

Embodied knowledge

The experience of meaning and the struggle towards proficiency in glassblowing

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ABSTRACT ■ Becoming a proficient glassblower involves an indispensable shift away from cognitive readings of practice towards corporeal readings. In learning glassblowing myself in the course of an ethnography of handicrafts in New York City, the subtleties of apprenticeship, the modes of reading and understanding the practice, both cognitive and corporeal, have emerged, making more complex our understanding of the transmission, development, and modalities of practical knowledge. Such ethnographic dissection brings phenomenological considerations to bear on the question of achieving proficient practical knowledge, and enables us to sharpen our understanding of the role of meaning in practice.

KEY WORDS ■ glassblowing, apprenticeship, intentionality, body, practical knowledge, Bourdieu

Coming to glassblowing

I had been advised by a colleague to read all of aesthetic theory for a good year, starting with Kant. It was September 2003 and I was trying to concretize the research design for my dissertation on craft. I left the meeting disheartened and unsatisfied: could the debates in aesthetic theory get at the tacit understandings, experiences and skills of a craft? That evening I

contacted the educational directors of numerous craft facilities in New York City. By the end of the week, I found myself at New York Glass, a not-for-profit glassblowing studio, discussing the possibilities for research with the educational director:

‘So is your question on the difference between art and craft? Do you just want to observe?’ the educational director asked me. ‘Well, actually, I’d like to enroll in the course, to actually take the course. You see, I do ethnographic work, which means that I do my research through participation. It is not so much the question of the difference between art and craft that I’m interested in, as how we actually learn a skill, like glassblowing – I’d like to actually learn myself’ I replied. (Field notes, 23 September 2003)

Though the classes for the semester were already full, a deal was sealed that I could attend a beginners’ glassblowing class. I left New York Glass that day with a vague sense of promise: since then, a year and a half of field research at New York Glass has fruitfully gone towards understanding the development of practical knowledge in glassblowing.

Outside of glassblowing facilities associated with universities, New York Glass is the largest and most comprehensive educational facility on the east coast.¹ Many glassblowing workshops are set up in garages, primarily to cut the cost of installing a ventilation system – you just open the garage door – but also because the space is just right; there are usually only up to five glassblowers using a workshop, requiring no more than two or three glory holes, in which the glass is reheated as it is worked upon, two or three annealers, in which blown glass lowers to room temperature, and no more than one furnace, the box which keeps the tons of glass molten. New York Glass, however, an endowed not-for-profit institution, used by over 40 professional glassblowers, has eight glory holes (a ninth is being built), nine to 11 annealers, one of which is 15 feet long and three feet deep, and two furnaces (a third is being built).

Though the use of the facility is rumored to have declined over the last seven years due to political struggles for power within the board of directors, which has resulted in loss of endowments and consequent difficulty in maintaining the facilities, New York Glass is still a-bustle. Not only does it offer five courses in basic glassblowing per semester, they also offer specialty glassblowing, like Venetian glassblowing, as well as numerous courses in kilning, casting, lampworking and bead-making. There are weekend intensives, one-day courses, demonstrations by visiting artists, glassblowers in residence, and of course the everyday use of self-employed glassblowers blowing glass.

I had been blowing glass for six months when I attempted to blow the enigmatic goblet. When I arrived that Tuesday night, it was no surprise to find the glassblowers at their benches, blowing pieces, their assistants

hustling about, top-loading finished pieces into the annealers and opening the furnace doors to unleash that ever-emergent glimpse of inferno-like orange. There were the glory holes, blowpipes with freshly gathered molten glass undulating at their ends and, of course, that heady smoky scent of burning newspaper and pure unadulterated heat. I had become accustomed to the place. I knew my way around and could prove myself to be not an entirely incompetent glassblower. I was comfortable. It was therefore all-the-more engaging, disquieting, challenging – basically thrilling – when we, myself and my eight classmates, after having watched our instructor, Rob, demonstrate how to blow a goblet with our teaching assistant Jane, tried to take up the task ourselves: in technique it exceeded anything that we had yet encountered.

I had a basic set of skills: gathering glass from the furnace, blowing a bubble to form cylinders, bowls and plates, and using the basic instruments, numbering six both metal and wooden, to these ends. The goblet utilized these skills. To a point in the process, I was proficient. However, blowing the goblet also required new skills. Its challenge would be to combine learned with unlearned and thus presented me with a unique opportunity to evaluate how glassblowing is read by the glassblower, in varying stages of proficiency, specifically to reflect upon the ebb and flow of sensations, techniques, and modes of consciousness.

Reading the practice

A goblet begins with that invariable gather of glass from the furnace. I withdrew the blowpipe, a broomstick-length hollow steel tube, from the warming rack, where its tip rested in a row of low blue-orange gas flames. I no longer needed to think through my handling of the pipe – its weight, length, and red-hot tip. As the first step of blowing every piece of glass, I had long learned, following innumerable gathers, to let the pipe swing into a near vertical position before my body when removing it from the warming rack, gripping the cool steel just under the plastic tip with my right hand while lightly using my left to support the pipe from the middle. I walked in this way to the cinder-block furnace, a box about two feet deep inside and five feet in height and width, separated from the cement floor by an expansive metal grate. I knew I had the pipe gripped properly from the proximity of its unheated end to my face; its other end, orange with heat, had to be safely positioned just above my shoes – unlikely to burn myself, others, or to knock over anything. But, I sensed the ‘rightness’ and did not need to double-check, I had done it time and time again; all of my attention therefore was on getting a good gather of glass to start off this challenging piece well.

