About Danish artillery in the mid-1800s

The following texts are from the contemporary textbooks "Ledetraad i Artillerie til Brug ved Forelæsinger", 1849, by Artilleriecapitain CC Lundbye and the same author's "Veiledning i Læren om Det svære Skyts til Brug ved Teaching ved Royal Landcadetcorps", 1852.

Both texts give an extremely clear insight into the necessary equipment and accessories, as well as their use in the field for system 1834 - yes, in fact, for all forward defense from around 1800.

In order to preserve the character of the times, the original language has been retained throughout and even the author's "spelling mistakes" have been included.

Both books are kindly lent by IH Johansen.

Guide to Artillery for Use in Lectures

THE SKYTS SYSTEM OF 1834

By cannons is meant the heavy projectile, whose internal hollow bore is completely cylindrical, and with which the aim is to be able to expel the projectile with the greatest possible speed and in as flat a trajectory as possible.

The different cannons are named after the weight of the massive iron ball which corresponds to the same, e.g. 84-pounder, 24-pounder, or 6-pounder cannons are those whose corresponding balls weigh 84, 24, or 6 pounds. But since the main purpose of a cannon is either to launch massive balls, or to launch hollow balls that are filled with gunpowder and are called grenades, then, in order to more precisely describe the nature of the cannon, one must add if it is intended; a ball cannon, or a grenade cannon; - thus having e.g. 24 pounder Ball cannons and 24 pounder Grenade cannons. The size of a cannon with regard to the same corresponding ball, is also called, by a common name, its caliber; - both the 24-pound ball cannon and the 24-pound grenade cannon are guns of the 24-pound caliber. From this also follows what is understood by mentioning field calibers, fortress calibers, etc.

It deserves to be noted here that since a grenade is hollow inside, it will therefore have a smaller weight than the massive ball of similar diameter, hence its name. Thus, the 24-pound grenade weighs 16 pounds, and from this it again follows that the grenade cannons are also considerably lighter than the ball cannons they have in common with.

The grenade and ball cannons which were cast later than 1830 have a completely identical construction, so that both types of cannons have the following names and classification of the cannon.

The rear piece and the front piece, which two pieces are truncated cones, which, where they - approximately in the middle of the length of the cannon - collide, form a so-called drop. The front part of the front piece is somewhat reinforced and forms as follows:

The head, which runs flat behind the front, with which it collides in a plane called the neck and which is covered by the collar. At the top point of the head is marked a lined screw hole for a brass cylinder called the falcon.

The buttress reinforcement is provided at the top with an attachment shoulder, through which and through the buttress reinforcement, in the vertical direction, a cylindrical hole, the attachment hole, passes. At the back of the attachment there is a lined screw hole for a clamping screw.

The grape serves to treat the cannon with more ease than would be the case where it was missing.

The studs, with their stud discs. On the 2 pins the cannon rests on its base during operation, and about them it can be turned in a vertical direction. The trunnions serve to keep the cannon steady in its base, so that it cannot shift to the sides when firing.

The soul is the entire cylindrical hollow Space in the Cannon.

Caliber is the diameter of the soul and is somewhat larger than the diameter of the sphere, and this results in:

The clearance, which is the difference between these two diameters. For the Field Cannons the Clearance is approximately 1", for the Coastal and Fortress Cannons it is approximately 1 1/2" large. The mouth is the front part of the soul; the entire front face of the gun is called the muzzle face.

The bottom is the back part of the soul in which the charge is placed; it is formed in such a way that it is easy to wipe clean. The estate indicates the iron strength in the rearmost point of the butt. The diameter of the cannon at this point - or above the highest point behind - will therefore be equal to twice the load + calibre. If the property is equal to Caliber, said Diameter is therefore equal to three Calibers; The cannon is then called full stock. Also for other thicknesses, the goods are measured out in parts of Calibret, so e.g. when it is 3/4 Caliber or 5/4 Caliber large, in which cases the cannon is called 3/4 Gods or 5/4 Gods; with a less precise statement, the canon in these cases is also called the canon of under-land or over-land.

The core line is the line that runs through the middle of the soul, or its axis. The length of the barrel is understood as the distance from the highest point behind to the muzzle surface, so the grape is not included in the length of the barrel. The length of the different guns is indicated in Caliber, and one is thus called e.g. a cannon 11 caliber long, when the caliber is precisely contained 11 times in its length.

The soul lines, the upper and lower, are the lines which, parallel to the core line, limit the soul when the cannon is seen in longitudinal average.

The trap hole is the opening through which the charge is ignited; it is at all the Cannons 2 1/2"' in Diameter.

