



Longbranch Research Associates *presents:*

# So-Called Experts

*a book always in progress & free.*

CHAPTER 2

## Design II

*as of August 25, 2015*

Creationism, the anti-Darwin theory of how we came to be what we are, gave way in the twenty-first century to “intelligent design” (ID) which, despite protests from its supporters, is just another name for the same thing. As Judge Jones, referring to the theologian John Haught, wrote:

[T]he argument for ID is not a new scientific argument, but is rather an old religious argument for the existence of God. [Haught] traced this argument back to at least Thomas Aquinas in the 13th century, who framed the argument as a syllogism: Wherever complex design exists, there must have been a designer; nature is complex; therefore nature must have had an intelligent designer.<sup>1</sup>

Both sides agreed, the imprimatur of the Dover, Pennsylvania School Board on Intelligent Design was an assertion of religion. The question was whether that was proper in a public school, not whether that was the Board’s intent. Judge Jones does not comment on the fact that both sides accepted that humans and other plants are “designed.” The question is whether, when one sees design, he sees purpose. Can there be design without conscious intent? Without, that is, a designer?

That might seem like a silly question. Many people who do not believe it is divinely created place a piece of driftwood or a rock on a shelf or mantel, not only to remind them of a place they have been, but as a work of art or, at least, design. Others place “found art” in settings and sell it. The place from which it emanates is not a necessary feature of its appreciation. The design, as perceived by the buyer, is worth paying for. Design, in other words, is a subjective determination made by a human (no other creature seems to make such purely aesthetic decisions, although there is some evidence that other creatures take aesthetics into account). Its existence implies nothing about how it came to be.

Yet we find, in as progressive an era as the 1970s, a statement from someone we think to have been in advance of his times, R. Buckminster Fuller:

When we say that there is a design, it indicates that an intellect has organized events into discrete and conceptual interpatternings. Snowflakes are design, crystals are design, music is design, and the electromagnetic spectrum of which the rainbow colors are but one millionth of its range is design; planets, stars, galaxies, and their contained behavior such as the periodical regularities of the chemical elements are all design accomplishments. If a DNA-RNA genetic code programs the design of roses, elephants, and bees, we will have to ask what intellect designed the DNA-RNA code as well as the atoms and molecules which implement the coded program.<sup>2</sup>

What a surprise to find that Bucky Fuller followed the Aquinas logic: Where there is design there is a designer! One would think that such a bold statement preceding a book would be congruent with the book that follows it. My impression, however, is that Victor Papanek, the book’s author, rewrote his opening after receiving Bucky’s Introduction, to assert that Bucky’s view is not his. Not that Bucky was wrong in his assumptions, says Papanek, only in his conclusion:

Design is the conscious effort to impose meaningful order.

The order and delight we find in frost flowers on a window pane, in the hexagonal perfection of a honeycomb, in leaves, or in the architecture of a rose, reflect man's preoccupation with pattern, the constant attempt to understand an ever-changing, highly complex existence by imposing order on it—but these things are not the product of design. They possess only the order we ascribe to them. . . . Though they have pattern, order, and beauty, they lack conscious intention. If we call them design, we artificially ascribe our own values to an accidental side issue.<sup>3</sup>

Papanek agrees with Fuller that design must be the result of intelligent activity, but uses that definition to dispute that nature contains design. Nature has no “conscious intention,” so nature cannot be the source of design. I find this position as stupid as Fuller's, and surprisingly so, as otherwise this is a far-sighted, almost inspirational book, well ahead of its time (well ahead, for example, of Raymond Loewy) in asking industrial designers to be conscious of methods of production, and the impact of that production on the environment.

This debate about how to interpret “design” in nature, declaring it not to be “design” in Papanek's case, is fruitless. Consider an experiment in which we show consumers four Christmas decorations, all mimicking a snowflake. Let's say two of these “designs” were taken by some advanced photographic process from actual snowflakes, and two of them were drawn by human designers. All four were fabricated in the same way, from the source design. Let us further hypothesize that each of the four designs is chosen as the favorite by about one-fourth of a panel of viewers.

Should we now tell them that two are not, in fact designs? Then what are they? “Oh, two come from nature itself,” we say. Some of our panel might say that then they are designs, the product of an intelligent designer. Others will say “That's nice, but why can't design come from nature?” Surely no one will say “Then you cannot produce those two, whichever they are, because they are not the product of intent, and therefore are not designs at all.”

In Chapter 11 I will show that we eventually come to a consumer's name

for objects, regardless what the initial name was. Here, let's take a consumer view of design. If design is something that pleases the viewer—more broadly, that serves a function well and is also aesthetically pleasing—then its origin is of no importance. The goodness of design is determined in the beholding, not in the making. Man does design, in both the functional and aesthetic sense, but then so does nature. The combination of bees, butterflies and hummingbirds (and sometimes wind) does a better job of pollinating than any mechanism man has invented. If you want to think that therefore a god thought it up, you are welcome to, but the presence or absence of a deity has nothing to do with why we call it good design. We evaluate that it works well. It is pleasing to our intelligence and, for the most part (aside from pollen and bee stings) to our sense of aesthetics.

