Structural semantics with particular reference to the vocabulary of colour in modern standard French.

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ABSTRACT

This work is a study of the vocabulary of colour in modern standard French carried out within a framework of structural semantics. The first chapter contains a general discussion of semantic structure with particular reference to the relativity hypothesis and semantic universals. Then follows an analysis of data from three sources (1) colour terms elicited directly from French native speakers (2) colour terms elicited using the questionnaire method and (3) colour terms from the computer corpus of the Trésor de la Langue Française.

The notion of basic colour terms is examined and the correlation between basicness and frequency is investigated. An account is given of experiments carried out by French speakers in order to establish (a) the best examples (foci) of colours designated by basic terms and (b) the boundaries between them. Results of these experiments are compared with the results of similar experiments carried out on other languages and the degree of cross-cultural agreement about colour foci and colour boundaries is ascertained.

Colour terms are considered not only in the language as a whole but also in sub-systems of the vocabulary and in context. Collocationally restricted terms are examined and in particular the uses of 'brun' and 'marron' are investigated.

Physical and physiological aspects of colour are examined, particularly with reference to the notion of lexical opposition.

Basic colour adjectives are examined on the levels of inflectional and derivational morphology, special attention being
given to approximate colour terms.

The concluding chapters contain a discussion of the key works of the past three decades by linguists, anthropologists and psychologists in the field of colour, and an account of some of the implications of my own findings for structural semantics.
## CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>Semantic Structure</td>
<td></td>
</tr>
<tr>
<td>1.1. The notion of semantic structure</td>
<td>1</td>
</tr>
<tr>
<td>1.2. The relativity hypothesis</td>
<td>5</td>
</tr>
<tr>
<td>1.3. The work of Berlin and Kay</td>
<td>8</td>
</tr>
<tr>
<td>1.4. Field theory and colour terms</td>
<td>16</td>
</tr>
<tr>
<td>1.5. Primary and secondary structure</td>
<td>29</td>
</tr>
<tr>
<td>1.6. Basic terms and core meaning</td>
<td>29</td>
</tr>
<tr>
<td>2. Colour Terms in Modern French</td>
<td></td>
</tr>
<tr>
<td>2.1. The corpus</td>
<td>31</td>
</tr>
<tr>
<td>2.2. Work with informants</td>
<td>34</td>
</tr>
<tr>
<td>2.3. A comparison of frequency lists</td>
<td>38</td>
</tr>
<tr>
<td>3. Mapping the Basic Colours in French on the Colour Array</td>
<td></td>
</tr>
<tr>
<td>3.1. Extracting the basic terms</td>
<td>48</td>
</tr>
<tr>
<td>3.2. The mapping experiment</td>
<td>59</td>
</tr>
<tr>
<td>4. Analysis of the Questionnaires</td>
<td></td>
</tr>
<tr>
<td>4.1. The questionnaires</td>
<td>68</td>
</tr>
<tr>
<td>4.2. Results of the questionnaires</td>
<td>70</td>
</tr>
<tr>
<td>4.3. Correlation between order of mention and evolutionary order</td>
<td>79</td>
</tr>
<tr>
<td>5. The Terms 'Brun' and 'Marron'</td>
<td></td>
</tr>
<tr>
<td>5.1. 'Brun' and 'marron' as basic terms</td>
<td>91</td>
</tr>
<tr>
<td>5.2. The uses of 'brun' and 'marron'</td>
<td>93</td>
</tr>
<tr>
<td>5.3. A detailed analysis of the uses</td>
<td>98</td>
</tr>
<tr>
<td>5.4. 'Brun' and 'marron' in the questionnaires and the concordances of the TLF</td>
<td>101</td>
</tr>
<tr>
<td>5.5. The implications of changes in usage and frequency of 'brun' and 'marron'</td>
<td>114</td>
</tr>
</tbody>
</table>
Chapter 9. (contd.)

9.7. Compound colour adjectives 215
9.8. Verbs derived from colour adjectives 224

10. Important Contributions to the Study of Colour Vocabularies

10.1. Ethnoscientific studies 233
10.2. The work of Verne F. Ray 236
10.3. Conklin on Hanunoo 241
10.4. Landar, Ervin and Horowitz on Navaho 249
10.5. Snow on Samoan 250
10.6. Merrifield on Chinatec 254
10.7. Conklin's review of Basic Color Terms 255
10.8. Broch on Hare Indian 261
10.9. The work of cognitive psychologists in the field of colour 263

11. Colours as Natural Nameables 275

11.1. Colour discrimination 275
11.2. Colour naming 284

12. Some of the Implications for Structural Semantics of the findings recorded in this work 296

Abbreviations 305
Bibliography 306
Appendices 338
1

Chapter 1

SEMANTIC STRUCTURE

1.1.1. The idea that each language has its own semantic structure, as well as its own phonological and syntactic structure, is one of the basic tenets of structural linguistics, although this idea has not gone unchallenged in recent years, and as we shall see in the course of this work, some modification of it may be necessary. Semantics is, in the mere traditional sense of the term, a study of word meanings (Ullmann, 1974), and research in structural semantics usually concentrates on the vocabulary, or part of the vocabulary, of a particular language. Colour vocabularies, especially, have often been used by structural semanticists to demonstrate that each language is cut to a unique pattern. It is not therefore surprising that it is to colour vocabularies that linguists and cognitive psychologists have turned in recent years to provide the most interesting counter-examples.

The idea that each language has its own structure is usually attributed to de Saussure, although it undoubtedly had its origin in earlier work, for example that of Humboldt. I shall not attempt a discussion of de Saussure's ideas here, since there is a wealth of critical literature on the subject. Certain notions are, however, especially relevant to my work. One of them is that there is an underlying substance, an amorphous mass of thought, upon which a pattern is imposed by the language systems of individual languages. The amorphous mass of thought is common to all mankind but the pattern imposed on it is, according to de Saussure, specific to each language.
This idea is also found in Hjelmslev. According to Hjelmslev all languages share a common factor which he calls 'purport'. However, the same purport is formed, or structured, differently in different languages, according to Hjelmslev, and he demonstrates this by the now classic example of colour terms in English and Welsh. It is worth looking at his analysis again in the light of more recent research on colour vocabularies.

<table>
<thead>
<tr>
<th>green</th>
<th>gwyredd</th>
</tr>
</thead>
<tbody>
<tr>
<td>blue</td>
<td>glas</td>
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<td>gray</td>
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</tr>
</tbody>
</table>

The cuts at different places, which indicate different categorizations of the colour space, are what Hjelmslev calls 'content form' and content form is, according to Hjelmslev, culture specific. The unstructured colour continuum, before it undergoes the structuring process, is what Hjelmslev calls 'purport' and it is language universal. What is particularly interesting is that Hjelmslev regards the relation between purport and content form as being an arbitrary one. He writes "the content form ... is independent of, and stands in arbitrary relation to, the purport". (Prolegomena, p.52). Much the same point is made in Gleason (1955) and Lyons (1971). This view of the arbitrary way in which language structures the colour space is one that was held for a long time and it was not challenged in any significant way until 1969 when Berlin and Kay published their Basic Color Terms, with its bold universalist
hypothesis. I shall return to this point later.

1.1.2. The semantic anisomorphism of colour vocabularies.

It is undeniable that colour vocabularies cannot be brought into a one-to-one relationship with each other. Lyons (1971) refers to 'the semantic anisomorphism of different languages' and illustrates it by examples from the colour vocabularies of English, French and Hindi. "The English word brown has no equivalent in French (it would be translated as brun, marron, or even jaune, according to the particular shade and the kind of noun it qualifies); the Hindi word pila is translated into English as yellow, orange or even brown (although there are different words for other shades of 'brown')." (Lyons, 1971, p.56).

1.1.3. Semantic universals.

For de Saussure and Hjelmslev only the amorphous mass of thought is universal; the way in which it is structured and the resultant structure are language-specific. The structuring of the amorphous mass of thought is usually referred to now by linguists and psychologists by expressions such as 'the categorization of reality', and what has been called into question is whether the categorization of reality is carried out in an arbitrary way and in a way that differs from language to language. Language, and in particular, lexemes, are a guide to the way in which speakers categorize reality. We must always keep in mind, however, the distinction between extra-linguistic reality and language, and structural semanticists such as Coseriu and Pottier are ever conscious of this problem. We must remember too that language does not choose only distinctions
which coincide with boundaries in extra-linguistic reality.
(Coseriu and Geckeler, 1974). For example the reality of the
colour continuum has no boundaries, but colour vocabularies contain
discrete elements each of which has a fairly precise meaning in
relation to the meaning of the others.

If underlying reality, whether it be de Saussure's 'amorphous
mass of thought' or the physical reality of the world around us,
is universal, it would not seem unnatural to suppose that there are
certain salient features of that reality which are more readily
lexicalised than others. Lyons suggests two kinds of
salience, biological salience and cultural salience, and mentions
that it may be impossible sometimes to draw a line between the two.
Psychological saliency of lexemes is another kind of saliency and
there are certain indices of such saliency such as priority in
order of listing, frequency of listing, and frequency of recall.
(Romney and D'Andrade, 1964, Battig and Montague, 1968, Lehrer,
1974). There is a possible link between the psychological
saliency of colour terms as indicated by such indices and the
physiological saliency of colours as determined by the physiology
of colour vision. Both types of saliency are linked to the notion
of the basic colour term, and I shall discuss those links in detail
in later sections.

If the semantic structure of each language is not unique then
there must be certain features of semantic structure which are
common to some, and in some cases perhaps, to all languages. A
consideration of this possibility has led linguists to a search for
semantic universals. There are two main kinds of universal

in Chomskyan linguistics, formal universals and substantive universals. Chomsky himself gives as an example of a formal semantic universal "the condition that the colour words of a language must subdivide the colour spectrum into continuous segments" (Chomsky, 1969, p.29). An example of a substantive universal in the domain of colour would be that put forward by Berlin and Kay (1969), namely that there is a fixed set of eleven basic colour categories from which each language draws. The number which each language chooses to lexicalise, using a one-word term, may vary from two to eleven, but the set from which each language draws is, according to Berlin and Kay, a universal set. This idea is similar to the Jakobsonian notion of a universal set of phonetic features from which each language draws.

1.2.1. The relativity hypothesis.

The relativity hypothesis, often referred to as the Sapir-Whorf hypothesis, has been much discussed and tested since it was first put forward in the thirties by Whorf who extended the ideas on cultural relativism put forward by Sapir (1921). It is generally accepted now that the original hypothesis was inadequately stated to allow for modern empirical research and in my discussion of the Sapir-Whorf hypothesis I shall concentrate on the research of the past three decades, research that has concentrated on the testing of the hypothesis.

1. For the historical account of the background of the relativity hypothesis, going back to Plato and Aristotle and passing through F. Bacon, Locke, Hamann, Herder and Humboldt, see Penn (1972).
There is a wide difference of opinion as to interpretation of the Sapir-Whorf hypothesis and I shall not go into details of those different interpretations here, but refer the reader to the excellent discussion of the different and conflicting aspects of the hypothesis by Max Black (1959). It has also been pointed out that there is no one Sapir-Whorf hypothesis (Landar, 1966; Penn, 1972). All that I shall say here is that it is important to distinguish between a strong and a weak interpretation. A strong form of the hypothesis would assert that language determines cognitive processes, whereas a weak form would state, with more caution, that there may be some influence of language on cognitive processes.

1.2.2. The testing of the Whorfian hypothesis.

Recent work on the Sapir-Whorf hypothesis has concentrated on rigorous testing. Before one can do this one has to try to arrive at some idea of its scope. Fishman (1960) points out that there are various levels at which the Whorfian hypothesis may be studied. The first level is, according to Fishman, the least novel level, and it is the level at which most linguists (as opposed to cognitive psychologists, for example) have studied the hypothesis. At this level it is the lexical store or semantic structure that is studied. At this level it is noted that language X has a single term for phenomenon x, whereas language Y has no term (and therefore refers to the phenomenon by a circumlocution) or else has perhaps three terms. The well-known example of the many Eskimo words for snow comes to mind at this point as well as the colour terms mentioned in section 1.1.2. It is indisputable that languages differ in this way. At this level one is concerned only with language and language
behaviour. One is concerned with codifiability and relative ease of
designation. It is important to note that at this level one is
concerned not with all-or-none differences but with what Fishman
calls 'relative ease of designation'. He quotes Hockett (1954);
"languages differ not so much as to what can be said in them, but
rather as to what it is relatively easy to say in them".

Given that languages are not completely isomorphic in their
lexical structure, what remains to be tested? I would say that
what remains to be tested is the hypothesis of extreme linguistic
relativity, namely that each language codifies experience in a unique
and arbitrary way. In relation to colour vocabularies this would
mean saying, with Hjelmslev, that each language divides up the colour
array into sections in an arbitrary way. This is the assumption that
has been challenged by Berlin and Kay (1969) and which I shall examine
and test at various points in this dissertation. Such testing must
inevitably entail a search for language universals and, as Marshall
(1965) points out the search for universals has become more urgent
than the demonstration of instances of linguistic relativity.
Testing on this level is what Fishman calls the language-language
behaviour level. It is important to compare results of testing on
this level with results of testing on other levels so that an overall
picture may be obtained of the relation between language and
cognition, and I shall mention those levels briefly here.

At level two the relation is between language and non-language
behaviour, such as learning and recall. Testing in this area has
been done by cognitive psychologists such as Lenneberg, (1955, 1957,
1961), Brown and Lenneberg (1954). As Julia Penn (1972) points out
experiments up to 1957 tend to support the Whorfian hypothesis that
language influences cognition, but later experiments (Lenneberg,
1961) tend to cast doubt on it. I discuss those experiments in some
detail in Chapter 10.

The other two levels described by Fishman, at which the Whorfian
hypothesis may be studied, are concerned with syntactic structure
and are not therefore relevant to my own research. I shall mention
only Whorf's own work on Hopi and Nootka (Whorf, 1956), and, in the
area of cognitive psychology, the work done by Carroll and Cassagrande
(1958).

1.3.1. Berlin and Kay and the Whorfian hypothesis.

One of the most extensive and important pieces of testing of
the Whorfian hypothesis in recent years has been done by Berlin and
Kay (1969) on colour vocabularies. Since their work has had such
influence on all future research in this area I shall discuss it in
some detail.

1.3.2. Berlin and Kay's hypothesis.

Berlin and Kay set out to show that semantic universals exist
in the domain of colour and that moreover "these universals appear
to be related to the historical development of all languages in a way
that can be properly termed evolutionary" (Berlin and Kay, 1969,
p.1). The first thing to be kept in mind is that Berlin and Kay
argue against an extreme form of the Whorfian hypothesis, and it is
when seen against this background that their views seem revolutionary.
Many others consider that the Whorfian hypothesis is untenable in
its extreme form (for example, Lyons, 1963).
Berlin and Kay loosely (their own term) state the Whorfian hypothesis and their views against it thus:
"The prevailing doctrine of American linguists and anthropologists has, in this century, been that of extreme linguistic relativity. Briefly, the doctrine of extreme linguistic relativity holds that each language performs the coding of experience into sound in a unique manner. Hence, each language is semantically arbitrary relative to every other language. According to this view, the search for semantic universals is fruitless in principle. The doctrine is chiefly associated in America with the names of Edward Sapir and B. L. Whorf. Proponents of this view frequently offer as a paradigm example the alleged total semantic arbitrariness of the lexical coding of colour. We suspect that this allegation of total arbitrariness in the way languages segment the colour space is a gross overstatement". (Berlin and Kay, 1969, 1-2).

Berlin and Kay came to their own hypothesis through intuitive experience in several languages of three unrelated major stocks and a feeling that colour words translate too easily among various pairs of unrelated languages for the extreme linguistic relativity thesis to hold. This is not a new argument against the extreme Whorfian hypothesis (Lyons, 1971, 43-44).

1.3.3. Berlin and Kay's data.

Berlin and Kay collected data from informants in twenty languages drawn from a number of unrelated language families and supplemented it with data from written records. They sampled ninety-eight languages in all.
Berlin and Kay have been criticised for using data obtained at second hand from written sources for seventy-eight of the languages tested. They have also been criticised for using, in some cases, only one informant. Nevertheless the breadth of sampling across languages is impressive and since 1969 researchers have been prompted to supplement Berlin and Kay's data with data from other languages. Some of those languages are discussed in Chapter 10. My own data is drawn mainly from French, but I present some data from Modern Standard Welsh and from Zulu (Appendices 10 and 11). The data from Welsh shows that the colour system of modern spoken Welsh (as opposed to the literary Welsh to which Hjelmslev refers) is the same as that of modern spoken English, and it confirms Berlin and Kay's universalist hypothesis. The data from Zulu is interesting in that it refutes Berlin and Kay's evolutionary hypothesis (1.3.6), or at least suggests that it may have to be modified.  

1.3.4. Berlin and Kay's findings.

Berlin and Kay's results confirm their universalist hypothesis and, in their own words, "cast doubt on the commonly held belief that each language segments the three-dimensional color continuum arbitrarily and independently of each other language".

1)Since completion of this research, the results of which are contained in this dissertation, Paul Kay has published a paper suggesting modifications of his original hypothesis, and it is interesting to note that, although Zulu is not one of the languages he mentions, the data from Zulu would confirm some of his revised ideas. (Kay, 1975).
1.3.5. A set of eleven basic colour categories.

According to Berlin and Kay the smallest number of basic colour terms in any one language is two, and they give nine instances of two-term languages (p.152 - 156). The highest number of basic terms in any one language is eleven, and Berlin and Kay list twenty languages showing this number. No European languages with fewer than eleven basic terms are listed and it is probable that there are no modern European languages in this category. (Berlin and Kay give Homeric Greek as an example of a language with only five basic terms).

Two languages, according to Berlin and Kay, appear to have twelve basic terms. Hungarian appears to have two basic terms for red; 'piros' and 'vörös'. Russian appears to have two basic terms for blue; 'sinij' and 'goluboy'. It may be that French has two basic terms for brown, 'brun' and 'marron', although, since the term 'marron' is applied to the fruit having that colour, its status as a basic term is open to doubt (See below 3.1.2. and 6.1.1.).

1.3.6. The evolutionary hypothesis.

While testing their main hypothesis, Berlin and Kay came across something new and totally unexpected. They found that if a language encodes fewer than eleven basic colour categories, then there are strict limitations on which categories it may encode. They list the distributional restrictions of colour terms across languages thus:

1. All languages contain terms for black and white (light and dark).
2. If a language contains three terms, then it contains a term for red.
3. If a language contains four terms, then it contains a term for either green or yellow (but not both).
4. If a language contains five terms then it contains terms for both green and yellow.

5. If a language contains six terms, then it contains a term for blue.

6. If a language contains seven terms, then it contains a term for brown.

7. If a language contains eight or more terms, then it contains a term for purple, pink, orange and grey.

Berlin and Kay found that out of the 2,048 possible combinations of the eleven basic categories only 22 are actually found, and that moreover the twenty-two types which do occur are not unrelated but may be summarized by (or generated from) a rather simple rule, which they represent thus:

\[
\begin{align*}
\text{white} & < \text{red} < \text{green} < \text{blue} < \text{brown} < \\
\text{black} & \quad \text{purple} \\
\text{yellow} & \quad \text{pink} \\
\text{} & \quad \text{orange} \\
\text{} & \quad \text{grey}
\end{align*}
\]

Berlin and Kay argue that the above rule represents not only a distributional statement for contemporary languages but also the chronological order of the lexical encoding of basic colour categories in each language. I think that more evidence will have to be adduced from historical linguistics to support the second claim, but it is nevertheless an interesting hypothesis that languages may not only acquire but also lose colour terms in a certain fixed order. It is however clear from the evidence of the ninety-eight languages sampled by Berlin and Kay that, with one or two minor exceptions, the partial ordering rule applies to contemporary languages. Although the above representation of the ordering rule shows six equivalence
classes, there are seven stages in the evolution, because it was found that the yellow-green class corresponds to two stages. This is shown by the following representation of the evolutionary order:

\[
\text{white} \rightarrow \text{red} \rightarrow \text{green} \rightarrow \text{yellow} \rightarrow \text{blue} \rightarrow \text{brown} \rightarrow \text{purple}
\]

\[
\text{black} \rightarrow \text{green} \rightarrow \text{blue} \rightarrow \text{brown} \rightarrow \text{orange} \rightarrow \text{grey}
\]

A language with only two terms is referred to throughout Berlin and Kay's work as a Stage 1 language, and so on up to Stage 7.

Obvious extensions of research into the evolutionary hypothesis would be in the field of language acquisition. Lyons (1972, 17) points to the possibility that children may learn the denotation of colour terms in the same 'natural' order. It would not be within my scope to examine this, as such research lies within the field of psycholinguistics.

I did test, however, the possibility that informants may list colour terms in a certain 'natural' order and from my results it appears that there is some correlation between order of listing and Berlin and Kay's evolutionary order (4.3.).

1.3.7. Berlin and Kay's methodology.

A full description of Berlin and Kay's methodology is to be found in Basic Color Terms (5ff.). Briefly, the data was gathered in two stages. Firstly, the basic colour words were elicited from the informant. Secondly, each subject was instructed to map both the focal point (best example) and the boundary of each of his basic colour terms on the array of standard colour stimuli provided (329 Munsell colour chips mounted on stiff cardboard and covered with clear acetate.)
1.3.8. The notion of basic colour term.

Berlin and Kay lay down certain criteria for basic colour terms. Everyone may not have the same idea of what a basic colour term is, and any criteria must be to some extent arbitrary, but provided Berlin and Kay's criteria are applied consistently, they enable researchers to make meaningful comparisons across languages.

Since I intend to apply Berlin and Kay's criteria to French colour terms I shall set them down here.

Ideally each basic colour term exhibits the following characteristics:

(i) It is monolexemic; that is its meaning is not predictable from the meaning of its parts (cf Conklin, 1962).
(ii) Its signification is not included in that of any other colour term.
(iii) Its application must not be restricted to a narrow class of objects.
(iv) It must be psychologically salient for informants. Indices of psychological salience include, among others, (1) a tendency to occur at the beginning of elicited lists of terms, (2) stability of reference across informants and across occasions of use and (3) occurrence in the idiolects of all informants.

These criteria suffice in nearly all cases to determine the basic colour terms in a given language. The few doubtful cases that arise are handled by the following subsidiary criteria:--

(v) The doubtful form should have the same distributional potential as the previously established basic terms. For
example, in English, reddish, whitish, and greenish are English words, but *aguaish and *chartreus(e)ish are not.

(vi) Colour terms that denote objects or materials characteristic-ally having that colour are suspect, for example gold, silver, ash. This subsidiary criterion would exclude 'orange' in English if it were a doubtful case according to the basic criteria.

(vii) Recent foreign loan words may be suspect.

(viii) In cases where lexemic status is difficult to assess (see criterion (i)), morphological complexity is given some weight as a secondary criterion. The English term blue-green might be eliminated according to this criterion.

I would make one general criticism of Berlin and Kay's criteria. I think they do not make it clear that they sometimes invoke criteria that belong to the language system (for example the criterion of hyperonymy) and sometimes criteria that belong to what Coseriu would call the language norm (Coseriu and Geckeler; 1974). I would say that the criterion of psychological saliency belongs to the language norm, along with the criterion of frequency. Berlin and Kay did not investigate the relation between basic colour terms and frequency. My own results show that there is such a correlation (2.3.6).

All Berlin and Kay's criteria are linguistic criteria. They do not depend on extra-linguistic notions such as primary colour in physics for example. It is important perhaps to point out that the notion of basic colour term in the Berlin and Kay sense implies the notion of base term in morphology but it is a wider notion. Basic
colour terms may not be derived terms (criterion i). It is also likely that they will have derived forms (criterion vi). I shall examine the latter possibility more closely in Chapter 9.

1.4.1. Field theory and colour terms.

The notion of semantic structure is closely bound up with the notion of semantic fields. In addition to the original works by, notably, Trier (1931, 1934) Weisgerber (1930) and Porzig (1950), there have been many discussions and critiques of the notion of semantic field by people such as Basilius (1952), Öhman (1953) Spence (1961), Seiffert (1968) and Lehrer (1974). Structuralists on both sides of the Atlantic have taken up the notion of semantic fields and developed it along their own individual lines. In America the notion has been most fully developed by ethnolinguists and anthropologists such as Conklin (1955, 1957, 1962, 1964), Metzger and Williams (1965), Frake (1964), Berlin, Breedlove and Raven (1968), and they characteristically structure the vocabulary in the form of hierarchical taxonomies. European linguists, on the other hand, concentrate on the structure of the vocabulary seen as a network of relations between lexemes; such relations as opposition and hyponomy (Lyons, 1963, 1971 and forthcoming; Geckeler (1971a, 1971b, 1971c).

I cannot enter into a full discussion of field theory semantics, but shall pick out the salient points and discuss them briefly, concentrating mainly on the application of the notion of field theory to the analysis and description of colour vocabularies.

1.4.2. Lexical and conceptual fields.
Trier's notion of a conceptual field existing independently of, or at least alongside, a lexical field is one that has been retained by contemporary linguists, but it has been modified and extended. Trier's idea that the lexical field divides the conceptual field into parts like a mosaic has been criticised. One criticism is that it does not allow for overlaps and gaps (Spence, 1961, 94; Lehrer, 1974, 16). If we think of the substance of colour as a conceptual area, organized to form a conceptual field (Lyons, forthcoming) we see that there are not only overlaps at the boundaries between hues but also parts of the colour array, which are not readily lexicalised by a one-word expression. I emphasise 'one-word' because, strictly speaking, in lexical fields one should be concerned with single words and not with compounds or phrases. This is one of the differences between lexical fields and taxonomies (Lehrer, 1974). The work of Berlin and Kay (1969) on colour vocabularies has been the most extensive to date and their results show in each of the languages examined by them there is overlapping in the areas of the colour array lexicalised by basic colour terms as well as parts of the colour array which are not covered by a basic term.

1.4.3. Semantic fields and the Whorfian hypothesis.

The idea of lexical and conceptual fields relates to the Whorfian hypothesis (1.2.). Many point out that conceptual fields cannot be defined independently of language, and it is the case that psychologists working with conceptual networks (Wettler, 1973) not only use lexical items in order to label the nodes in their networks but also invoke linguistic notions such as the notion of sense relations, in order to establish the links between the nodes.
At this stage, however, as Lehrer (1974) points out, the relationship between language and thought must be considered an open one.

1.4.4. The delimitation of semantic fields.

One of the difficulties presented by the field theory is that it is not always possible to determine the extent of any one field. Trier's idea of semantic fields joining together "to form in turn fields of higher order, until finally the whole vocabulary is included" (Öhman, 1953, 127) has not been worked out. Most work on semantic fields has been done on small sections of the vocabulary.1 Certain sections of the vocabulary are clearly more easily defined and limited than others. Colour vocabularies fall into this category. As Lehrer points out in respect to the set of cooking terms, which is one of her own examples, "the words in the set have not been agonized over".

It is usually clear which lexical items belong to the lexical field of colour. Only one French informant out of one hundred and fifty-four gave me a term which I would say does not belong to the field of colour. That term was 'chine'. 'Chiné' denotes a mixture of two yarns in weaving. The two yarns may be of different hue, or of different shades of the same hue, but I would not say that the feature (Colour) is one of the criterial semantic features or meaning components of 'chine' whereas all the obvious colour

terms in informants' lists do share that feature. (For the notion of semantic feature as applied to colour terms see 1.4.7.).

Whether the whole of the vocabulary can be covered by semantic fields as Trier suggests is open to doubt. There may be lexemes which do not belong to a lexical field (Lyons, forthcoming). Lehrer (1974) suggests that 'even' and 'only' may be examples of such lexemes, but as she points out, even they are not totally unrelated to the rest of the vocabulary.

1.4.5. **Folk taxonomies and lexical fields.**

I have already pointed out in section 1.4.2. one of the possible differences between taxonomies and lexical fields, namely that in taxonomies compounds and phrases may appear, whereas in lexical fields usually only single words appear. Although Conklin himself does not always use single terms in his classifications (Conklin, 1962), he defines a folk taxonomy as "A system of monolexemically labelled folk segregates related by hierarchic inclusion" (Conklin, 1962a, 128). However other linguists and anthropologists have questioned whether categories must necessarily be monolexemically labelled (Brent, Breedlove and Raven, 1968). It is certainly the case that at the highest point in the hierarchy there is sometimes no monolexemic taxon or 'unique beginner' (Brent et al., 1968; Lehrer 1974, 20). Lehrer in her example of a colour taxonomy places 'color' at the top.

<table>
<thead>
<tr>
<th>color</th>
<th>brown</th>
<th>red</th>
<th>blue</th>
</tr>
</thead>
<tbody>
<tr>
<td>tan</td>
<td>beige</td>
<td>cocoa</td>
<td></td>
</tr>
</tbody>
</table>

Table 1a. (From Lehrer, 1974 P.20)
If one were considering this as a lexical field, rather than a folk taxonomy, one might question the appearance of the entry 'color' on the grounds that 'color' is a noun whereas the other terms in the taxonomy are adjectives. The item has a place in a folk taxonomy, however, because lists of colours could not be elicited without recourse to the 'unique beginner' on the part of the questioner (for procedures of eliciting terms see Metzger and Williams, 1965). One would therefore be unable to find out what the 'folk segregates' of the taxonomy were. According to standard ethnographic procedure, it is through work with informants, and not through introspection, that folk taxonomies are constructed. Berlin and Kay's work on colour terms and much of my own work depends on lists of colour terms elicited from informants.

Colour may be regarded as an example of a folk domain, but one must keep in mind that as such it need not be congruent with what physicists understand by colour (Conklin, 1955). Table 1a shows brown, red and blue as being subsumed under the same taxa and all three as being on the same level. In a folk taxonomy this is satisfactory enough - people would say "brown is a colour", "red is a colour", "blue is a colour". In physics however there is an important distinction between brown on the one hand and between red and blue on the other; the latter are primary colours and the former is not. Black, white and grey raise similar difficulties. In a folk taxonomy one would probably place black, white and grey on the same level as brown, red and blue because most people would list them as colours. There is, however, a difference between chromatic and achromatic colours, and a possible hierarchy would be -
There are no single lexemes with which to label the taxa at the second level. Brown is not easy to place in the 'taxonomy' represented in Table 1b. In the colour array it lies close to the chromatic colours or close to the achromatic colour black, according to its brightness and saturation. There is an argument for saying that, in a folk taxonomy, as opposed to a technical or scientific taxonomy, the level of chromatic versus achromatic does not have a place. One cannot however ignore the chromatic/achromatic distinction where the contrast is functional in language. That is why it is not possible to place the adjective 'coloured' at the top of the taxonomy or lexical hierarchy. In English, and in French, the terms 'coloured' and 'colore' generally denote coloured as opposed to black, white or grey or, very often, coloured as opposed to white.

In a true taxonomy, according to Lehrer (1974), no overlap is allowed. The following example from Lehrer would not be a 'true' taxonomy. It raises important points, however, to which I shall refer back, and so I shall reproduce it here.
A true taxonomy would, presumably, subsume under red only such terms as scarlet, vermilion, crimson and so on; that is to say terms related to red by the relation of hyponomy.

1.4.5. **Sense relations and lexical fields.**

One of Trier's notions about the nature of lexical fields is a key notion in structural semantics. It is the notion that a lexical field is a set of lexemes interrelated in sense. Lyons (1963) investigates the sense relations of incompatibility, hyponymy, synonymy and antonymy. Other linguists, although they do not necessarily subscribe to the field theory, also set up semantic relations between signs based on the logical relations of set theory, especially the relation of inclusion, giving rise to the semantic relations of hyponymy and hyperonymy, and the relation of total overlap, giving rise to the semantic relation of synonymy (Mulder and Hervey, 1972, p.49-50).

In the field of colour the relation of incompatibility holds between the basic colour terms in English. The relation of hyponymy holds between, for example, 'scarlet', 'crimson', 'vermilion' etc. on the one hand, and 'red' on the other. The relation of synonymy is unlikely to hold between basic terms, but may hold between peripheral or non-basic terms. For example Lehrer might have written 'turquoise' instead of 'aqua' to denote a colour overlapping the blue and green areas. For some people of course 'aqua' and 'turquoise' might not be synonyms or even near synonyms. Colour naming of peripheral colours is notoriously idiosyncratic and I shall not attempt an investigation of synonymy in relation to colour terms in French,
except in the case of 'brun' and 'marron' (Chapter 5). The relation of antonymy may possibly hold between certain colour terms such as 'black' and 'white', 'red' and 'green' and 'blue' and 'yellow'. I discuss this question fully in Chapter 7.

Lyons (1963, 2.5.) emphasises the importance of context for semantic analysis and maintains that any meaning relations that are established are established for particular contexts or sets of contexts and not for the totality of the language (Lyons, 1963, p.80). In Chapter 6 I show that colour terms may enter into different relations with other colour terms according to the context in which they occur. In the context of talking about hair, beer or tobacco for example, 'brun' is opposed to 'blond' but in other contexts the opposition may be otherwise.

1.4.6. Homonymy and lexical fields.

The idea that homonyms are lexemes of identical form but belonging to different semantic fields is generally accepted by field theorists and structural semanticists (Lehrer, 1974, p.10; Geckeler, 1972, 124ff). Lehrer gives as an example the term 'orange' belonging to the field of fruit and 'orange' belonging to the field of colour. The same observations apply to the French terms 'orange' and 'marron'. In the case of 'orange' and 'marron' one may apply a further criterion of homonymy, as laid down by Ullmann (1973). The two homonymous terms will have different sets of derived forms. In the case of 'marron' it will be seen that the colour term 'marron' has no derived forms (Chapter 10), and so this will be a zero set. One has, therefore -
marron\(_1\) & \(\emptyset\)  
marron\(_2\) & marronnier  
orange\(_1\) & orange, oranger (verb)  
orange\(_2\) & oranger, orangerie, orangeraie.

It is also the case that homonymous forms enter into different collocations.

I have not taken into consideration, for the purposes of this argument, the existence of a third homonym 'marron' denoting crooked (derived from 'cimarron'), or the figurative use of 'marron' to denote blows. Neither have I distinguished between homonymy and polysemy. Diachronic considerations (e.g. cimarron ≠ marron) may be important in determining whether terms are homonymous or polysemous.

1.4.7. The contribution of Porzig to semantic field theory.

The importance of Porzig's contribution to theories of semantic fields lies in the fact that he insists upon the importance of the notion of syntagmatic relations. The relations discussed in 1.4.5. are paradigmatic ones. Porzig based his theory on relations between verbs and nouns, and between adjectives and nouns. He sees the relation between, for example, bite and teeth as a necessary relation. (Womit beisst man? Natürlich mit den Zähnen) and between, for example, blond and hair, as a necessary relation (Was ist blond? Menschliches Haar). (Porzig, 1950, p.120). Porzig's notion of necessary or essential relations (cf Coseriu's Implikation) are very close to the Firthian notion of collocation, and I shall examine how they apply to colour terms in Chapter 6.
As Porzig himself points out, the above examples show that one cannot bite except with the teeth ("man nichts beissen kann als mit den Zähnen") and only human hair can be blond ("nur das menschliche Haar blond sein kann"). (Porzig, 1950, p.121). He points out, however, that in figurative use the relation is not always a necessary one - one may have a biting pain for example (beissender Schmerz).

1.4.8. Componential analysis and the theory of semantic fields.

Certain sections of the vocabulary are more amenable to componential analysis than others. Lounsbury's study of kinship terms is a key work in componential analysis (Lounsbury, 1952), but although kinship terms and colour terms are often thought of as two of the most favoured domains in structural semantics, very little has been written on the semantic features of colour terms. This is probably because the sensory-perceptual nature of the domain raise difficulties that are not encountered in other domains. The domains of living things, animals or persons, as well as physical objects are very often taken as domains suitable for componential analysis. The following analysis of 'chair' by linguists belonging to two very different schools, one American and one European, show that when one is dealing with certain terms there is a certain consensus of opinion as to the semantic features. The first analysis is from Katz (1972),

(Object), (Physical), (Non-living), (Artifact), (Furniture),
( Portable), (Something with legs), (Something with a back),
(Something with a seat), (Seat for one).
The second is from Pottier (1964)

chaise : $s_1$, $s_2$, $s_3$, $s_4$, (pour s'asseoir, sur pieds, pour une personne, avec dossier).

(In Pottier's analysis $s$ stands for 'seme' or semantic feature). Pottier's four features correspond to Katz's last four. This is not co-incidental. Katz's representation is unordered, unlike his earlier representation of 'bachelor', for example, which was hierarchically ordered (Katz and Fodor, 1963). Nevertheless, the first five or possibly six features of 'chair' in the analysis by Katz could be hierarchically ordered, but the last four could not. (They would be classed as distinguishers in the 1963 analysis). The main difference between Pottier's analysis and that of Katz is that Pottier does not include features of great generality and universality in the analysis into 'semes'. He includes only those features (sèmes) which are criterial for chair (chaise) as opposed to stool (tabouret) etc. The more general universal features he calls 'classemes' ('classeèmes'). Classemes, for Pottier, are binary features such as animate/inanimate, human/non-human. ¹ The notion of classemes is important for the examination of the combinational function of lexemes and it is one to which I shall return when I come to examine collocationally restricted terms (Chapter 6).

¹. Cf Coseriu's notion of classeme (Klasseme) in Coseriu (1967c, 295) and Coseriu and Geckeler (1974, 152).
Katz's analysis of 'chair' shown above does not show his early distinction between markers and distinguishers (Katz and Fodor, 1963; Katz and Postal, 1964). The distinction has been criticised (Bolinger, 1965; Weinreich, 1966) but Katz defends it in later works (Katz, 1972, 1974). Since the distinction has some relevance to the semantic features of colour terms I shall discuss it briefly here.

Semantic markers, according to Katz, represent senses of constituents in the following ways. They reflect the structure of a conceptually complex sense and serve as the formal elements to make the analysis possible. They serve as elements in terms of which semantic generalizations can be made; for example 'chair', 'hat', 'planet', 'shadow', 'car', 'molecule' have (Object) in common whereas 'breadth', 'truth', 'ripple' etc. do not. (Katz, 1972).

Distinguishers, on the other hand, provide a purely denotative distinction which plays the semantic role of separating lexical items that would otherwise be fully synonymous. Distinguishers mark purely perceptual distinctions among the referents of conceptually identical senses (unlike markers which represent conceptual components of senses). These perceptual distinctions can presumably, according to Katz, be defined by a psychological theory of the mechanisms of (visual, auditory, tactile, and so on) perception. (Katz, 1974, 84).

Colour terms will therefore, according to Katz, have distinguishers but not markers, since they mark purely perceptual qualities.

We may of course consider that there is a universal concept
In this case we would say that colour terms, red, green, blue etc., share a semantic marker (Colour) and that what separates them in meaning are the distinguishers [Red], [Green], [Blue]. If we argue that no reasonable line can be drawn between markers and distinguishers (Bierwisch, 1967 quoted in Lehrer, 1974, 50), we can say that (Red) is a semantic marker and we can then say that the term 'crimson', for example, has the semantic markers (Colour) and (Red). In the case of compound terms such as 'reddish' in English or 'rougeatre' in French, one might include a marker (Approximation to a colour).

I have already mentioned the importance of Pottier's classemes for determining the combinatorial possibilities of lexemes. Katz's semantic markers have the same kind of role. According to Katz (1974) selection restrictions are defined in terms of semantic markers not in terms of distinguishers. This is not to say that distinguishers have no role in marking semantic properties and relations, such as semantic ambiguity, synonymy, paraphrase, analyticity etc., in Katz's view. He gives the example of 'Red is green' and points out that in this case we have a perceptual distinction and that the elements between which the antonymy relation holds are distinguishers (Katz, 1974, 85).

It may be that in talking of the semantic components of colour terms it does not matter if we regard them as markers or distinguishers. What is important, however, is that we should make a clear division between what are the linguistic features of the lexeme and what are features of the extra-linguistic world. It would not be correct to assign to colour terms, for example, such features as (X wavelength),
(Y brightness) and so on. These are physical properties of colours, not semantic features.

1.5.1. Primary and secondary structure.

Oppositional relations between lexemes in a lexical field exemplify what Coseriu (1968, 7) calls primary paradigmatic structure. Primary means that "the lexemes are a part of the 'primary vocabulary', i.e. they do not imply other words, but correspond to immediate experience - as opposed to the secondary structures, which constitute the further development of a primary element (domain of word formation)." (Coseriu and Geckeler, 1974). In Chapter 9 I shall discuss derived colour terms in French.

1.6.1. Basic terms and core meaning.

Some lexemes in a lexical field are clearly more basic than others, and in the field of colour terms, this is very obvious. I have already discussed Berlin and Kay's notion of basic colour term (1.3.8.) I shall concentrate mainly on basic colour terms in my research, since it is the relationships between basic terms that most clearly determine the primary paradigmatic structure of a language. It is also basic terms that are most likely to act as base terms at the level of secondary structure (derivation).

It should be kept in mind, however, that there may be no hard and fast division between basic and peripheral terms, and it may be that a colour term which is peripheral in the vocabulary as a whole may be basic in a smaller subset. For example, the French term 'roux' may be judged to be a peripheral term, or at least a non-basic term according to Berlin and Kay's criteria in the vocabulary as a whole, but in the set of colour terms which may be applied to hair it may
be judged to be, if not a basic term in the strict sense of the word, then certainly not a peripheral term (See below, 6. 2).

Berlin and Kay (1969) suggest that basic colour terms may have a core meaning denoting the best example of a colour, which is centred on a very small area of the colour array. Furthermore, these best examples (foci) are universal. I shall test to see whether French informants agree with Berlin and Kay's informants from ninety-eight language groups on which are the foci corresponding to basic colour terms in French (See below, 3.1 and 3.2).

The idea that colour categories, as well as other categories such as shapes, have a core meaning that is given is taken up by Rosch (1973) and I shall discuss her findings in Chapter 10. In Chapter 11 I discuss a related question whether colours are natural nameables.
Chapter 2

COLOUR TERMS IN MODERN FRENCH

2.1.1. The Corpus.

The total number of colour terms in modern French probably runs into thousands. About ten million surface colours can be distinguished by the normal human eye under optimum observing conditions and in theory a language could assign a name to each of these distinguishable colours. In practice this is never done and most colour dictionaries list names for only about one thousand colours. Some of these names are devised for trade purposes and as such are subject to the influences of fashion.

In view of these facts it would be impracticable to take as a corpus all the colour terms in modern French. Even if such a list could be drawn up it would be extremely long, it would be an open list and it would be unstable because colour names come and go according to changes of fashion. Also such a list would contain little used and even idiosyncratic terms. The first two objections, namely length and open-endedness do not in theory preclude such lists from being amenable to linguistic analysis, but in practice such lists would be unwieldy. The second two objections, namely instability and idiosyncracy are valid theoretical objections. A study of colour terms is a study of the language system and not of individual speech utterances.

2) Maerz and Paul (1930, 1950); Ridgway (1912); Plochere (1948).
3) This is not to say that one can study the one in complete isolation from the other.
For the synchronic linguist's purpose the language system must be considered to be stable, and it must be considered to be conventional, that is to say its grammar and lexicon must be shared by subjects belonging to the same speech community.¹

The system of colour terms is already a sub-system of the larger system of the language as a whole, and for purposes of analysis it is desirable to divide that sub-system into smaller sub-systems. Any such sub-division must be to some extent arbitrary, to begin with at any rate, and I decided to give my attention to the principal colour terms in modern French. But what are the principal colour terms? There is no ready-made list of such terms and such a list has to be elicited either from informants or from written sources.

2.1.2. Written Sources.

I shall consider the latter first. The most obvious kind of written source of colour terms is a monolingual or bilingual dictionary. Unless however the dictionary lists all the principal colour terms in one place, as does the ROBERT ² under the entry 'couleur', one's search is likely to be long and arduous and the list will be just as comprehensive as the dictionary one happens to have chosen.

1). This is one of the basic tenets of both Saussurian-based structuralism and of transformational grammar. It has been recently challenged however. See especially Paul Kay, "Synchronic variability and diachronic change in basic color terms" (1973).

2). I shall refer to the large dictionary in six volumes as the ROBERT and to the small dictionary as the PETIT ROBERT.
Word lists are another kind of written source and these often have the advantage of a thesaurus type of presentation, where one can find lists of colour words under a general heading such as 'couleurs' \(^1\) or 'les sensations et les perceptions'. \(^2\) Very often however such lists are not accompanied by any description of the method which led to their compilation. Where such lists are accompanied by such an account \(^3\) one still has to search through alphabetical lists and pick out the colour words from all the others. This is more easily done in word lists than in a large dictionary, since word lists are usually limited to a fairly small number of basic words. \(^4\) This may, however, be a disadvantage since one is liable to end up with a very small sample - twelve words only if one consults *Le Français Fondamental (2\(^{me}\) degré)*. Word lists like those of Henmon, Vander Beke and Gougenheim do however give useful information about the frequency of use of the various terms and this will be discussed later.

Written texts, literary and non-literary, are possible sources of colour words, but one would have to read thousands of texts before one could establish even a list of the principal colours, and in practice one would not think of doing this. What one can do is to consult a computer corpus such as that of the T.L.F. at Nancy.

1). B. Pautex, 1923, 7th ed. reviewed by Bally.
3). The word lists of Henmon, Vander Beke, *Le Français Fondamental*.
4). 3000 in the case of *Le Français Fondamental (2\(^{me}\) degré)*.
This is a corpus of over 90 million words, drawn from mainly literary texts of the 19th and 20th centuries. All the colour terms from those works can be found printed out in various ways. This will be discussed in a later section.

2.1.3. Oral Sources.

There are two ways (at least) of extracting information about words from oral sources. One can listen to tape-recordings, made by oneself or someone else, of spoken texts, and extract all the colour words. This method would have the same disadvantage as that of reading texts; one would end up with a short list of words which might not justify the time and trouble taken.

A more direct and quicker method is to work with native informants and this is the method I have used. Since direct access to native speakers was limited, I used the questionnaire method as well, and this method will be described in detail in a later chapter.

2.2.1. Work with Informants.

The work done with French speakers falls into two parts. In the first part informants were interviewed separately and a list of colour terms in French was elicited from each one. The lists were then examined and a shorter list of basic terms was drawn up, according to certain criteria, which will be discussed later.

1). I have also consulted dictionaries, word-lists and print-outs from the T.L.F. as well as using my own intuitions about colour terms in French, but my main corpus is the list of colour terms obtained from native speakers.
In the second part informants were asked to mark on a colour chart the focal point and the outer boundary of each of the basic colour terms elicited in part one. This mapping exercise is fully described in a later chapter.

2.2.2. Eliciting the Terms

Thirteen informants were interviewed separately. Of these, ten were women and three were men. Ages ranged from 20 to 50. Informants were unpaid. All were native French speakers and four of them had lived in Britain for several years. Each informant was interviewed once and interviews lasted for up to one hour. Interviews were conducted entirely in French. Conversations were transcribed by hand rather than tape-recorded, partly for practical reasons and partly because I thought that the presence of a tape recorder might make informants’ responses less spontaneous.

I began the interview by asking the informant to name the colours in French (The form of the request was "dites-moi" (or "donnez-moi") les noms des couleurs en français."). Although my eventual aim was to isolate the principal colours I did not ask the informant for principal colours. As will emerge, informants did in fact tend to start their lists with basic terms and then go on to non-basic terms. They sometimes paused after giving me the first few and asked if I wanted compounds. I noted pauses and groupings. I encouraged informants to go on until they appeared to have great difficulty in thinking of a new term. Informants’ individual lists are to be found in Appendix 4.

1). This follows the method used by Berlin and Kay (1969).
2.2.3. **Analysis of Informants' Lists.**

There are two ways of looking at lists obtained in this way. One can regard them as being ordered lists or one can regard them as being unordered lists. It is useful to do both.

