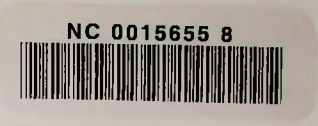

# PRODUCT SEMANTICS

A Dissertation submitted:

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and

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Facult of Design

Department of Industrial Design

by

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CONTENTS

# 1. INTRODUCTION

"For prehistoric man, the notion of shaping a club and using it to hunt was indeed a technological breakthrough. In the same respect, the development of the printing press, electricity and computers must be considered to be technological innovations. A common thread that ties all major technologies together in their ability to both liberate and enslave man. The club that can be used for hunting can also become a weapon to control and intimidate others; the technologies that can provide unprecedented access to information can become a tool for individual creative expression or a means of evading originality by categorizing solutions into predictable patterns."

(Brian Donnelly, Impact of Technology on the Design, Manufacture and Marketing of Consumer Products: Proceedings of INTERFACE 87)

During the course of modern design, now stretching back almost a century, there has been a running philosophical debate between the caps of formalism and functionalism. Formalists contend that elegance in products will create beautiful people and functionalists hold to beauty as the natural product of utilarian perfection. To some it appears to be a contest between an

established aristocracy of desire and an impatient democracy of need. Now the debate has expanded to include a third philosophy that is less concerned with form or function that it is with design for public service. The humanist designer strives for balance between social and cultural values and sees products as components in larger, increasingly more fragile environmental systems.

The book "Le systeme D'objet" by the French semiologist Baudrillard, appeared in 1968 and emphasised the communicative characteristics of consumer objects. Baudrillard proposed these were part of the "culture of communication" and as such furnished the opportunity of self-expression for the consumer within the existing culture. Similar theories have drawn attention to the consumer object as a symbol conveying encoded information in addition to its function, with the further belief that the object transmits a message which modifies the user's behaviour, consequently affecting the environment within which it operates.

The phenomemon of the human memory and the closely related accumulation of traditions and customs is currently under investigation by Adolfo Natalini, a member of Superstudio, one of the groups in the Architettura Radicale. His research concentrates on non-urbanised cultures, particularly agricultural ones, which are under constant threat of extinction and suffice

only in marginal regions of our society. From the remnants of these diminishing cultures he extracts information by concentrating his efforts on implements such as rakes, sickles, scythes, spades and baskets. He selects precisely these objects in their generic state, sculpted by the user, so that designers and user coincide. The techniques of their designing processes, Natalini hopes, will hold clues to enable us to reduce the gap between the designer and the user.

In ancient cultures, a single person designed, manufactured and utlised an object, producing it to meet individual specific requiements. Although the later introduction of specialists for the production of specific types of objects removed the user from the immediate production line, the process remained sensitive to the user's requirements. Only with the Industrial Revolution did specialization estrange the designer from the producer, forcing the designer further still from the user. In this newly forged consumer society, the ability to recognise and rephrase individual needs was vanquished, the result was a manipulated society.

The Industrial revolution was in all senses of the word a social revolution. By devising the means to harness the power of nature, man was able to mass produce products such as cookware and services such as railroad transportation radically altered

man's standard of living and irreversibly shifted the economy from an agricultural to an industrial plane.

A crucial factor in determining the success of mass production technology was the refinement of the concept of standarized parts. Author John Heskett writes:

"By the middle of the nineteenth century the rest of the world became aware of the new methods of manufacture in the United States that established the fundamental patterns and processes of modern industrial mass production. These were characterized by large-scale manufacture of standardized products, with interchangeable parts, using powered machine tools in a sequence of simplified mechanical operations. The implications of this approach, which became widely known as the "American System" of manufacture, were not confined to production methods, but also affected the whole organization and co-ordination of production, the nature of the work process, the methods by which goods were marketed and not least, the type and form of goods produced."

(J. Heskett, Industrial Design, Thames and Hudson, London, 1980)

Because mass production and mass marketing relied on high volumes of standardized products, a major goal of the merging field of

industrial design was to define values, and desires for broad population segments, and apply these results to the design of products with mass appeal. This approach was conducive to a period in history when american society could be dissected into large, defineable economic classes the general behaviour of which was relatively predictable. However, as technology forced us further into the future, the concept of segregating society into broad classifications gradually began to erode.

Approaching the end of the 1960s, when (according to sociologists) we entered a post-industrial society, the many processes of social and cultural change included one of vital consequence, which was the disappearance of the major mass markets.

"The pyramidal structure of the market, made up of a narrow apex of opinion makers and an inert mass of consumers divided into economic strata (the famous social classes) who supinely accepted the fashions and fictions imposed on them, has been replaced by the figure of the "intelligent consumer", a citizen able to make independent choices about his patterns of consumption and behaviour. This has brought a new polycentric configuration to markets, which have all become specialized, based on autonomous cultural systems that no longer correspond to the old socio-economic divisions of class, but cut across them

diagonally. Ever since 1968 the concept of "majority" as a value has collapsed, to a point that now only minorities are considered capable of producing culture and quality".

(Andrea Banzi, Hot House - Italian New-Wave Design, London 1984).

Therefore just like the contempory fashion industry one might propose that greater emphasis will have to be placed on creating products for individuals and specialized groups relegating the traditional approach of high volume/low cost production to posterity.

Throughout history, there have been times of slow and times of fast technological innovation. The same holds true for cultural innovation. For a long period now functionalism has stood the test of time, but now many signs indicate that cultural innovation hs achieved a pace that puts the timelessness of functionalism into question. In periods of constant change, different aspects come to be stressed, and this necessitates flexible adaption or replacement. Ettore Sottsass claims:

"Everything that becomes culture loses its force and its tastefulness after a certain time, because it no longer expresses what has to be said".

(Peter Van Kester, Michelle De Lucch, London 1986)

This therefore, would demand a concentration of effort towards a greater realism and closer adaption to a changing situation. The need to estabish a new frame of operation, more in touch with the social and cultural changes, taking place in the world around us, a consciousness that afford the industrial designer some active influence over these same developments.

"Over the last 20 years, we have found ourselves operating in a historical context which al the factors of cultural disaggregation have been exacerbated, in the sense that any unified hypothesis of design, as method or as language, has disappeared."

(Andrea Branzi, Hot House - Italian New-Wave Design, London 1984)

Industrial designer Dick Powell of Seymore Powell attibutes th new developments in microelectronics as a possible explanation for the turbulence design philosphy is currently experiencing, claiming:

"Designers can't use copy-book methods and standard tools anymore, they are having to adapt and evolve. But we are still in this period of change - it may take 10 years, or more. Many

of the products around today will probably be considered - seminal with hindsight, but at the moment they seem like a joke - it's the idea behind them that's seminal. One product that will probably be seen as a brave move in 20 years time in Sharp's coloured fifties QT50 radio cassette (fig. 1)."

(Dick Powell; Review of 1985; Design, December 85)

Fifties America, appropriately, fostered the design philosphy Powell believes is currently undergoing a revival - a distancing from "honesty of purpose" and mechanical considerations in favour of a greater emphasis on visual, sensual and emotional appeal.

This thesis will attempt to discuss the current approaches finding popularity in the field of product semantics and the renewed interest in the emotive functions of products.

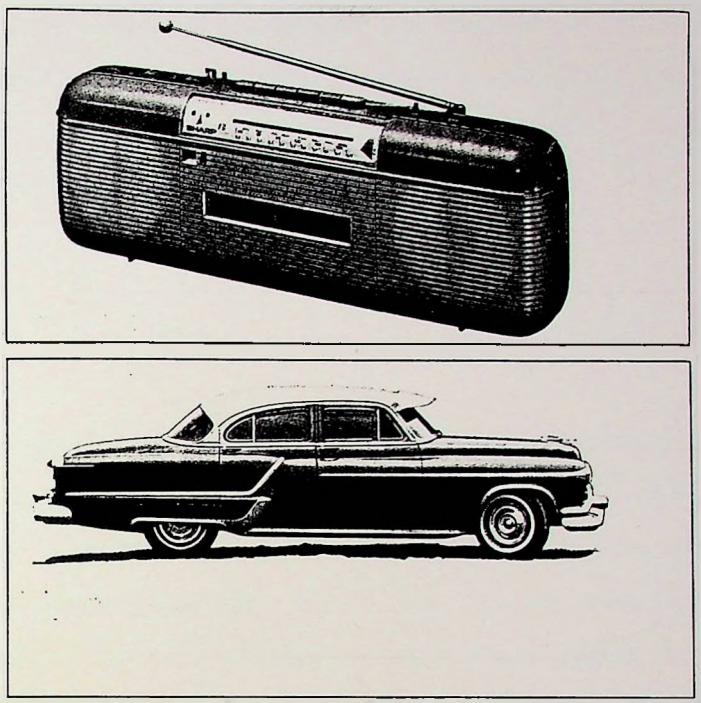


fig 1.

