

Product Design and Analysis

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Consumer product design is directly related to satisfying the physical and psychological needs of people. The words DESIGN AND DESIGNING immediately imply change in relation to the organisation of many interconnected elements. These elements are themselves the product of change; social change, technical change, materials and production improvements, market developments and economic change. This course highlights the essential features of what product design is and how developments are made in product evolution and promotion. The course embodies both theory and practice in design, graphic communication and photography, always seeking to improve understanding and expression.

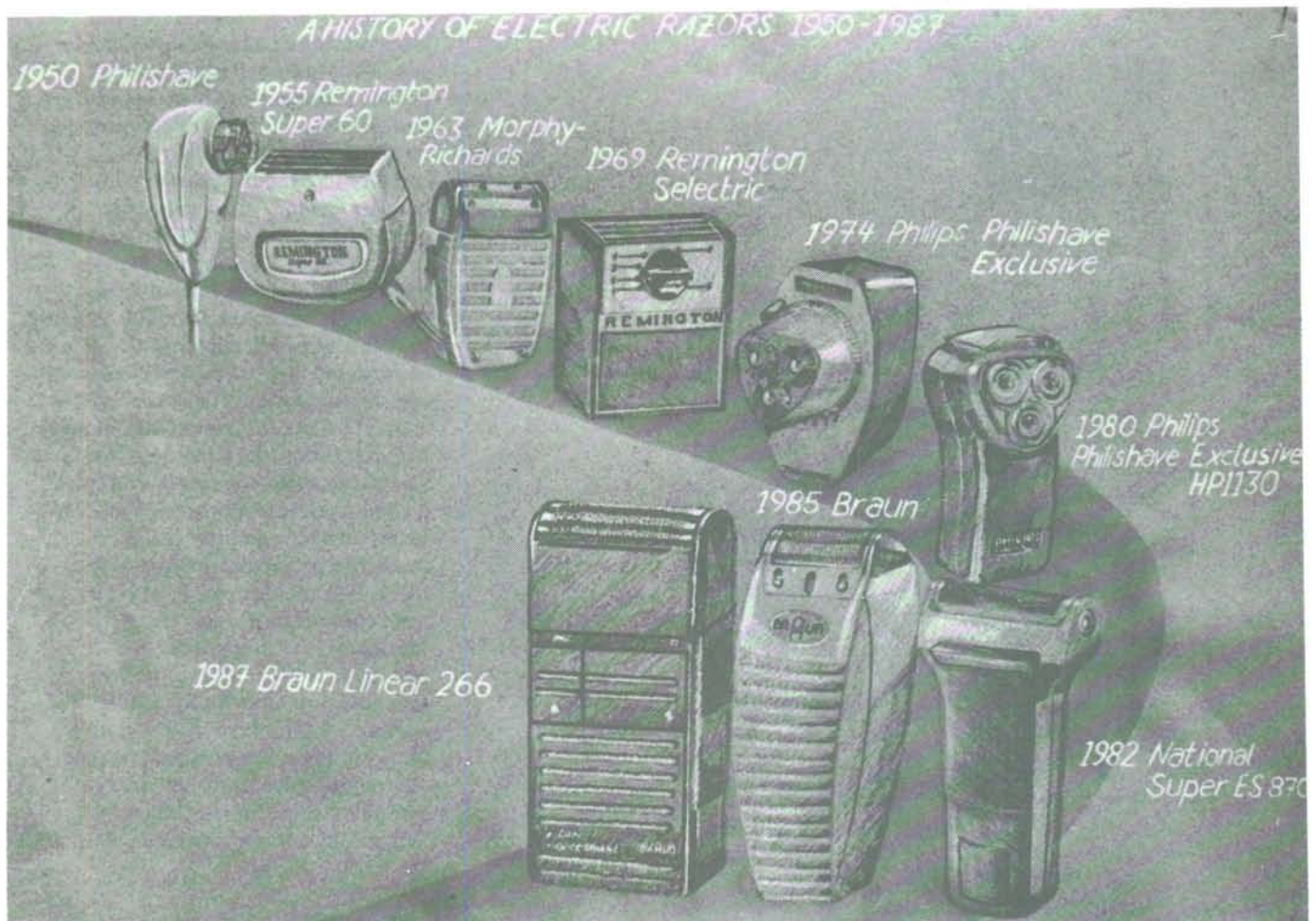
This part of the Design and Technology B.A. course starts at the

beginning of Year 2 and runs through to the end of Year 3. During year two, part of the course is common for all students and is referred to as P.D.A. Core. It involves lectures and discussion about product design with some coursework coupled with lectures on photography with studio and darkroom practices in black and white. The course seeks to extend the student's analytical powers, relate the practices of product function to materials and production, compare and examine product aesthetics and ergonomics with economics and market factors. Photography is used to heighten the student's visual sensitivity, compositional organisation and technical ability in order to translate visual imagery into graphic statements that include photomontage illustration, and typeface selection.