If one regards the lists as being unordered, one obtains information about such things as the total number of words elicited and the frequency of mention of the various words. I shall look at these two things first.

2.2.4. **Total number of words elicited.**

The total number of words elicited from thirteen subjects was 351 and the number of different colour terms was 126. These 126 terms constitute the data for the first stage of the research. The complete list of colour terms elicited from informants is to be found in Appendix 5.

2.2.5. **Frequency of mention.**

The frequency with which terms were mentioned varied from 1 mention (for unusual terms such as 'aubergine' and 'alezan') to 13 mentions (for common terms such as 'rouge' and 'orange'.) The following table shows the terms with a frequency of mention of 5 or over :-
Table 1 - Colour terms mentioned by five or more informants.

<table>
<thead>
<tr>
<th>Colour Term</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>rouge</td>
<td>13</td>
</tr>
<tr>
<td>orange</td>
<td>13</td>
</tr>
<tr>
<td>bleu</td>
<td>12</td>
</tr>
<tr>
<td>marron</td>
<td>12</td>
</tr>
<tr>
<td>gris</td>
<td>11</td>
</tr>
<tr>
<td>jaune</td>
<td>11</td>
</tr>
<tr>
<td>vert</td>
<td>11</td>
</tr>
<tr>
<td>violet</td>
<td>11</td>
</tr>
<tr>
<td>blanc</td>
<td>10</td>
</tr>
<tr>
<td>noir</td>
<td>10</td>
</tr>
<tr>
<td>rose</td>
<td>10</td>
</tr>
<tr>
<td>beige</td>
<td>9</td>
</tr>
<tr>
<td>brun</td>
<td>8</td>
</tr>
<tr>
<td>mauve</td>
<td>7</td>
</tr>
<tr>
<td>pourpre</td>
<td>7</td>
</tr>
<tr>
<td>crème</td>
<td>6</td>
</tr>
<tr>
<td>bleu-ciel</td>
<td>6</td>
</tr>
<tr>
<td>ocre</td>
<td>5</td>
</tr>
<tr>
<td>roux</td>
<td>5</td>
</tr>
</tbody>
</table>

It will be noted that the terms designating Berlin and Kay's eleven basic categories have a high frequency of mention in the lists elicited from informants. In fact if one draws an arbitrary line at 10 one can say that Berlin and Kay's basis terms are those terms having a frequency of ten or over in the elicited lists. (This would
be making the assumption that the term designating the category brown is 'marron' and not 'brun' in French, an assumption not warranted, at least at this stage). Since however it is completely arbitrary to draw the line at 10, the terms with a lower frequency must still be considered as possible basic terms until ruled out by other criteria. It will be seen at a later stage that there are in fact good reasons for considering that all the terms with a frequency lower than 10 in informants' lists, with the possible exception of 'brun', are not in fact basic terms. In the meantime however they should be kept in mind as border-line cases.

2.3.1 A comparison of frequency lists.

In order to compare the frequency with which informants mentioned colour words in lists with frequency counts of colour words in published word lists, three published sources were examined. They were A French Word List, by Vander Beke, L'Elaboration du Francais Fondamental (1er degré), by Gougenheim, Rivenc, Michea, Sauvageot, and Le Dictionnaire des Fréquences du T.L.F.

2.3.2 In Vander Beke eleven colour terms are listed. Of those eleven one term, 'rose', is listed without any indication of whether it is the flower or the colour, and therefore there is no way of telling the frequency of the colour term. The frequency given in Vander Beke is the absolute frequency, that is the total number of occurrences of the word. The total number of occurrences in Vander Beke's corpus is 1,147,746. In order to compare the frequency of words in V.B. with the frequency of words in other word lists where the total number of occurrences is different it is necessary to
calculate the relative frequency. The relative frequency, by convention, relates to a corpus of 100 million occurrences. Table 2 shows the absolute and relative frequency of colour words in Vander Beke, in decreasing order.

Table 2 - Colour terms in Vander Beke.

<table>
<thead>
<tr>
<th></th>
<th>Absolute frequency</th>
<th>Relative frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>blanc</td>
<td>........... 268</td>
<td>23,350</td>
</tr>
<tr>
<td>noir</td>
<td>........... 248</td>
<td>21,607</td>
</tr>
<tr>
<td>bleu</td>
<td>........... 174</td>
<td>15,160</td>
</tr>
<tr>
<td>rouge</td>
<td>........... 172</td>
<td>14,985</td>
</tr>
<tr>
<td>vert</td>
<td>........... 82</td>
<td>7,144</td>
</tr>
<tr>
<td>gris</td>
<td>........... 72</td>
<td>6,273</td>
</tr>
<tr>
<td>jaune</td>
<td>........... 46</td>
<td>4,007</td>
</tr>
<tr>
<td>brun</td>
<td>........... 29</td>
<td>2,526</td>
</tr>
<tr>
<td>pourpre</td>
<td>........... 12</td>
<td>1,045</td>
</tr>
<tr>
<td>azur</td>
<td>........... 11</td>
<td>958</td>
</tr>
<tr>
<td>mauve</td>
<td>........... 6</td>
<td>522</td>
</tr>
</tbody>
</table>

Nine of Berlin and Kay's basic terms appear in Vander Beke. 'Orange' and 'violet' do not appear. 'Mauve' and 'pourpre' do appear but if, as seems likely, the meanings of 'mauve' and 'pourpre' are included in the meanings of other terms, they cannot be considered to be basic. This point will be more fully discussed in Chapter 3. The reasons for the inclusion of 'mauve' and 'pourpre' and the exclusion of 'violet' may be that Vander Beke's sources were mainly literary and dated from
The histogram in Figure 1 shows the relative frequency in decreasing order of what I shall consider for the moment to be the eight basic colour terms contained in Vander Beke.
Histogram showing relative frequency, in decreasing order, of eight colour terms in *Vander Deke*.

Histogram showing relative frequency, in decreasing order, of six colour terms in *Le Francais Fondamental (1er. degre)*.
2.3.3. Le Français Fondamental (1ère degré) gives the frequency of only six colour terms.¹ Unlike Vander Beke the authors of Le Français Fondamental examine mainly spoken sources, and it has a corpus of 312,135 occurrences. The final list from which the six colour terms were extracted contains only words with an absolute frequency of 20 or over. Table 3 shows the absolute and relative frequency of the colour terms in Le Français Fondamental (1ère degré), in decreasing order.

Table 3 - Colour terms in Le Français Fondamental.

<table>
<thead>
<tr>
<th></th>
<th>Absolute frequency</th>
<th>Relative frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>noir</td>
<td>............</td>
<td>47</td>
</tr>
<tr>
<td>blanc</td>
<td>............</td>
<td>45</td>
</tr>
<tr>
<td>rouge</td>
<td>............</td>
<td>36</td>
</tr>
<tr>
<td>bleu</td>
<td>............</td>
<td>30</td>
</tr>
<tr>
<td>vert</td>
<td>............</td>
<td>29</td>
</tr>
<tr>
<td>jaune</td>
<td>............</td>
<td>21</td>
</tr>
</tbody>
</table>

The histogram in Figure 2 shows the relative frequency, in decreasing order, of the six colour terms contained in Le Français Fondamental.

¹) There are 12 colour terms in Le Dictionnaire du français fondamental (2ème degré) but no note of their frequency.
2.3.4. In *Le Dictionnaire des Fréquences* du T.L.F. there are many more colour terms than in either of the two word lists examined so far. The corpus is much larger - 37,653,685 words for the twentieth century from mainly literary texts. It is not my purpose to examine at this point all the colour terms in *Le Dictionnaire des Fréquences*, but mainly those terms used to designate Berlin and Kay's eleven basic categories. Table 4 shows twelve such terms, including two to cover the category BROWN, namely 'brun' and 'marron'. Frequencies are for the twentieth century only.

**Table 4 - Twelve colour terms in Le Dictionnaire des Fréquences**

<table>
<thead>
<tr>
<th>Term</th>
<th>Absolute frequency</th>
<th>Relative frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>noir</td>
<td>14,198</td>
<td>37,706</td>
</tr>
<tr>
<td>blanc/blanche</td>
<td>12,758</td>
<td>33,882</td>
</tr>
<tr>
<td>rouge</td>
<td>7,914</td>
<td>21,017</td>
</tr>
<tr>
<td>bleu</td>
<td>6,328</td>
<td>16,805</td>
</tr>
<tr>
<td>rose</td>
<td>5,413</td>
<td>14,375</td>
</tr>
<tr>
<td>vert</td>
<td>4,449</td>
<td>11,815</td>
</tr>
<tr>
<td>gris</td>
<td>3,890</td>
<td>10,330</td>
</tr>
<tr>
<td>jaune</td>
<td>3,121</td>
<td>8,288</td>
</tr>
<tr>
<td>brun/brune</td>
<td>1,734</td>
<td>4,604</td>
</tr>
<tr>
<td>orange</td>
<td>443</td>
<td>1,176</td>
</tr>
<tr>
<td>violet</td>
<td>413</td>
<td>1,096</td>
</tr>
<tr>
<td>marron (ADJ)</td>
<td>100</td>
<td>265</td>
</tr>
</tbody>
</table>
It should be noted that Le Dictionnaire des Fréquences gives separate entries for MARRON, noun, and MARRON, adjective, and we can therefore see clearly the frequency of the colour term. It is clear from the explanatory notes contained in the introduction to the Dictionnaire des Fréquences that MARRON, noun, refers to the fruit and not to the colour term used as a noun in such sentences as le marron ne me va pas, meaning "brown does not suit me". No specific mention is made of colour terms but it is explained that forms such as beau used as an adjective and beau used in expressions such as 'le beau' meaning "that which is beautiful", are not considered to be homographs. This explains why most of the colour terms in Table 4 are not marked as homographs. The fact that there are no separate entries for colour terms used as adjectives and for colour terms used as nouns indicates that, when there is a separate entry, as for MARRON, then the object and not the colour is being referred to by the lexeme under the heading of noun. There is, however, no separate entry for ROSE, noun, and ROSE, adjective, and it is therefore impossible to know from the frequency counts whether the reference is to the flower or to the colour.

Similarly there are no separate entries under ORANGE. The fact that the entries ROSE and ORANGE are marked as homographs does not help us decide. ROSE is a homograph, because the form rose may stand for a colour or for part of the verb ROSE, meaning "to make pink". ORANGE is considered to be a homograph for similar reasons. GRIS is a homograph because the form grise may stand for a colour or for part of the verb GRISER. Since the citation form of adjectives is considered to be the masculine singular form the entry is under GRIS.

I have been unable to find an explanation in the Dictionnaire des Fréquences for the fact that, whereas for most colour terms an
entry is given under the masculine singular form only, in the case of BLANC and BRUN entries are also given under the feminine singular form. Entries under BLANCHE and BRUNE are too numerous to be accounted for by such rare uses of 'blanche' as a noun to denote the white ball in billiards or of 'brune' to denote twilight. In any case these are probably further examples along the lines of 'beau' and 'le beau'. In Table 4 I have added together the frequencies of the masculine and feminine forms of these terms.

The histogram in Figure 3 shows the relative frequency of eleven colour terms in Le Dictionnaire des Fréquences. 'Rose' is omitted because its high frequency is probably due to the fact that the term designates the flower as well as the colour.

2.3.5. A Comparison of Frequency Counts.

The histogram in Figure 4 shows a comparison of the relative frequency of eleven colour terms in the three sources.

It is impossible to compare directly the frequency of mention of colour terms by informants with the frequencies given in the three word lists, since they do not occur in comparable contexts. Certain comparisons can be made however. The eleven words most frequently mentioned by informants correspond to Berlin and Kay's basic categories, and they in turn correspond to the eleven colour terms with the highest frequency in Le Dictionnaire des Fréquences. In the shorter list of Vander Beke the nine colour terms with the highest frequency are drawn from Berlin and Kay's eleven basic categories, and in the short list of Le Français Fondamental the six colour terms, chosen for inclusion by virtue of their high frequency in the language as a whole, are also drawn from Berlin and Kay's basic eleven.
2.3.6. Correlation between frequency and basicness of colour terms.

There seems to be a correlation not only between the frequency with which informants list terms and the overall frequency of terms in the language as shown in word lists, but also between the frequency of colour terms and their basicness.

2.3.7. Correlation between frequency and evolutionary ordering of colour terms.

A further correlation seems likely. There appears to be some correlation between the evolutionary order posited by Berlin and Kay and the order of frequency both in informants' lists and in published word lists and frequency dictionaries. Berlin & Kay's evolutionary order is:

- black \rightarrow red \rightarrow green \rightarrow yellow \rightarrow blue \rightarrow brown \rightarrow purple
- white \rightarrow red \rightarrow yellow \rightarrow green

The correlation is closest in Le Francais Fondamental, where the order is noir, blanc, rouge, bleu, vert, jaune. The only term out of order here is 'bleu', and some of my later results, which are based on a larger corpus, point to 'bleu' being a relatively important term in respect not only to frequency but to psychological saliency.
Figure 3. Histogram showing the relative frequency of colour terms in the Dict. des Frequentes du TLF.

Figure 4. Comparison of relative frequencies of 11 colour terms in TLP(X), Vander Beke(o) and Fr. Fond.(•).
Chapter 3

MAPPING THE BASIC COLOUR TERMS IN FRENCH

3.1.1. Extracting the basic terms.

From the total list of different colour terms elicited from informants, 126 terms in all, I extracted the basic terms, and informants were then asked to map these basic terms according to a procedure closely resembling that used by Berlin and Kay (1969).

The method I used to extract the basic terms from the list was this. I picked out the terms which seemed to correspond to Berlin and Kay's basic categories. They were:

- white - blanc
- black - noir
- red - rouge
- green - vert
- yellow - jaune
- blue - bleu
- brown - marron, brun
- purple - violet
- pink - rose
- orange - orange
- grey - gris

I applied Berlin and Kay's four main criteria for basic colour terms to the French terms in the list. I have already listed Berlin and Kay's criteria in Chapter 1. According to those criteria 'blanc', 'noir', 'rouge', 'vert', 'jaune', and 'bleu' clearly emerge as basic terms. These terms also have a high frequency not only in
informants' lists but also in the language as a whole.

The remaining six terms are less clearly defined as basic. For example, there appear to be two terms in French to correspond to the category brown, and I examined each one to see if perhaps one of them could be eliminated.

3.1.2. MARRON.

On applying Berlin and Kay's criteria I found the following:-

1). 'Marron' is monolexemic.

2). As far as can be judged from information elicited from informants the signification of 'marron' is not included in that of any other colour term; no informant indicated that 'marron' was a kind of 'brun' for example. Indeed two informants indicated that 'marron' was the general term ("le terme général" or "le terme generique").

3). The application of 'marron' does not seem to be restricted to a narrow class of objects. This finding is confirmed by later information from 100 questionnaires and from the texts of the T.L.F.

4). 'Marron' is psychologically salient for informants. That is to say that -

a) It has a tendency to occur at the beginning of lists.

b) It has a stability of reference across informants and occasions of use.

1). This is borne out by the mapping exercise. See especially Fig. 5 which shows the area designated by the term 'brun' as being included within that designated by 'marron'.
c) It occurs in the idiolects of all informants
(12 out of 13 mentioned it and all informants recognize its existence as a colour term they would use even if they do not mention it.)

Since there is a question mark at criterion (3), I applied Berlin and Kay’s four subsidiary criteria and found the following:

5) 'Marron' does not have the same distributional potential as previously established basic terms. For example one cannot say 'marronâtre', but one can say 'blanchâtre', 'noirâtre', 'rougeâtre', 'verdâtre' and 'jaunâtre'.

6) One cannot say that 'marron' does not also denote the thing characteristically having that colour. It is not easy to tell, certainly not without psychological tests, to what extent speakers still associate the colour term with the fruit, but the fact that 'marron' is usually invariable, i.e. is not inflected for gender or number, may indicate that there is still some association and that 'marron' is felt to be in some way different from other common colour adjectives. In certain recent texts, however, 'marron' does appear with plural-s.

1. For example in Roger Vailland (1945), "les yeux marrons", and in Aragon (1936), "les mous gris, marrons, noirs".
6) Contd. There is no consistency here however and it may be that 'marron' is changing from an invariable adjective to a variable adjective as its association with the fruit weakens.

7) 'Marron' is not a recent foreign loan word.

8) 'Marron' is not morphologically complex.

There are therefore two points on which 'marron' is suspect as a basic term: it may be a hyponym of 'brun', and it is the name of the thing characteristically having that colour.

If however frequency of mention is a criterion then 'marron' would be accepted as a basic term. In informants' lists its frequency is high (12 out of 13). Its overall frequency in the texts of the T.L.F. is relatively high for a colour term.

It appears therefore that 'marron' is at least quite likely to be a basic term and it should certainly be retained at this stage of the investigation at least.

3.1.3. BRUN

Brun was next considered as a basic term, and the following was found:

1) It is monolexemic.

2) Its signification may be included in that of 'marron'. Two out of the thirteen informants said explicitly that this was so. One cannot, however, reach a conclusion on this point at such an early stage on the basis of information from two informants. Nevertheless, later tests and
2) Contd. inquiries indicate that 'brun' may indeed be included in 'marron'.

3) The application of 'brun' may be restricted to a narrow class of objects. Evidence gained at first hand from informants indicates that 'brun' may be restricted to hair, skin and eyes. However, evidence from the T.L.F. texts does not corroborate this conclusively and at this stage a question mark must remain at 'brun' as regards this criterion.

4) 'Brun' is psychologically salient for informants. It has a tendency to occur at the beginning of lists; it appears to have stability of reference across informants and occasion of use; it occurs in the idiolects of all informants.

Since there was some doubt about whether or not 'brun' fulfilled criteria (2) and (3), I applied the subsidiary criteria and found that:

5) 'Brun' has the same distributional potential as previously established basic terms such as 'blanc', 'noir', 'bleu', 'rouge', 'vert' and 'jaune', in that it can take the suffix -atre, and has the verb form 'brunir'.

6) 'Brun' is not the name of an object.

7) 'Brun' is not a recent loan word.

8) 'Brun' is not morphologically complex.

Evidence against 'brun' being a basic term is not conclusive at this stage and I therefore decided to retain both 'brun' and 'marron' as basic terms for the moment.

2. See especially Figure 5.
Figure 5. Composite areas for 'brun' and 'marron' for 15 informants.
The area designated as 'brun' is enclosed in dotted lines.
The area designated as 'marron' is enclosed in solid lines.
3.1.4. **VIOLET.**

I have given 'violet' as the basic term for the category 'purple' but the term 'mauve' should also be considered either as a replacement term for violet or as a co-term in the way that, for the moment, 'brun' and 'marron' are being considered as co-terms for the category brown.

I shall apply the main criteria to both 'violet' and 'mauve'.

1) Both 'violet' and 'mauve' are monolexemic.

2) The meaning of 'violet' does not seem to be included in the meaning of any other colour term. No informant indicated for example that the colour denoted by 'violet' was a shade of the colour denoted by 'mauve'. However several informants indicated that they considered that the colour denoted by 'mauve' was a shade of that denoted by 'violet'. One informant (C) said that 'mauve' was a variation ('variation' in French) and she classed it along with such terms as 'grenat' and 'vieux rouge'. Others considered the colour denoted by 'mauve' to be a kind of 'purple' but informants do not agree as to whether it is a lighter or darker variation. One informant (A) gave the group,

```
lilas
mauve
violet
aubergine
```

For her 'mauve' denoted a dark colour. ('C'est foncé').
Another informant (F) gave the group,

violet
lilas
mauve
pourpre

For her also the colour denoted by 'mauve' was dark (and sad), whereas that denoted by 'violet' was bright and that denoted by 'lilas' was very pale.

A third informant (E) gave the group,

violet
mauve
rose

For her 'mauve' was a kind of 'violet', but in this case she said it was pinker and not darker.

A fourth informant (M) gave the group,

mauve
violet

She made the observation that 'mauve' is lighter than 'violet'.

Evidence from the texts of the T.L.F. show that 'mauve' is distinct from 'violet' and is lighter. ¹

¹ The difference between 'violet' and 'mauve' seems to be on the dimension of brightness rather than of hue, but saturation may come into it as well. The mapping experiment was done using only fully saturated chips, and those informants who assigned an area to both 'violet' and 'mauve' were consistent in placing 'mauve' in the lighter part of the colour array than 'violet'. See Figures 7, 9, 17, 18, 19 and 20 in Appendix 6.
3) In application neither 'violet' nor 'mauve' is restricted to a narrow class of objects, although 'mauve' is perhaps more commonly used for clothes and materials than for other things.

4) Both 'violet' and 'mauve' appear to be psychologically salient for informants.

Since there was some doubt about 'mauve' in particular when criterion (2) was applied, I tested both terms further by applying the four subsidiary criteria.

5) 'Violet' has the same distributional potential as the previously established basic terms in that it takes the suffix -âtre, but 'mauve' does not.

6) 'Violet' is not the name of an object although it is closely connected with the name of the flower, 'la violette' in French. 'Mauve' is the name of a plant, the mallow, but it is very doubtful if most speakers who use the colour term connect it with the plant or flower. Both 'violet' and 'mauve' are variable adjectives.

7) Neither 'violet' nor 'mauve' is a recent loan word.

8) Neither 'violet' nor 'mauve' is morphologically complex.

As regards frequency 'violet' is seen to have a higher frequency than 'mauve' in informants' lists (11 to 7) but in the Dictionnaire des Fréquences du T.L.F. there is very little difference in frequency. The relative frequency for 'violet' is 1096 and for 'mauve' it is 1001, (both for the twentieth century).
Although 'mauve' does seem to be an important colour term, 'violet' seems to be more basic in that it subsumes 'mauve' and also it has the same distributional potential as previously established basic terms. I decided therefore to include only 'violet' in the list of basic terms I drew up prior to the mapping exercise.
Perhaps it should be mentioned at this point that I did not consider 'pourpre' at all as a possible basic term to cover the category purple since, according to informants, it is clearly considered to be a hyponym of 'rouge'.

3.1.5. ROSE

'Rose' might be considered to be a little doubtful as a basic term on the following count:—

It is the name of a flower. However the colour term has probably become dissociated from the name of the flower by now. The fact that it is consistently a variable adjective would tend to support this.

As against this rather doubtful objection it has the following characteristics which would indicate that it is a basic term:—

1) It is monolexemic.
2) Its application is not restricted to a narrow class of objects.
3) It is psychologically salient for informants; it has a high frequency of mention and it tends to occur at the beginning of lists.
4) It has the same distributional potential as other clearly basic terms in that it can take -âtre.

I decided therefore to include 'rose' in the list of basic terms.
3.1.6. ORANGE

The main objection to the definition of 'orange' as a basic term is that it is the name of a fruit. However, as in the case of 'rose', the name of the thing may by now have become dissociated from the name of the fruit. Texts of the T.L.F., however, reveal that in the nineteenth century, and in the twentieth century up until about 1930, the colour adjective was nearly always invariable. I found only one example of the plural form oranges in the nineteenth century texts. (Where an isolated example like this occurs of course there is always the possibility that it is a printer's error). 'Orange', however, seems to fulfil the other criteria for a basic term with the exception that it does not have the same distributional potential as previously established basic terms. There is no dictionary attested term 'orangedtre', for example.

However since 'orange' fulfilled the four main criteria, I included it in the list of basic terms drawn up prior to mapping.

The final list of basic terms which I asked informants to map on a colour chart was:-

Blanc, noir, rouge, vert, jaune, bleu, brun, marron, violet, rose, orange, gris.

It must be kept in mind, however, that there may be other words which should be considered. I looked in particular at those words having a frequency of 5 or more in informants' lists, that is to say (apart from the twelve terms above) crémé, bleu ciel, ocre roux, and beige. 'Bleu ciel' is obviously not a basic term. 'Roux' is excluded because it is restricted in use to hair. 'Ocre' we feel intuitively is not a basic term, and it would probably be excluded on the grounds
that its meaning is included in the meaning of another term. It is usually considered by informants to be a kind of yellow, probably differing from yellow on the dimensions of brightness and saturation. 'Beige' and 'crome' are both considered to be hyponyms of either 'brun' or 'blanc'. All of these terms are interesting and they will be discussed more fully later.

3.2.1. The Mapping Experiment.

The mapping procedure closely followed that of Berlin and Kay.

3.2.2. The Stimuli

The colour chart from the envelope in the back of Basic Color Terms by Berlin and Kay was used. The chart is a printed copy of the array of Munsell chips used by the authors. Munsell colour chips are standard colour samples provided by the Munsell company. The chips used by Berlin and Kay were a set of 329 chips of 40 equally spaced hues and eight degrees of brightness, all at maximum saturation, and 9 chips of neutral hue (white, black, grey).

3.2.3. The presentation

The colour chart was laid out on a neutral grey surface and covered by a fresh sheet of clear acetate for each informant.

1. Later experiments using an array including non-saturated colours, for example those done by Eleanor Rosch and Heider (1972) have shown that the most saturated colours are the best examples of colours designated by basic colour names,
3.2.4. **Illumination.**

An anglepoise lamp with a 100 Watt tungsten bulb was used. This source has a colour temperature of 2860°K, which is close to that used by Berlin and Kay. Their lamp had a colour temperature close to that of I.C.A. Standard Illuminant A (2842°K).

3.2.5. **The Subjects.**

The subjects for the mapping experiment were twelve of those thirteen informants from whom I had already elicited the lists of colour terms discussed in Chapter 2, plus three new informants from whom I also elicited lists prior to the mapping experiment. All were monolingual French speakers and all were tested for colour blindness using the Ishihara test.

3.2.6. **The Mapping Procedure**

The informant was given a chinagraph pencil and was asked to indicate for each of the basic colour terms on the list:

a) all those chips he would under any circumstance call x.
b) the best example of x (or examples if he felt there was no one best example).

3.2.7. **The Results.**

The results of the mapping are shown in Figures 6 - 20, contained in Appendix 6.

Figure 21 shows the normalised foci of the basic colour terms in a) French and b) Twenty languages tested by Berlin and Kay.

2. For a table showing the comparative colour temperatures of different light sources see Judd and Wysecki (1963) p.251.
Figure 21. Normalised foci of basic colour terms in ........ French.

and twenty languages tested by Berlin and Kay
It should be noted that none of the French subjects marked a chip to denote white and, when asked why not, they said that for them white was the colour of the paper on which the chart was printed. This difficulty would not arise if single chips laid out on a grey ground were used, as in Berlin and Kay's experiments.

The table below gives a comparison of the mean of colour foci for 15 French informants and for 20 languages investigated by Berlin and Kay. The Munsell numbers for the foci designated by individual informants is to be found in Appendix 7.

Table 5. A comparison of the mean of colour foci

<table>
<thead>
<tr>
<th></th>
<th>French informants</th>
<th>Berlin and Kay's 20 languages</th>
</tr>
</thead>
<tbody>
<tr>
<td>rouge</td>
<td>8R 4.9/</td>
<td>5.1R 3.6/</td>
</tr>
<tr>
<td>orange</td>
<td>5.3YR 6.8/</td>
<td>3.3YR 6/</td>
</tr>
<tr>
<td>jaune</td>
<td>7Y 8.93/</td>
<td>2.15Y 7.24/</td>
</tr>
<tr>
<td>vert</td>
<td>2.6G 5/</td>
<td>5.6G 4.57/</td>
</tr>
<tr>
<td>bleu</td>
<td>1.2PB 5/</td>
<td>.8PB 4.59/</td>
</tr>
<tr>
<td>violet</td>
<td>3.2P 3/</td>
<td>5.4P 3.75/</td>
</tr>
<tr>
<td>rose</td>
<td>9.5RP 6.7/</td>
<td>8.25RP 6.83/</td>
</tr>
<tr>
<td>marron</td>
<td>7.5YR 3/ (BROWN)</td>
<td>5.6YR 3.39/</td>
</tr>
<tr>
<td>brun</td>
<td>5Y 3/</td>
<td></td>
</tr>
<tr>
<td>noir</td>
<td>N 1/</td>
<td>N 1.2/</td>
</tr>
<tr>
<td>gris</td>
<td>N 5/</td>
<td>N 5.5/</td>
</tr>
</tbody>
</table>

The notation used is the Munsell notation, where the number before the letter is the hue number and the number before the oblique is the value (brightness) number. Since all the colours were fully
saturated no saturation number is given. When given it is placed after the oblique, according to the conventions of the Munsell notation.

For most colours there was a high degree of agreement as to the chip representing the best example of that colour. Table 6 shows the standard deviation for French subjects, that is the intra-language deviation and also the inter-language deviation for Berlin and Kay's 20 languages.

Table 6. Inter-language and intra-language deviation

<table>
<thead>
<tr>
<th></th>
<th>French</th>
<th>Berlin and Kay's 20 languages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard Deviation</td>
<td>Hue</td>
</tr>
<tr>
<td>rouge</td>
<td>1.87</td>
<td>.25</td>
</tr>
<tr>
<td>orange</td>
<td>1.794</td>
<td>.40</td>
</tr>
<tr>
<td>jaune</td>
<td>1.575</td>
<td>.25</td>
</tr>
<tr>
<td>vert</td>
<td>1.752</td>
<td>.79</td>
</tr>
<tr>
<td>bleu</td>
<td>1.749</td>
<td>.79</td>
</tr>
<tr>
<td>violet</td>
<td>2.809</td>
<td>.66</td>
</tr>
<tr>
<td>rose</td>
<td>5.235</td>
<td>.60</td>
</tr>
<tr>
<td>marron</td>
<td>2.317</td>
<td>.55</td>
</tr>
<tr>
<td>noir</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>gris</td>
<td>-</td>
<td>.24</td>
</tr>
<tr>
<td>blanc</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

The figures contained in the above table indicate that there is more agreement about where to place the focus of a basic colour on the
colour array on the dimension of brightness than there is about where
to place it on the dimensions of hue. At the same time the figures
indicate that there is, nevertheless, a very significant measure of
agreement about where to place the foci of basic colours on the colour
array, both among speakers of the same language and among speakers of
different languages. Agreement among French speakers is especially
marked for the clearly basic colours, namely red, yellow, green and
blue, and also for orange. It is less clearly marked for pink and
for brown when designated by the term 'brun'. There is more agreement
about where to place the focus of the category designated as 'marron'.

The figures for Berlin and Kay's 20 languages show that the
greatest measure of agreement is to be found for the focus of red, but
that there is also a high measure of agreement as to where to place
the foci of yellow, blue and orange. Berlin and Kay's results show
least inter-language agreement in the green area, but the results for
French show a high measure of intra-language agreement in this area.

3.2.8. Discussion

It should be kept in mind that the task informants were asked to
perform was not a colour naming task but a colour mapping task.
Informants were asked to assign to each one of eleven basic colour
terms an area in the colour space. Given the nature of the task, one
would expect to find certain areas left blank. One informant, however,
covered the whole colour array completely, using only the eleven basic
terms, indicating that, for him at least, even peripheral colours could
be included in eleven basic colour categories. Another informant
covered the whole area with the exception of one square, and eight
others covered the whole area but added some non-basic terms to the
list given to them. Two informants refused to assign an area to the term 'rose' without also assigning areas to the terms 'beige', 'beige rose', 'bleu rose', 'rose buvard' and 'grenat'. The latter term denoted, for that informant, a colour of the same hue as pink but of lower (i.e. darker) brightness value.

More interesting than the insistence of certain informants on breaking up the area of pink was the insistence of six informants on assigning an area in the colour space to the term 'mauve' as well as to the term 'violet'. In every case 'mauve' was used to denote a lighter shade of purple and the two foci are placed more or less in line on the dimension of hue but they are fairly well spaced out on the dimension of brightness. As can be seen from Table 5, the average focus of the category denoted by the French term 'violet' is very close to the average focus of purple in the 20 languages tested by Berlin and Kay. On the dimension of hue there is only a very small difference of two chips and on the dimension of brightness a difference of less than one chip. If purple is a universal colour category with a universal focus as Berlin and Kay suggest then the French term to denote that category appears to be 'violet'. However, 'mauve' has already been seen to be a salient term in French (3.1.4.) and results of the mapping experiment bear this out. It is also a term which appears to have a very stable referent. All six informants who mapped 'mauve' placed it on the hue band denoted by the Munsell number 2.5 P, and five of the six placed it on the brightness band denoted by Munsell number 5 or 6.

The results of the mapping experiment support Berlin and Kay's findings that there are certain areas of colour whose foci are universal. As can be seen from Figure 21 the foci of basic colours given by the
French informants fall either within the small areas covered by the foci of basic colours in the 20 languages tested by Berlin and Kay or just outside them. The one notable exception is the focus of the colours denoted by 'brun' in French. The focus of the colour denoted by 'marron' lies well within Berlin and Kay's area of brown but the focus of the colour denoted by 'brun' lies rather far outside it. It lies only three chips outside the area, and that does not indicate a very great perceptible difference in colour. Nevertheless, considering how close the other foci are to Berlin and Kay's foci, the placing of 'brun' may be significant. It may be that the basic colour term used to denote the focus of the colour category brown is 'marron' and that the term 'brun' is used to denote peripheral examples. The difference between focus and periphery is an important one and will be discussed more fully later.

I have not shown the normalised focus for the term 'mauve' in Figure 21 but it is interesting to note that it falls just within Berlin and Kay's area of purple, on the square designated by the Munsell number 2.5 P 5.8/. As I have already pointed out, the focus of the category denoted by 'violet' is nearer to the normalised foci for purple in 20 languages, but, since the focus of the category denoted by 'mauve' falls within the area of purple as well, the question of whether it is 'violet' or whether it is 'mauve' that is the basic term cannot be decided on the results of the mapping experiment. It may be that in the case of 'violet' and 'mauve' we have a similar kind of situation as we had in the case of 'brun' and 'marron', namely a situation in which we have a basic term to denote the focus of a category and another important term to denote
peripheral examples. There is one important difference between 'brun' and 'mauve' as linguistic entities. I would consider 'mauve' to be a hyponym of 'violet' but I would not consider 'brun' to be a hyponym of 'marron'.

The results of the mapping exercise for French also confirms Berlin and Kay's findings that there is less agreement about where to draw the boundaries of colour categories than there is about where to place the foci. This can be seen if one compares Figures 6 - 20, and also if one compares those fifteen figures showing the mappings for individual languages contained in Appendix 1 of Berlin and Kay's book.
THE QUESTIONNAIRES

4.1.1. The questionnaires

The method of eliciting colour words from informants orally was supplemented by the use of questionnaires. Two hundred questionnaire forms were sent to France and one hundred and thirty-nine were filled in and returned. A sample questionnaire can be found in Appendix 12.

4.1.2. The informants

Informants were native French speakers between the ages of twelve and sixty-seven. Of the informants forty-one were male, ninety-six were female and two did not indicate their sex. Their cultural and geographical backgrounds were varied. Of the one hundred and thirty-nine informants thirty-four were secondary school children, eighty were students and twenty-five were from various professional backgrounds. Forty-one informants lived in Strasbourg, thirty-nine in Paris and eleven in Nancy at the time of filling in the questionnaires, but they were not necessarily natives of those towns. The remaining forty-eight came from all over France.

4.1.3. The form of the questionnaires

The main purpose of the questionnaires was to elicit a corpus of colour words in French but since I wished to limit the corpus and to exclude the more idiosyncratic and esoteric terms, I worded it thus:

"Écrivez ci-dessous les noms des couleurs principales en français (les noms qu'on utilise dans le langage de tous
les jours)."
All informants apart from one took the contents of the brackets to be an elaboration of the preceding request, but one informant took it to be a separate request and in addition to a list of colour words gave a list of common words such as 'mère', 'père', 'manger', 'courir' etc.

Further information was requested on the same form. I wished to know if the accepted term for turquoise blue in French was 'bleu turquoise' or 'vert turquoise' and informants were asked:

"Cochez le terme accepté:
Bleu-turquoise □
Vert-turquoise □
Tous les deux □

I also wished to know if 'brun' and 'marron' were different in use and especially if either or both were restricted in application to a certain class of objects. Informants were therefore asked:

"Écrivez une liste de choses qu'on pourrait décrire proprement comme étant:

<table>
<thead>
<tr>
<th>BRUN</th>
<th>MARRON</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The last request on the questionnaire was designed to find out if colour words were considered by informants to have antonyms and informants were requested:
"Écrivez le contraire de:
    noir          
    rouge         
    bleu          

4.2.1. Analysis of the results of the questionnaires

The first part of the analysis, that dealing with frequency and order of mention, was carried out using data from the first 100 questionnaires. That is the analysis described in this chapter. Those parts of the analysis dealing with 'brun' and 'marron' and with antonymy are discussed in later chapters.

4.2.2. The total number of terms

The total number of running words listed in the 100 questionnaires was 1,731 and the total number of lexemes was 221, which is about 100 more than were elicited orally from informants. Since questionnaire informants were asked to list only the main colour terms (les couleurs principales) there are therefore, according to one hundred people questioned, 221 main colour terms in French.

4.2.3. Frequency of mention

The frequency with which terms were mentioned varied from 1 mention for unusual terms such as 'acajou', 'anthracite' and 'ardoise' to 95 mentions for a common term such as 'blanc'.

The table below shows the 20 most frequently mentioned terms in decreasing order of frequency in (a) the questionnaires and (b) the orally elicited lists.
Table 7. Frequency of mention of common colour terms.

<table>
<thead>
<tr>
<th>Term</th>
<th>Percentage of informants who mention it</th>
<th>Term</th>
<th>Percentage of informants who mention it</th>
</tr>
</thead>
<tbody>
<tr>
<td>blanc</td>
<td>95</td>
<td>rouge</td>
<td>100</td>
</tr>
<tr>
<td>noir</td>
<td>93</td>
<td>orange</td>
<td>100</td>
</tr>
<tr>
<td>rouge</td>
<td>92</td>
<td>bleu</td>
<td>92</td>
</tr>
<tr>
<td>bleu</td>
<td>92</td>
<td>marron</td>
<td>92</td>
</tr>
<tr>
<td>vert</td>
<td>86</td>
<td>gris</td>
<td>88</td>
</tr>
<tr>
<td>jaune</td>
<td>85</td>
<td>jaune</td>
<td>85</td>
</tr>
<tr>
<td>orange</td>
<td>73</td>
<td>vert</td>
<td>85</td>
</tr>
<tr>
<td>violet</td>
<td>63</td>
<td>violet</td>
<td>85</td>
</tr>
<tr>
<td>rose</td>
<td>60</td>
<td>blanc</td>
<td>77</td>
</tr>
<tr>
<td>brun</td>
<td>53</td>
<td>noir</td>
<td>77</td>
</tr>
<tr>
<td>gris</td>
<td>51</td>
<td>rose</td>
<td>77</td>
</tr>
<tr>
<td>marron</td>
<td>50</td>
<td>beige</td>
<td>69</td>
</tr>
<tr>
<td>beige</td>
<td>31</td>
<td>brun</td>
<td>61</td>
</tr>
<tr>
<td>turquoise</td>
<td>23</td>
<td>mauve</td>
<td>54</td>
</tr>
<tr>
<td>mauve</td>
<td>21</td>
<td>pourpre</td>
<td>54</td>
</tr>
<tr>
<td>bleu marine</td>
<td>19</td>
<td>crème</td>
<td>46</td>
</tr>
<tr>
<td>bleu ciel</td>
<td>16</td>
<td>bleu ciel</td>
<td>46</td>
</tr>
<tr>
<td>jaune citron</td>
<td>15</td>
<td>ocre</td>
<td>38</td>
</tr>
<tr>
<td>bleu outremer</td>
<td>12</td>
<td>roux</td>
<td>38</td>
</tr>
<tr>
<td>bordeaux</td>
<td>11</td>
<td>rouille</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td></td>
<td>marine</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td></td>
<td>carmin</td>
<td>31</td>
</tr>
</tbody>
</table>

Since the sample for (b) is small (13 informants) the frequency as expressed as a percentage is not nearly as significant or accurate as the frequency in (a) where the sample is much larger (100 informants).

It will be noted that the twelve most frequently
mentioned words in the questionnaires correspond exactly to Berlin and Kay's twelve basic terms and that moreover there is a big jump in frequency between the twelfth term and the next one down.

4.2.4. **Grouping of terms**

When the informants listed terms verbally certain groupings were apparent but when the lists were written such groupings became much clearer. Groupings were indicated in several ways; by writing, for example, general terms in one column and derived terms in another; by leaving a gap between groups; by listing vertically for the most part but, where a term was felt to have one or more hyponyms, by listing the hyponyms alongside the general term.

Some interesting groupings are as follows:

1) The grouping of 'noir' and 'blanc' together within brackets at the end of a list, indicating that for the informant who gave this grouping 'noir' and 'blanc' are different from the other terms he gave which were:

   rouge, orange, jaune, vert, bleu, indigo, violet.

   They are different in two ways; they are not colours of the spectrum and they are achromatic as distinct from chromatic colours. The high frequency of mention of 'blanc' and 'noir' indicates, however, that those terms are definitely triggered by the stimulus word 'couleur'.

2) The grouping of hyponyms along with the general term. Some such groupings were:
First informant

(1) Bleu, bleu ciel, bleu myosotis
(2) Blanc, beige, blanc cassé
(3) Bleu marine, bleu d'outre-mer, bleu turquoise
(4) Vert émeraude
(5) Vert olive, vert kaki

(The omission of the general term 'vert' is probably accidental.)

One interesting point about this informant’s groupings is that there appear to be two distinct categories of blue for her, one light and one dark, (cf. Russian 'goluboj' and 'sinij', which may denote separate basic categories). The difference is presumably one of brightness (or, to be more accurate, of lightness, since we are dealing with surface and not light colours here). The informant places the general term 'bleu' among the light blues but it would be difficult to make out a case for 'bleu marine' being a general term which includes 'bleu d'outre-mer' and 'bleu turquoise'. We would rather want to say that 'bleu marine', 'bleu d'outre-mer' and 'bleu turquoise' are all included in a general term such as 'bleu foncé'. There might however be some doubt in most people's minds that 'bleu turquoise' is dark. The distinguishing features of 'bleu turquoise' would rather be (a) that it is a greeny blue and (b) that it is not dark but deep or pure or intense, that is to say that it is free from white or black or grey.
This informant divides up the greens in an interesting way, although, as is the case with most informants' groupings, only a very few of the many possible members of the green class are mentioned. They are:

vert émeraude
vert olive, vert kaki

The first one, 'vert émeraude', is held to be distinct from the other two and in this case the difference is one of saturation rather than of brightness. 'Vert émeraude' like 'bleu turquoise' is a pure hue of medium brightness (around Munsell 5) and high saturation (i.e. a high degree of freedom from admixture of grey) whereas 'vert olive' and 'vert kaki' are also of medium brightness (around Munsell 5) but they are of low saturation (i.e. they have a high proportion of grey in them).

The grouping of 'blanc', 'beige' and 'blanc cassé' by this informant bears out the findings of a previous section, namely that 'beige' and 'blanc cassé' are regarded by some as hyponyms of 'blanc'.

Second informant

This informant lists general terms and hyponyms thus:

(1) Blanc, blanc cassé
(2) Rouge, rouge bordeaux, rouge vif
(3) Bleu, bleu foncé, bleu-turquoise, bleu ciel, bleu clair, bleu nuit
(4) Vert, vert kaki, vert-bouteille, vert-clair
(5) Rose, vieux rose
(6) Brun, marron
(7) Violet, mauve

Again the groups are incomplete but informative nevertheless.

(1) This grouping is further evidence for the case that 'blanc cassé' is a hyponym of 'blanc'.

(2) Two things emerge from this grouping:

(a) 'rouge bordeaux', usually shortened to 'bordeaux', appears to be a hyponym of 'rouge'. It may be, however, that in certain uses, as applied to clothes for example, 'bordeaux' denotes a colour quite distinct from that denoted by 'rouge'.

(b) 'rouge bordeaux' and 'rouge vif' are contrasted and this contrast illustrates a difference on the dimension of brightness but not of saturation. Both colours are fully saturated (i.e. free from an admixture of grey) but 'rouge bordeaux' is darker (i.e. contains more black) than 'rouge vif'. Still on the dimension of brightness 'rouge vif' also contrasts with 'rouge pâle' and 'rouge clair', both of which terms suggest a lighter colour than 'rouge vif' (i.e. a colour with more admixture of white). On the dimension of saturation 'rouge vif' would contrast with 'rougeâte' which suggests a diluted red.
The different reds mentioned above could be represented using Ostwald's\(^1\) formula where FC = full colour (rarely encountered in nature)

\[
\begin{align*}
W &= \text{white} \\
B &= \text{black}
\end{align*}
\]

According to Ostwald no other attributes are needed, since all colours can be made up using combinations of these three. FC + W + B add up to unity. I have added a letter in brackets after FC to indicate the hue; R for red, B for blue etc.:

- rouge vif \(= FC(R)\)
- rouge clair \(= FC(R) + W\)
- rouge pâle \(= FC(R) + W\)
- rouge bordeaux \(= FC(R) + B\)
- rougeâtre \(= FC(R) + B + W\)

N.B. 'rouge clair' and 'rouge pâle', although they have the same formula are not necessarily referential synonyms because the proportion of white may differ. The affixation of 'pâle' generally indicates that the colour contains more white than a colour described as 'clair'. 'Clair' is held to be nearer to 'vif' than 'pâle' is. This is according to subjects tested so far. I describe further tests in a later chapter.

(3) The hyponyms of blue given by this informant are

1) Ostwald. *A Colour Primer.*
interesting, mainly because they show a distinction between 'bleu foncé' and 'bleu nuit' on the one hand and between 'bleu ciel' and 'bleu clair' on the other. The difference between 'bleu foncé' and 'bleu nuit' seems to be on the dimension of brightness, and not of saturation, since there seems to be no suggestion of greyness in either colour; greyness is expressed by such a term as 'bleuâtre'. 'Bleu nuit' seems to be darker than 'bleu foncé' (but I shall have to test further). The difference between 'bleu ciel' and 'bleu clair' is also on the dimension of brightness and 'bleu clair' is considered to be lighter (i.e. higher on the scale of brightness) than 'bleu ciel'. 'Bleu ciel' is considered to be closer to 'bleu vif'.

(4) The terms subsumed under 'vert', although few in number, illustrate very well the only two dimensions on which hues can vary, namely brightness and saturation. If we take 'vert' to indicate the pure hue we can say that 'vert kaki' differs from 'vert' on the dimension of saturation, being less saturated or more grey than 'vert'. 'Vert bouteille' differs from 'vert' on the dimension of brightness being darker than 'vert', and 'vert clair' differs from 'vert' also on the dimension of hue, but this time it is lighter and not darker.

(5) 'Vieux rose' is the only hyponym of 'rose' that this informant gives, and it represents a variation on the
dimension of saturation, the affixation of 'vieux' suggesting greyness.

(6) The order in which this informant has written 'brun' and 'marron' suggests that for her 'marron' is a hyponym of 'brun', but as has already been seen, the reverse may be the case for some informants.

(7) Here 'mauve' appears to be a hyponym of 'violet' and this is borne out by other informants' data.

Other lists show groupings of the same kind, that is to say of hyponyms listed alongside the general term, and the groupings differ only in the particular terms included, for example the hyponyms of 'vert' may include less common or more idiosyncratic terms than the three listed above - terms such as 'vert d'eau', 'vert salade', 'vert pin', 'vert amande' etc.

One list is unlike the others in that the informant distinguishes hyponyms where the hyponymy is indicated by the terms 'vif', 'foncé' and 'clair' from hyponyms where the hyponymy is indicated in other ways. This informant's list is structured in a very definite way and it will be analysed in more detail later.

Sometimes an informant doubts whether hyponyms, especially of the compound word type, can properly be called principal colour terms, and one informant writes 'vert-sapin', 'vert-pomme', 'rose-bonbon', 'bleu-marine', 'bordeaux' and 'jaune citron' in a separate column headed
"Principales?".

