# Trevor HJ Marchand

## Workshop 1: Craftwork as Problem-Solving

### Introduction

My aim in coordinating a workshop on "craftwork as problem-solving" was to bring together a mixed group of designer-makers, architects, anthropologists, and researchers of craft to discuss problem-solving tactics and strategies employed by craftspeople. The call for papers invited presenters to explore the multiple kinds of intelligence involved in design and making, and the ways in which the intelligent practices that constitute craftwork and problem-solving are perceived and evaluated by makers themselves and by the societies in which they work.

Furthermore, workshop presenters were invited to consider the roles that society, culture and the environment play in forming and transforming the problem-solving strategies that makers engage in. These include, for instance, training regimes and formal educational background; access to tools, supplies and workspace; the limits and potentials of the physical body (including ageing, illness and injury); socialisation and cultural understanding (including perceptions of environmental and social sustainability); political and economic regimes; changing technologies, and the introduction of new materials. Problem-solving in craftwork also operates in relation to a wider arc of social and environmental concerns including green agendas and environmental sustainability, the desire for socially-beneficial engagement, and the pursuit of communal identity. In sum, problem-solving in design and making involves the ways in which these factors and concerns are interpreted through localised regimes of making and doing.

### Learning through mistakes

Over the past two decades, anthropological fieldwork has taken me to West Africa, Arabia, and East London. My studies with craftspeople have consisted chiefly of training and working alongside masons and carpenters in order to better understand local apprenticeship regimes, social politics, and embodied ways of learning and knowing. Still photography remains an important tool for documenting and representing craftspeople, but video is becoming increasingly central to my work. In 2012 I commenced an in-depth study of embodied learning among a cohort of novice fine-woodwork trainees at London's Building Crafts College. Video data from the college was used for analysing "problem-solving" strategies that are communicated and negotiated between woodworkers.

"Being in the zone" and operating in "oneness" with tools and materials is only part of the story behind skilled handwork. Learning and practising a craft inevitably includes ruptures to the flow and making mistakes. Even the most seasoned expert is susceptible to making errors when experimenting with new tools, methods or materials; confronting novel design challenges; or, simply, when having an "off day" in the workshop. A degree of risk is therefore inherent to handwork.

But risk in handwork extends beyond control of the mind-body in action to encompass the quality and performance of the tools and the properties of the materials. The design or function of a tool, for instance, may not be entirely proficient for the task at hand, or it might malfunction during operation. Materials – especially natural ones such as timber, stone or clay – possess distinctive characteristics, inconsistencies, and "flaws" that behave and respond in sometimes unpredictable or unforeseen ways to applied actions with a tool.

The fine woodwork carpentry practices I researched at the Building Crafts College constitute a 'workmanship of risk'. Slip-ups are a persistent possibility. Learning to quickly and accurately identify the error and to make the necessary adjustments or repairs is therefore an essential element in the woodworker's skill set. In many cases, identifying the exact location, cause and nature of the problem involves a little detective work which inevitably delays production, but, productively, it progresses learning. Speed, efficiency and accuracy in solving problems come with experience, and such experience comes only through making mistakes in the first place, and setting them right.

A part of my ongoing research is to explore in detail how mistakes are identified and problems solved at the carpentry workbench. My observations and analysis focus on video-recorded sessions between trainees and woodwork instructors. The day-to-day practice of sorting out slip-ups and repairing gaffes is more usually undertaken by carpenters on their own, and in silence. But when it unfolds between two individuals, their thoughts, ideas and strategies are verbally communicated as well as practically negotiated through their coordinated – and sometimes not so coordinated – activities. Problem-solving processes are thereby more immediately accessible to the researcher's observation, transcription and analysis. Additionally, my recording of workbench sessions captured the dynamics of teaching and learning, and of communicating and interpreting techniques in language, and with the body. Trainees were not only guided through the activity of identifying the mistake(s) they had made and deciding upon a suitable remedy, but they occasionally benefitted from the instructor's demonstrations of how to more adeptly engage with a particular handtool.

**Woodwork instructor Cheryl and first-year trainee Nikki coordinating efforts to solve a problem with a wood joint. Photograph by Trevor Marchand, 2012**

An example of a one-on-one workbench tutorial session is that between Cheryl, the first-year convenor, and Nikki, a first-year trainee with no previous woodworking experience. The tutorial between Cheryl and Nikki lasted 7 minutes and 46 seconds, and it focused on an ill-fitting timber "stopped mortise-and-tenon" joint that Nikki was making. The below represents a selection of the long transcription of the interaction between the two parties:

> Cheryl (C): 'This piece feels like it's…' Without completing her utterance, Cheryl picked up the assembly and turned it over, setting it back down on the worktop on its opposite face to examine further.
>
> Nikki (N): Leaning with his elbows on the worktop and moving in closer to Cheryl, Nikki reached with his left hand into the focal space and, while touching the seam between the two components, inquired softly 'Could it be on *this* side somewhere…?'
>
> C: Absorbed in her own thinking, Cheryl interjected, redirecting Nikki's attention to what she was examining: 'Right, have a look at *that*'. She placed her right hand on top of the stile, near to where it joined the rail. The instructor began 'If we look at it from the other side…', and she completed her thought by

physically demonstrating how the two joined components rocked back and forth. Nikki grunted understanding. 'So that's… that's lower down' she said, pointing to the bottom face of the rail where it joined the stile. 'And so when I press on *there*…', Cheryl moved her hand back to the top of the stile component and rocked it by pressing down with her middle finger, once again finishing her statement with the physical action. 'Remember?' she asked Nikki, referring to an earlier conversation they had, 'I said this looks like it's tilting'.

N: 'Yeah.' Nikki leaned in closer to watch Cheryl's fingers pressing down on the top of the stile.

C: 'It clearly is. Isn't it?' Cheryl declared. 'So if we pull these apart' she continued, while teasing the tenon out of the mortise, 'let's make sure it isn't one wonky piece or another wonky piece; that it's just a wonky joint'.

The detailed transcription produced from the video recording contains more than just the dialogue and an account of the carpentry exercise in question. It includes thick description of posture, movement and activity, as well as hand gestures and the ways in which either party investigated the timber and carpentry joints through touch. It reports how visual judgement was employed, the ways sight lines and shared focal points were established, and how available light sources in the workshop were optimised for carrying out visual assessments of the timber joint components. Throughout the exchange I note the selection of various carpentry tools and other utensils, and the ways they were used by either party to point, measure, compare and repair. I describe how the instructor scrutinised Nikki's lines and the indentations made with pencil and marking gage respectively while preparing his timber components. In doing so, Cheryl was able to "excavate" and interpret the student's previous procedures, to judge the accuracy of his saw cuts, and to detect where the trouble spots lay. The transcription also includes observations of the ways instructor and trainee employed basic physics (i.e. testing resistance and balance) to diagnose the trouble with the joint.

Finally, the transcription endeavours to capture the fluctuating rhythms of Cheryl and Nikki's exchange, and to record their use of humour, their changing facial expressions, and the flux of emotional states including frustration, bewilderment and accomplishment. These details serve to more accurately identify convergences and divergences in communication and understanding between the two parties, as well as their struggles to speak, to do, and to be heard.

Fieldwork at the Building Crafts College included in-depth audio-recorded interviews with the trainees and instructors. By interweaving material from my interview with Nikki with the transcription of the workbench tutorial, the final analysis provides insights into his educational background, individual ways of learning, attitudes toward teaching, and his recent attraction to woodworking. Such insights flag up moments during the tutorial when the instructor successfully accommodated Nikki's preferred mode of learning – or not; and, likewise, when Nikki resisted or was less responsive to Cheryl's preferred methods of teaching. Ultimately, the detailed account aims to make apparent the complexity and "thickness" of exchange that unfolds between both parties in a short period of time, and in collaboratively resolving a problem.

## Summary of Key Issues

A number of general conclusions can be drawn from the problem-solving tutorials I have recorded at the Building Crafts College, and these are applicable to many kind of hands-on craftwork. Problem solving in craft relies, in the first instance, on having a critical eye (and sense of touch) to spot an upcoming challenge or to detect that something has gone amiss; and to make that observation as early in the design-and-making process as possible. Once challenge or trouble has been detected, patience is required to systematically examine the thing(s) being made; retrace steps and procedures; review the methods of making; imagine alternative ways forward; and evaluate them, perhaps with the aid of sketches, drawings and mock-ups. In contrast to eliminating a mistake altogether, a maker may purposefully choose to leave traces of it in the finished work or to positively incorporate it in the finished piece. Making errors and skilfully integrating them can become part of the overall design process.

Whether eliminating or integrating an error, the activity of problem solving is embedded in the maker's existing knowledge and experience. But, in the process, experimentation with the tools and materials and testing out new techniques to find solutions pushes boundaries and broadens horizons. Possessing a willingness to learn, and to learn in perpetuity, is vital. The central case study showed

that the task of resolving a simple mortise-and-tenon joint presented a learning opportunity not only for the trainee, but for the instructor as well. The activities of problem solving and learning go hand in hand.

Problem solving is built into every stage of the work: design, costing, budgeting, making and delivering a commission to a client all present challenges to overcome. In sum, craftwork is problem solving; and the craft of carpentry is defined by the distinct array of challenges it throws up for its trainees, instructors, and seasoned practitioners.

Presentations and discussion over the two-day workshop took up many of the ideas and lines of investigation discussed above and expanded upon them with unique insights and case studies. Papers also went beyond the suggested themes outlined in the call for papers, and explore a number of fascinating, related themes. Papers from workshop contributors follow.

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