

A diagrammatic approach to Peirce's classifications of signs¹

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ABSTRACT

Starting from an analysis of two diagrams for 10 classes of signs designed by Peirce in 1903 and 1908 (CP 2.264 and 8.376), this paper sets forth the basis for a diagrammatic understanding of all kinds of classifications based on his triadic model of a sign. Our main argument is that it is possible to observe a common pattern in the arrangement of Peirce's diagrams of 3-trichotomic classes, and that this pattern should be extended for the design of diagrams for any n-trichotomic classification of signs. Once this is done, it is possible to diagrammatically compare the conflicting claims done by Peircean scholars regarding the divisions of signs into 28, and specially into 66 classes. We believe that the most important aspect of this research is the proposal of a consolidated tool for the analysis of any kind of sign structure within the context of Peirce's classifications of signs.

Keywords: Peircean semiotics, classifications of signs, diagrammatic reasoning.

1. PEIRCE'S DIAGRAMS FOR 10 CLASSES OF SIGNS

In a draft of a letter to Lady Welby composed by the end of December 1908 (dated 24-28 December, L463:132-146, CP 8.342-76, EP2:483-491; we will be referring to this diagram

1. An earlier version of this paper was presented at the 7th International Congress of the International Association for Semiotic Studies, in Dresden, 1999. Some of the results presented here have been published in *Semiotica* 2003, 147 (1/4); 2004, 151 (1/4).

as ‘the Welby diagram’)², Peirce designed the diagram shown in figure 1, and added the following comments:

The number above to the left describes the Object of the Sign. That above to the right describes its Interpretant. That below describes the Sign itself. 1 signifies the Possible Modality, that of an Idea. 2 signifies the Actual Modality, that of an Occurrence. 3 signifies the Necessary Modality, that of a Habit . . . (L463:146, CP 8.376, EP 2:491)

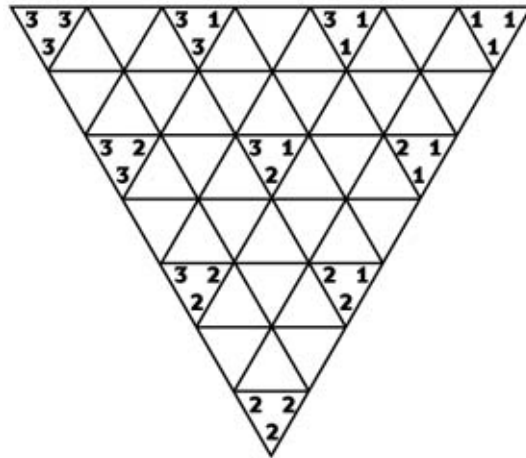


Figure 1. The Welby diagram: a diagram of ten classes found in L463:146, CP 8.376, EP2:491.

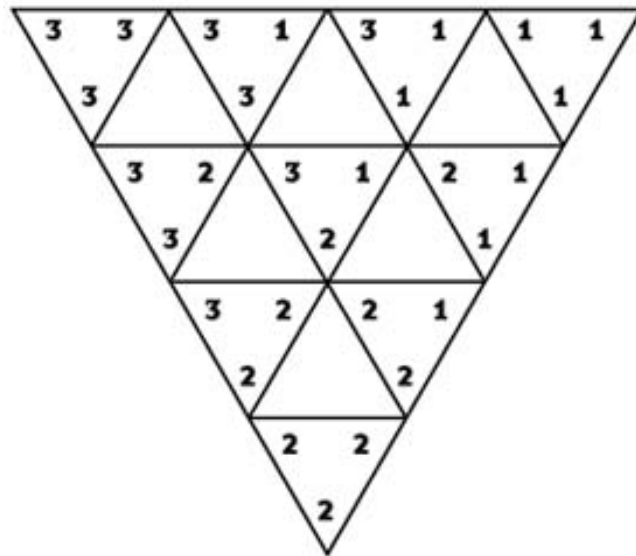


Figure 2. A modified version of the Welby diagram, created by the authors.

2. ‘L’ and ‘MS’ refer to Peirce’s manuscripts numbers and pages in accordance to Robin’s *Annotated Catalogue* (Robin 1967). ‘CP’ refers to volume and paragraph numbers in the *Collected Papers* (Peirce 1994). ‘EP2’ refers to volume and page numbers of the *Essential Peirce 2* (Peirce 1998).

In order to proceed with our argument, we present a modified version of this diagram (figure 2), where the triangles that are not occupied by a class have been eliminated³. If we compare figure 2 with an earlier diagram of the 10 classes, designed by Peirce in the fifth section of his 1903 Syllabus (figure 3, MS 540:17, CP 2.264, EP2:296; we will be referring to this diagram as ‘the Syllabus diagram’)⁴, we can infer that both show the same 10 classes in the same relative position, although the structure is vertically flipped (compare figure 2 and figure 4). This happens if we consider that the occupied cells in the Welby diagram present the classes according to the notation for the division of signs commonly adopted by Peirce scholarship (e.g. Weiss & Burks 1945:386; Merrell 1994:180; Serson 1997:134; Sanders 1970:7; Jappy 1984:19), and also found in MS 799:4 (321 for rhematic indexical legisign, 211 for iconic sinsign, etc.).