The above examples of groupings are given in order to illustrate that even when informants are asked only to list (at random) they often list in an organised way, revealing a natural tendency to group together general terms and hyponyms.

4.2.5. Order of mention

According to Berlin and Kay, one of the indications that a colour term is psychologically salient for an informant is that it appears at the beginning of lists. I found that in both the questionnaire lists and the lists elicited from informants the twelve basic terms did indeed tend to appear at the beginning of lists. I also noticed that the more clearly basic terms such as 'rouge', 'bleu', 'jaune' and 'vert' seemed to appear before less clearly basic terms such as 'orange', 'violet' and 'rose'. Moreover, it was noticeable that some informants listed terms in an order that corresponded roughly to Berlin and Kay's evolutionary order. For this test I used both the lists from the questionnaires and the lists elicited orally from informants. The results are shown in the following sections.

4.3.1. Correlation between order of mention and evolutionary order

I took as a working hypothesis that there was a significant correlation between the order in which subjects named colours and the evolutionary order
posed by Berlin and Kay. It will be remembered that the evolutionary order posited by Berlin and Kay is:

\[
\text{[white]} \rightarrow \text{[green]} \rightarrow \text{[yellow]} \rightarrow \text{[brown]} \rightarrow \text{[purple]} \rightarrow \text{[pink]} \rightarrow \text{[orange]} \rightarrow \text{[grey]}
\]

4.3.2.

I decided to test for the first six terms only.

Taking the questionnaires first, the terms most frequently mentioned among the first six terms are 'bleu', 'rouge', 'blanc', 'vert', 'jaune' and 'noir' in that order of importance. Table 11 shows how importance was assessed. I took Berlin and Kay's order to be white, black, red, green, yellow, blue, although strictly speaking white and black share the first place and green and yellow share fourth place. I assessed the correlation using the formula for Spearman's coefficient of rank correlation \( \rho \).

The calculation is shown in Table 3:

1) Formula: 

\[
\rho = 1 - \frac{6 \sum D^2}{n(n^2 - 1)}
\]

where \( D \) is the rank difference
### Table 3. Correlation between order of mention and Berlin and Kay’s evolutionary order

<table>
<thead>
<tr>
<th></th>
<th>Rank in Berlin &amp; Kay Questionnaires</th>
<th>Rank in Ry Questionnaires</th>
<th>Difference Rx-Ry</th>
<th>D^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>white (blanc)</td>
<td>1</td>
<td>3</td>
<td>-2</td>
<td>4</td>
</tr>
<tr>
<td>black (noir)</td>
<td>2</td>
<td>6</td>
<td>-4</td>
<td>16</td>
</tr>
<tr>
<td>red (rouge)</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>green (vert)</td>
<td>4</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>yellow (jaune)</td>
<td>5</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>blue (bleu)</td>
<td>6</td>
<td>1</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>0</td>
<td>46</td>
</tr>
</tbody>
</table>

Since \( n = 6 \) and \( D^2 = 46 \)

\[
1 - \frac{6 \times 46}{6(6^2 - 1)} = -0.31
\]

Since a coefficient of +1 indicates perfect correlation, a coefficient of -1 indicates perfect inverse correlation and a correlation of 0 indicates complete absence of correlation, the result -0.31 shows an inverse correlation near to zero, that is to say an absence of correlation.

However it was obvious from a glance at the lists of words contained in the questionnaires and in the lists elicited from subjects that there was a strong tendency for Berlin and Kay’s eleven basic terms to appear at the beginning of lists and that moreover certain ones, namely red, blue, green, yellow, tended to appear before
brown, violet, grey and pink. The positions of black and white tended to be more erratic, perhaps because some subjects consider black and white to be on a different level from the chromatic hues.

Following Berlin and Kay, I shall call terms which appear at the beginning of lists psychologically salient. Tables 9, 10, 11 and 12 show the psychological saliency of the twelve basic terms in informants’ elicited lists and in the questionnaires.

Table 9. Number of questionnaire informants rating terms in preference order indicated by column heading

<table>
<thead>
<tr>
<th></th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>4th</th>
<th>5th</th>
<th>6th</th>
<th>7th</th>
<th>8th</th>
<th>9th</th>
<th>10th</th>
<th>11th</th>
<th>12th</th>
<th>No. of mentions</th>
</tr>
</thead>
<tbody>
<tr>
<td>blanc</td>
<td>23</td>
<td>20</td>
<td>1</td>
<td>4</td>
<td>12</td>
<td>7</td>
<td>7</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>93</td>
</tr>
<tr>
<td>noir</td>
<td>10</td>
<td>12</td>
<td>9</td>
<td>5</td>
<td>13</td>
<td>14</td>
<td>6</td>
<td>8</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>0</td>
<td>93</td>
</tr>
<tr>
<td>rouge</td>
<td>21</td>
<td>13</td>
<td>31</td>
<td>17</td>
<td>7</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>99</td>
</tr>
<tr>
<td>vert</td>
<td>3</td>
<td>11</td>
<td>19</td>
<td>27</td>
<td>13</td>
<td>12</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>95</td>
</tr>
<tr>
<td>jaune</td>
<td>6</td>
<td>8</td>
<td>12</td>
<td>5</td>
<td>19</td>
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4.3.3. **Elucidation of the tables**

I assessed the psychological saliency of the twelve basic terms in the following way.

Firstly, I counted the number of questionnaire informants who put 'blanc' in first place, the number who put 'noir' in first place and so on for all twelve terms. I made three separate calculations for 'brun' and 'marron', one taking 'brun' alone, one taking 'marron' alone, and one taking 'brun' and 'marron' together (that is to say, I considered that there was only one composite term 'brun/marron' corresponding to the English term 'brown'). If a subject mentioned both terms (only 17% of the subjects did) I ignored the second term.

Secondly, I counted the number of questionnaire informants who put 'blanc' in second place, the number who put 'noir' in second place and so on for all twelve terms.

I continued thus until I had counted the mentions of all twelve terms in the first twelve places as shown in Table 9.

In order to assess the relative importance or psychological saliency of the twelve basic terms I awarded points to each term according to its ratings in Table 9.

Table 11 shows how points were awarded. It is seen from Table 11 that 'bleu', with a total of 1041 points, is the most important term.
4.3.4. Discussion

The histogram in Figure 22 shows clearly the order of importance of each item in the questionnaire lists. In the histogram, 'brun/marron' is considered as a composite term. The order of importance is:

'bleu', 'rouge', 'blanc', 'vert', 'jaune', 'noir',
'brun/marron', 'orange', 'violet', 'gris', 'rose'.

This order does not correspond exactly to Berlin and Kay's evolutionary ordering, but there are several important observations.

Although the order of the first six terms in the histogram is not the same as that of the first six in Berlin and Kay, the terms are the same. After that, the last five terms in the histogram correspond exactly to Berlin and Kay's last five (violet, grey, pink, orange are unordered in Berlin and Kay).

There are several possible reasons for the discrepancy in order between my informants' first six terms and Berlin and Kay's first six. 'Blanc' and 'noir' may not immediately come to mind when one is asked to think of colours; the three first colours, 'bleu', 'blanc', 'rouge', are the colours of the French flag and sometimes informants indicated by an exclamation mark on the questionnaire sheet that these three colours have a special significance for them. In the oral test subjects would sometimes say something like "bleu, blanc, rouge, bien sûr".

The histogram in Figure 22a, showing the relative
importance of the eleven basic terms for informants interviewed orally is slightly different from that in Figure 22. Again 'bleu' is the most important item, followed by 'rouge'. Next, however, came 'jaune' and 'vert'. In both histograms 'jaune' and 'vert' are adjacent, although the order is reversed. In Berlin and Kay's evolutionary order we have either green succeeding yellow or yellow succeeding green. 'Blanc' and 'noir' come further down in informants' oral lists than they do in the questionnaire lists. It may be that the white paper of the questionnaire form acts as a stimulus trigger for 'blanc' and, by association, 'noir'. They come so far down the oral lists that they push 'brun/marron' and 'orange' up among the first six.

In the histogram in Figure 22 it is seen that 'orange' and 'brun/marron' occupy an intermediate position between the first group and the last, but in the histogram in Figure 22a the steps are more evenly spaced. In both histograms it is seen that 'gris', 'violet' and 'rose' come last, and as has already been pointed out, it may be that there are reasons for thinking that these terms may be less basic than the preceding ones.
Figure 22. Histogram showing the psychological saliency of basic colour terms (questionnaires).
Figure 22a. Histogram showing the psychological saliency of basic colour terms (Informants' lists).
Chapter 5

THE TERMS 'BRUN' AND 'MARRON'

5.1.1. The possibility that both 'brun' and 'marron' are basic terms

Evidence so far suggests that there may be a case to be made out for saying that, according to Berlin and Kay's criteria at least, French has twelve basic colour terms, the extra term being accounted for by the presence of two terms to designate that area which is for most languages one basic category, labelled by one basic term.

5.1.2. Mapping 'brun' and 'marron'

The fifteen native speakers who participated in the elicitation test all had both 'brun' and 'marron' in their colour vocabulary and they were accordingly asked to map both terms on the colour chart. (A full account of this test is given in Chapter 3.) Not all of them, however, marked two separate areas as being areas designated by these terms and not all of them marked a separate focus for each term. Nine informants marked two separate areas and their mappings are shown in figures 6, 7, 10, 11, 13, 16, 17, 19 and 20.1 These figures show that for eight informants the main difference between 'brun' and 'marron' is to be found on the dimension of hue and seven out of those eight place 'brun' to the right of 'marron', indicating that they judge 'brun' to be more yellow and 'marron' to be more red. This judgment is consistent

1. See Appendix 6.
with certain remarks made by informants during the oral elicitation test; remarks such as "Je préfère le marron. C'est une couleur plus chaude". One informant however (Fig. 10) places 'brun' to the left of 'marron' among the yellow-reds and shows 'marron' as extending towards yellow. For one informant (Fig. 19) the difference between 'brun' and 'marron' is not one of hue but is one of brightness alone. For all eight informants there is a difference on the dimension of brightness as well as on the dimension of hue, and 'marron' is generally shown as extending more towards the white or light end of the brightness axis than 'brun'; that is to say 'marron' is generally considered to be a lighter colour than 'brun'. For one subject however the exact reverse is the case.

Four informants marked the brown area and called it 'marron'. They refused to designate any squares as 'brun'. Their mappings are shown in figures 8, 9, 12 and 17. Two of the fifteen, however, although they indicated only one area, said that they would name the colours enclosed as either 'brun' or 'marron' depending on the context.

The total area designated as 'brun' by all fifteen informants is quite extensive, as Figure 5 shows (see Chapter 3). It extends from red to yellow-green on the dimension of hue, and from very dark to quite light on the dimension of brightness. It can be seen from Figure 5 that on the colour array the area designated by 'brun' falls completely within the area designated by 'marron' apart from two squares. It must be kept in mind, however,
that Figure 5 shows a composite pattern of all 15 mappings. Individual mappings, as we have seen, show either that 'brun' and 'marron' designate two distinct areas or that 'brun' and 'marron' designate the same area and that the difference between the two terms is to be found in their use and not in their referents. In the following section the different uses of 'brun' and 'marron' will be examined.

5.2.1. The uses of 'brun' and 'marron'

It was noted that six informants considered 'brun' and 'marron' to be referential synonyms; that is to say they considered the two terms to designate the same area of the colour chart. They all indicated, however, that the two terms were not identical in use and that, for example, 'brun' and not 'marron' would be used for hair. Even those informants for whom 'brun' and 'marron' were not referential synonyms did not consider that the conditions governing the use of the terms depended on the position on the colour chart of the colours designated. They too indicated that, regardless of the kind of brown, whether a red brown or a yellow brown, one would never use 'marron' for hair or skin for example. If this is so then two notions in linguistic theory are relevant here: the Firthian notion of collocation\(^1\) and the notion of selection restrictions as found in Transformational

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1. Firth first used 'collocation' as a technical term in his paper 'Modes of Meaning' in Firth, Papers in Linguistics, 1934-51.
Generative grammar.

5.2.2. The notion of collocation

Without going as far as Firth did and setting up a separate collocational level between the grammatical and the situational, and without maintaining, as Firth did, that the collocations of a word are part of its meaning, it may still be worthwhile studying collocations as a certain kind of meaning relation on the syntagmatic level. We should however beware of confusing collocations, in the Firthian sense, and 'locutions toutes faites'. It should be noted that such fixed expressions containing colour words in French often belong to figurative language. For example, 'nuit' collocates with 'blanche' in the fixed phrase 'passer une nuit blanche'. A collocation in the Firthian sense, and to use a translation of Firth's well-known example, would be that of 'nuit' with 'noir' or some such adjective denoting darkness. Meaning by collocation is not, however, says Firth, the same as contextual meaning. By context Firth appears to mean, although he is not very clear about this, context of situation and culture, and when Firth says that 'ass' collocates with 'silly', 'obstinate' etc., he is not saying that this depends on situation, culture, register,

1. cf. Lyons, J., 'Firth's Theory of Meaning' in Bazell, In Memory of J.R. Firth(1966), pp. 296-7. Some writers do, however, consider that collocations include at least 'locutions toutes faites', for example Crystal and Davy in Investigating English Style, p. 142.

2. Firth, 'Modes of Meaning', p. 193, in Firth (1957)
style or mode, but rather that in texts it is very likely to find the word 'ass' accompanied by the words 'silly' etc.

Not all pairs of words co-existing in a text are collocations, even words existing in the same noun phrase. Consider the following:

1) un pantalon noir blanc aux genoux

The pair 'noir blanc' is given as a binary group in the Groupes Binaires du TLF, alongside more likely combinations such as 'bleu blanc' and 'gris blanc', and it is not until one consults the larger concordance that one sees from the I.C. structure that the relationship is not between 'noir' and 'blanc' but between 'noir' and 'pantalon' and 'blanc' and 'genoux'.

Even for those collocations I have called 'likely combinations' it is revealing to examine a longer context, because the syntactic relation between the terms is different in each case. One finds:

2) l'oeil bleu blanc ADJ. + ADJ.
3) d'un gris blanc N + A

and for 'jaune blanc' one finds that this combination exists only if the colour adjectives are separated by 'et' or 'ou' (in the texts of the T.L.F. at any rate, although it would be possible to imagine a context where 'blanc' modifies 'jaune'.)

It is doubtful if any of the above pairs are collocations. The terms occur together but in order to 'collocate' in the Firthian sense they must usually or frequently occur together. But is even this enough? Can one say for
example that because the combination 'pantalon noir' is usual and frequent that one of the collocations of 'pantalon' is 'noir' and one of the collocations of 'noir' is 'pantalon'? At best perhaps one could say that in 'pantalon noir' one has an example of unilateral collocation. The number of colour words applicable to 'pantalon' is limited and therefore the likelihood of 'noir' occurring with 'pantalon' is fairly good. The number of things to which 'noir' is applicable, however, is very large and so the likelihood of 'pantalon' occurring with 'noir' is not very great.

The adjective 'noir' is of course restricted to certain nouns, as are all colour adjectives. Unless used figuratively, colour adjectives apply only to first order entities, and of those usually only to things rather than people. Chomsky's 'green ideas' is semantically odd. When one says that colour adjectives 'go along with' certain nouns one would probably not wish to call these combinations 'collocations'.

5.2.3. The notion of selection restrictions

The notion of selection restrictions is probably a more useful one here, and is a more precise notion than

1. For the notion of mutuality of collocation see Firth, *Modes of Meaning*, p. 196, in *Firth (1957)*

2. Although now that trousers are a feminine garment a large number of fashion colours might apply.

collocation.

A selection restriction according to Katz (Semantic Theory, 1972) "will state the condition under which the sense represented by the set of semantic markers can combine with other senses to form a sense of a syntactic complex constituent".

Thus the sense of colour word \( x \) will combine with the senses of words that may be used to refer to first-order entities such as 'table', 'chair' etc. but not with the senses of words that may be used to refer to second-order entities such as 'truth' etc. Also all other colour words will have the same range of combination with other senses that colour word \( x \) has. 'Brun' and 'marron' will thus have the same range of combination as other colour words in French such as 'rouge', 'bleu' etc.

We have seen, however, that 'brun' may combine with 'cheveux' but 'marron' may not. Thus we can say of 'brun' and 'marron':

1) neither may be predicated of second or third order entities such as 'war' or 'truth', unless in figurative language.

2) both may be predicated of a very wide range of first-order entities such as 'trousers'.

3) only 'brun' may be predicated of 'hair'.

4) there is no class of things to which 'marron' but not 'brun' may apply.

It appears, therefore, that 'brun' may be used to describe
a wider range of objects than 'marron'. This bears out previous findings that suggest that 'brun' may be the more general term. It does however appear to be the case that 'marron' is becoming much more common in use than it was twenty years ago and one may even find now an isolated example where 'marron' is applied to 'hair'. Also, although 'brun' and 'marron' may both be applicable to certain classes of objects, it is very often the case that the one is more frequently used than the other or is felt to be more natural than the other.

5.3.1. A detailed analysis of the uses of 'brun' and 'marron'

A detailed study of the uses of 'brun' and 'marron' follows.

Two methods of collecting data were used. Firstly, the 139 informants presented with the questionnaire were asked to write down a list of things which one could appropriately call 'brun' and a list of things which one could appropriately call 'marron'. (The instructions were: 'Ecrivez une liste de choses qu'on pourrait décrire proprement comme étant - BRUN ... MARRON."

Secondly, certain documents of the T.L.F. were examined under the headings 'brun' and 'marron'. The documents consulted were:

1. The concordances for 'Brun', 'Bruns', 'Brune' and 'Brunes' for the nineteenth and twentieth centuries.
2. Certain 'Fiches-Textes' for the above.

1. The 'fiche-texte' of 18 lines was consulted when the meaning or usage was not clear from the shorter 'concordance' of 3 lines.
3. The concordances for 'Marron' and 'Marrons' for the nineteenth and twentieth centuries.

4. Certain 'Fiches-Textes' for the above.

5. 'Groupes Binaires' for 'Brun'.

5.3.2. The questionnaires

Of the 139 informants who filled in the questionnaires, 12 did not answer the question of 'brun' and 'marron' at all or else wrote "Je ne vois pas de différence".

One queried the form of the question and wrote "Il n'y a pas de choses 'proprement' marron mais des choses pouvant être marron".

One informant gave exactly the same list for 'brun' and 'marron', and in other instances, although the informant did not give identical lists, the lists had some items in common.

Most lists were fairly long, containing up to ten items, but six informants gave only one item for 'brun' and one for 'marron'. Where only one item was given under each heading, the one for 'brun' was always 'cheveux' and the one for 'marron' was always 'yeux', with one exception, 'bois'.

'Marron' was usually taken with the sense of colour term but two subjects gave 'policier' and 'sceau' as the only examples of things which can be described using 'marron', showing that they took 'marron' to mean 'crooked'.

1. I was unable to consult the binary groups for 'marron' since no work has yet been done beyond the letter 'c'.
Sixty-seven different things were mentioned in all, and I found that they fell into fairly well-defined categories. Table 3 shows the distribution of 'brun' and 'marron' among these categories.

Table 3. The distribution of 'brun' and 'marron' (Questionnaires)

<table>
<thead>
<tr>
<th>Category of object</th>
<th>BRUN No. of mentions</th>
<th>MARRON No. of mentions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hair</td>
<td>60</td>
<td>7</td>
</tr>
<tr>
<td>Eyes</td>
<td>20</td>
<td>45</td>
</tr>
<tr>
<td>Other physical attributes</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>Clothes and material</td>
<td>23</td>
<td>41</td>
</tr>
<tr>
<td>Trees and parts of trees</td>
<td>23</td>
<td>38</td>
</tr>
<tr>
<td>Animals (including horses)</td>
<td>22</td>
<td>4</td>
</tr>
<tr>
<td>Leather and leather goods</td>
<td>14</td>
<td>22</td>
</tr>
<tr>
<td>Persons (physical type)</td>
<td>12</td>
<td>-</td>
</tr>
<tr>
<td>Paint colour</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>Earth and terra cotta</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>(Wooden) furniture</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>Food</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Tobacco</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>
5.4.1. Notes on the usage of 'brun' and 'marron' as indicated in the questionnaire answers and the concordances of the T.L.F.

The concordances of the T.L.F. were examined under the headings 'brun', 'bruns', 'brune', 'brunes', 'marron' and 'marrons'. The broad categories of objects to which those terms were most frequently applied corresponded to the broad categories from the questionnaires (see Table 3), but some interesting examples from smaller subsets of those categories were also noted. An exact breakdown in numerical terms, such as was done on the questionnaire results, was not attempted. On the whole, the evidence from the T.L.F. supports the evidence from the questionnaires and also, since it is drawn from a much larger corpus, it sometimes supplements it. It must be remembered that the corpus of the T.L.F. to which I had access is a chiefly literary corpus whereas the data from the questionnaires reflects the colloquial usage of the informants. However, considering the size of the T.L.F. corpus (90 million occurrences from about 1000 texts) and the wide range of texts (novels, plays and letters), I think that one can say that the use of common colour terms such as 'brun' and 'marron' in literary texts is likely to reflect their use in the spoken language of the time.

The concordances for the nineteenth and twentieth centuries were examined.¹

¹ Throughout this dissertation I shall give the author's name and date of work after all references from the texts of the T.L.F. For the title of the work readers are referred to the Trésor de la Langue Francaise, Vol. I, pages XLIX-LXXIV.
I shall discuss the uses of 'brun' and 'marron' under specific headings.

5.4.2. Hair

As can be seen from Table 3 the largest class of things to which 'brun' or 'marron' is said by the informants to apply is the class I have called 'physical attributes'. 'Brun' received 100 mentions under this heading and 'marron' 53. Since 'hair' was mentioned 60 times under 'brun', I have separated it from other physical attributes and in this section compare the distribution of 'brun' and 'marron' under this heading. Since informants gave no information beyond that fact that 'brun' may appropriately be used of hair, I examined examples from the concordances and 'fiches-textes' of the T.L.F. as well, under the headings 'brun', 'bruns', 'brune', 'brunes', and under the headings 'marron' and 'marrons'.

In the questionnaires there were 60 mentions of 'cheveux' under 'brun' and 7 mentions under 'marron'. I found the 7 mentions under 'marron' surprising, and carefully checked the documents of the T.L.F. for similar examples.

In the texts of the T.L.F. 'brun' is, as one would expect, very commonly used for hair. It is often opposed to 'blond' in the text, and the main division in hair colouring seems to be between 'brun' and 'blond', as the following examples show:

"on est blond ou brun sans le vouloir"

(Bourget, 1883)
"était-il grand ou petit, brun ou blond?"

(Goncourt, 1851-73)

'Brun' is close to 'noir' and both together may be opposed to 'blond' as in

"cheveux ... longs chez les femmes et noués en chignons, bruns ou noirs et même blonds."

'Brun' is distinct from 'noir' and is lighter:

"elle a les cheveux bruns, presque noirs"

(Bernanos, 1923)

'Brun' is also distinct from 'châtain', which is used to described hair which is neither dark nor fair. It is also used of a person having hair of that colour, as in

"il est châtain ... oui ... ni blond, ni brun."

(Duranty, 1960)

'Brun' is the preferred term (over 'marron') not only for hair on the head ('cheveux' or 'chevelure') but for any kind of body hair, for example down, as in

"la lèvre qu'ombre un duvet brun"

(Martin du Gard, 1913)

and

"(sur ses mains) le même duvet brun"

(Martin du Gard, 1923)

'Brun' may be applied to 'sourcils', 'favoris', 'cils' ...

'Brun' may be applied to 'tonsure', 'tignasse', 'touffe', 'barbe', 'moustache' ...

'Brunes' may be applied to 'moustaches', 'mèches', 'ondulations', 'tresses' ...

The rule is that if 'brun' (as opposed to 'marron')
is the appropriate term to apply to the superordinate it
is the appropriate term to apply to the hyponym. The
superordinate term, in this case, would be 'poil'.

```
POIL ('brun')
POIL D'ANIMAL ('brun')     POIL HUMAIN ('brun')
cheveux sourcils cils moustaches etc.
```

By metonymy 'brune(s)' may be used with such nouns
as 'raie', 'têtes' and so on, as in
"la raie encore brune de sa tête"
and
"ces têtes blondes, brunes et châtaines"
(Péladan, 1884)

The rule here is that if 'brun' (as opposed to 'marron')
is the appropriate term to use for the whole it is the
appropriate term to use for the part and vice-versa.
Following Bever and Rosenbaum (1970), I shall call this
kind of hierarchy which is formed by the relation of the
whole to its parts, the 'Have a' hierarchy.
```
TÊTE ('brun')     CHEVELURE ('brun')

CHEVEUX ('brun') RAIE ('brun')
```

1. 'Poil' may be used either for human or animal hair.
As will be seen later, 'brun' and not 'marron' is the
appropriate term for animals' coats or fur. 'Poil',
as well as meaning body hair, in general, may also be
used for 'cheveux', as in "Ses traits étaient ceux des
hommes du pays; brun de poil et la peau claire."
(P-J Jouve, 1935)
'Brun', when used of hair, may be modified, usually by 'clair' or 'foncé'; for example

"une masse de cheveux brun clair"

(G. Roy, 1945)

Following the usual rule for the agreement of adjectives, both 'brun' and 'clair' remain unchanged in form, although 'cheveux' is plural. Other more individual, stylistic modifications of 'brun' occur as in

"ses cheveux de ce brun tourné, sale"

(Huysmans, 1891)

In the texts of the T.L.F. for the nineteenth and twentieth centuries I found only one entry for 'marron' applied to any kind of hair and that was in Malègue (1933). Referring to a baby's head he writes

"rien qu'un duvet de cheveux marron".

The only other reference where 'marron' is in any way connected with 'cheveux' is

"ses cheveux brillants comme l'écorce d'un marron d'Inde".

(Simone de Beauvoir, 1958)

It is possible that the modern usage which allows 'marron' to be used for hair may derive from such metaphors.

'Châtain' is commonly used of hair and although the sense of 'like a chestnut' has been largely lost the use of 'châtain' as a colour adjective may derive from earlier uses in such phrases as "des cheveux brillants comme une châtaigne". It may be, as the seven examples from my informants seem to indicate, that 'marron' will become a
commonly accepted term for hair colour just as 'châtain' did, partly through metaphorical uses such as that in Simone de Beauvoir's example and partly because of the similarity of meaning of 'marron' and 'châtaigne/châtain'.

It appears that, although the use of 'marron' to describe hair is acceptable in spoken French, it is still not so in written French. It may be however that this use of 'marron' will be extended, in time, to written French. It may even be present in recent texts; the latest entry for 'marron' in the concordance of the T.L.F. is from Simone de Beauvoir (1958).

It is obvious from the questionnaires that there is lack of agreement among informants about whether 'marron' should be used for hair. Seven informants enter hair under 'MARRON', fifty-eight enter it under 'BRUN' and two enter it under both headings. Presumably the fifty-eight who enter it under 'BRUN' did not consider that it would be appropriate to enter it under 'MARRON'.

Informants interviewed orally all said that they would not apply 'marron' to hair.

There is the possibility that those informants who use both 'brun' and 'marron' to describe hair do not regard them as synonyms. I have not been able to check this, since none of my informants interviewed orally found the use of 'marron' to describe hair acceptable.

If the two terms are not synonyms, it is likely that 'brun' will be the more general term, perhaps including 'noir', and that 'marron' will be restricted to certain
lighter shades of brown. The use of the term 'brun' as applied to hair is more fully discussed in Section 6.2.1. when it is contrasted with other members of the subset of terms used to describe hair.

5.4.3. Eyes

Both 'brun' and 'marron' are collocable with 'yeux'. The evidence from the questionnaires is borne out by evidence from the concordances of the T.L.F.

In the answers to the questionnaires forty-five informants gave 'marron' as being collocable with 'yeux' and twenty gave 'brun'.

In the concordance of the T.L.F. for the nineteenth century I found only one entry of 'marron' as applied to eyes. It was "de beaux yeux marron" (Zola, 1877).

In the concordances of the nineteenth century I found no examples of 'des yeux bruns'. Where 'brun' occurred with 'yeux' it was modified, as in 'des yeux brun clair'.

In the concordances for the twentieth century I found fifteen entries where 'marron' qualified either 'yeux' or 'couleur' when applied to eyes.

In the concordances of the twentieth century there were many examples of the application of 'brun' to eyes.

'Brun' and 'marron' may apply to part of the eye, as in "les prunelles marron" and "des prunelles brunes, légèrement fauves" (Loti, 1886). The terms may also apply, by transference, to glances, as in 'un beau regard marron'.
5.4.4. Other physical attributes

According to the questionnaires, 'brun' is much more commonly applied to parts of the body other than hair and eyes than 'marron' is. A large number of the mentions of physical attributes under 'BRUN' is accounted for by its use with 'corps', 'peau' or 'teint'. It is very unusual to find 'marron' used to describe parts of the body. In the texts of the T.L.F. I found only three such examples. They were

"le visage marron de Madame de Curel prend une teinte grise"

(Gyp, 1923)

"elle n'était plus écarlate ... elle avait tourné tout marron"

(Céline, 1936)

"leurs faces bises, jaunes ou marron"

(Barbusse, 1916)

5.4.5. Clothing and material

Both 'brun' and 'marron' may be used for clothing. Twice as many questionnaire informants, however, placed clothes and material under 'MARRON' as did under 'BRUN'. Both terms are commonly used in the texts of the T.L.F. to describe articles of clothing and materials. I have not analysed a corpus such as that drawn from fashion magazines, but I would think that 'brun' would be rarely, if ever, applied to clothes and fashion accessories in such texts.¹

¹. In the lists of fashion colours published by Marie Claire (Modoscope) from 1971 to 1974 there is no mention of 'brun' but only of 'marron'.
There is a certain fixed phrase in which 'brune' and not 'marron' is obligatory. It is 'les chemises brunes' to denote the brown shirts of a certain Nazi group. In such a phrase we have an example of a true collocation in the Firthian sense. I would have thought too that 'brun' would always be the term applied to a monk's habit ('habit de moine') or to the cloth from which it is made ('bure'). Several such uses are found in the texts of the T.L.F.. However one informant entered 'tissus de moine' under the heading 'MARRON'. One single entry is always suspect, but since this informant deliberately specified monk's clothing, I feel that this entry should not be discounted.

5.4.6. Trees and parts of trees

An early hypothesis I formed, namely that 'brun' and not 'marron' was the term applied to natural objects as opposed to manmade objects was quickly refuted by the thirty-eight mentions in the questionnaires under 'MARRON' of trees and parts of trees. Seventeen mentions are of the fruit. The fruit was usually named in the questionnaire answers using the term 'marron', often in the plural form, but sometimes more specific expressions such as 'marrons chauds' or 'marron d'Inde' were given, perhaps because informants felt that it was too obvious to say 'un marron est marron', or perhaps because they wished to make it clear that the variety of chestnut they were

1. An inedible variety of chestnut.
referring to was that variety designated by the French term 'marron' and not by 'chêtaigne'. Only one reference was made in the questionnaires to the variety designated by the term 'chêtaigne' and it was placed under the heading 'MARRON'. I would not, however, rule out such expressions as 'un marron brun' (where the fruit is being referred to) or 'une chêtaigne brune'. My intuition about the latter usage is borne out by contextual evidence from the concordances of the T.L.F., for example, "les brunes chêtaignes".

(Claudel, 1892)

Apart from references to trees and parts of trees there are references to other natural phenomena and objects in the concordances of the T.L.F. under both 'brun' and 'marron', and again it would not be true to say that 'brun' is the more common term used in describing rocks, fields and so on. The overall frequency of 'brun' is greater of course (see Section 2.3.4).

5.4.7. Animals (including horses)

The questionnaire results show that 'brun' is much more often applied to animals than 'marron' is. I found only one example of 'marron' used to describe an animal in the concordances of the T.L.F.. It was "un énorme rat marron"

(Triolet, 1945)

1. "Horse chestnut" in English.
I found no examples of 'marron' applied to horses in the texts of the T.L.F.. This is not surprising since there are so many special terms to denote brown horses (see Chapter 7). One questionnaire informant, however, did write 'cheval marron' under 'MARRON'. 'Brun' is quite commonly used of horses when one does not wish to use a more specialised term.

No questionnaire informants listed birds or insects under 'BRUN' or 'MARRON' but the texts of the T.L.F. show that both terms may be applied to birds and both terms may be applied to insects.

As in the case of natural objects, I formed an early hypothesis that 'brun' and not 'marron' is the term applied to living creatures, especially living creatures covered with fur, but the examples from the texts of the T.L.F. refute this. We may consider that the few examples from those sources showing the use of 'marron' to describe living things are idiosyncratic, but we must also consider the possibility that such uses may be indicative of changes in the use of a lexeme, in this case the extension of the use of 'marron' to a widening range of entities.

5.4.3. Persons (physical type)

I found no examples of 'marron' as a colour term applied to persons or physical type, either in the questionnaire answers or in the texts of the T.L.F.. One can say 'un homme brun' but not 'un homme marron'
except with the sense of a dishonest man. Certain phrases such as 'un beau brun' and 'un petit brun' are almost fixed phrases and numerous examples of them are to be found in the texts of the T.L.F..

5.4.9. Paint colour

Both 'brun' and 'marron' are used to denote paint colours. As with clothing colours, 'marron' is more common than 'brun' for car colours according to informants.

5.4.10. Earth and terra cotta

My early hypothesis that 'brun' was more common than 'marron' for use with natural things was refuted by the four mentions of earth in the questionnaires under the heading 'MARRON'. Nevertheless in the texts of the T.L.F. the term 'brun' is much more commonly used than the term 'marron' to describe earth and fields.

5.4.11. (Wooden) furniture

Again I expected 'brun' to be more commonly used than 'marron' to describe natural wood, but 'bois marron' was given by several informants, and several examples of the application of 'marron' to furniture are found in the texts of the T.L.F..

5.4.12. Food and drink

Apart from the use of 'brun' in certain fixed phrases such as 'sauce brune' and 'roux brun' it appears from informants' answers that 'marron' may be used to describe food. The usual items given were coffee, chocolate, and caramel. One informant even specified that for her it
was 'café liégeois' that would be described using the term 'marron'.

Beer is always described as 'bière brune', as opposed to 'bière blonde'.

No questionnaire informants said that wine could be described using the term 'brun', but a few examples of such a use were found in the texts of the T.L.F. 'Marron' was never found in collocation with 'vin'.

No questionnaire informants listed 'pain' under 'BRUN', probably because the usual expression in French to denote brown bread is 'pain bis', but a few examples are to be found in the texts of the T.L.F. showing the term 'brun' in collocation with 'pain'. 'Marron' was not found with 'pain'.

5.4.13. Tobacco

'Brun' and not 'marron' is always used when talking of tobacco. 'Tabac brun' is a fixed phrase, opposed to 'tabac blond'.

5.4.14. Miscellaneous

Only five miscellaneous items were found in the questionnaires under 'BRUN' and 'MARRON', and in the texts of the T.L.F. most uses of 'brun' and 'marron' fall under the broad headings shown above. One rather interesting item was wrapping paper. The expression 'brown paper' in English may be translated into French by the expression 'papier brun'. One informant gave 'papier d’emballage' under the heading 'BRUN'. The expressions 'papier gris' and 'papier bulle' are less often used in contemporary speech. The following
example from Simone de Beauvoir (1954), however, makes me wonder if the term 'marron' may not also be used to describe brown paper (in the sense of ordinary wrapping paper). It is

"un gros paquet enveloppé de papier marron".

It must be kept in mind, however, that the denotation of 'paper found wrapped round something' may not be co-extensive with the denotation of 'wrapping paper'. All brown paper is not wrapping paper, as the following example from Zola (1877) shows

"de papier vert et de papier marron, de feuilles et de pétales, taillés dans la soie".

An examination of the longer context shows that Zola is referring to paper for making artificial flowers, probably tissue paper.

The expression 'papier brun' may also apply to wallpaper, and several examples are found in the texts of the T.L.F. showing this use of 'brun'. There are also several examples showing that 'marron' may be used as well to describe wallpaper.

5.5.1. The use of 'brun' and 'marron' over a wide range of objects

It appears from the examples in the preceding sections that both 'brun' and 'marron' are used to describe a wide range of objects, and that, while it may be true to say that for certain classes of objects it is more usual to use one term rather than the other, there are very few classes of object which may be described using the one
term but not the other. Apart from the use of 'brun' and not 'marron' in certain fixed phrases such as 'sauce brune', 'bière brune' and possibly 'pain brun', the only other obligatory use of 'brun' is to described physical type. Physical type is closely bound up with hair and skin colour and the term used to describe these is usually 'brun' and not 'marron'. I would regard the seven mentions of hair under the heading 'MARRON' as being unusual, but nevertheless, it should be kept in mind that such mentions may point to a slowly changing pattern of collocations for 'brun' and 'marron'.

What are the implications of the above findings for the position of 'brun' and 'marron' as basic terms? One of Berlin and Kay's criteria for establishing whether a term is basic or not is that it should not be restricted to a narrow class of objects. According to the evidence of the questionnaires and of the texts of the T.L.F., both 'brun' and 'marron' fulfil this criterion, as well as fulfilling the other main criteria. Since both terms fulfil the main criteria, according to Berlin and Kay it should not be necessary to invoke the subsidiary criteria. However, two subsidiary criteria strike me as being important. 'Marron', as well as being a colour term, is also the term used to denote an object characteristically having that colour. This may, in view of some, debar it from being a basic term. For example, Zollinger (1973) in one of several important
articles on colour vocabularies defines a basic word as
"a word whose relation to an object is unrecognizable to a person untrained in linguistics".

If we rule out 'marron' on this score then we must also rule out 'orange', 'violet' and 'rose'. We would then be left with 'blanc', 'noir', 'rouge', 'jaune', 'vert', 'bleu', 'brun' and 'gris' as basic terms in French. Zollinger would go even further and rule out 'brun' and 'gris' as well, on the grounds that they do not denote colours which are primary in the physical sense. The relationship between colour naming and psycho-physical aspects of colour will be discussed in a later section on antonyms. Zollinger would retain 'blanc' and 'noir' as basic terms because they denote colours which are basic in the psycho-physical sense. Zollinger's findings fit in with the observations in an earlier section of this dissertation about the possibility of a two tier hierarchy of basicness of colour terms. Six terms, namely 'blanc', 'noir', 'rouge', 'bleu', 'jaune' and 'vert', seem to be more basic than 'brun', 'marron', 'orange', 'violet' and 'rose'. This does not help us, however, to decide whether to retain 'brun' or 'marron' or both as basic terms. If we accept, with Berlin and Kay, that there are at least eleven basic terms, that is to say if we retain 'orange', 'violet' and 'rose', then it seems to me that we must retain 'marron' as well as 'brun' as a basic term, on what I shall call the word-object relation criterion at least.
The second subsidiary criterion that seems important to me is that which concerns the morphological freedom of 'marron'. It does not have the same morphological freedom as other clearly basic terms in that it is not inflected for gender and number, it does not undergo suffixation and it has no verbal derivatives. 'Orange' however, is a fairly recent colour term, the first reference to it in the texts of the T.L.F. being in a text of 1812 and even in the twentieth century texts it is often not inflected. The first example I found in the texts of the T.L.F. showing the plural form 'oranges' was from Céline (1936) and authors as recent as Beauvoir (1954) and Triolet (1945) use the form without s to qualify plural nouns. It may be that 'marron' is following the same pattern as 'orange'. The first reference to 'marron' as a colour word in the texts of the T.L.F. is in a text of 1824 (Balzac), and as yet there have been very few examples of the form 'marrons'.

'Orange', 'violet' and 'rose' all differ from 'marron' in that they have derived forms; verbs, past participles or forms showing suffixation. As will be shown in the chapter on morphology, it is mainly basic colour terms in the Berlin and Kay sense that have derivatives. It may be, however, that 'marron' is in a state of transition and that as it becomes more frequent it will develop derived forms, especially forms such as 'marronâtre'.
5.5.2. Changes in frequency of use of 'brun' and 'marron'

In the preceding sections I have discussed the extent over a wide range of objects of the use of 'brun' and 'marron' both in spoken French, as reflected in the questionnaire answers, and in written French as reflected in the computer corpus of the T.L.F. It is more difficult to compare the frequency of use of the two terms in the two sources. The *Dictionnaire des Fréquences du T.L.F.* gives important information, however, about the relative frequency (i.e. the frequency over 100,000 lexemes) of each term for the first half of the nineteenth century, the second half of the nineteenth century, the first half of the twentieth century and the second half of the twentieth century up to 1964. Table 9 shows the relative frequency of 'brun' and 'marron' for those four periods and the percentage of mentions of 'brun' to 'marron' for the same periods. (I shall call this the 'brun to marron ratio'.)

Elucidation of Table (see following page)

The low figure for 'MARRON' in the first period is possibly accounted for by the fact that the first entry for 'marron' as a colour term in the texts of the T.L.F. is for 1824 (Balzac), and so, in effect, the first period, as far as 'marron' is concerned, is a period of 25 years and not of 60. The jump of about 3% in the 'brun to marron ratio' from the first period to the second does not therefore have the same significance.
Table 9. The relative frequency of 'brun' and 'marron' over four successive periods and the 'brun to marron ratio'

<table>
<thead>
<tr>
<th>Period</th>
<th>brun/brune</th>
<th>marron</th>
<th>brun to marron ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1739-1849 (60 years)</td>
<td>2369</td>
<td>194</td>
<td>6.7</td>
</tr>
<tr>
<td>1850-1879 (29 years)</td>
<td>6096</td>
<td>571</td>
<td>9.3</td>
</tr>
<tr>
<td>1880-1913 (33 years)</td>
<td>5399</td>
<td>523</td>
<td>9.7</td>
</tr>
<tr>
<td>1919-1964 (45 years)</td>
<td>4126</td>
<td>527</td>
<td>12.7</td>
</tr>
</tbody>
</table>

as the jump of 3% from the third period to the fourth.
The histogram in Figure 22b shows the progressive increase in the 'brun to marron ratio'. The increase in the last period is especially significant.

Figure 22b. Histogram showing the increasing 'marron' to 'brun' ratio
5.5.3. The syntagmatic behaviour of 'marron'

In early texts of the T.L.F. 'marron' was sometimes found combined with 'brun', as in

"la redingote d'un brun marron".

(Balzac, 1837)

No such combination of 'brun' and 'marron' is found in the concordances of the twentieth century. Balzac, however, did not always combine 'marron' with 'brun', as the following example shows:

"une redingote de drap marron grossier".

(Balzac, 1835)

Early texts also show the use of the term 'marron' in combination with the term 'couleur', as in

"une redingote en drap couleur marron".

(Balzac, 1835)

No such combination of 'marron' and 'couleur' is found in the concordances of the twentieth century. The lack of consistency in the way 'marron' is used, not only within the works of one individual author but in the works of authors writing about the same time, indicates that in the early days of its existence as a colour term 'marron' had not yet become completely dissociated from the name of the object and had not yet begun to behave, syntagmatically, like clearly basic colour terms. It is significant that terms which are clearly secondary terms,

1. For example, Flaubert (1886) writes "une redingote marron".
such as 'citron' and 'saumon' are very often combined in speech and in written texts either with a basic colour term, as in 'jaune citron' or with the term 'couleur', as in 'couleur saumon'. I found many such examples in the lists of informants who were interviewed orally and in the questionnaires. Many such examples from literary texts are found in the Groupes Binaires du T.L.F..

5.5.4. Some conclusions about the use of the terms 'brun' and 'marron'

Both 'brun' and 'marron' are used to describe a wide range of objects. We cannot say that either of those terms is restricted in use.

In contemporary spoken French the use of the term 'marron' may be in the process of becoming extended to hair, which was hitherto designated only by 'brun' and not by 'marron'. Informants are not in agreement about this use of 'marron' and this informant variability may be an early sign that a change is occurring in the structure of the basic colour lexicon in French. A theory such as the Berlin and Kay theory, which posits at the most eleven basic focal areas, does not prohibit systems with more than eleven basic terms. Berlin and Kay (1969) have already pointed to two such twelve-term systems, namely those of Hungarian, which appears to have two basic terms for red and Russian, which appears to have two basic terms for blue. We must take into consideration, however, the possibility of such twelve term systems, where they appear to exist, being only temporary or interim systems. It
may be that two basic colour terms co-exist for a time but that after a certain period of equal co-existence one term may gain ascendancy over the other, which may become restricted in use and therefore be relegated to the status of a secondary term. It may be that as 'marron' becomes more frequent in use and more widely used over a broad range of objects it will replace 'brun' as a basic term, leaving 'brun' as a secondary term restricted in use to hair, skin and physical type.
Chapter 6

COLLOCATIONALLY RESTRICTED TERMS

6.1.1. The notion of collocationally restricted terms is not confined to structural semantics. The Firthian notion of collocation has already been discussed in Section 5.2.2. As examples from that section show, true Firthian collocations are often between an adjective and a noun. The notion of selection restrictions in Transformational Grammar is different in that the selectional features which determine, for example, the noun to accompany a certain verb, are of greater generality (1.4.7.). Pottier's classemes, are also of great generality (Pottier, 1964); in the case of nouns they are features such as animate/inanimate and human/non-human. Coseriu's notion of lexical solidarities (lexikalische Solidaritäten) includes a notion close to that of Pottier's classemes (Affinität) but allows also for relations between lexemes denoting specific entities such as horses and lexemes which may collocate with them (Coseriu 1967, p. 296). I shall be concerned with the latter type of relation which Coseriu calls implication (Implikation). The example Coseriu gives to illustrate this relation is the example of 'cheval' and 'alezan' in French where 'cheval' is the determining lexeme and 'alezan' is the determined lexeme. The relation is one of necessary implication, since 'alezan' may not be used in collocation with any
other lexeme apart from 'cheval', according to Coseriu.

6.1.2. Terms which denote horses' coat colours in French

The subset of colour terms which may be used to denote the colours of horses' coats in French contains many terms that belong to it exclusively. Colour terms which are of greater generality such as 'brun', 'noir', 'gris' and 'blanc' are also used to describe horses' coats, but subsumed under these four general terms are many special terms. Under 'brun' in the Robert, for example, one finds:

- alezan, aubère, bai, baillet, isabelle, louvet, rouan, saure.

Under 'noir':

- moreau.

Under 'gris':

- pinchard.

Under 'blanc':

- rubican.

Historically these terms are interesting\(^1\) but synchronically the interesting point is that these terms are used exclusively of horses, or perhaps other equines, and that they enter into a relation of necessary implication with lexemes such as 'cheval', 'âne', 'mule', 'mulet'.

Sometimes a specific term such as 'bai' may be used

\(^1\) For example they show traces of once general colour terms which have now disappeared except in this restricted context. They also show examples of diminutive suffixes, which were once commonly used in colour terms, but which are now very rarely used in colour terms (Chapter 9).
along with a more general term, as in "un grand bai brun" (Zola, *Nana*), or "un grand cheval bai brun" (*Malegue*, 1933).

Sometimes when used along with 'bai', 'brun' is used to mark an opposition denoting, perhaps, that the colour is a brownish shade rather than a reddish shade, as in "le voyant alternativement bai brun et bai cerise" (*Du Bois*, 1923).

6.2.1. **Terms which denote hair colour in French**

The colour terms in French which are commonly used to describe hair are 'blond', 'brun', 'noir', 'châtain' and 'roux'. 'Gris' and 'blanc' are also used. Less common terms, but ones which were given by informants as everyday words, are 'auburn' and 'cendré'. The terms which are used exclusively, or almost exclusively, of hair are: 'blond', 'châtain', 'roux', 'auburn' and 'cendré'.¹ 'Cendré' is often used to modify other colour adjectives as in 'gris cendré', 'blanc cendré' and even 'gris brun cendré' (*Gide*). When used of hair the colour adjective which is understood is always 'blond' and 'cendré' when applied to hair therefore implies 'blond cendré'.

