

Program

All code is language. Or more precisely, all code is written in a language. There is no one “true” language of code, anymore than Chinese is truer than English; rather, they exist on a continuum stretching between the human and the machine. Choosing a language is a tradeoff between the speed and efficiency with which the machine can analyze and execute the code and human understanding and expression (each language offers the coder unique modes of style and tone). For AOR we have written unique software wherein a beekeeper’s body is transformed into particles. By more closely examining how the code relates to what appears on the screen—both through description and the code itself, printed at the bottom of each page—we can see how software offers us something more, a way to overcome the work of art as mere imitation or expression.

The program first differentiates the figure of the beekeeper from the background by analyzing each pixel and filtering it through a value limit; pixels found to be pure black are ignored while all others are passed on. This process breaks the image into constituent particles, each corresponding to a single pixel in the image. Differentiating the figure from

the ground is necessary for the program to recognize the beekeeper against the void he inhabits. When designing the system to determine a limit distinguishing keeper from void, it was understood that there will necessarily be mistakes in the analysis; even in a seemingly simple system comprised of discreet points of color it is difficult to determine with accuracy exactly where one thing ends and another begins. Much as each viewer has a unique understanding of a particular boundary, an understanding tied to the objects and goals at hand (the biologist armed with an electron microscope will have a different opinion than a cook welding a butcher's knife), the software itself is embedded with a particular perspective on how make such a judgement for its purpose.

Transitioning from a state of a solid figure, the beekeeper begins to vibrate with a slow but steady emission of particles as each chooses when to strike out on its journey; almost as if responding to the hidden statistical pulls of half-life and decay. Each particle chooses a random destination somewhere in its 2-dimensional universe. This is done through the creation and manipulation of a series of parameters governing each particle's type of movement, direction, and velocity. The movement of the particle is not simply a straight line from A to B; the path itself is curved, drawn as a single slow wave from its current position to a point in the vicinity of its destination. At each step a new curve is drawn and a single step is taken. A set of newly generated random parameters are combined with those set at the particle's creation to generate a unique curve. In this way the particle moves consistently but unpredictably, appearing more as a slow meandering than a directed drive towards a goal. There is no single ideal path, but an infinite number of paths emerging at each step. Once a new path has been generated, the particle takes its next step by moving along the path a fraction of the total distance between its current position and its destination.

As the distance between a particle and its birthplace widens, it begins to feel a pull back towards its origins. It is a pendulum swing back towards a center of gravity. The becoming-

universe of the particle is inextricably tied to its having-been-beekeeper. As the pull strengthens, the particle begins to choose new paths, to a new destination, back from whence it came—we see the figure of the beekeeper coalesce before our eyes. Each particle is engaged in a cyclical transition between states of dispersion and cohesion. An endless cycle between clear states of solid figure and radically dispersed particle, each position separated by liminal moments of ambiguity¹.

It is easy to see how the themes of the Beekeeper assert themselves in the very behavior of the particle. The particle itself has no concept of history, or at least no absolute history or even a memory. Its history is embedded in its motion. Each move is dependent on all prior moves. A selection among infinite temporary paths each bringing it one step closer to its goal. At any given moment, a single historical path can be constructed by plotting out the particle's position at each moment in time; but in truth what this would reveal is only the accumulation of choices made in the face of the infinite. Not only are random factors at play in determining the particle's path, but this randomness is compounded at each step. As a result, its motion is non-deterministic and cannot be derived from a simple formula. All prior moves are brought to bear on the current state such that each subsequent step is as bound to the accumulation of these choices as it is to the random factors which are constantly at play.

As a consequence of these non-deterministic factors, our standard conception of time is called into question. Imagine a film of a vase slipping off a table, striking the ground, and smashing to pieces. When the film is played in reverse we see a remarkable, unnatural site as the vase pulls itself together and leaps back to the surface of the table. This idea, that all things being equal we can reverse the arrow of time and see

1 Like Cache's images in a state of pure dispersion, "They belong to the realm of aleatory images whose forms are never defined, because they are always recomposed according to the fate of their encounters." Bernard Cache, *Earth Moves: The Furnishing of Territories* (Cambridge, Massachusetts: MIT Press, 1995) p. 105.

a predicatable world drawn in reverse, where what we call causes in our universe become effects in this mirror world, is entrenched not only in our day-to-day understanding of the world, but also in the classical physics handed down from Galileo to Newton to Einstein. In the contemporary disciplines of non-linear dynamics and quantum mechanics however, this idea is being challenged. Time ceases to flow in a symmetrical fashion. Cause and effect take on a stronger character than Hume's mere coincidence². Similarly in *Beekeeper*, you cannot reverse the arrow of time and see the same movement in reverse, you cannot ask the system to show you where every particle was or will be located at a given time. You can only watch the stream of *Beekeeper* becoming universe.

