instruments, have been able to demonstrate the adverse effect of even small amounts of alcohol on various isolated bodily functions such as sensory perception and discrimination, reaction time, fine coordination, judgement, alertness and efficiency of dexterity. The changes observed have no apparent difference in quality, magnitude or expression from those due to fatigue, hunger, distraction and a

host of other environmental factors. These facts establish that one small drink of intoxicating beverage places the shooter under an enormous handicap. The false feeling of well-being is deceptive. Alcohol and gun powder do not mix.

C. COFFEE:

What's wrong with drinking coffee? That's easy - caffeine. Each cup contains an amount equal to about two pinches of salt. That doesn't sound like much, until you realize that it is one third the amount given by doctors as a heart stimulant. With three cups of coffee you're getting a dose of caffeine calculated by scientists to be medically effective for making a heart work harder and faster. When a heart is ready to quit, and wouldn't pump another beat without it, maybe such a measure is justified. But are you sure your heart is ready for a synthetic jolt three to six times a day?

1. Effects of Coffee on the Human Body.

Many coffee drinkers say they can't do without it as a pick-me-up during the day. But let us see what really happens after that coffee break. Dr Rolf Ulrich, in his book, "Coffee and Caffeine", reports that after coffee consumption, mental tempo rises first, and speed of association increases, but there is a notable decrease in the quality of work being done. In test examinations it was seen that the subjects finished more quickly, but that false conclusions were more frequent. Reliability and accuracy definitely took a beating as a result of a coffee pep-up.

The physical result is the same. Caffeine raises muscular output temporarily, but in severe physical demands of longer duration, the muscular output decreases. As a famous scientist has said "Coffee acts like a spur, which drives a horse to do its best, but cannot replace oats." That's the whole problem in humans - many of them do expect coffee to take the place of "oats". They pass up a solid breakfast because they can get by with coffee. The stimulating and exhilarating effects coffee produces is quickly followed by exhaustion and unsteadiness. No matter how we look at it, coffee takes more from the body than it gives. All coffees contain caffeine but in varying amounts. Fresh ground coffee is the most potent in caffeine. Instant coffees contain half as much and decaffeineated coffees contain about one third as much. It is imperative that a shooter refrain from drinking coffee before and during the shooting session and be moderate in coffee consumption when not firing.

Are you considering a change of pace drink, like tea? Before you do, read the following.

2. TEA: It is not generally known that tea has larger amounts of caffeine and tannic acid (the two most detrimental ingredients) per weight, than coffee. Caffeine in tea leaves is about three percent in ratio of one to two percent in coffee. The general effects of caffeine are cerebral, cardiac and dieretic (copious urination) stimulation. As to tannic acid, tea leaves have about ten percent while coffee berries have only about five percent content. Tannic acid, when brought into contact with mucous membrane, acts as an astrigent and dimishes its secretions. It coagulates albuminous substances and thus hardens animal source food matter in the stomach with which it comes in contact. It also leads to more rapid clotting of the blood when absorbed into blood circulation. There is evidence of liver damage from extensive use. In solution, it is unstable and should not come in contact with metals. Since coffee is made about twice as strong as tea in liquid form, a strong cupful of either will contain about two grains of caffeine and over three grains of tannic acid.

3. COLAS: Stay away from the colas. Cola drinks, in addition to other soft drinks, contain that well known perk-up ingredient, caffeine. The newer bottles contain a listing of cola contents which should serve as a reminder. Know them and avoid them.

D. TOBACCO:

Since January 1964 when the Surgeon General revealed to the American public the results of an investigation into cigarette smoking and health, many smokers have quit the habit. At the end of one year a poll taken revealed that one out of every four smokers had quit. This small percentage points up the fact that most smokers will continue the habit no matter what the future consequences might be. The smoking habit is easily acquired and even after a short duration becomes a difficult habit to break. For this reason one who has not yet acquired the habit should be encouraged to abstain. The objective of this section is not intended to persuade one to quit smoking even though this would be the best answer to the problem. The intent is to provide you the shooter with information that will enable you to establish control of smoking in order to improve your shooting. Who knows, once you gain control of the smoking habit and can turn it on or off at will you might be inspired to quit all together.