3. There is a very similar figure on another draft for Lady Welby (L463:155), most probably designed by overlaying the Welby diagram (it is easy to observe that if we overlay L463:155 and L463:146). In this draft, Peirce gives the following explanation:

...the three divisions according to the Modality of Being of the Sign itself, of its Object, and of its Interpretant cannot make 27 classes of Signs but only Ten; namely, appropriating a little triangular space with a vertex down ∇ to the description of each class, and denoting by

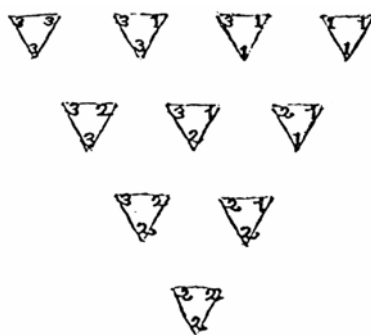
(1 Possible)
{2 Actual } Modality, I write one of these numbers in each of the three corners of the triangular space.
(3 Necessitant)

The lower corner to characterize the Mode of Being of the Sign Itself

The left hand upper corner to characterize the Mode of Being of its Object

The right hand upper corner to characterize the Mode of Being of its Interpretant

Then the Ten resulting classes of signs will be those shown in the Scheme below



4. There are drafts for this diagram in MS 540:27-29 and MS 799:2, where it is possible to observe that Peirce was very concerned in finding a coherent way to diagrammatically present the 10 classes.

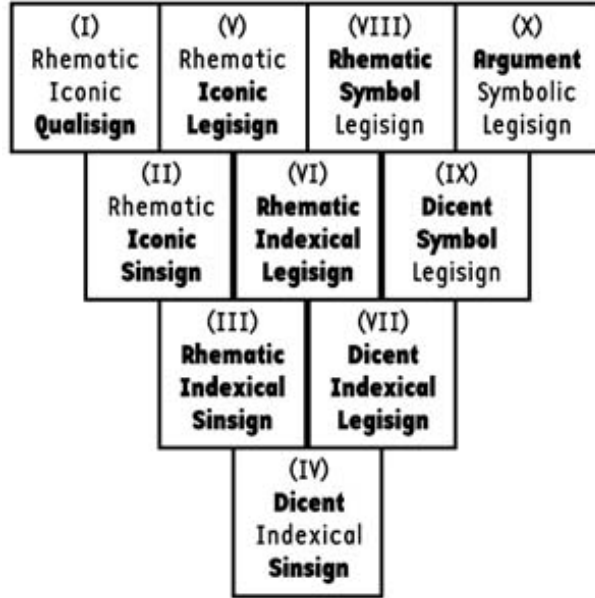


Figure 3. The Syllabus diagram: a diagram of the 10 classes found in MS 540:17, CP 2.264, EP 2:296.

But this seems to be in disagreement with the description of the diagram given by Peirce in the draft to Lady Welby, once “the number above to the left” in the modified Syllabus diagram corresponds not to “the Object of the Sign” (as in the Welby diagram), but to the nature of the sign in itself (cf. EP2:291). In a similar way, the number below, in the modified Syllabus diagram, describes not “the sign itself”, but “the relation of the sign to its Object” (ibid.). There seems, however, to be an certain agreement in what regards the number “above to the right”. According to the note on the Welby diagram, this number “describes [the Sign’s] Interpretant”, and in figure 4 it describes the way in which “[the sign’s] Interpretant represents it” (ibid.).

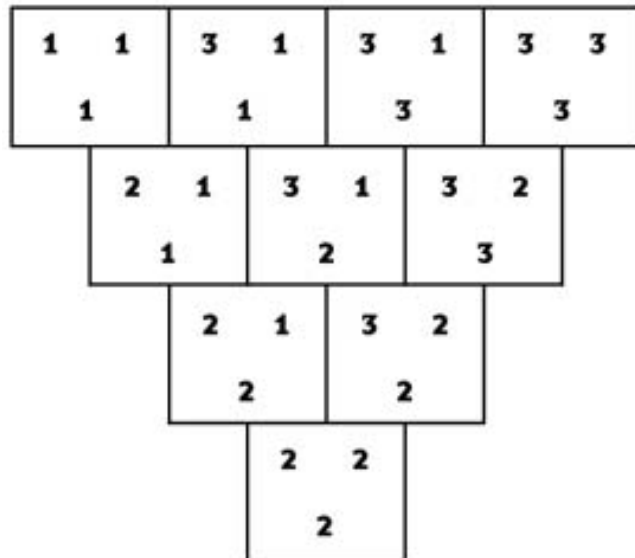


Figure 4. A modified version of the Syllabus diagram, created by the authors.