## 2. THE QUESTION OF FUNCTIONALISM

"As we find a mound in the forest, six feet long and three feet wide, shaped into a pyramid with a shovel, we become serious, for something tells us "someone is buried here". This is Architecture".

Adolf Loos, 1921

The interpretations that followed the functionalist theories of Adolf Loos and Louis Sullivan are questionable. Anonymous black-box exteriors have evolved as stylized solutions and are employed indiscriminately across the product range. The omnipresent black hue, infering seriousness and professionalism, is intended to confer product credibility. Frequently the design bears minimal relationship to the function of the object and offers reinclination to the operation or purpose.

Cara McCarty writes in "Mario Bellini, Designer":

"They exemplify the increasing trend of our technological society toward a loss of contact with the object: there is little to which a human being can respond".

(Cara McCarty, Mario Bellini, Designer. Museum of Modern Art, 1987)

Yet it is this practice, precisely, that merits the appeallation functionalism. Louis Sullivan's imperative 'form ever follows function' is quoted oblivious to the passage merely a few lines below.

"All things in nature have a shape .... that tells us what they are".

(Louis Sullivan, The Tall Office Building Artistically Considered 1896).

Industrial design today is faced with the failure of using solely a traditional "modernist" ideology. No longer does the formula "form ever follows function", provide the whole answer, and even the less restrictive guideline that "form expresses function". In an age of electronics, both maxims are well nigh meaningless, unless all electronic products should be shaped like a silicon chip, because so often the miniaturization of electronic components has removed the traditional constraint of significant physical component dimensions.

Increased relevance has been prescribed to comprehension of the

semantic facets of design because of the inherent difficulty in designing micro-electronic products. In the machine age the internal componenets and their relative configuration greatly determined the external shell of which attention to conditions of use were largely ignored. With the fifties and the introduction of electronic products on a vast scale, the decorative container with its prominent control mechanisms sufficed as a suitable design solution. The need for a closer symbiosis between man and product. The language in operation during this period was consistant with the container characteristics of these products. With the emergence of micro-electronics, product volume has diminished in both scale and importance.

Size and shape is primarily contingent on the way and context in which the user interacts with these products. The contact occurs only on the products surface and the solitary function of the products volume is to present this surface. Semantic application is a valuable tool for defining how the exterior can now best perform its function, not merely the physical and physiological functions, but the physchological, social and cultural contextual functions, which constitute the symbolic environment.

An observation on consumer behaviour today reveals an increased consumption of nostalgic objects or nostalgically designed objects. Lionel Tiger, a professor of Anthropology and author of

"The Manufacture of Evil: Ethics, Evolution and the Industrial System", states that:

"Communitites confused or discontent in the present often strongly rediscover the moral and spiritual meaning of the traditional objects of their past".

(Lionel Tiger, Progress May Not After All, Be Our Most Important Product; The New York Times, January 11, 1987)

This confusion or discontent has usually been associated with so-called "traditional" societies - certainly not industrial ones. Recently, however, the increase use of high technology - especially the electronic technology of everyday life - has elicited a counter reaction: a withdrawl from the rational scientific world in favour of exposed emotion. The impersonalization inherent in our fast-paced technological advance has brought to light peoples need to be emotionallly touched by their objects. Uri Friedlaender, currently a designer with Moggridge Associates in London, claims:

"People express their political and ideological values through the objects they surround themselves with. In so doing, people use objects as a vocabulary for visual communication through

which the choice of objects becomes a creative, expressive act. In ancient cultures, many objects fulfilled only symbolic and emotional needs, such as the gravestones, jewellry and cult items. Others fulfilled a symbolic meaning apart from their practical function".

(An Historical Perspective on the New Wave in Design Innovation, 1984)

The current cultural milieu and mounting dissatisfaction with technologies indifference is providing and environment conducive for considering the symbolic content of industrial products as a fundamental necessity in the design process next to the functional and aesthetic content.

"Whatever new technology is introduced into society, there mut be a counter balancing human response - that is, high touch. The more high tech., the more high touch".

(John Naisbitt, Megatrends : Ten New Directions Transforming Our Lives).

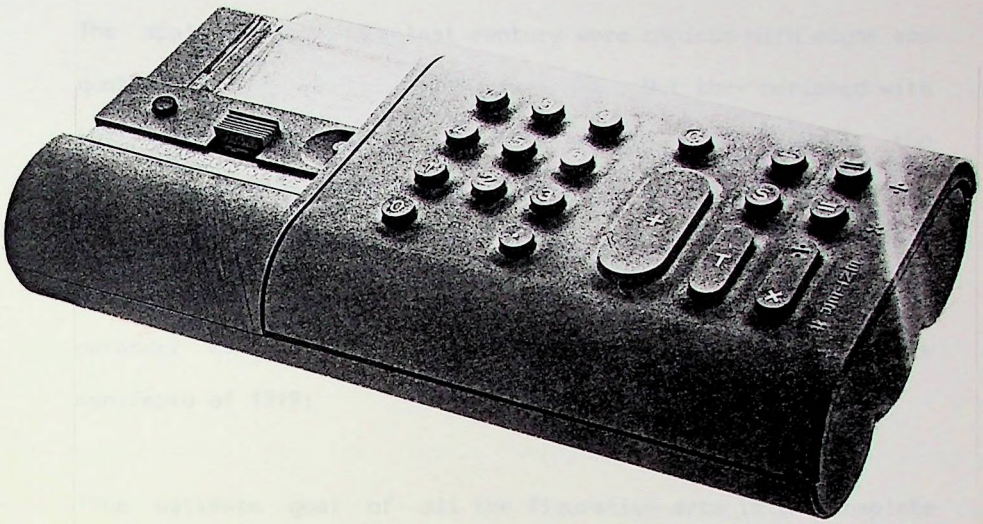
The "old functionalism" with its methodical and rational

propensities must be ousted by an emotional and sensual orientation, a 'new functionalism'.

A contemporary exemplification of the consciousness is found in the work of Mario Bellini. Bellini emphasizes the tactile interface, advocating that adults should explore the environment through their senses like children. He achieves this effect by capitalising on the intrinsic expressive capabilities of materials such as plastic which lends itself to smooth sculptural shapes, and can be moulded in stretched membranes, conjuring forth sensuous landscapes or the human form..

The Divisumma 18 Electronic Printing Calculator (fig. 2), designed in 1972, polar opposes the anonymity of high-technology products. Enveloped by a continuous flexible anthropomorphically suggestive rubber-skin key board, which affords greater purchase for playful manipulation, it is a welcome alternaive to the imbiguitous high efficency facade of contemporary technological products. Articulated push buttons, covered with soft rubber skin, are reminiscent of nipples, where emphasis is most definitely on arousing a sense of pleasure and provoking emotional response.

Stimulus generally unassociated with industrial products and an



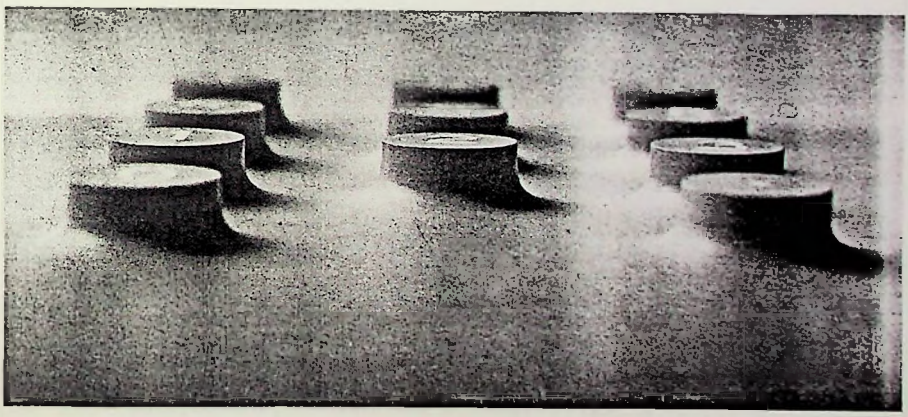


fig 2.

attestment to a distancing from the concept of a product as a mere functional appendix.

The applied arts of the last century were copious with signs and quotations, of metaphors and ornament. But they perished with the encroachment of the present century, subjugted by the theories of unity propogated by the Bauhans with its emphasis on the integration of arts and techniques, with architecture, as the predominant, general, instruction of control, posing as a defender of a possible unity of prupose. Gropins wrote in his manifesto of 1919:

"The ultimate goal of all the figurative arts is the complete building".

(Andrea Branzi, Hot House, Italian New-Wave Design, London 1984)

The consequence of this hypothesis was the evolvement of the product as a contribution to a whole, which hitherto had functioned as an independant transmitter and a source of enrichment within the domestic space. In this sense the products significance was dependant on its ability to relate in dimension to its environment, which was the building; they hence became anonymous, devoid of any authentic cultural and therefore practical relationship with the user.