1. The Effects Tobacco has on the Human Body.

Nicotine is a powerful alkaloid poison. Its chemical formula is C10H14N2, which means that it contains carbon, hydrogen, and nitrogen in the proportions indicated by the numbers.

Being a volatile substance, it is carried along with the burning smoke of the tobacco. In cigarettes about 61 percent of the nicotine is burned and destroyed, 27 percent is ordinarily exhaled, and about 12 percent is absorbed by the smoker. The absorbed nicotine specifically affects the nerves that regulate the heart rate and the size of the blood vessels, and, therefore, alter the pulse rate and the blood pressure. For about ten minutes after smoking is begun, the pulse rate is slowed about five beats per minute because of an increased stimulation of the nerves that slow the heart beat. After this temporary slowing effect, nicotine depresses these sames nerves. This results in an increased pulse rate that lasts for two or three hours. The increase, for the average person, is from five to ten extra beats per minute. One cigarette after breakfast will step up heart beat for half the shooting day. With the damage already done, abstaining for the rest of the days' shooting is to small avail. The work of the heart is affected not only by the increased pulse rate but also by the decrease in size of the arteries. Both of these factors raise blood pressure and increase the work of the heart.

The carbon monoxide which is also present in tobacco smoke will, if inhaled, reduce the capacity of the hemoglobin of the red corpuscles to carry oxygen. This is due to the fact that hemoglobin absorbs carbon monoxide about 300 times faster than it does oxygen with which it ordinarily combines. Therefore, to the extent that the blood takes on carbon monoxide it cannot in that same proportion, carry oxygen. This results in "cutting the wind," or breathlessness, whenever there is exertion.

These combined effects of nicotine and carbon monoxide explain why the pistol shooter must avoid smoking if he is to shoot with the greatest possible skill. This conclusion does not mean that an individual or a team whose members smoke may not win, if it is competing against inferior opponents, but it does mean that any individual shooter on a team cannot perform at his best if he uses tobacco and the top competition today does not allow a margin of indulgence if you expect to win. Denying yourself a quick drag on the weed is not a sacrifice, it is a necessity for victory.

In 1959 Dr. Cuyler Hammond began a study for the American Cancer Society to prove that there exists an association between cigarette smoking and many physical complaints. The study involved 1,079,000 men and women (smoker and nonsmokers). For comparison purposes, listed on the following page are five of the more important complaints:

Complaint	Cig. Smokers	Non-smokers
Cough	33.2%	5.6%
Loss of appetite	3.3%	0.9%
Shortness of breath	16.3%	4.7%
Easily fatigued	26.1%	14.9%
Loss of weight	7.3%	4.5%

One can readily see that the complaints were more prevalent among the cigarette smokers than non-smokers. The study further revealed that lung functioning is affected if one inhales cigarette smoke regardless of age. For example: A young man who smokes one pack of cigarettes per day has the same efficiency of lung functioning of a man 20 years senior to him who does not smoke.

Simply explained, cigarette smoking affects the smoker by:

(1) Initially, slowing the pulse rate

(2) Increasing the pulse rate

(3) Increasing blood pressure and overworking the heart

(4) Reducing the oxygen capacity of the blood, causing shortness of breath

(5) Bringing on fatigue more quickly.

From the standpoint of shooting, smoking does affect performance, and more importantly, control. It is possible to become more proficient in shooting and still continue smoking, but the road is long and the progress slow. Many of our top shooters can attest to that fact. Today we have the top shooters in the non-smoking class, not that they have never had the habit, but that the determination to reach the top was stronger than the addiction to tobacco. Occasionally, you may see one sport a cigar, but seldom, if ever, will you see one inhale tobacco smoke. Consequently, the crux of the problem of smoking is the inhalation of tobacco smoke. Herein lies the answer. Stop inhaling and you have solved the problem. It is the inhaled nicotine and carbon monoxide that are responsible for upsetting the normal body balance. For this reason we find many shooters making the switch from cigarettes to pipes and cigars, since the smoke of each is generally too toxic for the normal person to inhale. Performance as well as health improves accordingly. For the shooter/smoker who is a do-or-die cigarette addict, and hopes to become proficient with the pistol, we have a recommended system that will work if followed as directed. The system has worked with members of the U.S. Army team. In routine fashion, delay smoking your first cigarette of the day for as long as possible. The objective is to delay the smoking of cigarettes until shooting for the day has been completed. You will be surprised at your ability and will-power, and also your improved control. Don't hope for miracles immediately, but keep your scores and watch your progress. Learn to moderate smoking, even when not involved in shooting by lengthening the intervals between smokes. For the shooter who will consider quitting, we offer a plan, entitled "You Can Quit Smoking." Mark Twain once said that he had no difficulty giving up smoking, and added "I've done it a thousand times." If you decide, though, make it permanent.

