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Design Research Society
50th Anniversary

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Looking Forward, Looking Back: Designing Designing A Conversation

John Chris Jones
Peter Lloyd

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23 june 2016 past and future of design

(from my digital diary of spontaneous or barely-directed thought)

on the 50th anniversary of the DRS i am asked to speak with James Powell and Peter Lloyd about the past, present, and future of designing... and i am regarding this as a good moment in which to rethink this expansive and connective activity we call design...

...a gentle wind blowing in through a nearby window... a chair squeaks as an unknown person moves a little in the apartment above... the chair squeaks again... and i hear someone outside (also unknown to me) who is hitting the building with a hammer... and i wonder how it is we can live at ease among so many people so close by... unafraid of being murdered in our sleep

...and now i recognise another sound... this time of someone sawing wood... or perhaps a plastic substance... made (i guess) from oil beneath the ground... or from gas beneath the sea...

later when i went outside i spoke to several people with hammers and saws and drills who were fitting lightning conductors to this block of flats

that evening there were warnings of thunder over London but nothing struck the conductors

and now i hear a faint beep-beep from a car in the distance...

no danger...

Consumer needs 14

A systematic design method

The following article describes a logical method of designing that could have applications in most industries producing durable consumer goods.



These examples of cutlery, designed by evening students at the Regional College of Art, Manchester, are shown full size on page 51. The course ended before the work was completely finished; for example the handle to the spoon had not been designed.

The importance of a constructive approach to the training of product designers is self evident. In schools of art in this country differing attitudes to training exist and no generally accepted policy has emerged. Pre-occupations with traditional study, aesthetic exploration or production engineering show in various courses. The following exercise in design is an example of a different method, a systematic analytical approach, from the user's point of view, which is being tried out at the school of industrial design at the Regional College of Art, Manchester.

It is thought that this method can be applied to the design of any industrial product. In a first trial of the method a class of third year design students was given the task of relating the shapes of knives, forks and spoons as closely as possible to the actions for which they are used. This example was chosen because the detailed analysis of user behaviour, on which the method depends, could be made without going outside a classroom. The project appeared recently on Northern BBC television, in the programme *Outline*.



the problem

This is to discover useful changes that can be made to the shapes of table forks; table knives; dessert forks; dessert spoons.

the method

This is based on observation and analysis of the actions for which the product is intended and not on the feelings of designers or users. The sequence followed was:

Stage 1 Find tool actions for each food.

Stage 2 Find tool shapes for each action.

Stage 3 Find tool shapes for the groups of actions performed by each utensil.

Stage 4 Find handle shapes for each utensil.

Stage 5 Test the new designs and report their advantages and failings.

stage 1 *to find tool actions for each food*

The foods eaten with these utensils are classified according to their effects on tool shape. The actions for each type of food are classified on chart 1, page 52. The groups of these actions which are performed by each utensil are recorded on chart 2, page 52.

stage 2 *to find tool shapes for each action*

Traditional and experimental tool shapes were tried out for each action with each type of food. Defects in the traditional tool shapes and requirements for improved tool shapes are noted on chart 3, page 52, and on similar charts for the other utensils.

stage 3 *to find tool shapes for the groups of actions performed by each utensil*

New shapes were derived systematically from chart 3 and similar charts. These shapes were refined by further trials and experimental meals. (See chart 3, page 52.)

stage 4 *to find handle shapes for each utensil*

First the areas in contact with the hand were roughly fixed by trials with approximate shapes. Then the contact areas were more precisely fixed by successive trials in hands of various sizes for each action. (See diagram A, page 52.) Finally the parts between contact areas were designed by

eye (because there is no further information to go on) and in a manner appropriate to the material used. The linking of the contact areas offers some freedom of aesthetic decision to the designer. (Compare the contact areas in diagram A with the photograph of the knife opposite by holding the page up to the light.)

stage 5 to test the new designs and report their advantages and failings

Each utensil was given a performance trial at real and experimental meals. The criticisms can be summarised as follows:

Table knife

The straight blade in contact with the plate performs much better than does the conventional shape, but the sharp corner might with advantage be curved.

