

OUTLINES SUGGESTING CLASSIFICATION PROBLEMS

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Classifications of Irregular Geometric Forms

It is a very bold individual indeed who will suggest ideas concerning descriptive methods pointing toward a system for the simplification of classifications for archaeological artifacts. The chief difficulty in the way of arriving at simplified classifications lies in the great diversity of irregular forms. Consequently, the problem becomes so intricate, so full of pitfalls, that one is apt to become lost in a maze of detail out of which there is but slight possibility of gathering together and properly grouping the essentials.

Whether the subject be axes, celts, gorgets, projectile points or any one of the many groups of artifacts, we must recognize at the very start that there are certain forms which almost defy description. This fact has led us to search for the basic geometric form of a given object, and then, secondly, to describe its deviation or modification from this basic form with the least possible amount of description.

The great need for such a plan made itself first apparent in our work on gorgets. Several hundred of these were re-arranged into the groups and sub-groups of the "International Classification". We were immediately confronted with the spectacle of an appallingly large number of forms that did not fit adequately into the classification: that is, the general classificatory term was not enough to give a proper mental picture of the object. We discovered that this classification inadequacy was due to a lack of proper descriptive terms for the modifications of geometric forms.

Before proceeding with this problem we made a careful search for something entirely new as a method of approach to classification. This finally resulted in confirmation of the geometric nomenclature adopted by Dr. Warren King Moorehead and his committee when the "International Classification" was developed. The knowledge that such a plan as we had in mind should be worked out on the geometric principle led us to present to certain institutions, and to individuals qualified to be helpful, this question: "Is there an Industry or an Art that has developed a classified nomenclature for certain irregular geometric forms which occur both in nature and as the result of man's handiwork?" A very diligent search revealed the fact that no such work had been done, while the general response with the suggestion that it should be done was of surprising interest to us.

With this much behind us, the next step was to let the objects themselves do most of the talking. As we worked with an artifact this thought was always foremost in our minds: How may this object be most briefly described in a manner that will be readily understood by others? This has been a long, gruelling process, but it has had its rewards, for the artifacts themselves have become articulate in showing us similarities in apparent dis-similarities. Through a unified method of describing modifications we gradually began to see greater uniformity

in basic forms. The plan as it developed soon outgrew the single problem of gorget forms, for we discovered an inter-relationship between these and other artifact forms whose classifications and descriptions gradually and naturally assumed this new relationship to the modification terms. This, for the very adequate reason that the terms apply to any and all geometric forms wherever they be found, either in nature or as the result of special treatment and change by man. Our work is not final in any sense of the word; and the results are not one individual's observations but rather the accumulated developments and refinements of our co-workers and numerous friends. The process is still going on, for we are continually seeking for fundamental simplicity. The multitude of variant forms have not been allowed to carry us into a highly complicated system, and if we have erred on the side of simplicity, possibly that is a good fault. What we have attempted to do is most certainly subject to friendly and constructive criticism, for we are interested in one purpose only, and that is to make available for our friends and co-workers in Archeology as also for anyone in the Arts and Industries who may have occasion to use it, a generally recognized classificatory nomenclature for irregular geometric forms.

The basic flat geometric forms are the circle, the triangle, and the square: one continuous line, three lines and three angles, four lines and four angles, respectively. Other forms are either combinations or variants of these. Without thought of so doing, and at the very beginning of our work, we automatically dropped the term "variant" and substituted the term "modification". Strangely enough this seemed to be the key to our problem for while so many artifacts were basically rectangular or triangular, the slight modifications worked into the finished objects so altered their forms that to say this was a rectangle, that a triangle, etc., appeared to be a very inadequate and often times incorrect description of the artifact. But there the object was as big as life itself, a modified rectangle or the modification of some other form as the case might be. This situation was met by providing the terms: *Rectanguloid*, meaning rectangular-like; *Trianguloid*, triangular-like, and *Circuloid*, circular like.

This at once indicates a modification of the basic form. In this connection it is important to say that there may be times when it is quite sufficient for the purpose in hand to say that a celt is rectanguloid, a projectile point trianguloid, or a gorget circuloid, as the case may be, and let it go at that. If however, as is generally the case, it is important more fully to describe an artifact, a group of modifying terms which have a definite meaning may be used.