## 3. CHALLENGES FOR TRADITIONAL SEMANTICS

"Product semantics is the study of the sumbolic qualities of man-made forms in the context of their use and the application of this knowledge to industrial design".

(Reinhart Butter, Exploring the Symbolic Qualities of Form, Innovation, 1984).

Traditional semantic theory, emphasizing linguistic expressions, distinguishes between sign, referent and thought: that is between something that is intended to represent, something that is represented thereby and someone who makes the connection.

Product semantics stridently opposes these traditional distinctions. A products form initally communicates aspects of the product itself; secondly, aspects concerning the broader context of its use; and both aspects to the user who interacts with it and develops the conceptual connection. It is important to emphasis that a products form does not communicate what it is. The product is what it communicates to the user. A control knob when recognized as such suggests "turn me", it's proximity in relation to the configuration of parts or its label suggests the consequence of such an action. The button is referential

to its self and to the product of which it is a part. Therefore, in product semantics the imputed relationship between sign and referent is eroded and becomes one, the remaining links between the product and its user form a circle. The user manipulates the object, and receives feedback through the consequences of these actions, leading to further manipulations and so forth. In this continuing process, the user and the object finally adjust to each other cognitively and behaviourally.

Reinhart Butter the man who first coined the phrase "product semantics", suggests:

"All man-made forms have socio-cultural histories, elaborate existing archetypoes, and all are loaded with social meanings that place them in the symbolic context of their use".

(Reinhart Butter, Exploring the Symbolic Qualities of Form, Innovation 1984).

Butter believes that the traditional distinction between syntax, semantics and pragmatics is not particularly relevant. C. Morris, outlines the traditional distinctions:

"The relationships among signs belong to the domain of syntax; the relationships between signs and their referents constitute the

semantic domain; how both effect a user defines the domain of pragmatics; and all three are subsumed in semiotics, the general theory of sign processes".

(C. Morris, Signs, Language and Behaviour, New York, Prentice Hall, 1946)

General adherence to these traditional distinctions encourage one to think in linguistic metaphors which propagates the theory that the symbolic qualities of products should refer to something other than themselves, promoting the proliferation of products with no individual product identity.

Both signs and their referents relative to a community of users, can be comprised as a symbolic unity.

Klaus Krippendorff and Reinhart Butter, IDSA, promulgate that meanings pertinent to product design may be communicated via four symbolic channels:

* Information displays, these represent and convey visual and audial information by means of screens, speakers and moveable sign boards. The information furnished is reciprocally related with phenomena extrinsic to the

products form. Assuming that the user only interacts with the surface of a product places this information beyond the realm of product semantics. The designers concern is confined to the interface between such displays and the user.

* Graphic elements or two-dimensional markers, encompasses adhesively applied labels, colour codes and instructions that are permanently fixed to the products surface. These are classified as linguistic signs. Their meanings are extrinsic to the object conveying the information. They are also outside the domain of product semantics and pertain to their own semantic domain. Nevertheless this does not affod disregard for the meanings they capacitate within themselves.

* A products form, shape and texture, define with some measure of exactitude what the product is, how it might be used, by whom, its context and to what ends. A products form, shape and texture are expressly indiginous to that product, and they are unfathomable without the object being that object for a user. In this sense formal components contrast with graphic elements. The essential characteristic concern of product semantics is the symbolic content of the products form, shape and texture.

* Indications of a products internal states are external formal clues of the internal functions of the product when operational. Much concern is addressed to the logic of the information provided about the components and interior functioning of products. This information allows the user a conception of how that object might work internally without disassembling the unit. Such indications may employ three-dimensional forms rather a loose case of form expressing function. Windried Scheur's fan Heater (fig. 3) illustrates the different functions of the switch, the asymetrical fan case and the supporting legs in an easily identifiable product in which the external form mimics the internal mechanism.

There are four kinds of semantic infelicities in the design of forms in relationship to the context in which a product may be placed.

* The most rudimentary infelicity common to the practice of product semantics is the failure to differentiate products, thereby rendering them indistinguishable to the user. Priority must be given to prevent such occurances in emergency equipment - fire extinguishers, escape doors, emergency buttons - that must be immediately evident under traumatic conditions - Infelicities in identification can

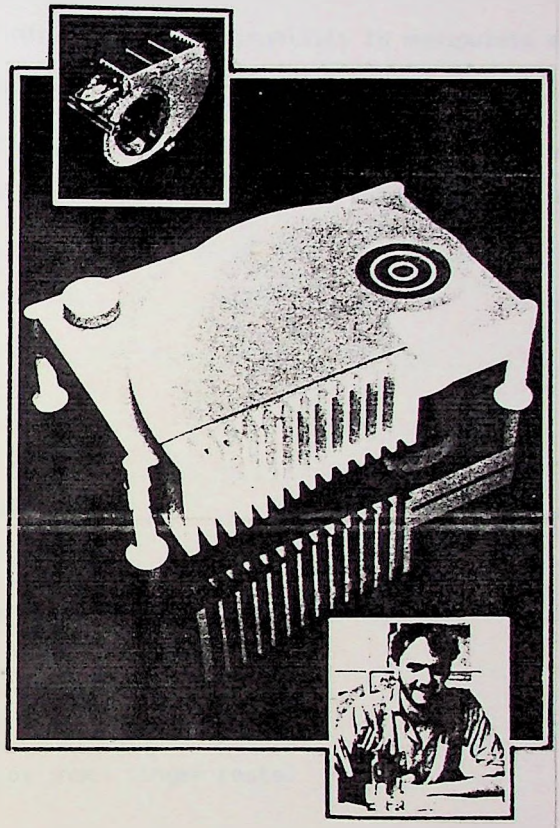


fig. 3.

also prove costly when extensive public campaigns or training programs are required to differentiate one product from another or to make a particular product recognizable for what it intends to be or do.

* A second infelicity is the inability to manipulate a product in the desired way this is an important concern of product semantics and of particular significent is the visual/tactile differentiation of a products component part, involving the manipulation of some and discouraging contact with other parts, especially if the part is hazardous to the user, as with an electric carving knife or the hot plate of a cooking unit.

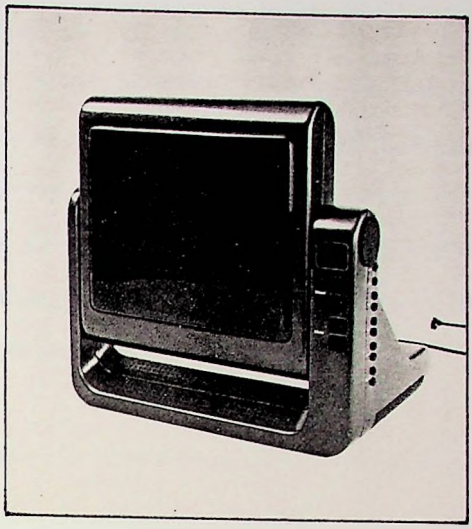
The spatial configuration of component parts, movements and controls that must be logical, not for the designer but in terms of the user's mental model of the product he wishes to manipulate. For example the most logical position for a power switch on a hand operated circular saw might be where the thumb or index finger rests.

Also the indication of the products internal states in places easy to read and of a kind necessary for or supportive of its successful manipulation. In providing such indications, designers should opt to stay with existing

population stereotypes, such as reading from left to right and turning a knob clockwise to increase volume or treble.

* A third kind of infelicity obstructs exploration of a products nature by the user interacting with it, either to improve its operation or to discover alternative applications without external assistance. To overcome this infelicity, forms that stimulate curiosity and encourage harmless play may be employed, likewise forms that are somewhat ambiguous or novel and require of the user that they invent their personal meanings and cognitive representations suitable to handle the object effectively.

* A fourth kind of infelicity stems from a products inability to fit the symbolic environments wherein users must operate them. The interpretation of objects depends chiefly on the symbolic qualtities of other objects that surround or interact with them. A 30 year old radio no longer satisfies the expressive needs of a modern day teenager, regardless of sound quality. It basically will not fit the social, high-tech environment which defines their identity. Figure 4 illustrates an attempt to develop a television receiver that is unique in form and less restricted in use by contextual definitions and therefore more liberated to operate within alternative symbolic contexts.



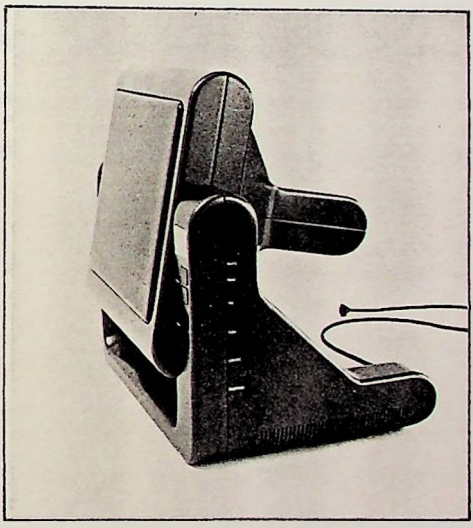


fig. 4.

