those long shots of which sportsmen are so proud, and which are due to the central pellets flying straight to a very considerable distance, much beyond that of the outer pellets.

The next point in a gun is balance ; that is, the metal in the barrels must be so apportioned and the general con­struction be so arranged that there is no tendency in the muzzle to droop at the moment of discharge, just when the faculties of the sportsman are absorbed in taking aim and his muscular energies are in abeyance. The gun should balance at a point a little in front of the trigger-guard. The centre of gravity should also be low, so that there may be nothing of what may be called “ top-hamper,”—in other words, that his gun may not roll in his hand, but may keep on an even keel, as it were, while he is taking aim. If we weigh in the scales two guns of nearly the same weight, the one well the other ill balanced, the former, although feeling quite light in the hand, will generally be found to be really heavier than the latter,—a fact which is frequently the cause of much surprise to sportsmen. When properly balanced, a gun can be carried with much less fatigue.

The calibre—a much disputed point—is, within the bounds commonly used, a question more of the capability of the sportsman to carry weight than one touching his effectiveness in the field. It has been plausibly argued that it matters little how narrow the calibre of a fowling- piece is, and that even gauge “35” (·510 inch) is wide enough. It certainly would throw a few pellets of swan- shot effectively, especially if the barrel was not less than 40 inches long. But for all common purposes the most useful calibre is the twelve-bore, if the weight is not under 61/4 lb, or somewhat less for hammerless guns. When a less weight is required, “16” gauge (which in breech­loaders is really “ 15”) is preferable. Calibre “20” belongs to toy-weapons, such guns being also uncertain in their delivery; and, as strong and effective “16” double-barrelled guns can now be made weighing only 6 lb, a smaller calibre can hardly be required, except under peculiar conditions. Against the advantage of less weight has to be set the important matter of recoil, and one cause of recoil is the elongation of the body of the shot (and especially of the small-sized shot used in such guns) when placed in the barrel or cartridge. The longer that body, and the smaller the shot, the greater the difficulty in starting it ; hence, to bring a “ 20 ” as regards recoil to an equality with a “12,” the weight of the charge of shot must be unduly reduced, with a more than proportionate reduction of the probability of killing, save in the exceptional cases where the size is not larger than snipe-shot. The shot in a “12” has no part at any appreciable distance from the wadding over the powder, and every pellet may fairly be said to receive a direct impetus from the explosion. An exceed­ingly light gun has also the fault of causing unsteadiness when the sportsman takes aim.

The length of the barrels need not exceed 30 inches. If a sportsman possesses a remarkably correct eye, he may safely go down to 26 inches or even less ; but it must be borne in mind that the shorter the barrel the greater the necessity for a perfectly correct aim. Any divergence on a barrel under 26 inches is vastly increased at 30 or 40 yards. On the other hand, aim is more quickly taken with short barrels. Thirty inches is a sound medium.

Of late years there has been a run on what are termed “choke-bores” (see Gunmaking, vol. xi. p. 281). But unless the choking is most mathematically true the flight of the shot will not be coincident with the axis of the barrel or the line of aim, but will “train off” in some oblique direction ; and this obliquity will also be more or less affected by any required modifications of the charge. A

choke-bore, therefore, restricts its user to narrow conditions in loading it. The velocity of the shot is also consider­ably reduced, the killing power depending less on that than on the object aimed at being struck with a greater number of pellets. Neither do all the pellets fly with equal velocity, so that, as was proved several years ago by ingenious experimentation (first announced by the present writer), these advance, as it were, in a narrow and pro­longed column, whereas a properly bored “friction and relief ” barrel throws its shot in the figure of a broad disk, with all the pellets travelling practically at the same rate,— the inner or central ones having, however, more sustained killing power, their “ quality of motion ” being of a higher degree and greatly prolonging the range. A weapon bored on the friction and relief method certainly puts the sportsman in a better position for all kinds of common game at fair sporting ranges ; but since the introduction of breech-loaders barrels so bored have (undeservedly) fallen so greatly into disuse that the delicate art of friction and relief boring has nearly been lost. A purely cylindrical barrel only shoots well when perfectly clean,—a condition that every discharge impairs.

With a weapon that suits him, the sportsman will find that, on lifting it quickly to his shoulder, keeping both eyes open, and fixing them on any small object at some distance off, the barrels will be directly pointed towards that object without his having taken any slow or exact aim. To verify this, let him keep the gun in position and shut his left eye, when he will find still more plainly that his aim is true. The gun has been so constructed as to bring the rib between the barrels (for double-barrelled guns are always under­stood) right in front of his line of vision. In other words, the barrels and stock have been so constructed, inclusive of the fine lines already referred to, that, so far as the required purpose is con­cerned, the whole piece may be said to form an integral part of his own body. A few minutes’ daily practice in so pointing a gun at any small object, although in a room, will give the sportsman dexterity in its use even before he has burned powder in it. How the shutting of one eye (unknown in billiards and similar games) in taking aim came to be practised in using firearms seems inexpli­cable to those who know how detrimental it is. The keeping of both eyes open was formerly not quite unknown, but was so little practised that, when the present writer took the matter up some thirty years ago and publicly advocated it, he was looked upon as being quite in error ; but now his correctness is acknowledged, and what is termed the “two-eye” system is coming more and more into use. There are still many uncertain “shots’’who are not aware that their frequently unaccountable misses are caused by the scientific fact that shutting one eye deprives them of the power of measuring distances, and also of watching the movement of a running or flying object. As a rule, whilst the right eye is actually taking aim, the left is acting subsidiarily and showing the right whether or not it is taking it correctly. It may be noted that almost all exceptionally good shots have the eyes set wide apart, and so take their observation from a broader base.

The attitude in taking aim should be free and upright, with the left foot somewhat advanced. The right elbow should never be raised to a horizontal level with the shoulder,—a common but bad practice. The gun should be lifted directly upwards, the but-end just grazing the right front of the chest when reaching its final position, the eyes all the while looking fixedly upon the object. To illustrate this by way of contrast, there is another bad style of throwing the gun forward, the shooter all the while trying to look along the rib (which cranes the neck), and then bringing it back against the shoulder before firing. This, however, is a waste of muscular power and quite throws out the adaptation of the stock to the shoulder, because it is impossible to bring back the gun quite correctly, and it has therefore to be readjusted (which can hardly be accomplished) before firing. Besides, all this consumes time, for which game will not tarry. In military phrase, three “motions” are required ; with the proper style there is only one.

The question how far the left hand should be extended in taking aim is much disputed, but is really of secondary consequence. Pigeon-shooters extend it as far as they well can, because their great object is to prevent the muzzle from drooping at the moment of discharge ; but from this, and also from their custom of planting their feet firmly and squarely upon the ground, so as to stand with their full front to their probable line of aim, no lesson in shooting game need be taken. Good game shots are not unfrequently poor shots at pigeons, and *vice versa* ; to be expert at the former depends upon the acquisition of a certain knack, and above all of calculation in time, i.c., of the power of estimating the average time from the