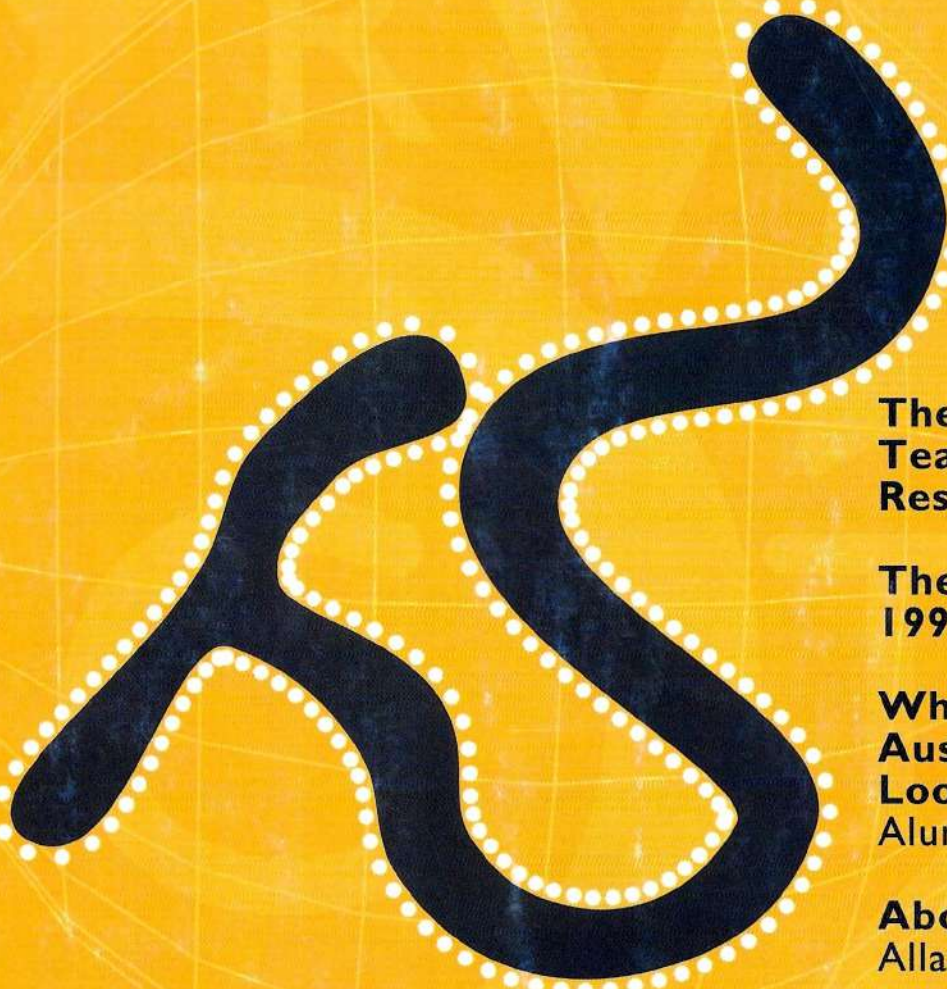


# THE JOURNAL

OF THE SCHOOL OF DESIGN

NUMBER 2



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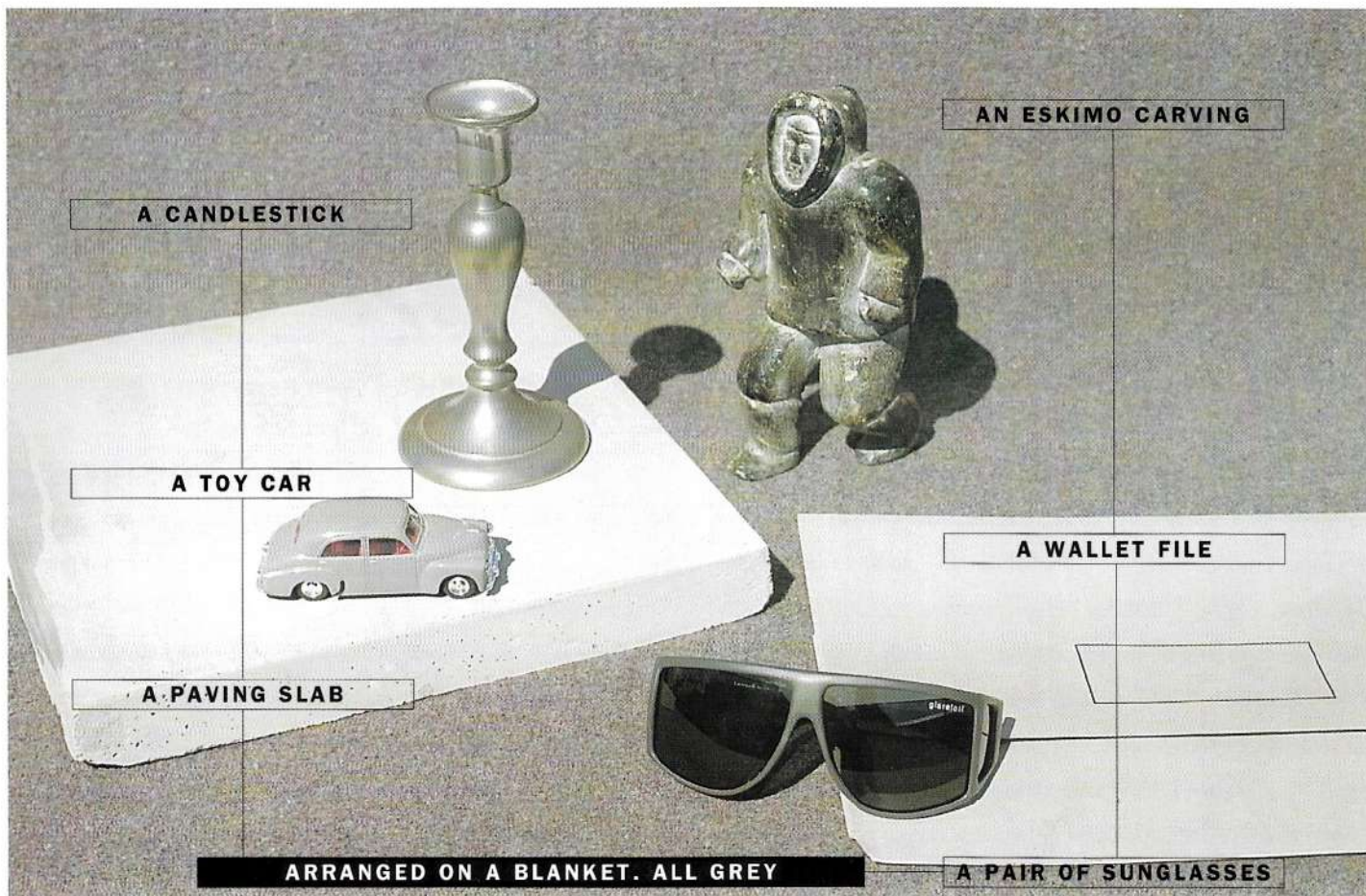
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"I don't believe the story of Eskimos having 20 different words for "white", but I could believe that they have 20 different words for snow. These words would surely include aspects of the appearance of snow beyond mere whiteness. Snow that has an icy surface looks different from snow that has just fallen; each would have a different name."

# TINCTURE - A NEW/OLD WORD FOR THE APPEARANCE OF THINGS

PAUL GREEN-ARMYTAGE



WHILE PEOPLE MIGHT ACCEPT THAT THE ONE WORD GREY COULD BE APPLIED TO EACH OBJECT I DON'T THINK THEY WOULD REGARD THEM ALL AS BEING THE SAME COLOUR. THE PAVING SLAB IS A