## Designers Who Are Not Users

In the early 1960s, I purchased a then state-of-the art tape recorder, an 800 series Crown. Tape speed is regulated in an analog tape recorder—reel-to-reel or cassette—by a spinning metal rod, regulating the speed from  $3\frac{3}{4}$  to  $7\frac{1}{2}$  to 15 and even 30 inches a second or, in the case of a cassette, 1.875 inches a second. The tape is passed between that rod, called the capstan, and a rubber wheel, the pinch roller. The pinch roller is set against the capstan, squeezing the tape so it does not slip. Crown was famous for its speed change mechanism: A rubber band stretched between the flywheel attached to the drive motor, and what looked like three pulleys on a rod that became the capstan. The pulleys had progressively larger diameters.

The motor, and hence the flywheel, never changed speed. The speed with which the pulley, hence the capstan, drove the rubber band, however, was determined by the diameter of the pulley. The larger the diameter, the longer a point on the rubber band had to travel to achieve a given rotation, thus the slower the capstan would rotate. Although many people laughed at a “professional” tape recorder driven by a rubber band, it was in fact a magnificently smooth system. Sure, you had to go around to the back of the

machine to change speed, but how often would you do that? Instead of electronically adjusting the motor, you mechanically adjusted its rubber band. Just stretch it and put it around the “pulley” you want. It was either crude or brilliant. That design element set Crown tape recorders apart from all others.

Analog tape recording requires a “bias” signal, a tone of 100,000 Hz (cycles per second) or so, to be added to the audio signal. Being additive, the bias signal raises the entire signal into the linear part of the magnetic tape. On playing back, you would never hear it, because the final transducer (loudspeakers or headphones) could not reproduce it, and human hearing does not extend to such frequencies. To be sure (and animal friendly), the play-back head, having a slightly wider gap than the recording head, was incapable of sensing such a tone. Wonderful inventions those analog tape recorders. Only the Crown was designed so that it was virtually impossible for one person to operate it.

As part of the “set-up” for any professional recording job, the operator had to adjust the bias level for the tape being used. He would record a tone, let’s say 1,000 Hz (that is, 1 KHz), and “tune” the bias by adjusting a potentiometer (a variable resistance or “pot”) that controlled the current of the bias tone. Looking at the playback meters, he adjusted the pot to maximize the volume of the material being recorded. These volume meters, of course, are always on the front of a tape recorder. They are otherwise used to set recording levels.

This operation would be easy enough were the variable resistance pot also on the front of the machine. That is where every other company placed it, usually accessible only with a screw driver. Not something you want to fiddle with accidentally, but something you need to control. Crown, however, placed this pot inside the machine, accessible only from the rear. You could picture the technicians at the factory—two of them, one reading the meter at the front, the other with a screw driver at the back. “A little more . . . a little more . . . back . . . there, stop.” Maximum volume, bias set, professional tape recorder sent off to customer.

It apparently never occurred to a designer at Crown that one person alone

might be doing the recording. That never happened at the Crown factory, and apparently no one who worked at Crown ever took a tape recorder home to use. Or never adjusted the bias. This tape recorder was my first introduction to truly stupid industrial design.<sup>4</sup> The reasons for that stupidity were immediately obvious: One should not design that which he does not use. Do not design cookware if you never cook. Do not design a camera if you do not take pictures. Do not design a tape recorder that requires two people to set the bias. Put the bias adjustment on the front, where the meters are. It is such a simple rule.

This kind of thing still happens. Below is a posting to the Pro Audio email list in 2005. It is not important to understand it all. You can see the point. The manufacturer assumed that one would use the device either in analog mode or in digital mode, and so used connectors that were already there for analog as the digital connectors. It is confusing enough that the same three-pin “XLR” connectors are standard for low impedance microphones, for balanced 1 volt analog lines and for digital signals; but on most equipment a label points you to the right place.

Date: Wed, 20 Jul 2005 14:06:21 -0400  
From: John McDaniel <johnmcd@one.net>  
Subject: Cabling an I/O that is both digital & analog on same connector

Thanks in advance for the technical expertise of the group.

I've recently purchased an APT Milano ISDN codec. Upon receipt, I was surprised to find that rather than having separate analog and AES connections on the back, it uses the 3 of the 4 XLR analog I/O connections to connect AES in, AES, out and AES reference when in digital I/O mode.

For a list price of \$6,000 that's a shortcut I didn't expect.

Anyway, on to installation. I want this device to show up on my digital router \_and\_ on my analog patchbay (all in the same rack in the machine room).

Can I route the connections to a set of panel mount DPDT toggle switches set in a blank rack panel and then flip (literally) between analog (patchbay) and digital (router) as desired.? We're all wired up with Belden 1800B so I'm covered with the appropriate interconnect. What are my switch concerns and what is the best type of switch for the job?

It's a real PITA to have a nice machine room with a router and clear easy patching, that requires you to climb behind the rack to deal with patching this one device.