We are of the opinion that the best way to explain these modification terms is to show them in connection with pictorial examples. The greatest diversity of form is probably to be found in the flat gorgets.

Gorgets

There are two methods for saying the things we wish to say, one of which is a general treatise on methods for describing modified geometric forms with the application to groups of objects supplemental thereto. The second method is actually to work out the modifications in terms of a

concrete problem, and then, later, by inference, catch the larger picture. We believe this second method is much clearer and less tedious and has the added advantage of very definitely showing the applied terms as they fit a concrete problem. With gorgets we are dealing with types familiar to all archaeologists; and so, without further descriptive background, we are ready to proceed with our problem.

Rectanguloid Forms

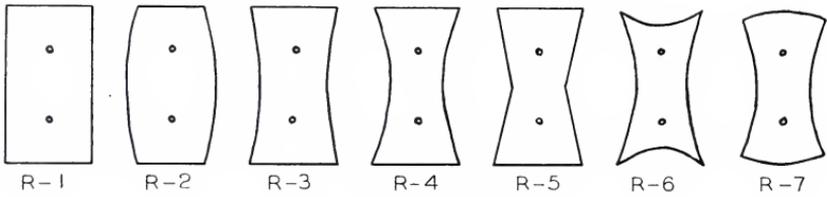


FIG. 1. Rectanguloid forms.

Many so-called rectangular forms are not true rectangles: that is, "having four sides and four right angles." Figure 1, R-1, is a true rectangle or rectangular form, but to describe R-2 we must consider the modification of the sides which do not join the ends at right angles. The word *Rectanguloid*, that is, rectangular-like, conveniently indicates that our figure is a modified rectangle. The slight outward curve of the sides is described as *Excurvate*. Therefore, R-2 is described as *Rectanguloid—sides excurvate*. In R-3 the sides are curved slightly inward; so R-3 is *Rectanguloid—sides incurvate*. R-4 is a well-known gorget form for which there is no need of change with the exception of using the word *rectanguloid*, thus: *Rectanguloid—sides concave*. It is of interest to note that a figure with convex sides is not shown, for we have discovered a more correctly defining term for this form as will be shown later (E-4). In R-5 the sides are modified not as curves, but with angular lines, therefore R-5 is described as *Rectanguloid—sides constricted*. In R-6 we have concave sides and concave ends, described as *Rectanguloid, Quatre-concave*. R. 7 is *Rectanguloid—sides concave, ends convex*. Here we have the maximum modification to which a rectangle may be subject. It very closely borders on the Panduriform, but is nevertheless most certainly *Rectanguloid*.

The Elliptical Forms

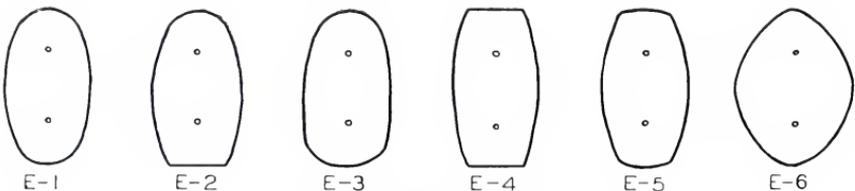


FIG. 2. Elliptical forms.

The curvilinear symmetry of its sides indicates an elliptical form. Figure 2, E-1 represents the elliptical form unmodified. It is simply

Elliptical. In E-2, however, while we have a basically elliptical form, one end has been cut off by a straight line. This, of course, is a truncation; so we suggest describing E-2 as *Elliptical—monotruncate*. If, instead of truncation, one end has been flattened or blunted as in E-3, the term *oblate* exactly describes this modification, and, therefore, E-3 is *Elliptical—monoblate*. If both ends be truncated, as in E-4, we have an *Elliptical—bitruncate* figure. When flattened or blunted as in E-5, it is *Elliptical—bioblate*. There are elliptical forms which approach a circle, as E-6, *Hyper-elliptical*.