## 4. SEMANTIC TRANSFER

"To meet today's humanistic needs, the human quality of a product - its good design - will be defined increasingly by the products ability to express its meaning for man. As a result, semantic characteristics must increasingly determine form. To make such use of semantics, the spacial relationships can be organised according to their meaning in a semantic space or dimension".

(Hans-Juergan Lannoch, How to Move from Geometric to Semantic Space; Innovation 1984)

Hans-Juergan Lannoch, a graduate of HJG Ulm and a major proponent of the semantic vanguard presents the hypothesis that our verbal language provides the most differentiated and comprehensive expression of meanings in the context of people's communication with the spatial environment.

"Having an historic origin and evolution, language expresses not only the casual relationships between humans and objects, but also the socio-cultural context of that relationship".

(Lannoch, How to Move from Geometric to Semantic Space; Innovation 84)

Calling the process semantic transfer, his approach, in essence, requires that he translate into concrete form, words and expressions drawn forth in association with the concept of an object.

Semantic transfer commences with the semantic analysis of verbal descriptions. The ambiguity inherent with works prevents a pragmatic approach therefore a broad descriptive approach is favoured, encompassing socio-cultural and metaphorical implications, rather than a precise definition of words.

The word hot represents not solely a material quality. There is a hot dog, hot-lips, a hot-shot and hot-headed. Lannoch's semantic transfer, necessitates transferal into formal composition the complicated linguistic imagery developed during the words semantic analysis. The results of this transferal process have no technical or functional ends. Rather the discovery and creation of visual words in three-dimensional form is warranted, stimulated by our verbal comprehension and sensorial experience with the physical properties of our natural, technical and social environment.

Lannoch commences with a "sphere-like but amorphous object". The introduction of simple form elements develop a link between the product and our verbal image. Expressing the word hard, for example, crisp edges an immediate form changes, could be introduced, emphasised by solid structures or an upright position. However, no

definitive form exists for a particular word, but rather ambiguity.

Accepting that the user interfaces with only the exterior of a product, words are selected that determine surface orientation, such as, smooth, coarse, soft, flat, cool, warm. Apart from the communicative role of product semantics, the preponderance with formal elements demonstrates that products do not have an inside, only an exterior which is turned toward man.

## 5. ART AS A MEANS OF INSPECTION

"What do you thing an artist is ? An imbecile who has only his eyes if he's a painter, or ears if he's a musician, or a liar at every level of his heart if he's a poet, or even if he's a boxer, just his muscles ? On the contrary, he is at the same time a political being, constantly alive to heartrendering, fiery or happy events, to which he responds in every way. How would it be possible to feel no interest in other people and by virtue of an ivory indfference to detach yourself from the life which they so copiously bring you?"

Pablo Picasso 1945 (referring to Guernica, A concise History of Modern Painting: Herbert Read)

Echoing Picasso's sentiments, Marcel Duchamp believed that in spite of the sweeping revolution that already had taken place, art was still being considered as a purely "retinal affair". In Britain, the study of design and its history, according to Adrian Forty in Objects of Desire, Design and Society 1750-1980 (London 1986), has suffered from a form of "cultural labotomy", which has rendered design connected only to the eye, and severed its connections to the brain. This mode of perception, particularly when addressed to the subject of product aesthetics, restricts the arguement to one of subjectivity and

relegates it to the status of a trivial endeavour.

To evade this "retinal affair" critique, the word 'presence' might be employed as a euphemism for 'aesthetics'. 'Presence', more aptly expresses the qualities of an object that can be perceived by one or more of our senses. 'Appearance', also limits the discussion to qualities apprehended through vision only. Similarly, the words 'shape' and 'form' would offer a limited scope : they exclude colour according to Wim Gilles:

"An object can be appraised through visual as well as tactile experience. It can also be judged through kinesthetic (weight-distribution, plasticity), acoustic (resonance, sound), olfactory (smell, such as that of real leather for car upholstry), and gustatory (taste) experience. Even time experience may play a role: The time it takes to scan or palpate an object or to walk around it may contribute to the judgement".

(Wim Gilles, Innovation, IDSA, 1985)

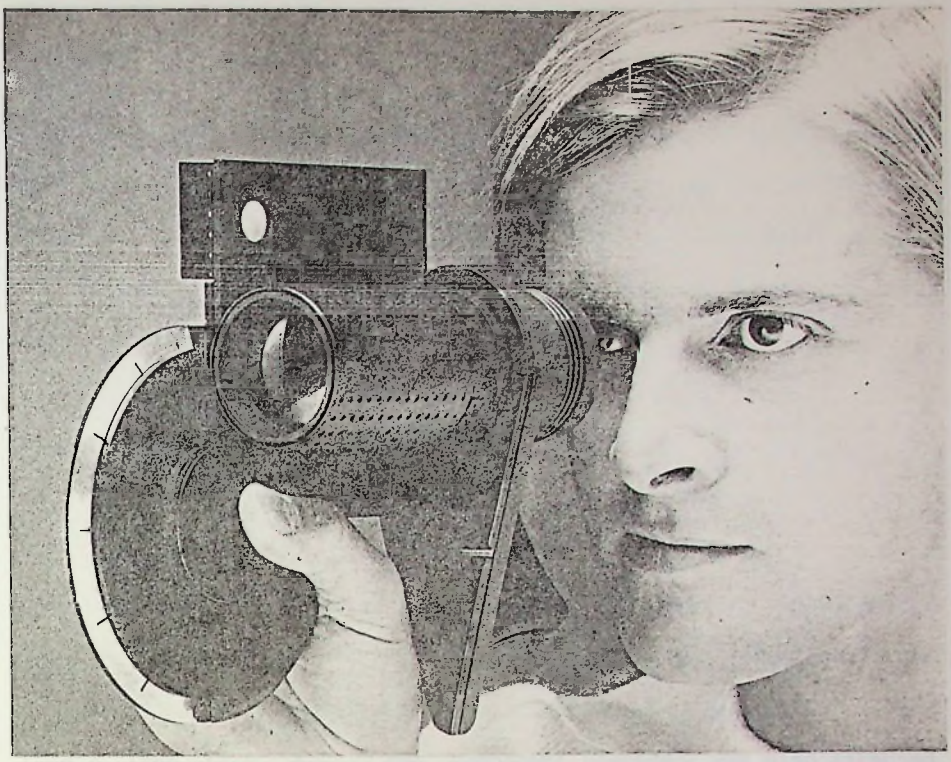
The presence is one of the industrial products many distinct values or qualities, including its performance, its energy - efficiency, its utility and safety in use, its reliability, durability and serviceability. These qualities of use are designed into the object.

In contrast, the presence of an object, its sensory qualities, are contained in the product, whether by default or by design.

Contrary to what some people want to believe, the sensory qualities of form do not necessarily follow its function. As Peter Behrens admonished, it was a "fallacy" to believe that "even the most exacting and stringent attempts to satisfy functional requirements" could, on their own, create "the moment of beauty". (Industriekultur, Peter Behrens and the A.E.G). If we are to ignore functionalist imperatives and if technology is removing constraints on product form, what direction is the designer to take to create "the moment of beauty". The wealth of images created by the visual arts is one area that can begin to provided inspiration for the designer in the creation of product presence.

David Gresham and Martin Thaler attribute the visual arts as a source of imagery for their CD Video Camera (fig. 5). Funded by the RCA in conjunction with the Cranbrook Academy of Art, their aim was to investigate the role and potential of product semantics in the design of a handheld video camera. They propose:

"Product semantics opens many new possibilities for designers. This language can expand the design process and simultaneously make the product more understandable to the user. Semantic expression alone is no formula for design, but it is a point of departure for the designer



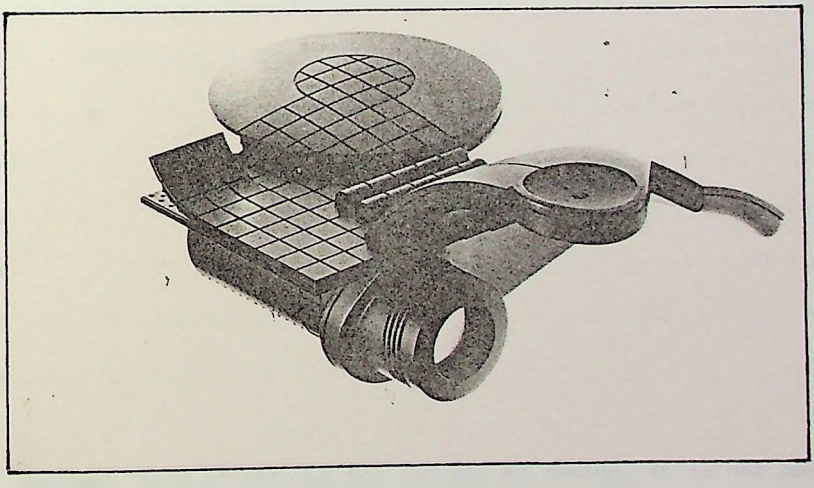


fig. 5.

in the conceptual process, a concept that can be used in conjunction with the principles of form, scale, composition and proportion developed by the visual arts. Together they can expand the language of design, a language of aesthetics and meaning rather than pure functionalism".

