

Taken from The Hausam System of Plain Penmanship

By LH Hausam, 1923.

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Thanks, Joe V)

Slant In Arm Movement Writing

Slant in writing, when done with the arm movement, is determined physiologically, and must, therefore, vary with individuals. The variations cover only a few degrees but since they admit of scientific explanation they should be considered. Slant, in writing done with the arm movement, is due to (a) the relative lengths of the bones in the upper and forearms; (b) the relative distances between the points where the muscles operating these bones are attached and the ends of the bones, and (c) the angles of the muscles to the bones which they operate. In other words, slant in arm movement writing is a mere matter of mechanics, being governed by the laws of levers, as shown in the accompanying illustration.

In the illustration A and B represents the fore- and upper-arm bones, respectively. The relative length of these bones constitute the first factor mentioned in the foregoing paragraph as determining slant in arm movement writing. The lines C, D, E and F represent muscles. The relative distances between the points at which these muscles are attached to the bones and the ends of the bones constitute the second factor in determining slant in arm movement writing. The "swells" in the upper-arm and in the forearm determine the angles of the muscles (which pass over these swells) to the bones to which they are attached. These angles of muscles to bones constitute the third factor in determining slant in arm movement writing.

Explanation of the Illustration

When the muscle E is contracted the upper-arm is drawn forward, moving the forearm with it. Simultaneously, according to physiological law, (when the other muscles are permitted to act automatically) the muscle D is also contracted, drawing the forearm outward (right arm). This simultaneous movement of the upper-arm forward and the forearm forward and outward causes the pen in the hand to pass from 1 to 2, thus not only making the necessary movement for height but also carrying the pen toward the right for making the necessary spacing along the writing line. Following this, when the muscle F is contracted, drawing the upper and forearm backward, the muscle C simultaneously contracts automatically, drawing the hand with the pen toward the left as it moves backward, bringing the pen to the point 3. This compound action causes the pen to be carried across the page in a ratchet form of movement. If the muscles of the forearm are held in a relaxed state and stress placed merely on the muscles of the upper-arm, thus allowing the muscles in the forearm to act automatically, the hand will be carried entirely across the page without conscious effort. This may be tested by placing the arm in the

correct writing position with the pen at the left side of the paper and then, closing the eyes, producing the forward-backward movements in the upper-arm and allowing the forearm to act automatically as explained. The result will be that the hand will be carried across the page.

The reason the downward movements or strokes slant less than the upward movements or strokes is due wholly to the physiological structure of the arm; that is, to the lever elements in the upper and forearm (the angles of muscles to bones, and the distances from points at which the muscles are attached to the ends of the bones). Training of the arm movement involves the ability to make movements of a given length and to make the draw-back movements correspond exactly with the forward movements. That the slant is irregular in beginning with the arm movement is due to irregularity in impulses given to the muscles in the upper-arm and interference with automatic simultaneous action in the muscles of the forearm. Perfect relaxation of the muscles of the forearm promotes uniformity of slant.

While the physiological and mechanical laws that govern slant in arm movement writing are fixed, the slant may, nevertheless, be easily modified or disturbed by irregular or spasmodic effort, made either consciously or unconsciously, and also by at least four modifications of position, and one of movement; viz.:

1. If the angle at the elbow is too obtuse or too acute.
2. If the hand is bent toward the right or left at the wrist.
3. If the hand is tilted more than is required to relax the muscles.
4. If the elbow is placed too far forward or too far back.
5. If more or less finger movement is mixed with the arm movement.

The five modifications of position affect the slant of writing in the following described manner:

The angle formed by the forearm and upper-arm may vary about twenty degrees either way from the right angle before any appreciable effect in the slant of the writing is noticeable. That is to say, if the forearm is placed at the middle of a sheet of paper 8 1/2 inches wide, so as to form a right angle at the elbow, the hand may be moved from one side of the paper to the other without making the angle at the elbow sufficiently obtuse or acute to modify the slant appreciably. There is, of course, a very slight modification of slant noticeable in free, rapid arm movement writing within the angle limits described, but it is negligible. As the writing field approaches or extends beyond the forty-degree limit (twenty degrees on either side of the right angle) the slant shows more marked modification.

