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1. The genesis of a poem represents an act of creative genius, through which a myriad thoughts, images, emotions and associations are congealed into a single, permanent, unyielding structure, the poetic form. Once the spirit that moved the poet has crystallized in the form of a poem, the various components comprising the poem remain embedded in the structure, like flies in a block of amber, waiting to be released by application of the proper knowledge. Unfortunately, the full knowledge required to unravel the complete structure of a poem is the exclusive possession of the poet himself, and anyone else wishing to partake of this knowledge must approach the poem via circuitous and often tortuous routes, in full awareness of the fact that the entire picture will probably never become clear. The casual reader, as well as the trained critic, must put forth an effort in order to grasp the subtleties of poetic expression, and the success of any attempt at interpretations is roughly proportional to the magnitude of the expended effort. A crucial question in this regard thus becomes the precise extent to which the meaning and significance of a poem may be approached by an outside observer, whether one may hope to fully understand the author's intentions, perhaps even more clearly than the author himself. A long and bitter battle, the tenets of which will not be entertained here, has raged over the last point, that of reaching and understanding greater than that possessed by the author. From a purely epistemological point of view, it appears safe to assert that we cannot extract *meaning* from a literary work without the concomitant assumption that such meaning figured in the intent of the author; thus, Kurt Mueller-Vollmer¹ has stated:

¹ Kurt Mueller-Vollmer, « To understand an author better than the author himself: on the hermeneutics of the unspoken », *Language and Style*, 5 (1971), 43-52.

There seems to be only a negative answer to the question of whether we can understand an author better than he did himself. For our definition of the author does not allow for such understanding, inasmuch as it would demand that we construe a meaning independent from and outside the meaning-sponsoring acts of the authorial consciousness. (p. 46).

Textual meanings — by virtue of their being embedded in a fixed system of linguistic signs — are unchangeable and potentially accessible to all readers at all times. (p. 50).

Without entering into the heated debate concerning the rôle of speaker's intent in determining the meaning of an utterance², it is clear that the remarks cited above strictly apply only to the semantic content of poetic expression, while leaving considerable leeway in such areas as imagery, association, metaphor, connotation, and so forth. From the outset, one may separate the semantic content of a literary text from the more subjective areas of significance, and further subdivide the latter category into factors which figured in the intent of the author, and purely fortuitous results occurring independently of the author's plan. While the study of fortuitous association and imagery may be of interest to the field of aesthetics, it is totally irrelevant to the discipline of literary criticism, where the frontiers delimiting the scope of enquiry rest firmly within the sphere of author's intentions. It is the task of the literary critic to establish the correlations between the author's intentions and the resulting literary expression, and consequently it is imperative that no extraneous material be allowed to enter the analysis. Unfortunately, the dividing line between fortuitous observations and structures intentionally created by the author is in most cases impossible to establish, even given the author's own commentaries concerning the composition of his works. This is especially true when dealing with such areas as imagery and association, for while the linguistic and semantic structures may be regarded as defined by the authorial consciousness, the seemingly endless web of associations and images which surrounds a poetic work may represent the action of a number of psychological forces, including dreams, forgotten memories, and

² Although this topic has received discussion at the hands of many philosophers, it is perhaps H. P. Grice who has directed the greatest single effort toward the problem. See, for example, « Meaning », *Philosophical Review*, 66 (1957), 377-88; « Utterer's meaning, sentence-meaning, and word-meaning », *Foundations of Language*, 4 (1968), 225-42; « Utterer's meaning and intentions », *Philosophical Review*, 78 (1969), 147-77. An opposing position is taken by Paul Ziff, « On H. P. Grice's account of meaning », *Analysis*, 28 (1967), 1-8. Further considerations may be found in such works as the following: Dennis W. Stampe, « Toward a grammar of meaning », *Philosophical Review*, 77 (1968), 137-74; T. E. Patton and D. W. Stampe, « The rudiments of meaning: on Ziff on Grice », *Foundation of Language*, 5 (1969), 2-16; John B. Searle, *Speech Acts* (Cambridge, 1970), esp. pp. 16-17, 88.

non-linguistic sensory impressions, which may fail to manifest themselves in the author's conscious reflections. Regarded in this fashion, it may be seen that, while still remaining within the realm of structures attributable to the author, it is conceivably possible to arrive at a total conceptual grasp of a work which exceeds in scope the conscious intentions of the author, thus imparting a legitimate interpretation to the concept of « understanding an author better than the author himself ». It must be reiterated, however, that searching for such meaningful structures, especially structures which remain hidden from the author's own conscious awareness, may not be confirmed through any empirical procedure, for even under the best of conditions the inherent indeterminacy of the unspoken intent must remain to render any such analysis incomplete. The best that can be hoped for is a plausible case regarding the inclusion or exclusion of any particular element in a composite interpretation. In collecting the data to be utilized in such an analysis, one must therefore resist the temptation to ascribe to the author every structure, image, or association that can be discovered; on the other hand, one must not react too strongly in the opposite direction, by shying away from any attempt at searching for the motivations underlying the conscious attempts of the author.