The Oval and Ovate Forms

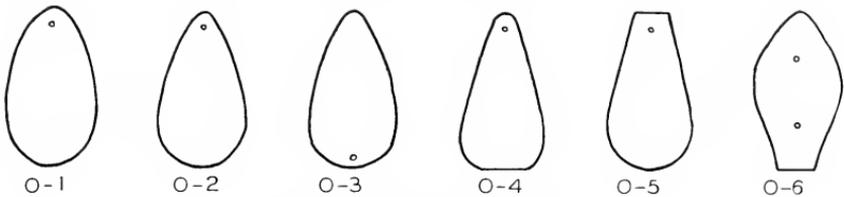


FIG. 3. Oval and ovate forms.

The *oval* form is represented in Figure 3, O-1, and the *ovate* as O-2. Here we are following the distinction in leaf terminology, the oval with its egg-shaped apex, and the ovate pointed at the apiculate end. The perforation in both O-1 and O-2 is at the apex, described as *Apicular perforation*.

The listing of the first three forms follows: O-1, *Oval—Apicular perforation*; O-2, *Ovate—Apicular perforation*; O-3, *Ovate—Basal perforation*. An interesting form widely distributed in nature, and found in several archaeological artifact groups is shown in O-4. Here is a form which deserves special treatment. It is most certainly an Ovate with a truncate base. We discovered that the word *cuneal* (meaning wedge-shaped) as a modifying term to ovate gave us the combination.

Cuneal-Ovate we believe clearly and adequately describes this form. Therefore in describing O-4 we have a *Cuneal-Ovate, apicular perforation*. O-5 is an *oval* or *ovate*, whichever you may wish to call it, with *Truncate apex* and *apicular perforation*. Occasionally there may be such a form as a *Cuneal-Ovate* with *Truncate apex*, but a figure of this nature is usually more correctly described as an *Ovate-Oblong, sides ex-curved*, as will be shown in connection with *Trianguloid* forms. (T-R-4). O-6 is an *Obovate—Truncate base*. *Obovate* means “reversed egg shape, having the broad end upward or toward the apex.” *Oblation* is not a modification for the oval and ovate forms with the single exception that an Ovate with obliterated apex is, of course, an Oval.

There is another fact concerning the oval and ovate forms which should be taken into consideration. Quite often we find artifacts of these forms with bodies, the sides of which for a portion of their lengths are almost straight. In such a case the word *linear—Linear oval*, or *Linear ovate* as may be required, conveys a proper mental picture of this proportional relationship.

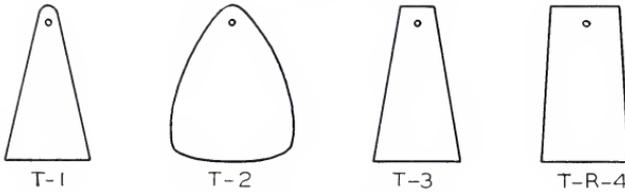
The Trianguloid Forms

FIG. 4. Trianguloid forms.

Figure 4, T-1 is a regular triangle with apicular perforation. T-2 is the deltoid form of the triangle, and in this figure the two sides and base are excurvate. Therefore T-2 is described as *Trianguloid—Deltoid form tri-excurvate, Apicular perforation*. T-3 is *Trianguloid—Truncate apex Apicular perforation*.

T-R-4 is a very well known and often repeated form among archaeological artifacts. We were able to find a regular dictionary word to describe it, *ovate-oblong*. An ovate-oblong is an oblong having one end broader than the other. In this word-combination, “ovate” is a descriptive adjective. The wider end is the base; the narrow end the top. Therefore it is a trianguloid form basically; but we have shown it here with the trianguloid forms to emphasize the difference between it and T-3. The ratio of convergence of the sides is the distinguishing feature between T-3, a trianguloid with truncate apex, and T-R-4, ovate-oblong. Once this distinction is noted, there will be very little, if any, confusion between the two forms. Ovate-oblongs which have heretofore been classed as Rectangular caused us much consideration until the term was discovered; and this discovery became one of the first suggestions that these modification terms could be used for other groups: for example, it gave us a new definition for so many celts which we were now able to classify as Ovate-oblong, sides excurvate, elliptical in cross-section.

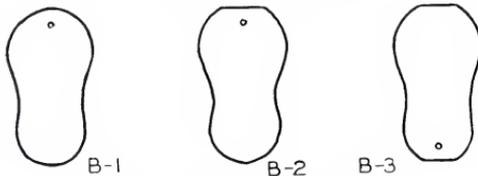
The Panduriforms

FIG. 5. The panduriforms.