Regards, j mcd

Like the writer, McDaniel, I have both digital and analog signals on my

patch bay. The digital signals are clearly marked. No jack passes both kinds of signal.

So-called experts, some on this same email forum, told me not to place digital signals on an otherwise analog patch bay. Others warned me against using an industrial transformer to create “balanced power” in my studio. These are two of the best things I have ever done in audio, running the entire studio off balanced power (where I create 110 from the 220 volts coming into the building and do not get ground currents from refrigerators turning on and all that) and patching the digital signal. The so-called “experts,” trying so earnestly to counsel me, were wrong.

You could reply that just because the industrial designer does not have my particular needs in mind does not mean that he has made a mistake. To avoid getting into my needs, let’s rely on David Pogue, inventor of the “For Dummies” books, technology writer for the *New York Times*. Writing about the Motorola Droid X “smart” telephone:<sup>5</sup>

Inexplicably, there are two separate e-mail programs to learn: one for Gmail, one for other types. Each works differently. Why? There is no way, in Gmail, to change the type size for e-mail. Evidently nobody who works at Google is over 40.

As I signed a non-disclosure agreement with Digidesign, I cannot reveal the details of the error I found in Pro Tools, the most professional audio mixing software available, when I first purchased it in the early 1990s. I’m talking an error here, not a difference of opinion. It was fixed in the next major version, and I received a free upgrade. No hard feelings, mind you. I am a fan of Pro Tools. They and the intermediate dealer (Sweetwater Sound) handled the situation well, understanding that I was right, there was a flaw in the software. Why did they need me to find it? Because they are not experts? Because they write software they do not use?

I will offer just one more example. This is a surprising one. It is Apple, the company known, above all, for its design. They build a small box that transfers

signals from your home wi-fi to your TV set. And what is on your home wi-fi that you want the TV to play? In my case, it is radio. I listen most to the NPR station in Charlotte, WFAE-FM, which is two hours away. I live on a mountain, and therefore get reasonable radio transmission, unless there is bad weather. Then the radio gives me more fuzz than content. But that station, and the BBC (when I do not like what WFAE is playing), come in through my cable, out my router, into the Apple box and into my TV, as clear as anyone would want.

So, what does Apple do with the screen? Let's first ask what they *should* do. For a TV to function as a radio, it should turn off the screen. Or, if you will, play black. Touch a button on the Apple control and it will function as a selector screen. Select your station, and then the screen should go to black. This is radio. I want to see—NOTHING.

It may be radio to me, but to Apple it is TV. Apple floats a series of outdoor photos, flooding your room with light, multiple images floating from bottom to top. Many of these images contain white, as if specifically selected to illuminate the TV's surroundings. They are still images, pulled no doubt from a memory chip in the Apple box. Not even my own photos—theirs.



That is what Apple does, indicating clearly that no one in that company listens to the radio. What I do is keep a bath towel draped over my TV, so I can play the radio without all this moving light.

In April, 2014, these pictures were not present. There was a black screen, just as there should have been. I thought: Perhaps, Apple has learned that radio listeners do not want video. No such luck. The visuals came back in May. Perhaps there is a control I do not know about that turns them off, but why are they there in the first place? The lesson remains: People who do not listen to radio should not be the screen designers when TV plays radio.

# What Do Designers Do?

Designers observe. The intent of their products is usually to manipulate us (to sell us something), often to please us, and on occasion to make some kind of statement, artistic or philosophical or political or something else. Design is a signal. We are supposed to respond to it. I have no problem being manipulated, for example, to turn right when I enter a grocery store. That is where the fresh produce usually has been placed. If I want only dairy, I will go to the far left. Designers have developed this placement to get milk and egg buyers to the farthest end of the store, so they will see other products during the trip. Yes, it is manipulative, but it is also common knowledge, making life easy for the customer new to this particular store.

This understanding serves everyone's interests. A well laid out store will allow me to get to the products I want quickly. Then I face the products themselves. If designers would just use (that is, use intelligently) products, they would figure out how to improve them. But either they don't or they can't. So they observe others doing so. Penelope Green tells us:<sup>6</sup>

This observational research is how LG learned that people were trying to jam their sports water bottles into fridge-door water dispensers and finding the standard cavity too small, leading the company to make dispensers in its new refrigerators more than 11 inches tall, the largest in the industry. And the same kind of research explains why Amana makes an oven with indented racks: its researchers noted a disturbing tendency of some bakers to scald their forearms when reaching deep in an oven to retrieve pans set at the back. Observing the human animal in its native habitat (as well as in company labs carefully constructed to look like home), corporate researchers study not only how many times these humans open their refrigerators (55 times a day, according to General Electric) and what might be the most intuitive and comfortable shape for their dishwasher handle, but how that dishwasher or refrigerator supports their idea of themselves.