2. FINDING A COMMON PATTERN IN PEIRCE’S DIAGRAMS

Despite the conflict in what regards the location of the trichotomies within the celules, and the consequences of this conflict, it is possible to observe a common pattern in the location of the classes in both diagrams. This common pattern can be found even if it is not possible to establish an exact mapping between the classes described by each diagram and the ordering of the trichotomies. If the ordering of trichotomies in the Welby diagram (figure 1) is (O-S-I) while in the Syllabus diagram (figure 3) the implied order is (S-O-I), the classes described by each diagram may not correspond to the same 10 classes of signs (cf. Houser, personal communication). We will argue, however, that both diagrams follow the same underlying diagrammatic principle.

In order to do that, let us consider the numbering of the classes as following triangular coordinates,⁵ where a triplet (a, b, c) correspond to the quantities of “ones” (a), “twos” (b), and “threes” (c) that form each class, given by an ordered set of integers that vary from 0 to 3. The sum of the quantities of ones, twos, and threes that form each triplet/class will always be 3 ($a+b+c=3$), once we are working with 3-trichotomic classes.

5. The diagrammatic strategy applied here has been inspired by Shea Zellweger’s (1991) approach to Peirce’s triadic logic.

In the extreme corners of an equilateral triangle we will locate triplets $(0, 0, 3)$, $(3, 0, 0)$, and $(0, 3, 0)$, corresponding to classes 333, 111 and 222. In the middle thirds of the sides of the triangle, we will arrange the triplets that correspond to the sequence that is given by considering each side of the triangle as an axis where the elements of the triplets vary from 0 to 3 in respect to the triplets located in the corners—so that, for example, in the side that has $(0, 0, 3)$ and $(3, 0, 0)$ as its endpoints, we will have the sequence of triplets: $(0, 0, 3)$, $(1, 0, 2)$, $(2, 0, 1)$, $(3, 0, 0)$. Finally, in the center node, which can either be located by the crossing of the altitudes of this triangle or by uniting the nodes with line segments that are parallel to the sides of the triangle, we will place the triplet $(1, 1, 1)$, that corresponds to class 321 (figure 5).

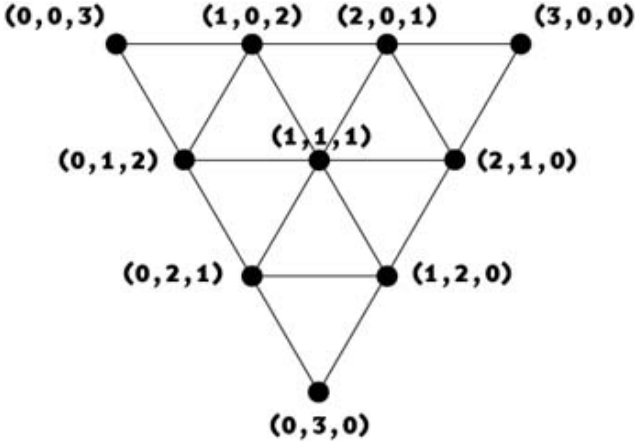


Figure 5. Creating a pattern of ten vertices from triangular coordinates.

Now, having this pattern of 10 vertices, we can draw triangles around them and ‘translate’ the corresponding triplets into classes: $(0, 0, 3) = 3$ “threes”= 333; $(0, 1, 2) = 1$ “two” and 2 “threes”= 332; and so on (figure 6). We obtain a diagram that corresponds exactly to figure 2, the modified Welby diagram.

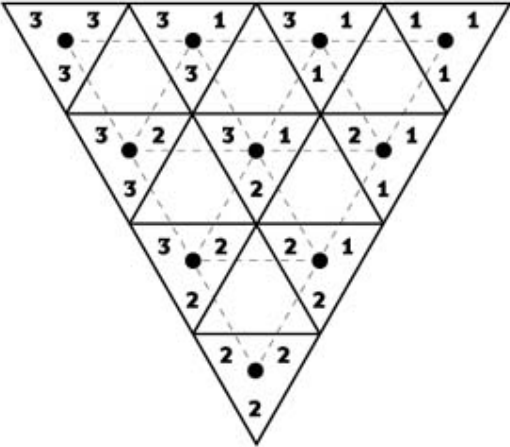


Figure 6. The Welby diagram re-designed around the triangular coordinates.

If we invert the quantities of “ones” and “threes” in the coordinates —so that (0, 0, 3) will correspond to 3 “ones”, and (3, 0, 0) to 3 “threes”— and build squares instead of triangles around the vertices, we will obtain exactly the position of the 10 classes as found in the Syllabus diagram (compare figure 7 with figure 4).

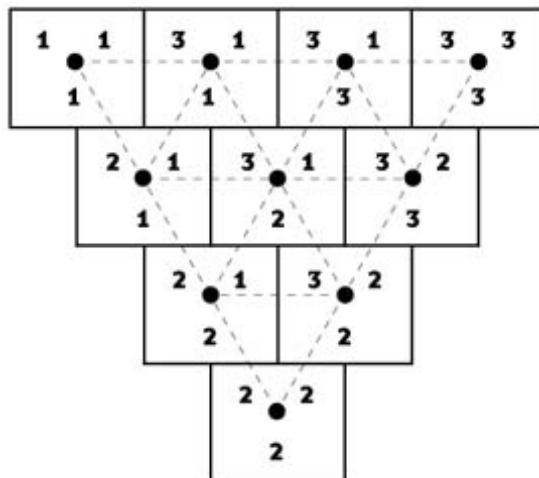


Figure 7. The Syllabus diagram re-designed around the triangular coordinates.