A Panduriform is “an obovate with a concavity on each side, like a violin”, “fiddle-shape.” There are many large thick gorgets of this form, and, with the reminder that as an obovate the apiculate end is the larger, we have in Figure 5:

B-1, *Panduriform—apicular perforation*; B-2, *Panduriform—truncate apex, Apicular perforation*; B-3, *Panduriform—bitruncate, Basal perforation*.

Pentagonal and Other Several-Sided Forms

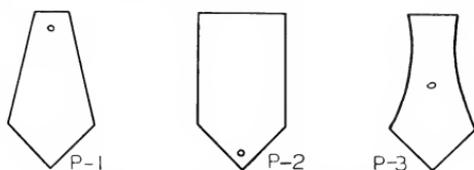


FIG. 6. Pentagonal forms.

Pentagonal-shaped gorgets such as Figure 6, P-1, P-2, and P-3, have usually been classified as shield-shaped. This does not convey a definite picture by reason of the fact that a shield may be any one of many shapes—circular, square, rectangular, elliptical, etc.

In classifying and describing these forms we have taken into consideration the number of sides and the geometric pattern they make. Figure 6, P-1, is pentagonal, made after the pattern of an ovate-oblong whose base has been modified by two lines forming a pointed base.

P-1 is *Pentagonal—Ovate-oblong with pointed base, Perforation at the top.*

Now in P-2 we have a *pentagonal* (five-sided figure) which is *Rectanguloid with one end straight, reverse pointed; perforation at the point.* P-3 is *Pentagonal—ovate-oblong with incurvate sides; base pointed; center perforation.* A variety of modifications may be found in these forms, subject to the terms already outlined. Furthermore, if the figure be six-sided it is hexagonal, the same principle holding for figures having any number of sides, the description indicating the number of sides and the basic geometric modified forms they assume.

Compound Forms

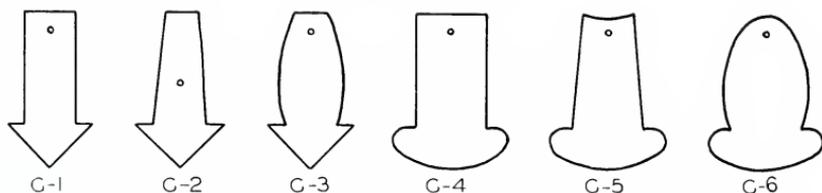


FIG. 7. Compound forms.

Closely following description of a classification plan for pentagonal forms, which indicates the wide range of combinations of modifications which can be briefly and graphically catalogued, we have in Figure 7 a group of compound forms for which it is necessary only to show the application: C-1, *Rectanguloid—1 end forming Sagittal point, reverse straight; perforation at straight end;* C-2, *Ovate-oblong—sagittal base, center perforation;* C-3, *Ovate, Truncate apex, sagittal base, apicular perforation;* C-4, *Rectanguloid—1 end forming a lunate, reverse straight; perforation at straight end;* C-5, *Ovate-oblong—lunate base, incurvate top; top perforated;* C-6, *Oval—lunate base, apicular perforation.*

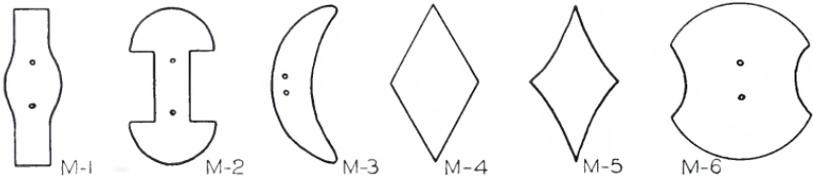
Miscellaneous Forms

FIG. 8. Miscellaneous forms.

Above (Fig. 8) are illustrated a group of miscellaneous forms which are found in practically all gorget collections. They are classified as follows:

M-1, *Expanded center type, 2 perforations*. No attempt has been made to change the name of this well-known artifact form. M-2.—Attempted classifications of this form have always been rather obscure. We have gone to the bannerstones for a descriptive formula: *Round-wing bipennate tablet, 2 perforations*. M-3, *Lunate, tablet-form, 2 perforations*. M-4, *Rhombus, tablet-form*. M-5, *Rhombus, tablet-form, quatre-incurcate*. If the sides of M-4 or M-5 be of unequal length the forms are *Rhomboids*. M-6, *Circuloid—2 opposing equi-concavities, 2 perforations*.