The knuckles are still a little too close to the plate edge.

The hollow under the handle may be too deep.

Some users do not place the first finger in the designed position for downward pressure.

Table fork

The change in direction of the prongs is an ingenious means of overcoming the conflicting requirements for holding, spearing, scrape loading, carrying solids and carrying peas. Unfamiliar users take some time to learn the twisting motion of changing from spearing with the prongs to scraping with the flat end. Once learnt this seems less troublesome than the various ways of adapting conventional forks to lifting solids and peas. The simple handle is reasonably satisfactory and is well suited to the twisting motion. There seems to be no provision for eating spaghetti.

Dessert spoon

The new design is not a definite improvement over the conventional design. It is better in some respects and worse in others:

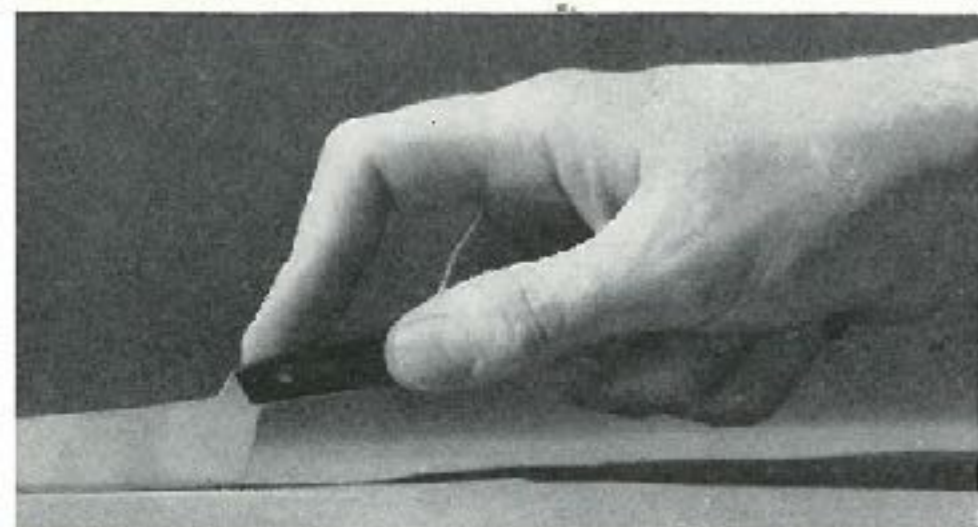
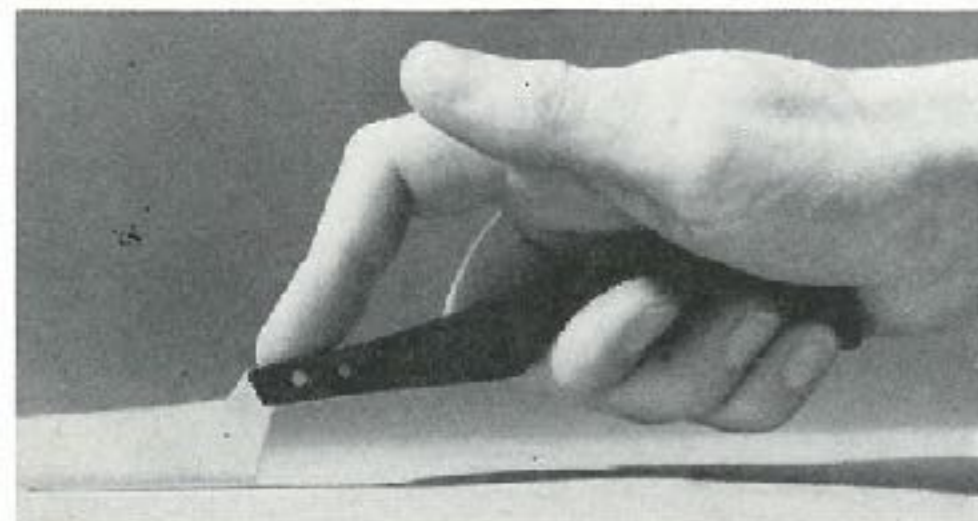
Better for pushing, digging, scraping and cutting.