To start the course in product design and analysis a simple product in daily

use is examined in detail. Typical products are, the clothes peg, the coat hanger or the cup and saucer. To take the cup and saucer as an example, comparisons and contrasts are drawn between different designs ranging from different ceramic types, various plastics versions and metal designs. Some are currently available others historic. In each case the product is fully examined in size capacity, weight, form, thickness, surface finish and decoration, proportion, balance, handle shape, cup saucer location, spillage, drainage and serviceability in the home/canteen or outdoor environments. The social, time of day, liquid content, machine washing and market factors coupled with material, production and economic considerations are all viewed in relation to their particular influences on the development of a design. Surface area, heat loss and transmission, and

History of Electrical Shavers, Year II



handleability are brought into the discussion when examining form and proportion, materials and handle-design ergonomics.

The value of examining a product of this type in detail makes the student realise the inter-relationships between materials selection, manufacturing technology, social requirements and the full range of aesthetic criteria.

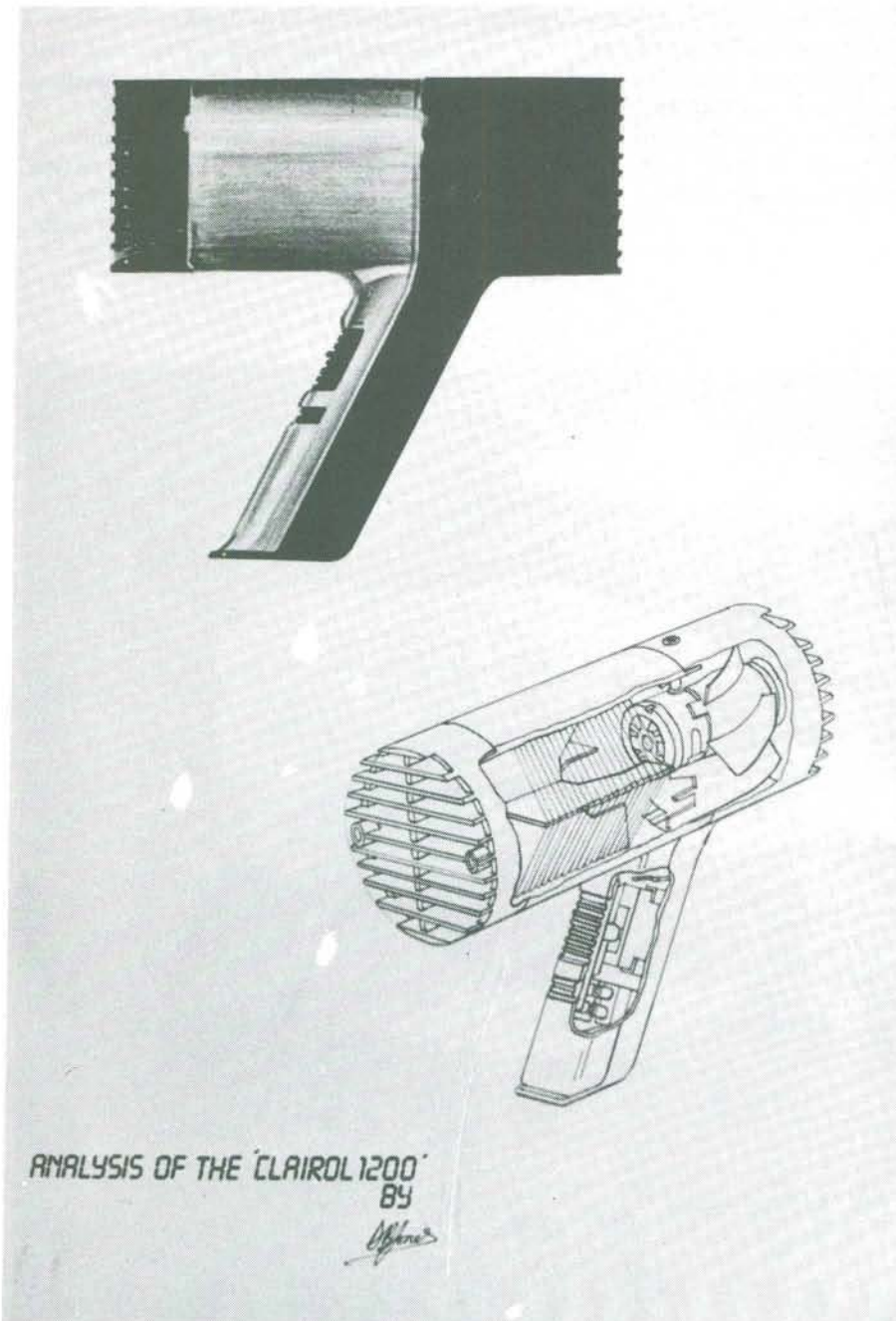
The rapid process of technological change indicates a serious rethink about product semantics as we proceed into