This shows that the use of the diagrammatic method described above can explain the underlying logic of the design of Peirce’s diagrams for 10 classes of signs, despite the fact that those diagrams may refer to different classifications of signs. As far as we know, Peirce never designed diagrams for 28 or 66 classes of signs, but it is fair to believe that in order to do that he would have applied the same principles used for his diagrams of 10 classes. In the next section, we will show that the diagrammatic method described so far not only explains the underlying logic of the diagrams designed by Peirce, but can also be applied as a method for the construction of diagrams for any n-trichotomic classification of signs.

3. FROM 10 TO 28 AND 66 CLASSES

While the 10 classes are based on three trichotomies, the 28 classes of signs (EP 2: 478-481) are based on 6, and the 66 classes on 10 trichotomies (CP 8.345, EP 2: 483-490). In order to show that the diagrammatic method described in the last section works for any n-trichotomic classification of signs, we will start by applying it to the 28 classes yielded by 6, and to the 66 classes yielded by 10 trichotomies.

In order to design a diagram for 28 classes, we must be working with 6-trichotomic classes. We will ascribe a quantity from 0 to 6 for each element of the triplet, and the sum of those elements will always be 6 ($a+b+c=6$). For example, in the horizontal axis of the

triangular coordinates we will arrange the triplets: $(0, 0, 6)$, $(1, 0, 5)$, $(2, 0, 4)$, $(3, 0, 3)$, $(4, 0, 2)$, $(5, 0, 1)$, $(6, 0, 0)$. Using the same procedure described in the section above, we will have 28 vertices, corresponding to 28 classes (figure 8).

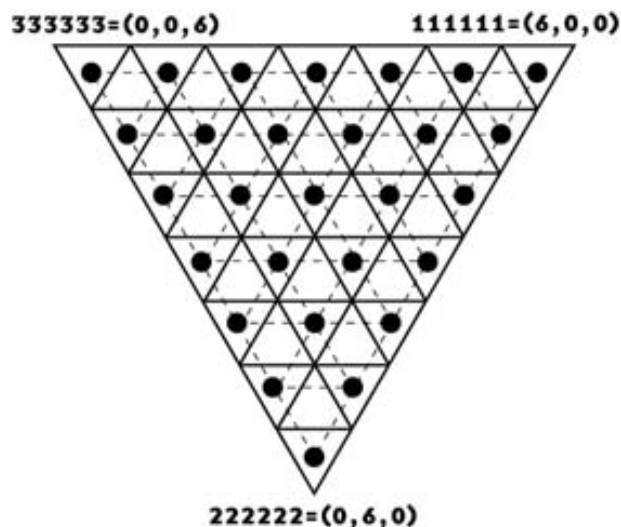


Figure 8. The black dots indicate the crossing of the 6-trichotomic triangular coordinates.

Having defined all the 28 vertices, we can transform each triplet in a sequence of “ones,” “twos,” and “threes” that define a class of sign according to the cenopitagorean categories. For example, the triplet $(1, 2, 3)$ —the second vertex, from left to right, in the third row, from up to down—will be translated in the 6-trichotomic class “333221”; the triplet $(0, 6, 0)$ will be translated in the 6-trichotomic class “222222”; and so on, as shown in figure 9.

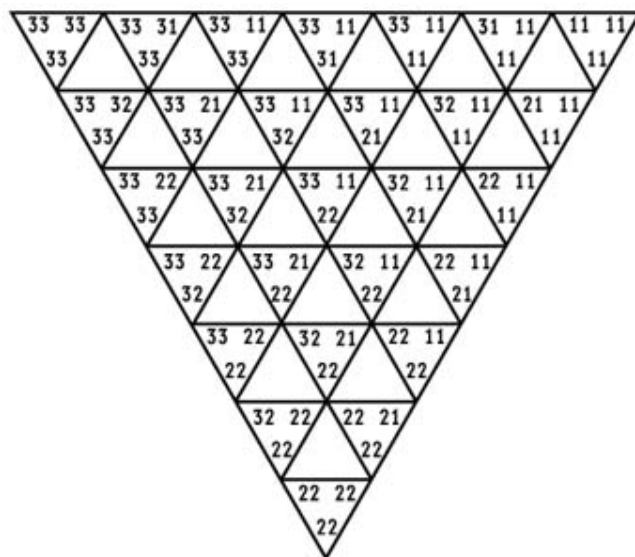


Figure 9. The 28 triplets translated into 28 classes of signs.