6.2.2. **The value of 'blond' in different sub-sets**

I said that 'blond' is used almost exclusively of

1. The suffix -é in colour terms may denote 'approximate colour' but not necessarily. For example, 'rose' denotes pink, not pinkish. As Becker (1975) points out, such forms in -é cannot be seen simply as participial forms, since the verb usually comes later. For example, 'azurer' appears in the 13th century and the verb 'azurer' does not appear until 1549.
hair. By extension it may be used of things which are of a light yellow colour. However, 'blond' is used mainly of hair, beer, tobacco and sauces. The value of the term is not however the same in all of these sub-sets, as will be seen if we examine the sense relations and the oppositions into which the term enters in each sub-set. For example, 'blond', when used of beer, is opposed to 'brun' in 'bière blonde' and 'bière brune'. When used of tobacco the opposition is again 'blond'/'brun' as in 'tabac blond et tabac brun'; 'cigarettes blondes et cigarettes brunes'. When used of sauce the opposition is also 'brun'/'blond', but here a third term, 'blanc', enters into the opposition. One therefore has 'sauce blanche, sauce blonde et sauce brune' in that order of darkness of colour. The degree of darkness of colour usually, but not always, derives from the colour of the basic roux (mixture of butter and flour cooked together until the desired colour is reached). It is therefore not surprising that the same three-fold opposition holds for 'roux' and one has 'un roux blanc', 'un roux blond' and 'un roux brun'.

When 'blond' is used of hair the term enters into two different kinds of relation of opposition. Firstly, 'blond', like all colour words, is opposed to every other colour word, or, if we think of 'blond' as

1. In the Saussurean sense of 'valeur'.
belonging to a sub-set of words which apply to hair, then it is opposed to every other colour word in that sub-set. Secondly, 'blond' is opposed to 'brun'. That is to say a broad division is made into fair-haired and dark-haired. Examples such as the following from literary French point to this broad division:

"on est blond ou brun sans le vouloir"
(Bourget, 1883)

"était-il grand ou petit, brun ou blond?"
(Goncourts, 1851-78)

"la brune rêvant d'être blonde, la blonde d'être brune"
(T'Serstevens, 1933).

Sometimes a middle term, 'châtain', is mentioned along with 'blond' and 'brun' as in:

"ni brun ni blond mais châtain".

For most informants 'châtain' denotes mid-brown, of indeterminate colour, mousey, and has no suggestion of red.

The value of 'blond' will be different in all three cases. If we imagine the range of principal colour terms for hair as lying on a continuous band from light to dark its value would be different according to whether it was thought of as belonging to say, a five-term system, a three-term system or a two-term system:
In (1) 'blond' is one of five terms for hair colour and shares with them, let us say, the task of denoting the complete range of hair colour. In (2) 'blond' is one of only three terms and its share of the work will be greater. It will take on part of the work done by the missing 'roux'. The remainder of the work previously done by 'roux' will, I suggest, be taken over by 'châtain'. My reason for suggesting this is that 'roux' may denote a light or a dark red and is sometimes modified by 'blond' ('blond roux') and sometimes by 'châtain' ('châtain roux')(Petit Robert). If there were no term 'roux' therefore, it would seem likely that some red shades would fall under 'blond' and some would fall under 'châtain'. 'Brun' in a three-term system would subsume 'noir'.

In a two-term system such as that represented in (3), I suggest that part of the work done by the missing 'roux' will, I suggest, be taken over by 'châtain'. My reason for suggesting this is that 'roux' may denote a light or a dark red and is sometimes modified by 'blond' ('blond roux') and sometimes by 'châtain' ('châtain roux')(Petit Robert). If there were no term 'roux' therefore, it would seem likely that some red shades would fall under 'blond' and some would fall under 'châtain'. 'Brun' in a three-term system would subsume 'noir'.

1. But only in a hypothetical sub-system of three terms, or in a context such as the one above. In the language as a whole, although there may be a broad opposition 'brun'/'blond', it is sometimes necessary to make the distinction between 'brun' and 'noir'. One might say 'Il n'est pas brun, il est noir'.
'châtain' would fall to 'blond' and part to 'brun', depending on whether the referent could be described as light or dark mid-brown ('châtain clair' or 'châtain foncé').

The terms 'brun' and 'blond' may refer to physical type as much as to hair colour, and when they do the meaning of the terms will include features which denote skin colour as well as hair colour. When 'brun' is used as a noun, as in 'un petit brun', 'un beau brun', two very common collocations, it is the type that is referred to and not only the hair colour. Similarly 'une brune' not only has brown or black hair but also a mat complexion and, probably, brown eyes. If she does not have a mat complexion this is remarkable as the following example shows:

"au lieu d'être brune brune elle était brune rose"

(Giraudoux)

If she does not have dark eyes this too is remarkable as the following example shows:

"ses prunelles dont la nuance glauque étonnait dans ce teint de brune"

(Martin du Gard, 1928)

She may even be described as 'une brune' without having brown or black hair. The following example shows that

1. In French 'le teint mat' or 'le teint olivâtre', not 'le teint brun'. 'Brun', when applied to complexion, usually denotes suntanned.
'brune' covers more than hair colour and may even exclude it:

"une longue brune aux cheveux platines"

(Simone de Beauvoir, 1954)

Similarly 'blond' may denote not only fair-haired but also fair-skinned ('au teint clair') and, probably, blue or green-eyed.

6.2.3. The value of 'brun' in different sub-sets

As has been shown for 'blond', the meaning of 'brun' varies according to the sub-systems in which it appears. It has already been shown that when 'brun' refers to tobacco, beer or sauce it is opposed to 'blond', and that in the last named sub-system a third term, 'blanc', may appear giving rise to a three-way opposition. All that was said about 'blond' when used to denote hair colour or physical type applies also to 'brun' where oppositions are concerned, and Table 10 shows how the value of 'brun' changes according to whether it appears in a two-term, a three-term or a five-term system.

Since 'brun' is a much more frequently used term than 'blond' it is to be expected that it will appear in many more sub-sets than 'blond' does and also that the opposition may not always be 'brun'/'blond'. For example, when the terms are applied to bears, the opposing terms are 'brun' and 'blanc'. 'Ours brun' is almost a fixed expression, and in Europe at any rate, 'ours' alone generally implies 'ours brun'.

Since 'brun' is a much more frequently used term than 'blond' it is to be expected that it will appear in many more sub-sets than 'blond' does and also that the opposition may not always be 'brun'/'blond'. For example, when the terms are applied to bears, the opposing terms are 'brun' and 'blanc'. 'Ours brun' is almost a fixed expression, and in Europe at any rate, 'ours' alone generally implies 'ours brun'.
6.3.1. **Colour terms which apply to bread in French**

In the small sub-set of colour terms which apply to bread, 'brun' is opposed to 'blanc'. It has however a near synonym, 'bis'. Both terms, 'brun' and 'bis', are therefore in opposition to 'blanc'. There is no term in this small sub-set that belongs exclusively to it, although the use of 'bis' in other contexts is very rare. ¹

6.4.1. **Colour terms which apply to wine in French**

In the sub-set of colour words that apply to wine the two broad divisions are into 'blanc' and 'rouge'. There is also an intermediate term 'rosé'. ² These divisions derive from the nature of the wine and mainly from the species of grape and the length of fermentation time, and so may be said to be natural divisions. Other colour words such as 'jaune', 'paille', 'bleu' may be found applied to wine, especially in literary contexts. 'Brun' may be applied to wine but usually only to wines such as sherry and madeira. One should not therefore think of 'brun' as being opposed to 'blanc', 'rouge' and 'rosé' in the sub-set of colour terms in wine.

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¹ Le Petit Robert lists 'un teint bis' and 'une toile bise', but some informants do not recognise these. One informant would accept 'toile bis' but not 'toile bise'.

² 'Rosé' is classed as an approximate colour term by Becker (1975), but he does say it also denotes the same as 'rose' as well. This would appear to be the case when it is applied to wine.
terms that apply to wine but rather one should think of it as being opposed to other terms in a smaller sub-system of colour terms which apply to wines of the sherry type. In this sub-system 'brun' is opposed to 'pâle', and often collocates with 'doux'. 'Pâle' often collocates with 'sec' in this sub-system.

6.5.1. Colour terms which apply to eyes in French

In the sub-system of colour words that apply to eyes most of the terms do not belong to it exclusively. Such terms are 'brun', 'marron', 'bleu', 'vert' and 'gris'. There are, however, a few fairly common terms which apply exclusively to eyes, namely 'noisette', 'pervenche' and 'pers'. These are not basic terms perhaps as they could be subsumed under 'brun' and 'bleu'. In this sub-set 'brun' is opposed to all the other colour words in it and there is no binary opposition as there was in the case of 'brun'/'blond' in the sub-set of terms for hair. There is a binary opposition 'clair'/'foncé' for eyes.

6.6.1. Colour terms which apply to complexion in French

The sub-set of colour words which apply to complexion and skin is another distinct sub-system with its own system of oppositions and containing colour words that

1. 'Pers' is now restricted to eyes but it was not thus restricted in Old French. Godefroy's Dictionnaire de l'Ancien Français defines it as "bleu de diverses nuances, tantôt bleu foncé et tirant sur le noir, avec des reflets verts, tantôt bleu azuré."
belong exclusively to it. The main division here, leaving aside the broad division 'blanc'/ 'noir', is into 'teint clair' and 'teint mat'. 'Brun' may apply to a permanent state. For example, someone from the South of France may have a brown skin ('une peau brune'). It is, however, more likely to denote a temporary state and then it is a synonym of 'hâlé' or 'bronze'. This example illustrates how a lexeme may enter into different sense relations according to the sub-set in which it is. 'Brun' is a synonym of 'hâlé' only in this sub-set, and in other sub-sets it may have different synonyms. A mat complexion need not necessarily be brown ('brun'). It may be olive, yellow or yellowish ('olive', 'jaune' or 'jaunâtre'). It may even be white, but in this case 'blanc' would denote a temporary state as when a person turns with fear.1

Colour terms which apply exclusively to skin in modern French are 'livide', 'blême' and 'blafard'. Of those only 'livide' denoted a colour in Latin (lividus). The others denoted paleness rather than whiteness.

6.7.1. The above examples show how certain colour terms may belong exclusively to certain sub-sets of lexical

1. Inchoatives 'brunir' and 'blanchir' exist, but there is no inchoative corresponding to 'mat'. There is, however, a state noun, 'matité', as in 'la matité des gitanes'. 
items which are restricted in application to certain entities. This is another way of saying that certain lexemes may collocate only with certain other lexemes.

The notion of context is relevant here and one's choice of lexeme is determined not only by the linguistic context, but also by the situation. Word meanings need not be thought of as being fixed, but may be thought of as changing according to the context or universe of discourse (Lyons, 1963). This is illustrated by the fact that sense relations such as antonymy and synonymy do not always hold between the same two lexemes. 'Brun' and 'noir' may be synonyms, or near synonyms, when talking of hair, but when talking of skin 'brun' is a synonym of 'bronzé'. 'Blanc' may be opposed to 'brun' when talking of bread, or bears, but 'blond' is opposed to 'brun' when talking of tobacco.
Chapter 7

ANTONYMY

7.1.1. Antonymy as a special kind of opposition

Before attempting to answer the question of whether colour terms have antonyms, I shall consider antonymy within the wider framework of opposition. The notion of antonymy is fundamental to structuralism, not only in linguistics but in other fields such as anthropology and literary criticism. The notion of opposition, and especially of binary opposition, has been particularly important in phonology, but it also has an important place in structural semantics.

Opposition, as I use the term, is not necessarily confined to binary opposition. It is important, however, to distinguish between binary opposition and opposition where no implications are drawn as to the number of elements in the set. Colour terms are generally held to fall into the second category. If we consider that the set of basic terms consists of a set of eleven terms, it is the generally accepted view that each element in that set is opposed to every other element. This is the kind of opposition that Coseriu, following Trubetzkoy (1932), calls 'equipollent', and as the term suggests the opposing terms in the set are of equal value. One cannot point to any two terms as the terminal elements of a polar axis, in the way that one can, for

1. Lyons (forthcoming, section 9.1.) uses the terms 'opposition' and 'contrast' to make this distinction.
example, point to the two terms 'freezing' and 'boiling' as the terminal elements of an axis along which lie the terms 'freezing', 'cold', 'cool', 'tepid', 'warm', 'hot' and 'boiling'. Coseriu, in common with many linguists, calls the latter type of opposition 'graded opposition' ("oppositions graduelles"), and I shall return to the notion of graded and ungraded opposites later. According to Coseriu, the type of opposition found holding between colour terms in modern French is equipollent opposition, but he also points to another kind of opposition found holding between certain colour terms in Latin. He calls this kind of opposition 'privative opposition' ("oppositions privatives"). The difference between two terms standing in a relationship of privative opposition one to the other is that one of the terms possesses a distinguishing feature which is lacking in the other. For example, 'albus' is opposed to 'candidus', the difference between the two terms being that the one, 'candidus', possesses the distinguishing feature 'shining' that is lacking in the other. In the same way 'ater' is opposed to 'niger', which possesses the feature 'shining' which is lacking in 'ater'.

I accept that the notion of equipollent opposition applies to colour terms in modern French, but I would like to consider also the possibility that the notion of binary opposition may also be applicable to certain (two-term) sets of colour terms.

I shall use the term 'opposites' for the two
opposing lexemes in such sets. There is nothing unusual about this use of the term. It is customary to distinguish between gradable opposites such as 'large' and 'small' and ungradable opposites such as 'male' and 'female'. The differences between gradable and ungradable opposites has been treated elsewhere in the literature and I shall not attempt a discussion here.¹ It may be convenient to call ungradable opposites 'complementaries' and gradable opposites 'antonyms' and I shall observe this convention.² There is an important difference between the logical relation holding between complementaries and the logical relation holding between antonyms. Complementaries divide the universe of discourse entirely into two complementary subsets. Strictly speaking, since I have said that opposites, of which complementaries are one example, are lexemes, I should say that complementaries are convenient labels used to refer to members of complementary sets, which, between them, divide up the universe of discourse entirely. Antonyms do not divide up the universe of discourse entirely. This difference will be important when we come to consider whether colour terms are complementaries or antonyms.

7.1.2. Colour adjectives compared with adjectives from other sensory domains

Colour terms are adjectives, and in order to compare

1. See especially Lyons (forthcoming, section 9.1.).
2. cf. Lyons (ibid.).
them with other adjectives which clearly have complementaries or antonyms, it will be necessary to examine the kind of entity of which they may be predicated. Adjectives denote qualities of entities. In the case of colour adjectives the entities of which they are predicated are first order entities unless the adjectives are used figuratively, when they may be used to describe second order entities, that is to say, processes, events or states of affairs in the external world; 'une nuit blanche', 'un cafard noir' would exemplify this kind of use in French. First order entities are persons or things. By things I mean physical things and by physical things I mean not only three-dimensional solids which are relatively stable but also such things as sky and sea.

Adjectives denote qualities of matter and philosophers commonly distinguish secondary qualities from primary qualities such as mass, position and motion. Primary qualities belong to matter located in time and space. Spatial adjectives, because they are readily connected with physical dimensions, direction, and, more importantly, when we come to think of antonyms, with polarity, are perhaps the most easily thought of as having antonyms.

Adjectives of speed and motion also furnish clear cases of antonymy. The scale, being temporal rather

1. Lyons uses the expression 'first order entities' to denote persons and objects located in space and time.
than spatial, is less easily visualised in concrete form perhaps but is none-the-less ordered in a non-arbitrary way. What one takes to be the two poles is of course to some extent arbitrary and one is again faced with the same problem as one finds with spatial adjectives. An adjective such as 'fast' denotes relative rather than absolute fastness.

One class of adjective denoting primary qualities which does not present us with clear cases of antonymy is the adjectives of shape.

Colour adjectives denote secondary qualities as do all adjectives of perception and sensation. By perception I mean auditory, tactile, gustative and olfactory perception as well as visual perception. Visual and tactile perception have in common that one can perceive not only secondary qualities such as colour, smoothness, roughness etc. but also primary qualities such as length, breadth, roundness, squareness, nearness and speed. One cannot however perceive by hearing, tasting or smelling any of these qualities except perhaps indirectly as is shown by a sentence such as "I could hear that the train was going very fast".

Colour qualities and sound qualities have in common that they are not perceivable by any of the other four senses. One can, for example, see that something is smooth as well as feel that it is. One can smell that something is vanilla-flavoured as well as taste that it is. One cannot, however, hear, feel, taste or smell that
something is 'red'. Neither can one see, feel (in the tactile sense), taste or smell that something is loud, unless perhaps indirectly as is shown by such a sentence as "I could see from the volume indicator that the music was very loud". One must however take into consideration synaesthetic metaphors as described by Ullmann (1972, p. 367). Applied to the field of colour such a notion would be exemplified by such expressions as 'un rouge criard', 'un vert acidulé' and perhaps 'un rose doux', although in the latter example it is not clear whether 'doux' is transferred from the sensory domain of taste ('sweet') or of touch ('soft') or from neither. 'Doux' may be a connotative term used in the same way as 'tendre' is in such expressions as 'un vert tendre'.

The point that colour qualities are not perceivable by any sense other than the visual is one that is made by Katz (1970), and is one of the reasons he gives for maintaining that colour words do not have semantic markers but only distinguishers.

Colour adjectives are alone among the common adjectives of sensation in not presenting cases of antonymy. I think that most people would agree that the following pairs of antonyms would be acceptable:

1) loud; soft (or quiet)
2) smooth; rough : soft; hard
3) sweet; sour (or bitter)
4) fragrant; malodorous (or foul)

All the antonyms contained in the above pairs are
gradable. Also the individual adjectives are relative in the same way as, for example, adjectives of size are. A loud whisper is only relatively loud. They are also more subjective and evaluative than adjectives of size, position and speed are. As regards the sensations of taste especially personal opinions often enter into the evaluation. Such individual evaluations do not however affect the relation of opposition which is a relation between lexemes. This point is made by Coseriu and Geckeler (1974, p. 142).

The above pairs of adjectives may all be thought of as polar opposites, but only in the case of adjectives of hearing could we point to a physical scale. As in the case of adjectives of size and speed the outer limits would be to some extent arbitrary but one could fix a scale going from X decibels down to Y decibels. In the case of adjectives of touch, taste and smell the polar opposites are psychologically rather than physically determined.

7.1.3. Polar opposition among colour terms

Is there any case to be made out for the existence of polar opposites among colour terms? At first glance it would appear not. The spectrum is a continuum and although it is often portrayed as a straight band one should rather think of it as a continuous circle with no beginning and no end. There is however one reason perhaps for portraying the spectrum as a straight line, and that is that the wavelength varies along the spectrum
from about 400 to about 700 millimicrons thus:

700 0 400
red orange yellow green blue violet

In a sense then red and violet are polar opposites, but as will be seen later 'violet' is not usually considered to be the opposite of 'red'. Another argument against using the wavelength as a way of determining the opposite of a colour is that the colours we see are not pure spectral colours but are composed of a mixture of wavelengths.

If one looks at the hue circle in a book on colour theory,\(^1\) one sees that complementary colours, which may be considered to be opposite colours, lie not at either end of a polar axis like the one above but at diametrically opposite points of a circle. Such circles often have added to them some representation of the dimensions of brightness (or lightness) and saturation as well, and may shed some light on the physical opposition of colours at least. The diagram below is reproduced from Burnham, Hanes and Bartleson and shows the three-dimensional nature of the colour space:

Diagram I.

The above diagram shows clearly the complementary colours which are in opposition, namely red; green and blue; yellow. This diagram is only a crude representation however and does not show that it is a certain red that is the complement of a certain green and a certain yellow that is the complement of a certain blue. Ostwald shows this clearly in his colour circle.

The ordinary speaker is however unaware of these finer points and those who think about these things at all would say that red is the complement of green and yellow is the complement of blue. The question remains however whether these speakers would consider the word 'red' to be the opposite of the word 'green' and the word 'yellow' to be the opposite of the word 'blue'. According to Ogden (1932: 83) these pairs are regarded as opposites in Basic English. I tested for opposition between the French terms and shall discuss the results of the test in a later section.

Diagram I shows also the oppositions on the other two dimensions, namely those of brightness (or lightness) and of saturation.

On the dimension of brightness we have polar opposites dazzling and dark with gradation coming between. If we think of the brightness dimension as a lightness dimension, i.e. as a dimension appertaining to surface colours, the terms used to denote the polar opposites would be 'white' and 'black', if we are thinking of opaque surfaces, or 'clear' and 'dark', if we are
thinking of transparent surfaces. The only colour terms relating to these three pairs of polar opposites, in the usual sense of colour term, are 'black' and 'white', and there appears to be a good case to be made out for 'black' being regarded as the opposite of 'white'.

On the dimension of saturation the two extremes of the axis are a point on the hue circle and a point on the neutral axis. Polar opposites would therefore have to be something like 'fully saturated' and 'fully greyed', i.e. 'neutral'. These are not colour terms in themselves but are attributes of colour terms in the same way as 'dazzling' and 'dark' are. We cannot therefore talk of antonyms of colour words on this dimension.

It appears from the foregoing that the only likely antonyms among colour words in French are 'noir'; 'blanc'; 'rouge'; 'vert'; 'bleu; jaune'. I therefore tested 139 French subjects to see if this was the case.

7.2.1. The Method

One question on the six-question questionnaire sent to French speakers was

"Ecrivez le contraire de:

noir ____________________

rouge ____________________

bleu ____________________ ."

7.2.2. The Informants

To the 100 informants already consulted (see
previous section) were added students and professional people from Paris between the ages of 18 and 52. The total number of informants for this part of the research was therefore 139, of whom 96 were female, 41 were male and 2 did not indicate their sex. It is not known if any of the questionnaire informants are colour-blind.

7.3.1. The Results

The opposite of *noir*

123 informants gave *blanc* as the opposite of *noir*, that is 88% of the informants. Three more gave *blanc* as well but qualified their answer with a question mark or a remark such as "blanc si l'on veut". If these three are included this brings the percentage up to 91%. Of the others, one gave *not noir* indicated by - noir; five left the space opposite *noir* blank or else inserted a dash; six stated explicitly that *noir* had no opposite ("pas de contraire"). It is clear therefore that most people consider *blanc* to be the opposite of *noir*.

7.3.2. The opposite of *rouge*

It is much less clear from an analysis of the questionnaires if *rouge* is considered to have an opposite and if so what it is.

46 informants either left the space blank or else inserted a dash; 3 inserted a question mark and 7 stated explicitly that *rouge* had no opposite. 56 informants therefore gave no opposite for *rouge* -
that is 40% of the informants. 35 informants (25%) gave 'vert'; 21 (15%) gave 'bleu'; 9 informants (6%) gave 'jaune'; 1 informant (.7%) indicated that it was opposed to every other colour; 1 informant (.7%) indicated that it was not 'rouge' and one said that it had different opposites according to its connotations.

Of the others, 4 gave 'noir', 2 gave 'gris', 2 gave 'rose', 2 gave 'marron', 2 gave 'violet', 1 gave 'blanc' and 1 gave 'parme'. In other words practically any one of Berlin and Kay's basic colours is considered, by one informant at least, to be the opposite of 'rouge'. The only three basic colours missing from the list of opposites in fact are 'orange' and 'jaune' (too near to red?) and 'brun' (perhaps not basic?).

However a substantial number of informants gave 'vert' (25%) and even 'bleu'. I shall examine some of the reasons for this.

'Rouge' and 'Vert'

It has already been seen that red and green are considered to be complementary colours. To understand what is meant by complementary colours it is necessary to return to the idea of the colour circle or, to be more precise, the chromatic circle, since it is only hues and not the achromatic blacks, whites and greys that are thus arranged. I have already mentioned the Ostwald colour circle with its 24 equally spaced hues and this is one of the most accurately worked out circles.
Since the time of Newton it has been recognised that all hues are capable of being arranged in a continuous circle and that one can pass from one hue to another by imperceptible changes. This would however give an indefinite number of hues and in practice it is more common to regard these hues as falling into a small number of groups. Newton, in *Opticks*, distinguished seven. Some say that this was because he associated the hues with the seven notes of the diatonic scale. Others say that it is simply because he liked the number seven. In early works he omitted indigo. This may be an indication that his division of the spectrum into seven hues was arbitrary, but there may also be physical and physiological reasons for the uncertain status of indigo.¹ The seven hues distinguished by Newton were

- red, orange, yellow, green, blue, indigo, violet.

Other colour theorists have divided the spectrum into different numbers of groups. One of the best known of those theorists is Munsell, who divided his colour circle into ten; that is into five main colours: red, yellow, green, blue, purple; and five intermediate colours: yellow-red, green-yellow, blue-green, purple-blue and red-purple. Munsell was not a physicist and his classification, although it has its roots in the

physical primaries, is mainly one of convenience. It has the great advantage that it allows for the allocation of standard numbers to a very wide range of shades and enables researchers using the Munsell system to compare results in a consistent way.

Ostwald's 24 hues are divided into eight main groups: red, purple, blue, turquoise, seagreen, leaf-green and yellow. Ostwald arranged his hues in a circle and found that his opposite pairs withstood the test for complementary colours, that is to say that when the two hues were optically mixed, for example by spinning discs, a neutral grey was produced. In the Ostwald system 'red' is the complementary of what Ostwald calls 'seagreen'.

One reason for informants saying that 'rouge' is the opposite of 'vert' is doubtless that they have been taught to regard these as complementary colours. This result may therefore be a culturally determined one. There may, however, be physiologically determined reasons for informants saying that 'rouge' is the opposite of 'vert' and I shall return to these in Section 7.4.1.

Another reason for French people saying that 'rouge' is the opposite of 'vert' might be because of the system of traffic lights. This is a culturally determined opposition and not a physiologically or psychologically determined one. One might argue here that the opposition is only indirectly between 'rouge'
and 'vert' and that the direct opposition is between something like 'avancer' and 'arreter'.

One reason given by an informant for 'vert' being the opposite of 'rouge' was that 'vert' denotes a cold colour and that, presumably, 'rouge' denotes a warm colour. Goethe (1810) pointed out that complementary colours exhibit polar qualities such as warmth and cold. There is some evidence to suggest that the warmth of red is not purely subjective, based on the associating of red with fire, heat and sun, but that there is some physical basis for the division of colours into warm and cold colours. This can be confirmed by using a special thermometer.

'Re Rouge' and 'Bleu'

Why so many informants should have given 'bleu' as the opposite of 'rouge' is less easy to understand. One reason may be that 'bleu' is next to 'vert' on the spectrum and that for certain reds (orange reds) certain blues (green blues) are the complementary colours.

All sorts of other factors, subjective or objective, might be at work to induce an informant to give 'bleu' as the opposite of 'rouge'. For example, the series 'bleu, blanc, rouge' might come readily to a French person's mind, because of the tricolour flag, and in such a series 'bleu' and 'rouge' might seem to be opposed.

7.3.3. The opposite of 'bleu'

When asked to give the opposite of 'bleu' 61
informants out of 139 indicated that it had no opposite, either by leaving a blank or by saying that it did not. The most frequently given opposites were as follows:

<table>
<thead>
<tr>
<th>Colour</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>rouge</td>
<td>19</td>
<td>14%</td>
</tr>
<tr>
<td>jaune</td>
<td>13</td>
<td>13%</td>
</tr>
<tr>
<td>orange</td>
<td>12</td>
<td>9%</td>
</tr>
<tr>
<td>vert</td>
<td>11</td>
<td>8%</td>
</tr>
</tbody>
</table>

On the results of analysis of the previous question - indicate the opposite of 'rouge' - one would have expected the complementary colour 'jaune' to be the most frequently mentioned. Also, if the Hering opponent theory holds, then 'jaune' would be the opposite one would expect for 'bleu'.

The informant who represented the 'rouge-vert' opposition as a 'chaud/froid' opposition did the same for 'jaune-bleu'. 'Jaune' is perhaps a less obviously warm colour than 'rouge' but the reds, oranges and most of the yellows belong to the warm end of the spectrum.

The mention of 'orange' as the opposite of 'bleu' is not surprising when one considers that for some blues (turquoise blues) orange is the complementary colour. The mention of 'vert' on the other hand is surprising, since 'vert', being the colour adjacent to 'bleu' on the spectrum, would appear to be near to blue rather than opposite it.
7.4.1. **Physiologically determined reasons for the relation of opposition between certain colour terms**

In this section I wish to examine the possibility that there may be physiologically determined reasons for informants considering that 'blanc' is the opposite of 'noir', 'rouge' is the opposite of 'vert' and 'bleu' is the opposite of 'jaune'.

There are two main theories of colour vision, the Young–Helmholz three component theory, and the Hering four colour opponent process theory.

The Young–Helmholz theory assumes that there are three kinds of receptor in the retina that react selectively to light according to its wavelength, and produce the separate sensations of red, green and violet. The messages from the three kinds of receptor are combined in the visual system the moment colours are seen. The particular colour seen depends on which receptors are acted on by light and how much they respond to the light. The visual receptors for photopic vision are usually considered to be the cones and this is therefore a cone response theory.¹

The Hering opponent process theory is more interesting from the point of view of complementary colours. The Hering theory assumes that there are six basic unitary

¹. Later theorists, for example Willmer, suggest perhaps that rods have something to do with colour (hue) vision, and that the blue component has rod-like qualities.
colours: red, yellow, green, blue, white and black. It
gives an account of colour vision in two stages. During
the first stage, as in the Young–Helmholz theory, light
is absorbed into the receptors. This absorption starts
activity in the rest of the visual system. Activity in
the visual system is found in three pairs of processes
with the two members of each pair being opposites or
opponent processes. According to Hering, there is a
blue–yellow pair of processes, a green–red pair of
processes and a white–black pair of processes in the
visual system. The particular colour seen depends on
which of the three opponent processes are responding,
on the direction of the responses and on the amounts
of the responses.

Later work by Hurvich and Jameson (1957) supports
the Hering theory. Their theory is also a theory based
on a two-stage process of colour vision, the first stage
being in the cones of the retina and the second stage
being located beyond the retina in the nerves. According
to the Hurvich–Jameson theory, there are four light-
receiving units containing combinations of three
photochemicals. It is at the second stage that the
three opponent processes come into play.

One of the most significant findings by adherents
of the opponent process theory, from our point of view,
is that different opponent processes have different
response thresholds. The most sensitive process is
the white process, the next most sensitive is the red-
green process and the least sensitive is the blue-yellow process. It may or may not be accidental that the decreasing order of sensitivity of the paired processes correlates with the decreasing order of acceptability of the three pairs of antonyms.

The Young–Helmholz theory also has its later supporters, notably Rushton (1962), Marks, Dobelle and MacNichol (1964). It may be that the two main theories of colour vision complement rather than contradict one another. Neither theory seems to have all the answers; neither theory can, for example, explain all kinds of colour blindness.

The phenomena of colour blindness and of after-images are physiologically conditioned, and it is significant that the linked pairs in both cases correlate with the antonyms 'rouge' and 'vert' on the one hand, and 'bleu' and 'jaune' on the other.

7.5.1. Conclusion

If we consider the set of basic colour terms in French to comprise the terms 'blanc', 'noir', 'rouge', 'jaune', 'vert', 'bleu', 'brun', 'marron', 'rose', 'orange', 'violet', we can say that each of these terms stands in a relationship of equipollent opposition to the others.

We can also say that for three pairs of terms drawn from that set, a relationship of binary opposition appears to hold. Those pairs are 'blanc:noir',

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We can also say that for three pairs of terms drawn from that set, a relationship of binary opposition appears to hold. Those pairs are 'blanc:noir',"
'rouge:vert' and 'bleu:jaune'. The clearest case of antonymy is that of 'blanc:noir'. Here each of the lexemes is gradable. One can say 'plus blanc', 'moins noir' and so on. Moreover each lexeme denotes the end point of a polar axis, and one can readily point to a mid-point denoted by the term 'gris'. The pairs 'rouge:vert' and 'bleu:jaune' present less clear cases of antonymy. All four lexemes are gradable, but one cannot point to a lexeme which denotes a mid-point between red and green on the one hand, and blue and yellow on the other. It has been shown, however, that those four lexemes denote colours which can be represented as polar opposites in certain representations of colour space. The term used by Lyons (forthcoming, section 9.2.) for such opposites located in three-dimensional space is 'antipodal opposites'.

It is significant that the six basic terms which present cases, albeit not clear cases, of antonymy are those terms which have been found elsewhere in this dissertation to be in some ways more basic than the others, and which designate the four physical primaries plus black and white.¹

It may also be significant that the three pairs of antonyms correspond to the three opponent processes of the Hering theory of colour vision, and that, moreover,

1. See also Zollinger (1973).
there appears to be a hierarchy of acceptability of antonyms that corresponds to the varying response thresholds of the three opponent processes, the lowest response threshold (for black and white) correlating with the pair of lexemes most readily accepted as antonyms, and the highest response threshold (for blue and yellow) correlating with the pair of lexemes least readily accepted as antonyms.
Chapter 8

THE TERMS 'CLAIR', 'FONCE' AND 'PÂLE'

8.1.1. Lexicalisations indicating differences in hue, saturation and brightness

Colours vary on the three dimensions of hue, saturation and brightness. One is not however aware that one is organising one's colour experience along those lines and colour names do not usually indicate those variations.

Hue terms are generally taken to be those terms that denote spectral hues. In French those terms are 'rouge', 'orange', 'jaune', 'vert', 'bleu' and 'violet', and when one exemplifies the relation of equipollent opposition that holds between colour terms (7.1.1.) one usually points to the opposition that holds between those terms. Physically the colours denoted by those terms are differentiated the one from the other by wavelength. The above terms do not always denote pure spectral hues however. In talking of object colour one may use each term to denote a wide range of shades of varying saturation and brightness. A difference in brightness and a difference in saturation often go together and there are lexicalisations that indicate combinations of brightness and saturation difference. In English one has such terms as 'pale', 'deep', 'dark', 'brilliant' and 'dusky'. In French one has such terms as 'pâle', 'clair', 'foncé', 'soutenu' and 'vif'.
8.1.2. 'Clair' and 'fonce'

When asked to list the principal colours in French informants often gave such terms as 'bleu clair' and 'bleu foncé'. The terms which translate 'clair' and 'fonce' in English are 'light' and 'dark'. The contrast between 'clair' and 'fonce' is on the level of brightness, or to be more precise, since one applies the terms only to surface colours, on the level of lightness (see Appendix 1).

The terms most frequently modified by 'clair' and 'fonce' in the questionnaires were 'vert' and 'bleu' but all the basic terms apart from 'blanc', 'noir', 'violet' and 'orange' were mentioned along with 'clair' or 'fonce' or both. Table 11 shows the distribution in the questionnaire answers along with the number of mentions.

Table 11. The distribution of 'clair' and 'fonce'

<table>
<thead>
<tr>
<th></th>
<th>Clair</th>
<th>No. of mentions</th>
<th>Fonce</th>
<th>No. of mentions</th>
</tr>
</thead>
<tbody>
<tr>
<td>blanc</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>noir</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>rouge</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>1</td>
</tr>
<tr>
<td>jaune</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>1</td>
</tr>
<tr>
<td>vert</td>
<td>+</td>
<td>7</td>
<td>+</td>
<td>6</td>
</tr>
<tr>
<td>bleu</td>
<td>+</td>
<td>5</td>
<td>+</td>
<td>3</td>
</tr>
<tr>
<td>brun</td>
<td>+</td>
<td>2</td>
<td>+</td>
<td>2</td>
</tr>
<tr>
<td>marron</td>
<td>+</td>
<td>3</td>
<td>+</td>
<td>4</td>
</tr>
<tr>
<td>rose</td>
<td>+</td>
<td>1</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>gris</td>
<td>+</td>
<td>2</td>
<td>+</td>
<td>1</td>
</tr>
<tr>
<td>violet</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>orange</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

1. & 2. See following page.
There may be accidental omissions in the above table. All we can deduce from it is that certain terms can be modified by 'clair' or 'foncé' or both in spoken French. It may be possible to modify the other terms but it may be that there is some good reason why informants have not indicated this.

*Blanc* and *noir*

It is not possible to modify *blanc* and *noir* using 'clair' and 'foncé':

*blanc clair*  *blanc foncé*
*noir clair*  *noir foncé*

In reality a pure white or a pure black is rarely found but nevertheless white is generally considered to be the lightest of colours and black the darkest. In experiments informants named as *blanc* either the Munsell chip at brightness level number 9 which is the highest number on that dimension, or else said that white was the surrounding paper. They named as *noir* the Munsell chip at brightness level number 1 which is the lowest number on that dimension.

1. (previous page) One informant, when asked to list the principal colours in the questionnaires added "clair/foncé pour toutes les couleurs principales".

2. (previous page) The English term 'clear' does not translate 'clair'. In colour terminology, as well as denoting transparency it sometimes denotes purity or full saturation of colour. 'A clear blue' might be translated into French as 'un bleu pur'.

3. (above) In experiments where it is desirable to have pure white a magnesium oxide surface is used and this is regarded as the purest white.
It is therefore non-functional to say 'blanc clair' and odd to say 'blanc foncé'. There are of course terms such as 'blanc cassé' which denote an off-white shade, perhaps number 8 instead of number 9 on the Munsell scale of brightness. Similarly it is non-functional to say 'noir foncé' and odd to say 'noir clair'.

'Rouge'

'Rouge foncé' was mentioned by one informant. 'Rouge clair' was not mentioned by any informants, but it is a dictionary-attested term (Le Petit Robert). In everyday speech it is not frequent however. The reason for this may be that there is a basic term to denote pale red, namely 'rose'. It has already been shown that the difference between red and pink is not a difference of hue but one of brightness.

The area designated by informants by the term 'rouge' has a wide spread on the dimension of brightness, extending from numbers 2 to 7 on the Munsell brightness scale. One would therefore expect to find the two lexicalisations 'rouge clair' and 'rouge foncé'. The native speakers I have consulted find 'rouge foncé' more acceptable than 'rouge clair'.

'Jaune'

'Jaune foncé' was mentioned by informants but not 'jaune clair'. 'Jaune clair' would be possible but may be unlikely because yellow is a light colour. Informants showed 'jaune' as extending from numbers 6 to 9 on the
Munsell brightness scale, and most informants placed it between numbers 8 and 9 which is very light. 'Jaune foncé' therefore seems a little odd. It may be that yellows at the lower end of the scale, that is colours designated by numbers 6 and 7, could be thus named, but it is likely that in everyday speech other expressions such as 'brun clair' would be used rather than 'jaune foncé'. I feel that 'jaune clair' and 'jaune foncé' are both slightly odd and suggest that the reason for this is that the range of brightness for yellow is much smaller than that for colours such as blue and green and that within this small range it is not necessary to have the two lexicalisations. (My own intuitions about the oddness of 'jaune clair' and 'jaune foncé' are borne out by those of native speakers).

'Vert'

'Vert clair' and 'vert foncé' are very common expressions, and one would expect to find the two lexicalisations because the range of brightness for the colour named 'vert' is very wide, extending from numbers 2 to 9 on the Munsell scale.

'Bleu', 'brun', 'marron', 'gris'

The remaining terms which are commonly modified by both 'clair' and 'foncé' also designate colours with a wide range of brightness. Colours designated by 'bleu' range from 2 to 9, by 'gris' from 2 to 9, by
'marron' from 2 to 7 and by 'brun' from 2 to 7.

'Violet'

The colour designated by 'violet' also has a wide range of brightness, from 2 to 9 on the Munsell brightness scale. No informants however mentioned 'violet clair' or 'violet foncé'. Both expressions are possible, but the informants I have consulted do not find them acceptable. I think 'violet foncé' is felt to be unacceptable because 'violet' is generally held to denote a dark colour - informants named as the best 'violet' chip number 3 on the brightness scale. Informants also indicated that 'lilas' or 'mauve' was a light purple and it may be that there is no need for the expression 'violet clair' because the other common terms exist.

'Rose'

'Rose clair' was mentioned but not 'rose foncé'. The range of brightness of the colour designated by 'rose' is fairly wide, extending from 3 to 9, and one would therefore expect both lexicalisations to exist. 'Rose foncé' is odd however. One might say perhaps 'un rose soutenu' but not 'un rose foncé'. The reason for this may be that we have the reverse of what happens to 'rouge'.

\[
\begin{align*}
\text{rose clair} & \quad ?*\text{rose foncé} \\
?*\text{rouge clair} & \quad \text{rouge foncé}
\end{align*}
\]

The expression 'rose clair' is felt to be unacceptable
by informants I have consulted, and this may be because of the existence of other expressions such as 'rose bébé'.

*Orange*

'Orange' is not generally modified by 'clair' or 'foncé'. It is possible of course but the resulting expressions are much less common than those with 'bleu', 'vert' etc. The colour designated by 'orange', like that designated by 'jaune' has not a very wide range of brightness. It is a colour of medium brightness, extending from 5 to 8 on the Munsell brightness scale, and it is not therefore necessary to differentiate between the shades at the lower end and those at the higher end.

Other terms

It should be noted that although the colour terms most commonly modified by 'clair' and 'foncé' are those twelve that have up until now been considered as basic, other terms may also be modified in this way. *Ocre clair* and *ocre foncé* were given by two informants.

There are however restrictions on the terms that may be modified in this way. Odd expressions would be where

(1) The base term already denotes a light colour or a dark colour

?*beige clair       *indigo foncé

1. All such estimates are based on informants' mappings.
(2) The base term is a near synonym for a basic term modified by 'clair' or 'foncé'.

*anthracite foncé  (anthracite = gris foncé)
*lie de vin foncé  (lie de vin = rouge foncé)
*bordeaux foncé  (bordeaux = rouge foncé)
*myosotis clair  (myosotis = bleu clair)

(3) The term is a compound which already denotes a modification of the basic term towards lightness or darkness

*bleu de Prusse foncé
*gris perle clair
*gris anthracite foncé
*jaune d'or clair
*jaune paille clair
*vert printemps clair
*vert pin foncé

(4) The term is a hyponym of a basic term

*écarlate clair
*écarlate foncé
*tomate clair
*tomate foncé

(5) The term is a compound made up of a noun plus an adjective, a past participle or a prepositional phrase

*feuille morte clair
*framboise écrasée foncé
*coq de roche clair
(6) The term is of the form colour adjective + 'coloré' + colour adjective
   *gris coloré rouge foncé
   *gris coloré bleu clair
   *gris coloré jaune foncé
   *gris coloré vert clair

8.2.1. 'Clair' and 'pâle'

Informants are agreed on the fact that there is a distinction between 'clair' and 'pâle'. All say that 'pâle' is paler than 'clair', and this view is borne out by the results of tests with colour samples.

It was shown in the last section that all twelve basic colour terms may be modified by 'clair'. It does not follow that they may all be modified by 'pâle'. For example, 'brun clair' and 'marron clair' are attested by informants, but 'brun pâle' and 'marron pâle' are felt to be odd. The basic terms which were shown to be unlikely to be modified by 'clair' such as 'rouge', 'jaune', 'violet' and 'orange' are even more unlikely to be modified by 'pâle'. The terms however which are frequently modified by 'clair' are also found to be frequently modified by 'pâle'. 'Bleu pâle', 'vert pâle', 'rose pâle' and 'gris pâle' are all well attested forms.

8.2.2. Test to show the difference between 'clair' and 'pâle'

In order to test how objective informants' information
was about the relative brightness of 'clair' and 'pâle', I ran the following test.

**Subjects**

Three of the native French speakers who had participated in earlier tests.

**Apparatus**

Colour cards prepared from colour plates from the Methuen Book of Colour. These cards were chosen for this experiment because the colour chart of Munsell colours used in earlier experiments contained only fully saturated colours, and informants' remarks suggested that 'pâle' denotes a diminution of saturation or full colour as well as a diminution of brightness. The Methuen colours show variation on the dimension of saturation as well as on the dimension of hue and brightness.

**Presentation**

Five cards containing 240 samples of blues varying in hue, saturation and brightness were arrayed in front of the informants in good daylight out of direct sunlight. The cards were prepared from pages 19-23 of the Methuen Book of Colour. The samples ranged in hue from purple blues (Card No. 19) through pure blues to greenish blues (Card No. 23). Informants were asked to indicate good examples of 'bleu clair' and good examples of 'bleu pâle'. 
Results

Results are shown in Table 12. Both the Methuen notation and the Munsell renotation are shown. In the Munsell renotation the first number indicates the hue, the number to the left of the oblique indicates the brightness and the number to the right of the oblique indicates the saturation. The higher the brightness number the lighter the colour, and the higher the saturation number the more pure the colour contained in the sample.

Table 12. 'Bleu clair' and 'bleu pâle'

<table>
<thead>
<tr>
<th>Methuen notation</th>
<th>Munsell renotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bleu clair</td>
<td></td>
</tr>
<tr>
<td>21 A 5</td>
<td>6.5 PB 6.5/7.6</td>
</tr>
<tr>
<td>22 A 4</td>
<td>5.5 PB 7.4/5.3</td>
</tr>
<tr>
<td>22 A 5</td>
<td>5.5 PB 6.3/6.9</td>
</tr>
<tr>
<td>23 A 4</td>
<td>2 PB 7.5/4.6</td>
</tr>
<tr>
<td>23 A 5</td>
<td>2 PB 7.0/6.0</td>
</tr>
<tr>
<td>Bleu pâle</td>
<td></td>
</tr>
<tr>
<td>21 A 3</td>
<td>7 PB 7.9/4.0</td>
</tr>
<tr>
<td>21 A 2</td>
<td>9 PB 8.5/2.2</td>
</tr>
<tr>
<td>23 A 3</td>
<td>2.5 PB 8.1/3.2</td>
</tr>
</tbody>
</table>

8.2.3. Discussion

Informants did not select any one hue as representing 'bleu clair' or 'bleu pâle'. It will be seen from Table 12 that the hue varies along a scale from 2 PB to 9 PB. That is to say, informants judge that one
can have a light or a pale shade of a slightly greenish blue, a blue blue or a slightly purple blue, which is not surprising.

There is however very little variation on the brightness scale for all samples designated as 'bleu clair'; only one step on the Munsell scale, from 6.5 through to 7.5.

Similarly there is only a very slight variation on the brightness scale for all samples designated as 'bleu pâle'; less than one step on the Munsell scale, from 7.9 to 8.5.

There is only a very small difference in brightness between the samples designated as 'bleu clair' and those designated as 'bleu pâle' but the difference is consistent (Figure 23). It can also be seen from the results shown in Table 12 that there is a consistent difference in saturation between samples designated as 'bleu clair' and those designated as 'bleu pâle', those designated as 'bleu clair' being consistently more saturated than those designated as 'bleu pâle'.¹ This finding bears out informants' remarks to the effect that 'pâle' denotes 'less colour' or even 'washed out' or 'faded'.²

---

1. The higher the number on the saturation scale the more colour there is in the sample, and the lower the number the less colour there is.

2. 'Bleu délavé'. 'Délavé' collocates more often with 'bleu' than with any other colour name. The modern (contemporary) use of 'indigo' in French is interesting. When applied to denim it does not have its usual denotation of "deep blue" but denotes 'blue that will fade on washing and continue to fade on successive washings'.
Figure 23. The difference between 'bleu pâle' (P) and 'bleu clair' (C).
Chapter 9

MORPHOLOGY

9.1.1. Lexemes, word-forms and grammatical words

So far I have talked of colour terms without specifying what I mean by 'term'. In a section on morphology, however, it will be necessary to be more specific. By 'colour term' I mean "a lexeme denoting a colour". For each term there will be two lexemes, one an adjective and one a noun, as in the expressions 'un livre rouge' and 'le rouge est une couleur'. The noun versus adjective distinction may be problematical (Landesman, 1972) but need not concern us at this point.