The above remarks, while pertinent to all areas of textual interpretation, are of the utmost relevance when dealing with specimens of poetry, for poetic expression affords the greatest potential for subjective judgement. The remainder of this paper represents an attempt at applying these remarks to a particular poem, in order to illustrate some points of potential significance, and to suggest some possible directions for future study. All reported results must be evaluated in the light of the preceding discussion, for what is being sought after is not a definitive interpretation but rather a delimitation of certain factors that *may* have entered into the creation of a particular poem. The poem chosen for discussion is Rimbaud's famous (or infamous) « Voyelles », and more specifically, the following remarks are directed toward the choice of colors to represent the vowels: « A noir, E blanc, I rouge, U vert, O bleu ». The value which might derive from a reexamination of a poem which has served as the point of departure for so many varying analyses may perhaps be questioned, and the sceptical reader may even wish to concur with Henri Cazals³ when he asserts that « C'est le jour où le sonnet des *Voyelles* ne sera plus pris au sérieux que l'on pourra parler sérieusement de Rimbaud ». Others, however, the present writer included, have inclined toward the view that « *Voyelles* » does indeed offer

³ *Combat*, December 4, 1961.

grounds for serious reflection, and have put forth a concentrated effort to establish the most comprehensive analysis that may be extracted from this relatively short poem. The present note in no way pretends to take a place beside the numerous detailed and elaborate studies that Rimbaud's sonnet has occasioned; rather, a tentative and admittedly rudimentary attempt is made to bring additional areas of investigation under the pale of the discussion.

2. As suggested by the remarks of Cazals, the reception which has been afforded « Voyelles » may be roughly divided into accounts which consider the poem to represent pure nonsense, and critical reviews seeking to establish a deeper understanding of the poem. Viewed in the context of Rimbaud's entire poetic production, it is unlikely that « Voyelles » was conceived without serious reflection, but due to Rimbaud's excessive preoccupation with symbolism, it may be countered that the semiotic value of the appearance of the five vowels in the poem contains little or no reference to their status as actual vowels, but rather that the vowels are mere symbols for a far-reaching series of non-linguistic images and associations. From this point of view has originated the by now widely accepted practice of regarding Rimbaud's work as exclusively dealing with written signs, standing, by virtue of their shape or their equivalence with letters of other alphabets, for concepts far removed from the linguistic function of the vowels⁴. The literature which has resulted from this methodological orientation is enormous and will not be reviewed here, since the intent of the present study lies in the opposite direction. Suffice it to say that, in view of Rimbaud's overall use of symbols, it is quite plausible that some non-linguistic associations were intended by the written aspects of the vowels, although one suspects that the totality of symbolism that has been attributed to this poem far exceeds the author's original intentions.

In addition to the purely graphological aspect of the vowels, other investigators have traced the verbal impact of Rimbaud's choice of vowels, emphasizing the sound-vowel as opposed to the letter-vowel, since of course Rimbaud's poetry was designed to be spoken aloud as well as to be read. Staying within the purely verbal dimension, a number of different tacks have been taken in analyses of the poem. In certain instances the sounds of the individual vowels are related to further images and associations, both within the poem and drawn from the outside world. Other investigators have attempted to establish the correlation between vowel timbre and color by examin-

⁴ For one of the most far-reaching of such interpretations, see R. Faureson, « A-t-on LU Rimbaud? » *Bizarre*, no. 21-22 (1962).

ing potential networks of associations with other French words, while still others have sought the answer to the vowel-color association in terms of the psychological phenomenon of « colored hearing » or *audition colorée*. While only the last-mentioned category is of direct relevance to the present undertaking, it is useful to comment briefly on other verbal aspects of the poem.

Claudine Hunting, in a recent article devoted to the verbal dimension of « Voyelles »⁵, states her position as follows (p. 472): « ... n'envisager ce poème que dans une perspective purement graphique, c'est en restreindre singulièrement la portée. Bien plus, c'est ignorer son aspect le plus révélateur: l'expression même de la *voix* de Rimbaud, le poète-chanteur, l'aède moderne ». Stressing, then, the verbal potential of the poem, Hunting goes on to consider each of the vowels in turn, in terms of the vocal gestures required in production and the relative degree of sonority based on laryngeal vibrations. These considerations are then related to animal cries and to a host of other associations based on verbal imagery. Moreover, by discussing the physiological aspect of the production of the vowels, Hunting has introduced a totally new dimension into the study of the sonnet, based on gestural symbolism. To fully appreciate the potential significance of such vocal gestures, it is only necessary to consider a somewhat different, although analogous case, occurring in Molière's *Le Bourgeois Gentilhomme* (Act 2, scene 4), where M. Jourdain is being edified by the « spelling lessons » offered by the Maître de Philosophie:

M. de Phil: La voix U se forme en rapprochant les dents sans les joindre entièrement, et allongeant les deux lèvres en dehors, les approchant aussi l'une de l'autre sans les joindre tout à fait: U.