Following the same method, it is possible to build triangular coordinates for the sixty-six 10-trichotomic classes of signs (figure 10). It is easy to see that this method could work for any n-trichotomic classification of signs, although we are restricting our examples to the values of n suggested by Peirce and deemed valid by Peirce scholarship (e.g. Weiss & Burks 1945; Sanders 1970; Lieb 1977; Jappy 1989; Marty 1990; Maróstica 1992; Müller 1993; Linde 1996). The reason why this method works is indeed very simple: although the number of trichotomies considered may vary, each of them is always composed by 3 categories (firstness, secondness, and thirdness), which, combined according to Peirce's principle of determination (firsts can only determine firsts, thirds can only be determined by thirds), give us triangular numbers that follow the formula $[(n+1)(n+2)/2]$ (cf. Weiss and Burks 1945:387), and can easily be arranged in triangular coordinates.

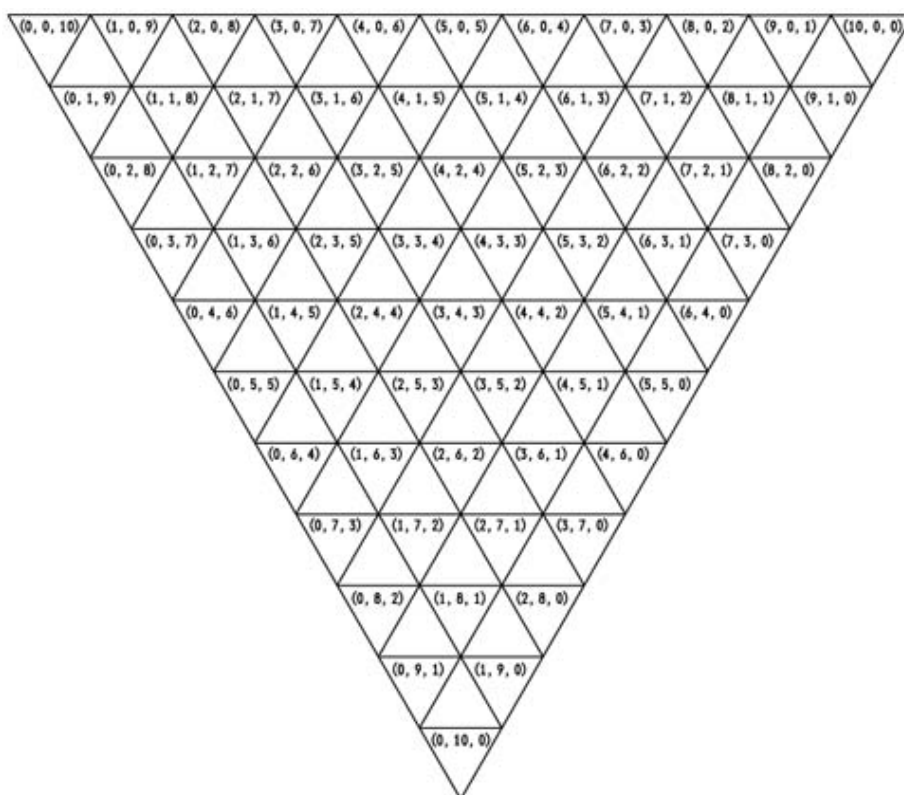


Figure 10. A diagram for 66 classes of signs, built with 10-trichotomic triangular coordinates. The classes are shown as triplets.

4. CONFLICTING CLAIMS REGARDING THE 28 AND THE 66 CLASSES OF SIGNS

While the 10 classes of signs (or at least the 10 classes as proposed by Peirce in his 1903 Syllabus MS 540, CP 2.233-272, EP2:289-299) can be said to be fairly well understood and consistently approached by Peirce scholarship (at least in what regards the components and

resulting classes of this division of signs), there is no such agreement in what regards the divisions into 28 and 66 classes. A fundamental source of disagreement is the inclusion of two trichotomies that refer to the nature (or “Mode of Presentation”, or “Mode of Being”, cf. L463: 134 and 150, CP 8.344, EP2:482-483) of the Immediate and Dynamic Objects. Peirce refers to those trichotomies in different passages of the series of drafts and a letter to Lady Welby composed in late December 1908 (Peirce 1997:80-85, L463:150-160 and 132-146, CP 8.342-376, EP2:478-491).

In what regards the character and ordering of trichotomies, a fundamental source of disagreement is the inclusion of two trichotomies that refer to the nature (or “Mode of Presentation”, or “Mode of Being”, cf. L463: 134 and 150, CP 8.344, EP2:482-483) of the Immediate and Dynamic Objects. Peirce refers to those trichotomies in different passages of the series of drafts and a letter to Lady Welby composed in late December 1908 (Peirce 1997:80-85, L463:150-160 and 132-146, CP 8.342-376, EP2:478-491).