2. YOU CAN QUIT SMOKING!

Light a cigarette, smoke it, taste its bitterness, put it out. Even as you do, you know that you'll want another. Not that you enjoy it. You simply want it. And why? When you smoke a cigarette, for instance, nicotine, carbon monoxide, small amounts of hydrocyanic acid, pyridine and various phenols and aldehydes are absorbed into your lungs and mouth. Your nervous system is momentarily stimulated. Your blood pressure goes up. Your pulse rate increases.

Most important of all, your blood vessels undergo a constriction. This "slows you down." That is, after the momentary stimulation, smoking depresses, for a far longer period.

When you smoke, you are artificially slowing down your body's normal activities. If you are suddenly confronted with an emotional psychological emergency: adrenalin is pumped into your blood stream, your muscles tense, you breathe faster and get edgy, jittery--"nervous." Tobacco smoke retards these natural processes by slowing the blood circulation and thús "calming you down." You find a smoke is "good for your nerves."

If you smoke a pack and a half of cigarettes a day, you smoke an average of one cigarette every 32 minutes of your waking hours. That many crises don't arise every day. You need cigarettes simply because your body has come to expect this depressant effect every so often. You begin consciously to want a cigarette.

There is little true pleasure in smoking. The harsh taste, the hot dryness is tolerated, for the sake of tobacco's mild narcotic effect. If it were possible for you to go without cigarettes for the next 24 hours, and then light one, you would find out how distasteful and noxious tobacco smoke really is. If you think this is an exaggeration, try it.

Think back to the time many years ago when you smoked your first cigarette. How did it taste? Gaseous, strong, biting, wasn't it? This is the experience that you may give your system 30 to 60 times a day. You are able to do it because the human mechanism is a marvelously adjustable piece of machinery which can get used to almost anything.

What can you do about it?

You have already taken one big step toward giving up smoking: you have been thinking about the detrimental effects of smoking and about giving it up. If you want to stop smoking, think about giving it up at one fell swoop. Think of it cooly and calmly, without fear or hopelessness. Think of what it would be like to never have to smoke. Giving up smoking isn't all self-denial; there are compensations. There are so many good things to enjoy more that when you give yourself a chance to appreciate them, you will never want to go back to smoking.

When you give up smoking, your food will taste much better. Your nose and throat and lungs will not be continuously permeated with smoke. You will begin to smell the world around you. When you walk into a garden you will smell as well as see flowers. When you get up in the morning, you won't find your throat clogged with phlegm, and you won't cough or clear your throat so often.

You will actually feel far less nervous. That's hard to believe--and during the first days of non-smoking you will be nervous. The depressant effect smoking has exerted on your body for years suddenly ends, and the unfamiliar effect is almost overwhelming. You will possibly be more emotional; you may laugh at trival things and, for a while, be tense, jumpy. But gradually the nervousness diminishes. You'll be calmer, more poised. For, when you stop slowing down your body and cutting your energy with tobacco, you will find that you have much more energy. There seems to be more time to get things done.

A word of caution here. It is generally believed that a reformed smoker gains weight. If you have trouble with your waistline, remember this: when you stop smoking, you will not gain more than a few pounds. When you stop smoking you will have a great increase in energy. In using up that energy, you will burn away a lot of the weight that you put on.

If you have read this far, you probably think you are about ready to swear off. Don't do it yet.

Watch and wait until some time when your life is on a fairly even keel. Don't try it when you are leaving on an important trip, or preparing to give a big party, or when you are facing some personal emergency. Don't postpone it too long, either, or you will lose the momentum you are gradually building up.

But some sunny morning--maybe on a weekend--you will wake up feeling especially good. You will have had a good night's sleep; you will feel fit for anything. The idea of stopping smoking will pop into your head. Why foul up a wonderful day with the noxious fumes of burning tar and nicotine? Decide, then and there, quietly and firmly, that you're through with smoking! This is the moment, intelligently selected and properly prepared for, when you can get off with the running start.