The base of shock is called the iron strength between the rearmost point of the bottom of the soul and a plane perpendicular to the core line through the highest point behind.

The two sight points, rear and front, are formed by the highest point behind and by the highest point in front, the latter being on the head of the cannon.

The visor line is the line that can be drawn through the visor points. The line that runs in the middle of the studs is called the stud axis and it intersects the core line, to determine the location of the visor points one must think of a plane perpendicular to the stud axis through the core line, thereby the visor points would be determined by the intersection of this plane with the largest circle behind and the largest circle above the head of the Cannon. The plane determined in this way is called the visor plane and naturally contains both the visor line and the core line. Since the cannon is constructed in such a way that it is thicker above the highest point at the back than above the highest point at the front, so the pointer line will cut the core line at a certain angle; this is called the elevation of the sight shot and is equal to 1 1/2 degrees for all guns.

The settlement is half the difference between the diameters above the highest point behind and in front.

Backweight is called the pressure of the bottom of the cannon against its base when the cannon rests freely on its studs. These are precisely placed on the cannon in such a way that the rear weight is as great as is necessary with regard to convenient operation and the quietness of the cannon when firing. In the case of ball cannons, the rear weight is approximately 1/11 of the cannon's entire weight; at the Field Grenade Cannons are

on 1/6, and for the larger grenade guns 1/8 to 1/16 of the weight of the gun.

The weight of the cannon must be in a suitable proportion to the weight of the bullet or of the grenade that must be able to be launched by the bullet or grenade cannon, as well as to the charge that must be able to be used for this purpose.
For field shooting, one can assume: that the ball cannons should weigh approximately 135 times as much as the massive ball that is fired from them, and the grenade cannons should weigh approximately 100 times as much as the grenade assigned to them weighs. In the case of the battery gun, it can be assumed: that the ball guns should weigh approximately 200 times the corresponding ball, and that the grenade guns (according to the largest charges determined for them) could weigh from 90 to 160 times the weight of the grenade. The cannon's weight is entered in Roman numerals in Sk-pounds, L-pounds and pounds on the breech to the right of the breech.

The cannon still has the following marks:

On the right tap: the name of the cannon foundry,

- left ditto: the royal name digit, and the year when the cannon was cast, (below that royal name digit).

To the left of the prison hole: The serial number of the cannon in the delivery.

At the back of the butt base, under the grape: The casting number at the cannon's casting.

A Canon is designated by stating:

l) Its Caliber (Bullet Weight in Pounds),

2) The warehouse from which it was delivered,

3) The year it was delivered,

4) Its attached serial number.

The number of cannons of the same caliber that are delivered in the same year and from the same factory are given consecutive serial numbers, therefore the above four statements are necessary to define a single piece with certainty. The casting number, on the other hand, has no value in this respect, but is only for information at the receiving offices.

THE SIX POUND FIELD MADE

The field armament of the 6-pounder ball and 12-pounder grenade cannon - hereafter referred to only after the 6-pounder cannon - consists of the following main parts, each of which would be discussed in more detail, namely:

A. Lavette, with:

l made block,

2 Laminated walls,

l Ax with Ax lining,

2 crates with seats,

2 Wheels.

B. The performance, with:

l Subordination,

l fork rod,

2 Wheels,

l Presentation box.

When the cannon is to be fired, the lavette is brought out of connection with its projection, and it then rests on the ground on both wheels and the rear end of the lavette block, whereby the cannon takes an approximately horizontal position and, as will be shown later, can conveniently be given that direction are challenged. If, on the other hand, the cannon is to be moved, then the lavette is brought into connection with its front position (forecarriage), whereby Affutagen forms a four-wheeled vehicle. In the first case, the cannon is said to be de-pronged, in the latter case it is pronged.

In addition to the wooden parts of which the Affutagen consists, there is also a large part of fittings on it; The purpose of these is either to strengthen the wooden parts and to hold them together, or also to serve as fastening means for several loose items that are brought onto the deck.

The made block is made of oak and lengthwise composed of 2 planks, which are held very strongly together by means of tenons and bolts. The front 1) end of the block, up to where it begins to decrease in both height and width, is called the chest piece; the part of the block that reaches from the chest piece to the lower knee (which gives the block an approximately horizontal surface when the lavette is sprouted) is called the tail piece, and the rear part of the block is called the tail piece; this is rounded at the bottom in a sled-like manner, in order to allow the lavette to slide smoothly over the soil in the case of several flats.