At the furnace, my partner, Heather, slid open the coal-chute-sized iron

door at hip height. I quickly dipped the red-hot tip of the pipe into the water bucket to remove any carbon, sending small streams of steam to my knees from the sizzling water. Between the door and the vat of molten glass was a small ledge, about six inches wide. I lifted the pipe with both hands to a horizontal position level with the ledge and gently rested the pipe, nearly at its tip, upon it. Withdrawing my left hand, I pushed the warm tip into the furnace until the edge of the ledge reached the pipe's mid-point where my left hand had been, effectively becoming a mid-point of balance. It was here, at the ledge's edge, that I felt the pipe. Just as the child tries to become more buoyant on the see-saw so that her friend may come to the ground through her effect on the mid-point of balance, I let my right hand, which still gripped the steel at the pipe's other end, become light until the pipe's warm tip within the furnace lowered toward and into the slightly undulating molten glass. Seized by the viscosity of the glass, the pipe, without a counterforce from the right hand outside, would have sunk. Instantly, thus, my right hand set to work, the left too taking up a place just below the right, quickly rotating the pipe clockwise so as to both keep the pipe from sinking beyond four inches deep and to 'gather' the glass through twirling – much as one would gather honey by twirling a teaspoon in the honey-jar at the breakfast table. I gathered confidently; the over-zealousness of the grip of the glass on the blowpipe told me that the blowpipe had gone too deep. Pushing directly down on the end of pipe closest to me with my right hand, I brought the other tip out of the glass and swiftly withdrew the pipe with a mango-sized gather of glass at its tip from the furnace. Heather slid the furnace door closed.

I had seen gathering demonstrated, had been instructed in how to gather, and had gathered many times prior to the above-mentioned gather to blow the goblet. By the fifth week of the class, we had stopped following Rob, our instructor, to the furnace to watch his initial gather. The technique of gathering had been broken down into successive moments as I had noted in my field notes during my first glassblowing days:

We were asked to individually step forward to the furnace with our blowpipes and 'gather'. 'Just rest your pipe on the little ledge here,' Rob advised, 'just like you would on a windowsill and then just lower the tip into the glass with your right hand on the end of the pipe. Watch the reflection of the pipe in the glass rise to meet the pipe, then lower it in just a few inches and give it a few swift twirls – one, two, three – that's all you should need. Keep it on the ledge, and bring the tip of the pipe up. Place your left hand on the pipe just beneath the right, pull it up and out. Don't worry, you'll do it quick enough, because this isn't the sort of place you want to hang around too long.' (Field notes, 19 October 2003)



Figure 1 Gathering from the furnace.

Gathering from the furnace

Bringing the blowpipe into the proper holding posture, twirling the blowpipe strongly and with a steady cadence, placing it at the proper leverage point on the ledge, lowering it at the proper speed and placing its tip into the glass at the proper depth – these were all vital components to successfully gathering. We would also practice these components independent of each other, abstracted from the actual process, as when Paul, my glassblowing instructor in the fall of 2003, recommended that we twirl broomsticks while watching TV at home to improve our finger dexterity. Though when learning to gather, the steps of the gather are explained and sometimes demonstrated distinctly like successive points on a line, to gather proficiently is not only a matter of linking together these successive actions.

The difference in moving from one step (lifting) to the next (lowering) to the next (twirling) and yet the next (lifting again) and so forth, and being able to ‘gather’ marks the difference between the gather of a novice and the gather of a proficient glassblower: the novice tends to proceed successively. Here we already see two possible sets of objects of attention for the

glassblower to read amidst her practice: (1) the part that is an end in itself and (2) the part as it serves a project, a whole. When gathering for the goblet, I looked to the gather's mass and its position on the tip of the pipe in anticipation of working on it towards a goblet. Towards this end, I registered the efficacy of the gather, not the successive components, or techniques of the gather, upon which my attention had been riveted in my first days of glassblowing. I did not consciously decide to continue to twirl when removing the blowpipe from the furnace, only sensed that, though a bit deep, the gather had been proficient for the purpose of blowing a goblet. This is a marked progress for the novice, who, accustomed to serving the instrument, finds the instrument through techniques actually becoming a part of her.² In *Personal Knowledge*, Michael Polanyi (1962) discusses this process through which instruments recede from consciousness and become extensions of the body:

[T]ools . . . can never lie in the field of . . . operations; they remain necessarily on our side of it, forming part of ourselves, the operating persons. We pour ourselves out into them and assimilate them as parts of our own existence. We accept them existentially by dwelling in them. (Polanyi, 1962: 59)