Follow these rules:

a. Start yourself off with as much momentum as you can. Tell your friends that you have given up smoking. Don't be smug or complacent or boastful, but let people know what you are doing. Then, at some point when you are seriously tempted to smoke, the thought of all the derisive laughter you'll get for giving in may well carry you over the crisis.

Most smokers have fixed ideas about the occasions when a smoke tastes best. The first cigarette after breakfast, or the one with a cocktail before dinner. If such associations are likely to tempt you to smoke, brace yourself in advance for such temptations; tell yourself that such an occasion is coming, and that you must be prepared to want to smoke badly. If you hold out only for a moment, that sudden strong temptation will die almost as quickly as it arose.

b. Don't permit yourself to make a single exception. Until the non-smoking habit is firmly implanted, "don't." If a habit is not fet, it dies relatively quickly, but it can subsist for a long time on the slightest food. If you occasionally let yourself have one cigarette or pipe on the ground that "just one won't hurt," you will keep alive the desire to smoke. Just as one drink is too many for an alcoholic, one cigarette is too many for the heavy smoker who is trying to reform. Win the battle of the moment--every time you say no to the temptation to smoke, you are making the next "no" easier.

c. Deliberately expose yourself to temptations and conquer them. Just as a fighter conditions himself for a major fight by road work and sparring, you can develop your determination by deliberate temptations. Carry matches and light cigarettes for your friends. If you are accustomed to riding in the smoking car, continue to do so, and look at all the people around you who are riding there by necessity and not by choice. They can't give up smoking. You have!

d. Baby yourself in everything else. Most of us are inclined to launch sudden, ambitious programs of self-improvement. We try to do more than we can reasonably expect of ourselves. On the contrary, indulge yourself. Eat what you want and enjoy it. Have an occasional cup of coffee or soft drink when you feel the desire to smoke. Make it a habit to carry mints, gun, or salted nuts. During the first few weeks keep substitutes on hand--and pop one into your mouth whenever you feel like smoking.

e. Let your sleep work for you. On the night of the first day that you give up smoking think for a moment when you go to bed of how today you did not smoke. Then tell yourself, "Tomorrow I am not going to smoke." Repeat it to yourself as you get drowsy. This will be the last thing in your conscious mind as you drop off to sleep. When you wake in the morning, remind yourself that you are going to get through this day, too, without smoking. Don't make a big issue of it. Just briefly say: "This day I don't smoke." Even if you don't follow the other rules set down here, this exercise in "controlled sleep" could get you over the hump. You will find a sense of freedom and independence and self-assurance results from simply going half a

day without tobacco. This is a sharp, continuing pleasure, and every minute helps to strengthen you against the next minute's temptation. Above and beyond this pleasant, heartening knowledge is the awareness that you are doing something of which you will be proud--not to mention healthier and happier--for the rest of your life. Six months or six years from now, when someone offers you a cigarette, you will refuse it, but not weakly or defensively. You will say "Thanks--I used to smoke, but I gave it up."

3. A Commentary by Dr. Crane in the Newspaper "Arizona-Republic", Phoenix, Arizona, 1 May 1961

A famous swimming coach at Ohio State University who produced many Olympic stars has said, "We do not permit any member of our swimming or diving teams to use alcoholic beverages or tobacco in any form or quantity." This typical attitude of modern coaches is medically sound. Here are the reasons why tobacco hampers athletes (and also predisposes heart patients to fatal coronary attacks):

a. Carbon monoxide in the smoke "fixes" some of your red blood cells so they cannot carry oxygen. This carbon monoxide content of the smoker's blood may run as high as 10 percent. Indeed, the smoking of just 3 cigarettes, says the American Medical Association, produces the relative oxygen deficiency of a 7, 500 - foot mountain top altitude. Obviously, shortage of oxygen to the muscles "winds" an athlete. Smoking also makes his heart beat faster, even when he is standing still.