(Compact Disc Video Camera, Innovation, IDSA, 1984)

In resolving the final configuration of the camera, its mask-like quality was inspired by the cubist experiments in abstracting the human form, with particular reference to Picasso's abstraction of the female face (fig. 6). The component placement was also arranged around an extension of the geometric composition and inherent proportional system of the profile and face (fi.g 7).

Whilst, achieving a remarkable expression of the cameras function by clearly relating the component parts to the geometry of the user's head and face, the use of the viewfinder is severly restricted to the right eye. Had the camera been suitable for both eyes, the mask-like quality of the product would have been infinately more difficult to resolve. This is indeed a case of asethetic novelty at the expense of function, an inexcusable infelicity.

As Duchamp said of art, we too can say of design, it is not merely a

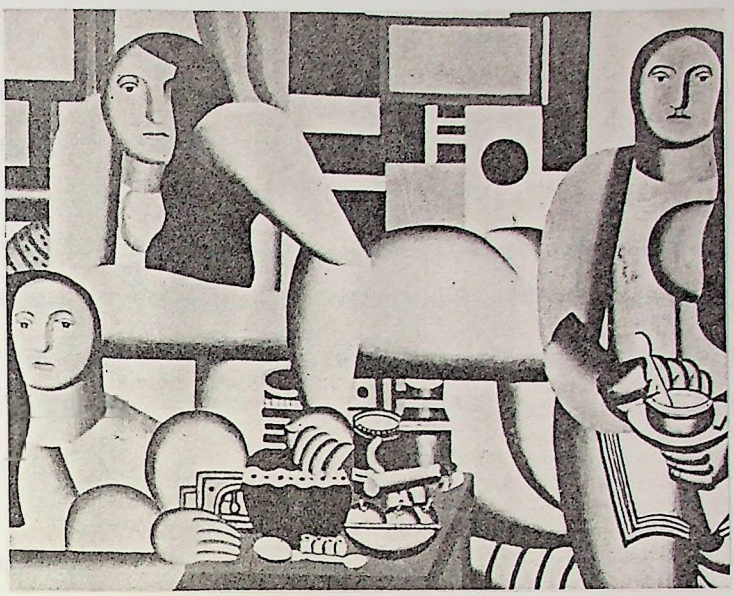


fig. 6.

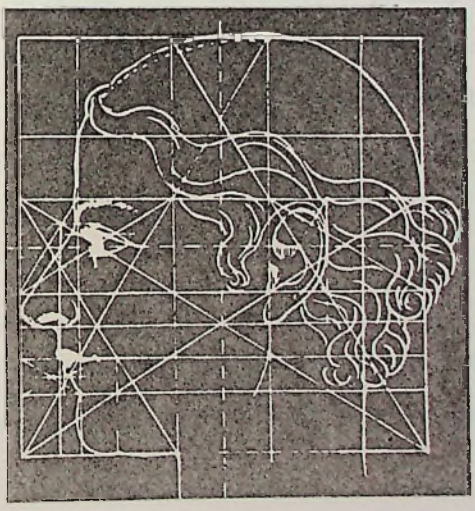


fig. 7.

"retinal affair". Semantics if it is ever to gain credibility, must be seen to enhance the performance of the product and never work to the detriment of it. The reproach of Bill Stumpf, a Minneapolis designer is particularly relevant here,

"The semanticists' focus on visual imagery and metaphors can even undermine functionality. My only concern is that America can't live on a diet of metaphors. Design is not just a visual experience. We've lost track of the fact that things should work better than they do".

(Forsaking the Black Box: Designers Wrap Products in Visual Metaphors, Wall Street Journal)

Adrian Forty in Objects of Desire, Design and Society 1750-1980, (London 1986) broaches the arguement regarding confusion of design with art and the subsequent idea that manufactured artefacts are works of art. A view compounded by the emulative exhibit of industrial products in museums of painting and sculpture. Attempting to differentiate, he writes,

"In capitalist societies, the primary purpose of the manufacture of artefacts, a process of which design is a part, has to be to make a profit for the manufacturer. Whatever degree of artistic imagination

is lavished upon the design of objects, it is done not to give expression to the designer's creativity and imagination, but to make the products saleable and profitable. Calling industrial design 'art' suggests that designers occupy the principle role in production, a mis-conception which effectively severs most of the connections between design and the processes of society".

(Adrian Forty, Objects of Desire, Design and Society 1750-1980, London 1986)

S. Bayley, takes a less mercenary perspective claiming:

"Industrial design is the art of the twentieth century".

(S. Bayley, Good Shape, Style in Industrial Products 1900-1960, London 1979)

A statement which presents additional obscuration differentiating art from design.

The aesthetic content of industrial products are subjected to numerous technical and marketing constraints, corrupted by unwarranted preferences held by intermediaries and distorted by the visual and tactile illiteracies manifested by those in charge of production and

marketing.

According to Sedionary industrial designer, Daniel Weil:

"Aesthetics of products are controlled through cost effective arguements, taken as absolutes, but they are not, they are subjective and reveal archiac concepts of production".

(Catherine McDermott, Street Style, British Design in the '80s, New York 1987)

Under contemporary conditons, art objects are generally both conceived and constructed by (or under the supervision of) the artist, this is untrue with industrial products. It is this autonomy, which has influenced the belief that the important utility of art is to provided free expression to creativity and imagination. Whether or not this is the case with art it most certainly is not with industrial design.

For Weil, the barrier between art and design does not exist. He cogently argues that there is no reason beyond our conditioned expectations of what technological artefacts should look like and why design should not accommodate the wealth of cultural reference and personal experience found in art. Marcel Duchamp proposed using a Rembrandt as an ironing board, and Weil envisages no reason why a

painting by Picasso and a washing machine should not merge as categories of object both in our minds and in the physical world, Weil claims:

"These things are not static; they are constantly active. What I'm trying to say is why can't we make them by means of references, ideas, sculptural form, colour, materials - anything that will define the final form - permanently, like paintings that have the capacity to be reinterpreted by a new critic every year, and find another meaning in them part from their functional purposes".

(Daniel Weil, Design, November 1986).

The knowledge product semantics provides about how objects work within the context of their use cannot entirely be expressed in terms of Linear communication between a designer and a user. The crucial difference lies in the individuality of the user's interpretations which evolve in the continual process of their involvement with the product.

Donald J. Bush a design historian, and author of the Streamlined Decade, explains:

"A useful object may convey differing meanings according to its

particular configuration. Even in its most generic state it may have bivalent or multivalent connotations".

(How Objects Speak: Product Semantics for the 1980s, Proceedings of Interface 1987)

This being true, Weil's rather utopian concept of "permanent activity", with respect to industrial products may be realized. Compared to the artists autonomy, the circumstances of industrial designer's restrict them to mere contribution communicators, although very important ones.

Weil's polemical approach yields work copiously encoded with meaning and facilitates decipherization more commonly associated with the plastic arts. A lamp fabricated from funnels and fairy lights was constructed according to instructions from Duchamps Large Glass. A clock (fig. 8) features cubist imagery "because cubism had a very deep interest in the concept of time.

People in different communities produce things, some of which they consider artful. Sometimes the producers are religious figures, at times outlaws, or celebrated heroes, such as artists and sometimes just plain folk, as in folk art.

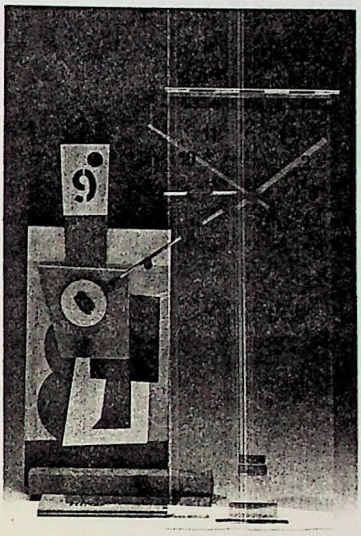


fig. 8.