In this series Peirce presents “the ten respects according to which the chief divisions of signs are determined” (L463: 134 and 150, CP 8.344, EP2: 482) starting with the “Mode of Being” or “Mode of Apprehension” of the “Sign itself.” This is followed by three “respects” that refer to the Object (“Mode of Presentation” or “Mode of Being” of the Immediate and Dynamic Objects, “Relation of the Sign to its Dynamical Object”), followed by six “respects” that refer to the Interpretant. On the other hand, Peirce explicitly gives an order of determination for the first six trichotomies, starting not with “Sign itself”, but with the two (Dynamic and Immediate) Objects, followed by “Sign itself,” followed by three trichotomies dealing with the nature of the three Interpretants, followed by four trichotomies that encompass relations between Objects or Interpretants and the Sign (Peirce 1977:84-85, EP2:481). In both cases, though, Peirce affirms to be not absolutely sure about the status or the exact order of those trichotomies (cf. EP2:481, 483). Moreover, Peirce refers to the three kinds of Interpretants with different names: Immediate, Dynamical and Normal (L463: 134 and 150, CP8.344, EP2:482); Destinate, Effective and Explicit (Peirce 1977: 84; EP2:481).

The fact that we can find a lot of disagreement among scholars regarding the 28 and 66 classes of signs, thus, should come as no surprise. According to Houser (1992:502), “a sound and detailed extension of Peirce’s analysis of signs to his full set of ten divisions and sixty-six classes is perhaps the most pressing problem for Peircean semioticians.” We will not be able, however, to fully address this question here. What we are proposing, instead, is a new way to approach this problem, by making use of diagrams that can serve as tools to

expose, compare, and analyze many different claims regarding Peirce's classifications of signs.

5. SOME EXAMPLES OF THE APPLICATION OF THE TRIANGULAR DIAGRAMS

We will now give some brief examples of how those diagrams can be used, visually rendering some conflicting claims regarding the 28 and 66 classes of signs. We will assume that, as suggested by some scholars (e.g. Marty 1990:225-228; Maróstica 1992:117-120), it might be possible to establish correspondences between the 10 classes of signs (as described in the 1903 Syllabus)⁶ and the 28 and 66-fold divisions of signs. The 10 classes will serve, therefore, as a reference for our comparisons.⁷

In order to justify this assumption, it can be noticed that our diagram for the 28 classes has a close correspondence with the Welby diagram. In fact, both have the same number of vertex-down triangles (28), although in Welby only 10 of those are occupied by a class. A question that follows from this observation is whether Peirce had the 28 classes in mind when he designed this diagram for 10 classes. If he did, what the Welby diagram suggests is that the 6-trichotomic classes that follow the pattern⁸ [h1=h2=t1, h3=h4=t2, h5=h6=t3] correspond to 10 special classes of signs. Peirce, however, makes no explicit claims about the possibility of establishing such correspondences, as some Peirce scholars do.

6. We consider (cf. Weiss & Burks 1945, Sanders 1970:9-10, Jappy 1989: 147, Marty 1990: 231) that those classes are based on the following trichotomies and triadic divisions:

S = Sign itself: 1. Qualisign, 2. Sinsign, 3. Legisign

S-Od = Relation of Sign to Dynamic Object: 1. Icon, 2. Index, 3. Symbol

S-If = Relation of Sign to Final (or Normal) Interpretant: 1. Rheme, 2. Dicent, 3. Argument

This leads to the 10 classes of signs shown in figure 3.

7. We will adopt the following names and abbreviations in order to refer to the 10 trichotomies involved in the division of signs into 10, 28, and 66 classes:

S = Sign itself

Oi = Immediate Object

Od = Dynamic Object

S-Od = Relation of Sign to Dynamic Object

Ii = Immediate Interpretant

Id = Dynamic Interpretant

S-Id = Relation of Sign to Dynamic Interpretant

If = Final (or Normal) Interpretant

S-If = Relation of Sign to Final Interpretant

S, Od, If = Relation of Sign to Dynamic Object and to Final (or Normal) Interpretant

8. We will refer to the trichotomies involved in the 3-trichotomic division of signs by *tn*, the ones involved in the 6-trichotomic division by *hn*, and the ones involved in the 10-trichotomic division by *dn*; where *n* indicates the position of a trichotomy in the order of determination.

Maróstica (1992:117-120), for example, argues that we can locate specific classes among the 28 (and also the 66 classes) that correspond to each one of the 10 classes of signs. She considers that the trichotomies involved in the 28 classes are [h1(S), h2(Oi), h3(Od), h4(Ii), h5(Id), h6(If)]; while the ones involved in the 10 classes are [t1(S), t2(O), t3(I)];⁹ and a correspondence between the 10 and the 28 classes, can be given by the pattern [h1=t1, h2=h3=t2, h4=h5=h6=t3]. There are only 10 classes among the 28 that satisfy this condition, and the resulting diagram is shown in figure 11.