I had what Polanyi terms a *subsidiary awareness* of the blowpipe.³

The objects of our subsidiary awareness 'are not watched in themselves; we watch something else while keeping intensely aware of them' (Polanyi, 1962: 55). Though my technical capability enabled my gather, I did not pay heed to each step, the distinctness of which had been insisted upon in my early days glassblowing, but rather attended the gather itself, the correctness of which informed, if necessary, immediate adjustments to my techniques: 'In the exercise of a skill . . . we are aware of that *from* which we are attending *to* another thing, in the *appearance* of that thing. We may call this the *phenomenal structure* of tacit knowing' (Polanyi, 1967: 11). I knew my gathering had been apt in virtue of the gather. The objects of subsidiary awareness are not objects of attention, but rather instruments of attention. Polanyi discusses the instrumentalization of the objects of subsidiary awareness in the context of hammering a nail: 'We *watch* the effect of our strokes on the nail and try to wield the hammer so as to hit the nail most effectively. When we bring down the hammer we do not feel that its handle has struck our palm but that its head has struck the nail' (Polanyi, 1962: 55). Of the gathering of the glass, or the driving of the nail, I have a *focal awareness*, which incorporates my *subsidiary awareness* of the instrument: 'I have a *subsidiary awareness* of the feeling in the palm of my hand which is merged into my *focal awareness* of my driving in the nail' (Polanyi, 1962: 55). Similarly, as I began the process of gathering the glass, my awareness of the blowpipe's weight in my palm receded and, in its stead, advanced the sensation of the ledge's edge at the blowpipe's mid-point followed by the

weight of the gathering glass on the blowpipe's tip, and finally the gather towards a goblet.

As our awareness of a practice shifts into focal awareness, so too does that practice take on a *lived* character, a graceful extended movement, an arc of embodied techniques. Rob and Paul's instruction, intentional or not, had consistently encouraged a shift towards this *lived* type of awareness. While Rob may instruct, 'Bring the pipe up level with the ledge' or Paul may instruct, 'Twirl the pipe at an even pace' – bringing our attention to what had been subsidiary – they often countered this with a quick counter-instruction to refocus on the project at hand, in this case, blowing the goblet. So while Paul, observing me warming my gather in the glory hole to blow out into a bubble, would call my attention to the pace of my twirling – 'Slow it down there cowgirl. Keep it steady' – he would also quickly thereafter retract my attention to getting the glass to the desired end, calling out over my shoulder, 'But keep your eyes on the glass! Don't take your eyes off the glass! It's starting to hang.' Sure enough, taking my eyes away from my hands on the pipe, I would look into the glory hole to see my gather nearly dripping off the end of the pipe. By bringing the technique into focal awareness, we could hone it. But we were quickly urged to allow what had become a momentary object of focal awareness, the technique and tool, to slip back into subsidiary awareness, a movement of attention, which having consciously attempted to make the technique more similar to the expectation, forged a slow process of restructuration.

This is the defining exercise of apprenticeship through which the apprentice fashions her practice by making an implicit technique explicit, improving and re-aligning that technique with its intended purpose, and allowing the revised technique to again recede into unconsciousness, with the effect of shaping the still nascent glassblowing element of her *habitus*, 'the system of structured, structuring dispositions' (Bourdieu, 1990: 50). Paul and Rob's direction of our attention towards technique is an abstraction of a moment from the process in which it is embedded; a moment of reflection, evaluation and decision, a moment to which we may properly refer to as reading, that process through which we retrospectively discern meaning of, in this case, our actions or technique. That an evaluation of the gather, a reading of the glass, would necessarily be retrospective leads me to suggest that reading a skill, like glassblowing, may be the mark of the novice and, while it can improve technique through bringing it into a state of exception, it can never be an operative mechanism of proficiency. When gathering for the goblet, I did not need to evaluate each of its constitutive moments to understand the deftness of the gather. Sense-making happened otherwise than this retrospective meaning-making.

Meaning in practice

I ‘understood’ gathering. This understanding was not an intellectual synthesis of successive acts by a discerning consciousness. Rather, it was a bodily intentionality:

practical, non-thetic intentionality, which has nothing in common with a *cogitatio* (or a noesis) consciously orientated towards a *cogitatum* (a noema), is rooted in a posture, a way of bearing the body (a *hexis*), a durable way of being of the durably modified body which is engendered and perpetuated, while constantly changing (within limits), in a twofold relationship, structured and structuring, to the environment. (Bourdieu, 2000: 143–4)

Moreover, this bodily intentionality ‘is a kind of necessary coincidence – which gives it the appearance of a pre-established harmony’ (Bourdieu, 2000: 143). When I understood, I effectively aligned the particular techniques with the whole intended end through bodily intentionality: ‘to understand is to experience the harmony between what we aim at and what is given, between the intention and the performance – and the body is our anchorage in a world’ (Merleau-Ponty, 1962: 144). The body is itself able to assimilate new significances – the ‘body is that meaningful core’ (Merleau-Ponty, 1962: 147). Thus, in virtue of bodily intentionality, the particular techniques become *sense-full*.