On the breastpiece the following fittings are found: a strong drawstring, or square iron ring, surrounds the block closely behind the axis, and serves to hold the two planks together; a Head Bolt secures the Lavette to the Axe; on the rear part of the chest piece is the adjusting screw, whose nut is made of metal and attached to the block by two bolts. The setting screw has a cross handle at the top and above that a flat, slightly rounded head on which the cannon's rear rests during operation. On the left side of the chest piece, approximately directly in front of the set screw, there is an oil pipe and a needle clamp, in which the latter are placed trap-hole devices, a description of which will be given in a next section.

On the water section are the fittings: In the middle under the built-in block there are 2 loading chains, one of which can be attached to each side of the block by means of the leaf hooks with jaws placed in this way; in these chains the Ladetøiet is hung, which is prevented from sliding down towards the Swan by a Setter stop plate, which is also found under the Lavet block. On each side of the block is placed a scouring plate, the purpose of which is to prevent the castor's wheel from damaging the block during tight turns. On the right side of the made block, close to the wall, there is a hanging hook with two tensioning straps, in which two iron pre-tensioning swivels are placed. On each side of the block there is a lifting bar at the point where the svandstykket and the svandsen stand together, which lifting bars are secured by two cross bolts.

On the Swan is marked by fittings: A Swan B!ik, which lies below the Swan and protects it from wear and tear; this fitting is extended backwards as it forms the show ring, which serves to unite the lavette with its front when show off is to be done. The upper plate lying on top of the Swan, which is firmly joined to the first-mentioned bracket by two rivets, belongs to the Svandsblikket. On top of the breech, two hand spiked rings are also attached to vertically penetrating bolts, which find use in the operation of the cannon.

The two made-up walls are made of oak; at the top of each wall is a dowel bed, and at the bottom of each wall is an axis cut. The lavet walls immediately support the cannon when it lies in its lavet; they are placed one on each side of the breast piece of the base block, to which and to the axis they are attached in several ways.
Brackets on both walls are:

The pan iron, which covers the front end and the entire upper surface of the wall, by which it also leads the tenon bed, in which the cannon's tenon must rest.

The pan cover lies above the tappet and is secured with the help of two Standbolts.

The axle bracket encloses the axle guide which engages in the axle recess; it is held in place by three stand bolts. The front end of the Axebøilen is bent into an eye and a setter hook is placed in it, in which, as well as in the Ladetøikjæde referred to at the Lavetblock, a setter can be placed, a total of two such under the Lavette.

Six discs, namely three on each side of the plywood block, are embedded in this and in each of the second walls, so that the walls retain a small distance between themselves and the plywood block when they are installed, which contributes to the conservation of the wood. Through the front and rear pairs of washers, and also through both walls and the block, go two transverse bolts that hold the whole thing together. In each wall there are a total of five stand bolts, which partly serve to hold the roof cover and ax braces, partly to pinch the wood together at the top edge. One of these bolts in each wall also serves as a back support stand bolt, which will be discussed later, when describing the seats.

Fittings used to attach operator clothing are found on the right wall: a hanging hook for the pipe puller; as well as two setter hooks, one of which is at the top of the backrest stand bolt; in these hooks the setter is placed while movements are made with the cannon in use. On the left wall: a hand-nail hanger and a hand-nail hook with a knob, which fittings serve to place two hand-nails in it.

On top of the made block, somewhat in front of the set screw and recessed into both walls, is placed an oak saddle, on which the rear part of the cannon can be brought to rest by turning the set screw all the way down. On Marcher, this does not suffer from the movements of the cannon around the studs.

The axis with the axis lining carries both the lavet block and the lavet walls.

The ax is entirely of iron; it has two axle arms that are conical, on which the wheels are placed; At the end of each Ax arm there is a square lens hole. The middle and longest part of the Ax is square and is called Axedammen; it is lowest in the Middle. It has three holes, namely for two stand bolts and for the main bolt. On the inside of the axle arms, close to the dam, two shock washers are placed so that the square part of the axle does not damage the wheels. When the wheel is placed on its axle arm, a traction disc, a lashing disc and finally a lashing, which, after passing through the axle arm, is tied in front with a lashing strap. The lance disc grips the lance and therefore has no movement around the ax arm. This, on the other hand, takes place with the draw pulley, which has an eye in which a rope or line can be placed to help with the movement of the lavette where such could be needed under certain circumstances.