M. Jourdain: Il n'y a rien de plus véritable: U.

M. de Phil: Vos deux lèvres s'allongent comme si vous faisiez la moue; d'où vient que si vous la voulez faire à quelqu'un, et vous moquer de lui, vous ne sauriez lui dire que: U.

Perhaps the aspect of the poem which has received the greatest attention, and indeed, the one which occasioned the present remarks, is the use of colors to represent the vowels, a poetic device which, while not original with Rimbaud, is most commonly associated with his name, due to the controversy which has raged over the interpretation of « Voyelles ». Since it is not the intent of this paper to review all the analyses of the poem, a task which has been adequately fulfilled elsewhere, no explicit mention will be made of the numerous studies which have dealt with the vowel-color associat-

⁵ Claudine Hunting, « La voix de Rimbaud: nouveau point de vue sur les "naissances latentes" des "Voyelles" », *PMLA*, 88 (1973), 472-83.

ions in « Voyelles », with a single exception, that being the most complete and comprehensive study of the poem realized to date, Etiemble's *Le Sonnet des Voyelles*⁶. Ironically enough, the most thorough, well-documented, and penetrating analysis of this aspect of Rimbaud's poem comes from a man who has set out to disprove any serious basis for correlation between vowels and colors in « Voyelles », and who, indeed, is opposed to any and all serious interpretations of the poem, from whatever point of view. Strongly agreeing with Cazals' statement, and asserting that « quand il s'agit de Rimbaud, aucune folie du temps ne manque à l'appel », Etiemble proceeds to prove his own assertion by devoting an entire book to an iconoclastic treatment of various interpretations that the poem has occasioned. Of primary importance to the subject at hand is Etiemble's exhaustively documented account of *l'audition colorée*, which occupies nearly half of his book.

Since his study is based primarily on the phonetic properties of the vowels, the so-called *sons-voyelles*, attention is directed toward the rôle played by the individual vowels in relation to the color associations evoked by Rimbaud. Although encompassing an extremely wide range of material, Etiemble's study employs a polemical style and a rather questionable methodology, for he operates on the premise that in order for Rimbaud's choice of vowel-color associations to be taken seriously, there must exist a demonstrable correlation between the vowels and various color-words or color-suggestive words in French and/or there must exist a high degree of correspondence with other poems or accounts in which vowels have been paired off with colors or similar non-verbal phenomena. With this premise in hand, Etiemble proceeds to amass a great deal of evidence to be utilized in building a case against the serious interpretation of « Voyelles », for it is not difficult to demonstrate that Rimbaud's poem bears very little resemblance to other poems on the same theme. The first aspect of the poem to come under consideration and subsequent attack concerns the presence, both in the poem itself and in the French language in general, of color-words or color-suggestive words containing the vowels in question; that is to say, that each vowel phonetically suggests word which conjure up the particular color which Rimbaud associated with that vowel. The reasons for seeking such a correspondence are obvious, for most frequently, cases of so-called « phonetic symbolism » derive from associations with words containing the « symbolic » sound; thus, for example, Charles Bally⁷ notes that many French speakers will con-

⁶ Etiemble, *Le Sonnet des Voyelles*. Paris, Gallimard, 1968.

⁷ Charles Bally, *Traité de Stylistique Française* (3rd ed., Paris, 1951), pp. 54-5.

sider the verb *tinter* to be highly onomatopoeic, while the completely homophonous *teinter* evokes no such sentiments. Similarly, Marcel Cressot⁸ notes that « Considérée isolément, un son n'a d'expressivité évidente que dans la mesure où il rappelle un bruit en rapport avec la chose évoquée ». Often, the failure to consider this aspect of phonetic symbolism has caused studies on this topic to suffer from complete circularity, and some of the most complete and comprehensive accounts of phonetic symbolism show distinct traces of being dictated by lexical items already present in the language being considered⁹. It is therefore not surprising that Etiemble's inquest should direct itself toward the associatory or symbolic potential of the French vowels, nor that he should attach significance to the fact that these potentials are not realized in Rimbaud's poem. The sole conclusion that may be drawn from this bit of evidence alone, however, is that Rimbaud did not employ the device of phonetic association when assigning colors to the vowels of his sonnet, which still allows for the possibility of discerning other areas of significance.