As proficiency rises, so too do the specificities and the particulars of technique recede and become, as objects of subsidiary awareness, servants of the whole. For Polanyi, we may ‘regard this function [of the particular] as its *meaning*, within the whole’ (Polanyi, 1962: 58). It is in its attendance *to* something, that the *meaning* of particulars is indicated: ‘All particulars become meaningless if we lose sight of the pattern which they jointly constitute’ (Polanyi, 1962: 57). The meaning of the particular is in its incorporated lived service, or functioning towards the whole, not within the abstracted retrospective interpretation and consequent understanding of its function. When the interpretive effort of ‘reading’ the practice, understanding how the parts fit into the whole, remains salient to that practice, as essentially a semantic understanding of meaning it forms an immense barrier to the *lived* experience of the craft as meaningful.

It is not so easy as either/or, however. In fact, they are often co-existent for both novice and master. We have discussed how semantic readings of meaning are more or less necessary, depending upon the extent of incorporation of the practice. The difference between the novice and master lies both in the extent of the necessity to retrospectively read meaning into practice, but also in the roots of the novice and master’s lived experiences of the practice. In the development of proficiency, the glassblower’s

beginning experience of the practice becomes the ‘fundamentals’ of the craft, those embedded dispositions and schematizations of glassblowing. The novice, however, is without this operative ‘foundation’, hence the oft-advertised ‘no experience necessary’. But the oddness of this statement is that even that very first experience of the novice must be informed by some experience. She is not experience-less, though she is assured that ‘no experience is necessary’. In fact, she arrives at her first day with already equipped dispositions and schemata for handling the forthcoming situations, experiences that must bear on her very first moments of glassblowing to greater or lesser degrees.

For example, gathering involves the sensation of heat and the motion of retrieval, each common to my previous experiences of working a campfire and fishing respectively. It was these past experiences that bore on my experience of first reaching towards a vat of molten heat, and engendered a schema with which I could manage the task of gathering: I didn’t go so far as to burn myself, nor did I send molten glass flying by yanking out the blowpipe when retrieving it from the furnace. For the novice, her lived experience is likely to be informed, not from a lived practice of the meaning of the particular technique as it serves the whole, but rather from other areas of her life, with which she can handle the newly encountered situation. Her adaptation is not conscious; it happens at the level of the body. Her body ‘catches’ already-known components of glassblowing, like heat and retrieval, and with some adjustments handles and gets through the new situation with greater or lesser degrees of success. These adaptations are specifically in response to what she finds herself confronted with and, in this sense, lack an anticipatory quality. They do, however, in re-positioning the body, set up the opportunity for the restructuring of the novice’s *habitus*, that system of dispositions that can anticipate, in accord with the *field*, those rules of glassblowing. Thus, through the adaptations, the glassblowing *habitus* begins to take shape, she develops a ‘feel for the game’ (Bourdieu, 1990: 66). Gus, a glassblower at New York Glass, once casually commented that:

[G]lassblowing has to become something that’s in your body and not something that you’re thinking about and that only comes from doing it. It doesn’t come from thinking about it. And that’s why it is important to go through the process again and again. (Interview with Gus Jenson, glassblower, 22 April 2004)

As the novice progresses, her adaptations to newly presented situations in glassblowing are grounded less and less in previous non-glassblowing experiences and more and more in her solidifying glassblowing skills, accomplished through restructuring. Thus, that retrospective meaning-reading of practice, so vital to the apprenticeship, is required to a lesser

extent as the novice's lived experience is informed by the fundamentals of the practice, glassblowing, itself: significance is to a lesser degree grasped by an intellectualized constituting consciousness, but becomes a 'motor grasping of a motor significance' (Merleau-Ponty, 1962: 143). However, there is still always the encounter in practice of the new and the unknown. For the novice, this unknown truly may be unknown, not just unexpected. So, while she may be proficient in elementary skills of the practice, such as the gather, she may have no schematization with which to handle a new disciplinary expectation: her dispositions may not yet envelope the discipline's canon and she may therefore be in a position of being able to handle points of blowing a piece proficiently, while being able to approach other technical points only through harkening back to non-glassblowing schematizations – the mark of an amateur.

In my attempt to blow the goblet, while I was able to complete the first steps proficiently, the gather and blowing the initial bubble, I found attaching the stem and foot extremely difficult. With the sense of the inevitability of the upcoming technical difficulty, anxiety flowed into my hands as I carried the gather on the blowpipe back to the workbench from the furnace. I blew out the bubble, paddled its bottom flat and asked my partner, Heather, to bring me a *bit*. A bit is made by gathering a small amount of glass onto the tip of the punty and shaping that gather into a slightly tapered cylinder by rolling it, called *marvering*, on a steel table, called a *marver*. I would then attach this finger-like piece of glass to the bottom of the bubble to serve as the goblet stem.

When Heather returned with the bit, I was waiting with my blowpipe positioned vertically before me, mouthpiece resting on the top of my right shoe, bubble positioned right in front of my face, left hand holding the diamond shears, used to pull, attach, and cut through the still hot glass bit. Heather positioned herself to my left, aligning her right shoulder with my left and centered the punty vertically in front of her body, the hot bit of gathered glass hovering just above her feet. 'Check your hands,' I called to her, attempting to linger on that sense of assuring composure and exaggerated confidence that accompanies the initial posture of a practice. She did, consciously shuffling her feet forward, closer to me, lining up our shoulders, testing that the width between us equaled the length of the punty. She placed her left hand above the right on the punty and set it into a pendulum-like swing. (Field notes, 8 April 2004)

It needed to happen in a blink of an eye, as Rob and Jane had demonstrated. It hadn't and we had to re-heat our already-too-cold pieces.