Lexemes may be regarded as the fundamental units of the lexicon (Matthews, 1974, p. 22). Dictionaries, word lists and concordances contain lexemes. Sometimes, however, different forms of the same lexeme may appear in the above sources. In informants' written lists the masculine singular form was usually given, but occasionally the feminine singular form was given. For purposes of frequency counts I considered those to be two forms of the same lexeme and if, for example, ninety-two informants listed 'blanc' and two listed 'blanche' I considered that to constitute ninety-four mentions of the lexeme BLANC. In concordances and frequency dictionaries it is usual to find all forms of the same lexeme listed under one heading, for example under VERT, but in the Dictionnaire des Fréquences of the T.L.F., for example,
the forms brun, brune, blanc and blanche are listed separately. The notion lexeme is a particularly important one in lexicography. Lexemes may be simple or compound.

Lexemes have to be distinguished from word-forms (Matthews, 1974, p. 26). Corresponding to the lexeme BLANC there are four different word-forms in written French, namely blanc, blanche, blancs and blanches. In spoken French there are two forms, transcribed as [blâ] and [blâ]. In the case of colour adjectives, which nearly always come after the noun in French and therefore at the end of the rhythm group, it is not usually necessary to take liason into account. Poetry is a special case. In the concordances of the T.L.F. I found a few examples where the colour adjective preceded the noun, mainly in word groups where the second unit was an English loan word, as in 'blanc cottage' and 'blanc cold-cream'. In cases where colour adjectives precede the noun it is necessary to take the rules of liason into account (see Léon, 1966, p. 118-131 and Schane, 1968, p. 1-17).

The various word-forms corresponding to the lexeme BLANC constitute what is known as the paradigm of BLANC in traditional grammar, and it is usually set out in a table thus:

<table>
<thead>
<tr>
<th></th>
<th>Masculine</th>
<th>Feminine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singular</td>
<td>blanc</td>
<td>blanche</td>
</tr>
<tr>
<td>Plural</td>
<td>blancs</td>
<td>blanches</td>
</tr>
</tbody>
</table>
All the basic colour terms in French are inflected for gender and number. The term 'marron' is very rarely inflected, but it may not be a basic term. Only one example was found in the texts of the T.L.F. where 'marron' was inflected and it was of recent origin (Vailland, 1945). The term 'orange' is usually, but not always, inflected in contemporary texts. The earliest example I found in the texts of the T.L.F. showing inflection of 'orange' dated from Céline (1936).

So far two different kinds of word have been distinguished - lexemes as exemplified by BLANC, NOIR etc. and word-forms as exemplified by blanc, blanche etc. It is sometimes necessary to distinguish a third kind of word, the grammatical word (Lyons, 1971, p. 196). In the above discussion of word-forms it was in a sense irrelevant that the different word-forms fulfilled different syntactic functions. All that was relevant in the consideration of the notion 'word-form' was that the forms differed phonetically or orthographically.

Consider, however, the form which is transcribed as [ruʒi]. This form may appear in different syntactic constructions. For example

1. Elle rougit quand elle l'entendit.
2. Elle rougit facilement.
3. Je rougis facilement.
4. Elle a rougi quand elle l'a entendu.
5. Ne rougis pas.
In (1) we have an example of the third person singular preterite, in (2) an example of third person singular present, in (3) an example of first person singular present, in (4) an example of past participle and in (5) an example of imperative. We thus have examples of five different grammatical functions fulfilled by the same phonetic form \([ruʒi]\).\(^1\)

In a sense all five examples are examples of the same lexeme ROUGIR and of the same word-form\([ruʒi]\) but since they fulfil different grammatical functions there is a sense in which they should be considered to be five different words.

9.2.1. The Morpheme

The basic unit of morphology is the morpheme. The list of basic colour terms in French contains twelve words, 'blanc', 'noir', 'rouge' etc. (it is not necessary to distinguish between the different senses of the term 'word' at the moment) and each of these words is composed of a single morpheme. Consider, however, the following list:

1. blanchâtre
2. blanchet
3. Blanchir
4. blanchi

1. One could find more. One might wish to take aspect into account as well as tense.
5. blanchiment
6. blanchissage
7. blanchisseur
8. blanchisserie
9. blanchissement
10. blancheur
11. blanchaille
12. blanchement
13. blanchoyer
14. blanchoiement

The above words are all connected in some way with 'blanc'. Some are adjectives, some are nouns and one is an adverb, but we recognise a common phonological element, /blæʃ/ and a common element of meaning, 'white'. Since morphemes are abstract units we can represent them in any appropriate way. It would be usual to say that the base morpheme in the above terms is 'blanc', and it might be written in capitals to denote its abstract nature. The above words are composed of a base morpheme plus an ending. In some cases the ending is unanalysable, as in 'blanchâtre', and in some case the ending may be further analysed, as in 'blanchissage'. These endings form new words from a basic word and are called formatives by some linguists.1 Since these formatives are minimal

1. For example, by Mathews, Inflectional Morphology. But it is not an established term. The French term is 'formant', but this use leads to confusion with the acoustical phonetics term.
grammatical units they are morphemes.

Since morphemes are signs they have both form and meaning. In 'blanchâtre' it is possible to distinguish two morphemes; one basic morpheme plus a formative, giving BLANC + ÂTRE. The meaning of the morpheme is something like 'white' and the form is grammatically and phonologically conditioned in surface realisation by the ending -âtre. The suffix -âtre denotes 'approximation to a quality or property', and 'blanchâtre' is usually translated into English as 'whitish'. The lexeme BLANCHÂTRE stands in paradigmatic opposition to lexemes such as BLANCHET on the one hand and to lexemes such as BLEUÂTRE and JAUNÂTRE on the other.

Similarly in 'blanchet' we can distinguish two elements: BLANC + ET.

In this case the formative ET has much the same meaning as the formative ÂTRE, 'approximation to a quality or property', but has a different phonological and orthographical form.

'Blanchâtre' and 'blanchet' may be grouped together as approximate colour adjectives derived from 'blanc', and it is to such forms that I shall devote most attention in the following sections.

1. I am not concerned at the moment with the method of representing meanings.

2. This is the rule for all derivations from colour adjectives.

3. A much less common term than 'blanchâtre', defined in the Dict. Robert as 'légerement blanc'.
The remaining members of the list, numbers 3-14, may be analysed in the following way:

3. BLANC + IR
4. BLANC + I
5. BLANC + IR + MENT
6. BLANC + ISSE + AGE
7. BLANC + ISSE + EUR
8. BLANC + ISSE + ERIE
9. BLANC + ISSE + MENT
10. BLANC + EUR
11. BLANC + AILLE
12. BLANC + MENT
13. BLANC + OYER
14. BLANC + OYER + MENT

'Blanchir' is a typical verbalisation, not only of colour adjectives, but of adjectives in general. 'Blanchir' may be transitive or intransitive. The formative IR is the usual one in such verbalisations but ER is sometimes found, for example in such terms as 'oranger', 'roser', 'griser', 'dorer' and 'empourprer'. ER is less likely to be used for verbalisations of basic terms than IR is.

Numbers 4-9 may be regarded as derivatives of the

1. 'Empourprer' shows prefixation as well as suffixation, which is unusual in the derivation of verbs from colour adjectives in French. Unlike the German prefix er-, en- (or en-) in French does not have inchoative force. 'Empourprer' is a transitive verb and the inchoative form is the reflexive 's'empourprer'.

verb 'blanchir'. Numbers 10-11 are nominalisations of 'blanc'. 'Blancheur' exhibits the usual suffix for the formation of nouns from colour adjectives.

The suffix of 'blanchaille' denotes collectivity, and may or may not have pejorative overtones. It may, as in this case, be found in nouns denoting an individual and, as here, it may have diminutive as well as pejorative overtones. It is not usually attached to colour adjectives and when it is, the colour adjective has a figurative sense, as in 'bleusaille'. 'Un bleu' is a new conscript and 'bleusaille' is either a group of such conscripts or an individual conscript.

Number 12, 'blanchement', is an adverb which is rarely used, and as far as I have been able to discover 'blanc' is the only colour adjective which may be adverbalised in this way. 'Vertement' is a dictionary-attested term (Robert) but it is used figuratively, as in 'répliquer vertement' ('to reply sharply').

Number 13 is a less common verbalisation than 'blanchir' and is restricted to a few colour terms. Number 14 shows its nominalisation.

9.3.1. **Approximate colour terms in French**

I shall call 'approximate colour adjectives' such terms as 'blanchâtre', 'blanchet', 'bleuâtre', 'bleuté', 'jaunasse' and so on. In French such adjectives denote diminution or attenuation of colour, but in some languages, Roumanian for example, one may find a suffix
Table 13. Suffixes denoting 'approximation of colour'

<table>
<thead>
<tr>
<th></th>
<th>-atre</th>
<th>-asse</th>
<th>(-ace)</th>
<th>-acé</th>
<th>-elet</th>
<th>-é</th>
<th>-té</th>
<th>-et</th>
<th>-aud</th>
<th>-ot</th>
<th>-ard</th>
<th>-in</th>
<th>-inet</th>
</tr>
</thead>
<tbody>
<tr>
<td>blanc</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<td>noir</td>
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<td>rouge</td>
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<td>violet</td>
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<td>pourpre</td>
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</table>

N.B. 'Blanchet', 'brunet' and 'bleuet' are listed as 'rare' in the Robert. 'Verdet' and 'griset' are listed only as nouns. 'Purpurin' is entered alongside 'pourpre' in the above table.
which has an intensifying force. In Roumanian the suffix -oi may be attached to 'galben' (yellow) to form 'galbanoi', and to 'alb' to form 'alboi' (Bidu-Vranceanu, 1970).

By far the most common suffix denoting 'approximation to a colour' is -atre. However I found eleven suffixes in French which are used to denote 'approximation to a colour'. They are: -ATRE, -ASSE, -ACE, -ELET, -É, -TÉ, -ET, -AUD, -OT, -ARD and -IN. Although not all the forms I found are in common use in contemporary spoken French, the rules of affixation which emerge when the distribution and combinatory possibilities of these suffixes are examined, make it worthwhile to analyse the whole range of approximate colour adjectives in some detail.

Table 13 shows the distribution of the eleven suffixes, over a list of colour terms containing the twelve terms I have considered as basic up until now, with the addition of 'roux', 'olive', 'blond', 'ocre' and 'pâle'. Of the last five 'pâle' is not a colour term in itself but is used only to modify other colour terms. I have included it because the form 'pâlot' has the suffix -ot, which was commonly affixed to colour adjectives in Middle French; the remaining four additional terms may not be basic terms according to Berlin and Kay's criteria,

1. Sources: Dictionnaire Robert and Dictionnaire Inverse, Juilland.
but they are important terms and they all may undergo affixation. It will be remembered that one of Berlin and Kay's subsidiary criteria for basicness is that all the basic terms should show the same distributional potential. According to this criterion 'marron' would not be a basic term since it never undergoes the process of affixation. However, as I have shown elsewhere, 'marron' satisfies Berlin and Kay's four main criteria for basicness and two of the subsidiary criteria. The fact that 'roux', 'blond', 'olive' and 'ocre' undergo affixation of course does not make them basic terms in Berlin and Kay's sense since they do not satisfy the main criteria. However, it may be that we should not be thinking of basicness as something absolute but that we should be thinking of different degrees of basicness, and in this case the fact that 'roux', 'blond', 'olive' and 'ocre' share an important property with clearly basic terms such as 'rouge', 'vert', 'bleu' and 'jaune' might persuade us to give them a place among terms which are in some sense basic.

It is seen from Table 13 that the distribution of the suffix -âtre is much wider than that of any of the others. In fact it is the only affix denoting

1. Certain forms in -âtre were even listed in questionnaire answers as being principal colour terms. They were 'bleuâtre', 'rougeâtre', 'verdâtre', 'jaunâtre', 'noirâtre' and 'blanchâtre'.

1
'approximation to a colour' that has survived with any force in Modern French from among a number of such affixes which were in common use in Classical Latin, Vulgar Latin, Old French and Middle French.¹

9.3.2. Approximate colour terms in Latin, Old French and Middle French

Both Classical and Vulgar Latin had a wide range of means at their disposal for expressing 'approximation to a colour'. If we consider only the method of affixation, we find the following suffixes and prefixes:

Suffixes: -olus, -ulus, -ellus, -aceus, -aster, -entis, -sus.

Prefixes: sub-, per- and inter-.

The method of prefixation is not found in Old French but suffixes were much more commonly used and were used over a wider range of colour adjectives than in Modern French.

Suffixes found in Old French which are not found in Modern French, at least not with the meaning 'approximation to a colour', and not in the same orthographical form, are:

-az as in aubornaz, blanchaz, roujaz
-ard as in blanchard, bleuard²
-as as in jaunas, noiras
-at as in noirat, roujat

1. For a very full account of approximate colour terms in the Romance languages, written from both a synchronic and a diachronic point of view, see Becker, H.U., Romanische Approximative Farbbezeichnungen, Bonn, 1974.

2. 'Grisard' is found in Modern French, but only as a noun.
-el as in roussel
-quin as in noirquin
-in as in sorin
-on as in vairon

Suffixes found in Middle French which are not found in Modern French are:
-iquet as in bruniquet
-on as in grison, noiron
-inas as in blanchinas
-eton as in noireton
-elant as in roselant
-inet as in rosinet
-on as in vairon

9.3.3. **Approximate colour terms in Modern French**

The suffixes which are used in Modern French to form approximate colour terms are contained in the following list and with them is a list of the approximate colour adjectives in French which are formed using these suffixes.

-ace violace, olivace, ocracé
-asse jaunasse, blondasse
-atre blanchâtre, noirâtre, rougeâtre, verdâtre, jaunâtre, bleuâtre, brunâtre, rosâtre, grisâtre, violâtre, roussâtre, olivâtre, blondâtre

1. -in is affixed only to peripheral terms in Modern French such as 'incarnadin', 'azurin', 'purpurin'. Those terms are found in literary contexts.
-aud noiraud, rougeaud
-é orangé, rosé
-elet blanchelet, rougelet, verdelet, brunelet, griselet, rousselet, blondelet
-et blanchet, rouget, jaunet, bleuet, brunet
-in incarnadin, azurin, purpurin
-ot pâlot
-té bleuté

The above list contains terms found in the Robert and in Harrap's French-English Dictionary and most of them are found in inverse dictionnaires such as the Dictionnaires Inverses du T.L.F. and Juillard's Dictionnaire Inverse. Some of the terms have a very low frequency in the Dictionnaire des Fréquences du T.L.F.. The terms with the highest frequency are those found to be most acceptable by informants (see below Section 9.6.1., and Tables 16-19). Some of the terms do not appear at all in the Dictionnaire des Fréquences du T.L.F., which indicates either that they do not appear at all in the literary texts analysed or that they appear only once. The following tables show the relative frequency of terms in -âtre and of other derived terms as given in the Dictionnaire des Fréquences du T.L.F.
Table 14. Frequency of terms in -âtre

<table>
<thead>
<tr>
<th>Term</th>
<th>19th Century</th>
<th>20th Century</th>
</tr>
</thead>
<tbody>
<tr>
<td>bleuâtre</td>
<td>1242</td>
<td>979</td>
</tr>
<tr>
<td>blanchâtre</td>
<td>817</td>
<td>337</td>
</tr>
<tr>
<td>rougeâtre</td>
<td>710</td>
<td>387</td>
</tr>
<tr>
<td>verdâtre</td>
<td>679</td>
<td>650</td>
</tr>
<tr>
<td>grisâtre</td>
<td>606</td>
<td>331</td>
</tr>
<tr>
<td>jaunâtre</td>
<td>502</td>
<td>499</td>
</tr>
<tr>
<td>noirâtre</td>
<td>471</td>
<td>284</td>
</tr>
<tr>
<td>olivâtre</td>
<td>107</td>
<td>69</td>
</tr>
<tr>
<td>violâtre</td>
<td>97</td>
<td>167</td>
</tr>
<tr>
<td>roussâtre</td>
<td>97</td>
<td>79</td>
</tr>
<tr>
<td>rosâtre</td>
<td>42</td>
<td>84</td>
</tr>
<tr>
<td>brunâtre</td>
<td>36</td>
<td>87</td>
</tr>
<tr>
<td>blondâtre</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

Table 15. Frequency of terms other than those in -âtre

<table>
<thead>
<tr>
<th>Term</th>
<th>19th Century</th>
<th>20th Century</th>
<th>Term</th>
<th>19th Century</th>
<th>20th Century</th>
</tr>
</thead>
<tbody>
<tr>
<td>violacé</td>
<td>97</td>
<td>278</td>
<td>bleuet</td>
<td>214</td>
<td>231</td>
</tr>
<tr>
<td>olivacé</td>
<td>--</td>
<td>--</td>
<td>rouget</td>
<td>33</td>
<td>50</td>
</tr>
<tr>
<td>ocracé</td>
<td>--</td>
<td>--</td>
<td>brunet</td>
<td>30</td>
<td>45</td>
</tr>
<tr>
<td>blondasse</td>
<td>12</td>
<td>23</td>
<td>jaunet</td>
<td>30</td>
<td>21</td>
</tr>
<tr>
<td>jaunasse</td>
<td>3</td>
<td>2</td>
<td>Blanchet</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>noiraud</td>
<td>30</td>
<td>143</td>
<td>incarnadin</td>
<td>27</td>
<td>23</td>
</tr>
<tr>
<td>rougëaud</td>
<td>76</td>
<td>209</td>
<td>purpurin</td>
<td>9</td>
<td>10</td>
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<tr>
<td>orangé</td>
<td>140</td>
<td>350</td>
<td>asurin</td>
<td>--</td>
<td>5</td>
</tr>
<tr>
<td>rosé</td>
<td>413</td>
<td>300</td>
<td>bleute</td>
<td>9</td>
<td>220</td>
</tr>
<tr>
<td>roussete</td>
<td>--</td>
<td>7</td>
<td>pâlot</td>
<td>64</td>
<td>124</td>
</tr>
</tbody>
</table>

N.B.: No terms in -elet are included in the Dictionnaire des Fréquences du T.L.F. apart from 'roussete'. The high frequency of 'bleuet' is probably accounted for by the fact that the approximate colour term and the term denoting the flower are counted together. This observation may also apply to 'jaunet' and 'rouget' which is the name of a fish as well as a colour term.
9.4.1. I shall discuss each one of these suffixes separately, beginning with the most important one, importance being judged in this instance to correspond to frequency, as indicated in the above tables.

-âtre

The suffix -âtre, from the Latin -aster through Old French -astre, expresses approximation or attenuation and often has a pejorative force. The derived form may be either an adjective or a noun. When the derived form is an adjective, the base is usually an adjective, often a colour adjective, but it may sometimes be a noun as in 'opiniâtre'. More rarely the derived form is a noun and in this case the base is usually an adjective as in 'bellâtre', but it may sometimes be a noun as in 'musicâtre'.

Colour adjectives in -âtre conform to the pattern adjective + -âtre.

The base form is the feminine form of the colour adjective. This is apparent when one considers such forms as

1. Usually transcribed phonetically [ãtr]. However, many French speakers, especially young speakers, do not distinguish a front a[k] from a back a[[k]]. c.f. Martinet, Elements and Schane, p. 19 and note p. 134.

2. The lexeme 'âtre' is an obsolete colour word for black, especially a dull, dark black borrowed from the Latin 'ater', meaning dull black as opposed to 'niger', shining black. There is no evidence of any etymological connection between the suffix -âtre and the lexeme 'âtre'.

blanchâtre and roussâtre. In derivations where the base form is identical phonologically and orthographically in the feminine and masculine forms this is not obvious and when one looks at forms such as grisâtre it is not clear whether the rule is "feminine form of adjective + âtre" or, perhaps, "masculine form of adjective + liaison + âtre". Since however the last rule would not account for such forms as blanchâtre and roussâtre it must be discarded. In orthography the final e of the feminine form is dropped but the now final consonant of the stem is pronounced as if the e were retained, (cf. the pronunciation of 'grisâtre'). The e is retained in rougeâtre in order to preserve the pronunciation ([ɛ]). The form verdâtre is best accounted for by phonological conditioning. An older form verd, fem. verde, is given in the FEW, but it is not found in all dialects.

The commutation of the suffix in 'violâtre' should be noted. This may be simply a process of shortening or it may be that 'violâtre', or an even earlier form, was taken over as an approximate colour term from an already existing term meaning 'belonging to the viola species'. Many botanical forms are thus formed, for example, 'oleaster' < 'olea'.

The form blondâtre is a relatively late form first appearing in the nineteenth century.

In colour terminology the distribution of -âtre is
confined to the following terms:

- blanchâtre
- bleuâtre
- blondâtre
- brunâtre
- grisâtre
- jaunâtre
- noirâtre
- olivâtre
- rosâtre
- rougeâtre
- roussâtre
- verdâtre
- violâtre

B indicates a term derived from a basic term.

Of the thirteen terms contained in the above list, ten are derived from colour terms which are basic according to Berlin and Kay's criteria.

Of the remaining three terms two, 'blondâtre' and 'roussâtre' are derived from the principal colour terms which apply to hair, and it is not surprising to find approximate colour terms in this domain.

The remaining term 'olivâtre' is derived from a very common term for the complexion, especially in the South of France, and again it is not surprising to find an approximate colour term in this domain.

Is there any reason why -âtre should not be affixed to all colour adjectives? Why should 'orangeâtre' and 'marronâtre' not be as acceptable as 'blanchâtre' and 'bleuâtre'? 'Orangeâtre' and 'marronâtre' are not
dictionary-attested terms, although both forms are phonologically and morphologically possible. Personally, if I heard them I would not find them too odd, but the acceptability of borderline cases is very often subjective. 'Turquoisâtre', 'kakiâtre' and 'indigoâtre' would, however, be distinctly odd to me, and to most people I think. (This is confirmed in tests with native speakers. See below, Section 9.6.) What is there about 'orangeâtre' and 'marronâtre' that makes them seem more acceptable than the other three terms? It may be that the forms from which they are derived are common, frequently used, terms. Moreover, according to Berlin and Kay's four main criteria\(^1\) they are basic terms. If they follow the pattern of the ten other basic terms then one would expect them to have derived forms in -âtre. If they did one could make a generalisation as follows: All basic colour terms have derived terms in -âtre, but not all colour terms in -âtre are derived from basic colour terms (for example, 'olivâtre', 'blondâtre' and 'roussâtre' are not derived from basic terms). At the present stage of development of the language, however, 'orange' and 'marron' must be regarded

1. And some of the subsidiary criteria as well. But one could not invoke the subsidiary criterion that states that terms are basic because they have a certain distributional potential because then one would run into circularity.
as exceptions to the above rule. The reason for this may be that they are less frequently used forms than the other basic terms, or, more simply, that the derived form would be trisyllabic whereas all the other forms in -âtre which are derived from basic terms are disyllabic. Against this one has an example like 'olivâtre'. Another reason might be that 'orange' and 'marron' are the names of objects commonly having that colour. Against this, however, one has the existence of 'rosâtre' and 'violâtre'. It may be, however, that in the case of 'orange' and 'marron' the name of the colour is still closely associated with the name of the object, whereas in the case of 'rose' and 'violet' it has become dissociated from it. If this is the case, then it is possible that through time, as 'orange' and 'marron' become less closely associated with the names of the objects then the forms 'orangeâtre' and 'marronâtre' will make their appearance as accepted terms.

With the exception of 'olive', the base colour words from which the accepted terms are derived are variable adjectives, that is to say they are inflected for gender and number. It has already been seen in examples from the T.L.F. that, with only one exception, 'marron' is invariable and that it is only in recent texts dating from 1936 and later that 'orange' is variable. We can therefore make another generalisation as follows: If a colour adjective can be modified by
the addition of -âtre then it can also be inflected for gender and number. (*Olive* is an exception here.)

However the reverse does not hold. Some colour adjectives are variable but they do not undergo modification by the addition of -âtre. Such adjectives are 'mauve', 'pourpre' and possibly 'beige'. The forms *mauveâtre* *beigeâtre* and *pourprâtre* are phonologically possible and although 'mauve', 'beige' and 'pourpre' may not be basic terms, they denote colours which are capable of modification.

A generalisation as the one above would rule out such terms as *turquoisâtre*, *indigoâtre* and *kakiâtre* which are intuitively felt by native speakers to be unacceptable in any case (see below, Section 9.6). It would also rule out such terms as *crêmâtre*, *rouillâtre* and *ocrâtre*, which some might feel to be more acceptable (see below, Section 9.6).

The suffix -âtre is found with compound terms. In the Dictionnaire Inverse du T.L.F. (Volume I) I found the following:

1. noir-verdâtre
2. gris-violâtre
3. blanc-jaunâtre
4. gris-noirâtre

1. Examples from the T.L.F. show that 'beige' may or may not be variable. It may be in a state of transition.
5. blanc-grisâtre
6. mi-blanchâtre

This is potentially a very productive pattern and limits would be placed on its formation only if limits were placed on the formation of the base compound by the physical nature of the colour referent. For example, *rouge-vert* would be odd and therefore *rouge-vertâtre* would be odd as well. 'Mi-blanchâtre' is not a common term but the form MI + COLOUR TERM + ÂTRE is a potentially productive one. The I.C. structure of 'mi-blanchâtre' is not clear. In the above six examples the base form to which -âtre is affixed is itself a base form which has undergone modification. Colour terms in French may be modified in several ways. Apart from affixation they may be modified in the following ways:

1. By another colour term; e.g., 'bleu-vert'
2. By 'mi-'; e.g., 'mi-blanc'
3. By a term denoting an object; e.g., 'jaune-citron'
4. By 'fonce'; e.g., 'bleu fonce'
5. By 'clair'; e.g., 'bleu clair', and by 'pâle'; e.g., 'bleu pâle'
6. By a phrase such as 'tirant sur'; e.g., 'un bleu tirant sur le vert'

Only modified terms derived in the ways shown in numbers (1) and (2) may undergo further modification by -âtre.

The following would not be accepted terms:

*jaunâtre citron; *jaune citronâtre
*bleuâtre fonce
*bleuâtre clair
*tirant sur le bleuâtre

When used as part of a colour term the suffix -âtre does not combine with other suffixes. The sixteenth century form jaunastrement as in jaunastrement blanc has not passed into Modern French as jaunâtrement and therefore we would not expect a form in Modern French *jaunâtrement blanc.

9.4.2. -ASSE

In the domain of colour terms the suffix -asse is restricted to 'jaunasse' and 'blondasse'. It is however a very common suffix in other sections of the vocabulary. It has augmentative or pejorative value. It may be affixed to nouns, verbs and adjectives to form nouns or other adjectives. When used in colour terms the derived term is of the form:

COLOUR ADJECTIVE + ASSE.

With only two examples from which to generalise it is difficult to formulate the rule for the derivation, but the simplest rule is the same rule as that for derivations in -âtre, that is to say:

(1) FEMININE FORM OF ADJECTIVE + ASSE.

A rule such as

(2) MASCULINE FORM OF ADJECTIVE + ASSE

would require an additional rule such as LIAISON to account for 'blondasse'.

Rule (1) is simpler, and the only addition required
would apply to written French only. It would be that the final e of the feminine form of the colour adjective should be omitted before -asse.¹

If we look at other derivations of the form ADJECTIVE + ASSE we see that rule (1) fits them. Informants agree that the suffix -asse has a pejorative value when affixed to colour terms and sometimes translate 'jaunasse' as 'dirty yellow' and 'blondasse' as 'faded blond'. One informant linked the two adjectives 'blondasse' and 'fadasse' together. The definition of 'blondasse' in the T.L.F. is "d'un blond fade". There would seem to be no good reason why affixation using -asse should be restricted to 'blond' and 'jaune'. Why not have the following?

*blanchasse
*rougeasse
*bleuasse
*verdasse
*brunasse
*violasse

Informants, when tested, judged certain of the above terms to be acceptable (see below, Section 9.6), especially 'rougeasse' and 'verdasse'.

9.4.3. -ACE

-ace appears to be an orthographical variant of

¹ Schane would posit an underlying phonetic form, e.g. *blds*, *jons*. Then all the rule need state is "omit the schwa before the vowel".
-asse, but is never found in colour terms. In other sections of the vocabulary the forms are not in free variation, but I have not been able to determine any rules for predicting which adjectives, nouns or verbs are likely to take -asse and which are likely to take -ace.

9.4.4. -ACE

The suffix -ace is used in colour terms but is restricted to the following:

violacé
olivacé
ocracé
purpuracé

Of those only 'violacé' is in common use: it is used almost exclusively of the complexion.

If we look for restrictions on the affixation of -ace to colour terms we note that:
1. -ace is restricted to non-basic colour terms except in the case of 'violacé'
2. -ace is restricted to colour terms which are closely associated with the names of things or substances

9.4.5. -ELET

Although it will be seen from Table 13 that -elet is distributed over seven colour adjectives, these terms are not in fact in everyday use. Of the seven terms

1. According to the T.L.F. -ace is the learned form (< Lat. ax) and -asse is the popular form.
only three appear in the *Dictionnaire Robert*. They are 'blondelet', 'rousselet' and 'verdelet'. The T.L.F. lists seven terms in -elet:

- blanchelet
- blondelet
- brunelet
- griselet
- rougelet
- rousselet
- verdelet

The only term from the above list to appear in the *Dictionnaire des Fréquences du T.L.F.*, is 'rousselet' (Table 15, Section 9.3.3.). In all examples the derived term is of the form:

```
COLOUR ADJECTIVE + ELET.
```

The form of the colour adjective that is taken as the base form is the feminine form. This is clearly seen in examples such as 'blanchelet' and 'rousselet'.

The denotation of -elet is 'approximation to a colour' and terms in -elet do not usually have any pejorative connotation. It is comparable to -être in some ways.¹

The suffix -elet is restricted to use with basic colour terms, with the exception of 'blond' and 'roux'. However, as has been noted before, 'blond' and 'roux', although they may not be basic terms, are nevertheless

1. "Le suffix -être fonctionne souvent parallèlement avec le suffix -elet, dès le XlVe siècle avec la même nuance (un peu blanc etc.)." (*T.L.F.* Vol. I)
important terms in that they are two of the main terms for hair. The three main colour terms for hair, 'blond', 'brun' and 'roux' very often behave like the twelve basic colour terms. In the case of 'brun' we have an example of a term that belongs to more than one set; the set of basic colour terms and the set of principal colour terms for hair.

It is interesting to note that in the case of the three main colour terms for hair we have parallel morphological patterns for all three terms. For example we have:

- blondâtre roussâtre brunâtre
- blondelet roussélet brunelet
- blondir roussir brunir
- blondi roussi bruni

There would seem to be no good reason why other forms in -elet should not exist, for example

*noirelet
*jaunelet
*roselet¹

Informants, however, were unwilling to accept even the dictionary-attested forms (see below, Section 9.6).

9.4.6. -ê

The suffix -ê is found in the following colour terms:

- rosé
- orangé

¹ The word 'roselet' exists in Modern French, but only as a noun meaning "ermine in its summer coat".
The suffix -é does not however denote 'approximation to a colour' in all of those terms.

Becker (1974) suggests that in the case of 'rosé' the suffix -é may not always have the denotation 'approximation to a colour' but that 'rosé' may mean simply "pink". This is not easy to determine by questioning informants, since 'rosé' is used almost exclusively of wine nowadays and has a special meaning. 'Orange', however, according to informants does not mean simply "orange", but rather denotes a colour that is mainly orange, and informants would, for example, describe a pull-over using the term 'orangé' if the predominant colour in it were orange.

'Azuré' is not a term that is used in everyday speech, but when nine informants were asked if they found it an acceptable term, all but two said they did (see below, Section 9.6).

1. The T.L.F. gives three contexts for 'azuré'. (1) Technological (= painted blue) (2) Literary and poetic (3) Printing (fer azuré = strié de lignes obliques).
'Cendré' is an acceptable colour term and is fairly common especially when used along with 'blond' to denote hair colour.

The idea of 'approximation' does not seem to enter into the meaning of 'azuré' and 'cendré'. Informants usually paraphrase them as "the colour of the sky" and "the colour of ashes".

'Argenté', 'cuivré', 'bronzé' and 'doré' have a double meaning and may mean either "covered with silver", "covered with copper" and so on, or else "silver-coloured", "copper-coloured" and so on. The first meaning implies the second but the second does not necessarily imply the first. No idea of 'approximation' seems to enter into the meaning of the above four terms when they are used to denote colours.

The suffix -é might suggest that terms derived by its addition are past participles of first conjugation verbs, that is verbs in -er, but according to Becker (1974) this cannot be so since the verb forms in -er appear later. This may be the case for some forms but not for all. For example the first meaning of 'ocre' is 'coloré par de l'ocre' and it was only later that it came to mean, by extension, 'd'une couleur brune tirant sur le jaune et d'une nuance plus pâle que l'ocre proprement dit' (Robert). From this definition it would appear that the suffix -é adds an idea of approximation to the basic term.

'Pourpré', on the other hand, does not appear to
denote approximation and would appear to be synonymous with 'pourpre'.

Becker points out that derivations in -é are often found in colour words associated with objects and he cites 'argenté', 'cendré', 'cuivré', 'doré' etc. as examples. One could extend this statement and say that in fact all derivations in -é are found with colour words associated with objects or substances, arguing that 'azuré' is derived from the word denoting the entity 'azur'1, 'ocré' and 'pourpré' from the words denoting the colouring substances. Even in the case of 'rosé' and 'orangé' where it may be that the colour term has become dissociated from the object, it can still be argued that originally 'rose' and 'orange' were names of things.

9.4.7. -TE

The existence of only one approximate colour term ending in -té, namely 'bleuté', suggests that the form -té may be a variation of the form -é, conditioned by the final vowel phoneme of the base term 'bleu'. All the terms in -é are derived from base forms having final consonants in the spoken form or having, as in the case of 'argent', a final consonant which, although

1. 'Azur' is a colour term but is an elliptic form of 'bleu d'azur' or 'bleu azur', both of which are expressions found in the T.L..F.
not normally pronounced, nevertheless serves as a liaison between the final nasal vowel of 'argent' and the vowel of the suffix.

If, however, 'bleuté' is to be considered as a phonologically conditioned variant of *bleuè, it will have to be included in the list of terms in -ê, and it would constitute an exception to the rule that terms in -ê are derived from base terms which are closely associated with the names of objects.

9.4.8. **-ET**

The two morphs -et and -é are in complementary distribution. The suffix -et has diminutive force, and is found in a wider range of derivations from basic colour adjectives than -é is. It is found in the following:

- blanchet
- rouget
- verdet
- jaunet
- bleuet
- brunet
- griset

The above terms, however, are not commonly used in speech and in some cases they are no longer used as colour terms. 'Blanchet' is rare as a colour term (T.L.F.). 'Rouget' generally denotes a kind of fish, although it is listed in the Robert as a colour term also. 'Verdet' is now
used only to denote commercial copper acetate. 'Bleuet' is the name of a flower and is rare as a colour term (T.L.F.). 'Griset' is the name of a small bird. 'Jaunet' is the name of a flower but can also be used with the meaning "slightly yellow". 'Brunet' in the masculine form means "slightly brown" but in the feminine form, when nominalised as in 'la brunette' it has the meaning of the "woman with dark hair".

9.4.9. -AUD, -EAU and -OT

The suffixes -aud, -eau and -ot may all be affixed to colour terms to form derived terms but such derivations are extremely rare in contemporary French.

'Bougeaud' and 'noiraud' are dictionary-attested terms and are also found in spoken French. The suffix -aud is sometimes pejorative and is found in other derived adjectives such as 'nigaud', 'faraud', 'pataud' and 'lourdaud', as well as in nouns such as 'salaud'. 'Rougeaud' usually denotes "red, of complexion".

'Noiraud' is defined in the Dictionnaire Robert as 'qui est noir de teint, de type très brun'.

The suffix -ot has a diminutive rather than a pejorative force and is found in the term 'pâlot'.

1. For example in the Dictionnaire Robert and Juillard's Dictionnaire Inverse.

2. nigaud = gauche, niais, sot
faraud = fier de ses habits, personne
pataud = gauche, maladroit
lourdaud = lourd, maladroit
which is not strictly speaking a colour term. It is found in other adjectives such as 'bellot' and 'vieillot'.

The suffix -eau, when affixed to a colour term, is found only in 'rousseau' which is now used only as a substantive to denote 'un homme aux cheveux roux'. It would not be used in contemporary spoken French. The suffix -eau has a diminutive force and in sections of the vocabulary outside the domain of colour words it is found mainly in nouns, where it may denote "young" as in 'saumoneau' and 'pintadeau'.

The above suffixes, -aud, -eau and -ot, are homophonous and are in complementary distribution, but since they appear in such a small set of little-used colour terms, this is perhaps not a very significant observation.

9.4.10. -ARD

Becker (1974) mentions the following terms in -ard:

blanchard
bleuard
grisard
jaunard
rougeard

None of the above terms are found in Modern Standard

1. bellot (vieux ou régional) = mignon (d'un enfant)
vieillot (un peu vieux) = vieux avant l'âge, faisant vieux.

2. saumoneau = young salmon; pintadeau = young guinea fowl.
French, with the exception of 'grisard' which is no longer used as a colour term, but only as a nominal with a range of meanings (see Robert).

9.4.11. -IN

The suffix -in which occurs in Old French in common terms such as 'sorin', is found in Modern French only in peripheral terms such as 'incarnadin', 'azurin' and 'purpurin', and these terms are not in everyday use, but are rather literary and poetic.

From the above sections and from Table 13 it can be seen that although Modern French has a fairly large number of suffixes which are found affixed to base colour terms to denote 'approximation to a colour', these suffixes are restricted to certain base terms, and in the following section I shall attempt to make certain generalisations about the derivation of approximate colour terms from base colour terms using suffixes. I distinguish between base colour term, which I take to be the term from which a derived term is derived, and basic colour term in the sense in which Berlin and Kay use it. In the following section when I talk of basic colour term I shall assume that French has the twelve basic terms mentioned elsewhere in this dissertation. All basic terms, in this sense, with the exception of 'marron' may serve as base terms in derivations, but not all base terms need be basic terms; for example, 'olive' is not considered to be a basic term in the Berlin and
Kay sense but it serves as a base term for derivations such as 'olivâtre' and 'olivacé'.

9.5.1. Some generalisations about the derivation of approximate colour terms

1. All basic colour terms except 'marron' and 'orange' take -atre

In addition, 'roux', 'blond' and 'olive' take -atre. 'Roux' and 'blond' are very important colour terms for hair, more important for example than 'chatain', which may not be modified by -atre. 'Olive' is also an important colour term in its own small sub-set, the sub-set of colour terms which may apply to the complexion.

2. -atre excludes -asse except in the case of 'blondasse' and 'jaunasse'

It would appear that where an approximate term in -atre exists there is no need for a term in -asse as well, although, as has been seen, terms such as 'blanchasse', 'verdasse' etc. would seem to be potentially well-formed terms. -asse appears to be more clearly pejorative than -atre and the term 'jaunasse' appears to be more restricted in use than the term 'jaunâtre'. Informants say that it is used mainly of the complexion.

3. -atre excludes -ace

Where both forms exist as in 'rosâtre' and 'rosace' the terms have quite different meanings, the first being
"pinkish" and the second "an object, usually a stained glass window, in the form of a rose".

4. **-acé** is used only with colour terms denoting an object characteristically having that colour
   Such terms are: violet
   olive
   ocre.
   Of those only 'violet' is a basic term. Not all colour terms associated with objects have derived forms in -acé, however, as is shown by the non-existence of terms such as **orangeacé, marronacé, rosacé.**

5. Terms in -elet are confined to certain basic terms and the three most important terms for hair
   The terms in -elet are 'blanc', 'rouge', 'vert', 'brun', 'gris', 'blond' and 'roux'. Again it is seen that the three most important terms for hair behave morphologically like basic terms.

6. **-e, -te and -et** are in complementary distribution
   No colour term is found taking more than one of those suffixes. For example, one finds 'blanchet' but not **blanche**; 'orangé' but not **oranget.**

7. **-aud** is restricted to 'noir' and 'rouge'.

8. **-aud** excludes -ot
   For example, one finds 'rougeaud' but not **rougeot; palet' but not **palaud.**
9.6.1. **Degrees of acceptability of approximate colour terms**

I have suggested that in addition to dictionary-attested terms denoting approximation to a colour, there may be 'potential' forms (Sections 9.4.1. and 9.4.2.). Potential forms would be any forms that could be generated by a morphological rule such as the rule Base ≡ Base + Suffix where the base is a colour term and the suffix is -âtre, -asse, -acé etc. I suggested that some of those potential forms might be more acceptable to speakers than others, and that there might be degrees of acceptability (cf. Leech, 1974, p. 210-213). In order to test this idea, and also to test whether all dictionary-attested terms are felt to be acceptable by native speakers, I carried out the following test.

9.6.2. **Test CTQ2 (a).** The acceptability of terms in -âtre, -asse, -acé and -elet

**The material**

The material consisted of four lists of French colour terms, the first list containing terms ending in -âtre, the second list terms ending in -asse, the third list terms ending in -acé and the fourth list terms ending in -elet. Mingled with dictionary-attested terms in each list were terms which I regarded as potential terms. The complete lists are contained in Appendix 12.

**The informants**

Eight native French speakers, male and female,
between the ages of 20 and 30. They were attending a summer school in this country and were mainly students and professional people.

The method

Informants were presented with a sheet containing the four lists and were asked to follow the instructions written at the top. These were:

"Marquez, s'il vous plaît, les termes sur les listes de la manière suivante:

✓ si le terme est acceptable dans le français courant
x si le terme n'est pas acceptable dans le français courant
? si le terme est douteux

I chose a three-point scale type of choice rather than a yes-no type, because I did not wish to force the informants into an arbitrary polarisation. This is the method used by Zimmer (1964, p. 95ff), and the method found most satisfactory by Quirk and Svartik (1966) in their investigations of linguistic acceptability.

The results

List 1. Forms in -âtre

Only four out of the thirteen dictionary-attested terms in -âtre were judged to be acceptable by all eight informants. They were:

blanchâtre
rougeâtre
verdâtre
jaunâtre
'Bleuâtre' was judged to be acceptable by seven of the eight informants but by the eighth it was considered to be doubtful. It seems that there are degrees of acceptability, and the following table shows dictionary-attested terms in order of acceptability by informants. In measuring the degree of acceptability, one point was awarded for a 'yes' answer, half a point for 'doubtful' and no points for 'no'.

Table 16. Acceptability of colour terms in -âtre

<table>
<thead>
<tr>
<th>Approximate term</th>
<th>No. of Points</th>
<th>Relative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>blanchâtre</td>
<td>8</td>
<td>337</td>
</tr>
<tr>
<td>rougeâtre</td>
<td>8</td>
<td>387</td>
</tr>
<tr>
<td>verdâtre</td>
<td>8</td>
<td>650</td>
</tr>
<tr>
<td>jaunâtre</td>
<td>8</td>
<td>499</td>
</tr>
<tr>
<td>jaunâtre</td>
<td>8</td>
<td>499</td>
</tr>
<tr>
<td>jaunâtre</td>
<td>8</td>
<td>499</td>
</tr>
<tr>
<td>bleuâtre</td>
<td>7½</td>
<td>979</td>
</tr>
<tr>
<td>noirâtre</td>
<td>6½</td>
<td>284</td>
</tr>
<tr>
<td>grisâtre</td>
<td>6</td>
<td>331</td>
</tr>
<tr>
<td>olivâtre</td>
<td>6</td>
<td>69</td>
</tr>
<tr>
<td>brunâtre</td>
<td>5</td>
<td>87</td>
</tr>
<tr>
<td>rosâtre</td>
<td>4</td>
<td>84</td>
</tr>
<tr>
<td>rossâtre</td>
<td>3½</td>
<td>79</td>
</tr>
<tr>
<td>blondâtre</td>
<td>1½</td>
<td>--</td>
</tr>
<tr>
<td>violâtre</td>
<td>1</td>
<td>167</td>
</tr>
</tbody>
</table>

It is difficult to draw firm conclusions from such a small sample, but one thing that is clear is that certain terms are more acceptable than others and I would be surprised to obtain a different result on this point if I repeated the test with a larger number of informants. For this
small sample I applied the 5% level of confidence
criterion used and described by Osgood (1960). According
to this criterion, out of eight subjects, six should
go the same way. Accordingly, I judged the following
terms to be the most acceptable:

blanchâtre
rougeâtre
verdâtre
jaunâtre
bleuâtre
noirâtre
grisâtre
olivâtre

The above list contains terms derived from eight of the
eleven terms with the highest frequency of mention in
the questionnaires (Section 4.2.3.). All eight terms are
dictionary-attested and all except one are derived from
terms which are basic according to Berlin and Kay's
criteria and which come high in Berlin and Kay's
evolutionary order. The exception, 'olivâtre' is,
however, a salient term in the sub-set of colour terms
which may be applied to the complexion.

The terms with the highest acceptability rating,
apart from 'blanchâtre', are terms derived from base
terms denoting the four colours which are considered
to be basic in any quadrichromatic theory of colour
vision (Section 7.4.1.). Although what was being
tested was linguistic acceptability and not colour perception, it is tempting to posit a link between colours which are, as far as is known at present, basic in the psycho-physical sense, and colours which are thought of as lending themselves most naturally to modification and thus to encoding as derived terms as well as base terms.

If we look at terms in the lower half of the list in Table 16, numbers 7 to 13, we see that the base term for the derivation is in all cases a term which denotes, not a unitary colour sensation but a sensation in which more than one colour may be observed. This is verifiable by experiment. One can, of course, perceive nuances of non-unitary colours, and some of these nuances are encoded in languages. No language, however, encodes every perceivable nuance - if it did its colour vocabulary would run into several thousands of terms. It therefore looks as though certain priorities are given to certain colour sensations when it comes to encoding. It may be that a language determines its priorities for its own cultural and social reasons, but it may also be the case that certain priorities are universal. Berlin and Kay's findings point to the latter view.

Table 16 shows that there is a certain correlation between terms which informants find most acceptable and terms which have the highest frequency in the Dictionnaire.
des Fréquences du T.L.F..

Of the terms which are not dictionary-attested only two were judged to be acceptable and they were judged to be acceptable by only one informant in each case. The terms were:

orangeâtre
ocrâtre.

Certain terms were judged to be doubtful, but again by only one informant in each case. Certain terms were judged to be definitely not acceptable by all informants. It is interesting to compare the terms which were judged to be definitely not acceptable and those over which informants, even one informant, felt some doubt. The following table shows the comparison:

Table 17. Non-acceptable terms in -âtre

<table>
<thead>
<tr>
<th>Doubtful</th>
<th>Definitely not acceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>marronâtre</td>
<td>turquoisâtre</td>
</tr>
<tr>
<td>beigeâtre</td>
<td>kakiâtre</td>
</tr>
<tr>
<td>châtainâtre</td>
<td>bordeauxâtre</td>
</tr>
<tr>
<td>crémâtre</td>
<td>indigoâtre</td>
</tr>
<tr>
<td>mauvâtre</td>
<td>rouillâtre</td>
</tr>
<tr>
<td>pourprâtre</td>
<td>parmâtre</td>
</tr>
<tr>
<td>citronâtre</td>
<td>vermilionâtre</td>
</tr>
</tbody>
</table>

In general the base terms from which ‘doubtful’ terms are derived have certain properties which the base terms of the ‘definitely not acceptable’ terms do not have:
1. They have a higher frequency, according to the questionnaires and standard frequency counts.
2. They are more likely to be monosyllabic.

To sum up, there appear to be degrees of acceptability not only of dictionary-attested terms in -âtre but also of terms which are not dictionary-attested but which might be called 'potential terms'. The terms judged to be most acceptable are those terms in -âtre which are derived from base terms with the following properties:
1. They have a high frequency count.
2. They are basic terms according to Berlin and Kay's criteria.
3. They are high in the evolutionary order hypothesised by Berlin and Kay.