VERY PALE GREY, THE SUNGLASSES VERY DARK AND THE CARVING IS A MIXTURE. SOME PEOPLE MIGHT NOW BE SATISFIED BUT THERE REMAIN FUNDAMENTAL DIFFERENCES IN APPEARANCE BETWEEN THE OBJECTS APART FROM THEIR COLOUR AND APART FROM THEIR DISTINCTIVE SHAPES. THE WOOLLEN BLANKET HAS AN OVERALL TEXTURE. THE CEMENT SLAB HAS PATCHES OF A ROUGH TEXTURE BUT IS OTHERWISE QUITE SMOOTH. THE WALLET FILE, MADE OF THIN CARD, IS ALSO SMOOTH AND IS MATT. THE STONE CARVING HAS AN IRREGULAR SURFACE VARYING NOT ONLY FROM PALE TO DARK GREY BUT ALSO FROM MATT AND SLIGHTLY TEXTURED TO VERY SMOOTH AND A BIT GLOSSY. THE METAL BODY OF THE TOY CAR IS UNIFORMLY GLOSSY BEING FINISHED IN GLOSS ENAMEL PAINT. THE CANDLESTICK IS PEWTER AND IS SMOOTH AND METALLIC. THE SUNGLASSES HAVE A DULL PLASTIC FRAME WHILE THE POLAROID "LENSES" LOOK GLOSSY AND ARE ALSO TRANSPARENT.