In the preceding pages we have outlined a method for gathering together in a classification-plan the modifications found in irregular geometric forms. We have been dealing with two manifestations of the line—a straight line and a curvilinear line. These may be pushed either inward or outward, or cut off, in all of which cases the object which the line or lines bound has been modified, and each line enters into a new relationship with other lines in the same plane. To provide a group of terms to describe these changes and their effect upon the object was our first purpose. This has made it possible, we believe, now to suggest a simplified classification for the group of objects to which these artifacts belong.

We wish to emphasize a suggestion made on a previous page that it may not always be necessary or even advisable to describe all modifications present in an artifact, but when and if this is advisable a method is available. In this connection, it is becoming increasingly more important to show these modifications in archeological literature because we are discovering that slight differences in the form of an artifact often denote widely divergent cultural affinities. The discovery in our workshop that all Adena-type gorgets have counter-sunk perforations to the practical exclusion of that in other types is but a different aspect of the same problem, and has not been neglected in our classification plan.

The Gorget Classification

The Gorget Classification consists of three main divisions: I—Geometric Forms; II—Morphological Forms; III—Culture Forms. The use of the organized group of modification terms we have described makes it possible to describe an artifact as minutely as may be desired. In division II. Morphological Forms, the form and structure of an artifact is so well known that it is not necessary to qualify it unless there be

some unusually distinctive modification. For example, the "Expanded Center" gorget is so well known as to form and structure that it is not necessary to describe its geometric form. If the ends of an artifact of this form are incurvate or concave, or if the centrum periphery is oblate, or the flat surface longitudinally ingrooved, it is a matter of individual responsibility as to these matters; but certainly "Expanded Center" gorget conveys the essentials as to the form and structure of this form. Division III, Culture Forms, go a step farther away from a geometric classification, as, for example, Folsom point. It is a culture form, and no description is necessary except as and when modified away from the accepted form. As time goes on and knowledge grows, artifacts will progress from Division I to Division II to Division III, where they will be known in their cultural relationship to other objects.

Classification of Gorgets

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| <p>I. Geometric forms.</p> <p>1. Circuloid</p> <p>2. Elliptical</p> <p>3. Oval or Ovate</p> <p style="padding-left: 2em;">A. Cuneal Oval or Cuneal
Ovate</p> <p>4. Rectanguloid</p> <p style="padding-left: 2em;">A. Ovate-Oblong</p> <p>5. Trianguloid</p> <p>6. Compound</p> <p>7. Miscellaneous</p> | <p>A. Bipennate</p> <p>B. Lunate</p> <p>C. Unusual</p> <p>D. Specialized</p> <p>E. Asymmetrical</p> <p>II. Morphological forms.</p> <p>1. Expanded Center</p> <p>2. Panduriform</p> <p>3. ———</p> <p>III. Culture forms.</p> <p>1. ———</p> |
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Celts

In dealing with celts we get away from flat objects (that is with rare exceptions) and must consider both outline and cross section. For example, the following will describe literally millions of celts: Ovate-oblong, quatre-excurvate, with rounded corners; elliptical in cross-section. It may be that the classification "Ovate-Oblong" is all that is necessary. If so, well and good. If it is desirable to give additional description it may be done with a minimum of effort and confusion. If to the above description be added the material of which the celt is made and its measurements, a complete mental picture of the artifact is provided.

Before suggesting a classification for celts there are a few things that should be said. First, concerning the descriptive term *rounded corners*. After much effort we have failed to discover anything that so simply conveys the idea. It is a good archaeological term and good geometry. We are not interested in adding anything new that can be avoided. However, the terms *elongate* and *linear* should be fixed. These have particularly to do with elliptical forms and oval or ovate forms. An *ovate*, for instance, may be overly long for its width; this should be described as an *Elongate Ovate*. Or the object may be basically ovate, however, with rather straightish sides; this would be a *Linear Ovate*, conveying the idea of sides (edges) that for a portion of their length are almost straight lines. There are many archeological artifacts, especially among the celts, projectile points, and blades, that must have these

modifying terms used if they are to be described with any degree of thought for making their forms visual.