Bending the wrist toward the right or left has the effect of emphasizing or off-setting the natural slant as determined by the structure of the arm. If the wrist is bent toward the left the slant will approach the perpendicular; if it is bent toward the right the writing will be inclined more toward the right. The wrist and hand should be straight with the forearm.

The wrist and fore-arm should, with the entire body, be kept as fully relaxed as possible in all penmanship practice. This relaxation will cause the hand to tip away from the body somewhat. The natural, physiological slant of the individual's writing takes into account this relaxed and somewhat tilted position of the hand and wrist; but when they are inclined more or less than the position established by perfect relaxation, the slant will be more or less modified. If the wrist is held level or tipped toward the body, the slant will approach the perpendicular; if it is tilted excessively away from the body the writing will be more inclined toward the right.

If the elbow is placed so far forward that the arm becomes straight there will be no slant at all, and the arm movement with the arm in this position will produce only perpendicular lines. It follows that placing the elbow forward to any degree from a line straight with the front of the body (where it should be placed in practicing penmanship), must have a tendency to make the slant of arm-movement writing approach the perpendicular. Conversely, if the elbow is placed backward from the correct position the effect in arm movement writing will be to increase the inclination of the letters toward the right.

The introduction of finger movement, of course, removes the subject from the field of true arm movement writing, but as it is very common to employ more or less finger movement with the arm movement, it is well to note its effect on slant. All admixture of the finger movement with the arm movement tends to make the writing approach the perpendicular. This is because the natural and simple action of the fingers, when pressing against each other, as in holding the pen, is forward-backward, and not sidewise.

From this discussion it is clear that to discover an individual's natural slant in arm movement writing, and to develop the use of it into a habit, the position and movement must always be correct. It is well known to all who have mastered a good arm movement handwriting that with increased experience, and the consequent fixedness of correct habits, the modifying influences become less and less annoying. Expert penmen apparently are able to ignore all laws and become laws unto themselves, just as do expert performers in music and with various mechanical devices. With beginners, however, the wise teacher will adhere to the known rules and laws with conscientious exactness.

NOTE. These explanations of slant in writing refer wholly to right-handed persons. If the left hand is used some of the explanations must be reversed and some are not applicable at all.

Height In Arm Movement Writing

Height, like slant, in arm movement writing is governed physiologically, or mechanically, by the laws of levers. Like slant, it varies within very narrow limits, except in isolated extreme cases. When the elements of correct position are observed and a well-developed arm movement is used the writing will be uniform at a given size, characteristic of the writer. This size will be modified in the same way and by the same causes that modify slant, as explained under the head, Slant in Writing. A correct position is of first importance, and teachers who succeed best will attach most importance to the elements of good position.

The modifications of the position of the arm that make the slant of arm movement writing approach the perpendicular, also have the effect of increasing the size of the writing; and those modifications which result in making the writing slant more have the effect of reducing the size of arm movement writing. Much irregularity in the size and slant noticeable in the writing of some pupils is caused by carelessness in position, especially of the writing arm. Every effort should be made to impress upon pupils the necessity of assuming the correct position every time they undertake to write, until at last this is done unconsciously. They must come to realize that individual natural size in arm movement writing, being a mechanical effect produced according to the laws of levers, can result only when all the elements of the arm movement machinery are employed without restraint, friction or modification.

There are, of course, deep-seated psychological causes beneath the mechanics of slant and height in arm movement writing. These psychological causes are absolutely fundamental in that they are structural causes in producing the machinery employed in writing. It is, therefore, safe to assume that the slant, height and spacing employed by an individual in correct arm movement writing are not only the natural effect of the mechanical action of the arm, but reflect the personality of the writer.

Spacing in Arm Movement Writing

A careful study of the explanations of Slant in Arm Movement Writing, as given under that title, will reveal the mechanical cause of spacing in arm movement writing. There is a natural individual spacing the same as a natural slant and size in writing and the same as a natural length of step in walking, and the best results are secured when the correct requirements of position are adhered to and a sufficient amount of practicing is done to disclose the individual's natural slant, size and spacing, and to establish them in habit.