The designer who produced the bottles that fit neatly in refrigerator doors, as those doors are currently made—shown in the previous chapter—might

be upset if that standard changes to accommodate people who try to put things there that currently do not fit. Like the modern concept of the dictionary, which reports how words are used rather than establishes how they should be, this observational approach has its good points and its bad points. It is clear that companies listen. What is not clear is how so many features that we perceive immediately as bad passed all this observational intra-company review. Why do they require outsiders to tell them? Don't designers have a clue?

## Doors

I am not the first to criticize design of everyday things. Or to delineate the problem of non-user design. Here is James Surowiecki:

In part, feature creep is the product of the so-called internal-audience problem: the people who design and sell products are not the ones who buy and use them . . . The engineers tend not to notice when more options make a product less usable.<sup>7</sup>

Less may be more. There are books about all this. By and large, Donald A. Norman's complaints are similar to mine.<sup>8</sup> As a professional designer (where I am but a citizen, a victim, as it were, of the designs of others), Norman attempts to deduce principles of good design. He would be called an expert.

Even though I agree with much that Norman says, this propounding of universal principles—a *sine qua non* of the book world, I suppose—leads to absurdities. Take, as an example, doors. The question is whether one pulls or pushes the door to open it. Norman has a simple principle, that the design should indicate the function. The “proper hardware” will “indicate just how the door is to be operated.”<sup>9</sup> He shows a photograph of doors with “large plates . . . a signal to push, but in fact the door is supposed to be pulled.” His principle: “If a door handle needs a sign, then its design is probably faulty.”

“Probably?” Is this a rule or isn't it?

Many doors have a horizontal bar (push) on one side, a vertical bar (pull)

on the other. Yes, these doors do inform us what to do to open them. But must all doors look like that? Norman's rule that design should indicate function led me to look more closely at some doors. I had already noticed that I could not tell whether to pull or push the doors of my local bank. Below is a photograph of what you see as you walk up (a reflection of the author's feet giving away the photographer's identity).

I think these are handsome doors. The large hand plates are well positioned, and well sized. One of the attributes that leads me to like this design is that the same hand plates appear on the inside. Being exactly the same as those on the other side, the closer set obscures the farther set. However, being exactly the same on both sides violates Norman's principle. The design cannot indicate the function.



One might rely on the custom (and law) that exit doors must push outward, because a crowd trying to egress (say, in a fire) would push, and be trapped by inward swinging doors. But few of us think of building codes when entering or leaving a bank. Norman is right: the doors should tell us what to do.

But not at the expense of this stellar design. A push bar, for example, would look absurd here. As I suggested to the bank manager, I would simply add the words "push" and "pull" to the metal plates. Indeed, I suspect "Pull" on the outside would be sufficient. Even people who do not speak

English should have no trouble with the word "Pull." Design can incorporate a

simple instruction, easily seen (large letters, placed directly on the handle) and easily followed. As you reached to push the handle, you would immediately and easily change your motion to a pull.

We see, in traffic signs, an adoption of international symbols. “Walk” has been replaced by a striding stick figure, “stop” by an outstretched palm. It is a redundancy for the sake of safety. It does not imply faulty design of street lights. No one has designed bathroom doors that indicate whether males or females should enter. That information requires a separate sign. Most of us manage to find that sign and interpret it correctly.



Perhaps we want an analogous simple picture that immediately says “pull” the way the word “pull” does. Maybe a hand, with fingers curved around, viewed from the knuckles. Then “push” could be signaled by the back of a flat (pushing) hand. A clear, simple instruction, be it in words or graphics, engraved into the handle, would help people entering or leaving my bank, and leave the design as clean and beautiful as it is.

Although decorations at Christmas blot out the beauty of their doors, the bank staff did tell me they appreciated the beautiful simplicity of these doors. Norman’s rule does not work here. Functional simplicity, and a fine aesthetic (notice that the handles are small scale versions of the doors themselves) does. Norman may have other things to say that would stand scrutiny, but I do not

credit him as being an expert. Not on doors.

## Buildings



In Chapter 1 I criticized writers on design who discuss features of a chair, telling us nothing about its comfort. I went through rooms in a house, discussing designs that make no sense, that demonstrate no expertise. For the most part I avoided discussing architecture, the design of buildings—or architectural criticism. In the middle of 2011, however, we meet the CCTV (China TV) headquarters building in Beijing, which the *New York Times* critic says “may be the greatest work of architecture built in this century.”<sup>10</sup> I’m not sure what that means, as we are not twenty percent into this century.

What else does Nicolai Ouroussoff say to justify his expense-paid trip to China?

[I]t is one of the most beguiling and powerful works I've seen in a lifetime of looking at architecture.

Mr. Koolhaas has created an eloquent architectural statement about China's headlong race into the future and, more generally, life in the developed world at the beginning of the 21st century. It captures our era . . .

The forms are a reworking of classical perspective; the irregular structure is an attack on Modernist ideas about structural purity. Both are an effort to break down what Mr. Koolhaas, like a number of other architects of his generation, sees as the oppressiveness of the Cartesian order that has shaped architecture for centuries. The design is also striving to make room for the impurities and imperfections that make us human.