The ax lining surrounds the ax dam above and on the sides, it is made of oak. This lining serves both to stiffen the axle properly and also to better secure the various parts together. Fittings include: two axle drag strips, one at each end of the axle liner; the iron axle, the wooden liner and the two elevation blocks are held together by these tie-rods, one of which is placed at each end of the axle liner to serve as a support for the boxes standing on it. The drawbars could be separated with the help of screws, so that the overhangs, which are attached to the washers for the steps, could be removed without removing the drawbars themselves. Two sand plates are placed over the ends of the axle liner, between it and the risers, to prevent irregularities from falling down between the wheel and the axle. A mirror screw is attached to the lower front edge of the axle liner and serves to carry the mirror screw in conjunction with one of the loading tool chains.

Two low-level boxes with seats are placed above the second elevation block on the axle lining. Each box in particular is attached to the axle lining with the help of two cross braces, which are joined at the Øskentverbolt, in which the prestressing rope could be attached. The floor of the box has, on the side that faces the low wall, a rafter to protect the seated crew from impact on the pan decks; in addition, the layer has hinges and an overhang corresponding to the twister placed on the front sides of the box. On the box against the wheel

on the opposite side, a handbrake is placed, by means of which a tarpaulin screen is stretched against falling irregularities from the wheel; the box's layer is also covered with painted tarpaulin to protect the wood against moisture. From the upper rear part of the handrail, a back strap goes over to the one stand bolt in the low wall. The foot step of the seat is formed by a foot step strip (of ash wood), which is strengthened below by an iron rail which also forms a fixed strut which is attached to the inner side of the paneled wall with bolts, another fixed strut belonging to the aforementioned iron rail is forged with The Assault of the Ax Drag Band; The foot step has another loose strut that goes from a ring on the handrail's lip to another ring on the outside of the foot step.

In addition to a main stock of manhole pipes, the craft boxes also carry such pieces of tools and a reserve of smaller items that could often find use and must be immediately on hand.

The six-pound flat wheel consists of: a hub (of oak), which forms the center of the wheel, and which is placed on the axle arm when in use; seven rims (of beech wood) that form the Hjulkrandsen, and which are mutually united at Dømlinger; fourteen spokes (of oak) form the connection between the hub and the rims; in each rim, two spokes are aligned in such a way that all the spokes are placed with equal distances between each other.

Fittings on the wheel include: an iron bushing (cast) with two warts and a lubrication chamber; it guides the hub inside and is prevented by the warts from being able to turn around in it. Two bellows rings are placed around the middle part of the hub; they are attached each with three pins; two hub rings, one for each end of the hub, are each attached with two nails. These four rings serve to pinch the wood together, which without them would easily split when the square tenons of the acorns are forcefully aligned with it. A wheel ring is placed outside the rims, which is attached with seven wheel ring bolts with inlaid heads.

When the spokes are aligned slightly in the hub, a distance appears from the plane, which can be laid through the leading edge of the rims and into the spokes, where they enter the hub, and this distance is called the drop.

When both wheels are on the axle, the distance between the outer side surfaces of the rims at the ground is called: the track. The track width is 5 feet, or about as great as the height of the wheel, which is 4' 10".

OPERATING EQUIPMENT

In order to be able to use the cannons and mortars, complete operating clothing and requisites are required, as well as several items are needed for the maintenance and cleaning of vehicles and tanks, as well as for spare cases. In the following, the most important of these requirements would be listed, namely:

At the field guns:

a. The leveling device serves to guide the charge to the bottom after it has been inserted into the muzzle of the cannon. The setter flask (a short wooden cylinder) is attached to the end of a setter rod, on the other end of the same rod is placed a lambskin-clad wicker flask, with which the piece can be expanded and cleaned. Each gun carries two setters, which, when not in use, rest in the setter hooks and loading tool chains with the setter piston supported against the setter stop plate under the lave block. In order to preserve the wicks against dirt, the wick covers are made of painted tarpaulin.

b. The scraper consists of two iron points spirally twisted against each other, which unite in a hole and are thus attached to a pole. At the other end of the same rod is the mirror screw, which consists of a conical iron screw, roughly like a drill bit. To preserve the mirror screw, screw a loose Vidsker flask around it. The scraper is used to take soft things out of the cannon; with the mirror screw, bodies of wood that must have entered the cannon are removed. A scratcher with mirror screw is carried with every other cannon; it rests in the hook under the axis of the Lavette and is secured by the left Ladetøikjæde, which, before it is placed around the Setterstangen, is passed through it

square eye that is formed by the branches of the scratcher. The mirror screw's loose wiper piston is also given a wiper cover for protection against dirt.