.....

The concept that goes with the word *colour* can accommodate the different greys - pale, medium and dark, but not the different textures or the different kinds of surface - matt, glossy, metallic, opaque or transparent. There is no word in everyday use for a concept which can include all these aspects of appearance. It would be useful to have such a word, especially for a concept that could include the colour as well as the texture and surface quality of objects.

Earlier this year [1] I proposed the adoption of the word *tincture*. This word is in the Macquarie dictionary [2] but it is not widely used. It has more than one meaning. For pharmacists it is "a solution of a medicinal substance in alcohol". A tincture may also be "a slight infusion, as of some element or quality" or "a trace; a smack or smattering." But for a dwindling group of specialists it is "any of the metals, colours or furs used in coats of arms."

As an example, in the concise terminology and medieval French of heraldry, the coat of arms of the Estcourt family would be described as: "ermine, on a chief indented gules three estoiles or." The top third (chief) of the shield is red (gules), the bottom two thirds are white with black markings to represent ermine. The two areas meet at a zig zag border (indented). On the red area there are three gold stars (stars - estoiles; gold - or). The metallic surface, the plain coloured surface and the textured surface, each with its own colour or colour combination, is a different tincture. In its heraldic sense, therefore, tincture includes colour, texture and surface quality. However the range of heraldic tinctures is strictly limited.

In heraldry there are only four *colours* in common use - red, blue, black and green. Purple is rare and rarer still are the dishonourable *stains* - an orange-brown and a colour that we might now call magenta. There are two *metals* - gold and silver, and eleven *furs*. The furs are conventionalised patterns and are variations on the theme of ermine and vair (squirrel skins).

It is this heraldic meaning of tincture that I want to revive and expand. I would like to be able to say that I like the tincture of a person's dress and know that I would be understood to mean the texture and any property of glossiness or transparency as well as the colour of the material from which the dress was made.

There is a relationship between what we see, what we think

and what we say. The more our ancestors made sense of what they saw, the greater the number of concepts they formed and the larger their vocabulary grew. It could be argued that the larger one's vocabulary, the greater one's capacity for thought and the richer one's experience of the world. This was recognised by George Orwell [3] who applied the idea in reverse. In the appendix to his novel *Nineteen Eighty Four* he described the principles of *Newspeak*, the official language of his imaginary future: "Newspeak was designed not to extend but to diminish the range of thought, and this purpose was indirectly assisted by cutting the choice of words down to a minimum."

Some years ago I realised that an inadequate vocabulary was responsible for much of the confusion about colour and, I presumed, a correspondingly underdeveloped visual sense. To take one example: It might appear that the blue, red and yellow primaries of printing differ in only one respect from the blue, red and green of television - until you see how different are the two blues and the two reds. It is true that the printers call their blue "cyan" and their red "magenta" and that one could call the blue of television "ultramarine" and the red "vermilion", but none of these names are in everyday use. For most people both blues are "blue" and both reds are "red".

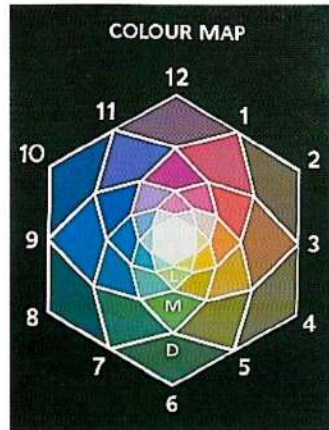
I accept the conclusions of Berlin and Kay [4] that there are only eleven *basic colour terms* in the English language: red, orange, yellow, green, blue, purple, pink, brown, black, white and grey. That was my daughter Emily's vocabulary of colour names when she was three and I asked her to name every colour in a comprehensive array. I doubt whether there would be any serious disagreement with her judgements. A striking feature is how wide is the range of colours that would be called blue or green and how narrow the range for yellow, orange and red.