Of greater overall intrinsic significance to the study of Rimbaud's color-choices is the correlation between « Voyelles » and other poems in which colors have been associated with vowels, of which Etiemble discusses a great number. It may be seen, upon comparing the vowel-color associations in these poems that, whereas a higher degree of correspondence exists among some of the other poems, the rate of correspondence between « Voyelles » and the other vowel-inspired poems is quite low; in fact, the only areas where a significant degree of correspondence may be noted is in the association of the vowel *e* with the color white, and of the vowel *u* with the color green¹⁰. Among the various poetic works surveyed by Etiemble, the only one which agrees with Rimbaud's choice of color associations for *a*, *i*, and *o* is the poem « The Vowels » by John Gould Fletcher (1913), evidently directly influenced by Rimbaud's work. The correspondence, or lack thereof, of vowel-color associations by authors claiming the ability to make such judgements thus leads to another general and controversial topic, that of purely psychological « colored hearing » or *audition colorée*. Since the end of the 19th century, and perhaps even earlier, it has been a recognized medical fact that certain individuals are able to consistently and involuntarily establish a psychological relation between sounds and colors, that they can in a sense « visualize » the sounds in question. This trans-sensory phenomenon is not limited to colored hearing, for there are also

⁸ Marcel Cressot, *Le Style et ses Techniques* (Paris, 1959), p. 19.

⁹ A noteworthy example is the richly documented work of Hans Marchand, « Phonetic symbolism in English word-formation », *Indogermanische Forschungen*, 64 (1959), 146-68; 356-77.

¹⁰ Etiemble, *op. cit.*, p. 119.

individuals who can distinguish colored objects through the sense of touch. Such observations have intrigued investigators in a number of disciplines, who have all joined in the search for possible empirical correlates for these associations. Despite the multitude of efforts, no conclusive results have been reported to date; the best that can be offered are statistical data regarding sound-color associations in large sample populations, which thus effectively places colored hearing in the same methodological category as ESP. Etiemble (pp. 129-30) gives the results of several such early studies; most interesting is that of Flournoy, gained from questioning 1,076 individuals. Although the responses of the subjects are spread out over the various possible colors, including a slot for those who made no color associations, there are certain associations which are statistically more frequent than others: for *a*, white is most common, followed closely by red and black; for *e*, it is yellow, followed closely by blue and white; for *i*, red, followed by white; for *o*, yellow, followed by red; for *u*, a very strong preference for green, followed a great distance behind by blue. The obvious difficulty in interpreting the results of such studies stems from the fact that, when administering a questionnaire to a randomly chosen and uninitiated group of people, it is impossible to distinguish between meaningful responses and arbitrary or capricious statements offered in response to unsolicited and puzzling questions. Moreover, there is no way of filtering out the effects of phonetic or other psychological associations which the presentation of sounds might evoke in a subject, which would obscure cases of true colored hearing free from extraneous influences. As a consequence, the statistical significance of the reported results becomes minimal, since all cases are lumped together in a single tabulation.

Of greater overall value are the more anecdotal but also more instructive accounts of individuals who possess the faculty of colored hearing. The linguistic significance of such behavior was pointed out by Roman Jakobson¹¹, during a discussion concerning the adoption of an acoustically-based set of phonemic distinctive features. On p. 82, Jakobson speaks of « the close connection of the vowels *o* and *u* with the specifically dark colors, and of *e* and *i*, on the other hand, with the specifically light colors ». He also notes that « a distinct inclination to connect the more chromatic vowels with the variegated colours, especially *a* with red, and conversely, the vowels *u* and *i* with the least variegated colors, even with the black-white series, is also apparent in colored hearing ... generally, associations with the dark vowels are apparently firmer and more compulsory

¹¹ Roman Jakobson, *Child Language, Aphasia and Phonological Universals* (The Hague, Mouton, 1968), pp. 82-84. Further data are reported by G. A. Reichard, R. Jakobson and E. Werth, *Language and synesthesia*, « Word », V (1949), pp. 224-233.

than associations with the light vowels; and, on the other hand, associations with the U-I line are firmer than associations with the A-line ». Unfortunately, Jakobson illustrates these interesting and provocative remarks with only a few examples, although reference to a few additional works is made, so that the full picture of colored hearing is not available. Nonetheless, Jakobson's observations suggest a certain degree of internal coherence in cases of colored hearing, a coherence also hinted at by Etiemble's data. However, the degree of correspondence between Jakobson's observations and those of Etiemble is not all that one might desire in order to tentatively establish a « universal » set of vowel-color associations, based on the common intersection of all reported results. Due to the wide diversity of the sources reported by Jakobson, Etiemble, and other investigators, the most likely course of action that suggests itself is to abandon the search for universal vowel « colors », and seek instead the possible correlates for each individual case of colored hearing. It should not be considered surprising that such a complex psychological behavior pattern as the phenomenon of colored hearing might differ from person to person, regardless of any general overriding tendencies that might be observed, for the very presence of colored hearing indicates a psychological makeup which is in some way expanded. Furthermore, it is quite probably the case that most, if not all, cases of colored hearing are at least partially due to a complex network of associations with the language as a whole and with the outside world, associations which must surely be different in each case. It is interesting to note, in this regard, that, just as the problem of vowel-color associations may not have a unique and universal solution, so the problem of establishing a universal set of phonological distinctive features runs into difficulties when faced with cross-language sections of psycholinguistic behavior. Phonologists have constantly sought to establish universal distinctive features based on languages considered as indivisible entities, but psycholinguists are becoming increasingly aware of the extreme variability generally found in the responses of untutored subjects when faced with putative distinctive features. If it is indeed the case that the set of observed vowel-color associations has no unique locus common to all or even to most cases of colored hearing, then one may conclude that, despite other services his book might have rendered, Etiemble has not conclusively demonstrated the non-sensory nature of Rimbaud's color-choices. The choice of whether or not to accept Etiemble's conclusions is largely a choice of methodology, for if one adheres to strict correspondence with other cases of colored hearing as the deciding criterion, then Etiemble may be conceded the victory. If, on the other hand, one chooses to search for more varied and individualized correlates of colored