c: The handmaiden is a round, strong wooden rod, slightly thicker at one end than at the other; it is used for the lateral direction, as well as for lifting the lavetsvands up when the cannon has to be moved with manpower. The handmaiden is provided with a wart which prevents it from slipping in the handpin rings when used, as well as with a loose ring; when the hand peg is not in use, it is placed with the thick end in the hand peg hanger and with the ring in the hand peg hook. Two handmaidens are allowed for each cannon.

d: The cannon stopper with straps is used to exclude inconsistency from the muzzle of the cannon. When the plug is not in the muzzle, it hangs up under the cannon's collar.

e: The dungeon tools make up for each Cannon: Rømnaal, Dørslag, and Boer. The Römnael is a thin brass needle, which is used for examining the dungeon. The doorknob is an iron pin, about the width of the dungeon, somewhat longer than this and flat at the end. The drill is made of steel, shaped like an ordinary twist drill at the end and with a handle at the top. These three tools are attached by twine to the Rømnaalskramperne, where they sit until they need to be used. If the trap hole is blocked, try to push the irregularities down the barrel with the threading needle; if this succeeds, the darslagt is put in the dungeon, and with light blows with a hammer or with the handmaiden, the inconsistencies in the dungeon are driven through the same; However, the door strike must be lifted a little after each strike so that it does not get stuck in the trap hole. The drill is used when harder things have to be drilled out of the prison hole; it is then carefully forced down a piece and then turned around, but pulled up from time to time so as not to get stuck, or even to break. In order to clean the prison hole, you also sometimes have to soak the object that clogs it by pouring water into the prison hole, after which you work with the prison tools.

f. The fore-tension ropes and the fore-tension swivels serve to drag the cannon forward by horse power without the aid of a pretension. Of each kind, two pieces are awarded per Pieces; The ropes have an iron hook at each end, with which they are attached to the rings of the cross brace bolts at the front of the ax dam; - The turnbuckles (which are made of iron) are hooked at one end of the ropes when in use, but when they are not in use they are hung on their hook on the right side of the building block and fastened here.

g. Triggers, which are used to fire the cannon, consist of a line that has a wooden handle at one end and an iron hook at the other. Each cannon is assigned two such triggers, which are stored in the right hand drawer when not in use.

h. The finger cap, is taken on the finger with which the trap hole is closed when the cannon is extended. A finger cap is carried with each cannon, which is stored in the left-hand storage box until it is needed.

i. Riveting nails, of which two pieces are carried with each cannon (in the left-hand box), are square steel nails of such a dimension that they could be driven a piece into the trap hole and break off, thereby rendering the piece unusable for the moment.

j. The card case is a leather case with a lambskin flap, in which the shots are collected for the cannon when fired. 2 to 3 such Cardu bags are carried in each Prestilling box.

k. The quadrant is of brass, formed as a right angle with a quarter circle arc, which is divided into degrees and subdivisions thereof. At the top point of the right angle is attached a movable angle leg, which by walking along the arc can measure angles, and which is equipped with a nonius and spirit level. With the help of this Angles above and below the Horizon could be indicated. This quadrant can also be used to measure angles in the horizontal plane. With every fourth Field Cannon, such a Qvadrant is carried, which is then stored in the left Lawetkasse.

l. The fake is a tapered brass pin, which is placed on the highest point of the cannon's head.
It has been previously explained that the Elevation of the sight shot at the guns is 1 1/2 degrees; but since (for reasons that would be presented when dealing with the use of the cannons) one does not want such a large sight shot elevation, the falcon has been screwed into a screw nut placed in the head of the cannon, whereby it is in one's power to be able to the height of this falcon give the cannon the angle you want for Viseerskud Elevation. This is determined to 1/2 degree for 6-pounder and 12-pounder ball guns and to 3/4 degree for 12-pounder and 24-pounder grenade guns. As the falcon is a very important piece for the cannon's use, in addition to the falcon screwed onto the cannon, another one is carried in reserve, which is kept in the right-hand lowet box.

n. The attachment is a brass rod with a brass head with a notch, which rod can be pulled up and down into the attachment hole in the attachment. In addition to an ordinary inch division, and a degree division for the corresponding cannon, this mounting bar also has divisions that correspond to the cannon's charges and distances, so that the elevation required for the present circumstances can be given with ease. In order for the attachment not to go too easily in the hole, it is affected by a spring inserted therein, and to be able to hold the attachment in a certain position, there is a clamping screw on the back of the attachment attachment. A spare attachment with accessories is carried in each Cannon's right-hand Lowet box.