In 1978 [5] I suggested that many colour problems could be solved if the colour array were divided into areas of equal size and if each area had its own name. I made 36 divisions and chose a name for the group of colours in each area. Yellow and orange were the only basic terms sufficiently precise for this subdivision. Of the other names some were more convincing than others. I proposed a design for what I called a "Colour Map" with the newly named colours organised in a kind of extended colour circle.

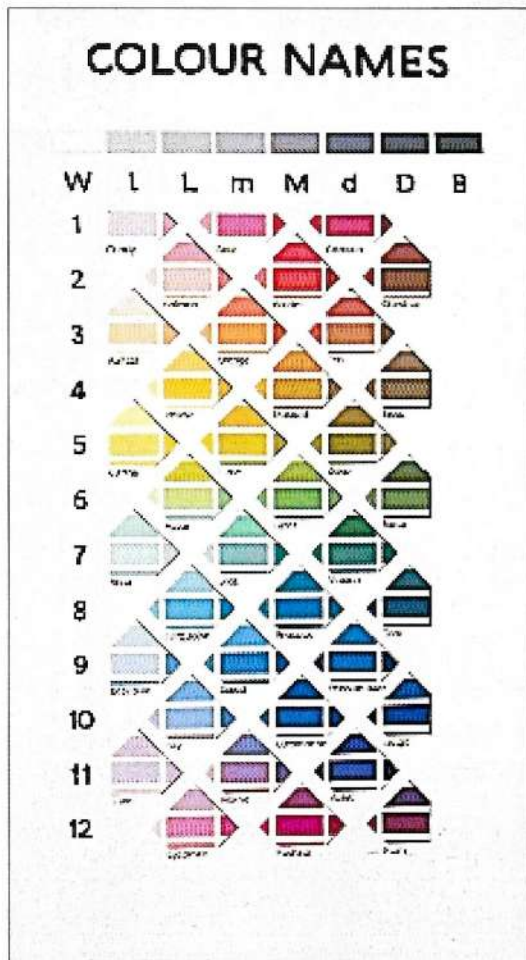
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2. DELBRIDGE, A. et al. eds. *The Macquarie Dictionary*. 2nd ed. The Macquarie Library Pty Ltd. Macquarie University, NSW, Australia, 1991.
3. ORWELL, G. *Nineteen Eighty Four*. F.A. Thorpe (Publishing) Ltd., Anstey, Leicestershire, 1982. (First published 1949)
4. BERLIN, B. and KAY, P. *Basic Color Terms*. University of California Press, Berkeley and Los Angeles, 1969.
5. GREEN-ARMYTAGE, P. "Violets aren't Blue - Colour Sensations and Colour Names". In Condous, J., Howlett, J. and Skull, J. eds. *Arts in Cultural Diversity*. Holt, Rinehart and Winston, Sydney, 1980.

## COLOUR NAMES

1. Candy	Rose	Crimson
2. Salmon	Scarlet	Chestnut
3. Apricot	Orange	Tan
4. Yellow	Mustard	Sepia
5. Citrine	Lime	Olive
6. Apple	Grass	Bottle
7. Aqua	Jade	Viridian
8. Turquoise	Peacock	Teal
9. Baby blue	Cobalt	Prussian blue
10. Sky	Ultramarine	Indigo
11. Lilac	Mauve	Violet
12. Cyclamen	Fuchsia	Plum



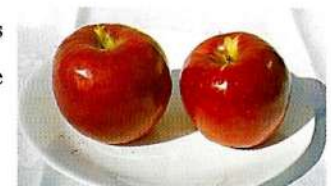
result of mixing paints, inks, dyes or lights; to analyse and plan colour combinations; to produce theoretically based “harmonies”; and for systematic exploration of possibilities. But I am now equally convinced that this is not enough. The colours may be similar, but there is a world of difference between rough brick and smooth terra cotta and between matt black and glossy black.



If Berlin and Kay’s criteria were applied beyond colour, only two words - gold and silver - would qualify as *basic tincture terms*. In heraldry, gold and silver are often represented by yellow and white. But for something to be gold it must look metallic as well as being yellow coloured - the concept *gold* includes surface quality as well as colour.