List 2. Forms in -asse

No colour term in -asse was judged to be acceptable by all eight informants. However the dictionary-attested terms were accepted by more informants than were terms which are not dictionary-attested. Six out of eight informants judged 'blondasse' to be acceptable and five judged 'jaunasse' to be acceptable. 'Blondasse' and 'jaunasse' were judged to be either totally acceptable or totally non-acceptable.

Non-dictionary-attested terms, judged to be acceptable by at least one informant in each case were:
verdasse (4 informants)
rougeasse (3 " )
brunasse (2 " )
bleuasse (1 informant)
marronasse (1 " )
blanchasse (1 " )
noirasse (1 " )

Some of the above terms were also marked as being doubtful terms. In addition to terms in the above list the following were judged by at least one informant in each case to be doubtful terms:

* orangeasse (1)
  * beigeasse (1)

The following table shows the degree of acceptability of colour terms in -asse. It should be remembered that only the first two terms are dictionary-attested terms.

**Table 18. Acceptability of colour terms in -asse**

<table>
<thead>
<tr>
<th>Approximate term</th>
<th>No. of Points</th>
<th>Relative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>D blondasse</td>
<td>6</td>
<td>23</td>
</tr>
<tr>
<td>D jaunasse</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>verdasse</td>
<td>4½</td>
<td>—</td>
</tr>
<tr>
<td>rougeasse</td>
<td>3</td>
<td>—</td>
</tr>
<tr>
<td>blanchasse</td>
<td>2</td>
<td>—</td>
</tr>
<tr>
<td>brunasse</td>
<td>2</td>
<td>—</td>
</tr>
<tr>
<td>bleuasse</td>
<td>1½</td>
<td>—</td>
</tr>
<tr>
<td>noirasse</td>
<td>1½</td>
<td>—</td>
</tr>
<tr>
<td>marronasse</td>
<td>1</td>
<td>—</td>
</tr>
<tr>
<td>orangeasse</td>
<td>1</td>
<td>—</td>
</tr>
<tr>
<td>beigeasse</td>
<td>1</td>
<td>—</td>
</tr>
</tbody>
</table>

D = Dictionary-attested term.
The terms most often judged to be acceptable are those terms in -asse whose base term has the following properties:
1. It has a high frequency count.
2. It is a basic colour according to Berlin and Kay's criteria.
3. It is high in Berlin and Kay's evolutionary order.
4. It is a term which encodes a basic colour in the psycho-physical sense.

List 3. Forms in -acé

The only dictionary-attested term to be accepted by all eight informants was 'violacé'.

The other two dictionary-attested terms were not considered to be acceptable by most informants. They are:
olivacé (judged acceptable by only one informant)
ocracé (judged acceptable by none)

However some terms which do not appear in dictionaries were considered acceptable by some informants at least, and two were considered doubtful.

Table 19. Acceptability of colour terms in -acé

<table>
<thead>
<tr>
<th>Approximate term</th>
<th>No. of Points</th>
<th>Relative Frequency T.I.F. (20 C.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D violacé</td>
<td>8</td>
<td>278</td>
</tr>
<tr>
<td>rosacé</td>
<td>3½</td>
<td></td>
</tr>
<tr>
<td>rougeacé</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>jaunacé</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>D olivacé</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>bleuacé</td>
<td>½</td>
<td></td>
</tr>
<tr>
<td>verdacé</td>
<td>¼</td>
<td></td>
</tr>
<tr>
<td>D ocracé</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

D = Dictionary-attested term.
As in the case of terms in -âtre and -asse the base terms of the most acceptable terms in -acé tend to be the most frequent, the most basic and those which come highest in Berlin and Kay’s evolutionary order.

The place of 'rosacé' high in the list may possibly be explained by the sound association between 'rosacé' and 'rosace', or by the fact that the form 'rosacé' exists, but not as a colour term. It is a botanical term meaning "appertaining to the rose".

The following terms were found to be unacceptable by everyone:

*brunacé
*orangeacé
*marronacé
*ocracé

List 4. Forms in -elet

Most informants considered all the terms in -elet to be totally unacceptable.

One informant marked as acceptable the following:
brunelet, blanchelet, noirelet, griselet, blondelet.

The following terms were found to be doubtful:
rousselet, rougelet, jaunelet, verdelet, roselet.

It follows from the above observations that, although evidence from the dictionary suggests that -elet is a fairly common suffix in colour terms, terms in -elet are not in fact used in contemporary spoken French.
Only one informant volunteered an example of how a term in -elet might be used. She cited 'un petit blondelet', but stressed that it was not really a colour term here.

**Conclusion**

From the above test it is seen that informants do not always agree with the dictionary when they come to decide which derived colour terms are acceptable and which are not. Not only do they reject the dictionary terms but they judge to be acceptable terms which do not appear in any dictionary. It should be pointed out that this observation holds for derived lexemes throughout the lexicon and not just for colour terms.

The suffix -âtre is the most common suffix denoting 'approximation to a colour' in Modern French. It is also seen to be the most productive one. This is shown not only by informants' readiness to judge as acceptable such terms as *orangeâtre, mauveâtre* and so on, but also by the fact that it is found in compounds such as 'gris-violâtre', 'blanc-jaunâtre' and 'gris-noirâtre', all of which are found in the *Dictionnaire Inverse du T.L.F.* (Vol. I).

9.7.1. **Compound colour adjectives**

Suffixation is only one way of forming approximate colour adjectives in French. Adjectives so formed express a nuance of a single HUE and modifications expressed are modifications on the dimensions of
of BRIGHTNESS and/or SATURATION. Sometimes it is necessary to express a mixture of two HUES such as blue and green. This may be done either by using a third lexeme or by compounding the two existing lexemes. In French 'turquoise' would be a result of the first method and 'bleu-vert' would be a result of the second, depending upon whether the predominant hue were blue or green. Sometimes, as has been seen, a combination of the two methods is used and terms such as 'bleu-verdâtre' or 'vert-bleuâtre' result. It is always the second term which is modified by suffixation. In a colour denoted by a term such as 'bleu-vert', however, it is not clear where the focus lies and I carried out the following test:

9.7.2. Test to determine the foci of the colours denoted by 'bleu-vert' and 'vert-bleu'

Material

French stamps, the colours of which are classified according to a standard system and recorded in a catalogue.1

Procedure

The stamps designated as 'bleu', 'vert', 'vert-bleu' and 'bleu-vert' were examined in good daylight and the colours matched with samples from the Methuen Book of Colour.

1. I am indebted to Professor Duncan McMillan for putting his collection of French stamps at my disposal.
Figure 24. Bleu-vert and vert-bleu.

V = 'vert' (stamps); B = 'bleu' (stamps)

BW = 'bleu-vert' (stamps); VB = 'vert-bleu' (stamps)

GREEN = focus for Green (informants' mappings)
BLUE = focus for Blue (informants' mappings)
The above four colours, as well as the foci for 'bleu' and 'vert' as indicated by informants in the mapping task (Section 3.2.), were mapped on to the colour array (Fig. 24).

Results

Table 20. 'Bleu-vert' and 'vert-bleu' in relation to 'bleu' and 'vert'

<table>
<thead>
<tr>
<th>Stamp colour term</th>
<th>Methuen notation</th>
<th>Munsell notation</th>
</tr>
</thead>
<tbody>
<tr>
<td>bleu</td>
<td>22D 6</td>
<td>4.5 PB/4.3/7.4</td>
</tr>
<tr>
<td>vert</td>
<td>26A 7</td>
<td>4</td>
</tr>
<tr>
<td>bleu-vert</td>
<td>25B 6</td>
<td>7</td>
</tr>
<tr>
<td>vert-bleu</td>
<td>24D 5</td>
<td>7</td>
</tr>
</tbody>
</table>

Discussion

Figure 20 shows that the colours designated by the compilers of the stamp catalogue as 'bleu' and 'vert' lie close to the foci of those colours designated as 'bleu' and 'vert' by informants in the mapping task. The slight difference is probably accounted for by the fact that I examined the stamps in good daylight, whereas the mapping experiments were done in artificial light, which would account for the slight shift towards the blue end of the spectrum. Figure 20 also shows that the colour designated as 'bleu-vert' is closer to that designated by 'vert' than it is to that designated by
'bleu', and that the colour designated by 'vert-bleu' is closer to that designated by 'bleu' than it is to that designated by 'vert'. This indicates that 'bleu-vert' denotes a kind of green and that 'vert-bleu' denotes a kind of blue. This is borne out by native speakers who tell me that 'bleu-vert est un genre de vert et vert-bleu est un genre de bleu'.

9.7.3. Productivity in compounding of colour adjectives

The method of compounding is obviously a very productive one and even if only the twelve basic terms are used, many permutations are possible. The only restricting factor will be whether the actual colour sensation denoted by the compound is capable of being perceived by the human eye.

In the section dealing with opposites of colour terms it was seen from the questionnaire results that there are some grounds for saying that certain terms have opposites and this finding lends support to the Hering opponent theory of colour vision. If the Hering theory is correct, and there is some evidence from recent workers in the field that it explains at least part of the complicated mechanism of colour perception (Hurvich and Jameson, 1957), then one would expect that certain colour sensations would be mutually opponent or exclusive and that the terms used to encode them would be mutually opponent or exclusive. These terms would be, in French:

1. 'blanc' and 'noir'
2. 'rouge' and 'vert'
3. 'bleu' and 'jaune'

I used the following test to find out if this is so.

9.7.4. Test CT2(b)

Material

A list of compound colour terms containing the following items:
- bleu-vert
- gris-bleu
- blanc-noir
- rouge-orange
- rouge-vert
- vert-jaune
- vert-rouge
- bleu-jaune
- jaune-orange
- jaune-bleu

Informants

Eight native French speakers, male and female, between the ages of 20 and 30, who were attending a summer school at the University of Dundee. They were mainly students and professional people.

Method

Informants were presented with the above list and were asked to mark the items in the following way:

- si le terme est acceptable dans le français courant
- x si le terme n'est pas acceptable dans le français courant
I chose a three-point scale type of choice rather than a yes-no type because I did not wish to force informants into an arbitrary polarisation. This is the method used by Zimmer (1964, p. 95ff) and the method found most satisfactory by Quirk and Svartik (1968) in their investigations into linguistic acceptability.

Results

The results are shown in the following table:

Table 21. The acceptability of certain compound terms

<table>
<thead>
<tr>
<th>Informant No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>bleu-vert</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>gris-bleu</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>blanc-noir</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>rouge-orange</td>
<td>✓</td>
<td>?</td>
<td>✓</td>
<td>(-gé)(^1) x</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>rouge-vert</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>vert-jaune</td>
<td>✓</td>
<td>?</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>✓</td>
</tr>
<tr>
<td>vert-rouge</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>bleu-jaune</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x?</td>
</tr>
<tr>
<td>jaune-orange</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
<td>✓</td>
<td>x</td>
<td>✓</td>
</tr>
<tr>
<td>jaune-bleu</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

1. Informant indicated that she would find 'rouge-orange' acceptable but not 'rouge-orange'. A possible explanation of this is that for this informant 'rouge-orange' may suggest 'rouge comme une orange' in the way that 'jaune citron' suggests 'jaune comme un citron'.

? si le terme est douteux
Blanc-noir is judged to be acceptable by only one informant. She marked all the terms as acceptable.

Rouge-vert is judged to be acceptable by only one informant.

Vert-rouge is judged to be acceptable by only one informant.

Jaune-bleu is judged to be acceptable by only one informant.

Bleu-jaune is judged to be acceptable by only one informant, and is judged to be a doubtful term by one.

Since the informant who marked the above terms as acceptable marked all the terms as acceptable, and since she was the only one of the eight who marked certain terms as acceptable, her result is not reliable. If we consider the other seven, we see that they are unanimous in rejecting the five terms 'blanc-noir', 'rouge-vert', 'vert-rouge', 'jaune-bleu' and 'bleu-jaune'. Only one of them was a little doubtful about 'bleu-jaune'. If we take this hesitation into account, it appears that, whereas informants are quite confident about rejecting combinations of 'blanc' and 'noir' on the one hand and 'rouge' and 'vert' on the other hand, they are less sure about the combination of 'bleu' and 'jaune'. This fits in to some extent with the results of the questionnaire on opposites. Informants were fairly sure about giving
'blanc' as the opposite of 'noir', less confident about giving 'vert' as the opposite of 'rouge' and much less confident about giving 'jaune' as the opposite of 'bleu'. This is interesting because it appears that there may be some physiological basis for this. Hurvich and Jameson (1957), in extending Hering's work on the opponent-process theory, found that there are different response thresholds for the three pairs. The most sensitive response is the white response, next in sensitivity is the red-green response and next is the yellow-blue response.

9.7.5. Conclusion

Restrictions are placed on the productivity of compound colour terms by the nature of the physical world and by the physiology of colour perception.

Hues which are adjacent on the colour circle combine most easily and terms which encode these combinations are the most acceptable. Such terms contained in the test material were 'bleu-vert', 'rouge-orange', 'vert-jaune' and 'jaune-orange'.

Terms denoting polar opposites at extreme ends of the brightness scale, that is 'blanc' and 'noir' do not combine.

The neutral term 'gris' which encodes a perceptual mixture of black and white, combines readily with a wide range of hue terms, giving terms such as 'gris-bleu'. 
Compound terms which combine terms encoding the three opponent pairs of the opponent-process theory of colour vision are not acceptable, hence the unacceptability of 'rouge-vert', 'bleu-jaune' and 'blanc-noir'.

9.3.1. Verbs derived from colour adjectives

Verbs may be derived from certain of the colour adjectives in French. The method is usually one of suffixation. A form such as 'empourprer' shows both prefixation and suffixation, but the usual form is BASE FORM + VERB ENDING.

As in the case of approximate colour adjectives, the base form is usually the feminine form of the adjective, but irregularities occur, as in 'noircir', where the /s/ has been inserted, and as in 'violacer', where the form of the derivation is not clear.

The most common ending for verbs derived from colour adjectives in Modern French is -ir, although other endings occur with a restricted number of base forms. The following table shows the distribution of these endings.

Table 21. /
Table 21. Verbs derived from colour adjectives

<table>
<thead>
<tr>
<th>Adjective</th>
<th>-ir</th>
<th>-er</th>
<th>-acer</th>
<th>-oyer</th>
<th>-ifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>blanc</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>noir</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rouge</td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vert</td>
<td>+</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>jaune</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>bleu</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>brun</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>marron</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>orange</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>rose</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>violet</td>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>blond</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>roux</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>ocre</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>olive</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>azur</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>pourpre</td>
<td></td>
<td></td>
<td></td>
<td>(em-)</td>
<td>+</td>
</tr>
</tbody>
</table>

N.B. Also to be noted are 'grisonner' < 'grison' and 'grisailer' < 'grisaille'.

9.8.2. Verbs in -ir

It will be noted from Table 21 that the ending -ir is restricted to basic colour terms with the addition of two terms, 'blond' and 'roux', which are important terms for hair colouring.

Not all basic terms, however, have derived forms in -ir. Those which do not are, significantly, 'marron', 'orange', 'gris' and 'violet'. It has already been seen that if we can talk of levels of basicness there is some
evidence for saying that these terms are on a different level from the others. They are less psychologically salient, less frequent and they are the last terms to appear, if Berlin and Kay's evolutionary hypothesis is correct.

Verbs in -ir may be both transitive and intransitive. Very often the same verb form may be either transitive or intransitive, but verbs which are formed by a combination of prefixation and suffixation, such as 'embrunir' and its iterative form 'rembrunir', are always transitive.

The following verbs in -ir, when used transitively, may be paraphrased as:

(a) Rendre vert, jaune etc.; in English "to make green, yellow etc."

(b) Faire devenir vert, jaune etc.; in English "to cause to become green, yellow etc."

<table>
<thead>
<tr>
<th>Verb</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>verdir</td>
<td>(156)</td>
</tr>
<tr>
<td>jaunir</td>
<td>(233)</td>
</tr>
<tr>
<td>brunir</td>
<td>(39)</td>
</tr>
<tr>
<td>bleuir</td>
<td>(180)</td>
</tr>
<tr>
<td>noircir</td>
<td>(353)</td>
</tr>
<tr>
<td>roussir</td>
<td>(46)</td>
</tr>
<tr>
<td>blanchir</td>
<td>(573)</td>
</tr>
<tr>
<td>rosir</td>
<td>(82)</td>
</tr>
<tr>
<td>rougir</td>
<td>(3659)</td>
</tr>
<tr>
<td>blondir</td>
<td>(29)</td>
</tr>
</tbody>
</table>

The figure in brackets indicates the relative frequency
in the T.L.F. for the 20th Century.

The above verbs may be used with a reflexive pronoun and in phrases with 'faire' either with or without a reflexive pronoun. They may also be used as intransitive verbs, and when they are, they are generally non-statives, and may be paraphrased as 'devenir vert, jaune etc.'.

The following sentences which were given by a native speaker are near paraphrases:

1. Le soleil jaunit les blés.
2. Le soleil fait jaunir les blés.
3. Les blés jaunissent sous le soleil.
4. Le soleil rend jaunes les blés.
5. Les blés deviennent jaunes sous le soleil.

With a non-animate 'subject', as in the above sentences, reflexive forms are less likely. With a verb like 'blondir' which is likely to take a human subject reflexive forms are found. The following sentences given by a native speaker illustrate some of the uses of 'blondir':

1. Le soleil blondit les cheveux.
2. Le soleil fait blondir les cheveux.
3. Les cheveux blondissent sous le soleil.
4. Le soleil rend blonds les cheveux.
5. Les cheveux deviennent blonds sous le soleil.
6. Elle se blondit les cheveux.
7. Elle se teint les cheveux en blond.
8. Elle se fait blondir les cheveux.

Numbers 1-5 are near paraphrases, as are numbers 6 and 7. The implication in 6 is that it is she herself who does the dyeing and in 8 that someone else does it for her.

The verbs in -ir listed above may be used to denote a state rather than a change of state, but such uses are rare, and are restricted to literary texts. Such a use is illustrated by the following examples:

1. "Ses yeux bleissaient comme une pervenche impossible à cueillir."¹
2. "Dans l'allée où verdit la mousse des vieux bancs."²

The surrounding context makes it clear that the meaning of the verbs is not 'to become blue' or 'to become green' but 'to be blue' and 'to be green'.

Non-stative verbs in -ir do not necessarily denote inchoative (inceptive) aspect. In order that they should it is generally necessary to preface them by 'commencer à'. The notion of beginning may also be conveyed by the addition of the suffix -onner to the base colour adjective, but this use is confined to 'grisonner' which means 'to begin to grow grey' and may be applied to hair or, by extension, to people.

9.8.3. Verbs in -oyer

The suffix -oyer denotes not so much the inception

of a state as constant changing of a state, or being on the point of entering into a state. In verbs other than those associated with colours it is fairly common, and is found in such verbs as:

larmoyer: être toujours prêt à verser des larmes ("to be always ready to burst into tears")

chatoyer: changer de couleur comme les yeux d'un chat ("to change colour like a cat's eyes")

In verbs associated with colours the suffix -oyer is confined to 'verdoyer' and 'rougeoyer' and those verbs most likely to be in literary contexts. 'Verdoyer' means "to be green, with changing reflections, as under the influence of sunlight etc." and 'rougeoyer' means "to be red, with changing reflections". 'Blondoyer' may mean to "have a fair complexion" but it usually means "to have blond reflections or highlights (of hair)". It is found in literary, usually poetic, contexts. They have a low relative frequency in the T.L.F. (5 for 'blondoyer' and 53 for 'verdoyer'). All verbs in -oyer are intransitive.

9.8.4. Verbs in -ailler and -ifier

The suffixes -ailler and -ifier are rarely found in derivations from colour terms and are restricted to

grisailler = peindre en grisaille, en gris
rubéfier = rendre rouge

'Grisailler' is an example of double suffixation and is composed of

BASE TERM + SUFFIX + SUFFIX.
'Rubefier', modelled on verbs from other domains in -ifier, is rarely used. The base form is not 'rouge' but a Latin form 'rubis'. It means "to make (the skin) red by means of an irritant". Other verbs in -ifier, apart from those derived from colour terms, are fairly common and generally the suffix denotes a permanent change of state or transformation from one state to another, very often of a substance. Some examples are 'momifier', 'solidifier', 'calcifier', 'clarifier', 'saponifier', 'saccharifier', 'pétifier'.

9.8.5. Verbs in -er

Verbs in -er which are derived from colour terms are always transitive. With the exception of 'roser', verbs in -er are derived from colour terms which do not have derivations in -ir as well. That is to say that, as far as verbs associated with colour terms are concerned, the suffixes -er and -ir are in complementary distribution with one exception.

Verbs in -er are much less frequently used than verbs in -ir, and are most commonly used in the form of the past participle; 'orangé', 'rosé', 'ocré', 'azuré', 'empourpré'.

'Violacer' might be considered to belong to the set of verbs in -er rather than to the set of one verb ending in -acer. If this is taken to be the case then it demonstrates a case of double suffixation, the derivation being
BASE TERM + SUFFIX + SUFFIX

This verb is generally found in the form of the past participle 'violacé'.

Several peripheral colour terms have derived verbs in -er. Sometimes only the past participle exists. They are:
dorer
argenter
bronzer
cuivrer
ambrer
mordorer¹
  - olivacé
  - safrané
  - basané
  - henné

Where the base term denotes a metal the derived term may mean either 'to cover with the metal' or 'colour in the colour of the metal'. Where the base term is a substance, such as saffron, the derived past participle may mean either 'flavoured with saffron' or 'coloured with saffron'.

9.8.6. Generalisations about verbs derived from colour adjectives

1. Colour verbs in -ir are usually both transitive and

1. more/maure (dark) + dorer. This verb is most commonly used in the form of the past participle 'mordoré'.
intransitive, but in some cases, e.g. 'blondir',
the transitive use is rare.

2. Colour verbs in -ir may be used reflexively.

3. Verbs with a prefix are never intransitive.

4. Eight of the basic terms have corresponding verbs
   in -ir.

5. 'Orange', 'marron', 'gris' and 'violet' are exceptions
to the above rule.

6. No non-basic terms, with the exception of 'blond'
   and 'roux', have corresponding verb forms in -ir.

7. Forms in -er corresponding to colour terms are
   rarer than forms in -ir.

8. Terms with corresponding -ir forms do not usually
   also have -er forms.

9. 'Rose' is an exception to the above rule.

10. Terms with corresponding -er verbs are usually
    peripheral terms.

11. -er verbs often have a double meaning, e.g. 'dorer' =
    "to cover with gold" or "to colour gold".

12. -er verbs are always transitive.

13. -er verbs may be used reflexively but less regularly
    than verbs in -ir.

14. Verb forms with suffixes other than -ir are extremely
    rare and in some instances may be restricted to one
    colour only.
Chapter 10

IMPORTANT CONTRIBUTIONS TO THE STUDY
OF COLOUR VOCABULARIES

10.1.1. Ethnoscientific studies of colour vocabularies

It was stated at the beginning that the domain of colour was a favoured domain in structural semantics. Although it may be that the procedures for the definition of domains have not yet been well worked out (Sturtevant, 1964), this is not so in the domain of colour. Although there may be doubt as to whether there is a superordinate term for the domain in French, as there is doubt whether this is so in English, there is no doubt that the domain exists, and informants find no difficulty in deciding which terms belong to the lexical field of colour terms and which do not. When questioned, all my French informants gave what are generally known as colour words, with one exception, 'chine' (Section 1.4.4.). All research done up to the present moment points to the domain of colour being a universal domain. Most work over the past twenty years has been done by cultural anthropologists and the term 'ethnoscientific'\(^1\) is often applied to their methods. According to such researchers the peoples of different cultural and ethnic groups have particular ways of classifying the elements

\(^1\) Sturtevant (1964) in a key paper defines ethnoscience as "the system of knowledge and cognition typical of a given culture".
that make up their universe. Just how particular these ways are to each culture is a key question not only in structural semantics but in all ethnoscientific studies. Cultural anthropologists see semantic structure in terms of taxonomies and in the first chapter I mentioned some of the domains that have been treated in this way (Section 1.4.4.). There is no reason why colour should not be treated as a taxonomy, but such a study would be outwith the scope of this dissertation, since I deal with only basic terms, that is with high level taxa. A study of the whole taxonomic hierarchy would entail the study not only of basic terms but also of secondary and perhaps tertiary terms. Such a study might be revealing. Recent research in psychology suggests that such terms may have special importance for cognition.¹

10.1.2. The language of experience

When people classify the elements of their universe they place them in categories which they label by lexemes. It is generally accepted that, apart from proper names, names are names of classes or categories rather than names of individual things. This dissertation has been concerned mainly with the lexemes which French speakers use to name the basic colour categories, that is with a small sub-set of lexemes within a larger sub-set within

¹ Burnham and Clark (1955); Lenneberg (1961); Roger Wales (personal communication).
what Lenneberg and Roberts call 'the language of experience'.\(^1\) The fairly advanced state of knowledge about the physiology and physics of colour vision and the concrete nature of the colour array has helped to make the study of this particular section of the language of experience easier perhaps, but there is no reason why similar research should not be undertaken in other areas of the vocabulary, for example in the areas of taste and smell, not only for French but for other languages. Such research may be intra-cultural. In that case the language system, the cognition system and the correlation between them would be studied for one language and one culture group only. There are however certain hypotheses which can be tested only cross-culturally, and obviously if one wishes to test hypotheses concerning universals then the larger the number of languages and cultures one samples the better. That is why Berlin and Kay's study of basic colour terms is so valuable in spite of certain criticisms that have been made of it. It is true that, of the 98 languages for which they presented data, only 20 languages, apart from Tzeltal, were tested by the authors themselves and for the remaining languages they had to rely on earlier written accounts, not always reliable perhaps. Nevertheless,

\(^1\) "The words and morphemes that refer to the most elementary forms of experience such as the sensations of temperature, of humidity or of light." (Lenneberg and Roberts, 1956, p. 499).
data from even twenty languages, chosen as they were from many different language stocks, is a considerable amount of data. Even the less reliable data from the remaining languages is not completely without value, especially if it leads other researchers to investigate those languages more closely. Since 1969 some of the languages not investigated by Berlin and Kay have been tested and this dissertation is a record of the research done on one of them. Although it might appear that this has been an intra-cultural study, it has been in fact a cross-cultural study, because by using the same methods as Berlin and Kay I have been able to compare results for French with their results for 98 other languages. I have also been able to compare my findings with those of workers in other fields, notably cognitive anthropologists, cognitive psychologists and philosophers.

10.2.1. The work of cognitive anthropologists – Verne F. Ray

In the fifteen years or so before the publication of Basic Colour Terms, the most important work on colour done by cognitive anthropologists was done by people like Verne F. Ray, Conklin, Landar, Ervin and Horowitz. Ray’s paper (Ray, 1952) lays down valuable guidelines for all future researchers including Berlin and Kay and those who followed them. In it he describes his own experiments on colour, going as far back as 1932. He is one of the earliest anthropologists to discuss the
relative merits of the trichromatic theory, still adhered to by physicists, and the four-colour theory, which seems to have more to offer to anthropologists, linguists and psychologists. Recent researchers such as Zollinger have found some evidence to support not only a four-colour theory but an opponent process four-colour theory (Zollinger, 1973) and some of my own findings also support an opponent process theory (Section 7.4.1.).

Ray recognised the advantages of using coloured lights whose wavelength can be accurately measured rather than pigment colours, but he was unsuccessful in his early attempts to use a spectroscope. Later researchers, however, such as Beare (1963) and Judd (1932) have used coloured lights successfully. Ray was one of the first to use colour chips, but he did not have the advantage of having the Munsell set, which is now the standard test material.¹ Some early workers had used dyed wool and fabrics but Ray saw that with three-dimensional material too many variables were introduced. Ray also points to the dangers of distortion of results caused by variables such as light, reflection and other factors such as proximity to other colours.

All those things are taken for granted by researchers now, as is the necessity of testing all informants for

¹. Although chips have long been considered ideal test material a recent researcher, Snow (1971, p. 398), points to a possible disadvantage of the colour chip material, namely that it is not necessarily indicative of actual usage.
colour blindness. Hay does however point to individual differences which may distort results - such things as colour preferences and colour symbolism, and it is only very recently that researchers have begun to take individual variability into their descriptions of cognitive models.\(^1\) Hay made an important point regarding the creativity of colour naming, a point that has been taken up recently by Bernard Harrison (1973). As Hay points out, one can understand the term 'yellowish-buff' although one has never heard it before. Conversely, as he points out, one can assign a name to an unusual colour, although one has never seen it before, even if one has to use a phrase or compound.

Hay, like most people writing before Berlin and Kay, supports the relativity hypothesis. He writes:

"There is no such thing as a 'natural' division of the spectrum. Each culture has taken the spectral continuum and has divided it into units on a quite arbitrary basis. The names applied to these units sometimes refer to the middle color or type of the band in question; in other cases, colors are defined wholly in terms of boundaries without the type concept playing any role. No color system derives from physiological limitations; no color system exploits fully the physiological sensitivity of the human being."

\(^1\) Notably Bricker (1974) and Sankoff (1971).
All of these points, with the possible exception of the last, are disputable and have been disputed especially by Berlin and Kay and recent researchers. Ray points to a very important distinction which may be crucial in the relativity question; he distinguishes between what he calls 'the middle color' and 'colors which are defined wholly in terms of boundaries without the type concept playing any role'. Berlin and Kay distinguish between focal and boundary colours and recent research such as that done by Eleanor Rosch, which I shall discuss later, concentrates on the focus of categories and has been given the name 'prototype semantics' by Fillmore (1974). Ray disposes, perhaps once and for all, of the evolutionary theory of colour vision. It is tempting to posit, especially in the light of Berlin and Kay's finding that some languages at the present time possess only two basic colour terms, that at one time man could perceive only two colours, then only three, then four and so on, but so far there is no evidence that this is so. Berlin and Kay's evolutionary hypothesis is different. They assume that all men have the same ability to perceive all colours but that basic colour terms enter languages in a certain fixed order.

Ray does not talk about 'basic terms'. He talks about 'unitary colours', and he brings out an important point about unitary colour perceptions. In physics the trichromatic theory does not provide for yellow except as a combination of red and green (lights).
However, as Ray and many other colour theorists have pointed out, there is no evidence that people see yellow as other than a unitary colour. Ray even goes so far as to say that, culturally, violet, orange and brown are just as unitary as red and blue. Now violet is usually considered to be an intermediate colour between red and blue, orange an intermediate colour between red and yellow, and brown is not even a spectral colour. It would not be surprising, therefore, to find that people see these colours as mixtures. Berlin and Kay, however, found that all three of these colours were basic colours and they added pink as well. In earlier sections I pointed to the fact that, whereas certain colours were clearly basic (red, blue, green and yellow), certain others were less clearly so, and those were violet, orange, brown and pink. That is to say the primary light and pigment colours appear to be more basic than the others. It should be made clear, however, that Berlin and Kay's basic categories are not the basic colours of light colour theory or pigment colour theory. They are what one might call, following Ray, cultural colour categories, and they are of interest to the linguist because they are capable of being lexicalised. One modern linguist, Eugenio Coseriu, who believes strongly that extra-linguistic phenomena are of no concern to the linguist, points out that, whereas the French term 'brun' is in all respects a basic word, the colour it denotes is not a basic colour in the
physical sense (Coseriu, 1964). In one sense Coseriu and cognitive anthropologists, along with cognitive psychologists, are on common ground. The correlation is not, it appears, to be sought between things in the external world and lexemes. For Coseriu, however, the only relations which are of interest to the linguist are to be found within the language system, whereas for cognitive anthropologists and cognitive psychologists the interesting relations are those which exist between cognitive processes and lexemes that tag them.

10.3.1. Conklin on Hanunóo

One of the key papers on colour vocabularies written before *Basic Color Terms* is Conklin’s well known paper on Hanunóo colour categories (Conklin, 1955). In methodology he followed Ray by using cards, dyed fabrics and wool but he added items from natural surroundings as well. Some more recent researchers (Snow, 1971) find this essential. Since Conklin was led to study Hanunóo colour terms by his earlier work on Hanunóo botanical categories, it was natural that he should adopt a taxonomic approach. As far as I know, little, if indeed anything else, has been done on colour taxonomies and Conklin’s findings for Hanunóo would serve as a useful basis of comparison for researchers who might wish to undertake such an analysis for other languages. I have been concerned mainly with basic terms, that is terms which correspond to Conklin’s
Level I terms. Conklin's data is used by Berlin and Kay who classify Hanunóo as a stage IIIa language, that is a language with basic terms for black, white, red and green. The presence of these three basic terms confirms Berlin and Kay's two main hypotheses. What is new and interesting about Conklin's findings is that, for example, 'rara?' means not only "red" but also "dry" and that 'latuy' means not only "green" but "wet". In French some informants indicated that there was an opposition between 'rouge' and 'vert' which corresponded to the opposition ripe and unripe. Conklin raises several points about Level II terms which might be interesting to take up in a cross-cultural study or intracultural study of secondary colour terms. Among the Hanunóo he finds sex differences in the use of secondary terms, men making more discriminations in the reds and greys (animals, feathers) and women more discriminations in the blues because of their familiarity with indigo-dyed fabrics. In lists elicited from French subjects there was no difference in the frequency with which basic terms were listed by men and women but on the whole women tended to give longer lists, lists containing more secondary terms, and lists containing more terms which are applied mainly to fabrics, such as 'beige' and 'écru' as well as terms which might be called 'fashion terms' such as 'vert amande'.
10.3.2. **Relatively specific colour words**

Conklin divides Level II terms into two classes and it would be interesting to find if all languages follow this pattern. The first division of Level II terms is into what Conklin calls 'relatively specific color words', words like *(ma) dapug*, "grey", from 'dapug', "ashes", *(ma)? arum*, "violet" and *(ma) dilaw*, "yellow", from 'dilaw', "turmeric". In French there is a basic term for grey, and the secondary term for grey, which might correspond to the Hanunôo *(ma) dapug*, namely 'cendre', is a very peripheral term and very restricted in use. In languages without a basic term for grey, but which like Hanunôo have a one-word secondary term for grey, a likely prediction would be that the same lexeme as that for ashes would be used since ashes are a part of the material environment of all people who make fire. In the languages I have looked at I found this appears to be so. Informants tell me that in Wolloff (Gambia) the common term for grey is the same as that for ashes; in Japanese the most common term for grey appears to be *hai iro*, "colour of ashes", but there is another term for grey, *nezumi iro*, "rat coloured", which also appears to be common; in Urdu (a stage VII language without a basic term for grey), the form iro may be omitted from this term only if the adjective is in predicate position, for example in the sentence it is *nezumi*. Iro may never be omitted in *hai iro*.
grey) I was given the term 'geri', "dust", and 'geri' appears to be an important term for grey, although not as common as 'sleti', "slate", which was given to me readily by Urdu, Punjabi and Hindi speakers. In Gujarati, the most common term for grey according to my informants appears to be 'poladi', which means "tea". I have not been able to investigate fully the term 'geri', but it would be interesting to see if it comes in at an earlier stage of the development of the colour vocabulary than the others terms for grey, which, although they also denote natural materials, reflect however a more advanced stage of man's development than the terms which denote ashes and dust.

The Hamunóo term for yellow is 'dilaw', which also means "turmeric". Turmeric, unlike ashes, is less commonly part of the material universe of man, but where it is used in cooking one might expect it to provide a common colour term, although not a basic one. Snow (1971) considers 'samasama' to be a basic term in Samoan. 'Sama' is the term used for yellowish turmeric powder mixed with coconut oil. He considers the term to be monolexemic because he considers that reduplication of morphemes does not render a term polymorphemic. It is open to doubt, however, whether the term 'samasama' is a basic term on other criteria. In Urdu the term 'zurd' is also derived from the term for turmeric, the basic term for yellow being 'pila'. In the language
of Borneo investigated by Wales, the common term for yellow is also the term for turmeric (Wales, personal communication).

On the basis of data from so few languages it would be premature to form generalisations about the tendency to create abstract colour names from the names of concrete elements. From evidence so far, however, it seems likely that all languages do create colour names in this way. Whether they are basic terms or not depends to some extent on one's definition of basicness, but if one accepts Berlin and Kay's definition of basicness then certain colour terms, although they may also be names of objects, are basic. Such terms would be 'orange' in French and 'orange' in English. 'Marron' in French may be another such term. We have to keep in mind, however, an important point made as early as 1910 by Woodworth. He refers to the 'fluid condition' of colour terms, a stage during development of a term when the name of a thing is sometimes used as a colour term and sometimes is not. Then at a later stage the usage as a colour term becomes fixed and finally the colour term becomes completely disassociated from the object.

10.3.3. **Culture specific colour words**

It is likely that the choice of objects, whose names are used to serve a double function in this way in any one language, depends on the material culture
of the speakers of that language. If, as McNeill (1972) suggests, the most important thing in the evolution of a colour term, along with the physiology of colour vision, is the natural resources and colours in the external world, then one would expect colour names to originate in the names of common elements in the environment of the speakers of various languages. McNeill substantiates this claim by examples from Navaho, where she shows that the five basic colour terms were originally the names of minerals and other earth substances used in Navaho religious ceremonies. McNeill concludes from this that the emergence of colour terms is culture specific and this view is shared by Landar, Ervin and Horowitz (1960) who also investigated Navaho colour terms. McNeill also reaches the conclusion that Berlin and Kay have not overturned the relativity theory and that in the development of colour words necessity and functional importance are the determining factors. She does not, however, in my opinion, refute Berlin and Kay's main hypothesis which is that there is a set of eleven basic universal colour categories, all or some of which may be lexicalised in any one language by a one-word term. The choice of lexeme to denote a particular category may, however, have been at one time governed by the saliency of objects in any one particular culture, and to that extent colour terms may be culture specific. This is certainly the case with certain secondary colour
terms, as we have already seen with certain colour terms in French such as 'café au lait'.

10.3.4. **Modified colour terms**

Conklin's second class of Level II terms consists of constructions based on the kind of specific term discussed above or constructions based on Level I terms. He gives as examples 'mabirubiru' meaning "somewhat mabiru", 'mabiru:ru(gid)' meaning "very mabiru" and 'madi:lawdi:law' meaning "weak yellow". All three terms are examples of what I have referred to earlier as 'approximate colour terms'. The first and last would be expressed in French by phrases such as 'assez noir' and 'd'un jaune peu soutenu' or by one-word terms such as 'noirâtre' and 'jaunâtre'. The term glossed as "very mabiru" could be expressed in French only by a phrase such as 'très rouge', but in Roumanian there is a suffix with augmentative force which may be combined with the colour adjective 'galb' ("yellow") to form a one-word term 'galbanoi'.

Conklin explains that 'mabiru(gid)', "very mabiru", denotes a colour close to the focal centre of jet black and one would expect to find that colour terms in other languages which mean "very x" would designate colours close to the universal focus for x. This could easily be tested empirically.

1. I have not found any similar one-word terms in any other language to denote intensive colour.
10.3.5. Non-colorimetric aspects of colour terms

Conklin makes an important point about non-colorimetric aspects of colour terms, aspects such as texture, iridescence, sparkle and dullness. Since, as he points out, they usually give rise to polymorphemic constructions, I have not been concerned with them in this dissertation on basic terms. This is however an area which might be researched more thoroughly. It has already been pointed out that colour terms in French, as in all modern European languages, are in equipollent opposition but in Latin this was not so since the two terms for white and the two terms for black were in privative opposition, the one term denoting the quality of shininess and the other not. In modern French I have not found any one-word terms which denote aspects of lustre, sparkle and so on, although perhaps 'doré', 'cuivré', 'argenté' and other terms derived from metals imply lustre. In Japanese, however, I was given three terms for red by an informant. One term is the basic term 'aka'. The second term, 'shu-iro', was described as having slight lustre and the informant was able quite easily to pick out a square for it on the Munsell chart.¹ The Munsell number for the chip designated as 'shu-iro' is 7.5 R 3/ which falls within the Berlin and Kay focal area for red. The third term for red,

1. The colours on the Munsell chart are not completely mat.
'shinku' was described by the informant as "a deep red which must have lustre" and he was unable to find a square for it on the Munsell chart. He suggested that it was a colour term that might be used in talking of silk. It looks as if the three terms 'aka', 'shu-iro' and 'shinku' may be opposed not on the usual dimensions of hue, brightness and saturation but on the non-colorimetric dimension of lustre.

10.4.1. **Landar, Ervin and Horowitz on Navaho**

I shall discuss briefly only one other study of colour terms written before *Basic Color Terms*, Landar Ervin and Horowitz's study of Navaho colour categories (1960). Like most studies of this time it is anti-universalist and is influenced by early work done by Lenneberg and Roberts on the correlation between codability and cognition (codability is roughly length and complexity of name). Navaho subjects were shown 29 Munsell colour chips varying only in hue and were asked to name them. In spite of the limitations of the test material - only the domain of hue could be investigated - all the Level I terms in Navaho and the commonest of the Level II terms were elicited. Landar's study differs from most studies on colour terms in that verbs related to colours were investigated as well as adjectives. This is perhaps an area where more research could be done. Landar is also one of the few researchers to have found that bilingual speakers have different
colour categories from monolingual speakers. Now, if Berlin and Kay's universalist hypothesis holds, this should not be the case for basic categories. The results obtained from my bilingual Welsh informant seem to confirm this (Appendix 11). For secondary categories, however, it may be otherwise.

Work done on colour by cognitive anthropologists and by linguists after the publication of Basic Color Terms in 1969 has naturally been influenced by it. Among the most important papers are Snow's paper on Samoan (1971), McNeill's paper 'Color and Color Terminology' (1972) with examples from Navaho, Pukapuka and Japanese, Merrifield's review of Basic Color Terms (1971) with his own data from four Chinatec languages and Broch's paper on Hare Indian colour terms (1974). I should also mention Conklin's review of Basic Color Terms (1973) which is not only a critique but also an important supplement to Conklin's previous work on colour and a pointer to future research in this area.

I shall briefly discuss the above papers, selecting points that are especially relevant to my own findings or which suggest topics for future research.

10.5.1. Snow on Samoan

Snow replicated Berlin and Kay's experiments and his results appear to refute the Berlin and Kay evolutionary hypothesis, because Samoan, according to Snow, acquired basic terms for brown and grey before
basic terms for green and blue (Snow, 1971). My own findings for Zulu show exactly the same. French, being a Stage VII language with its full complement of eleven basic colours is not a good language on which to test the evolutionary hypothesis, but research along diachronic lines might reveal some interesting facts about the evolution of colour words in French. The only three basic terms that look rather doubtful from the synchronic point of view are 'orange', 'violet' and 'rose', but since these terms are the last to enter languages if Berlin and Kay are correct this fact would tend to support their evolutionary hypothesis.

10.5.2. Selection restrictions on colour terms

Snow makes another important point. He indicates that the choice of a colour name, even a basic name, may depend on what kind of object is being described. He gives two basic colour terms for green in Samoan, 'lanumeatmata' ("the colour of something that is raw") and 'lanulau'ava' ("the colour of the leaf of the kava plant"). I would have thought that these were perhaps not basic terms because of their morphological complexity. However they certainly appear to be salient terms, and the important point that Snow is making is that one of them, 'lanumeatmata', is used of inanimate objects and the other, 'lanulau'ava', is used of animate objects. He reports, however, that the use of 'lanumeatmata' is changing now and that it can also be used for animate
things. The situation is in some ways analogous to that of the French terms 'brun' and 'marron'. When 'marron' first began to be used alongside 'brun' as a colour term it was used mainly for clothes. Gradually however its use has become much wider and some informants would say that 'marron' may be used for anything except hair. Its use for animate objects is still rare. Leaving aside the use of 'brun' for persons, which is in any case a special use and is derived from the use of 'brun' for hair and complexion, 'brun' is still much more common than 'marron' for animate objects such as animals and parts of animals such as fur. My subjects were asked to perform a colour mapping task, that is they were asked to mark those areas of the colour chart that they would call 'x' and those squares they would call 'best x'.¹ They were not asked to perform a colour naming task, that is to assign colour names to certain squares. Had they been asked to perform a colour naming task I might have found, as Snow did, that colour chips (or the printed replica of chips) were not an entirely satisfactory test material. Colour chips are, however, the most convenient, consistent and reliable material. To use a wide variety of objects from the material environment of the speakers would be

¹. My French subjects performed the same tasks as Berlin and Kay's subjects, because I wished to test Berlin and Kay's hypotheses using the same test conditions.
very difficult and in order to compare results it would be necessary to carefully colour-match test samples with samples such as Munsell colour chips which have a standard colour number. It is not of course necessary to show informants test samples in order to find out how they use colour names. One can ask them to what kind of object they would apply certain names. This was done in the questionnaires sent to informants in France. One can also analyse the way in which words are used in the spoken and the written language. Written texts are more easily analysed in this way and in this dissertation I have been able to draw on a corpus of over ninety million occurrences put at my disposal at the research centre of the T.L.F.. The sections of this dissertation on the uses of 'brun' and 'marron' and on collocations give only some idea of the kind of research that might yield interesting information about the use of colour names. I would see such research as being intra-cultural in nature rather than cross-cultural, but it would have cross-cultural implications as well. Berlin and Kay have already shown by their cross-cultural study that the terms used for basic categories are terms of wide application. Restricted usage would therefore be found at the level of secondary terms, and it is in this section of the vocabulary that the most interesting collocations would be found.

1. This is what had to be done when French postage stamps were used for one of the experiments.
10.6.1. **Merrifield on Chinatec**

Merrifield, in his review of *Basic Color Terms* (1971), makes the same criticism as Conklin makes in his review, namely that the data was collected directly by the authors and students from only 20 languages and that for the remaining 78 languages, apart from Tzeltal, the authors relied on data from the literature. Merrifield makes the additional criticism that in most cases only one informant was used. Merrifield's own experiments on four Chinatec languages are interesting from the point of view of methodology and his account of them provides useful information for field workers who may be working in places where such elaborate apparatus as that used by Berlin and Kay is not available. Instead of using Munsell chips, which are expensive and heavy, he used the printed colour chart from the back of Berlin and Kay's book. Instead of sheets of clear acetate and chinagraph pencils for the mapping tests he used cut up plastic bags and felt pens. I too used the chart, but, unlike Merrifield, I was able to use artificial lighting of approximately the same colour temperature as that used by Berlin and Kay. Merrifield used "the bright midday Oaxaca sky". He does not say if he avoided direct sunlight or not. In all experiments dealing with colour the source of light and the angle at which it falls on the sample are very important factors. Many researchers use good daylight; direct sunlight is generally considered to be bad. The ideal test conditions
are those under which Berlin and Kay worked but it is only practicable to use the kind of colour apparatus they used in a laboratory.

Merrifield's own results confirm Berlin and Kay's evolutionary hypothesis. In the four Chinatec languages he investigated the term for blue comes after the five others. Nevertheless he finds Berlin and Kay's evolutionary view loose but "perhaps best left that way until the time when we have the objective means to assess the relative complexity of culture and technology". McNeill, in her paper which I have already discussed, is very much concerned with the "relative complexity of culture and technology". She does not consider that Berlin and Kay have overturned the relativity theory and she sees necessity and functional importance as the determining factors in the development of colour words. She maintains that where the need arises a great variety of colour names emerge. This is undoubtedly so, but such names will be mostly secondary terms. Most research up until now has concentrated on basic terms, and I think rightly so. It is important to identify and analyse basic level terminology before going on to secondary levels. Conklin points this out in his review of Basic Color Terms (1973).