The well-known cross-section descriptive term *1 surface flat, reverse convex*, which applies to so many celts, cannot be improved. We have no suggestions concerning the descriptions of celt "beveling". Nothing that has been done through the arduous years of the past should be lost. We would like to help bring it all together and make it easier to use. The celt classification is basically the same as the gorget classification. If we are to make progress, many of the geometric celt forms will become morphological forms and some may become culture forms as we learn more fully their stories.

Classification of Celts

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| I. Geometric forms <ol style="list-style-type: none"> 1. Elliptical 2. Oval or Ovate <ol style="list-style-type: none"> A. Cuneal Oval or Cuneal Ovate 3. Ovate-Oblong 4. Rectanguloid 5. Trianguloid 6. Compound | 7. Miscellaneous <ol style="list-style-type: none"> A. Unusual B. Specialized C. Asymmetrical II. Morphological forms. <ol style="list-style-type: none"> 1. ——— III. Culture forms. <ol style="list-style-type: none"> 1. ——— |
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Blades and Projectile Points

We fully expect and are prepared to withstand much pressure on the subject of suggestions for a simplified classification for blades and projectile points. We are convinced that there is a natural meeting place somewhere between Thomas Wilson's encyclopedic classification and the ultra-practical classifier's division into three groups: triangular, stemmed, and leaf-shaped. As a matter of fact, we do not agree to the latter classification at all, because *triangular* is a morphological form; *stemmed* is not a form at all, but rather a secondary feature to some basic geometric form; and *leaf-shaped* can mean any one of several forms just as did shield-shaped with gorgets.

Generally speaking, "blades" include the larger artifacts, knives, spearpoints, ceremonial, and all forms with two points. As a more or less arbitrary rule, the projectile points are, of course, with one point, and usually under five centimeters in length. This thing of distinguishing between the type names for various forms is very largely a matter of personal judgment and at once suggests an interesting problem—the infinite variety in blade and projectile point forms, from the crudest to the finest of beautiful and intricately worked objects. Three factors governed this: time, the material, and the skill of workman. It is not necessary more than to suggest this, and leave it with the thought that a fine piece of flint, in the hands of a master chipper who had time to do the job, produced a beautiful or useful object. Many a worked flint is neither beautiful nor useful, nor ever was to its original user. Therefore, we suggest a division into three classes: C—Crude, B—Finished, A—Exceptional. It is not always necessary or even advisable to designate a blade or a projectile point as a "C" type or "B" or "A" type, but

there are times when this division may be helpful, for example, when working with a large group from one site, or when cataloguing a substantial quantity. This is a class distinction entirely aside from a general classification plan.

Preparatory to presenting our suggested classification, let us say that we have no suggested changes for describing barbs, bevels and serrations. We believe that our three-fold general classification outline adequately covers the requirements for blades and projectile points: I—Geometric forms; II—Morphological forms; III—Culture forms. In describing geometric forms the modification terms shown on earlier pages hold equally true. When a geometric term is used to classify a morphological form, it is something more than simply a geometric term. It implies an archeological background which has given to the term certain very definite connotations, and usually implies more or less general culture affinities which as yet are not specifically determined. Whether the descriptive term be geometric or otherwise, a culture term does indicate a very definite culture alignment.

Returning to the first classification group, geometric forms, we have two main sub-groups: (1) with two points; (2) with one point. In the first we have broken up the term *leaf-shaped* into four classifications using for these the three standard leaf-classification forms:

(1) elliptical, (2) lanceolate, and (3) linear, and adding (4) rhombus (Fig. 9). These forms are subject to the modifications already outlined.

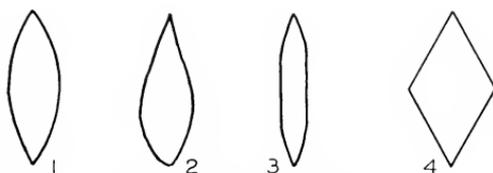


FIG. 9. Two-point forms.