While it is my intention that tincture should be applied only to appearance it can be helpful to consider the physical circumstances which give rise to a particular appearance. Richard Hunter [7] draws a distinction between colour attributes and what he calls geometric attributes. The latter includes gloss, haze and translucency. Colour is associated with the *spectral* distribution of the light - a predominance of long wave radiation leading to a perception of redness. Geometric attributes are associated with the *spatial* distribution of light - a surface which reflects light evenly in all directions appears matt, one which reflects light more strongly in one direction appears glossy. Appearance, therefore, provides a clue to the physical nature of things. The colour of a particular apple tells us that it is a *red delicious* and we can expect a particular taste. The degree of gloss suggests that one apple might be fresher than another. So we base our choice not on colour alone but on colour plus gloss. We base our choice on the tincture of the apple.



As it turned out the design of the colour map was not entirely satisfactory. I may return to the idea one day, but meanwhile I have found that the Swedish Natural Colour System NCS [6] is very simple to understand and offers a much more satisfactory conceptual framework for colour. I am satisfied that, for designers, the NCS is the most useful of the systems which make it possible: to describe colours; to understand colour relationships; to predict the likely

6. HARD, A. and SIVIK, L. “NCS - Natural Colour System: a Swedish Standard for Colour Notation”. *Color Research and Application*. 6, 3, pp: 129-38, 1981.  
 7. HUNTER, R. *The Measurement of Appearance*. Hunter Associates Laboratory, Fairfax, Virginia, 1972.

The concept of tincture offers a greatly enriched framework for apprehending the things we see. However our vocabulary for individual tinctures is hopelessly inadequate. Gold and silver does not get us very far. It is possible that languages will evolve to extend this vocabulary. In the case of colour words Berlin and Kay provided an unexpected insight into language evolution.

It would appear that there is a definite pattern according to which a language's vocabulary of basic colour terms increases. A possible process for vocabulary growth is suggested by one of Berlin and Kay's criteria for determining whether or not a word should be regarded as a *basic colour term*: "Color terms that are also the name of an object characteristically having that color are suspect .... This ... criterion would exclude *orange* in English if it were a doubtful case ...." The word orange, used alone but meaning "coloured like an orange", might have served a kind of apprenticeship when it was used by a minority, but it has proved its worth and now has its place in everyday language. Words like olive and turquoise might be going through a similar process.

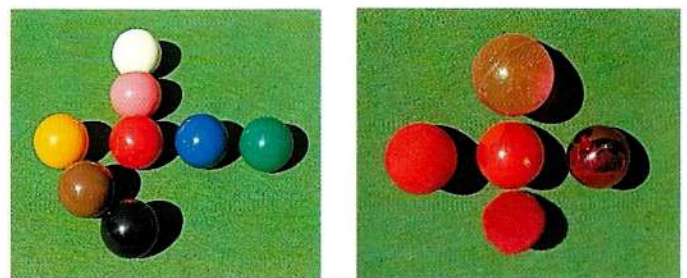
I don't believe the story of Eskimos having 20 different words for "white", but I could believe that they have 20 different words for snow. These words would surely include aspects of the appearance of snow beyond mere whiteness. Snow that has an icy surface looks different from snow that has just fallen; each would have a different name. I doubt whether Eskimos would use these words to describe something else like a sheet of paper or a dress, but if they were to do so they would be doing more than describing the colour - it would be the tincture of the paper or the dress.

Gold and silver, like orange, are established in everyday language. Bronze, like olive and turquoise might follow. However, even with the addition of words like olive and turquoise a vocabulary of colour names is not as useful as a colour order system. Better still would be a tincture order system.

It is clear that a tincture order system would be rather complicated since it must incorporate several dimensions of appearance as well as those of colour. Ordinary people might regard colour as one dimensional. A snooker ball is red - end of story. It is also glossy - end of another story. Colour specialists, on the other hand, know about

three dimensional colour solids and can imagine the snooker ball changing colour and moving through pink to white, via brown to black, towards yellow or towards blue and green - getting lighter, darker, duller, more vivid or changing hue. But its glossiness is no less intrinsic to its being a snooker ball than is its redness. In fact glossiness is the one dimension of tincture that unifies all the differently coloured balls on the table. Now we could imagine the ball losing its shine or becoming metallic, becoming translucent and then transparent. We could imagine its surface less smooth and becoming rough or even hairy.