Yes, the Cartesian order—that is to say, the standard grid, based on 90 degree angles—yes, that must be the problem with modern architecture. It could well be that building owners, as well as architects, want to make “statements” like this in their designs, but first, shouldn't the building function well? And shouldn't the critic tell us if it will? Sooner or later someone in one of the 50 story “legs” will tire of having to go up or down 20 or more flights to get to a transverse area, where he can cross over to the other leg and go down or up to the right office or studio. It is almost humorous that, in supposedly Communist China, the executives are separated from the workers. Is this is another “statement” the building is making? Ouroussoff does not contrast that feature with modern buildings in the United States, which make a point of allowing worker access to management. Too close to discussing function, I suppose.

## **Perceived Beauty**

Notice that more and more we have “experts” passing judgment on TV. One contestant on Project Runway, a competition among would-be professional clothing designers, used a gauze above a design of circles to temper them, in fashioning a dress. We utilize such a technique in weaving, creating multiple layers on one pass, where you can look through one to another. It is a difficult weaving construction, but sometimes with beautiful results. The so-

called “experts” who run the show, however, were only impressed by bold prints, one incorporating the designer’s initials. Haven’t we had enough of Coach’s “C” or “LV” (Louis Vuitton) or “MCM” (Mode Creation Munich) in sharp, contrasting colors? Yet the more subtle gauze is not “expert,” said the so-called design experts.

Food contests are less certain. We get to see the same fabric as the judges, but we do not get to eat the same food. Sometimes brides choose the wrong dress, making for good reality TV, perhaps, but leaving us uncertain where good advice comes from. Similarly, I find many of the choices made before a “makeover” superior to those made during the makeover.

Invariably, I find room redesigns to be improvements, but I wonder if wardrobe redesigns “stick,” if the subject does not ultimately say “this isn’t me,” slipping back to her (it is almost always her) former sense of self, as does the character Andrea in *The Devil Wore Prada*. All aspects of one’s life, these days, are subject to critique by “experts.” What happened to knowing who you are, and living your life accordingly? Or, why do women wear four-inch stiletto heels while shopping? I don’t get it.

## **Ink Jet Printers**

I want to print directly on CDs, and obviously I am not alone. The CD manufacturing industry produces two kinds of printable recordable CDs, one with white background and the other with silver matte background. Both take ink-jet ink. Also, both require some straight through printing mechanism. You cannot curl your CD around a platen, the way you do with paper.

Initially, only Epson produced consumer printers for this purpose, although specialist brands (notably Disk Maker) produce automatic devices that will print up to 50 CDs, by taking one from one stack of blanks, and then, when printed, placing it on another stack. Most of us will not print that many CDs, or do not want to pay that price for automation. The first Epson printer I purchased that accommodated CDs, Model 900, required that you line up two

arrows, one on a plastic platter in which you place your disk, one on the printer. And you did so from the rear of the machine. It was then pulled through to the front.

Two things struck me as peculiar. First, many people place printers against a wall. You do not ordinarily have access to the rear of a printer, after installation, as the only thing you do there for most printers is plug in a cable. Second, this is too inexact a way to line up your CD under the print head. Surely a designer who actually wanted to print on CDs would have designed a stop: move your platter until it hits the stop, then the printer will move the stop out of the way when it prints.

Epsons are the worst printers to own if you print only occasionally. This is an industrial design failure that goes back to how Epson and Hewlett Packard (HP) made different decisions. The HP ink cartridge contains the print head, whereas the Epson cartridge sends ink to the permanent print head. The result is that the Epson printer clogs and, if you leave it still long enough, it cannot be unclogged. An HP printer, on the other hand, usually will start right up whenever you need it. If it doesn't, replace the ink cartridge (or take it out and clean it with a wet paper towel), and it will.

No amount of spraying Windex on to the spikes that enter the Epson cartridge—in later designs, the holes into which the spikes, now attached to the cartridge, are inserted—to absorb and then dispense ink, would rescue the 900. (Seriously, Windex is the “trick” evolved by Epson printer users to dissolve dried-up ink. Epson itself, denying that such a problem occurs, cannot sell a cure for it.) So I bought an Epson R260. The loading problem has been solved. You still put the CD in a separate tray, and you put that tray under the print head, again aligning two arrows. You put the tray into the front of the printer which, when it operates, first sucks the tray in further (aligning it more exactly), and then, when done, spits it again out the front. No rear access required.

This front loading is a welcome improvement. The original concept was flawed. Surely a customer told them to load from the front. Unfortunately, after

some period of non-use, the ink passages clog up, the printer becomes impossible to use or clean. Epson is still Epson. So it seems that Epson listens to customers, but is caught in a technology that ultimately will not work. Their printers are badly designed at a deep technological level, no matter how well they are designed at more surface levels. Too bad: Their ink is excellent.