hearing, then Etiemble's study, while providing valuable negative answers to certain possibilities, may not be regarded as closing the door to all future avenues of approach. In adopting the latter methodological alternative, the remainder of this paper will seek to suggest, in a highly tentative fashion to be sure, some possible correlates for Rimbaud's color choices. If some of the following remarks appear excessively speculative, it should be recalled that the exact mechanism of phonetic association is at present unknown, and consequently any reasonable speculations which might be brought to bear may serve to push the accumulated results closer toward an ultimate solution. No claims are made here regarding the necessary validity of the associations to be discussed; rather, an attempt is made to explore the possibility of discovering additional areas of significance.

3. Both the sounds of speech and the colors visible to the human eye are wave phenomena; that is, they consist of periodic vibrations transmitted across a conductive medium, and as such both light and speech sounds may be subjected to a spectral analysis, in order to break down a complex signal into its constituent simple harmonic wave components. While ordinarily such analysis is done by means of specialized instruments, nature also provides the human ear, though not the eye, with the ability to perform rudimentary spectral analyses. The M.I.T. *Handbook of Colorimetry* (p. 3, fn. 4) notes:

The eye is, of course, incapable of analyzing light into its spectral components. For example, even such a common source as sunlight is not intuitively resolved into the various spectral colors that it contains. Those who are accustomed to mixing dyes and pigments sometimes claim the ability to see in the resulting mixture the components which they have added. This is merely a judgement based on experience and not analysis. It is interesting to note in this connection that the ear possesses the analytical power which the eye lacks. The ear is capable of analyzing as complex a stimulus as the music of a symphony orchestra into the components produced by the various instruments.

Not only can the human ear perform a spectral analysis of a complex musical stimulus, but it is also capable, to a greater or lesser extent depending upon the individual, of analyzing the sounds of speech. Human speech is characterized by highly differentiated spectral patterns, and in order to apprehend the various phonemic differences, the ear must break down the sounds into their spectral components. The means by which this spectral analysis is effected remain an unsolved problem for neurologists, but it appears likely that the ear responds to gross spectral components, rather than to a

complete and undifferentiated continuum spanning the entire audible range.

In particular, the vowels of human speech are characterized by having the majority of their acoustic energy concentrated in well-defined frequency bands or *formants*. It is the location and relative intensity of the vowel formants, in particular the first three formants, that are almost completely responsible for identifying the various vowels, as well as adding secondary characteristics such as nasalization. The first formant is relatively low in the vowels [i] and [u], somewhat higher in [e] and [o], and highest in [a]. The second formant, on the other hand, decreases steadily in frequency along the scale [i], [e], [a], [o], [u]. For the five (oral) vowels just mentioned, the third formant does not play an important rôle in effecting identification, remaining relatively constant at a frequency well above that of the second formant. In the case of the front-rounded vowels, however, such as [y] (French *u*), [ø] (French *eu*), etc., the third formant is considerably lower, closely approaching the frequency of the second formant. Moreover, in the front rounded vowels the second formant is raised, approximating the frequency of the front unrounded vowels; thus, in the front rounded vowels the first three formants are bunched together, in a fashion suggesting a pure audio tone.

The resolution of the vowels into their component formant structures is normally undertaken automatically by the human auditory system, but a great number of individuals, especially those sensitive to music, are capable of hearing the differences in second formant frequency¹², thus ranking the vowels along a descending scale of « pitch » *i, e, a, o, u*. The first formant is not readily detected, but its physiological correlates may be approached by noting that the tongue is in the bottom of the mouth for the production of an *a*, in an intermediate position when forming an *e* or *o*, and highest when articulating an *i* or *u*; consequently, many individuals possess, although they may not be explicitly aware of this fact, an accurate grasp of the relative formant structures characterizing the vowels.