Smoking just one cigarette may thus zoom your pulse rate as much as 20 extra beats per minute, thereby wearing out your heart needlessly. The old ticker won't stand 28, 000 extra beats a day indefinitely. A heavy smoker is almost continuously under the influence of tobacco and usually awakes during the night for a few smokes. A cigar addict, used in experiment, smoked 6 cigars per day. His heart averaged 82 beats per minute. Quitting his tobacco habit for six months, his pulse averaged only 75 beats per minute which cut out 10, 080 extra pushes daily for that hardworking heart. You can see why tobacco users shorten their lives by 5 - 7 years.

b. Tobacco also promotes thickening of the artery walls with a consequent rise in blood pressure. This makes the heart work much harder and also predisposes tobacco addicts to strokes of apoplexy and coronary attacks.

c. Smokers also have a thicker coating of mucous in their windpipes and lungs. That is why they cough so much, especially when they change posture, vertical to horizontal at bedtime. Likewise, in the morning when they arise and go from horizontal to vertical, this sudden shift of fluid along the air channels then produces tickles and heavy bouts of coughing. That lining of thick fluid slows down the exchange of oxygen in the lungs, so this also makes the smoker shorter of breath when he engages in athletics of any sort.

4. The report of the Surgeon General of the US Public Health Service, released on 11 January 1964.

"SMOKERS DIE EARLY" it says. Smoking cigarettes is a health hazard that calls for corrective action - and is a major cause of lung cancer and other death-dealing disease, especially in men, a blue-ribbon federal panel reported today.

In short, the panel indicated, the more you smoke, the greater your risk of an early death. Deeply inhaled cigarette smoke sends a threat of premature death spreading through the lungs, arteries and the heart itself.

Lung tissue was obtained from more than 1000 postmortems, put on microscope slides and carefully examined by pathologists. The slides were identified only with coded numbers, and pathologists did not know their origin. Later, statisticians matched the pathological findings with the histories of the dead patients. The results added up to an elaborate description of progressive smoke damage.

Deeply inhaled smoke, the researchers found, irritates the cells that line the tiniest chambers of the lung (alveoli). The walls of the alveoli thicken, lose their elasticity and much of their ability to do their vital job of exchanging carbon dioxide for oxygen. Subjected to sudden stress--such as a cough or sneez--the alveolar walls rupture; a minute part of the lung becomes useless.

Even while it is attacking the alveoli, smoke also damages the small arteries that carry blood to the interior lung surfaces for oxygenation. The artery walls become fibrous and thickened. Soon, internal deposits on the thickened walls make the arteries so narrow that little blood can get through. Eventually many tiny arteries are blocked completely.

These two sets of events alone would be enough to explain why thousands of Americans are "lung cripples," suffering from what most U. S. doctors call pulmonary fibrosis and chronic emphysema. But the damaging chain of events runs on.

The destruction of smaller blood vessels in the lung and the thickening of slightly larger ones increases the blood pressure in the pulmonary arteries and puts a strain on the right side of the heart. It also prompts the left side of the heart to work harder to pump blood against increased resistance. A healthy heart could probably stand the extra work; a heart already weakened by other difficulties might fail.

Even while the heart is being asked to overexert, carbon monoxide from cigarette smoke combines with red blood cells and decreases their capacity to carry oxygen. As a result, the hard-working heart muscle is given less fuel to do its job. At the same time, tobacco's nicotine causes a construction of small arteries in the extremities and speeds up the heart, increasing its need for oxygen and complicating the coronary problem.

Smoking dulls the sense of taste causing loss of appetite, and thus creating a loss of weight. For this reason people who give up smoking tend to stop losing weight. They begin to taste food again and enjoy eating.

5. Expense.

If a man smokes two packs of cigarettes a day for 365 days it will cost him $220.00 a year! Quit smoking and automatically you save money, remain healthy, and start winning pistol matches. This is a bargain you can't afford to overlook.

6. Other Dangers.

The danger of serious illness or death from such infectious lung diseases as influenza, pneumonia and tuberculosis is increased if the lungs have been damaged by smoke.

7. Inescapable Conclusion.

Smoking is a dirty, filthy, costly, unhealthy habit and most champions do not smoke, drink alcohol, or drink coffee before and during a match or practice session.

E. DRUGS:

At one time or another some shooters have probably tried a sedative drug or tranquilizer to see what effects it would have on their shooting. Drugs affect different people in different ways, so dosage would be a problem even if they did any good toward reducing anxiety, nervousness, etc. Any time medication or drugs are used that affect the body functions, the side effects will do more harm than good to the shooter's performance.