the 1990's. Minaturisation through micro electronics and chip technology suggest that more and more products will become either smaller or more multi-functional. Manufacturing technologies such as integrated circuitry incorporated into three dimensional mouldings will soon be available. The implications of this are that products will be hollow in many cases, if they are to have sufficient form to be easily handleable. The designers of tomorrow will have a greater freedom to determine

product form and this form will not be dictated by the shape of interior components to the same extent as at present.

A complete re-appraisal of product function, human interfacing and aesthetic design qualities will result. The radio, the calculator, the computer and many other domestic appliances will be redefined or products will be coupled with one another to integrate systems rather than be components in a procedure. Technical innovation and coupling of sophisticated functional sequences will be introduced to save labour, time, and personal involvement. The limitations to rapid advances in these areas will be economics, market resistance, speed of production, product liability, development, cost of materials research and product design.

All man-made mass-produced products coming from the same assembly line and component sources are identical in every feature. Each feature has involved decisions to establish its size, shape, finish and interconnecting edge quality. The success or failure of the product is heavily dependent on how the features and their details have been managed to create an integrated design to satisfy the needs of a particular market. Similarity between the functional capability of competitive products is often so close as to be difficult to distinguish between performance, energy consumption, expected life and cost. In many instances the same technical contents are housed in products with dramatically different appearances coming from the same stable. The overall design, the marriage between forms, the location of switches and the provision of accessories can influence and even dictate the market sector aimed at. In these instances aesthetics become a function of the marketing analysis and promotion. The aesthetics of the product coupled with marketing, sell the product and introduce the public to the newer technological innovations that have evolved for their benefit. To see and understand these events students are shown examples of product form evolution in relation to changing technology and are provided with



Clairol Hairdryer, Year II

current competitive products to strip and analyse. They are required to trace the historical development of one product and are asked to graphically illustrate the major form changes of a product in a poster A2 size. They are also asked to produce a cutaway or exploded drawing and to make a sectioned model. This makes them 1) aware of developmental evolution due to technical change, 2) identify assembly

techniques in a technical device and 3) understand the spatial qualities of form design in a skeletal structure of lofted sections.

Feedback is an essential part of any activity process and the nature of a product must allow this to take place so that the operator knows the state of the machine, the mode of operation and make adjustments according to the needs of the individual, the activity and

the environment. Almost any product could be used for this discussion but the domestic smoothing iron provides some interesting points for evaluation.