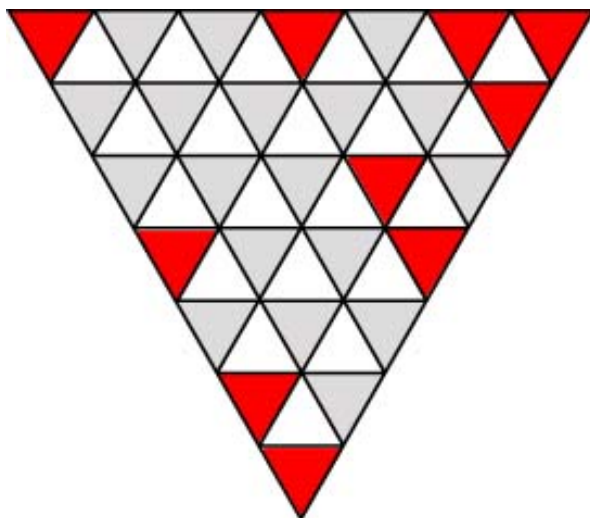


Figure 11. The 10 classes of signs (in gray) within the context of the 28 classes of sign (in gray or red), according to Maróstica (1992:117-118).

Other authors (e.g. Marty 1990:209-221; Müller 1994:147), however, have argued that the correct order of determination for the 6-trichotomic division of signs is [h1(Od), h2(Oi), h3(S), h4(If), h5(Id), h6(Ii)]. According to Marty, although the order of determination here (Objects determining Sign itself) seems to be in conflict with the order of determination found in the 3-trichotomic classes (Sign itself determining the relation of the Sign with its Object), the 28 classes can be understood as subdivisions of the 10 classes of signs, according to this pattern [h1=t1, h3=t2, h4=t3]. Here, for each one of the 10 classes, we will find one or more correspondent ones within the 28-fold division of signs, as shown in **figure 12**.

9. Maróstica (1992:115-116) proposes that, instead of a classification based on relations, we should understand the 10 classes as “combinations ... based on [Peirce’s] static type of definition of sign”. Therefore, instead of (S-Od) here we have (O), and instead of (S-If) we have (I). She claims, however, that those trichotomies lead to the same 10 classes of signs proposed by Peirce in his 1903 Syllabus.

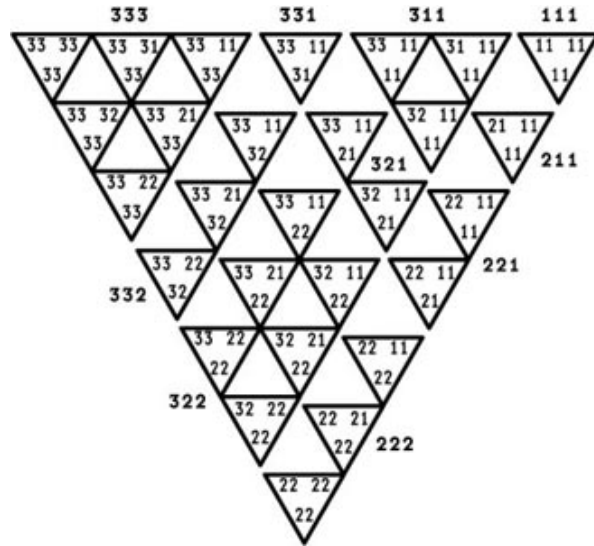


Figure 12. The 28 classes of sign seen as groups of classes that correspond to the 10 classes of signs, according to Marty (1990:225-228).

It can be argued, though, that no exact correspondence can be done between the 10 and the 28 classes of signs once that, if we agree that the trichotomies involved in the 10-fold division are: (S), (S-Od), and (S-If); while the ones involved in the 28-fold division are: (S), (Oi), (Od), (Ii), (Id), (If); whatever the order of determination might be, there is only one trichotomy, (S), that is clearly involved in both divisions. According to Peirce scholarship, however,¹⁰ the 66-fold division of signs involves both sets of trichotomies, plus a tenth one —(S, Od, If). The disagreement here regards mainly the order of determination of those trichotomies.

Figure 13 and figure 14 show the different diagrams that result from considering the order of determination proposed by Weiss & Burks (1945), and the one proposed by Lieb (1977). The former starts with the trichotomy that refers to “Sign itself”: [d1(S), d2(Oi), d3(Od), d4(S-Od), d5(Ii), d6(Id), d7(S-Id), d8(If), d9(S-If), d10(S, Od, If)]. The later starts with the trichotomies that refer to the Dynamic and Immediate Objects: [d1(Od), d2(Oi), d3(S), d4(Ii), d5(Id), d6(If), d7(S-Od), d8(S-Id), d9(S-If), d10(S, Od, If)].

It should be noticed that, while the three trichotomies that correspond to the ones found on the 10 classes are kept in their usual order of determination [t1(S), t2(S-Od), t3(S-If)], they occupy different positions in the different orders of determination for 10 trichotomies (dn) proposed by those authors. In Weiss & Burks (figure 13) we have [t1=d1, t2=d4, t3=d9]; while in Lieb (figure 14) we have [t1=d3, t2=d7, t3=d9].