Canon offers its MG5300 series, which can print on CDs. And, like HPs, it works when you want it to. However, like the Epson, it requires special label design software which—my standard complaint—was surely designed by someone who does not make CD labels. Neither Epson’s nor Canon’s software will take a design made in the other’s software—or any other software—unless one composes and saves that design as a single graphic, and then imports that graphic to the printer’s software. Look: Neither Epson nor Canon is a software company. So why not get a truly expert software developer, with programmers who design their own CD labels, to write the software for you?

Here’s another example of improvement. Suppose you want to print on several CDs. Using the 900, you have to get up from your desk, go to the printer, take out the printed CD and insert one that has been recorded, but not printed on. Then you go back to your desk and hit “print” on your computer. Any user would object: I want to signal the printer that it is ready to print as soon as it is, not after I walk back to my desk. And, with the R260, you can do this. Tell the computer to print multiple copies, and it will print one, then start the second at the touch of a particular button on the printer.

That this feature was not available from the beginning, and is not available on the Canon, is just another example of designers who do not use their products; at least not before they are produced. What seems astonishing to me is that a manufacturer has to get consumer feedback to do things right. Isn’t this what “designers” are supposed to do? But then, designers should anticipate that a printer left unused for some time will cease to be able to print. HP’s technical designers understood this problem; Epson’s did not.

Apple seems entirely different from the rest of the industry. Most of their

design changes come from the inside, not from customer complaints. Apple uses customer feedback to get information on the feature/price choices that consumers want to have. Want more memory in an iPhone? OK, but you will have to pay. Want to use your iPad on both wi-fi and 3G telephone networks? Well, AT&T's capacity would be overwhelmed by such demand, so we will just delay it while you build up demand for it.

Epson also has paid attention to another consumer complaint, that multi-color cartridges require one to replace colors that have not been exhausted. The colors for the R260 can be purchased separately. There are at least four major ink-jet printer manufacturers (Epson, HP, Lexmark, Canon), perhaps five, including Brother, each with different models taking different ink cartridges (indeed, even different numbers of ink cartridges). It is impossible for a store to carry all of these in inventory. Sam's Club has a reasonable price for all six R260 cartridges packed together, but does not carry them separately. Nor does Staples. So the designers thought to separate out the colors, allowing the customer to purchase only the colors he needs; but then the sales force bundled the colors so that when you want one you must buy them all!

Much like the Buick grill discussed in Chapter 1, the problem here is the organization of the company. Sales people should be included in the initial design process. At Epson, I suspect the sales people never asked the designers why they did what they did. And no one in designing the cartridges asked sales people if their customers would carry what they were making. The result is that the sales force has no strategy for making the individual color cartridges a feature. To the sales force, they are a nuisance.

The inability to go to a store to get a new cartridge means I have to purchase single color cartridges on line, and carry them in inventory. As I am now driven to the internet for ink cartridges, why would I purchase those made by Epson? Most stores, if they sold the colors separately, would do so only for the manufacturers. And I would buy them, for the convenience of getting a yellow when all I need is a yellow. But if I have to buy ahead, then I will (and do) buy generic cartridges, at a considerable savings. This cannot be the result Epson, as

a company, intended; but it is the result of their lack of design consciousness.

When this printer becomes unusable, probably through dried-up ink clogging the print head, I will end up throwing away ink. A new printer's ink requirements will surely not be compatible. Every ink jet printer I have purchased has required a different form of ink cartridge. This may be good design from the ink manufacturers' point of view, but from the consumer's point of view it is a design failure. It keeps me longer with the printer I have, using generic cartridges. The design of the unit, together with the design of the sales strategy, reduces Epson's sales. They seem not to know this.

Why there cannot be uniform cartridges usable for many printers, even different brands—as was the case with typewriter ribbons, for example—I do not know. OK, I do. It is because the point is to sell the ink, not the printer. The “give away the razor to sell the blades” model of marketing does not work unless your blades are special. That business model leads inexorably to bad design, the most obvious manifestation of which, these days, in addition to five-bladed razors, is the proliferation of incompatible ink cartridges. If a printer accepted only a certain kind of 8½ x 11 paper, if the Kuerik-type coffee-maker accepted only one brand of coffee, you would not buy it.

So the printer companies themselves have spawned the brandless ink cartridge business—whose ink, despite manufacturer protestations, I find to be sufficiently like the original ink that purchasing name-brand ink is not worth while. That is, requiring you to purchase specialized replacements creates competition in producing imitations, which breaks the model. Wouldn't everyone, even the manufacturers, be better off if they produced printers that met consumers' needs, rather than meeting what appear to be their own? But hey, they are the experts.

Why HP has not thought to make a printer that can print on CDs I do not know. I have scoured their web site looking for the word “CD,” and did not find it. I had sworn never again to purchase an Epson printer, which is why I purchased the Canon. Surely HP employees burn CDs. Could such a large printer

company have no one on staff who wants to print on them? No one at Epson does, either, or the flaws in their designs would have been immediately apparent. At least they observed that some people do, and filled the need, however clumsily. Canon, a late-comer to the CD printing game, leaves itself far behind with its inadequate software.