The snooker ball is now at an intersection in a complex network of appearance scales which would constitute a tincture order system.



In fact there already exists a kind of tincture order system. It was developed in Argentina and is referred to as a *General Theory of Design*. The work, initiated by César Janello, is being carried on by Claudio Guerri and José Caivano. The theory, described briefly by Caivano [8] has four sub-theories each of which has its own three dimensional structure modelled on the structure of a colour order system. *Colour* itself constitutes one of these sub-theories, the favoured models being the colour solids of Munsell [9] and Pope [10]. The other sub theories are *spatial delimitation*, *texture* and *cesia*.

Spatial delimitation refers to the configuration of an object - spherical, conical, irregular hexagonal etc. - and is not included in the concept of tincture.

Textures vary from smooth to rough. They are also characterised according to the extent to which the textural elements are closely packed or widely spaced and according to whether they are linear like corrugated cardboard, non-linear like sandpaper or somewhere in between. The model for texture has been described by Janello [11].

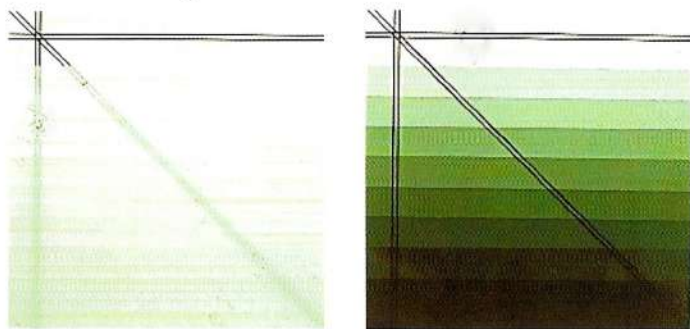
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8. CAIVANO, J. "Coincidences in the Syntactics of Diverse Systems of Signs used in Architecture, Visual Arts and Music". In Deely, J., Hayworth, K. and Prewitt, T. eds. *Semiotics 1989*. University Press of America, Lanham, Maryland, 1989.
  9. MUNSELL, A. A *Color Notation*. Munsell Color Company, Inc., Baltimore, 1967.
  10. CARPENTER, J. and FISHER, H. *Color in Art. A Tribute to Arthur Pope*. Fogg Art Museum. President and Fellows of Harvard College, Cambridge, U.S.A., 1974.
  11. JANELLO, C. "Texture as a Visual Phenomenon". *Architectural Design* **33**, pp: 394-6, 1963.



Cesia is a new word derived from Janello's first name, César. He proposed the word in the absence of any other to embrace such phenomena as gloss and transparency. Caivano has developed a model for cesia [12]. In the model there are five "primaries": clear transparency; translucence (translucent white); diffuse reflectance (opaque white); specular reflectance (mirror like appearance) and complete absorbence (black).

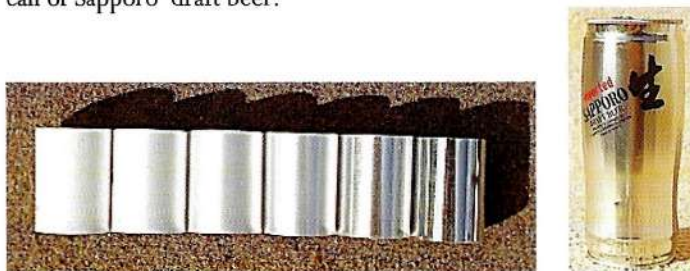
These are connected by scales. To judge where something might be on one of these scales it is usually necessary to have other elements in view. For example the degree of transparency/translucency can be judged by how clearly something can be seen when looking through the material. Two parallel lines are initially seen to be quite separate and distinct.

Gradually they become blurred, then they merge into a single line, which gets fainter and more blurred, until it disappears altogether behind a white fog.



With the scale from transparency to absorbence the lines remain separate and sharp but they become progressively more difficult to see until they disappear in blackness.

A scale of surfaces from diffuse reflectance (opaque white) to specular reflectance (mirror like) can be produced with mirror plastic and graded diffusing filters. Part of this scale can be seen on a can of Sapporo draft beer.