As remarked previously, the eye is incapable of performing a spectral analysis on visual stimuli; however, the full visible spectrum is readily available to the casual observer through such phenomena as rainbows and prisims, which reveal the spectral components of sunlight. Thus, the possibility exists for mentally forming a partial or total synthesis of the spectral characteristics of light and the

¹² A good discussion of the possibilities of discovering the formant structure of the vowels through purely introspective means is offered in the paper by José Inês Louro, « Estudo e classificação das vogais », *Boletim de Filologia* (Lisboa), 15 (1954), 215-48.

spectral characteristics of speech. As noted by Jakobson and others, colored hearing does not manifest itself exclusively with respect to the vowels, for certain individuals also possess well defined color associations for consonants; nevertheless, owing to their relative sonority, it is usually the vowels and liquid consonants that figure in cases of true colored hearing. The idea of associating the spectral characteristics of light with speech or music is not new; indeed, Voltaire, in his *Elémens de la Philosophie de Neuton* (1738) compares the seven colors of the visible spectrum with the length of vocal cord vibrations, thence to the seven whole-note intervals of the musical scale, starting with violet at the low end, and progressing to red at the high end, establishing in this fashion an inverse relationship between the wavelength of light and the wavelength of sound¹³. Turning now, to Rimbaud's color choices, and correlating the spectral composition of the colors with the second formant characteristics of the vowels, it is possible to group the three vowels *i* (red), *o* (blue) and *u* (green) along a scale of inverse wavelength, in the manner suggested by Voltaire. In considering the color associated with the vowel *u* (green), it is important to remember that we are dealing with the French front rounded [y], whose second formant is considerably higher than that of [o], and not with the back rounded vowel [u] (written *ou*), whose second formant is lower than that of [o]. Thus, based on second formant frequency, the French vowels may be arranged in the descending series [i], [e], [ɛ], [y], [ø], [œ], [a], [ɑ], [ɔ], [o], [u]. It may conceivably be possible to include the vowel *e* in this analysis, by viewing the color white as verging upon yellow, as in the other poems embodying vowel-color associations, which would then allow *e* to take its place in the spectrum between red (*i*) and green (*u*). This possibility, while not striking, is at least allowed by Rimbaud's imagery concerning this vowel: «candeurs des vapeurs et des tentes, lances des glaciers fiers, rois blancs, frissons d'ombelles», especially given the predominantly yellow color of sunlight. The association of *a* with the color black does not coincide with the spectral analysis, but demands another explanation. The most likely candidate is of course phonetic association with *noir*, and perhaps with other French words suggesting darkness, obscurity, or depth. Also deserving of additional consideration is the unique status of *a* as a low vowel, not paired

¹³ Some further observations on this subject, interesting although methodologically dubious, are offered by Gerhard Schmidt, «A sociological theory of language», *Modern Language Journal*, 31 (1947), 351-58; «Thinking and language», *Orbis*, 4 (1955), 66-73. Additional considerations are offered by H. G. Coenen, *Zum Verständnis von Arthur Rimbaud, Voyelles*, *Zeitschrift für französische Sprache und Literatur*, 75 (1965), 353-64.

off with any of the other vowels mentioned in the poem, but rather forming the bottom of the five-membered «triangle» described by the poem. While the conclusiveness of such a spectral interpretation of the vowel-color associations may of course be questioned, it must also be admitted that the data do not in themselves completely disconfirm this hypothesis. That Rimbaud had a keen ear for the melodic properties of words there can be no doubt, and if, even unconsciously, he regarded the vowels as forming a musical scale, the possibility of at least partially associating this scale with the image of the rainbow may have figured in the creation of «Voyelles».

4. Another area of possible significance to the interpretation of «Voyelles» concerns the phonological behavior of the vowels in question. In approaching this topic, the discussion verges upon one of the least-known areas of phonological theory, and should be considered highly tentative at best. The following remarks are included in the hopes of stimulating further empirical research into the possibility of incorporating such phonological concepts into the theory of poetics. The topic to be discussed concerns the *phonological strength* of the five vowels that figure in Rimbaud's poem; that is, their inherent behavioral characteristics with respect to the phonological system of French.

It has been noted for a long time that, based on their behavior during phonological processes, the vowels of the Romance languages are not equivalent, but may be arranged along a hierarchical scale of phonological strength, indicating the frequency with which a given vowel participated in, or resisted inclusion in, certain phonological events. While it is occasionally possible to observe the hierarchical behavior of phonological segments in synchronic processes¹⁴, phonological hierarchies are most easily observed in the diachronic dimension, by measuring the rate of loss or retention of segments across time. An examination of this sort yields values which, strictly speaking, are applicable only at the phonological level; that is, which do not necessarily exhibit a one-to-one correlation with the phonetic properties of the vowels in question. The question of whether such abstract values of phonological strength should be admitted directly into the phonological specification of segments in addition to, or instead of, phonetically based distinctive features is highly controversial, and the matter is far from being resolved. A position in favor of incorporating abstract phonological features into phonological