In sub-group 2, with one point, we are convinced there are but two classifications, (1) ovate or oval and (2) trianguloid. We must get hold of something basic. Inasmuch as these objects have one pointed end, we will have an expanding body traveling away from that point, the body bounded by two edges which form straight lines or curved lines or their modifications. The cutting off or boundary of the base is accomplished in the same manner. The modifications have already been described, but with this addition: We must consider that the lines may be affected in a manner peculiar to this special problem, that is, indented or notched. These notches may be: (1) in the sides, *sides notched*, (2) in the edge-base corners, *corners notched*, (3) with the edge-base corners broken off, *corners removed*, (4) in the base, *basal notched*, or (5) with a specialized indentation in the base, *bifurcated*.

We are still endeavoring to classify a modified geometric form, and, inasmuch as the artifact has but one point, it must, basically, be either ovate or oval or trianguloid. This is the case, for if you will pick up at random any blade or projectile point, unless it be an extremely crude "C",

an asymmetrical form, or a compound form, you will at once (or after a little practice) see its geometric or modified geometric form. The form of the notches or their placement does not alter the basic geometric form.

We believe that the basal portion of a point is of primary importance as a culture trait. The notches and stem prepared the base for hafting or other uses after the manner of the cultural standards of its user. The notching either did or did not provide a stem; or, by the same token, to provide a culturally correct stem, the notching *had* to be done after a manner effecting this result.

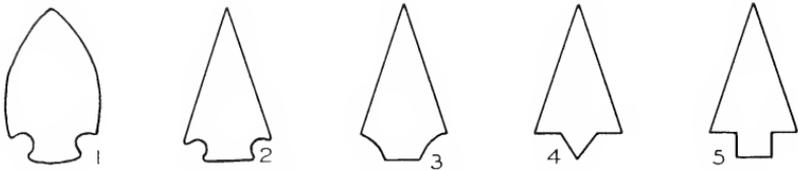


FIG. 10. Specimen forms.

However, merely to classify an artifact as a stemmed point does not tell enough of the story. To say that Figure 10, 1, is an *ovate, corners notched*, automatically conveys the idea of a stem. To say that Figure 10, 2, is *trianguloid, corners notched*, or that Figure 10, 3, is *trianguloid, corners removed*, gives us the picture of stemmed objects, but more, some conception as to their forms.

Now we are stepping on dangerous ground with our eyes open, and lest we be misunderstood, remember there are exceptions to every rule. We believe there are artifacts in which the stem appears to lie outside the geometric figure. For example to say that Figure 10, 4, is *trianguloid, with basal stem* we believe is not only a clearer picture, but also a more correct geometric description, for here we have no need to search further for our geometric form. The question of describing the stem (expanding, straight, or, in this case, contracting to a point) is a matter of individual wishes according to one's own particular ideas. In Figure 10, 5, the straight stem-end suggests *trianguloid, corners removed*, but we believe *trianguloid, with stem* is a truer geometric description. This does not destroy, but rather strengthens, the general plan.

In other words, "stemmed point" is not enough; we must know the picture of the base. We know this is contrary to the historical technic of archeologists, but we are more and more convinced that one cannot tell much about the base until he has an idea of the geometric form of the artifact as a complete object.

We place *Triangular Points* under Morphological forms. Archeologically speaking, a triangular point is more than simply a geometric description. *Folsomoid*¹ is also a morphological form, while *Folsom* is, of course, a culture form.

¹After these pages were written we discovered that the word *Folsomoid* had been used. See: Roberts, Frank H. H., Jr. A. Folsom complex. *Smithson. Misc. Coll.* 94:7. 1935.

Classification of Blades and Projectile Points

Classes

C—Crude

B—Finished

A—Exceptional

I. Geometric forms.

1. With two points

A. Elliptical

a. Hyper-elliptical

B. Lanceolate

C. Linear

D. Rhombic

E. Miscellaneous

a. Unusual

b. Specialized

c. Asymmetrical

2. With one point

A. Ovate or Oval

a. Cuneal-Ovate or
Cuneal-Oval

B. Trianguloid

C. Compound

D. Miscellaneous

a. Unusual

b. Specialized

c. Asymmetrical

II. Morphological forms.

1. Triangular

2. Folsomoid

3. ———

III. Culture forms.

1. Folsom

2. ———