## Heaters and Other Home Items

I discussed a particularly badly designed in-wall supplemental heater in the previous chapter. In general, we do not think of home heating units as having much of a “design” element, because most are in the basement, unseen. The closest most of us come to a heater is the wall thermostat; and if it is programmed, we go there seldom, maybe twice a year to change the time by one hour.

There is another kind of heater, however, and it is not all that rare. My aunt and uncle, living in La Conner, Indian territory in the northwest part of Washington state, dumped pellets into a hopper, from which they fell into a modified wood stove. The pellets were a mostly wood product. Their advantage over a fireplace was that the hopper mechanism fed them into the fire, which thereafter did not need to be as closely tended as if one were burning logs. This one stove, in the living-room, kept the entire one-floor house warm.

In the 1970s, when petroleum-based living seemed to be getting tenuous, there was a resurgence of the use of more local fuel for heat. Cast iron stoves that you put in your living-room became the “green” thing to have, long before that phrase was used. Then the fear of coal, oil and natural gas subsided. Brent Harold tells us:

The concept of the stove itself underwent fundamental revision. No more the primitive black box that looked its function of burning and being burned, stoves began looking more and more like fancy furniture with designer colors perfectly compatible with, say, off-white wall-to-wall carpeting.<sup>11</sup>

My friend Brent is more comfortable with the 1970s stove whose form

follows nothing but function. Not fashion, for sure. The market is different. For example, one can hardly find a refrigerator in a kitchen any more. It is there, but blended into the cabinetry. Dish washers look like drawers that might contain pots. The trend is to make individual kitchen appliances invisible. Are we afraid to let a kitchen look like a kitchen?

Another example is a banquette along a wall that is also a storage area for toys, remotes, even books—whatever belongs in the room but does not need to be seen. I am sympathetic to Brent's point, that the old stove-as-stove actually looks and feels better than the stove as furniture, but that is an aesthetic judgment on which people may thoughtfully disagree. What Brent skips over is the inexorable nature of the transformation he has observed. You cannot have something in your home without wanting it to be designed to be in your home. As soon as enough people had a telephone—and as soon as third party phones were allowed to use AT&T's monopoly lines—telephones underwent design changes. Remember when all telephones were black?

Design—without providing more function—takes over as soon as humans show a desire to own any kind of device. This is indeed a post World War II phenomenon, a post Raymond Loewy phenomenon. Perhaps design, in that sense, is a phenomenon of wealth. Once people are wealthy enough to have the basics, they start spending money on having the basics look good. One can hardly expect a wood stove to be immune.

The wood-pellet stove, however, did add function, not just exterior design. You could sleep in a cooled-down but warm house, and wake up without having to start a new fire. In central heating, the thermostat added function to burner controls. Indeed, as oil had to be delivered, just as coal had to, perhaps thermostatic control was the main reason my family switched to oil in the 1940s. Thermostats add the same function to heating that the single-lever faucet added to plumbing: At the thermostat you set the desired outcome, not the flame, the fuel consumption, or any other input. The programmable thermostat was not nearly as revolutionary. It now allows you to set different outcomes at different times of day. A nice touch. But the fundamental advantage of the thermostat,

just like one handle faucets, is that the user sets the outcome, the device regulates the inputs.

Why hot water heaters do not have programmable thermostats—so you can start your day with hot water without having kept it hot all night—I do not know. That same idea, that keeping water hot for possible use is wasteful during periods when you know you will not use it, is leading to another design, following the “hot water on demand” principle. There is a small tank of hot water, into which is immersed a coil through which cold water flows. Heat is transferred from the hot water in the small tank which, at the same time, is being re-heated. Where a family’s hot water heater keeps forty to seventy gallons hot at a time, this “instant” concept keeps only two or three gallons hot.

An alternative design utilizes natural gas. Flames directly heat the coil carrying the water from the cold inlet to the hot outlet. The principle is the same: The water is heated when it is needed. As is often the case, there are different ways to design to a concept, and so designers may experiment in how they achieve the end, as well as in what the units look like. Remember, such experimentation has only produced inferior toasters; but the hot water heater is not as evolved as the toaster. We have not settled on a single mechanism.

The “tankless” water heater concept might cut short the idea of a programmable thermostat on a large-tank water heater. However, in order to have hot water available at all faucets in my mill, I have added a three-gallon tank to the tankless heater. I then circulate that hot water to all faucets in a loop that ends back at this small tank. Because the faucets are distant from the hot water supply, the only alternative was to place an instant hot water heater at every hot water faucet. That was possible, but I made the choice based on my calculations of economy. As we work four ten-hour days per week, I do not want hot water instantly available at night or on three-day weekends. The circulating pump is on a timer, so someone in my mill at midnight will not enjoy the instant hot water available during work hours. But if wanted, it will come, eventually.

For the industrial laundry in the mill, I let the tankless heater send its hot

water into the 20-gallon tank of a conventional water heater because, frankly, I do not trust the tankless heater to be able to supply an 85 lb. washer with exactly the same temperature water every time. That is what is required for finishing our fabrics.