Some shooters no doubt prescribe certain remedies for themselves when they have a cold, a stopped-up nose or a headache. Here are some of the effects of the drugs found in these and other preparations. Most of the effects are not conducive to good shooting. In no way do we wish to imply that any shooter would resort to narcotics.

1. A depressant slows reflexes, lessens the desire to win, promotes carelessness, causes loss of concentration and coordination.

2. A stimulant causes nervousness, hypertension, increases heartbeat, excessive movement of the hands, trembling, etc. Most drugs are habit forming and all are a deterrant to good health if used continuously without proper medical advice. There is no substitute for good clean living, a healthy body and just plain GUTS!

3. Drugs in daily use.

a. Sedatives and depressants (relief of insomnia).

(1) Barbiturates.

(a) Phenobarbital has special effects against convulsions. Continued use increases tolerance and leads to dependence. Convulsions and acute anxiety may result if the drug is abruptly discontinued after long use. Alcoholics substitute barbiturates for alcohol and become just as devoted to it. Even after moderate doses, lassitude, dizziness, headache, nausea and diarrhea may occur. The toxic effects are respiratory depression, peripheral vascular collapse, feeble heart beat, low body temperature and continued stupor with depressed reflexes.

b. Analgesics (Pain relief and reduction of symptomatic discomfort).

(1) Aspirin - acetylsalicylic acid.

(a) Gastro-intestinal distress due to irritation is common. Continued dosage symptoms same as quinine (Cinchonism): Dizziness, ringing in ears, impaired hearing, acidosis and depressed blood clotting mechanism.

(2) Stimulants or adrenergics (Relief from drowsiness, depression, curbing the appetite, and relief from nasal congestion).

(a) Benzedrine, amphetamine and ephedrine respectively, elevate blood pressure, accelerates the heart beat, headaches, nervousness, insomnia, and spasms of the uninary bladder sphincter. (Muscular control that permits urination.)

c. Antihistamines (Relief of colds and fever and relief or prevention of allergy symptoms).

(1) Danger of toxic action, especially drowsiness, exerts a potent sedative effect. A form of antihistamine namely, methapyrilene is actually sold under the name "dormin"

and is used for sedative purposes. Used in conjunction with alcohol, this sedative action is especially dangerous as alcohol heightens the depressant effect.

d. APC pills. Basic ingredients usually are acetanlid or acetophentidin and caffeine. Continued use develops a blood condition known as methemoglobinemia or simply a union of oxygen and iron in the blood instead of oxygen and hemoglobin, the natural state. The oxygen in this instance is retained in the blood and not exchanged normally. Another combination used is acetylsalicylic acid, phenacetin and caffeine. The phenacentin adds the property of antipyretic (reduction of fever). Other effects similar to above.

e. Decongestant tables. Basic ingredients quite similar, usually as follows:

(1) Phenylephrine hydrocloride. A stimulant of the sympathomimetic groups. It is a local vaso-contrictor, elevates blood pressure, reduces swelling of nasal membrances. Usually mixed with a local anesthetic to retard rate of absorption. Used in treatment of vasomotor collapse which is a condition where the nervous system cannot control the dilation and contraction of the blood vessels.

(2) Phenindamine tartrate. An antihistamine. When used with tartaric acid, it may be detrimental to the kidneys.

(3) Acelylsalicyclic acid (aspirin). See asprin described above.

(4) An antipyretic (reduce fever) and analgestic. Continued use may lead to methemoglobinemia.

(5) Caffeine. A stimulant, produces wakefulness and respiratory stimulation. When combined with an analgesic is used to relieve headache. Continued use may produce nervousness and insomnia.

(6) Vitamin "C", (ascorbic acid): large doses lead to gastro-intestinal upset.

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NOTES

COMMENT SHEET

Your comments and recommendations for improvement of this manual and/or the Small Arms Firing School are solicited. You may tear out this sheet and hand it to any instructor or SAFS staff member or mail it to: Commanding Officer, USAMTU, Fort Benning, Georgia.

45803 Army-Ft. Benning, Ga. 5 Jan 65

PREPARE FOR SHOT

PLAN SHOT

RELAX BEFORE SHOT

DELIVER SHOT

ANALYZE SHOT

CORRECTION *(IF NECESSARY)*