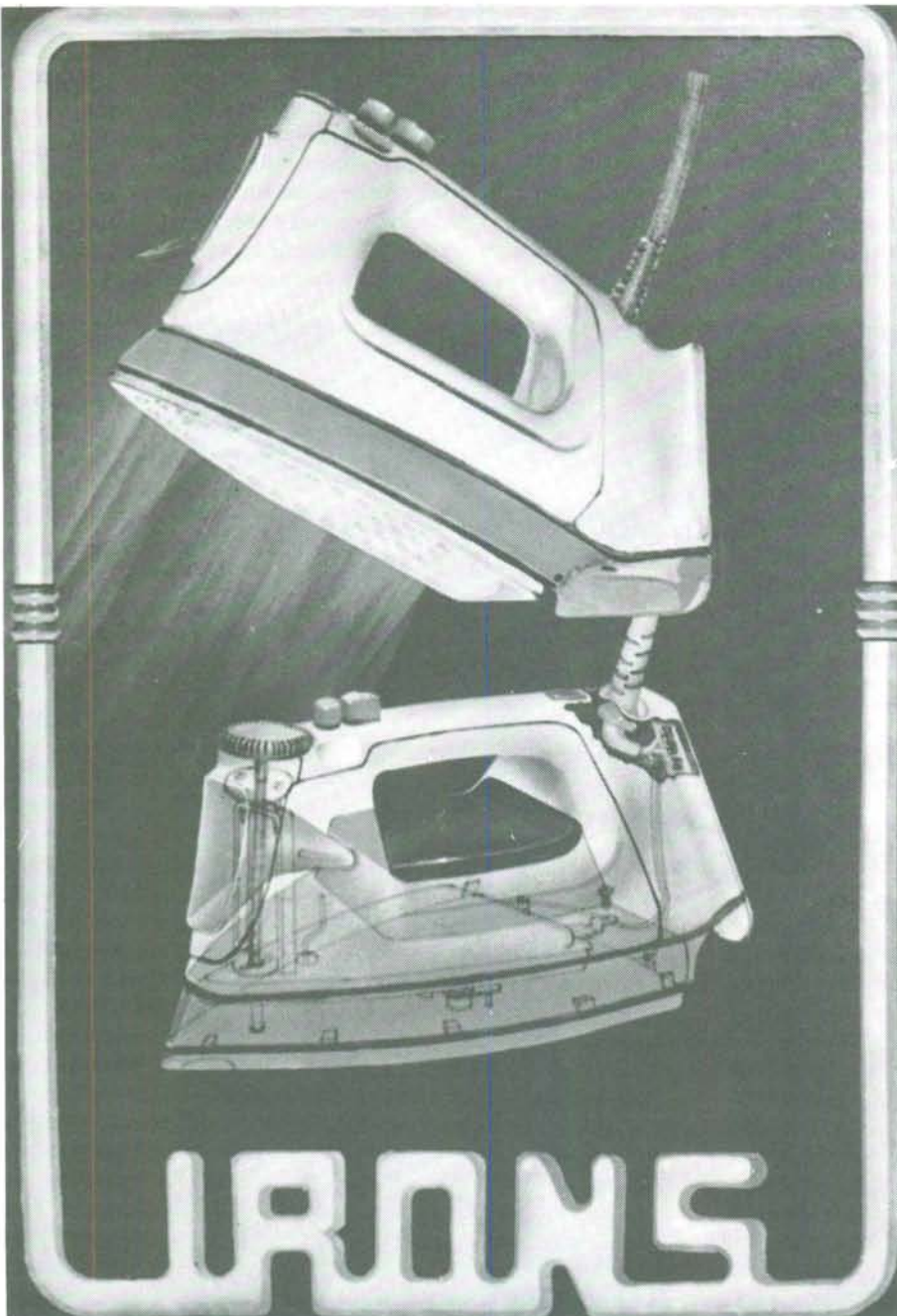
Historically it has evolved with changes occurring due to social demand for neat clothing and developments in materials technology, energy supply and control systems. The materials technology concerns both the components of the iron and the many fabric materials we wear.

Most models of irons over the last few years have incorporated thermal cutouts, a temperature control switch and an indicator light. It is interesting to learn student ideas about what this indicator light means and to then ask them to examine the ironing activity and identify what the user and any third parties need to know about the moment by moment mode of the iron. When the opportunity is presented to actually do some ironing the other aesthetic feedback sensory indicators become noticed which lie dormant if the task isn't performed.

The smell of warm damp fabric, the click of the thermostat, the hiss and vapour of the steam, the creaking of the board under pressure, the scratching of the cable on the board and the warmth of the fabric as it is turned, folded and pressed, are all important elements in the procedure.

Observations and recording of the minutiae of this or similar procedures is an essential part of understanding how people do things, the feedback aspects they take for granted, the assumptions they make.

Product design is about people and their activities; technology, materials and processing, ergonomics and market economics are the enablers. These latter elements make it possible for the product to provide the sophisticated improved service that people require to do the task in an easy, safe, efficient way using a good looking product that they can afford to buy and run economically. Product design is teamwork that exploits the specialist skills of many people. The marketing experts identify the needs of a particular group in society and establish its size and the potential quantities. The product capabilities and



See-through visualisation of domestic iron, Year II

functions are established and the related technology materials and processes selected.