o. Of general carriage requirements, carry: English wrench for each cannon (in its left-hand box); Spade, hoe and ax are carried on each stage in the fittings provided for them; the first two tools are also found on the Reqvisit wagons. Bivouacstalline is carried with every Vehicle; it is placed on the footboard of the preposition, or along the carriage's handle, and fastened with the seisereb belonging to the line. The bivouac stable line is a tarred 2 1/4" rope, equipped with an iron hook at each end and with interlaced iron hoses every 4 feet. There are 10 such hoses in each line, which gives the opportunity to tie as many horses as the line is stretched out; this is done by forming a loop around a fixed object with one hook of the linen, and by pulling it taut with the help of the thinner seisereb attached to the other end hook. , as well as kettles (for six men) are carried by all ammunition wagons and prop wagons hanging under the fattening on hooks placed there.

Guidance in the doctrine of the difficult marksmanship for use in teaching at the Royal Land Cadet Corps

ON THE USE AND ORGANIZATION OF THE FIELD ARTILLERY

In its equipment and use, the field artillery is such a complex weapon that it will be necessary, after dealing with its individual components and their use, to give an overview of its organization and conditions, where it comes forward to work together with the others The weapon that an army consists of.

DIVISION

The size of the field calibers is mainly determined by the effect and the mobility. In earlier times, there was a large number of different calibres, but since the whole material is more and more arranged according to the purpose of its use and with regard to this has received significant improvements in technical terms, the number of different calibres has been reduced, so that now in almost all European armies there are only two calibers of ball guns for field use, namely a smaller, 6-pounder (with the French, however, an 8-pounder), where mobility has won at [illegible] plans, and therefore possible with less speed.

The explosive effect of the hollow projectiles was already found to be so significant that in approximately one

Grenade launchers (howitzers) have been carried by the armies for centuries, and that they have long been assigned to the field batteries. In the Danish Field Artillery, each field battery carries at least two shell guns, 12-pounders for the six-pounder batteries and 24-pounders for the twelve-pounder batteries; sometimes even four grenade cannons are carried with the battery of 8 pieces, yes, one even equips the special grenade gun battery of 8 pieces in special equipment.

In addition to this division according to caliber size, the field artillery has yet another reason for division, namely with regard to its degree of mobility. Thus you have:

Horse Artillery, where the Artillerymen follow the Artillery on horseback; it is especially suitable for all rapid movements, which is why it is often assigned to the Cavalry, as well as placed in reserve. It does not need to take ammunition wagons into the fire when it has a sufficient number (about 40) of shots on the preposition. But it suffers considerably from enemy fire, is very expensive, difficult to recruit and needs far-reaching quarters, which is why it is not quick on its feet in an assault.

It mostly operates 6-pounder guns, although occasionally, e.g. in Russia, also l2-pounds.

The foot artillery, where the artillerymen are always on foot, has a completely opposite basic character. It operates the most difficult field calibers and moves slowly, which is doubly important for the sake of the crew. It sometimes even has difficulty in following the infantry, when the latter fire Gjenvei over the fields, while the cannons have to follow the curves of the road. It is not expensive and brings the fewest horses into the fire, as it, like the mounted artillery, can leave the Ammunition Wagons behind.

Riding artillery, where the artillerymen partly sit on the carriages, partly on the hand horses, was arranged in the later wars to combine the advantages of mounted artillery with the low cost of foot artillery.
This can probably be done with the smaller calibres, and they could thus on many occasions replace the mounted artillery, but the driving can never be as free as when no manpower is stationed.
Where moving artillery is forced to take ammunition wagons with it to transport the appropriate operating personnel, it is far behind the mounted artillery, since in that case twice as many vehicles must be brought into the fire, and these would greatly hinder the movements of the other troops. It will, however, always have the advantage over the foot artillery that it enables rapid marches, but especially rapid movements in the action itself. The driving Artillery rarely serves larger Caliber than 6-pounder. The new equipment means that the artillery can, even after having lost a number of horses, still be used as moving artillery. Also, the further reduced mobile artillery can serve as foot artillery.

EQUIPMENT

The size of the batteries depends on their tactical use, so that a commander can easily oversee and direct the battery. The number of pieces is therefore six or eight, with us 8; then the Battery is divided into two Half-batteries, and each of these again into two Divisions. In this way, where several batteries are assembled, for separate purposes, all grenade cannons can form whole grenade cannon batteries, whereby the cannon batteries still remain at six pieces.

Below is an overview of the equipment of our field batteries with the greatest level of equipment, whereby it is noted that for use in the vicinity of fortresses and depots the batteries are given less complete equipment, however no less than that each cannon always gets one. Ammunition wagon with him. The batteries are all so-called running.