Re-positioned, Heather again swung the hot bit. Intense anticipation filled my body: 'Rob and Jane were both calling out to me, "Take it with the shears! Pull it onto the bubble!"' (Field notes, 8 April 2004). Their



Figures 2 and 3 Emrys popping the bubble and letting it blow out.



Figure 4 Paddling the bottom of the bubble.



Figure 5 Marvering the bit for the stem.

words called for action: I knew I needed to do as they had demonstrated – I needed to take hold of the punty with the diamond shears (imagine large scissors with curved blades that leave a diamond-shaped hole in the middle when closed), pull it towards the bubble before me and set the glass bit onto the bubble. I had no established rhythm, such as I had when gathering, to carry my actions. In response, my body searched – Catching a basketball? Playing hot-potato? Seizing the jacks? – these all semi-consciously ran through my mind. I was seized by a type of stage-fright: my body could not anticipate the right moment. Consequently, I looked for it:

My eyes jumped between my stagnant bubble, Heather's swinging punty swinging with the bit and the space passing in between. I felt impotent standing there, waiting for, rather than bringing about, the correct alignment of the swinging punty and bit with the standing blowpipe and bubble. (Field notes, 8 April 2004)

I visually scanned the arrangement of the object's positions, for the proximity necessary to take the punty with the diamond shears, guide it towards the center of the bubble, and finally with a straight downward pull, bring the bit into contact with the bubble. I could feel the rapid movement of my eyes – it made me even more nervous – they couldn't keep the tempo, were not the proper organ, could not anticipate, but waited to receive.

I did not and in fact could not catch the spatial synthesis for which I waited. I wrote in my field notes that day:

Heather delayed the punty in its downswing, it was stagnant. I grabbed onto it with the diamond shears, with the unease of catching baited game, and pulled it towards the bubble, and attempting to center the bit on the bottom of the bubble, began to pull it down. The irrevocable touch down of the bit upon the bubble happened before I could notice and Rob and Jane were already calling, 'Pull off! Pull off! You've got to pull the bit up and off the bubble!' My body was both numb and abuzz in the agitation of the unknown, hands shaking, heart racing. I drew the punty away from the bubble with the diamond shears so that the bit elongated into a semblance of a stem. They continued, 'It's going cold! Cut it! Don't wait to cut it!' Not seeing the cold of which they spoke, but knowing that I had to act immediately, I hurriedly took the shears with my right hand, clumsily positioned them on my fingertips for leverage and clamped down onto the glass: quartz-like veins of opacity broke through its clarity, as I exerted as much brute pressure as I could muster; the glass moaning under the bandying shears like paper-thin ice of a frosted sidewalk puddle under foot on a February morning. (Field notes, 8 April 2004)

In my attempt to take the bit for the stem of my goblet, I had lost the ability to synthesize my movements with a greater movement toward the goblet and could not attend to the technique, let alone to the goblet, from the particular techniques, which had been possible in the initial gather and blowing of the bubble. There was no recession of a trained body into unconsciousness, operating of its own accord, as I had experienced in the gather for the goblet. In its stead arose the bare punty, blowpipe and glass – each distinct – seemingly unrelated, but needing to be brought together as had been demonstrated. My efforts, however, to spatially read for the right moment of bodily intervention, to see when the time was right, were doomed to fail: 'Motion perceived visually remains purely kinematic. Because sight follows movement so effortlessly, it cannot help us to make that movement an integral part of our inner lives' (Bachelard, 1988: 8). Such efforts forsake what is essential to practice: temporality. Practice, whether novice or proficient, must be temporally not spatially motivated, the hallmark of non-reflective corporeal readings. Therefore, Rob and Jane, in their efforts to instruct with their calls

to action, set me into motion, made me temporal – my temporality needed to be primary to my configuration. Though I answered their calls with motion, I could not find quite the right way to handle the situation and therefore crassly mimicked what I had seen in the demonstration – the reaching out for the swinging punty and adherence of the bit to the bubble – gauging this spatially with my vision not temporally with my body. In my interjection into the process I seemed out-of-time, an interloper.

The inability to experience the particulars within a lived relation to the whole – when the glass, pipe, and shears become separated from blowing the goblet – when we are frozen in a moment of *ek-stasis* from the practice – is not the only way in which the practice can become meaningless, in Polanyi's sense. That is, it need not be moments of anxiety, non-recognition, and corporeal unrelatedness that usher in meaninglessness of a practice. In fact, the amateur, in virtue of her relative competency, is more likely than either the novice, who constantly immersed in the dialectic of apprenticeship rarely loses sight of either the particular or the whole for too long, or the proficient glassblower, whose competency invariably links the particular to the whole, to lose that constitutive connection of the particular to the whole, and potentially misread the particulars in terms non-related to glassblowing, whether from previous experiences, like when you first gather and though you're doing it, you say 'I have no idea what I'm doing' or in non-temporal terms, like the reification of a technique into successive positions.