"Industrial societies have exaggerated the pompous and finally fruitless difference between high and low art. We have failed to see that industrial designers are really the folk artists of our civilization. The work they do, which we may possess innocently in our homes, is as vital and reflective of our life and times as the ceremonial treasures we line up on museum walls. But by and large we do not know who these designers are. They are barely part of the power structure of taste. An industrialist is more likely to be familiar with the Milanese artist who painted his mantel masterpiece than with the designer whose work is the point-of-sale statement about the products attracting the cash to support the collector's habit. Our most familar objects are created by strangers".

(Progress May Not, After All, Be Our Most Important Product, New York Tmes, January 11 1987).

Form and content are inseparable in art, while for industrial design the content generally antedates the form. A painting is an answer to a need that cannot be conceived apart from the painting that responds to it. Industrian design on the other hand, is a response to a need that can be discussed independently, and that can be satisfied by several alternate solutions.

Hilton Kramer explains:

"The designer must hand over what he has invoked to the hazards of contingency at the very moment that the artist will want to transform it into a state of meaning. Because the designer wishes to affect of lives more directly, he speaks for our experience only remotely if at all. Art illuminates experience without asking us to become something other than we are. The motive of all design is to change lives ..... even the most prosaic design always aspires to an ideal, while art addresses itself to actuality".

(Ralph Caplan, By Design, New York 1982)

Much of the most traditionally satisfying tasks are today given over to specialists. The tensions that result are obvious and one response to the intrusion of technology is a reaction against it, with the belief that machines are evil. This is perhaps more dangerous than the Luddite position, which was based on a basic fear of job competition. Perhaps, the anti-technological neuroticism is more complex. If industrial design becomes deeply effective with an emotional content proffered by art, it may help make our machine civilization more humane and technology less oppressive.

# 6. PRODUCT IMAGE

"The public is not unready to accept the superior; it is unready to accept the unfamiliar".

(Ralph Caplan, By Design, New York 1982)

The presence of a product has earlier been defined as a quality based on all possible sensory experiences. The image of a product is not the presence itself, but the mental picture evoked by its presence. It does not necessarily follow that the image will reflect the presence of a product accurately. As interpretation of the product is arbitrary the presence is subject to variance under social and psychological influences. One might claim that the image is the single most important cirterion in the judgement of its asethetic quality and it is this quality that challenges most of the designers creative talent.

Within the realm of imagery we can categorise: images of general characterization; referential images; symbolic images; and metaphoric images.

Images of General Characterization: These images can be identified comparitively by juxtapositions such as: tall-short; heavy-light; expensive-cheap;.

Images shuch as these may suggest a quality actually uncontained within the object. A heavy visual image for example, may on inspection find a product made of polystyrene foam. Images of characterization may be drawn forth simultaneously with other categories of images. They may be independant of other imagery, merge compatitively or conflict with it. Memphis experimented with this type of imagery quite extensively, combining heterogeneous, cheap and expensive materials, of rough and smooth textures, of opaque and sparkling surfaces; with ulterior motives of derogating high quality materials such as marble by combining it with plastic laminate or conversly, elevating plastic laminate to the status of marble. The "Capodanno" lamp, designed by Ettore Sottsass (fig. 9) is an example of such, combining brass, plastic laminate and florescent bulbs in an attempt to confuse the image of characterization.

Referential Images: This category is comprised of a number of sub-groups. Imitative images, confer the presence of one product to another a presence usually of a greater quality. To take a cynical perspective, this imagery can fall prey to the misdemeanour of plagiarism.

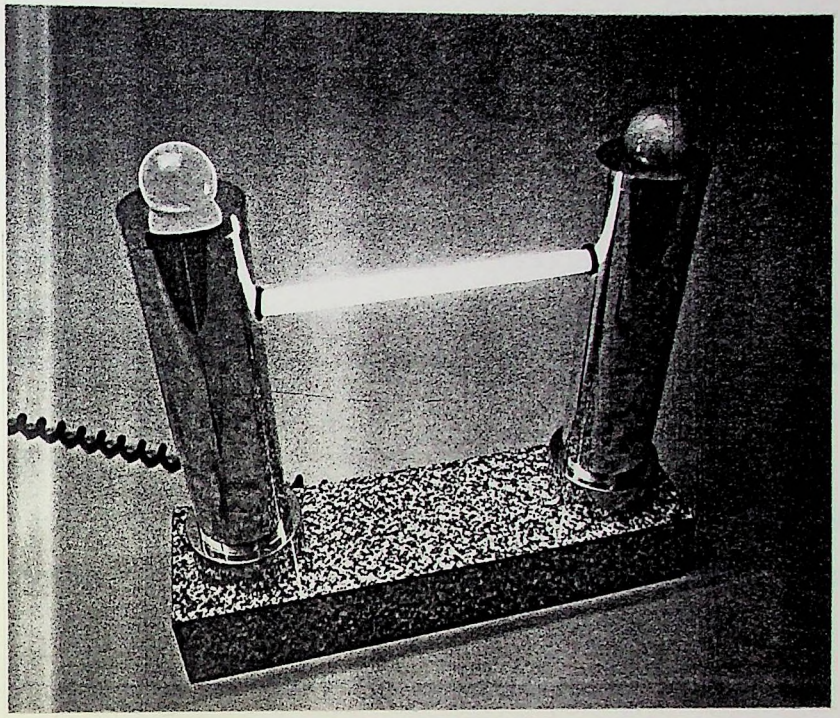


fig. 9.

Although such borrowing is generally deceitful, it need not necessarily be. Marketing often requires of a range of products a common identity, this is achieved by means of imitative imagery.

Deceptive imagery bears certain similarities to imitative imagery in that it represents that of which it is not. The prestigious pre-world war 2 ocean liners, the Queen Mary, the Normandie and the Queen Elizabeth, all flaunted large funnels. Technically, one funnel was sufficient, the dimensions of which could have been minimal; however the romantic imagery required of ocean liners dominating funnels.

Resultantly, larger-than-necessary funnels were featured, which occasionally served mainly to camouflage equipment or facilitate a bar. The unfortunate proliferation of woodgrain effect, plastic housings, is a further example of this imagery.

Products employing associative imagery, are often subject to idealized contexts such as the world of high society, movie-stars and oil-barons, that are beyond the scope of the mundane reality of everyday life. The incorporation of forms and materials associated with space exploration for the design of highway cruises is an example of such. Associative imagery also operates on a more terrestrial plane, where to communicate proficiently,

easily recognizable stereo types are normally employed. If a products association is professional, for example, details of presence that connotate professionalism must be generally recognized. Simple geometry, dull black finish, and hard edged components serve as the clues for professional equipment in the world of photography.

Associative images can, of course, also occur inadvertantly. The association may be favourable, but an unfavourable association will naturally promote adverse reactions on the part of the consumer. Philips, for example, recently developed a microwave over (fig. 10) for use on the dining-room table, the form of which was intended, by means of associative imagery, to simulate an old-fashioned cooking vessel or a fondue pot. However, the proposed form was humourously reminiscent of a nuclear power plant and was withdrawn.

Other subgroups of referential images are distinguished by what they refer to: location (urban, rural, Italian); time (contemporary, nostalgic, space age); style (Doric, Gothic, Baroque); ambiance (environments such as sports, bedroom, office); and fashion (trend-setting design details).

Fashion images evolve cyclically, commencing amidst convention when all individual products have a general likeness. Usually, a

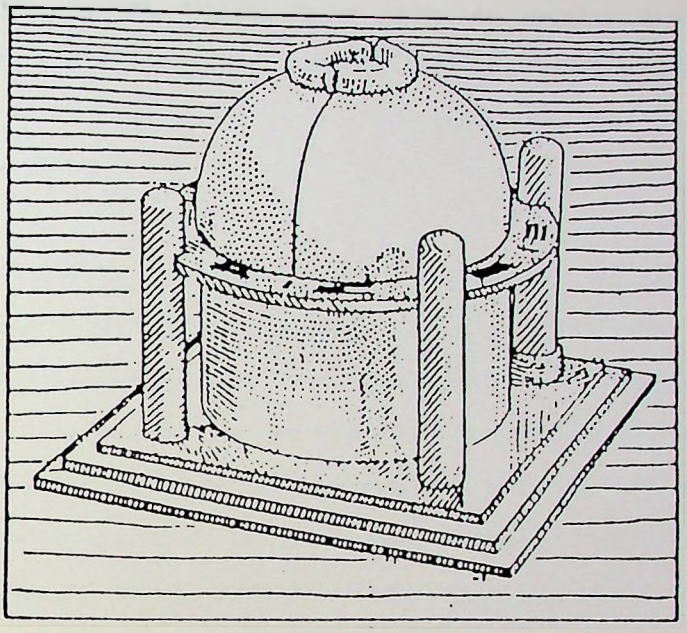


fig. 10.

designer will have the opportunity (or courage) to propound an alternative presence within this environment of convention, a presence that indicates a change of imagery. Once this alternative presence attains proven consumer popularity which exceeds that of its peers, it becomes a trend setter, ramifying into other product regions which begin to develop similar presences. Many consumer goods deficient of individual fashion, actually refer to another type of product, particularly with regard to colour.