All of which means that concepts that have been more or less perfected in terms of heating a house remain somewhat behind when it comes to heating water. The user wants to control outcomes. We are at the stage of industrialization that machines (computers) should be able to convert our outcome goals into instructions to process inputs. We should be able, as Ron Popeil says, to “set it and forget it.”

That concept is surely the future of design for things we use. The programmed videotape- recorder (VCR) let us say what we wanted to record, when. At first we had to know when they were broadcast, but then we could set a number. The VCR would record it whenever it was broadcast. With digital recording we do the same thing, even skipping advertisements. This is design as improvement, but not a correction for “failure,” as Petroski would have it. The VCR was not a failure, it simply was not a fully evolved machine.<sup>12</sup> Google is working on a car based on the same principle. Tell it where you want to go, and it will drive you there. You set the outcome, it figures out how to achieve it.

There are many places where that concept has not yet taken hold. The electric blanket, for example, takes input instructions: on or off, and what temperature. You cannot tell it how warm you want to be, and let it regulate itself (taking body heat into consideration) to get you there and keep you there. There is a probe in some microwaves, so that you can cook until “done.” Most cooking, however, and to a larger extent most microwave use, is input oriented: How high and how long.

I have three fireplaces in my house. They claim no bonus points for efficiency. With the glass doors open they probably suck up heat from the room, although they do radiate heat to the bodies in front, be they human or feline. But although my Uncle Maynie needed a fire for warmth, I use it for another

pleasure that includes warmth, but also the smell and sight of the fire. My friends with modern tightly sealed air-exchange homes forego this pleasure. The builders are so proud of their efficiency, but my less efficient open fireplace provides something else. I burn wood from trees grown on my property. I have to get the trees sawn and split and stacked, but I do not have to buy them. Perhaps I should be taxed for letting stored carbon escape into the air. But I would not live in a house without pets or a fireplace. Any design that takes them away is faulty.

One more thing. The dishwasher. We put dishes into the dishwasher during the day, starting with the food processor canister in which Bethanne makes pep-up every morning. We would like to wake to clean dishes. Indeed, as my coffee cup might be in there, I would like to wake to a just-cleaned and warm set of dishes. This calls for a program that will turn the dishwasher on at so that the cycle ends at, say, 7:00 in the morning. I should not have to know how long the cycle is. I would set the end time, and the machine would figure out when to go on. Maybe automatically, every day, with a “vacation” button that would defeat the turn on, but not lose the settings. We wouldn’t have to think to start the dish washer just before we go to bed—which, of course, sometimes does not happen. Ah, but this is fantasy.

Are we the only couple in the world who would prefer that our dishes be just washed in the morning? Some day the design will take us there, but I would bet that the initial switch allows us only to set a delay time. It would ask, When would you like the dishwasher to *start*? That is the wrong question. Ask me when I want it to *stop*, and then you, oh smart dishwasher, you figure out when it should start. This is not hard. Why does it not exist? Why have the so-called expert designers not thought of it?

## Footnotes:

1. *Kitzmiller v. Dover Area School District*, 400 F.Supp.2d 707 (MD PA 2005) at 718. In that case, Dr. Barbara Forrest testified as an expert, showing how ID texts were identical to Creationism texts, substituting Intelligent Design by copy-and-paste. Defendants had tried to exclude Dr. Forrest's testimony but, as Judge Jones noted in a preliminary finding, "We first recognize that there may be few experts with the particular area of expertise held by Dr. Forrest concerning the 'nature and strategy of the intelligent design creationist movement.' In fact, Dr. Forrest may be the only such expert." 2005 WL 4147867 (M.D.Pa. 2005) at \*4. Judge Jones intelligently and correctly recognized expertise-without-portfolio.
2. R. Buckminster Fuller, Introduction to Victor Papanek, *Design For The Real World*, Pantheon Books (1971) at viii.
3. Victor Papanek, *Design For The Real World*, Pantheon Books (1971) at 3-4.
4. One might place a mirror to reflect the meters on the front in a way a person at the rear could see them. It sounds easy, but this was a large recorder. Just getting the mirror right would be difficult.
5. David Pogue, "Big Body, Big Screen: This Month's Superphone," *New York Times* June 30, 2010.
6. *The New York Times*, June 14, 2007.
7. *The New Yorker*, May 28, 2007 at page 28.
8. Donald A. Norman, *The Design of Everyday Things*, originally 1988, 2002 edition, Basic Books.
9. Norman, page 88.
10. Nicolai Ouroussoff, "Koolhaas, Delirious in Beijing," *The New York Times*, July 12, 2011.
11. Brent Harold, *The Strange Interlude of The Tree In The House*, Kinnacum Press (2010) at 21.

12. Petroski's concept, design improvements through failure, finally came together in *To Forgive Design: Understanding Failure*, Harvard University Press (2012). The title more appropriately would recognize "catastrophic" failure, tragic, life-affecting (and life-taking) failure. To try to apply lessons from building and bridge collapses to design of furniture and kitchen implements was inappropriate.