In a tincture order system scales can be constructed where

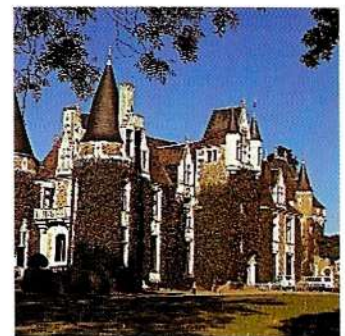
there are changes of colour combined with changes of texture and changes of cesia. With water, tea leaves and milk we can produce scales from transparency to translucence and absorbence which become brownish rather than blackish.



A scale which was yellowish, which varied in texture from rough to smooth and which varied in cesia from diffuse reflectance to specular reflectance could be constructed on which it would be possible to locate a gold painted candlestick and a polished brass lectern.



I hope it will be possible to extend the concept of tincture to include light sources so that one could appreciate such relationships as that between a candle flame a daffodil and a gold ring. I would also like to include the space between ourselves and the objects around us so that there could be a scale connecting a misty morning with a clear afternoon.



By way of summary, and as a further illustration of how useful the concept of tincture might be, it is worth quoting some of the observations made and questions raised by Ludwig Wittgenstein [13] in his *Remarks on Colour*:

12. CAIVANO, J. "Appearance (Cesia): Variables, Scales, Solid". Paper presented at the 7th Congress of the International Colour Association, *Colour 93*, Budapest, 1993.  
 13. WITTGENSTEIN, L. *Remarks on Colour*. Anscombe, G. ed. Basil Blackwell, Oxford, 1977.

Can a transparent green glass have the same colour as a piece of opaque paper or not? If such a glass were depicted in a painting, the colours would not be transparent on the palette. If we wanted to say the colour of the glass was also transparent in the painting, we would have to call the complex of colour patches which depict the glass its colour.

It could be that we had two words for "green" one for green surfaces, the other for green transparent objects. The question would remain why there existed no colour word corresponding to the word "white" for something transparent.

Why is it that something can be transparent green but not transparent white?

We speak of the "colour of gold" and do not mean yellow. "Gold coloured" is the property of a surface that shines or glitters.

There is gold paint but Rembrandt didn't use it to paint a golden helmet.

Mightn't shiny black and matt black have different colour names?

If we replace the word *colour* with the word *tincture* it is clear that colour/tincture words vary in the degree of precision with which they are used and that some of these words can be used in more dimensions of tincture than others.



Green objects can be light or dark, dull or vivid. They can also be transparent or opaque, matt, glossy or metallic. White objects must be light and can only be opaque or translucent, matt or glossy. They cannot be transparent or metallic. Yellow objects can be anything a green object can be except dark or metallic. We have a separate word for dark yellow - *brown*, and a separate word for metallic yellow - *gold*.



One could argue that it would be useful to have separate words for green surfaces and green transparent objects and for all the other different kinds of appearance, but we are stuck with the language we have inherited. While I find the *concept* of tincture very useful, I do not expect the *word*, with the meaning I have given it here, to appear suddenly in everyday conversation.

All this might seem to be no more than an intellectual game and quite irrelevant to the practical work of an architect, artist or designer. However I believe it is useful to have a structure for one's thoughts. If a colour order system reveals a range of possibilities beyond the limits of the colour cards produced by the paint, ink and textile manufacturers, a tincture order system, with its structure of related structures, would reveal an even richer world of possibilities.

#### POSTSCRIPT

Following the presentation of this paper Jill Yates introduced me to Ezio Manzini's book *The Material of Invention* [14]. My immediate impression is that the book should be required reading for designers, especially product designers.

The aim of the book, in Manzini's words, is "to supply cognitive tools and cultural reference that may help to make the new fields of the Possible more easily Thinkable for a designer." Manzini is clearly aware of the role of language and is conscious of the difficulties and dangers: "The potential Tower of Babel that looms ... has ... been partially reduced by the editorial effort to lead the reader along step by step, explaining things thoroughly, in a tour of new linguistic areas.... we ask the reader to accept another set of difficulties. We believe that every new word acquired is a glimpse of the possible."

I hope that the concept of *tincture* presented here might be useful for a reader of Manzini's book. It was certainly my hope that the word, with the expanded meaning that I have proposed, would offer "a glimpse of the possible."

#### ACKNOWLEDGMENT

The snooker balls which feature in the illustrations were kindly loaned by *Pot Black*, Queen Victoria Street, Fremantle.

14. MANZINI, E. *The Material of Invention*. The Design Council, London, 1989.