It is not surprising that following my experience of 'meaninglessness' in attaching the stem to the bubble I sought out a moment of repose in which to recuperate – I went to what I knew. Placing the bit onto the bubble had been grueling and I was exhausted. I turned, pipe with glass in hand, towards the comforting glory hole, that blazing barrel-like furnace, where the glassblower warms the glass on the end of her pipe with soothing rhythmic rotations.

Immensely relieved, my body fell into that familiar mode, my fingers automatically twirling the pipe to that long-established rhythm, my eyes looking nowhere into the glory hole, slowly becoming caught up in the flickering texture of heat – its white, orange and grey hues running around the furnace's walls, framing the rotating glass – I became mesmerized and I day-dreamed:

During the process of reheating the bit three times in order for me to 'shorten' it, I had amazing visions at the glory hole. Not amazing visions, but I can't escape the glass constantly conforming to phallic or sexual images. The glass started to move, the heat of the glory hole awakening its fluidity, its rounded end making gentle revolutions. I could not act on it; it was too charming, too intimate: I wanted to follow it, to see where it was going, where it could take me. I just stared at these still timid revolutions, pleased



Figure 6 Heating the piece at the glory hole.

that it answered within a moment my own gestures. I kept the bubble, the goblet's bowl, and the bit, the goblet's stem, rotating. My body faded away – into the rotating blowpipe, my eyes becoming increasingly captivated by the movements of the softening glass. My bubble became testicles, flaming orange, and the bit, the stem, on the end became a searching penis, swirling around as it softened with the heat. Though attached to my pipe it seemed to swim outwards, bounded within the course white-peach-tangerine walls of the glory hole – the breathing red embers below, the roar of the bathing gas flame – was it nice in there? Why did I seem to be cutting through the lake? Moving ever-outwards within the brilliant fiery red of the glory hole, the bit shortened and the penis reformed to a sperm, swimming towards me, the short tail struggling to propel the head up my blowpipe. I withdrew the blowpipe slightly, leaving only the bit under the flame: it sauntered and swayed round and round, directing the piece towards me. The sauntering amused me – I didn't mind. I wanted to keep the glass in the glory hole: I was relieved to become a spectator, to become captivated. The stem recklessly overheated, sauntered and swayed round and round – an enraged white sperm swimming towards me. (Field notes, 8 April 2004)

‘Ok, flash! You’re going to lose the piece’ Jane called, waiting for me at the bench. ‘Oh yeah’, I thought, both jumping and responding with lethargic reluctance to the call to make myself vulnerable once again to the unknown of blowing the goblet. I was interested in just staying at the glory hole, turning and turning the glass, watching the configuration swim in the brilliant red, feeling the warmth simultaneously. I was set back on task, knowing that I could no longer just heat, periodically holding the blowpipe semi-upright to shorten the bit. I now needed to continue on with the project of the goblet, of completing the goblet. I wondered if there were glassblowers who just stand at the glory hole with the glass, never ever completing one object. (Field notes, 8 April 2004)

At the time, this visual fantasia seemed brilliant, inspiring like a muse, and I thought surely that it must be a salient aspect of the glassblower’s pleasure of practicing her craft. When asked, however, about such experiences, the trope of all replies was that they only see the glass, that they watch the glass in terms of the end it is suppose to be achieving. Paul, my first instructor, spoke against such reverie, explaining that it would prevent the glassblower from blowing good glass: ‘You have to keep your focus on the glass. When you lose it, you lose the piece. I can’t think about anything but what I’m suppose to be doing’ (Interview with Paul Roberts, glassblower, 13 April 2004). Though I had initially thought that they were withholding experiences that may be embarrassing to discuss, I came to understand, through a consideration of the experience of the meaning of a practice, that such a reverie was essentially meaningless, as it could in no way relate the particular to the whole, nor was it embedded in the temporality of the practice. I had abandoned that oneiric relation to work when reverie is rooted in the material under hand and allowed the eye to gain ascendancy: I was ‘seduce[d] ... in the direction of forms and colors, of varieties and metamorphoses, of the probable shapes of future surfaces ... desert[ing] depth, intimacy with substance, volume’ (Bachelard, 1971: 11). I had lost the dynamic engagement with the material and allowed it to become an utterly decontextualized, detemporalized imaginative meandering.⁴ Linger- ing upon such pleasurable experiences, while perhaps periodically done by the proficient glassblower, can only foil the purpose of the practice and therefore can play no role in the proficient glassblower’s practice. This does not mean that there is no role for pleasure in the craft, but rather that pleasure must be embedded in what is meaningful, what is experienced in that coherent relation of the particular to the whole.

Proficiency in practice

Having returned to the task with Jane's help, the piece started to resemble a convincing goblet, and inspired – once again finding meaning through related practice – I became reinvested. Perhaps still high from the visual and sensual fantasia, I began to dream again. This time, however, invested in the piece, through the recognition of its feasibility, I could see, in my working upon the piece, an elegant goblet taking shape – in the opening of the bowl, I could see a beautiful curvature forming, ready to hug the aerating swirls of a Barolo, to catch its falling legs. I eagerly worked toward that end, sincerely evoking my skills to the best of my ability, confident that I could carry what had been a difficult piece into something great and significant. I centered the stem, smoothed the bowl, attached a foot with eagerness and finally put the piece away in the annealer to cool. When riding the Manhattan-bound bus home, I was inflamed by the idea of a goblet, pondering its technical difficulty, considering that perhaps goblets were the only pieces of glass worth blowing, and enthusiastically sketched goblets fit for Venetians in my notebook.