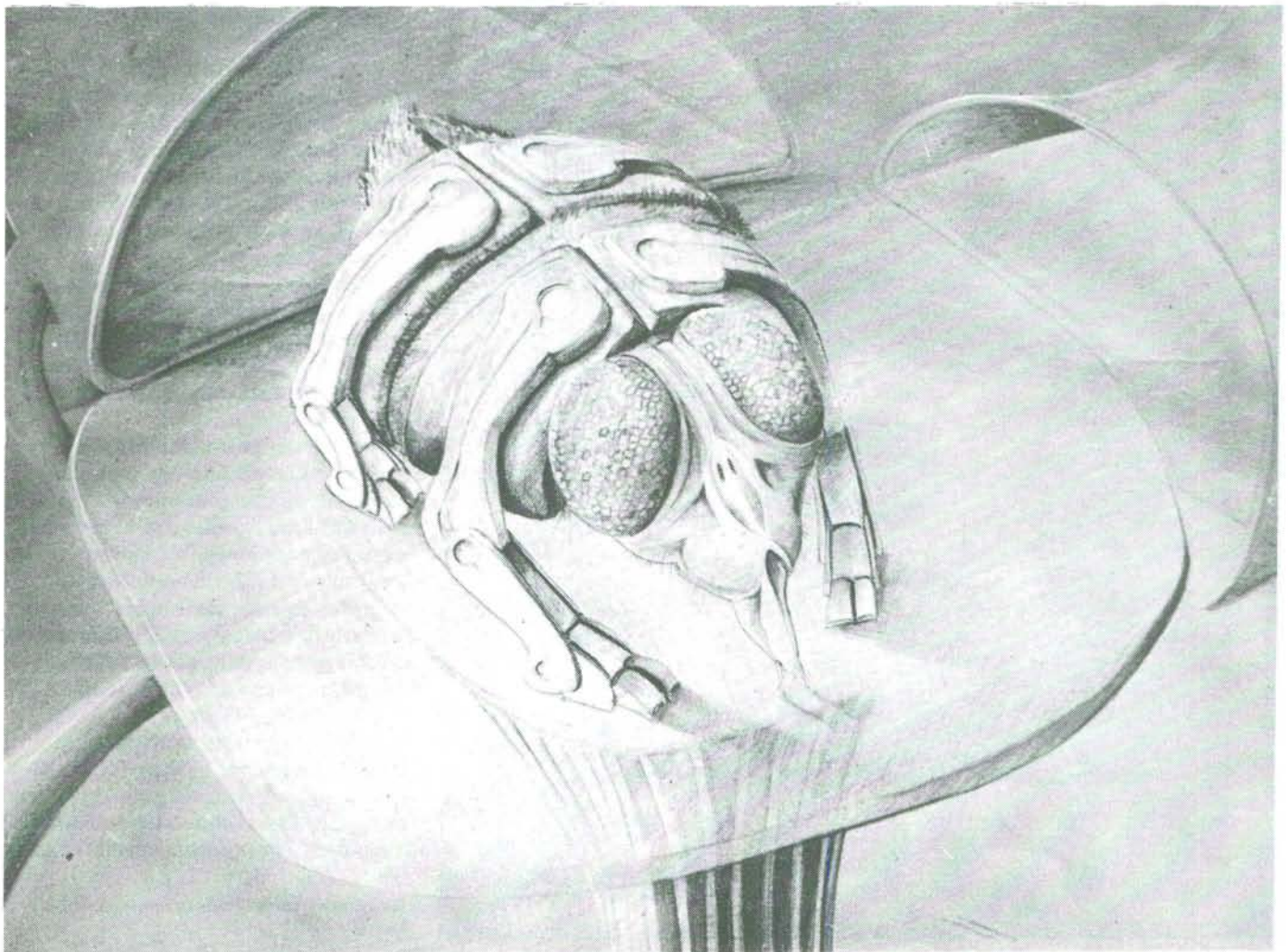
The product concept as a package is outlined and ideas prepared to create an aesthetic quality. This is important because the proposed product is to suit the market place of 18 months time and still be sufficiently advanced visually to suit the market for several years. The capital investment in development, design, tooling, marketing all have to be recovered with profits to enable the company to continue trading. The reputation of a product and the range it is in can establish an important brand loyalty. Badly designed products can destroy hard won reputations very rapidly. Discussions of this type lead comfortably into third year work on corporate identity exhibition and workplace design.