Worse for scooping, sipping and biting.

(A straight handle was fitted as the class ended before the analysis for this component was finished.)

Dessert fork

The tool shape is better than the conventional one for the two intended actions of pushing and holding down while the spoon cuts. The abandonment of the dessert fork as a means of carrying food to the mouth implies some changes of custom.



These criticisms may suggest that the method is far from infallible. The exponents of the method consider that it is not at fault and that errors in the final shapes could have come from two sources:

- 1 Logical and factual mistakes in carrying out the method. These are to be expected with a class of students working in this way for the very first time.
- 2 Insufficient time to continue experiments until errors become insignificant. In this case experimental work was simplified and stopped at an arbitrary point so that some tangible results could be obtained before the end of a short evening course.

systematic and intuitive methods compared

This systematic method of relating product shapes to the requirements of use is an alternative to the usual method of designing largely by eye. The differences between the two methods are outlined below.

At the beginning of the class each student designed a set of utensils wholly by eye in about one hour.

The analysis described here led to wholly different shapes and took about 50 hours.

A natural first reaction to such an exercise could be that it was elementary and hardly necessary for such familiar objects as knives and forks. The fact that the uses of the table fork and the dessert fork are so different as to warrant entirely different shapes shows how necessary such analysis is. Traditionally these forks are merely size variants of the same form, though they may well have been suitable for the eating habits of another century.

Design by eye

Design by systematic analysis

quick

slow

cheap

costly

depends on long experience

once the method has been learnt it can be applied to any product without practical experience

success or failure can only be discovered after the financial risks have been taken

success or failure can be evaluated before financial risks are run

is brilliant or feeble according to the talent of designer

enables average talents to achieve a reliable answer

can only be done individually

is suited to collaborative work

depends on a talent which can be encouraged but not taught

is very teachable

permits expression of personal feelings of designer - often at the expense of performance

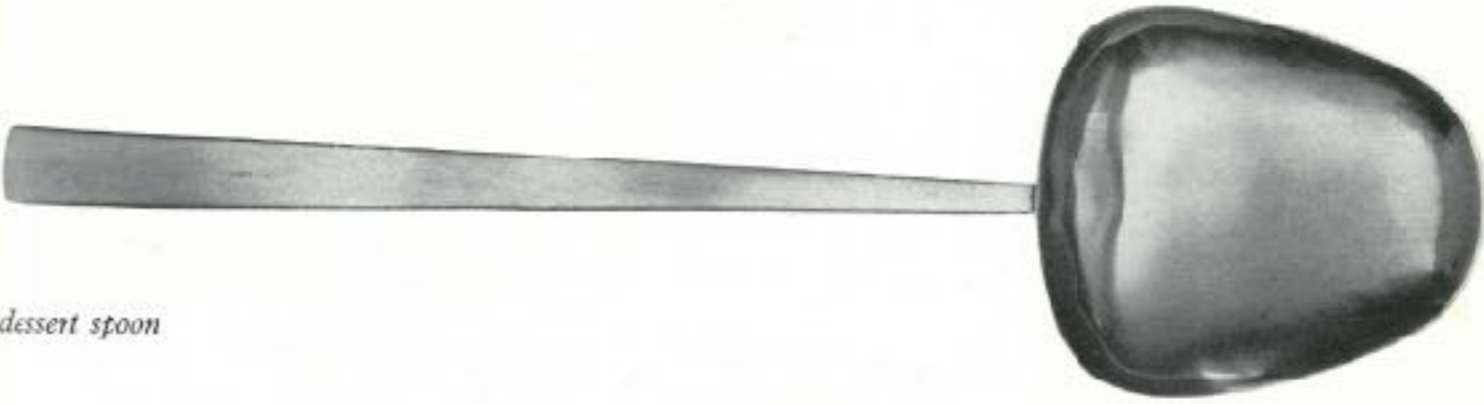
achieves best possible performance and leaves room for personal expression at certain points