Following this, you can imagine my shock when I returned to the shop that Thursday and found to my surprise that my goblet in no way resembled the elegant goblet I remembered placing in the annealer to cool. The glass hardly looked like a wine glass. Yes, it had the same components as a wine glass: foot, stem, and balloon, but it was more of a gesture towards a wine glass. My goblet, Rob joked, had turned 'globlet': it was lopsided and stout with a bowl like an inverted pyramid, the curvature of which could never accommodate my hope to gracefully aerate a kept Barolo, a stem as straight as a piece of ginger, and a foot that resembled a home-style silver dollar American flapjack.

I recorded my disappointment and disbelief:

That the beautiful ballooned glass for Barolo was so sharp in my mind's eye, the movement toward it so absolutely intentional, the reading of the movements of the glass so clear, the tools so well used . . . my hands seemed as if they were issuing forth this vision, but what happened, what the result was, was so, so, so, so absolutely far from all those intentions. (Field notes, 8 April 2004)

I had obviously misunderstood my actions – I had attempted to attentively read the movements of the glass and had acted accordingly as I had been instructed and had seen demonstrated; had roused all technical capability towards realizing that Barolo-accommodating goblet. Rob and Jane, though they would say there is merit in trying to achieve the form envisioned, never encouraged or played up the likelihood of it happening. Rather they often, as already discussed, drew our attention, cast distantly towards the



Figure 7 The ‘goblet’.

envisioned piece, back to technique. Each time we would lament for our failing to bring forth our envisioned pieces, they would patiently look at our pieces and read the faulty techniques inscribed upon them like lucid prose.

Looking at the inelegant goblet, I recalled each step of making the piece, blowing out the bowl of the goblet, attaching and pulling out the stem, humming a smooth rhythm for the turns of the pipe to fall into, pressing the small glass disc for the foot of the goblet – in the end everything had seemed to fall together, but these memories and impressions were at odds with what I held in my hand. How did I go wrong?

We have already discussed how the novice or amateur may attend to aspects of the practice, which do not directly bear on the purpose of the practice, such as visual reverie. Though this emerged in the blowing of the goblet, I was ‘brought back on track’ by Jane and able to finish the piece with not only technical competency, but also attentiveness and sincerity. We have also already discussed how a reading of the practice cannot be an operative principle of proficiency, as it calls for an interruption of practice, in virtue of the abstraction and reflection it requires. We have also seen that

confronted with the new, a type of interruption, an individual will draw from previous experience in order to manage the new situation, a type of corporeal adaptation anchored in the person's already established *habitus*. Proficient glassblowers are neither dreamers, cognitively reflective amidst their practice, nor predominantly reliant on co-option of corporeal knowledge from other realms:

‘I can’t talk and blow glass at the same time. I can’t stop to think about what I’m doing. I’m always way ahead, looking towards what will happen next. That’s the only place I can be; I can’t look back, nowhere else, just here. Anyway, I’ll explain what I’ve done afterwards,’ Kanik, a substitute instructor said, gesturing the fundamental form-giving techniques with his hands. (Field notes, 19 October 2004)

Moreover, proficient glassblowers have often said that glassblowing is not about blowing the perfect piece of glass, but coming up with effective solutions to all the problems that consistently present themselves in the process of glassblowing (Field notes, 19 March 2004). The force of proficiency is *non-reflective anticipation*, neither non-reflective, nor reflective adaptation. This is beyond the formation of practical knowledge or habit, that ‘knowledge in the hands, which is forthcoming only when bodily effort is made’ (Merleau-Ponty, 1962: 144). It is ‘[that] almost miraculous encounter between the *habitus* and a field, between incorporated history and an objectified history, which makes possible the near-perfect anticipation of the future inscribed in all the concrete configurations’ (Bourdieu, 1990: 66).

Proficient practical knowledge is this ability to anticipate the regularities of a system, the rules of glassblowing, and enact schemata to manage irregularities in virtue of having already incorporated the dispositions of that system, glassblowing. Yes, it is a corporeal knowledge, but proficiency is defined by the interrelatedness of *habitus* and field and the body’s consequent ability to anticipate: ‘[the body] is inclined and able to anticipate [regularities] practically in behaviours which engage a *corporeal knowledge* that provides a practical comprehension of the world’ (Bourdieu, 2000: 135). This anticipation is possible only when the practitioner understands the world’s imminence in which she operates and is therefore able to act immediately: the novice, though able to adapt, is not able to anticipate. Anticipation carries practice beyond the moment of action and is the faculty through which an envisioned piece can be realized. Though I had evoked my most sincere and well-executed technique towards a vision so tangible that I could see the Barolo swirling in the goblet under hand, that vision was an importation and in effect, had no relation in its consequences – no more than the swimming penis in the glory hole – to the task at hand. Perhaps it arose from pouring hundreds of glasses of deep burgundy Barolo as a waitress, perhaps it was from the Netherlandish feasts on the walls of