¹⁴ As an example, one may consider the paper by Arnold M. Zwicky, «Notes on a phonological hierarchy in English», in *Linguistic Change and Generative Theory*, ed. R. P. Stockwell and R. K. S. Macaulay (Bloomington, Indiana, 1972), pp. 275-301.

descriptions has been most strongly advocated by James Foley¹⁵, who states (p. 11):

The scale of relative phonological strength is established by observing the behavior of phonological elements. It does not refer to their physical (acoustic) strength, but rather to their systematic (phonological) strength. This strength scale does not possess physical reality, but rather systematic reality, i.e., reality within the system of phonology presented here. The elements on the phonological strength scale are not physical (acoustic) elements, but phonological elements. These elements, belonging to the abstract system of phonology, manifest themselves in the system of physical sounds.

Foley's statement represents an extreme view of the rôle of abstract phonological specifications. Objections may be raised that individuals respond to distinctive feature differences between segments based on their synchronic phonetic manifestations, and not on their historical behavior with respect to an abstract pattern. Nonetheless, it is generally agreed that these abstract patterns figure significantly in the historical development of natural languages, and the question of how the synthesis between abstract features and phonetic data is to be achieved remains unanswered.

As part of a much larger-scale investigation, the details of which are too lengthy to be reported here, the behavior of the various vowels comprising the early Romance vocalic system was studied for evidence of diachronic phonological strength, as evidenced by resistance to loss or modification. A cross-language statistical study, utilizing a carefully selected corpus of data in which every effort was made to eliminate errors and indeterminacies, was conducted to determine if the vowels could be ranked along a hierarchical scale of strength. The results of the cross-language statistical analysis rather conclusively point to the following scale of diachronic phonological strength, in order of decreasing strength: /a/, /o/, /e/, /u/, /i/. This scale represents the relative ease with which the individual vowels succumbed to instances of loss or modification in the early stages of the Romance languages, and represents an empirically verified version of anecdotal statements to be found in many manuals of Romance philology. The physiological correlates of such hierarchical behavior remain at present unknown. Careful measurements seeking to correlate vowel timbre with both inherent length and relative intensity failed to yield any conclusive results; from this it appears likely that the answers lie in articulatory correlates. However, a precise characterization of the inherent phonological strength of the

¹⁵ James Foley, « A systematic phonological interpretation of the Germanic consonant shifts », *Language Sciences*, 9 (1970), 11-12.

vowels will have to await further specifically directed research.

The idea that the various vowels may be considered as possessing varying degrees of « strength » is not confined to works of historical linguistics, but has been noted by poets and writers in the synchronic dimension as well, although of course based on impressionistic rather than empirical data. Just as an example, Feliciano de Castillo, in his *Tratado de Metrificação Portuguesa* (1850) offers a number of interesting remarks concerning his impressions of the intrinsic characteristics of the vowels. Speaking of *a*, he states « Esta letra é de todas a mais franca ». *O* is described as follows: « O O é na segunda escala das vogais o que o A é na primeira: som franco, rasgado, enérgico, e como uma explosão da alma ». For *e*, Castillo notes « Com menor volume, com menor explosão e ressonância do que o A ». The vowel *u* is described as « um som abafado, que se emite com a boca já quase de todo cerrada ». The vowel *i* receives the following characterization: « Se a vogal A que nos abriu a primeira escala dos sons, expressa a grandeza e a alegria, o I, em que a mesma escala termina, parece convirá com as ideias de pequenez e tristeza ». Finally, the entire vowel scale is summarized as follows: « O A é brilhante e arrojado; o E ténue e incerto; o I subtil e triste; o O animoso e forte; o U carrancudo e turvo ».

In her recent paper, Claudine Hunting also offers some remarks concerning the intrinsic character of vowels. For example, *a* is characterized as follows (p. 476): « Visuellement la bouche prononçant le son A se présente à son point d'aperture le plus grand, n'opposant aucun obstacle à l'émission de la voix qui conserve ainsi toute sa puissance originelle ». For *o*, the following remarks are offered (p. 479): « La voyelle finale est la plus sonore de toutes ... les lèvres se prolonguent alors démesurément en un instrument de musique des plus sonores: le clairon. La bouche, ainsi gigantesquement agrandie, résonne bruyamment ... ». The vowel *e* is described as follows (pp. 477-8): « En opposition à la voyelle éclatante qu'est le A, le son E, bouche plus fermée, lèvres légèrement avancées, est à peine perceptible. Il est plus un souffle qu'un cri ... l'atonie du son E correspond bien à celle de la couleur blanche qui est, en fait, absence de toute couleur ». *I* is characterized thus (p. 478): « Après l'accalmie passagère du E éclate le rire du I ... la forme allongée des lèvres très rapprochées suscite tout d'abord l'ouverture étirée d'une blessure ». Finally, Hunting arrives at the vowel *u* (p. 478): « C'est la voyelle dont la sonorité est la moins forte, mais la puissance de souffle la plus grande, car son énergie se concentre et vient buter contre l'obstacle des lèvres presque fermées ». These observations, and others like them which have appeared from time to time, reveal, despite their imprecise and impressionistic nature, an awareness of

intrinsic differences among the various vowels under consideration. That some connection exists between these synchronic observations and the diachronic behavior of the vowels seems certain, although it is impossible to posit any causal relationships based on these data. At this point it suffices to reiterate the general manifestations of intrinsic vocalic strength, which leaves open the possibility for consciously or unconsciously arranging the vowels along such a scale.