The batteries are composed as follows:

Kjöretøier.		Benævnelser.	6pd. Batterie.			12pd. Batterie.		
6pd. Batterie.	12pd. Batterie.		Personel.	Heste. Ride.	Heste. Trek.	Personel.	Heste. Ride.	Heste. Trek.
		Capitain af 1ste Classe, Batteriechef	1	3		1	3	
		— - 2den —, Commandeur for Batterie-Reserven	1	2		1	2	
		Premierlieutenant / Secondlieutenant } Halvbatterie-Commandeurer.	1	2		1	2	
			1	2		1	2	
		Overfyrværker, Comm. for Vognlinien	1	1		1	1	
		Commandeersergeant, hos Batt. Chef	1	1		1	1	
		Fourreer, hos Captn. af 2den Classe	1	1		1	1	
		Sergeanter, Delingscommandeurer	4	4		4	4	
		Bombardierer, Vogndelingscomm. 4 ved Batteriereserven 2	6	6		6	6	
		Trompetere	3	3		3	3	
		Overconstabler, pr. Kanon 2 er 16 ved Batteriereserven 8	24	20		24	14	
		Constabler til Betjening 40 / 56; Reservemandskab 24 / 24	64			80		
		Trainconstabler, Hesteholdere 8 / 4		8			4	
		Kanonlinien 24 / 32						
		Vognlinien 24 / 24						
		Reserve 8 / 8	64			68		
		Trainkudske, Oppassere og Hestepassere 10 / 10						
		Reservens Kjöretöier 41 / 56						
		hos Beslagsmeden 2 / 2						
		Reservehestene 6 / 8	59			76		
		Underlæge og Dyrlæge	2	2		2	2	
		Beslagsmed og tre Haandværkere	4			4		
8	8	Kanoner, bespændte med			48			64
8	8	Linie-Ammunitions-Vogne med			48			48
4	8	Reserve dito dito			24			48
1	1	Reserve-Affutage			4			4
1	1	Batterievogn						
3	3	Haandværkervogne						
1	1	Brödvogn			54			60
4	5	Fourragevogne						
		Reserveheste, talt			12			16
30	35		237	55	190	274	45	240

The strength of the field artillery in relation to the other troops depends partly on the theater of war and partly on the nature of the army. In mountainous and very rugged areas, there is only a need for a little artillery, it even often does more harm than good. Likewise, a valiant and war-accustomed army needs a comparatively smaller number of guards than an army which has not yet been led against the enemy, or which consists of very young personnel, and which, therefore, due to lack of knowledge of its moral strength, needs greater material support. It is generally reckoned that 2 to 3 guns for every 1,000 men is a suitable ratio, of which roughly 1/3 are artillery, the other 6-pound batteries, and of the number of guns then again 1/3 to 1/2 Grenade cannons.

When the various army units (divisions and brigades) have been assigned the necessary artillery, the other batteries, especially the easily mobile ones, are gathered under one commander and thus form the general Artillery Reserve, which remains at the immediate Disposition of the Commanding General, for in large

Lots of being able to use Artillery in threatening or decisive moments.

With an Armeecorps always comes a Field-Park to replace what is consumed. It consists of reserve cannons, lavettes and wagons, the reserve ammunition for all three types of weapons, laboratory and handicraft tools, as well as part of the batteries' train, when this cannot accompany them on special undertakings. This park is supplied when the army moves into the field from an even larger depot, the general reserve park, which is abundantly supplied with everything the army may need. It is planted far back in secured places, such as in Fortresses.

THE SETUP

In order not to get within the limits of tactics here, as well as in the next section on the use of artillery in the field, it will be necessary to point out that here only the purely artillery conditions in which the shelling can come are dealt with.

It then comes to the formation in consideration of obtaining the greatest possible effect, combined with cover and free movement from the position, without hindering oneself or other troops.

a) The area must be free and open to all sides from which the enemy can come, within cannon shot distance. It would be particularly dangerous if the enemy could occupy some point with infantry from which he could reach and shell our artillery.

b) The area must, if possible, promote the effect of our protection, while it is disadvantageous to the enemy's. This is achieved by the fact that in front of the enemy's position there is a hard and level field, which is advantageous for the ricochets, while our defenders are placed behind mossy lines, ditches, etc., which precisely prevent the balls from springing up.