10.7.1. Conklin's review of Basic Color Terms

As I have already said, Conklin's review is more than a review and should be carefully read by anyone
undertaking research in colour vocabularies. He stresses again the importance not only of the features of hue, brightness and saturation in colours but also the non-colorimetric features of texture, lustre, transparency, fluctuation, location and duration. The three last-named features suggest that colour verbs might yield interesting results on closer examination. I looked at such verbs in the section on morphology, but a cross-cultural study might be more revealing than an intra-cultural one. As Conklin points out, very little has been done on the syntax of colour terms. He mentions only Dixon (1970) on colour verbs in -en. Like McNeill, Conklin is aware of the influence of colorant technologies on colour vocabularies, and gives as an examples of this the term 'purple' where one has a transition from animal form to dye to colour category. It may or may not be significant that in French the terms showing this kind of evolution, such terms as 'pourpre', 'cramoisi', 'écarlate', 'vermillon' and 'vermeil' are not basic terms. In two Romance languages, however, Catalan and Portugese, the basic term for red is cognate, not with 'rouge', but with 'vermeil'. The term in Catalan is 'vermell' and the Portugese term is 'vermelho'. I think, however, that the evidence for 'vermell' being a basic term is rather slight. Berlin and Kay did not investigate Catalan themselves but relied on the notes of a researcher who had only one
informant. Becker (1974) gives 'roig' as the basic term in Catalan for red, but he relies on dictionaries and it would be interesting to replicate Berlin and Kay's experiments with a number of Catalan subjects. Berlin and Kay do not report on Portuguese at all and I take Becker's word for it that 'vermehlo' is a basic term in Portuguese.¹

10.7.2. Pigment colour and light colour

Conklin raises several important theoretical points in his review. He stresses that both pigment and light colour are universal and that both should be included in a study of colour terminologies. As I have already pointed out, most researchers work with pigment colour, usually in the form of colour chips, but the accounts of the experiments done by Beare (1963) and by Judd (1932) which were done using light colour would provide a useful starting point for future researchers choosing this kind of stimulus.

Beare points out that light colour can be more accurately measured. This is undoubtedly so, but it should be kept in mind that the colours of the world around us are not pure spectral colours and that presumably what we classify as red, green and so on are not the pure reds and greens of the spectrum.

1. I have since checked with Portuguese and Catalan native speakers. 'Vermelho' is indeed the basic term in Portuguese for red and in Catalan the basic term appears to be 'vermell'. The term 'roig', according to my informant, is restricted in use to hair and to use as a general term in sentences which would translate the English "the colour red".
The main difference between pigment and light colours that appears to be relevant to a study of basic colour terms lies within the area of primary colours. The three primary pigment colours are red, yellow and blue and the three basic light colours are red, green and violet. I have suggested elsewhere that, leaving aside the neutrals, the four terms 'red', 'green', 'yellow' and 'blue' appear to be more basic than the remaining four terms called basic by Berlin and Kay. These four apparently more basic terms are drawn from the set of terms which designate members of the composite set of light plus pigment primaries, namely the set containing red, yellow, blue, green and violet. The fact that, whereas violet is definitely a basic colour in physics, its name is not so definitely a basic term in language, may be due to the way in which people tend to see violet as a mixture of blue and red but red, green, blue and yellow as unitary sensations. The opposite can happen too. As I have already pointed out, quoting Coseriu, 'brown' may be a basic colour term in language although brown is not a basic colour in physics. Similarly 'orange' may be a basic colour term although orange is neither a primary light nor a primary pigment colour. It is even doubtful, according to Gregory (1966), if one can really see orange in the spectrum at all. Gregory also says that one cannot see indigo. There appears to be much more doubt about the perception of
of indigo in the spectrum than there is about the perception of orange. I cannot enter into that interesting debate here but refer readers to the *New Scientist* correspondence on that subject.¹ Whatever the position about the perception of indigo, however, there is no doubt that 'indigo' is not a basic colour term in French, just as 'indigo' is not a basic colour term in English. Thus it would appear that although there is no one-to-one correspondence between basic colour terms and primary colours, the four most basic hue terms according to my saliency tests and the four hue terms which appear first according to the Berlin and Kay evolutionary theory, are those terms that designate four out of the five primary and light colours, namely red, green, blue and yellow. The fact that the term for violet² is not included in my first four terms and appears at the end of Berlin and Kay's evolutionary order serves to remind us that the physiology and physics of colour vision are not enough to account for the way in which we categorise and lexicalise colours.

10.7.3. **Ordered sets of colour terms**

Conklin is one of the few writers on colour terms to mention that colours often appear, and are named, in


2. I take it that the basic terms for the category purple are 'violet' in French and 'purple' in English.
a certain order. It is of interest to linguists that lexical items may be in serially or cyclically ordered sets (cf. Lyons, forthcoming). Not all of the French informants were able to give me the colours of the rainbow or the colours of the spectrum, but those who were able to gave me seven colours in a certain order. It has been suggested that Newton just liked the number seven and added the name 'indigo' to make the magic number, (Gregory, 1966). However, whatever the number of spectral colours may be, the order in which they appear is fixed. Since the spectrum is a continuum, one could enter it at any point and begin one's list with any one of the seven colours, but in fact all my French informants began with 'rouge' and I think most English speakers would begin with 'red', because this is how they have learnt the list. The reason for learning the list in that order may not be completely arbitrary of course, since red has the longest wavelength and violet the shortest. Apart from the list of spectral colours I did not find many fixed order lists of colour terms in French. I found no irreversible binomials\(^1\) in French such as 'black and white' in English. French speakers may say 'noir et blanc' or 'blanc et noir', although the first expression is much more common. The apparent irreversible binomial 'le rouge et le noir' I would not consider to be a true

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1. For what is meant by an irreversible binomial, see Malkiel (1959).
one, since I would rank book titles along with idioms, which Malkiel would not consider as coming within the scope of irreversible binomials. I found one irreversible trinomial, 'bleu, blanc, rouge', but it is also doubtful since it designates the colours of the French flag. I found, however, that when French speakers listed those three colours together they always did so in that order, although they were not consciously naming the tricolour. It may well be, however, that when two or more colour terms are listed together in any context they tend to be listed in one order rather than another, and the order may depend on such factors as priority of a superordinate term over a hyponym and priority of a basic term over a non-basic term. This has been suggested by two researchers at Nancy working on the computer corpus of ninety million words compiled for the T.I.F.. They have isolated binary groups joined by such connecting words as 'et' and 'ou', but when their research is complete their data could be very useful for researchers who might wish to make a more detailed study of irreversible binomials in French (Michon and Potdevin, personal communication).

10.8.1. Broch on Hare Indian

One of the most recent papers by a cognitive anthropologist based on Berlin and Kay is that by H.B. Broch on Hare Indian colour terms (1974). It is interesting in that it appears to refute Berlin
and Kay's evolutionary hypothesis. The basic terms in Hare Indian, according to Broch, are those for black, white, red, yellow and blue. There is no basic term for green; the term for green is also the term for grass, leaves, cabbage, flowers and even petals which are blue, red and yellow. Broch's explanation, which is based on speculation, is that the term for blue may once have covered green colours as well and then, as time went on, when green needed to be singled out, the word for plants was used for green, leaving the old term to denote blue only. It is of course quite usual that a language should have only one term for blue and green. Zulu does, for example (Appendix 10). However, if Berlin and Kay's evolutionary hypothesis is correct a language should acquire a basic term for green before it acquires one for blue, which is not the case in Hare Indian. Furthermore it should acquire two basic terms, one for green and one for blue, before it acquires basic terms for grey and brown, which is not the case in Zulu. I think that Berlin and Kay's evolutionary theory may not be completely wrong but that it may be only roughly correct. The authors indicate this themselves when they show that either green or yellow may come first and that the last four terms are unordered. The position of the first three terms and their position at the beginning of the list seems to be more secure than the position and order of subsequent terms. I found that 'bleu' was a
more salient term than 'vert' in French and most refutations of Berlin and Kay's evolutionary order have to do with the position of blue. It may be that the whole blue-green area has to be examined more closely.¹ It should always be kept in mind that even in languages which have only one term for blue and green, it is always possible to distinguish the two categories by phrases or compounds, such as 'blue like the sky' or 'grass green' (cf. Longacre, 1956). Even in languages which do have two basic terms for the categories blue and green such phrases or compounds appear as secondary terms and in definitions. (See Lyons, forthcoming, for a discussion of definitions of colour terms, and also the definitions of the basic colour terms in such dictionaries as the Petit Robert.)

10.9.1. The work of cognitive psychologists in the field of colour

The work of cognitive psychologists in the field of colour is of interest, especially in as much as it supports or refutes the relativity hypothesis. Although few people would now adhere to the strong Whorfian hypothesis that posits a causal relation between language and culture or language and cognition, the direction

¹. A recent article by Kay (December 1975) suggests that the GRUB area does indeed raise problems not fully investigated in his previous study with Berlin (1969).
being from language to culture, early work by researchers such as Brown and Lenneberg (Brown, Lenneberg, 1954) does tend to support certain aspects of the Whorfian hypothesis at least. They concentrated on lexical features rather than grammatical features, as indeed most investigators of the relativity theory have done, and they used codability as the language variable. Codability is roughly the length and complexity of a colour term. Recognition recall was taken as the cognitive measure. Brown and Lenneberg found in their early experiments with English and Zuni speakers that the shorter and less complex a colour term was the more easily it was remembered. This applied to both language groups. Codability is, presumably, by its nature, language specific but if one finds that codability in L₁ correlates with memory for speakers of L₁ and that codability in L₂ correlates with memory for speakers of L₂ and so on, then one can make the generalisation that codability correlates with memory, or, as Brown and Lenneberg put it, with recognition recall. Since codability is being used as a language variable and recognition recall is being used as a measure of cognition, they can therefore posit a correlation between language and cognition. They point out, however, that their correlational evidence does not establish the direction of causality. These findings were borne out in later experiments by Lenneberg and Roberts (Lenneberg and Roberts, 1956).
They make an important additional point, namely that, although behaviour may affect memory, it does not affect perception. This may seem obvious now, but it was not always so obvious. The fact that some peoples had fewer terms for colour categories was sometimes taken as a sign that they could not perceive as many colours as peoples with larger colour vocabularies. The most codable colours, that is the colours with the shortest names and those with one-word names, are often focal colours, and these were the colours that Brown and Lenneberg found were most easily recognised and remembered in their earlier experiments. In later experiments, however, Lenneberg (1961) found that intercept colours were memorable. This led him to the view that codability is only one of several factors that lead to ease of recall. This had already been noted by Burnham and Clark (1955) who found that the most ambiguously named colours were the easiest to remember, and they point to low codability as anchoring points, which is just the opposite of Brown and Lenneberg's findings (Brown and Lenneberg, 1954). When such opposing results are found one looks for differences in the test methods from one experiment to the other and Eleanor Rosch Heider (1972) suggests that the reason for the widely differing results may be that for certain experiments saturated colours were used and for others non-saturated colours. It would seem that codability
correlates with memory but only when a saturated colour array is used.

In view of such conflicting evidence about the correlation between codability and cognition it is not surprising that later researchers have turned to a different kind of test from those that concentrate on codability and Lanz and Stefflre, in an appropriately named paper, 'Language and Cognition Revisited' (1969), show that communication accuracy is a superior predictor of memory for colours than codability. In their experiments Subject A had to pick a colour chip, describe it as, say, 'the colour of burnt pea soup', and Subject B who was hidden from Subject A had to guess which chip he had picked.

A point about the methodology of tests involving colour terms is perhaps worth making. Up until now there have been three main tasks that subjects have been asked to perform. The first is what I shall call the mapping task and that is the task that Berlin and Kay's subjects performed and which my French subjects performed. Subjects have to write down colour words, or say them to the researcher. Then they have to assign to each word a region in the colour space or on the colour array. Lenneberg points out that this sort of task does not completely reveal the mechanism of naming because certain areas remain unnamed. The second kind of task is called by Lenneberg a codability
task and, in performing it, subjects have to name certain samples selected by the researcher from the colour space. The third kind of task is a communication accuracy task in which one subject has to describe a colour chip using a phrase in such a way as to convey to a second subject which colour chip he is referring to.

In a sense, in all the experiments described above, the fact that colour and colour terms were being used is not the most important factor. The psychologist is using a non-linguistic domain, in this case colour, and a linguistic domain, in this case colour names, in order to reveal something about cognitive processes. The colour space is generally considered to be an ideal domain for language-cognition research because it is a continuum arbitrarily 'cut up', but some recent research has shown that this may not be so. The most important recent work on colour done from a cognitive psychologist point of view and influenced by Berlin and Kay's Basic Color Terms, is that done by Eleanor Rosch.

10.9.2. The work of Eleanor Rosch

I shall not describe her experiments in detail here, but shall concentrate on their implications for what Fillmore calls 'prototype semantics'. The idea of a prototype colour is closely linked to the idea of a focal colour and I shall first discuss Eleanor Rosch's findings about focal colours. I shall not go into details
of her methodology beyond saying that for her experiments designed to test her predictions about focal colours\(^1\) she tested speakers of over twenty languages of different language stocks, she used a colour array containing not only saturated but also non-saturated colours and she tested subjects' memory for colours in both short-term memory (30 seconds) and in long-term memory (3\(\frac{1}{2}\) days).

Her most important findings are the following. She found that the most saturated colours are the best examples of basic colour names, that is to say focal colours are to be found among the most saturated colours. Since Berlin and Kay used only fully saturated colours in their mapping experiments their subjects had no alternative but to choose a saturated colour as their example of a best colour. If, however, Rosch is correct, no different result would have been obtained even if non-saturated colours had been included in the array. In those experiments I conducted in order to find which colours subjects would name using non-basic words, I used an array containing non-saturated colours, namely the colour plates from *The Methuen Book of Colour* (Kornerup and Wanscher (eds.), 1967).

Rosch found that focal colours have shorter names (fewer words and fewer letters) and are named more rapidly in a recall situation than boundary colours.

This confirms the early findings of Brown and Lenneberg (1954) that codability correlates with ease of recall, but there is an important shift in emphasis. Whereas Brown and Lenneberg are suggesting that there is a correlation between colour terms and cognition, what Rosch is suggesting is that there is a correlation between the nature of colours and cognition. In her paper written with Olivier (1972) she sums up that notion thus:

"although there are linguistic variables which correlate with color memory accuracy under certain conditions, the nature of color memory images themselves and the way in which they structure the color space in memory appear little influenced by language".

At this point of course the whole question becomes less of a problem for the linguist than for the psychologist and psychologists working on colour are now designing experiments where visual stimuli alone are used. Results so far seem to indicate that subjects respond in the same way when non-verbal stimuli are used in colour tests, as they do when verbal stimuli are used. (File, personal communication).

Rosch found not only that focal colours were named more rapidly in memory tests than boundary colours but that primary focal colours were named significantly more rapidly than the non-primary focal colours. This supports my own findings about the saliency of the four physiological primaries, red, green, blue and yellow.
She did not find any significant differences in length of name between primary and non-primary focal colours, although what differences she did find were in the predicted direction. This is borne out by the length of the basic French colour names.

Rosch found that focal colours were remembered more accurately both by Americans and by Dani, who have only two basic terms in their colour vocabulary. There was a significant difference in latency for both groups,—primary focal colours were recalled faster than non-primary focal colours— but there was no significant difference in accuracy of recall for primary and non-primary focal colours.

Since the Dani had no one-word terms for colours apart from those for black and white, they had to be taught names for the 16 colours used in the learning experiment. Family group names, or sib names as Rosch calls them, were used—they were already familiar to the Dani—and in learning tasks it was found that focal colours became more quickly associated with colour names than non-focal colours. Some colours were learned more easily than others but no significant correlation was found between this order and the Berlin and Kay evolutionary order. It was found, however, that there was a significant difference between learning errors for primary and non-primary focal colours, there being fewer errors with primary focal colours.
Thus it appears from Rosch's research that not only are there focal colour categories which influence behaviour and language in a certain way but that within the set of focal colour categories there is a set of even more basic categories. All my own findings for French have tended to confirm this, as have the findings of Zollinger (1973) for other languages. Rosch, unlike Brown and Lenneberg, does commit herself on the issue of whether it is language that influences cognition or vice-versa. She concludes that

"far from being a domain well suited to the study of the effects of language on thought, the colour space would seem to be a prime example of the influence of underlying perceptual-cognitive factors on the formation and reference of linguistic categories". (Rosch, 1972)

Categories, whether they be perceptual or semantic, have internal structure. They have a core meaning (best examples) surrounded by other category members. In her paper on semantic and perceptual categories, in which she investigates the perceptual domains of colour and form, Rosch maintains that the core meaning is "given", not arbitrary (Rosch, 1973). In the domain of colour this means that the core meaning of a colour category is a "linguistic behavioural fact in relation to the physiology of colour vision". What people would call good examples of a colour are what Rosch calls prototypes, and she finds that subjects tend to define
a category as a set of variations on a natural prototype. Categories which have a natural prototype as their centre of variation are natural categories and in certain experiments Rosch sets out to test the hypothesis that natural categories are easier to learn than those which either do not include a natural prototype or which have one at the periphery rather than at the centre. She guessed that Berlin and Kay’s focal colours might be natural prototypes.¹ I shall not describe the experiments in detail. They are described in her paper entitled ’Natural Categories’ (1971). The results of those experiments showed that those categories which contained a Berlin and Kay focal colour at the centre were the easiest to learn. She did an analogous experiment with shapes, presuming that the triangle, circle and square were natural prototypes, and this time she found that natural categories based on natural prototypes were learned more quickly than categories which were based on deformations of them.

The idea of natural categories and natural prototypes is one that has not yet been fully investigated. According to Rosch “natural categories may represent a domain in which a direct relation between physiology on the level of single cells (De Valois and Jacob, 1968) and behaviour may be demonstrated”.

Linguists will perhaps be more concerned with semantic categories rather than perceptual categories

¹. Compare with Bernard Harrison’s ’natural nameables’ in colours. (see Chapter 11).
and Rosch points the way to future research here too. In her own experiments (Rosch, 1973), she chose categories from the Battig and Montague norms such as fruit, sport, science, bird (Battig and Montague, 1969). Subjects had to say if a given example was a good example or a poor example of its category. Rosch found that reaction time was faster for central members, for example for pear if the category was fruit than for peripheral members, for example prune.

Rosch's results tend to support Berlin and Kay's universalist hypothesis both developmentally and cross-culturally. It would appear that for colour categories there is a natural prototype or core meaning. This is borne out by my experiments with French subjects, who had little difficulty in picking out a best example for the eleven basic colour categories, and there was intersubject agreement about best examples to within a few squares. There was also cross-cultural agreement since the best examples chosen by French subjects fell within the small area within which Berlin and Kay's best examples from 20 languages fall. There was much less intersubject agreement as to where to draw the boundaries between colours, just as there was much less cross-cultural agreement about this. The implications are that basic colour terms such as 'blanc', 'noir', 'rouge' and so on have core meanings about which there is a great deal of agreement, but that they also have
a wide extent of meaning about which there is much less agreement. The French subjects tended to cover the entire colour array with their eleven basic colours. For them therefore each term had quite a wide spread of meaning. Had they been asked, however, to name each square of, say, the red area, they would no doubt have produced several terms for different shades of red. They might even have designated the 'best' red not by the basic term 'rouge' at all, but by a hyponym such as 'vermeil'. 'Rouge' is the category name and it may also be, but it is not necessarily, the name that is always applied to the focus or centre of the category.
Chapter 11

COLOURS AS NATURAL NAMEABLES

11.1.1. Colour discrimination

Experiments on colour perception, such as those I have described in the preceding chapter and those which I conducted myself, depend on man's ability to distinguish between colours. It is generally accepted that normal people\(^1\) can make quite fine discriminations in this area and it is generally accepted also that perceptual discrimination has empirically discoverable limits, that is to say we reach a point where we can no longer discriminate between colour stimuli. In all the tests I have described, including my own, the researcher has avoided this situation by choosing stimuli which are graded in such a way as to appear different according to some recognised system, in most cases the Munsell system. Tests that are designed specifically to test acuity of colour perception might contain stimuli which were more difficult to distinguish one from the other. Such a test is the Farnsworth-Munsell 100-Hue Test. Even in such tests however most people with normal colour vision make very few mistakes and are able not only to distinguish closely similar stimuli but to grade them in steps going from one end of the spectrum to the other, for example

\(^1\) For descriptions of colour-naming in aphasics see W. von Wartburg (1946, p. 189) and Goldstein (1948).
from the blues through the blue-greens to the greens. It is possible, nevertheless, to envisage a situation where one would be unable to discriminate between colour stimuli. Then one would say that one was seeing different samples of the 'same' colour. The situation is analogous to that in phonetics. It is generally accepted that no two pronunciations of the sound /p/ in English, for example, are exactly the same, but to the human ear, especially the untrained human ear, they are accepted to be the same.

I have said that it is generally accepted that perceptual discrimination has empirically discoverable limits, but according to Bernard Harrison (1973) this position is only relatively unexceptionable. He points out that given three closely similar colours, A, B and C, it might be impossible to distinguish A from B and B from C but it might be possible to distinguish A from C.

11.1.2. The ability of language to express the content as well as the form of experience

Harrison's book, *Form and Content*, presents a refutation of the inexpressibility thesis of such analytic philosophers as Schlick, Smart and Farrell. I cannot go into details of that thesis here. Its main argument is that language expresses the form but not the content of experience. One implication of

this thesis for semantics would be that the structure of the vocabulary reflects the ability of speakers to make discriminations between the stimuli of experience, and to relate these stimuli to one another. All research in structural semantics points to this being the case. It is not necessarily the case, however that language can express only the form of experience, and if this is so one must consider the possibility that the vocabulary will reflect not only the speaker's ability to make discriminations but also the ability to feel what is left when all discriminations have been made, that is, to express the content of experience as well as the form. If this is so, then, in terms of colour vocabularies, this will mean that colour terms will express not only discriminations between colours - red is different from blue, crimson is different from scarlet, and so on - but that they will also express what Farrell calls "the raw feel sense" of colours. According to Farrell we cannot describe the experience of seeing a red patch, because such an experience is featureless. Such a view has led linguists such as Katz to the conclusion that basic colour words such as 'red' are unanalysable in terms of componential analysis. Katz considers colours to be percepts not concepts and as such, according to Katz's definition of semantic markers, they do not have semantic markers (Katz, 1972). Cognitive psychologists do not accept
that we do not have a concept of red, blue, green etc.. Linguists have long been wary of concepts and have tried to evolve theories of meaning which do not depend on concepts or ideas in the mind, because such things are not verifiable empirically. All the work of cognitive psychologists described in Sections 10.9.1. and 10.9.2. rests on the assumption that it is possible, to some extent, to investigate what is going on in the mind. I have shown already that in most experiments conducted on colour by cognitive psychologists the psychologist works with a non-linguistic domain, colour, a linguistic domain, colour-naming, and a cognitive measure, usually recognition recall (Section 10.9.1.). Such experiments depend on an S - R kind of situation. A subject is confronted with a stimulus from the non-linguistic domain. He responds either by naming a colour, or by pressing a button, to indicate that the colour he is now seeing is the same colour or a different colour from the one he saw before. There is a danger here which should perhaps be pointed out, namely the danger of confusing the two different kinds of response. Harrison points to this danger. It is false, according to Harrison, to assume that button pressing is the same as assigning names and phrases. Such a premise would be true, according to Harrison, if, and only if, a name functions semantically as a label or a tag for a given stimulus in the same way that a behaviour response such as button pressing may do. If the premise were
true, then if two stimuli were the same they would be
tagged by the same lexeme. We know, however, that this
is not so. As I have already pointed out, creativity
enters into colour-naming. If we are confronted by an
unfamiliar colour we can name it in some way, although
not necessarily by a one-word term. In much the same
way, if we are confronted by an unfamiliar colour name
and are shown the stimulus which is tagged by that
unfamiliar lexeme, we will usually be able to assign
to that colour a colour-name which is familiar to us,
although again the name may not be a one-word term.¹
It is well known that identical standard colours can
be given many different colour names by fashion designers
and paint manufacturers. These colour names are, however,
unlikely to be basic ones. In everyday speech never¬
theless, it may well be that Berlin and Kay's foci
are more likely to be named by basic colour terms,
where such terms exist in the language, than by secondary

¹. To test this I took a French colour term which
was hitherto unknown to me as a colour term,
name 'vigogne' (Marie-Claire, Modoscope, 1973-4),
and matched its corresponding colour sample to a
Munsell chip. I found that it matched almost
exactly the Munsell chip YR 10 8/ and the Methuen
chip 638. If I had not had the name 'vigogne' at
my disposal, I would have named that chip 'tan'
in English and 'brun orange' in French. (The
Munsell number gives no indication as to the colour
name of the chip, and indicates only that it is
a yellow-red, dark in value and fully saturated.
The Methuen number likewise gives no indication
as to colour name, but in the Methuen Book of
Colour the chip is described as 'brownish orange'.)
terms. Rosch goes further and suggests that these foci are natural foci of natural categories (see Section 10.9.2.). If this is so, then they are what philosophers call 'natural nameables'.

11.1.3. Colours as natural nameables

The notion of natural nameables in philosophy fits the inexpressibility thesis supported by people such as Farrell (1950). To Farrell, red, in the "raw sense feel", is something given in experience. It is a natural pre-linguistic experience which is named according to the conventionally agreed rules of language. However, according to Harrison, the basic colour terms of a language do not designate natural nameables. Since this point is a very important and relevant one in research on colour terminologies, whether such research is undertaken from a linguistically oriented standpoint or from a cognitive psychology standpoint, I shall explain what I understand Harrison to mean by this. It is first necessary to understand that Harrison distinguishes between colours and what he calls 'colour presentations'. Harrison calls a particular hue, presented in a certain definite degree of saturation and tonality, a 'colour presentation'. According to this definition, the cover of a particular book on the reader's desk, for example, could be said to exhibit a certain colour presentation and the cover of other books on the reader's shelves would in all probability exhibit different
colour presentations. A colour, on the other hand, according to Harrison, is a set or category of colour presentations. To go back to the example given above, the cover of the particular book on the reader’s desk might be described as, let us say, blue and the covers of certain other books on the reader’s shelves, although exhibiting different colour presentations, might also be correctly described as blue. This illustrates an obvious fact about colour which we express in everyday speech when we talk about ‘different blues’, ‘different shades of blue’ and so on. Harrison’s distinction between colours and colour presentations enables him to say that, whereas colour presentations may be natural nameables, colours are not, because linguistic conventions enter into the naming of colours and thus colours are what philosophers call ‘constructed nameables’. They are constructed nameables because the limits of application of, say, ‘red’ are not determined independently of all linguistic experience by the nature of extra-linguistic perceptual experience. This might at first glance appear to be a contradiction of the Berlin and Kay hypothesis, but in fact it is not. Berlin and Kay point out that in the 93 languages they investigated cross-culturally they found agreement about where to place the focus of the basic colour categories but not about where to draw the boundaries between categories. It looks, from Berlin and Kay’s results, and from the results of other
researchers testing the universalist hypothesis, that it is colour foci that are natural nameables and not whole colour categories. Colour foci, which are 'best' examples of colours, satisfy Harrison’s definition of natural nameables in colour. They can be represented in the form of colour chips of a particular hue, presented in a certain definite degree of saturation. If they are Munsell chips they can be given a certain number indicating these three variables. This enables one to make statements about, for example the focus of red in French which are fairly precise. It will be remembered that for French, as for Berlin and Kay’s 98 languages, there was no single chip designated as the focus of each colour by all informants but that the chips fell within a very small area of the colour array. It was not possible to make such precise statements about the extent of colours and about where to draw the boundaries between one colour and another.

Harrison’s idea of natural nameables, therefore, fits in with Berlin and Kay’s hypothesis about universal foci. According to Harrison, however, all colour presentations, and not just those colour presentations which represent the 'best' examples of colours, may be natural nameables. This may be so but this does not mean that they are all named using basic colour terms.

It looks as though a basic colour term may have a double function in colour-naming. It appears to be used
to denote a whole class or category of colour presentations, that is to denote a 'colour' in Harrison's sense, and also to denote the best example of that colour. Members of the set of colour presentations other than those colour presentations representing the best examples of a colour will be named either by using the category name, for example 'red', or, if greater specificity is desired, by using a secondary colour term such as 'crimson', 'wine' etc..

I have already suggested that the colour presentations at the centre of the category need not necessarily, in all contexts, be named using the basic colour name. I suggested, for example, that under some circumstances the best red might be called 'vermeil' by a French speaker.

11.1.4. Colour foci as natural prototypes

Harrison's idea of natural nameables, as well as fitting in with Berlin and Kay's idea of universal foci, also fits in with Rosch's idea of natural prototypes, described in Section 10.9.2. Rosch suggests that colour foci may be natural prototypes. She distinguishes between the notion of natural prototype and the notion of natural category, whereas Harrison distinguishes between the notion of colour presentations and the notion of colours. Rosch is concerned with one particular kind of colour presentation, a prototype colour presentation.
11.2.1. Colour naming

So far in this discussion on natural nameables nothing has been said about the way in which speakers set about assigning names to colour presentations. Berlin and Kay suggest that a certain number of colour foci, up to eleven, are picked out as nameables by speakers of different languages and that these foci are not chosen in an arbitrary fashion. It is the case, however, that, at a certain stage of the evolution of the language in question, not all of the eleven foci are named using basic colour terms. Berlin and Kay do not suggest why certain foci should be picked before others, but it has been suggested in previous sections that the reasons for this may be a combination of physical, physiological, environmental and social factors. Harrison's model of colour naming fits Berlin and Kay's theory to a certain degree and is an attempt to explain how colour names are assigned to colour presentations. It is explained in detail in his book *Form and Content* and I shall give a brief expose of it here in order to compare it with other theories of colour naming. His model may be described in terms of a set of instructions as follows: Take the colour array. Take two or more distinct points on the colour array and assign colour names according to whether a particular presentation is closer to (more alike) the presentation which occupies one or other of these points. Call these points name-bases.
model may be represented schematically as follows:

**Step (1):** Let \( P_1, P_2, \ldots, P_n \) be name-bases.

**Step (2):** Let the phonemic strings \( S_1, S_2, \ldots, S_n \) be introduced in one-to-one co-ordination with \( P_1, P_2, \ldots, P_n \) as colour names.

**Step (3):** For any colour presentation \( P_0 \) determine which of \( P_1, P_2, \ldots, P_n \) it most resembles, say \( P_m \). The colour name associated with \( P_m \) is then the name of primary application to \( P_0 \).

Up until now it looks as though Harrison's model may be in contradiction to Berlin and Kay's theory, because it seems that we may choose to place name-bases anywhere we like on the colour array. Harrison himself suggests that a possible objection to his model is the fact that it seems to make the way we cut up the colour array a matter of arbitrary choice. He points out however that his model will not work unless he places certain limitations on it as regards choice of name-bases. In order to make the model work name-bases must not be placed too close together, and Harrison suggests that if two name-bases are chosen then one should be in the Purple-Red-Orange-Yellow area and the other should be in the Blue-Green area. Now this is a particularly interesting point if we look at it in the light of some recent findings regarding colour names in the field of cognitive psychology (for example Eleanor Rosch Heider and D. Olivier, 1972).
If we suppose for the moment that Berlin and Kay's evolutionary hypothesis is correct then we might expect the first two name-bases to be chosen one from the dark area of the colour array and one from the light area. Since, however, we could justifiably consider that the terms for black and white or dark and light are brightness terms and not hue terms we might make out a case for leaving these two terms aside and saying that according to Berlin and Kay's evolutionary hypothesis the first colour to be encoded is red and the second colour to be encoded is either green or yellow. This only partly fits Harrison's proposed model. According to Harrison's model, red might be chosen as one of the first name-bases and green as the other. There would be no reason, however, for choosing red before green. Also, according to Berlin and Kay, either green or yellow may appear as the third term. If yellow is chosen as the third term this might upset Harrison's model because red and yellow might be considered to be too close together. I have already suggested, however, in a previous section that the alternative positions of green and yellow point to the possibility of Berlin and Kay's evolutionary hypothesis being only roughly correct. Future research should concentrate on the yellow-green area. I have also suggested that the whole blue-green area should be more thoroughly investigated. Harrison's model would allow for the choice of either green or blue
as the fourth term and I have indicated elsewhere that
blue seems to have a more salient position in the
evolutionary hierarchy than Berlin and Kay's order
suggests. ¹

11.2.2. 'Dark and cold' versus 'light and warm'

Up until now I have suggested that the neutral
areas black and white, light or dark, could be left
aside in a discussion of a model of colour naming.
I have suggested that the obvious saliency of black
and white is due to a primary division of the colour
array into light and dark and that the picking out of
hue foci comes later. This is what Berlin and Kay and
most researchers up until now have thought, and this
is what Harrison assumes when he suggests that his
two first name-bases should be chosen from two areas
comprising the spectral hues only. Recent research,
however, on a two-term language by Eleanor Rosch Heider
and Olivier suggests that the first division may not
be into light and dark at all (Heider and Olivier, 1972).
They show that the two basic Dugum Dani terms do not
correspond to those colours that Americans call light
and dark. One term 'mili' refers to dark and cold

¹. Since this work was written, Kay (1975) has pub-
lished new data suggesting that the category GRUE
may emerge as a basic term either before or after
the yellow focus is encoded. See also Dougherty
Figure 25. The Dugum Dani term 'mili' (dark and cold).

Numbers represent the number of Dani informants who named the designated chip 'mili'. There were 40 Dani informants. (data from Rosch and Heider, 1972, p. 344.)
colours and the other term 'mola' to light and warm colours. (As far as I know, no-one has discussed the question of sound symbolism and colour terms.)

I have transferred Rosch and Olivier's results which are found on p. 344 of their paper, to a replica of the Berlin and Kay chart (Figure 25). I have shown only the results of the test using the 160 colour array since they are more revealing than the results of the tests which used a 40 colour array.

It will be seen from Figure 25, especially if it is compared with the corresponding colour chart from the back of Basic Color Terms, that 'mili' is more frequently used to name chips which are designated according to the Munsell scale of hue and brightness as belonging to one or other of two classes. They are:

(a) chips which are in the range of hues from green to blue irrespective of their brightness value or

(b) chips which are very dark, irrespective of their hue.

It is convenient, and as I have already pointed out not entirely unscientific, to call hues in the blue-green range 'cold colours' and those in the red-orange range 'warm colours'. Since of course the colour array is a continuum it is very difficult to draw the boundary between warm and cold colours and one would expect a good deal of intersubject and cross-cultural disagreement about where to draw the boundary. This is
reflected in Figure 25.

Rosch's findings about 'mili' and 'mola' are very important, and this is an area which I am sure will be further researched.¹ Naturally the most conclusive findings will come from research done on two-term languages such as Dani. However, this basic tendency to make a primary division of the colour array into cold and warm colours, if indeed this turns out to be the case, is reflected even in advanced colour terminologies. In botanical terms, the division of flowers into those displaying colours where blues predominate, as opposed to those displaying colours where yellows and reds predominate, has long been recognised as a basic division and is reflected in the special opposing terms 'cyanic' and 'xanthic'. In French I have suggested that evidence points to the difference between 'brun' and 'marron' being not on the dimension of brightness but on the dimension of hue and that a criterial hue feature of 'marron' is that it is a warm hue. Some informants indicated this by saying that 'marron' was a warmer colour than 'brun' and, as can be seen from Figure 5 (Chapter 3) this was reflected in the mappings. Of course in this case we must think in terms of relative warmth. It could be argued that both 'brun' and 'marron'

¹ Since this work was written, researchers working on early stage languages have confirmed Rosch's findings (Dougherty, 1976).
denote warm colours but that one is more warm than the other.

If Rosch and Olivier are correct about the extent of 'mili' and 'mola', Berlin and Kay will have to rethink their position on two-term languages\textsuperscript{1}, and the implications of a primary division into 'dark and cold' and 'light and warm' rather than into dark and light would be far-reaching. It has been assumed up until now that, in the evolution of a language, a primary division into light and dark is made and that at a later stage the hues are picked out one by one and lexicalised. The suggestion is that at the first stage hue is not taken into account. If Rosch and Olivier are correct, however, this is not so, and right from the start one may have to take into account simultaneous oppositions on the dimension of hue and on the dimension of brightness. By the time a language has evolved into a six-term system, however, it is reasonable to suppose that there are two terms which lexicalise the oppositions of light and dark on the dimension of brightness alone; such terms would be 'black' and 'white' in English and 'noir' and 'blanc' in French. Oppositions such as 'rouge' and 'vert' and 'bleu' and 'jaune' will lexicalise divisions on the dimension of hue alone. In the opposing pairs it is interesting to note that one term is in the warm range and the other in the cold range. Such

\textsuperscript{1} See Kay (1975), published after this work was written.
oppositions are probably dependent to a large extent on the physics of colour and the physiology of colour vision, as I have suggested in the earlier section on antonyms (Section 7.4.1.). The three opponent processes show both the division into dark and light and the division into cold and warm:

- black : white ; dark : light
- red : green ; warm : cold
- yellow : blue ; warm : cold

In considering Harrison's model of colour naming I should like to suggest that, although Harrison himself seems to be talking about the hue array, his model could work even if one considered the entire colour array, including black and white, provided the necessary restriction which Harrison points to is observed, namely that the first two name-bases chosen should not be too close together. I suggest that the ideal conditions for its functioning would be if the two name-bases were chosen, one from the dark and cold area of the colour array (the 'mili' area) and one from the light and warm area (the 'mola' area). In a two term language such as Dani the steps would be as follows:

Step (1): Let $P_1$ and $P_2$ be name-bases, chosen respectively from the dark/cold area of the colour array and from the light/warm area.

Step (2): Let the phonemic strings *mili* and *mola*
be introduced in one-to-one co-ordination with \( P_1 \) and \( P_2 \) as colour names.

**Step (3):** For any colour presentation \( P_0 \) determine which of \( P_1 \) or \( P_2 \) it most resembles, say \( P_1 \). The colour name associated with \( P_1 \) is then the name of primary application to \( P_0 \).

The name-bases white and black need not be excluded. White, since it is light will be judged similar to other light colours and the name 'mola' will be ascribed to it, and black, since it is dark, will be judged similar to other dark colours, and the name 'mili' ascribed to it. Pale shades of warm colours will be assigned the name 'mola' but pale shades of cold colours will be assigned the name 'mola' or the name 'mili' depending on whether they are considered to be more or less similar to the name-base with which they are being compared and for which a name is already known.

The above model is a very simple model based on the selection of only two name-bases, and on the supposition that only two colour terms are available for the partitioning of the colour array. Even languages with only two basic terms, however, have many secondary colour terms and Rosch and Olivier found in their experiments that although many subjects assigned either the name 'mili' or the name 'mola' to the 160 chips they were shown, some chips were named using a third term, although
not a basic one. Although the simple model I have shown for colour naming in Dani is, of course, based on Harrison's model it is not the same as his model. His model allows for an infinite number of name-bases and an infinite number of colour names. The illustration from Dani shows, I think, that Harrison's model can work, especially if the restraints he imposes on it are observed, and also if the restraint I have imposed on it is observed, namely that one name-base should be chosen from the dark/cold area of the colour array and one name-base from the light/warm area.

11.2.3. Natural nameables and colour foci

Harrison's theory of natural nameables fits in with Berlin and Kay's universalist hypothesis and with the findings of cognitive psychologists such as Rosch. Colour foci may well be natural nameables which are universal, but colour categories are probably not natural nameables. As Harrison points out, the limits of application of, say, 'red' are not determined independently of all linguistic conventions by the nature of experience. This view is borne out by the evidence of Berlin and Kay who find that the placement of colour boundaries by different cultural groups is highly unreliable, and by my findings for French which show that, although there is a good deal of intersubject agreement about colour foci, there is much less intersubject agreement about the boundaries between colours.
Harrison's model, as I have represented it, might appear to work for all speakers of one language, who belonged to the same cultural group and who observed the same language conventions. But would it necessarily work for speakers of different languages? Harrison would say that it would and explains this by the fact that the colour array is the same and that colour perception is the same for all peoples. As I have pointed out, Harrison cannot explain why red should appear before green. His model would also not explain why either yellow or green is the fourth term and why yellow should appear before brown. Harrison can only suggest that other factors than those described in his model may enter into the construction of actual colour vocabularies. Another explanation may be, as I have suggested, and as others have pointed out also, that the Berlin and Kay evolutionary hypothesis may not be valid in its entirety.

1. All researchers working on colour vocabularies this century, including Berlin and Kay, have assumed that this is so. However, a recent paper by Marc Bornstein (1975) suggests that certain peoples may actually perceive colours differently and therefore categorise them differently. This paper was drawn to my attention too late for discussion of it to appear in this work. His main finding supports the Berlin and Kay hypothesis about basic colour terms, but points to biological diversity of peripheral visual processes as accounting for variability of colour lexicons at a secondary level.
Chapter 12

SOME OF THE IMPLICATIONS FOR STRUCTURAL SEMANTICS
OF THE FINDINGS RECORDED IN THIS WORK

I said at the beginning of this work that the idea that each language has its own semantic structure is one of the basic tenets of structural semantics, but that some modification of this notion might be necessary. An investigation of the colour vocabulary of modern standard French, and a comparison of its structure with that of the colour vocabularies of other languages, has shown that some modification is necessary.

The basic tenet, that each language is cut to a unique pattern, still holds. It has been seen that languages vary in their basic colour lexicons, some languages having only two basic colour terms, some three and so on up to eleven basic terms. Even in languages with eleven basic terms, such as English and French, it has been seen that there is not complete isomorphism of semantic structure. There is no one term in French to translate the English term "brown" for example.

However, the findings recorded in this work, when taken along with the findings of other recent researchers working on colour vocabularies, notably Berlin and Kay (1969), suggest that there may be a universal infrastructure underlying the individual semantic structures of individual languages. In the case of colour there is strong evidence
to suggest that there is a universal set of not more than eleven basic colour categories from which each language chooses a certain number to lexicalise. Although French informants gave as many as 221 'principal' colour terms, when those terms were examined, it was seen that only eleven of them (or possibly twelve) satisfied Berlin and Kay's criteria for basic colour terms (Sections 3.1.1. - 3.1.6.). The doubtful term was 'marron'.

In order to test the above universalist hypothesis it was necessary to compare French subjects' mappings of the basic colour terms onto the colour array with the mappings of Berlin and Kay's subjects from ninety-eight language groups. It was found that there was a very high level of agreement about where to place the best examples (foci) of each of the colours designated by the basic terms, not only between the French subjects themselves, but between them and the subjects from the other ninety-eight language groups. This is strong support for Berlin and Kay's universalist hypothesis. It must be remembered, however, that the high degree of intra-cultural and cross-cultural agreement is found only for foci of colour categories. There is much less agreement about where different French speakers draw the boundaries between colour categories, just as there is much less cross-cultural agreement on this point.

The results of the mapping experiment with French subjects suggest that, although there are two possible
basic colour terms in French, which translate the English "brown", there is only one basic colour category BROWN. Evidence for this comes from the fact that six of the fifteen French subjects, although they all had both terms, 'brun' and 'marron', as salient terms in their individual colour lexicons, refused to mark two separate areas on the colour array and refused to mark two foci. What is perhaps unexpected is that for four of those six 'marron' and not 'brun' is the term they used to designate the colour category BROWN, (the other two said they would use either 'brun' or 'marron' depending on the context). Furthermore those four agreed to within a difference of one square - a very small perceptual difference - as to the best example of the colour designated as 'marron'. They also agreed on this point, again to within one square, with all the subjects who performed the mapping task. Moreover the normalised focus for 'marron' lies within the fairly small area covered by Berlin and Kay's normalised foci for BROWN in ninety-eight languages, whereas the normalised focus for 'brun' lies outside it (Fig. 21). On the evidence of the mapping experiments along, therefore, there is a strong suggestion that the colour term which French speakers would use, out of context, to designate the universal basic category BROWN is 'marron' and not 'brun'. It is unlikely that there are two universal categories in the BROWN area, one designated by 'brun' and one designated by 'marron'.
Subjects who marked two areas, one focussed in 'brun' and one focussed in 'marron', no doubt did so because they were asked to map twelve terms. The fact that six subjects refused to mark two areas, in spite of being asked to do so, suggests that there is only one category designated by 'marron', or, and this seems more likely, by 'brun' or 'marron' according to the context. Berlin and Kay do not discuss context, but a later researcher, Snow (1971), suggests that in Samoan there is one basic category GREEN designated by one of two basic terms according to the context (Section 10.5.2.). An investigation of the uses of 'brun' and 'marron' in different contexts did show that, although neither term is restricted to a narrow class of objects, there are certain collocations which are more appropriate to the one than to the other.

The notion of the basic colour term is linked to other notions. It was found that the most frequently mentioned terms in informants' lists, as well as the most frequent colour terms in standard frequency lists, corresponded to the eleven (or twelve) basic terms. Basic terms are not only psychologically salient but they are also physically and physiologically salient. Of the eleven basic terms, six, 'blanc', 'noir', 'rouge', 'vert', 'jaune' and 'bleu', have been seen to be more salient than the other five. These six terms designate the four physical primaries plus black and white, and they also designate the three pairs of the Hering
opponent-process theory of colour vision. Furthermore it has been seen that the three sets of paired terms which designate the three opponent processes are considered to be antonymous by a significant number of French speakers. There seems to be good reason for distinguishing between primary and non-primary focal colours. Berlin and Kay do not do so but other researchers do (Rosch, 1972; Zollinger, 1973). Primary focal colours are found to be more easily learned, more easily recognised, more easily recalled and they are the first to be learned by children (Bartlett, 1976). It has been outwith the scope of this work to investigate these psychological problems, but what has been found in the course of this research is that primary focal colours are more psychologically salient for informants, being more frequently named and tending to be named at the beginning of word lists. The terms which designate them are more productive morphologically, and terms which are derived from them, especially verbs, are more likely to enter into more numerous and more complex syntactic constructions than terms derived from non-primary terms.

All evidence points to a structuring of colour vocabularies which is not arbitrary but is conditioned at its most basic level by physiological factors, giving rise to the lexicalisation of the six primary focal colours, black, white, red, green, yellow and blue. The primacy of these six colours persists across cultures and within
individual cultures, giving rise to certain predictable patterns of linguistic and non-linguistic behaviour. As the need arises, more distinctions are made in the colour space and intermediate colours, grey, violet, and orange are lexicalised using one-word terms. Brown is the odd colour out since it is neither a primary colour nor an intermediate colour. It is generally classed with the non-primary focal colours and is considered by some researchers to be a neutral (Bartlett, 1976). Peripheral, non-focal colours are lexicalised by non-basic terms, probably, as McNeill (1972) suggests, according to social and cultural requirements. French has a particularly rich vocabulary of non-basic terms, but from the point of view of language structure they are not particularly interesting except in so far as they serve as examples of sense relations such as hyponomy and, possibly, synonymy.

Certain non-basic colour terms in French are particularly interesting, however, because, although they are not basic terms in the language as a whole, they assume many of the characteristics of basic terms in certain sub-sets. For example 'blond', which is an important term when applied to hair, has many of the characteristics of a basic term; it enters into a relationship of binary opposition with 'brun', it is very productive morphologically and its verbal derivative 'blondir' enters into many different types of syntactic construction as, for example, 'jaunir' (Section 9.8.2.).
In considering the structure of colour vocabularies, therefore, it is necessary to consider not only the structure of the vocabulary as a whole but the structure of smaller sub-sets and the lexical relations that hold between items in these sub-sets.

Since this work has been done within the framework of synchronic linguistics I have not taken diachronic considerations into account beyond suggesting that changes in the frequency of 'marron', changes in its range of application and changes in its morphology over the past few decades may be a pointer to a slow change in the basic colour vocabulary of French. There is as yet no consensus of opinion as to whether 'marron' has a plural form in _g_ or whether it may be applied to hair — indeed such examples as I have found of these phenomena are isolated ones. It has always been one of the basic tenets of structural linguistics, and indeed of linguistics, that the linguist's model is _langue_ which is homogeneous and not _parole_ which is variable. In a recent article, however, Kay (1975) suggests that the time may have come to put this idea under scrutiny, and that variations among individuals in the use of colour terms may indicate that the colour vocabulary of a language is passing from one evolutionary stage to another. I do not suggest that this is what is happening in French, but what I do suggest is that perhaps 'brun' will through time become a peripheral term, restricted in use perhaps to hair and complexion,
and that the basic term for the category BROWN will be 'marron', which will, like 'orange' break free of its associations with the fruit and develop all the characteristics of a basic term.