Returning to the color choices found in « Voyelles », we may now consider the possible significance of intrinsic vocalic « strength » in determining the color associations. Before attempting such an inquiry, however, it is necessary to reaffirm the fact that French *u* is not the back unrounded vowel [u] found in Latin and old French (and spelled *ou* in modern French), but rather the front rounded vowel [y]. No statistical data are available concerning the historical behavior of [y], but by observing modern French it is apparent that this vowel is considerably « stronger » than [u] in terms of resistance to reduction or effacement; it appears, in fact, that [y] shares a position close to that occupied by [o]. If this is indeed the case, then we may establish the following correspondence between the spectral positions of the various colors and the intrinsic sonority or strength of the vowels: [a]-black; [o]-blue; [y]-green; [i]-red. By allowing the color black to represent an extreme point of the visible spectrum, it is thus possible to rank four out of the five vowel-color pairs along the parallel scales of spectral position and sonority/strength, thus suggesting a possible significance for Rimbaud's color choices. There remains, however, one recalcitrant case, namely the vowel *e*. Being represented by the color white, *e* should be placed at the opposite end of the vowel scale from *a*, which is represented by black; however, the data from French and the other Romance languages do not support the placing of [e] in this position. It may nonetheless be possible to bring the vowel *e* within the tenets of the vocalic hierarchy by noting that, unstressed (orthographic) *e* in French, unless marked with a diacritic, is generally reduced to *schwa*; i.e. to a partially rounded centralized vowel, generally resembling [ø] or [œ]. This vowel, known by such names as *e muet* and *e caduc*, frequently falls in speech, under prescribed conditions¹⁶, and is in fact the only vowel in modern French which regularly falls under purely phonetically-motivated circumstances. In this sense, French *schwa*, represented orthographically by *e*, is truly the

¹⁶ For some ideas on the loss of schwa in modern French, including a review of other studies, see Ernst Pulgram, « French /ə/: statics and dynamics of linguistic subcodes », *Lingua*, 10 (1961), 302-35. Concerning the phonetic status of French schwa, see Richard E. Boswell, « The phonetic value of Mute-*e* », *French Review*, 45 (1971), 82-87.

« weakest » member of the modern French vocalic system; thus, its inclusion at the extreme point of a parallel scale of colors and vocalic strength may be justified by this phenomenon. By regarding Rimbaud's use of the letter E as a representation of the French « mute *e* », or schwa, it is therefore possible to arrange the five vowels along a scale of decreasing « strength » or sonority: [a], [o], [y], [i], [ə], corresponding to a segment of the visible spectrum bounded by the two « polar » color values black and white.

5. The preceding paragraphs have outlined some possible interpretations of Rimbaud's color choices in « Voyelles ». A crucial question still remains, however; namely, whether in fact such interpretations actually figured in the creation of the poem. Unfortunately, the present study cannot claim any degree of success in providing a positive answer to this question; indeed, under the circumstances it is unlikely that a definitive answer will ever be available. In view of the lack of success in conclusively answering this key question, the overall validity of the study may perhaps be questioned. By way of justification, it must again be pointed out that the goal of the preceding remarks was not to supplant previous analyses of « Voyelles » by a new interpretation, but rather to suggest some further areas of significance which may be related to the long-standing interpretations currently available. Up until now, all studies dealing with the verbal possibilities of the vowels found in the poem have sought their conclusions in the areas of imagery, metaphor, and phonetic symbolism. The present note has sought to further extend these analyses by considering some purely linguistic aspects of the poem. Before the validity of the above remarks can be definitively tested, further research into the matter of phonetic symbolism will be required. If Rimbaud was in fact guided by the phonetic and phonological properties of the vowels in question, then it is conceivable that the poet consciously or unconsciously made use of their linguistic properties, properties which have been noted by so many other writers. While Rimbaud undoubtedly utilized a variety of the poetic devices common to the art of poetry, the possibility that, in choosing the vowel-color associations, the poet was at least partially guided by purely linguistic considerations, should not be overruled. After all, every poet is a linguist of sorts, manipulating the linguistic parameters of his language so as to achieve configurations which transcend the values of everyday usage, and the profundity of a poet's production is in many ways directly proportional to his inherent awareness of the structures comprising the language of which his poetry is formed.