Bromechanical Alien Drawing, Year II

Other aspects of the second year product analysis main course use elements such as strip cartoon graphic work to describe sensations in a living experience, analytical drawing to understand and translate form graphically and emotive drawing to convey expression and atmosphere. Regrettably timetable time is limited but graphic techniques are demonstrated and discussed for inclusion into a coursework project. This project specifically seeks to take the student outside his or her realms of past experience with the express purpose of making them generate new image forms. The proposition is to create and draw a bio-mechanical alien being. The student that first decides on the environment and then considers the work and life cycle of the alien usually manages to generate the best creature. The chosen environmental conditions effect the size, structure, motive-form and detailing of

the alien. In graphic terms considerable opportunity is offered to express atmospheric and emotive qualities, to explore form, surface, colour and texture, to imply size, scale and ferocity. The need to explore, express and control ideas that can be projected into the future is considered of paramount importance. Too often students work from within themselves drawing only on their existing knowledge of how things are instead of how things should or could be.

A further second year product design and analysis main course project is a product packaging and photo advertising brief which has been used to bring the two main elements of the course together. The brief entails an examination of the form and visual criteria required for a cosmetic product package to suit either men or women, the student being free to identify which sex and an appropriate age range or



market group. The cosmetic container has to be designed and made during the first half of the term and given an image or special name.

Concurrent with this during the photographic period the group explores lighting and shooting various still life situations, involving natural objects, glass vessels and people. The processed photographs are examined and discussed prior to designing an advertisement for the cosmetic pack.

The completed cosmetic pack with any props or models is then staged and photographed in a manner to convey the appropriate imagery using the studio and principles learned earlier in the term.

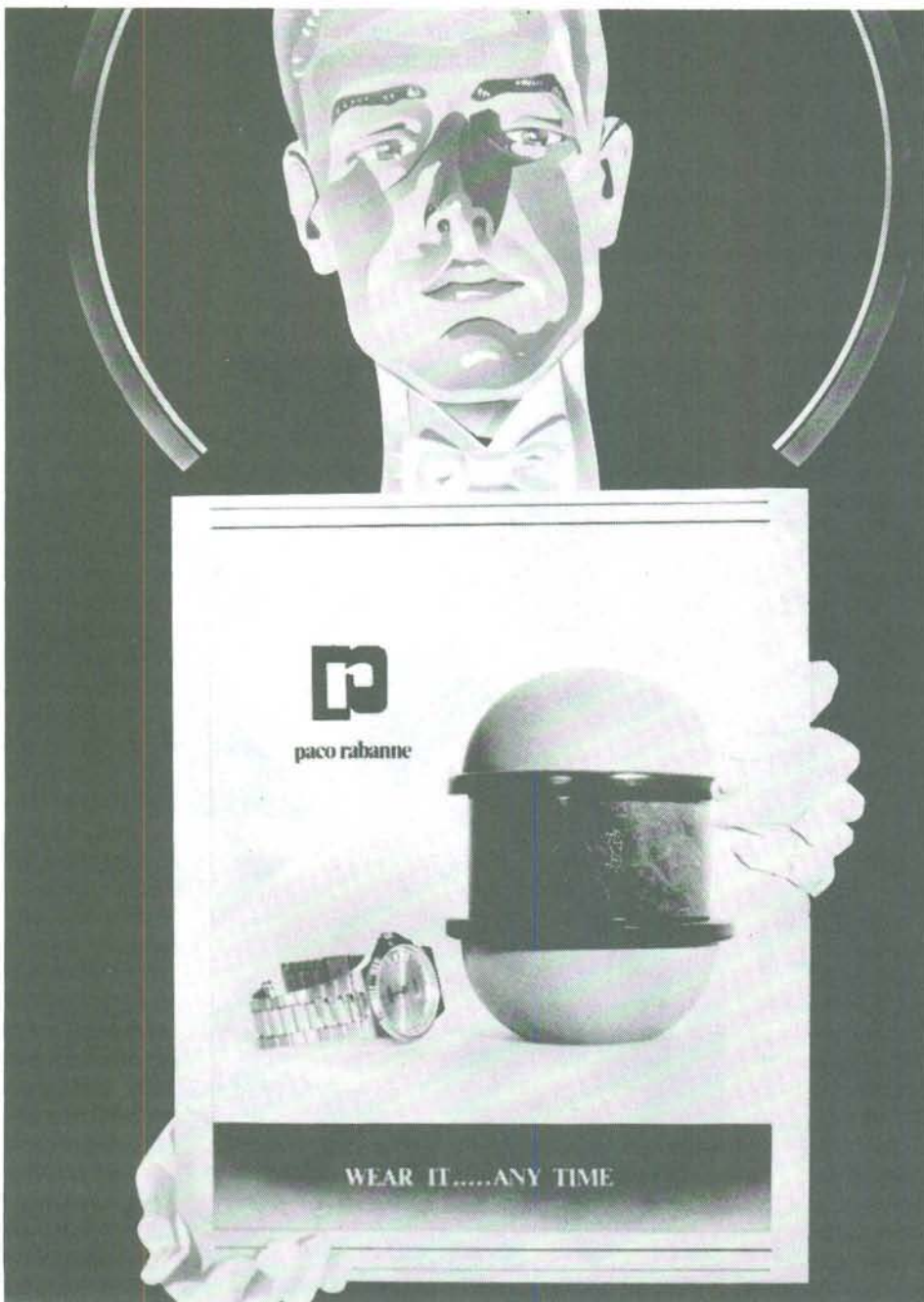
Product history during the last century forms a further academic study aspect that is part of product design and analysis. It covers in depth the well known art and design movements, the designers, innovators and industries of