What Determines Good Letter Forms

The multiplicity of forms of the same script letters in use throughout the country has given wide currency to the belief that there is no scientific basis of accuracy in letter

forms. It seems to be the universal notion that letter structure is only a matter of opinion, and that details of form are settled arbitrarily. These conclusions have an element of truth in them but in the main they are erroneous. It must be accepted that many, and perhaps most, of the forms presented in the published works on the subject are arbitrary designs, because most of them have not been arrived at scientifically.

Letter forms that are produced by an arm movement that has been developed to an extraordinary degree are remarkably similar in form, regardless of who may have produced them. The differences are chiefly matters of slant and height. The proportions, the kinds of curves and the general contour of the letters are in marked agreement among practically all the best penmen of the country. This must be true since the arm movement is purely mechanical in its operations and the forms produced by it when all its elements are working together in the most perfect harmony; that is, with the least friction and under the guidance of the most sympathetic and critical mind, must embody curves that are the resultant of mechanical forces as truly as any mechanical effect can be such.

This is illustrated in the following line of oval drills and letter forms. In the six different forms of the retraced ovals presented each shows a step in the work of perfecting the movement, as each also shows the form of O that would necessarily be the natural product of the movement if persistently trained in that particular form of movement drill. The physiological structure of the arm is such that when the arm movement has been developed to practically its highest capacity and is employed in the most nearly possible perfect manner; that is, with the nerves calm, the muscle relaxed, a right angle at the elbow, the table and chair of proper height, and all other contributing elements properly subordinated, it will produce an ellipse whose shorter diameter is practically two-thirds its longer diameter; whose two sides have lines of equal curvature, and whose two ends are alike. The more highly the movement becomes trained the more perfect will be the ellipse produced. The size and slant will vary slightly with individuals, and the proportion of width to length will also show slight variations, but the more highly the movement becomes trained the more positive, uniform, symmetrical and mechanically accurate will the form become.

This oval or ellipse is the basis of all capital letter forms, and practically all curves found in any capital letter have their perfect correspondences in the oval. It is, in fact, the type of all penmanship curves. Upon this fact, and the additional element of the straight line, rests all form structure in penmanship, and this fact makes letterforms, produced by a highly trained arm movement, as natural as the mechanics of the arm movement itself.

The distorted and misshapen forms found in many works on penmanship can be attributed to but one of two causes; viz.,

1. The result of an untrained or poorly trained arm movement.
2. Forms drawn by one who has neither perfected his concepts nor trained his movement.

The true test of letter forms is the penmanship type ellipse. All letters should be judged by this standard, as all letters are composed of either curves or straight lines or both, and the curves must be found in the penmanship ellipse. The ellipse may be of any size but it must be accurate to serve as a standard for judging letterforms. The size must also vary indefinitely to serve as a standard in all letters.

Poor letter forms are those in which the curves do not conform to the true penmanship ellipse; in which proportions do not harmonize; in which curved and straight lines are not assigned definite and correct places to satisfy the highest standards of beauty and legibility, and in which the strokes do not adapt themselves perfectly to ease and rapidity of execution. Good letters must meet the requirements of a well-trained arm movement; must satisfy the trained sense of harmony and beauty; must be perfectly legible, and must admit of easy and rapid execution. Such letters have their foundation in the mechanics of the arm movement. The expert finds them growing in his concept and also finds his movement following their outlines with ever increasing mechanical accuracy. He does not choose them as much as he finds them to be forced upon him. As he analyzes his productions he is often surprised at the uniformity he has unconsciously embodied in them. He produces these forms, so rich in beauty, because they reflect his perfected concept and his highly trained movement. They are graceful just as the movements of his arm are graceful, and for the same reason they embody uniform elements of accuracy and definite proportions. The same fundamental determining factors also result in eliminating the aspects of stiffness and awkward angularities.

So perfectly is the penmanship type oval employed, and so fully are the elements of smoothness, grace and harmony of proportions reflected in writing produced by a highly trained arm movement that the quality of the movement may be definitely judged from its product in these respects. It thus becomes an easy matter for the competent critic to determine whether or not the forms adopted by a penmanship author are determined by an inferior or superior arm movement or are selected independent of any movement consideration. No one can rightly judge these matters except those who have passed through the experience of developing the arm movement to a high degree because only such are able to judge the value of letter forms from the standpoint of execution as well as from that of legibility.