table knife



table fork



dessert spoon



dessert fork



SYSTEMATIC DESIGN METHOD

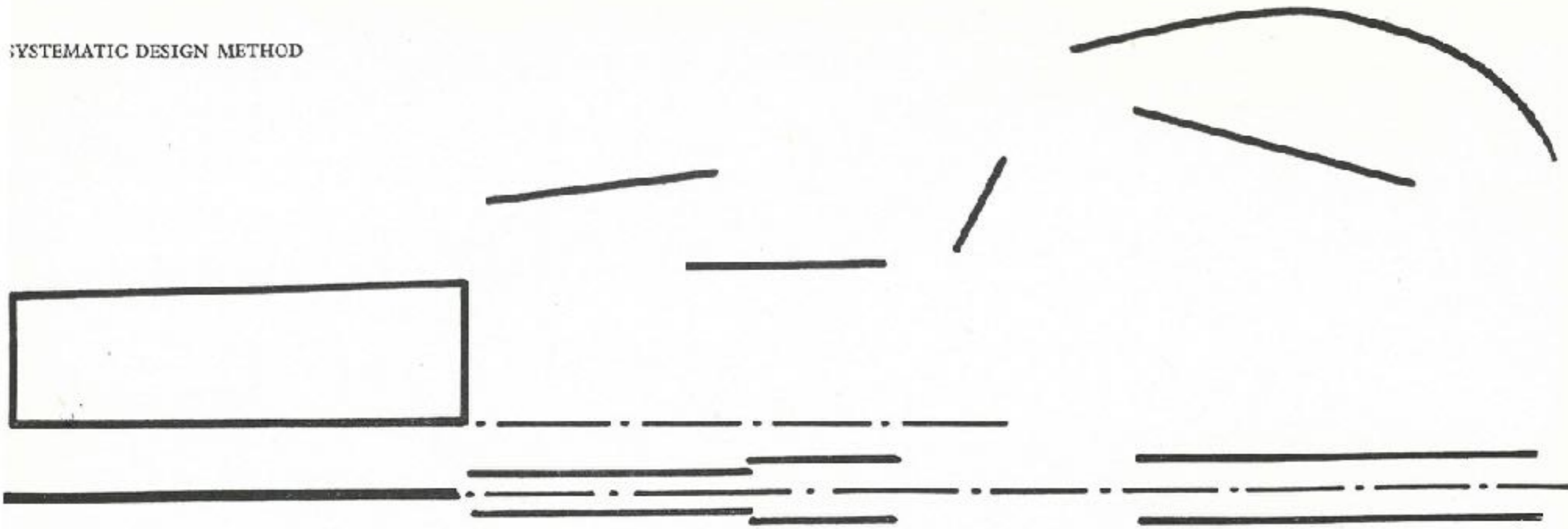


Diagram A. This diagram shows the areas of contact with the hand in the table knife handle which were worked out experimentally. The space between these areas allows some aesthetic freedom. Compare with the actual knife handle by holding the page up to the light.

These charts are from a series which classifies the students' investigations into the actions needed for each type of food (chart 1), the actions performed by each utensil (chart 2), and some of the defects of traditional tool shapes and ways of improvement (chart 3).