10. For an alternative proposal, see Maróstica 1992.

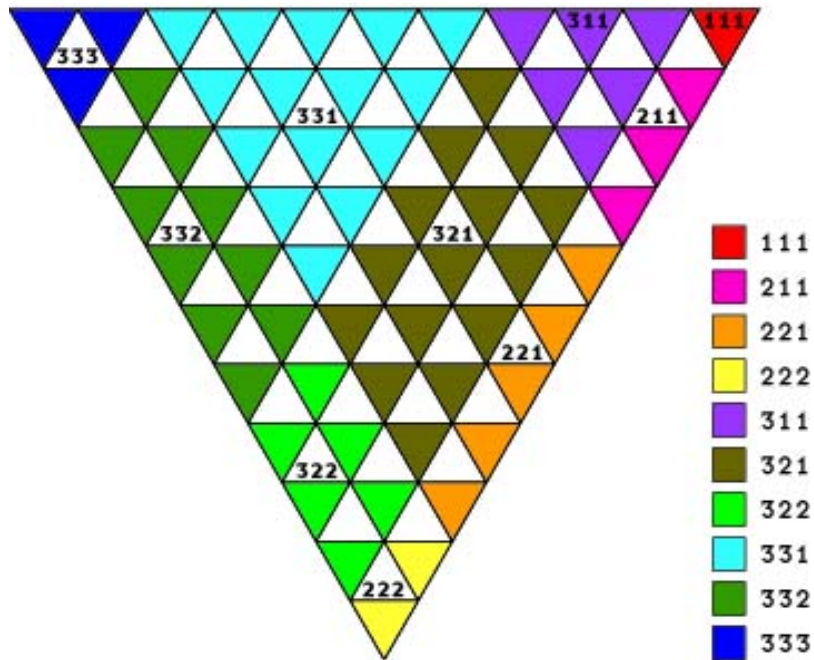


Figure 13. Correspondences between the 66 and the 10 classes of signs according to the order of trichotomies adopted by Weiss & Burks (1945).

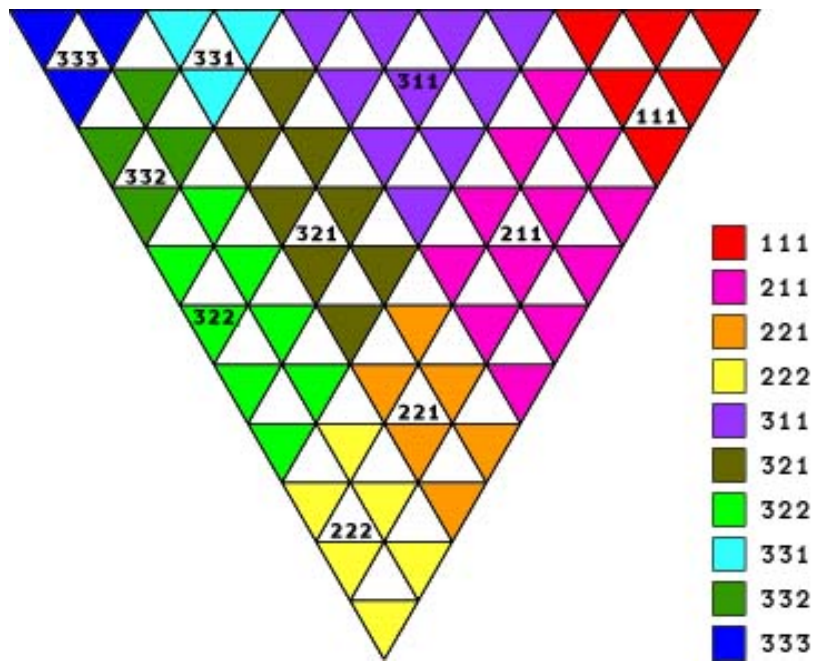


Figure 14. Correspondences between the 66 and the 10 classes of signs according to the order of trichotomies adopted by Lieb (1977).

As a result, the number of 10-trichotomic classes that correspond to the 3-trichotomic ones may vary. We find that, for example, Weiss & Burks order implies that there is only one kind of 10-trichotomic Qualisign, while, following Lieb's order, we have 6 different kinds of 10-trichotomic Qualisigns. Other hypothesis could be considered as well. What is

important to note here is that many different hypothesis can be compared using this diagrammatic tool. The consequences of those comparisons should be the topic of further research.

6. CONCLUSION

This paper provides two implicated results: (i) a geometric method to explain Peirce's strategy to construct the 'Welby' and the 'Syllabus' diagrams for ten 3-trichotomic classes of signs (2.264 and CP 8.376); and (ii) a method to construct any n-trichotomic diagram of sign classifications. Those results can be used as a diagrammatic approach to understand the unsettled 28- and 66-fold divisions of signs in terms of the less controversial 10-fold classification.

ACKNOWLEDGMENTS

The authors would like to acknowledge the support received, in the form of research grants, from FAPESP - Fundação de Amparo à Pesquisa do Estado de São Paulo. They would also like to thank Nathan Houser, Andre de Tienne, Cornelis de Waal, and the Peirce Edition Project staff for their comments on earlier versions of this paper, and access to Peirce's manuscripts copies; as well as Robert Marty and Shea Zellweger for discussion.

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