(c) Heights are advantageous to occupy, as they give a dominant fire upon the enemy, and, when they are flat, allow him to be fired upon throughout his advance. Heights provide very good cover for the target when it retreats so far from the crown of the height that precisely the line of sight can be guided on the target. Performances and carriages could be completely covered behind the Høiden.

d) Cover must be sought as long as it is not a hindrance to fire and movement. For this, fences and enclosures could be used, when only the effect of the stumps on stone fences and walls is taken into account; for one could thereby easily get into great danger. If time permits, then depending on the circumstances, one cuts oneself in more or less completely.

e) The artillery should, if possible, be hidden until the moment it is to be used. The more unexpectedly it emerges, the greater the impact it shows. If there are no terrain objects that could hide the artillery, then it can also be masked in its advance by other troops, preferably by cavalry.

f) Arranging in column is avoided, whenever possible, in the vicinity of the enemy, as this gives him a deeper target of cover. When the batteries are therefore multiplied and the charging is to begin, the ammunition wagons are sent back, if they are not necessary for the manoeuvres, whereas the representations after the firing keep behind their guns. Partly for safety, partly to give the operator the necessary plate, the cannon intervals should not be less than 20 steps.

CONDITIONS DURING THE FENCING

During the actual fencing, the artilleryman must show calmness and composure and carefully consider and observe the correct use of ammunition, as well as the fastest possible remedy for the defects that easily occur with such a complex equipment.

a) When the charging begins, one must fire slowly, so that each cannon commander can have an opportunity to observe his shots and thus carry out a ground fire that prevents the untimely waste of the ammunition. If the correct Elevation is thus found, then fire is fired more quickly, as follows: that at distances which are 1000 cubits or more, the battery is fired, i.e. the battery commander, or an officer ordered by him, commands "Fire" for each individual cannon; at distances between 700 cubits and 1000 cubits, half-battery is fired; at smaller distances by division; - with Kardætsker each cannon fires when it can place its shot.

b) The choice of the target usually depends on the Supreme Commander. A battle of artillery against artillery rarely leads to any final result, although there are cases such as, for example. at bridge crossings, where it may be unavoidable, whereas the attack columns which were later to attack the weaker points of the position should especially be weakened by concentrated artillery fire. Small troupes or flashers are never shot at. It is a matter of course that on the target one again chooses such direction points where the greatest effect or confusion is provided, just as the direction is modified according to the circumstances towards a moving target.

c) The movement of the shooter in the enemy fire must be done as quickly as possible. Artillery works solely by fire: on the contrary, it is only a target for the enemy's bullets.

d) The artillery must always have cover for the other troops. The artillery and its cover are inseparable, and one can assume that when a battery's flanks are well covered, then a frontal attack on the battery will not easily be carried out successfully. But the artilleryman does not leave his guard, even if the enemy penetrates the battery; the last shots are the most decisive, they could perhaps save the ship and would always bring honor to the crew. Only on higher orders are the performances and the staff sent back, which then includes the baggage. The Foot Artillerists who could not sit up joined the nearest Infantry.

e) Compensation for personnel and horses killed during the battle is obtained from the reserve. Should circumstances, however, prevent this supply, then the gunnery is operated with fewer men, and as long as you have 4 men at a 6-pounder and 6 men at a 12-pounder cannon, it must still be able to be operated. In case of larger departures, individual pieces are sent to complete the others. As far as possible, the mounts must be repaired as the artillerymen are taught in the drill schools, but where one mount is completely lost, one must try to bring the cannon away by lashing it under the axle of another. Only where absolutely no rescue is possible is intentional destruction of material used. After fencing, the necessary reports and requisitions regarding the condition of the battery are submitted.

f) When a Piece has to be left and you want to make it unusable for the moment, the Preposition is sent away and you take with you the Loading Tool, if possible the setting screw, the attachment, a wheel, etc.

A piece is nailed by driving a steel nail into the catch hole and breaking it off straight with the metal.

If a cannon is to be destroyed, a bullet, at least of the same caliber, is fired at a distance of a few feet against the middle piece close behind the studs, where it will then penetrate the soul.

An Affutage is destroyed by exploding a grenade between the walls. Ammunition carts are blown up by placing a lit Fuse into them. Ammunition such as filled cartridges, dungeon tubes, fuses, etc. are best spoiled by throwing them into water; by igniting it, consideration must be given to the damage that could thereby be caused.
The grenades could be blown up by gunpowder, or by driving an iron wedge into the fire hole. If a transport is in danger of being taken, it could happen that by destroying the ammunition and thus reducing the load, at least the cars could be saved.

Notes:
1) It is noted as a general rule: that fore and aft, right and left, at the projected Lavet, it is then always considered that the muzzle of the cannon indicates the Front (in front); this rule is also followed in the description of the individual parts of the Act.