note in relation to the prevailing social and economic conditions of the time.

Design, the outward emotive aesthetic qualities of the product with its implied semantic functions, practicalities and user friendliness are the foundation to this course of study. The nature of product and what moves the potential customer into buying is in constant question. How to create status, desire and move ahead of the times, have to be learnt and experienced. Product design semantics have to advance at the same rate as the technology that it carries to meet competition in the changing market places of the world. Knowing the past and the present helps establish ideas and ways for the future. The evolutionary theory of design is generally well respected. However the role of deduction in this process is less well understood and forms an important element to the study.

The Year Three Product Design and Analysis course is called History, Theory and Philosophy of Design. Approximately one half of the complete 3rd year group takes this course while the other half takes a detailed theoretical course in Technology. The history and philosophy involves lectures and seminars and during the course each student is required to present an illustrated paper on either a company and its design philosophy or on an internationally recognised designer. In the design theory periods, students are involved in graphic, photographic, exhibition and workstation work some of which is individual, some in teams.

The graphic inputs and assignments concern corporate imagery, the design and development of logos and their applications concurrent with a short project to develop a seasonal greeting card. The corporate image was based on the requirements for a competition this year and sought to provide meaningful symbols for stationery. The corporate identity project is used to lead into a major exhibition design project which is started by a visit to the National Exhibition Centre where stand design is examined in detail. Lectures, discussions, followed by group work subsequently takes place to organise the



Graphic and photographic of cosmetic promotion display, Year II

promotion and design detailing for the Finalists Degree Show. Five weeks inclusive at three hours per week is the time allocated for this project.

During the Christmas vacation students in the group are asked to prepare for work in the Spring term by visiting a local user of heavy earth moving machines for half a day. The design theory in this part of the course is concerned with operator/workstation cab environmental design. Lectures on environmental interior workspace, hand and foot lever control systems, feedback information systems, safety and symbols, behavioural requirements and seating, and a visit to a major equipment manufacturer form a foundation for this design study. Information collected during the vacation visits is given in seminars by the students. To concentrate the collection of information into specific study areas

each student is provided with a checklist of technical, human and economic points of importance to research.

The project work seeks to later develop technical graphic communication and detail modelling skills in both scale and fullsize to convey the full meaning of the operators' spatial working environment. In this manner it is intended that both the design and ergonomic theory can be evaluated and experienced.

Throughout the spring term a 1½ hour period is allocated per week for this group working with one another to prepare a photographic curriculum vitae. With the assistance of a colleague each student is required to prepare a photographic series of statements which convey their personalities and illustrate their work and leisure interests. The photographic quality, design content and graphic layout have to be carefully

controlled to suit reproduction in limited quantity on the photocopy machine to produce double A4 or A3 copies. These are then attached as a visual statement to back-up job applications.

In all the work carried out during the two years there is a constant message of aesthetic design and spatial sensitivity, human factors and comprehension, analysis of communications, products and functions, coupled with exploitation of developing technological systems. Design is the organisational component that brings all these aspects firmly together into a coherent statement.

Photographic Curriculum Vitae showing work and leisure activities, Year II