Symbolic Images: The symbol operates on an agreed upon set of conventions to signify something beyond itself. As the Cross and the Star of David represents a set of religious beliefs and their histories and origins, so too does the green, white and gold of our flag stand for a sect of secular beliefs and their progress. Symbols - images in and of themselves - are simplified pictures of something generally accepted by a particular public sector to represent an idea.

The application of symbolic images in products is limited, however, the application operates commonly in a reverse process, where products themselves evolve as a symbol of which it presumably is not intended to be. Other products symbolize social standing. In the Netherlands, the Volkswagon Beetle has been associated with the travelling salesman while the Citroen

2CV has been associated with young intellectuals and professionals. Similarly in Great Britain, the Lambretta has become the symbol for the mod. teenage faction which originated in the 1960s.

Metaphoric Images: The process of using product semantics to identify the signification of a product and its component parts is closely allied to the more intuitive process of creating metaphorical imagery which conveys visual and functional similarities between an object and abstracted, commonly known shapes, movements or occurrances that originate in nature, history or technology. It is the use of a metaphor in a particular context that gives a product its meaning. The process of reading, digesting and comprehending is an intellectural interaction between the user and the product that establishes knowledge as the basis for a unique understanding of the metaphor. A different "knowledge" will result in a new interpretation of the metaphor and possibly in a completely different relationship between user and object from that intended by the designer.

To illustrate this point let us consider a coffin situation on the centre aisle of a church. On approachment, the environments visual and sensual components induce us to associate what we perceive with former experiences telling us someone lies dead

within. Death is a solemn event, therefore on sight of the coffin, we feel sad. The initial reaction is an intellectual one based on knowledge, contingent on social and cultural heritage. The second reaction to the coffin is emotional. A meaning is interpreted for the coffin based on associations drawn from prior experience.

When the shape no longer fulfills its practical function, the function associated wih it, then the shape assumes the status of a metaphor. The coffin is a metaphor if it is not used to contain a carcase. If the coffin is estranged by removal from its natural environment, we still recognize it as such, greeting it with respect. A further alienation of the form, by scaling it up or down or by constructing it out of uncommon materials, gives the metaphor a new context. The intellectual process by which we interpret the shape and its associations in its new environment will provoke a novel interpreation of the metaphor and a different emotional response.

One of the most appropriate uses of metaphor is for products where the mechanical design gives no clue to the objects meaning, as in micro-electronic components. As technology minimises the required form, the design can invest the object with both practical and emotional communication by means of metaphor, thereby, allowing the user novel ways to perceive both the

product itself and the thing to which it refers.

Michael S. McCoy, Co-chairman of the design department at Cranbrook Academy of Art, which helped pioneer product semantics, points out,

"Appropriateness to the situation is still necessary. Certain design situations call for simplicity and clarity while others call for complexity and ambiguity, the difference between designing a stop sign and designing a book of poetry. The advantage to working with semantics and metaphorical images is that, by understanding what the forms signify, you can elect to make a design either clear and staightforward or rich with layers of meaning. The design of a control panel calls for the former approach whereas the design of a table may call for the latter".

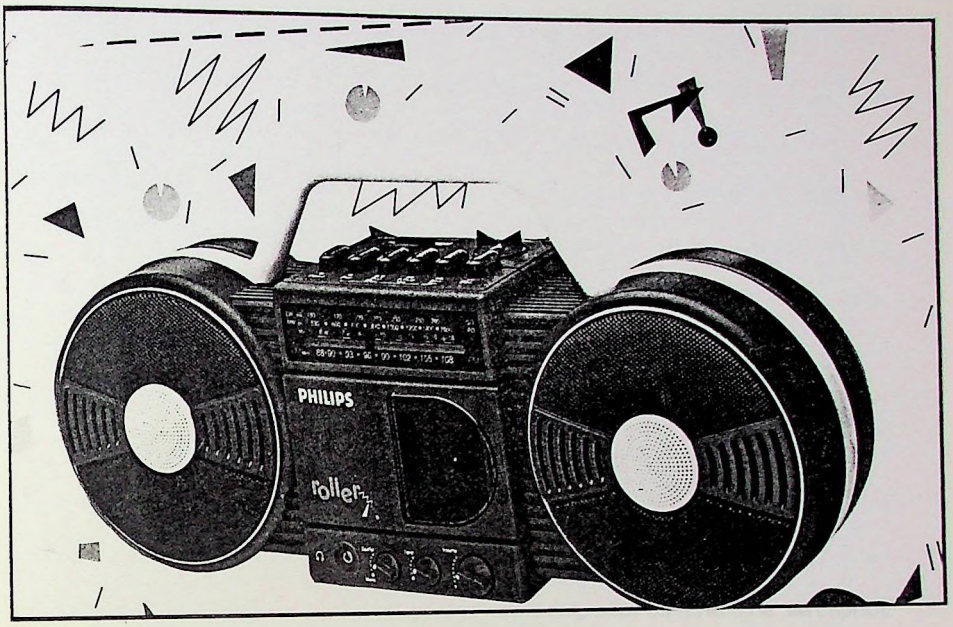
(Michael McCoy Defining a New Functionalism in Design - Innovation 84)

The perspective, enables design to become an interpretive process where metaphorical symbols are a visual language that provide a method of deciphering a meaning from abstract technology. It is of fundamental importance that the visual analogy enhances the function of the design. This is achieved by the mutually

supportive use of product semantics to improve the user's interaction and metaphor to make a statement about the products character and context. This contracts with the approach taken in the late 1950s, by General Motors Corp's Cadillac, which featured exaggerated tailfins intended to deliver a powerful impression or aerodynamic sleekness. But the fins, advertised as providing "stability at speed" served no real purpose other than to extoll pol-culture values like the romance of space travel. The missing element was the close linkage between meaning and function.

This linkage is however, evident in the roller radio, introduced two years ago by Philips, one of the first companies to embrace the semantic approach. The portable radios large circular speakers convey a sense of sound and also the impression of movement and action. The outsize handle, encourages and celebrates its portable facility. The conventional anonimity associated with control knobs is challenged by employing visual devices to clarify the function of each. Referring to the similarities products bear with each other, Robert Blaich, Managing Director of Philips, rationalises:

"So many products are not the same today, you could take off the labels and you would not know what company made them. We want to use semantics to differentiate our product".


PHILIPS
roller

(Forsaking the Black Box: Designers Wrap Products in Visual Metaphors, Wall Street Journal 1987).

Robert Nakata, a student at Cranbrook Academy of Art, conceived his stereo components as wall-mounted elements whose large control surfaces act as important visual features. For his stereo receiver, (fig. 11) he employed the metaphor of musical notation to arrange the receivers control panel, delineating control gloupings and hierarchies. The receivers metaphorical musical score acknowledges both the electronic technology and the music, and its semantic content, such as the volume control buttons that progressively increase in thickness to connotate increased volume, clarifies its functions. By recessing the control areas marginally in the abstract shapes of traditional musical instruments, he attempts to progress beyond the metaphor to suggest the complexity of the electronics beneath the surface. A revealing comment on the unrevealing nature of the minimalist black box is indeed apparent and although the semantic devices incorporated appear to enhance comprehension the metaphoric content, might remain undetected unless explained.

The Elaine Printer (fig. 12) is one of several projects undertaken by the designers at Technology Design for the synapse product group. Synapse was formed in 1985 to design and

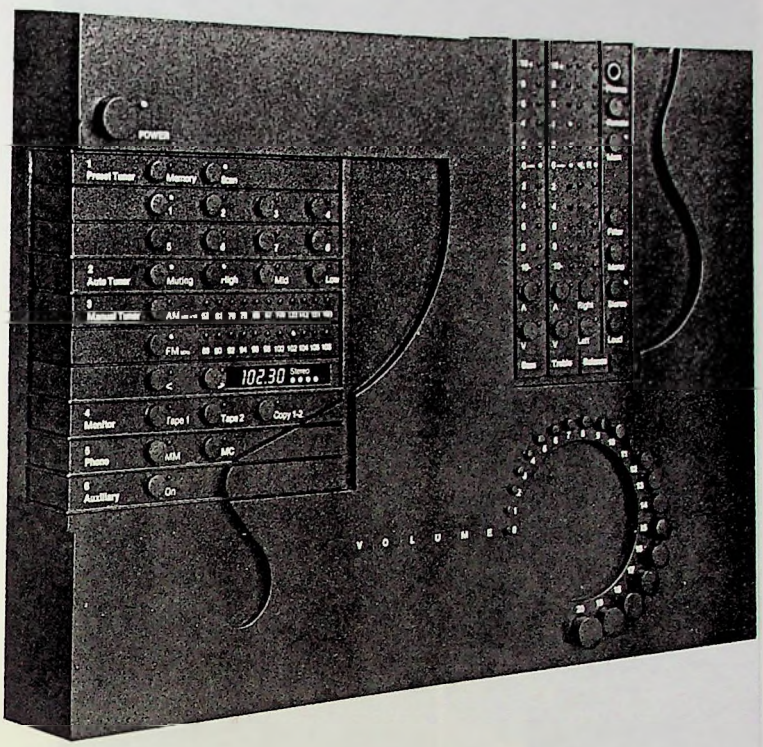

POWER
Preset Tuner
Memory
Scan
Auto Tuner
Muting
High
Mid
Low
Manual Tuner
AM
FM
102.30
Stereo
Monitor
Tape 1
Tape 2
Copy 1-2
Phono
MM
MC
Auxiliary
On
VOLUME
Treble
Balance
Left
Right

fig. 11.