CHART 1

TOOL ACTIONS		PREPARE					LOAD					CARRY				AT MOUTH					
FOODS		CUT SAW	CUT DOWN	PUSH	HOLD/SET AWAY	HOLD/SET DOWN	MASH	DIG LOAD	SPEAR LOAD	SHOVEL ON FLAT	SHOVEL ON CURVE	TRANSFER/SCRAPE	TRANSFER/SQUASH	SCOP UP	BY SPREADING	BY LIFTING SOLIDS	BY LIFTING FLAT	BY LIFTING LIQUIDS	DIG SPREAD FOOD	DIG LIFTED FOOD	SIP
TYPE OF FOOD																					
CRISP	Toast	•	•	•	•																
CRUMBLY	Pastry	•	•	•	•																
SOFT	Meat	•	•	•	•																
SEMI-SOLID	Potato	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SEMI-LIQUID	Mash	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
LIQUID	Mince	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Sauce																				
CRISP	Cereal	•	•	•	•																
CRUMBLY	Pastry	•	•	•	•																
SOFT	Pudding	•	•	•	•																
SEMI-SOLID	Ice-cream	•	•	•	•																
SEMI-LIQUID	Rice-pudding	•	•	•	•																
LIQUID	Pudding	•	•	•	•																
FLOATING SOLID	Stewed fruit	•	•	•	•																

CHART 2

TOOL ACTIONS		PREPARE					LOAD					CARRY				AT MOUTH						
UTENSILS		CUT SAW	CUT DOWN	PUSH	HOLD/SET AWAY	HOLD/SET DOWN	MASH	DIG LOAD	SPEAR LOAD	SHOVEL ON FLAT	SHOVEL ON CURVE	TRANSFER/SCRAPE	TRANSFER/SQUASH	SCOP UP	BY SPREADING	BY LIFTING SOLIDS	BY LIFTING FLAT	BY LIFTING LIQUIDS	DIG SPREAD FOOD	DIG LIFTED FOOD	SIP	
TABLE KNIFE		•	•	•																		
TABLE FORK					•	•																
POCKET FORK					•	•																
MESSING FORK					•	•																

CHART 3 TABLE KNIFE



TOOL ACTIONS	FAULTS OF CONVENTIONAL TOOL	REQUIREMENTS FOR NEW TOOL
CUT SAW	Blade unnecessarily long for present-day meals when meat has already been carved. Plate edge prevents use of a sufficient length of blade for sawing on plate.	Blade length required Whole sawing edge must be in contact with flat surface of plate Minimum radius of cutting edge Blade must be straight when viewed from above
CUT DOWN	Tilted blade leaves meat portion each side. 	Flat edge to be in contact with plate
PUSH	Semi-solid food falls over top of blade. 	Height of pusher Height at ends to be at least equal to height in centre to prevent food falling over top Width of pusher
DIG LOAD	Food falls off edges of blade tip. 	Blade width required at end
SHOVEL ON FLAT	Tilted and curved blade leaves portions each side. 	Flat edge in contact with plate Blade height
TRANSFER BY SCRAPE TO FORK	Satisfactory.	Length required Width required
TRANSFER BY SQUASH TO FORK	Satisfactory.	

22 february 2006 design methods in 250 words

after reading the Wikipedia entry* on [design methods](#)

The way in which artificial things are given form. Also changing this so as to take account of the effects upon customers, users and all who enjoy the benefits, or suffer the ill-effects, of industrial living.

Each person who takes part in designing should be able to combine intuition with rationality. And each should be aware of, and able to influence, the collective design process. Without these ingredients excellence is unlikely.

The term 'design methods' began as the name of [a conference](#) of designers and others in 1962. Since then the academic study of design processes has grown enormously but the effects upon the quality of industrial living have not been great. Design processes have expanded so that more people can influence them, and take part, but so far this has been within the limitations of specialist knowledge and the skills of existing design professions.

Traffic congestion, air pollution, world poverty and a host of such unsolved problems are greater, not less, than they were before. The population has grown greatly but the quality of industrial living is worse for many people.

To remedy all this, the way artificial things take form may have to become a public responsibility in an expanded design process ('[creative democracy](#)') that is sensitive to the thoughts and the experiences of everyone and is under the imaginative control of each one of us. Difficult as this may seem, there is much in the [literature on design methods](#) that can help to make it possible.