We can see how the underlying code does not have a mere representational relationship to the themes of the work. Rather these themes reveal themselves time and again in the very operations and organizations of the code itself. This deepens the thematics of whole and part, and makes clear the perceptual differentiation required to understand a world of infinite subdivision and multiscalar dynamics. The concept of nested whole and parts relationships is key to understanding how the code functions with respect to the work as a whole. In fact, such whole and parts relationships repeatedly appear at a variety of scales throughout the piece. There are two interconnected ideas at work here. First, there is the general notion of whole and parts where individual objects

2 "In reality, there is no part of matter, that does ever, by its sensible qualities, discover any power or energy, or give us ground to imagine, that it could produce any thing, or be followed by any other object, which we could denominate its effect. Solidity, extension, motion; these qualities are all complete in themselves, and never point out any other event which may result from them." David Hume, *Enquiry Concerning Human Understanding* (1777) Sect. 7, Part 1, 50. And later "It appears that, in single instances of the operation of bodies, we never can, by our utmost scrutiny, discover any thing but one event following another, without being able to comprehend any force or power by which the cause operates, or any connexion between it and its supposed effect." *ibid.* Sect. 7, Part 2, 58.

are organized into totalities, such as organs in a body, pixels in an image, or members of a population. Typically these relationships are understood hierarchically, but this need not be the case. It is possible to engage such a relationship without resorting to overemphasizing the unity of the whole against the fragmentation of the parts or, vice versa, reducing the whole to a mere collection of units. Perhaps the part and whole hold an equal status vis-a-vis one-another, but simply operate at different scales. Each hold unique properties not found in the other. “Like organisms and species, the relations between individuals at each spatio-temporal scale is one of parts to whole, with each individual emerging from the causal interactions among members of populations of smaller scale individuals.”³ Quantum particles can appear out of nowhere, refuse to reveal both their position and velocity at the same time, or become entangled with particles thousands of miles away. At the same time they directly form wholes with none of these properties, but another set all their own—liquids flow with wild yet predictable patterns, crystallize at certain temperatures and evaporate at others.⁴

Beekeeper exhibits a series of nested whole-and-parts relationships; the pixel is to the whole of the image, one step removed from the fragmentation that we do not even see, the particle becomes apparent only by asserting itself in the face of the beekeeper of which it is a part, and finally the code itself can be understood as a actualization of the themes of the work as a whole. Using the logics of part and whole we can see how Beekeeper escapes the traditional conception

3 Manuel DeLanda, *Intensive Science and Virtual Philosophy* (London, New York: Continuum, 2004) p. 117.

4 “Matter thus offers an infinitely porous, spongy, or cavernous texture without emptiness, caverns endlessly contained in other caverns: no matter how small, each body contains a world pierced with irregular passages, surrounded and penetrated by an increasingly vaporous fluid, the totality of the universe resembling a ‘pond of matter in which there exist different flows and waves.’” Giles Deleuze, *The Fold: Leibniz and the Baroque* (Minnesota: University of Minnesota Press, 1992) p. 5.

of art, and in this case even medium, as imitation, representation, or vehicle of some greater Idea. The Aristotelean notion of art as imitation ⁵is blown apart by taking it all the way through to an extreme. The work ceases to express or represent ideas or objects “out in the world”, but actualizes the becoming of its own themes. As Bernard Cache says, “The primary image is no longer the image of the object but the image of the set of constraints at the intersection of which the object is created. This object no longer reproduces a model of imitation, but actualizes a model of simulation.”⁶ Beekeeper does not merely represent the fluidity of our becoming in universe, but actualizes this condition in the very core of it’s operation.

C.B. McWilliams

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5 “For as there are persons who, by conscious art or mere habit, imitate and represent various objects through the medium of color and form, or again by the voice.” Aristotle, *Poetics* 471a15. The *Poetics* as a whole is a discussion of the proper types of imitations and their differences in “medium, the objects, the manner or mode”.

6 Bernard Cache, *Earth Moves: The Furnishing of Territories* (Cambridge, Massachusetts: MIT Press, 1995) p. 97.