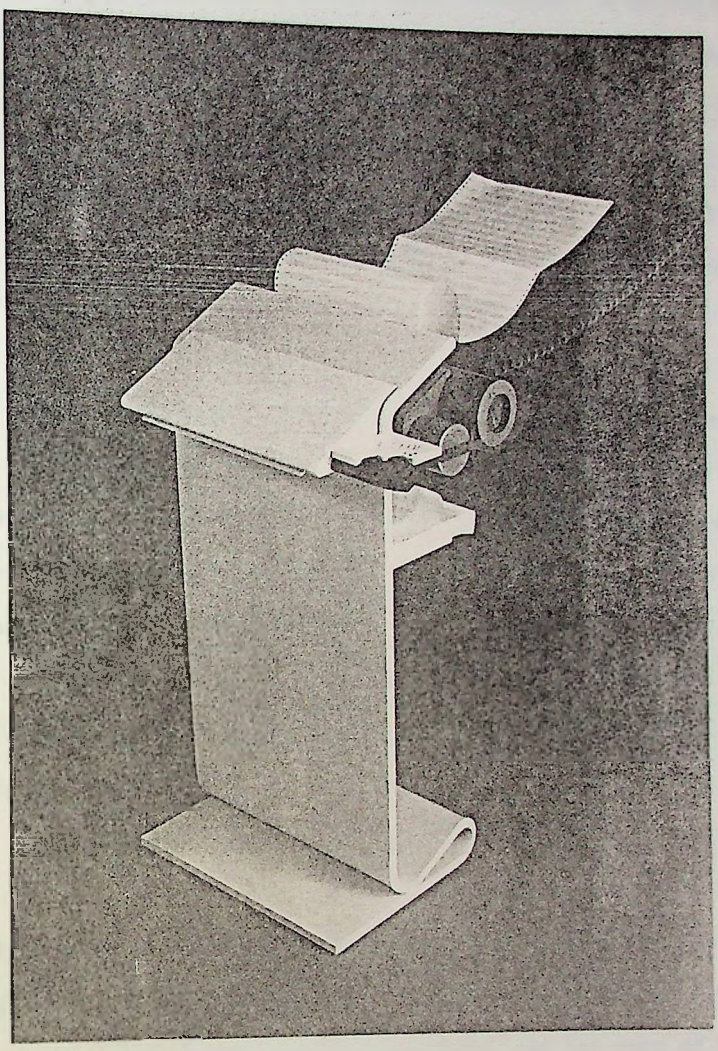


fig. 12.

commercially realize advanced or alternative design concepts. It undertakes projects like Elaine, that represent a degree of commerical risk not acceptable to most Clients, but that may still have merit in smaller markets or as explorations in concept. The project grew out of several questions about high tech. products, and the images and functional forms associated with them. Loyd C. Moore, Principal of Technology Design, claims:

"The idea of complexity and contradition was proposed 20 years ago. Post-Modernism, Memphis, semantics, patterning all seem to be rediscovering what the retailer, advertiser and consumer never forget - the emotive functions that objects serve in addition to the rational, mechanical ones".

(The Elaine Printer: Designing Personality Into the World of High Tech; Innovation)

The final form provides liberal images of several functional issues connected to the process of printing. Air is forced through the cylindrical cooling tunnel across the rear of the printer directly over all components, and an oversized, finned heat sink couples directly to the hottest internal components. The high-voltage electrical path is delineated with red,

commencing with the mains cord and progressing to the power switch situated by the operators controls. The overall form simulates the flow of paper from the base through the print mechanism and overtly expresses both technical functions (such as the paper path and heat dissipation) and emotive functions such a friendliness, approachability and personality.

The three preceeding examples are samples of an expanding vocabularly for high-technology products, that transcend the simple draping of technical requirements in a clean box and of images and associations that offer literal and metaphorical information about the processes enacted and that purposefully add expressions to an expressionless product area. Yet too many strongly expressive designs in one environment may creat chaos. Le Corbusier proposed that some objects and systems should act as backgrounds for a few expensive objects, experimenting in the 1920s with this concept by displaying strongly evocative objects (his chairs) against a more neutral background of cabinets and tables. In recognition of this theory we might visually de-emphasize the micro-wave and empahsize, indeed celebrate, the expresso machine. Functional groupings, such as audio/video systems or kitchen appliances might work together visually and technically as modules, while individual vibrant products provide a means of self-expression for the user.

Metaphorical design is neither a movement nor a new international style, although much of the new design approach embodied by Post-Modernism centres on metaphor, believing it as powerful a device for design as for literature because it illuminates a new perspective by suggesting evocative connections between the subject and memories for our experience.

Metaphorical design is a design activity that considers the user's psychological, social and emotional requirements. It is a more involved design activity that requires of designers an awareness of the users expectations and personal involvement in the design process.

# 7. CONCLUSION

"The visual illiteracy of which designer's complain is very largely a result of the visual pollution they helped to create. Like most pollution, it is a by-product of an uncontrolled process".

(Ralph Caplan, by Design, New York 1982)

Product semantics is still in its infancy. However the semiotic aspects of product design are not so much new as newly codified; "What's new is that we are looking at the subject in a more systematic fashion", say Reinhart F.H. Butter, "We want to take all the chance out of it". Design history offers many semantic examples. As a designer for the A.E.G. in Germany, Peter Behrens raised the light bulb to iconic status, replacing in the company's advertisements arbitrary "goddesses of light" with a clear symbol of the changes taking place in the modern world. The "machine style" of the 1920s was an adaptation of certain visual characteristics that signified functionalism. The streamform or teardrop of the 1930s borrowed aircraft forms for other vehicles and products in an attempt to suggest efficiency, speed and modernism. In the postwar era, a similar borrowing from jet planes and rockets updated the imagery. Symbolic form helped the user identify as an alert and involved

participant in technological advancement, a consumer at the forefront cultural change.

While such styling had and has an important role in design, its concerns were driven by economic concerns, by marketing and sales curves. It served the manufacturer well. In recent decades the design professions have moved in the direction of consumer concerns, employing and often developing new sciences with the intention of creating a closer symbiosis between user and artifact. Safety, efficiency, the reduction of fatigue and the long term health concerns of the user have been primary concerns.

Product semantics is not a new design style nor is it a psychological approach to functionalism. It is a serious attempt to study the communication that emerges from human interaction with product. Its application enriches our imagination and aims to prevent the failures we have rencently become conscious of.

Product liability is a capitalist justification for the employment of semantics, but so too is the broadening scope of international trade, where exported objects must communicate multi-lingually by means of signs and symbols of the widest possible currency.

The rapid and innovative changes of lifestyle we currently enjoy, supplies additionaljustification. Mobile employment patterns force us

into unfamilar workstations, where a refined approach to semantics could personalise our environment and improve both safety and efficiency standards with a reduction of insecurity on the behalf of the worker.

The individual is continually confronted by novel products and altrnative methods of product operation. Unfamiliar rental cars, innovative tamper-proof packages, radically new security locks on hotel doors, all mean that we are continually relearning. Semantics could help to improve this learning process through a visual form language that mediates between user and object.

It is possible that product designers will someday be guided by a proven, refined and agreed upon universal coding, just as graphic designers are now. If so, both clarity of function and symbolic content of products will have been enhanced and the design dictum for the age will be "Form Explains Function".

However rigidly imposed imperatives such as those inflicted the modern movement stifle the imaginative urge.

Louis Sllivan was too wise to insist that pure functionalism was the end of all design:.

"Formulas are dangerous things, they are apt to prove the undoing of a

genuine art, however helpful they may be in the beginning to the individual. The formula of an art remains and becomes more and more rigid with time, while the spirit of the art escapes and vanishes forever. It cannot live in textbooks, in formulas, or in definitions".

(Van Doren, Industrial Design, 1940)

He believed that each building should have it's own particular individuality, and he himself used much surface decoration.

"Language is made by the people who speak it, not by the school masters".

(Van Doren, Industrial Design, 1940)

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