the MET, perhaps it arose from a confused remembrance of the words of Gide or Garcia-Marquez – whatever its origins had been, I could not have brought it to bear on the glass under hand. It is only corporeal *anticipation* that can directly bring forth the envisioned object of the practice. The anticipation that marks proficient practical knowledge is not a reflective forward-*looking* gesture. It is a non-reflective corporeal forward-*going* movement beyond adaptation: this is the imperative of proficient practice. My body did not have this corporeal sight. Regardless of how brilliant that Barolo swirled, regardless of my sincerity and belief, I could only have misread my creating and creation: my body was blind.

I now remember the hesitance that flitted across the face of my instructor, Rob, when I suggested that he demonstrate how to blow a goblet:

‘Anything but that’, he said slightly bowing and waving his hands as if before a daunting task, ‘For a goblet, I have to be warmed up. Maybe at the end of class.’ However, since no one else had another suggestion, Rob begrudgingly began the demonstration, ‘I guess that I could show you how to blow out the bottom for a goblet at least.’ But, he did it all and the demonstration was more daunting than any of us could have foreseen; the complexity of blowing the piece was unparalleled to anything we had done before. I felt amazed and moved by something completely new. When Rob asked what I was going to blow, I answered with a semi-shrug – ‘A goblet, I guess’. (Field notes, 8 April 2004)

The shrug came not from my indifference, but rather from the humility brought on by the complexity of the demonstration. I was unsure of my ability to navigate myself through the making journey.

I had not yet realized that ‘navigation’, though perhaps seeing me through to the end, and consequently landing me with a stout ‘goblet’, involved an extremely complex set of readings, informed by sensation, reverie, imagination, memory, reflection, adaptation. Nor had I realized that it was not and never would be any of these readings, though necessary as they may be to the dialectic of apprenticeship, through which the *habitus* is restructured. Only through the arduous process of developing that corporeal sight does the glassblower become proficient and house the capacity to anticipate the necessary – the most meaningful reading of a practical skill, the bedrock of proficient practical knowledge.

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Notes

- 1 Glassblowing requires a serious commitment as well as a significant financial investment. The facilities needed to blow glass are too expensive for but a few to afford for themselves, so studios tend to be shared by both novices and experts, hobbyists and professionals. Few students continue the practice beyond a beginning level and even fewer intend to become professionals. The professionals work freelance, generally selling their pieces for resale in department stores or boutiques in the city or to private individuals. They also subsidize their freelance earnings through teaching enrolled courses or as a private instructor. Many are also artists in other mediums, such as music, painting and drawing. The students vary from dissatisfied bankers to retired physics teachers to searching hipsters. For most students a general yearning to create, to make, to express themselves, coupled with some previous exposure to and consequent fascination with glassblowing, a TV program or a demonstration seen in a tourist artisan village, brought them to glass. Most glassblowing in the United States is 'studio' glassblowing, as distinct from Venetian style.
- 2 David Sudnow discusses the shift away from an awareness of the particularities towards the whole in regard to his jazz piano playing as an 'express aiming' or 'melodic intentionality':

The emergence of a melodic intentionality, an express aiming for sounds, was dependent in my experience upon the acquisition of facilities that made it possible, and it wasn't as though in my prior work I had been trying and failing to make coherent note-to-note melodies. (Sudnow, 1978: 44)

- 3 Merleau-Ponty's famous discussion of the incorporation of the blind man's stick from an object in hand to an extension of his phenomenal body:

The blind man's stick has ceased to be an object for him, and is no longer perceived for itself; its point has become an area of sensitivity, extending the scope and active radius of touch, and providing a parallel to sight. In the exploration of things, the length of the stick does not enter expressly as a

middle term: the blind man is rather aware of it through the position of objects than of the position of objects through it. . . . To get used to a hat, a car or a stick is to be transplanted into them, or conversely, to incorporate them into the bulk of our own body. Habit expresses our power of dilating our being-in-the-world, or changing our existence by appropriating fresh instruments. (Merleau-Ponty, 1962: 143)

- 4 This does not mean that there is no role for imagination in glassblowing. Rather, imagination is formidable in the work of *homo faber* as *libido*, as *willed* reverie: 'It is the source of all the works of *homo faber*' (Bachelard, 1964: 30). I had understood reverie as 'relaxed consciousness': 'Since reverie is always considered in terms of a relaxed consciousness, one usually ignores dreams of definite action, which I will designate as reveries of will' (Bachelard, 1998: 13). In this sense, Bachelard writes that matter is dreamed not perceived and that the reverie of *homo faber* is:

born out of working with soft substances (*pâtes*), is also necessarily correlated with a special will for power, with the masculine joy of *penetrating* a substance, *feeling the inside* of substances, knowing the inside of seeds, conquering the earth intimately, as water conquers earth, rediscovering an elemental force, taking part in the struggle of the elements, participating in a force that dissolves without recourse. (Bachelard, 1999: 107)

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