Much of this work has been concerned with a comparison of the structure of the colour vocabulary of French with the structure of other colour vocabularies. The internal structure of the colour vocabulary in French has also been examined, and I have found nothing to contradict the structuralist notion that language is differential, that is to say each lexical item derives its meaning from the fact that it is opposed to at least one other lexical item. It has generally been thought that colour terms do not enter into relations of binary opposition, but while this is true of most colour terms in French, I have found that it is certainly not so in the case of 'noir' and 'blanc' and possibly not so in the case of 'rouge' and 'vert' and 'jaune' and 'bleu'. Oppositions on the level of distinctive features are found among colour terms, but, as has been seen, in the case of basic colour terms at least, colour words are not analysable into more than perhaps two features (Section 1.4.8.).

In conclusion I would say that, although there is a strong case for positing certain universal focal colour categories which are lexicalised in French by eleven (or possibly twelve) basic colour terms which share
certain properties with each other and with basic colour terms in other languages, it is also the case that there is not complete isomorphism between the colour vocabulary of French and the colour vocabularies of other eleven-term languages. It is also the case that, although there may be agreement about where to place the foci of colours in French, there is much less agreement about where to place the boundaries. This is not peculiar to French but applies to all the languages examined by Berlin and Kay, and it points to there being a 'core' meaning for each colour term which is more or less fixed and about which there is a large measure of agreement, and a peripheral meaning which is less clearly defined and about which there is much less agreement.
ABBREVIATIONS

The following abbreviations are used in the bibliography:

CLex  Cahiers de Lexicologie. Besançon.
LiR  The Linguistic Reporter. Center for Applied Linguistics, Washington, D.C.
MLQ  Modern Language Quarterly. Seattle.
RRL  Revue Roumaine de Linguistique. Bucharest.
StGram  Studia Grammatica. Berlin.
TLL  Travaux de Linguistique et de Littérature. Strasbourg.


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APPENDIX 1

Colour Theory. Some definitions.

HUE

"The quality by which we distinguish one colour from another, as a red from a yellow, a green, a blue, or a purple."

(Munsell)

"Hue is the attribute of a color perception denoted by blue, green, yellow, red, purple, and so on."

(Wyszecki and Stiles)

"Hue is the dimension of color that is referred to a scale of perceptions ranging from red through yellow, green, blue, and (circularly) back to red."

(Burnham, Hanes and Bartleson)

BRIGHTNESS (Munsell Value)

"The quality by which we distinguish a light color from a dark one."

(Munsell)

"Brightness (of an area perceived as self-luminous) is the attribute of a color perception permitting it to be classes as equivalent to some member of the series of achromatic color perceptions ranging from very dim to very bright and dazzling."

(Wyszecki and Stiles)

"Lightness (of an object perceived as nonself-luminous) is the attribute of a color perception permitting it to be classed as equivalent to some member of the series of achromatic object-color perceptions ranging for light-diffusing objects from black to white, and ranging for regularly transmitting objects from black to perfectly clear and colorless."

(Wyszecki and Stiles)
"Brightness is the dimension of color that is referred to a scale of perceptions representing a color's similarity to some one of a series of achromatic colors ranging from very dim (dark) to very bright (dazzling)."

(Burnham, Hanes and Bartleson)

"Lightness is a term frequently used in place of brightness to refer to opaque, reflecting objects seen in relation to other objects, and the scales range from black to white."

"Lightness is a term sometimes used in place of brightness to refer to transparent objects, and the scale ranges from black to clear."

(Burnham, Hanes and Bartleson)

SATURATION (Munsell Chroma)

"Saturation is the attribute of a color perception determining the degree of its difference from the achromatic color perception most resembling it."

(Wyszecki and Stiles)

"Saturation is the dimension of color that is referred to a scale of perceptions representing a color's degree of departure from an achromatic color (one lacking a distinguishable hue) of the same brightness." (Underlining mine)

THE OSTWALD SYSTEM

Ostwald distinguishes between CHROMATIC and ACHROMATIC colours.

All the achromatic colours may be compounded from two constituents WHITE and BLACK.

In achromatic colours there is a third element HUE.

Those colours in which the attribute of HUE is fully developed, so that they contain no admixture of other colours, viz. no White or Black, are called FULL COLOURS.
The colours actually met with in nature contain all three elements, viz. FULL COLOUR, WHITE, and BLACK.

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N.B. The Ostwald system deals with object (surface) colours and therefore has no need of the concept brightness (see other definitions).
APPENDIX 2

Words elicited from informants

<table>
<thead>
<tr>
<th>Word</th>
<th>Subjects</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>rouge</td>
<td>13</td>
<td>100</td>
</tr>
<tr>
<td>orange</td>
<td>13</td>
<td>100</td>
</tr>
<tr>
<td>bleu</td>
<td>12</td>
<td>92.3</td>
</tr>
<tr>
<td>marron</td>
<td>12</td>
<td>92.3</td>
</tr>
<tr>
<td>gris</td>
<td>11</td>
<td>87.6</td>
</tr>
<tr>
<td>jaune</td>
<td>11</td>
<td>87.6</td>
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<td>vert</td>
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<td>87.6</td>
</tr>
<tr>
<td>violet</td>
<td>11</td>
<td>87.6</td>
</tr>
<tr>
<td>blanc</td>
<td>10</td>
<td>76.9</td>
</tr>
<tr>
<td>noir</td>
<td>10</td>
<td>76.9</td>
</tr>
<tr>
<td>rose</td>
<td>10</td>
<td>76.9</td>
</tr>
<tr>
<td>beige</td>
<td>9</td>
<td>69.2</td>
</tr>
<tr>
<td>brun</td>
<td>8</td>
<td>61.5</td>
</tr>
<tr>
<td>mauve</td>
<td>7</td>
<td>53.8</td>
</tr>
<tr>
<td>pourpre</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>crème</td>
<td>6</td>
<td>46.2</td>
</tr>
<tr>
<td>bleu ciel</td>
<td>6</td>
<td>46.2</td>
</tr>
<tr>
<td>ocre</td>
<td>5</td>
<td>38.5</td>
</tr>
<tr>
<td>roux</td>
<td>5</td>
<td>38.5</td>
</tr>
</tbody>
</table>

No. of subjects: 13

(10f 3m)
### APPENDIX 3

List of words from the questionnaires with five or more mentions.

<table>
<thead>
<tr>
<th>No. of questionnaires</th>
<th>Total no. of lexemes = 1,176</th>
<th>Total no. of terms = 150</th>
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<tbody>
<tr>
<td>blanc</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>noir</td>
<td>93</td>
<td></td>
</tr>
<tr>
<td>rouge</td>
<td>92</td>
<td></td>
</tr>
<tr>
<td>bleu</td>
<td>92</td>
<td></td>
</tr>
<tr>
<td>vert</td>
<td>86</td>
<td></td>
</tr>
<tr>
<td>jaune</td>
<td>85</td>
<td></td>
</tr>
<tr>
<td>orange</td>
<td>73</td>
<td></td>
</tr>
<tr>
<td>violet</td>
<td>63</td>
<td></td>
</tr>
<tr>
<td>rose</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>brun</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>gris</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>marron</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>beige</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>turquoise</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>mauve</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>bleu marine</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>bleu ciel</td>
<td>16</td>
<td>+ ocre, roux, crème, pourpre</td>
</tr>
<tr>
<td>jaune citron</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>bleu outremer</td>
<td>12</td>
<td>vert clair 7</td>
</tr>
<tr>
<td>bordeaux</td>
<td>11</td>
<td>blond 7</td>
</tr>
<tr>
<td>vert émeraude</td>
<td>10</td>
<td>rouille 6</td>
</tr>
<tr>
<td>crème</td>
<td>9</td>
<td>vert foncé 6</td>
</tr>
<tr>
<td>rose bonbon</td>
<td>9</td>
<td>bleu pétrole 6</td>
</tr>
<tr>
<td>ocre</td>
<td>8</td>
<td>parme 6</td>
</tr>
<tr>
<td>kaki</td>
<td>8</td>
<td>vert bouteille 6</td>
</tr>
<tr>
<td>blanc cassé</td>
<td>8</td>
<td>bleu de cobalte 5</td>
</tr>
<tr>
<td>vermilion</td>
<td>8</td>
<td>bleu clair 5</td>
</tr>
<tr>
<td>caca d'oeie</td>
<td>8</td>
<td>bleu nuit 5</td>
</tr>
<tr>
<td>indigo</td>
<td>8</td>
<td>pain brûlé 1. 5</td>
</tr>
<tr>
<td>vert pomme</td>
<td>8</td>
<td>rouge carmin 5</td>
</tr>
<tr>
<td>pourpre</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

+ Including 'pin brûlé'


APPENDIX 4

Individual lists elicited from informants

The data Informant A

Voulez-vous me dire les noms des couleurs en français?

Où vais-je commencer? Voyons—je commence avec le clair.

She then gave me the colours in this order:

blanc
noir
coquille d'œuf
beige
jaune
jaune d'œuf
moutarde
orange
tangerine
roux
brun
marron
Café
camel
turquoise (vert)
bleu
bleu ciel
bleu foncé
eau de nil
vert foncé
olive
vert-de-gris
rouge
gris
gris clair
gris foncé

rose
lilas
mauve
violet
aubergine
tomate
tilleul
carotte
or
argent
acier
Donnez-moi les noms des couleurs en français.

- bleu
- rouge
- jaune
- blanc
- noir
- orange
- marron
- vert
- gris
- rose
- voilet
- pourpre

- bordeaux
- vêtements
- lie de vin (à peu près la même couleur)
- lilas (dans les mêmes tons mais beaucoup plus pâle)

- (jaune)
- crème
- ivoire
- ocre
- terre de sienne
- rouille
- beige

- (Mélanges)
- moutarde
- kaki

- roux
- fauilles, paysage
- vert nil (jaune vert)
BRUN

cheveux
quelque chose qui est plus foncé que le marron
un mur
papier
(je pense brun foncé)
terre
rare pour les vêtements mais toujours pour les vêtements de moines - bure est toujours brune et non marron.

MARRON

vêtements plus loin du noir plus rouge que brun
The data  Informant C

List of colour names in order of presentation.
bleu
rouge
vert
jaune
marron
orange
violet
blanc
noir

(Variations - subject's word)
jaune pâle
vert foncé (à la rigueur)
bleu pastel
bleu marine
grenat
vieux rouge
mauve

rose (pej.)
brun (je n'aime pas)
brun foncé
beige
gris (oublié)
pourpre
(Mots anglais, s's classification)
shocking pink
(after shocking pink the s. continued with
rose indien
vieux rose (quelquefois 'figure' )
bois de rose

Fig. 7.
<table>
<thead>
<tr>
<th>The data</th>
<th>Informant D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Donnez-moi les noms des couleurs en français.</td>
<td>--------------</td>
</tr>
<tr>
<td>rouge</td>
<td>+</td>
</tr>
<tr>
<td>vert</td>
<td>+</td>
</tr>
<tr>
<td>bleu</td>
<td>+ +</td>
</tr>
<tr>
<td>jaune</td>
<td>+</td>
</tr>
<tr>
<td>orange</td>
<td>-</td>
</tr>
<tr>
<td>noir</td>
<td>+</td>
</tr>
<tr>
<td>indigo</td>
<td>-</td>
</tr>
<tr>
<td>(vert)</td>
<td>+</td>
</tr>
<tr>
<td>blanc</td>
<td>+</td>
</tr>
<tr>
<td>brun</td>
<td>-</td>
</tr>
<tr>
<td>beige</td>
<td>-</td>
</tr>
<tr>
<td>mauve</td>
<td>-</td>
</tr>
<tr>
<td>pervenche</td>
<td>-</td>
</tr>
<tr>
<td>kaki</td>
<td>-</td>
</tr>
<tr>
<td>fraise écrasée</td>
<td>-</td>
</tr>
<tr>
<td>violet</td>
<td>-</td>
</tr>
<tr>
<td>tête de negre (marron tres fonce)</td>
<td>-</td>
</tr>
<tr>
<td>marron</td>
<td>-</td>
</tr>
<tr>
<td>rouille</td>
<td>-</td>
</tr>
<tr>
<td>roux (pour les cheveux surtout, mais aussi p.ex.les feuilles rousses)</td>
<td>-</td>
</tr>
<tr>
<td>or</td>
<td>-</td>
</tr>
<tr>
<td>or brûlé (dans les teintes de marron)</td>
<td>-</td>
</tr>
<tr>
<td>crème (plus clair que beige)</td>
<td>-</td>
</tr>
<tr>
<td>gris</td>
<td>+</td>
</tr>
<tr>
<td>bleu électrique</td>
<td>-</td>
</tr>
<tr>
<td>caca d'oe (pej.)</td>
<td>-</td>
</tr>
<tr>
<td>châtain (cheveux seulement)</td>
<td>-</td>
</tr>
</tbody>
</table>

Connaissiez-vous des couleurs pour les robes de chevaux?

pie

Est-il y a une différence entre brun et marron?
brun seulement pour les cheveux
marron pour tout le reste.

"une robe brune" serait drôle
"un mur brun" pourrait se dire.

Fig.8.
Subject when asked for the principal colours gave in this order:

indigo
noir
vert
blanc
rouge
jaune
bleu
marron
orange
gris
beige
violet
Donnez-moi les noms de couleurs en français.

bleu
rouge
vert
jaune
orange
violet
mauve (plus rose)
rose

(arc en ciel)
indigo
ocre
bleu-vert
- canard etc.
blanc
(Pas des couleurs)
noir

bleu turquoise ou vert-turquoise? turquoise tout court

BRUN  MARRON

Cheveux
la peau brune

chaussures
tout ce qui est cuir, sacs
une peau de mouton
yeux marrons (I was surprised at this but she assured me that that was what was printed on the passport).

Dites-moi le contraire de

noir       blanc
rouge      pas de contraire
bleu       pas de contraire

N.B. Like Françoise L., Anik considers that blanc and noir are not colours and like her she classifies acc. to the rainbow.
Nommez les couleurs en français.
(she gave me them in this order)

beige
brun
marron
lie de vin
bordeaux
bleu marine
rouge
turquoise
vert bouteille
gris perle
vert pomme
vert prairie
bleu canard
carmin
bleu ciel
rose bonbon
blanc cassé
jaune d'or
jaune citron
mordoré
orange
rose framboise
chameau

(et puis il y a les mélanges
bleu-gris
bleu-vert
sable
émeraude

Fig. 10
She also gave me the information that 'café au lait', corresponds to 'coffee' in English and suggested that this was due to different eating habits. She told me that 'chocolat' was a colour name in French and said it was 'specific'.

This subject was obviously at pains to give me unusual terms - she is a student of Linguistics and probably thought this was what I wanted. I tried to ask her the names of the principal colours. The conversation went like this:

Quelles sont les couleurs principales?

De base?

Oui - principales - enfin - de tous les jours.

bleu
rouge
vert
jaune
blanc
noir

Pourquoi n'avez-vous pas dit violet?

Je n'aime pas le violet.

She then gave me

violet (brighter)
lilas (tres pale)
mauve (dark, sad)
pourpre (not the same as the English purple)

This subject was not at all sure if bleu-turquoise or vert-turquoise bleu-emeraude or vert-emeraude (but seemed to favour vert-emeraude)

She suggested that the reason for her confusion might be that she had been discussing these points in semantics seminars.
Informant G

(l'arc en ciel)
violet
indigo
bleu
vert
jaune
orange
rouge

mauve
pourpre
ecarlate
carmine
vermillon
turquoise
pers (yeux)
bleu d'outremer (peinture)
bleu de cobalt
bleu de prusse
vert pomme
vert bouteille
vert d'eau
vert emeraude
pistache
vert-de-gris
rose
rose bonbon
bleu pastel
rose pastel? (suis pas sûre)
jaune canari
jaune serin
jaune citron
jaune d'or
ocre / ocre jaune
ocre rouge
fauve

Fig. 11
marron
chatain
brun
roux (cheveux)
rouille
acajou (Petit Robert - brun rougeâtre)
(toutes les nuances de gris)
gris
gris perle
gris anthracite

CHEVAUX
alezan (Petit Robert - brun rougeâtre)
Isabelle (gris sale)
pie
bai (brun rouge - Petit Robert)
crème
écru (plus gris)

BRUN MARRON
cheveux yeux
assez peu à part les cheveux la table
un homme brun vêtements
bière (petit Robert)
tabac

BLEU TURQUOISE OU V. TURQUOISE - bleu turquoise

Le contraire de:
noir blanc
rouge bleu je suppose, mais logiquement il devrait être vert-couleur complémentaire
bleu ?

N.B. She did not give me 'blanc' or 'noir' - perhaps because she does not regard them as colours - perhaps because she began with the rainbow colours and then just forgot b & r.
Donnez-moi les noms des couleurs en français.

rouge
taune
vert
bleu
orange
violet
marron
blanc
noir
rose

(Gradations)
(tons)

bleu-turquoise
   -de Prusse
   -d'outremer
bleu roi
   - Floride (entre le turquoise et le bleu roi) Pr.vêtements, peintures.

vert-bouteille
vert-pomme
cacatois  sp? was sure this was correct-homonym cacatois = square sail

rouge - vermilion
   - carmin

rose - (J'aurais dû mettre l'rose là - so for him 'rose' is a hyponym of 'rouge').
pourpre - profond - pr. vêtements.
écarlate
cramoisi

(Les teintes composées de marron)
beige
crème
chamois
gri
When asked about b.t. and vert.t. be said 'tous les deux ou t.
tout court.
Collocations of MARRON and BRUN
yeux cheveux
vetements teint (usually bruni)
vetements (poetique)

When asked for the opposite of
blanc: - (noir)
rouge -
bleu -

In politics rouge is opposed to blanc
Informant I

Donnez-moi les noms des couleurs principales en français.

rouge
vert
jaune
bleu
orange
gris
noir
marron
brun
violet
rose

(In an earlier list this subject gave me the colours above minus orange and rose but plus blanc.)
Informant J

Dites-moi les noms des couleurs principales en français.
vert
jaune
bleu
rouge
gris
noir
blanc
orange
marron
creme

Note: This list does not include 'brun'. When I asked him about this he said "Brun ne me vient pas à l'esprit".

What about violet? "Ah oui, mais peut-être pas principal - un mélange - pas une couleur fondamentale. Rose non plus n'est fondamental - mélange d blanc et de rouge.

What about brun? Is there no 'brun'? Cheveux bruns (plus proches du noir)

Do you say 'bleu turquoise or vert t-': Bleu t-.

Quel est le contraire de

blanc noir
rouge gris peut-être
bleu jaune
Dites-moi les noms des couleurs en français.

<table>
<thead>
<tr>
<th>Couleur</th>
<th>Éther</th>
</tr>
</thead>
<tbody>
<tr>
<td>gris</td>
<td>+</td>
</tr>
<tr>
<td>rose</td>
<td>+</td>
</tr>
<tr>
<td>beige</td>
<td>+</td>
</tr>
<tr>
<td>marron</td>
<td>-</td>
</tr>
<tr>
<td>noir</td>
<td>+</td>
</tr>
<tr>
<td>rouge</td>
<td>+</td>
</tr>
<tr>
<td>bleu</td>
<td>+</td>
</tr>
<tr>
<td>bleu-marine (surtout)</td>
<td>-</td>
</tr>
<tr>
<td>bleu-bleu</td>
<td>-</td>
</tr>
<tr>
<td>vert</td>
<td>+</td>
</tr>
<tr>
<td>vert-printemps</td>
<td>-</td>
</tr>
<tr>
<td>vert eau (un peu glauque entre le b. et le v.)</td>
<td>-</td>
</tr>
<tr>
<td>bleu vert</td>
<td>-</td>
</tr>
<tr>
<td>ocre</td>
<td>-</td>
</tr>
<tr>
<td>ocre jaune (entre le j. et le m.)</td>
<td>-</td>
</tr>
<tr>
<td>gris clair</td>
<td>-</td>
</tr>
<tr>
<td>gris foncé</td>
<td>-</td>
</tr>
<tr>
<td>blanc (j'ai oublié)</td>
<td>+</td>
</tr>
<tr>
<td>blanc cassé</td>
<td>-</td>
</tr>
<tr>
<td>bis</td>
<td>-</td>
</tr>
<tr>
<td>crème</td>
<td>-</td>
</tr>
<tr>
<td>parme (un mauve clair - un violet soutenu - non - 'pas soutenu').</td>
<td>-</td>
</tr>
<tr>
<td>carmin (un r. foncé)</td>
<td>-</td>
</tr>
<tr>
<td>vermillon (rouge vermillon)</td>
<td>-</td>
</tr>
<tr>
<td>écarlate</td>
<td>-</td>
</tr>
<tr>
<td>pouppe</td>
<td>-</td>
</tr>
<tr>
<td>orange</td>
<td>-</td>
</tr>
<tr>
<td>brun clair</td>
<td>-</td>
</tr>
<tr>
<td>sienne brule</td>
<td>-</td>
</tr>
<tr>
<td>marron</td>
<td>-</td>
</tr>
<tr>
<td>brun</td>
<td>+</td>
</tr>
</tbody>
</table>

Fig. 15
bleu ciel (un b. clair)  -
bleu azur (un bleu plus soutenu)  -
jaune citron (vif mais pastel)  -
jaune vif  -
ocre jaune  -
(paint colours, according to Odile).

Est-ce qu'on dit bleu turquoise ou vert turquoise ?
bleu turquoise (pas v. turq.)
vert émeraude et pas bleu émeraude
vert veronaise  (moins clair que le vert printemps)

Notes.
This subject knows a lot about paint colours because of her parent's business.

ocre   She would not say 'une robe ocre' mais 'une robe dans les tons ocres'.
       Also 'une robe dans les tons bruns'
       (She told me these were 'nuances').

BRUN and MARRON
Brun has pleasant connotations for her (compare with Françoise P. who prefers marron because brun for her has unpleasant connotations) She says it reminds her of 'brun terre'. She would even prefer to say 'une robe brune' rather than 'une robe marron' because of its pleasant associations although she feels that 'une robe brune' "n'est pas correct". She thinks that 'marrons' are poisonous chestnuts (her grandfather told her so) and that one should say 'châtaignes' for edible chestnuts.
Donnez-moi les noms des couleurs en français.
bleu
blanc
rouge
(pause then she repeated 'b. b. r. of course'.)
jaune
orange
marron
vert
noir
gris
blanc

Do you want compounds?
bleu d'outremer
terre de sienne
ocre
pourpre
violet
parme

Did I say green?
vert sapin
vert empire
vert véronaïse
bleu ciel
bleu foncé
bleu marine
bleu de Prusse
vert olive
vert émeraude
moutarde (pas sure si c'est un terme de c.)
jaune d'or
doré
argent
beige
sable
couquille d'oeuf (plus clair, plus lumineux que le beige) — il y a 
blanc
couquille d'oeuf (bright, light) — her words
beige (dull).

poil de chameau
chamois (lighter than poil de c.)

Il y en a d'autres — mais pas des mots de couleurs car seulement
pour les cheveux, p. ex. chatain.

chatain

brun (j'ai oublié)
brun clair
brun foncé

olivâtre (restreint au teint, p. ex. des Arabes).

among the reds another colour
carmín
roux
rouille (fashion colour 'une robe rouille' — perhaps better 'une
robe c. rouille').

Then I asked her which was the acceptable terme b. turq., v. turq.,
both, and she said

bleu turquoise (definite)

Then I asked her about brun and marron, and she listed

<table>
<thead>
<tr>
<th>BRUN</th>
<th>MARRON</th>
</tr>
</thead>
<tbody>
<tr>
<td>une personne seulement</td>
<td>pour tous les objets</td>
</tr>
<tr>
<td>I asked 'hair'? — yes</td>
<td>un vêtement ou n'importe</td>
</tr>
<tr>
<td></td>
<td>quel objet marron est le</td>
</tr>
<tr>
<td></td>
<td>terme général</td>
</tr>
</tbody>
</table>

Quel est le contraire de

blanc none
rouge "
bleu "

'blanc' est opposé à 'couleur'
Notes:
This subject has a very rich colour vocabulary - she is a research student in politics, and has done some linguistics as part of her anthropology course. She told me she was interested in painting which explained why some of the terms like bleu Prusse came so readily to her. She sees the blues thus:

bleu      foncé
d'outremer de Prusse marine
Dites-moi les noms des couleurs en français.

rouge
bleu
jaune
vert
blanc
noir
marron
gris
orange
tous les bleus - quand je pense au bleu je pense au bleu tunisien
- la mer - les volets.
bleu ciel - mode
bleu pâle
et le brun? pas de brun - presqu'un substantif
mauve
violet - pareil - mauve est plus clair

Her explanation of 'pieds noirs' - souliers cirés - péjoratif -
un français né en Afrique.

les gammes des marrons aux beiges
Je n'ai pas dit rose
marron - tête de nègre
grenat

Quand est-ce que vous dites 'brun' et quand est-ce que vous dites marron?

<table>
<thead>
<tr>
<th>BRUN</th>
<th>MARRON</th>
</tr>
</thead>
<tbody>
<tr>
<td>cheveux</td>
<td>souliers</td>
</tr>
<tr>
<td>yeux</td>
<td>rideaux</td>
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Brun c'est vague - plus foncé que 'marron'
Bleu turquoise et vert turquoise
bleu turquoise - sûre
vert émeraude et même bleu émeraude - le dernier pour un bleu
qui tire sur le vert.

LES CONTRAIRES
noir    blanc
rouge   pas de contraire
bleu    pas de contraire

En politique rouge est un symbole de gauche. Blanc aussi un
symbole (lys blanc) - pas dans la politique récente.
Faire un blanc - ne pas voter.

chemise noire - camisa negra - guerre civile espagnole - chanson.
APPENDIX 5

Colour terms elicited from informants

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APPENDIX 6

Individual mappings

The following figures (6 - 20) show the individual mappings of French informants of the basic colour terms in French.
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**Figure 7.** Mapping; Subject C.
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**Figure 8.** Mapping; Subject D.
Figure 9: Mapping, Subject E.
Figure 10. Mapping; Subject F.
Figure 11: Mapping; Subject G.
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**Figure 12.** Mapping; Subject H.
Figure 12. Mapping; Subject I.
Figure 14. Mapping; Subject J.
Figure 15. Mapping; Subject K.
Figure 16. Mapping; Subject L.
Figure 17  Mapping; Subject M
Figure 18. Mapping Subject N.
Figure 19. Mapping; Subject 0.
Figure 20. Mapping; Subject P.
### APPENDIX 2

**Foci of twelve basic colour terms in French**

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Mean: 8R'4.9'/ 5.3YR 6.8'/ 7Y'8.93'/ 2.6G 5/ 2.5G 5/ 2.5G 5/ 10GY 5/ 2.5G 3/ 1

Mean: 8R'4.9'/ 5.3YR 6.8'/ 7Y'8.93'/ 2.6G 5/ 2.5G 5/ 2.5G 5/ 10GY 5/ 2.5G 3/ 1

Mode: 7.5R 5/ 5YR 7/ 7.5Y 9/ 2.5G 5/ 2.5G 5/ 2.5G 5/ 10GY 5/ 2.5G 3/ 1

B & K Mode: 5R 4/ 2.5YR 6/ 2.5Y 8/ 10GY 5/ 2.5G 3/ 1

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**Mode** 2.5PB 5/ 3/ 5R 7/ 7.5YR 3/ 7.5YR 3/ 7.5YR 3/ 7.5YR 3/ 7.5YR 3/

**B & K** 2.5PB 5/ 3/ 5RP 7/ 5RP 7/ 5RP 7/ 5RP 7/ 5RP 7/

**S.D** 1.749/.75 2.809/.66 5.235/.60 2.317/.55

**Mean** 1.2PB 5/ 3.2P 3/ 9.5RP/6.7 7.5YR 3/ 7.5YR 3/ 7.5YR 3/ 7.5YR 3/ 7.5YR 3/

**Mode** 2.5PB 5/ 3/ 5R 7/ 7.5YR 3/ 7.5YR 3/ 7.5YR 3/ 7.5YR 3/ 7.5YR 3/

**B & K** 2.5PB 5/ 3/ 5RP 7/ 5RP 7/ 5RP 7/ 5RP 7/ 5RP 7/ 5RP 7/
### Foci of twelve basic colour terms in French

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**Mean** 5Y 3/  N 1/  N 5/
**Mode** 5Y 3/  N 1/  N 5/
**B & K Mode** 5YR 3/  N 9/  N 1/  N 5/
**S . D** 6.197/.59  0/  0/
### Comparison of Colour Foci: (The Mean)  

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**N.B.** When comparing the S.D of B & K's 20 languages with the S.D of French it must be remembered that not all of B & K's twenty were 11-term languages - only 6 of them were. Two languages, Ibibio and Tweltal, have no basic term for blue.

The formula for obtaining the S.D is:

\[
\sqrt{\frac{\sum d^2}{n}}
\]

where \( n \) = the number of values and \( \sum d^2 \) = the sum of the squares of their deviations from the mean.
### APPENDIX 8

**List of colour terms contained in the questionnaires**

| Total number of questionnaires | 100 |
| Total number of mentions       | 1781 |
| Total number of lexemes        | 221 |

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<td>2</td>
</tr>
<tr>
<td>vert salade</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sable</td>
<td>2</td>
<td>vert sapin</td>
<td>2</td>
</tr>
<tr>
<td>saumon</td>
<td>2</td>
<td>vert turquoise</td>
<td>1</td>
</tr>
<tr>
<td>Sable</td>
<td>2</td>
<td>vert vif</td>
<td>1</td>
</tr>
<tr>
<td>Terre de sienne</td>
<td>1</td>
<td>vieil orange</td>
<td>1</td>
</tr>
<tr>
<td>terre de sienne brûlée</td>
<td>2</td>
<td>vieux bleu</td>
<td>1</td>
</tr>
<tr>
<td>terre de sienne naturelle</td>
<td>1</td>
<td>vieux rose</td>
<td>1</td>
</tr>
<tr>
<td>terre sienne</td>
<td>3</td>
<td>violacé</td>
<td>2</td>
</tr>
<tr>
<td>tete de nègre</td>
<td>1</td>
<td>violet</td>
<td>63</td>
</tr>
<tr>
<td>tomate</td>
<td>1</td>
<td>violet bleu</td>
<td>1</td>
</tr>
<tr>
<td>turquoise</td>
<td>10</td>
<td>violet rouge</td>
<td>1</td>
</tr>
<tr>
<td>Vertâtre</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vermillon</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vert</td>
<td>86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vert amande</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vert anglais</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vert bouteille</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vert-bronze</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vert caca d'oie</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vert clair</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vert d'eau</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vert-de gris</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>verte</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vert emeraude</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vert fonce</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vert franc</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vert jade</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vert kaki</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vert mousse</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX 9

Samples of computer print-outs showing examples of 'bleu' in a 3-line context, in an 18-line context and in binary groups.
UNE HISTOIRE EN UN SOLEIL JAUNE ET UN CIEL BLEU

Le ciel tourna, devenant bleu, indigo, et les étoiles,

L'horizon changea, bleu, indigo, et les étoiles, pour devenir bleu, indigo, et les étoiles.

Le ciel tourna, devenant bleu, indigo, et les étoiles,

L'horizon changea, bleu, indigo, et les étoiles, pour devenir bleu, indigo, et les étoiles.
LE PRINTEMPS PASSE

ROSERAIT UNE JONCHE DE SURGEONS TENDRES,
ROUGES D'AURORE AU SOMMET, VERTS ET JUTEUX
À LA BASE, DANS LE VÉGÈTÉ, LES RAIDES BAGUETTES
D'ABRICOTIER, SACRIFIÉS, BROLERONT, UNE HEURE
ENCORE, LEUR PETITE FLAMME DE FLEUR AVANT DE

MOURIR, ET LES ABEILLES N'EN LAISSERONT RIEN

UNE NUE RONDE, À CINQ HEURES ET DEMIE DU
MATIN, SOUS LE RAYON HORIZONTAL ET LA ROSE, LE
BLÉ JEUNE EST D'UN BLEU INCONTESTABLE, ET
ROUGE LA TERRE TERRUGINEUSE, ET ROSE DE CUIVRE

LES PRUNIERS BLANCS. CE N'EST QU'UN MOMENT,
UN ÉPÉRIQUE MÉSONGÉ DE LUMIÈRE, QUI PASSE
EN MÊME TEMPS QUE LA PREMIÈRE HEURE DU
JOUR. TOUT CROIT AVEC UNE HÂTE DIVINE. LA
MOINORE CRÉATURE VÉGÉTALE DARDE SON PLUS
APPENDIX 10

Colour terms in Zulu - A possible refutation of the Berlin and Kay evolutionary hypothesis.

According to Berlin and Kay, colour terms enter languages in a certain partially fixed order. They represent the ordering thus:

\[
\begin{align*}
\text{black} &\rightarrow \text{red} &\rightarrow \text{green} \rightarrow \text{yellow} &\rightarrow \text{blue} \rightarrow \text{brown} \rightarrow \text{purple} \\
\text{white} &\rightarrow \text{yellow} \rightarrow \text{green} &
\end{align*}
\]

They found only six languages - the data of which appears to refute this hypothesis (Berlin and Kay, 1969, 42ff).

Zulu appears to be another such language. Zulu appears to have basic terms for BLACK, WHITE, RED, GREEN or BLUE but not both, YELLOW, BROWN, GREY, and possibly PURPLE. The single term for GREEN and BLUE 'luhlaza' covers a very large area of the colour chart, an area which English speakers would name 'green' and 'blue'. The Zulu informant, when asked to mark the focal point of 'luhlaza' said it was impossible to do so because sometimes the best 'luhlaza' would be in the BLUE area and sometimes in the GREEN. When it is considered necessary to distinguish in speech between the two the term is modified by 'like the sky' or 'like grass'.

It appears then that there is only one basic term for BLUE and GREEN. If the Berlin and Kay evolutionary hypothesis is correct a second term should have entered the language before the basic terms for BROWN, PINK, ORANGE and GREY. If the terms for those categories are basic, or indeed even if only one of them is, then this would appear to refute the hypothesis.

The terms for BROWN and GREY appear to satisfy the criteria laid down.
The terms for BROWN and GREY appear to satisfy the criteria laid down by Berlin and Kay for basicness. The informant was asked particularly if these terms were the names of objects characteristically having that colour, and he was certain that they were not, or, if they were, the connection was long forgotten. The term for PURPLE, 'nkankane' is very like the word for a certain bird, 'inkankane', and I therefore dismissed it as not being a basic term. The informant seemed to feel that there was no term for ORANGE, and only after some time gave 'mdubu', which he glossed as 'reddish brown', and I dismissed this term too as being doubtful. The two terms 'nsundu' (brown) and 'ngwevu' (grey) do however appear to be basic, and since they have appeared in Zulu before a second term for BLUE/GREEN then this would appear to upset the evolutionary theory, or at least to make further research desirable.¹

The Zulu informant's list of basic colours

<table>
<thead>
<tr>
<th>Term</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>mhlophe</td>
<td>WHITE</td>
</tr>
<tr>
<td>mnyama</td>
<td>BLACK</td>
</tr>
<tr>
<td>bomvu</td>
<td>RED</td>
</tr>
<tr>
<td>lupbuzi</td>
<td>YELLOW</td>
</tr>
<tr>
<td>lublaza</td>
<td>GREEN/BLUE</td>
</tr>
<tr>
<td>nsundu</td>
<td>BROWN</td>
</tr>
<tr>
<td>ngwevu</td>
<td>GREY</td>
</tr>
</tbody>
</table>

Doubtful terms

nkankane    PURPLE
mdubu       ORANGE

For the mapping of basic terms in Zulu see Figure 26.

1. Among published works refuting the Berlin and Kay hypothesis is that by D. Snow on Samoan colour terminology; Harold Beyer Broch on Hare Indian Colour Terms.

2. 'Mpunga' was also given for GREY.
Figure 26. Mapping of basic colour terms in Zulu.

mlhophe (WHITE) is the surround of the chart.  
luphuzi (YELLOW)

mnyama (BLACK)  
bonvu (RED)

luhlaza (GREEN/BLUE)  
nsundu (BROWN)

ngwevu (GREY)
Colour terms in Welsh

Hjelmslev's comparison of colour terms in English and Welsh is taken as the classic example of the way in which different languages take the same continuum, the colour spectrum, and impose arbitrary boundaries at different points along it (Hjelmslev 1943).

The argument of Berlin and Kay in Basic Color Terms is that those boundaries are not in fact altogether arbitrary but that there are certain universal foci for the basic colours.

Hjelmslev shows only four terms in Welsh to cover that part of the spectrum designated by green, blue, grey, brown and black in English. Modern spoken Welsh however has a fifth term, 'brown'. It appears that what may have happened is that at one time there was only one term 'llwyd' to cover both GREY and BROWN and that at a later date the English term 'brown' entered the language and took over part of the area formerly covered by 'llwyd'. Llwyd now has its focus in GREY and 'brown' has its focus in BROWN. If 'llwyd' always had its focus in GREY then that would upset the Berlin and Kay evolutionary ordering hypothesis because it would mean that a term for GREY entered the Welsh language before a term for BROWN.

There may be doubt as to whether 'brown' is a basic term in Welsh. It satisfies all the main criteria laid down by Berlin and Kay. It is however a loan word, although not a recent one. Berlin and Kay do not specify what they mean by recent. A Welsh speaker I consulted said she does not consider 'brown' to be a loan word in the way that she considers 'pinc' and 'piws' to be.
The following table from Ardener (1971) shows how Modern Standard Welsh differs from the literary Welsh examined by Hjelmslev.

Table 21  Standard Welsh and Modern Colloquial Welsh

<table>
<thead>
<tr>
<th>ENGLISH</th>
<th>STANDARD WELSH</th>
<th>MODERN COLLOQUIAL WELSH</th>
</tr>
</thead>
<tbody>
<tr>
<td>green</td>
<td>gwyrrdd</td>
<td>gwyrrdd</td>
</tr>
<tr>
<td>blue</td>
<td>glas</td>
<td>glas</td>
</tr>
<tr>
<td>grey</td>
<td>llwyd</td>
<td>llwyd</td>
</tr>
<tr>
<td>brown</td>
<td>du</td>
<td>brown</td>
</tr>
<tr>
<td>black</td>
<td>du</td>
<td>du</td>
</tr>
</tbody>
</table>

The entries under Standard Welsh (Literary Welsh) bear out Hjelmslev's observations and the entries under Mod. Coll. Welsh were confirmed by my findings when I carried out the following tests with a Welsh native speaker.

The data for Welsh.

Subject: Subject Q (Bilingual from Caern).

du  [di]       black

gwyn      white

coch      red

melyn     yellow

glas      blue

gwyrrdd  green

brown     brown

porffor  purple

llwyd    grey

pinc    pink (borrowed)
piws     purple
melyn-goch  orange
gwinau     brown (for horeses, hair)

When asked about orange she at first said there was no word for orange in Welsh and that she would use the English word and then she remembered 'melyn-goch' which she said was very common.

'llwyd' is grey, and is also used for a pale face or dull day.

The borrowed word 'piws' is more common than 'porffor', she said, and would be the word she would use if telling a friend about a new dress; if writing an essay she would use 'porffor'.

'glas' is blue but is sometimes used for grass (gwellt Glas)
(c.f. Gaelic 'gorm' which is blue but is also used for grass)

When questioned about 'llwyd' she did not think it could possibly cover any of that area covered by the English brown, but she did mention 'papier llwyd', brown wrapping paper (c.f. French papier gris)

'llwdni' is mildew

'llwyd' also means mouldy.
If no word 'brown' in Welsh she would probably use 'coch du'.
She would consider 'brown' and 'coch du' to cover the same area.

No Welsh word for turquoise - she had some difficulty in delimiting 'glas' because turquoise bothered her, but since she didn't have a Welsh word for it she didn't mark it. (Nevertheless, in spite of her apparent difficulty with blue, the area she marked corresponds very closely to the area marked by Berlin and Kay's English speaking subjects).

Order of listing - B and K's evolutionary order as far as yellow, but the subject has another explanation for the order -

Nursery rhyme

Our little ben is a nice little ben
Plu coch melyn a du
(plu = "feathers").
The subject was asked to map her basic colour terms on the colour chart used for all previous experiments and the mapping is shown in Figure 27.
Figure 27. Mapping of Welsh informant.
If the mapping in Figure 27 is compared with the mapping carried out by Berlin and Kay's American English subjects (Berlin and Kay, 1969, p.119) the following comparisons can be made between Modern Colloquial Welsh and American English.

A comparison of Modern Welsh and American English

Areas designated by 'LLWYD', 'GLAS', and 'GWYRDD'.

**llwyd**

The area designated as 'llwyd' corresponds almost exactly to that designated by 'grey'.

llwyd: 2 - 8 on the neutral scale

grey: 3 - 8 on the neutral scale

**glas**

The area designated by 'glas' does not include any chips on the neutral scale and corresponds very closely to the area designated by 'blue'.

glas 7.5 B G - 5 P - B on the scale of HUE for the high values (of brightness)

and 10 B G - 7.5 P - B for the low values

3 - 9 on the scale of BRIGHTNESS

**blue**

7.5 B G - 5 P - B on the scale of HUE

2 - 9 on the scale of BRIGHTNESS.

**gwyrdd**

The area covered by 'gwyrdd' corresponds closely to that covered by green especially on the dimensions of hue.

<table>
<thead>
<tr>
<th>HUE</th>
<th>BRIGHTNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>gwyrdd</td>
<td>2.5 G Y - 7.5 B G.</td>
</tr>
<tr>
<td>green</td>
<td>2.5 G Y - B G</td>
</tr>
</tbody>
</table>

1./ All numbers are in Munsell Notation.
**Foci for llwydd, glas, gwyrrdd**

<table>
<thead>
<tr>
<th>English</th>
<th>Welsh</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>llwydd</td>
<td>grey</td>
<td>5N</td>
</tr>
<tr>
<td>grey</td>
<td></td>
<td>5N</td>
</tr>
<tr>
<td>glas</td>
<td>blue</td>
<td>2.5 P B 5/</td>
</tr>
<tr>
<td>blue</td>
<td>gwyrrdd</td>
<td>6 adjacent chips of which one is 2.5 P B 5/</td>
</tr>
<tr>
<td>gwyrrdd</td>
<td>green</td>
<td>10 G Y 6/</td>
</tr>
<tr>
<td>green</td>
<td></td>
<td>2.5 G 5/ and 2.5 G 4/ (Note: 2.5 G is adjacent to 10 G Y).</td>
</tr>
</tbody>
</table>

**Brown**

<table>
<thead>
<tr>
<th>Area covered in English</th>
<th>HUE</th>
<th>BRIGHTNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5 Y R - 10 Y R</td>
<td>2 - 4</td>
<td></td>
</tr>
<tr>
<td>Area covered in Welsh</td>
<td>5 Y R - 2.5 G Y</td>
<td>2 - 4</td>
</tr>
<tr>
<td>Focus of brown in Welsh</td>
<td>2.5 Y 3/</td>
<td></td>
</tr>
<tr>
<td>Focus of brown in English</td>
<td>3 adjacent chips of which one is 2.5 Y R 2/</td>
<td></td>
</tr>
</tbody>
</table>
Sample Questionnaires

Remplissez le questionnaire suivant S.V.P.

1. Age approximatif:
2. Sexe:
3. Écrivez ci-dessus les noms des couleurs principales en français (les noms qu'on utilise dans le langage de tous les jours).
4. Cochez le terme accepté
   bleu-turquoise
   vert-turquoise
   tous les deux
5. Écrivez une liste de choses qu'on pourrait décrire proprement comme étant:
   BRUN
   MARRON
6. Écrivez le contraire de:
   noir .........................
   rouge ........................
   bleu ........................
Marquez, s'il vous plaît, les termes sur ces listes de la manière suivante:

- ✓ si le terme est acceptable dans le français courant
- ✗ si le terme n'est pas acceptable dans le français courant
- ? si le terme est douteux

<table>
<thead>
<tr>
<th>Liste 1</th>
<th>Liste 2</th>
<th>Liste 4</th>
</tr>
</thead>
<tbody>
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<td>blancâtre</td>
<td>blancasse</td>
<td>bleu-vert</td>
</tr>
<tr>
<td>orangeâtre</td>
<td>noirasse</td>
<td>gris-bleu</td>
</tr>
<tr>
<td>bleuâtre</td>
<td>orangeasse</td>
<td>blanc-noir</td>
</tr>
<tr>
<td>marronâtre</td>
<td>rougeasse</td>
<td>rouge-orange</td>
</tr>
<tr>
<td>brunâtre</td>
<td>verdasse</td>
<td>rouge-vert</td>
</tr>
<tr>
<td>verdâtre</td>
<td>marronasse</td>
<td>vert-jaune</td>
</tr>
<tr>
<td>beigeâtre</td>
<td>jaunasse</td>
<td>vert-rouge</td>
</tr>
<tr>
<td>blondâtre</td>
<td>brunasse</td>
<td>bleu-jaune</td>
</tr>
<tr>
<td>châtainâtre</td>
<td>blondasse</td>
<td>jaune-orange</td>
</tr>
<tr>
<td>violâtre</td>
<td>rosasse</td>
<td>jaune-bleu</td>
</tr>
<tr>
<td>roussâtre</td>
<td>bleuasse</td>
<td></td>
</tr>
<tr>
<td>ocrâtre</td>
<td>violasse</td>
<td></td>
</tr>
<tr>
<td>noirâtre</td>
<td>grisasse</td>
<td></td>
</tr>
<tr>
<td>crémâtre</td>
<td>chatainasse</td>
<td></td>
</tr>
<tr>
<td>mauvâtre</td>
<td>roussasse</td>
<td></td>
</tr>
<tr>
<td>pourprâtre</td>
<td>kakiasse</td>
<td></td>
</tr>
<tr>
<td>grisâtre</td>
<td>mauvasse</td>
<td></td>
</tr>
<tr>
<td>rosâtre</td>
<td>pourprasse</td>
<td></td>
</tr>
<tr>
<td>turquoisâtre</td>
<td>beigeasse</td>
<td></td>
</tr>
<tr>
<td>citronâtre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rougeâtre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>kakiâtre</td>
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<tr>
<td>bordeauxâtre</td>
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<td></td>
</tr>
<tr>
<td>indigoâtre</td>
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</tr>
<tr>
<td>rouilliâtre</td>
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</tr>
<tr>
<td>permâtre</td>
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<td>vermilionâtre</td>
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<td>jaunâtre</td>
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</tr>
<tr>
<td>(a)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b)</td>
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<td></td>
</tr>
</tbody>
</table>

Liste 3

<table>
<thead>
<tr>
<th>Liste 3</th>
<th>Liste 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>violacé</td>
<td>bleuelet</td>
</tr>
<tr>
<td>jaunacé</td>
<td>roselet</td>
</tr>
<tr>
<td>olivacé</td>
<td>violelet</td>
</tr>
<tr>
<td>rougeacé</td>
<td>orangelet</td>
</tr>
<tr>
<td>rosacé</td>
<td>brunelet</td>
</tr>
<tr>
<td>brunacé</td>
<td></td>
</tr>
<tr>
<td>verdacé</td>
<td></td>
</tr>
<tr>
<td>orangeacé</td>
<td></td>
</tr>
<tr>
<td>marronacé</td>
<td></td>
</tr>
<tr>
<td>bleuacé</td>
<td></td>
</tr>
</tbody>
</table>