

The Objective, The Subjective, and The Nature of Design Science

 Posted on 14 March 2018 by [cjf](#)

In Buckminster Fuller's magnum opus, [Synergetics](#), he makes the audacious assertion that "The subjective and objective always and only coexist and therewith demonstrate the inherent plurality of unity: inseparable union" (see [1013.16](#)). I had forgotten that, but I had remembered that in reading Bucky my understanding of the words "subjective" and "objective" was enriched and enlivened.

I subliminally remembered this quote at the end of my study of [Modern and Contemporary American Poetry \(ModPo\) with Al Filreis of the University of Pennsylvania](#). On 18 November 2015, [I attempted to explain the idea to the ModPo community](#).

But what did Bucky mean by "the subjective and objective always and only coexist"? Let me give my interpretation and suggest its profound significance for our lives and in characterizing the nature of Bucky's notion of design science.



In Bucky's *Synergetics* (and probably in his entire oeuvre), I think by "objective" he usually means voluntarily working to realize an objective, a goal, or a purpose whereas by "subjective" he means involuntarily subjected to happenings (which may be due to necessity or chance or circumstance). Bucky's meanings for "objective" and "subjective" are logical variants of their root words "object" and "subject" even though they are not the most common in contemporary parlance.

Do you agree that "objective" and "subjective" can be used in this way?

Here is my evidence for Bucky's usage: In [302.00](#) and [305.05](#), he explicitly identifies objective with voluntary and subjective with involuntary. In [986.032](#), he identifies objective with experimental and subjective with experiential. In [100.010](#), Bucky identifies objective with active/self and subjective with passive/otherness.

Do you agree with my interpretation of Bucky's use of the words "objective" and "subjective"? Can you cite other Bucky passages that further clarify his thinking?

Does Universe relentlessly subjugate us to situations which we did not voluntarily choose? Simultaneously, are we not also the agents of ongoing genesis intentionally and objectively building

our futures (to paraphrase Harold G. Nelson and Erik Stolterman in their profound 2012 book *The Design Way*)?

In [161.00](#), Bucky writes “When science discovers order subjectively, it is pure science. When the order discovered by science is objectively employed, it is called applied science.” In [326.03](#), we find “All the synergetic metaphysical consists of two phases (1) subjective information acquisition by pure science exploration, and (2) objectively employed information by applied science invention.”

Is the information of pure science about subjectivity? Is the information of applied science about objectivity? Is Bucky right about these distinctions?

I think so: pure science is about our abstract scientific knowledge. We don’t usually think of knowledge as subjective, but that is exactly what truths do: they make us subjects of the agreed wisdom. That is, truths imperially obligate us. For example, try as you will, the force of gravity will relentlessly pull you toward the center of Earth. All truths either subjugate us in this way or they are not truths.

This is the spirit in which I read Bucky’s assertions about “generalized principles” and “the cosmic intellectual integrity” ([1056.11](#)): we are all subjects of and must obey “the great design laws of eternally regenerative Universe”. According to Bucky, these laws may be seen as the cosmic intellectual integrity which can be called “God” (see [311.16](#)). God (whether theistic or deistic) is a ruler to which we are subjects, to which we are subjugated.

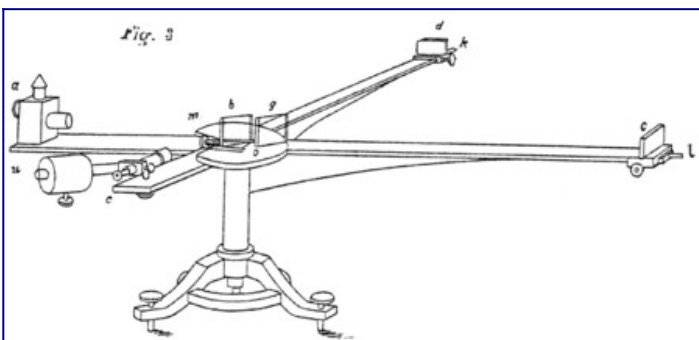


Do you agree that truth is subjective in the sense that we are its subjugated subjects?

In addition, the notion of objectivity is about purpose which is involved in all applied science and design.

Do you now agree with Bucky that pure science or knowing is subjective and that applied science or design is objective? Why or why not?

We began with Bucky’s quote “the subjective and objective always and only coexist”. How can it be that pure science and applied science always and only coexist?



Albert Michelson's 1881 interferometer which after further engineering with Edward Morley eventually led to a successful measuring of the speed of light. The example is typical: engineering breakthroughs are frequently prerequisite for scientific developments.

In 2015, I organized an exploration [Are Science and Engineering One Inseparable, Essential Way of Knowing and Doing?](#) based on Henry Petroski's interesting 2010 book *The Essential Engineer: Why Science Alone Will Not Solve Our Global Problems*. Petroski effectively shows how good science involves good engineering and good engineering involves good science.

I think the argument can be made simply: in order to test a scientific hypothesis, each experiment needs to be exquisitely engineered. So there is necessarily doing and design in science. Conversely, each step of the engineering process is based on some (possibly imperfect) understanding of how the world will respond to an objectively employed instrument or action. There is some basic knowledge underlying each action to intentionally change or design our worlds.

Are you convinced that scientific knowledge (pure science) and design (applied science or engineering) always and only coexist? Can you identify additional evidence in support of this claim? Can you find any countervailing evidence?

Can we go further?

If science as knowledge is a way of passively knowing and the arts, in general, are a way of purposefully doing, do science and the arts always and only coexist?

Any knowing disconnected from the experiences of doing would be fantasy not science. And, conversely, in order to act in the world one needs to have enough understanding of how effects can be achieved that some nascent knowing must inform any purposeful action.

So does science always and only coexist with art?

Can we even conclude that the arts are sciences and that science is an art?

When Bucky says "the subjective and objective always and only coexist" does he mean that the pure (knowing) sciences and the applied (doing / creating) arts including engineering are mutually intertwined?

How does Bucky's notion of design science fit in this schema?



In [165.00](#), Bucky writes “Generalized design-science exploration is concerned with discovery and use by human mind of complex aggregates of generalized principles in specific-longevity, special-case innovations designed to induce humanity’s consciously competent participation in local evolutionary transformation events invoking the conscious comprehension by ever-increasing proportions of humanity of the cosmically unique functioning of humans in the generalized design scheme of Universe. ...[We function as the] subjective discoverer of local order and thereafter as objective design-science inventor of local Universe solutions...”. In [174.00](#) to conclude this passage, he extols the scientist-artists.

I interpret Bucky as advocating a design science that is an intentional, participatory, and competent initiative to induce change through design creation and invention informed, guided, and developed through a scientific approach to knowledge. It suggests to me that design science, as Bucky imagined it, may be the actualization of the always and only coexisting subjective and objective. Of pure science and applied science. Of the sciences and the arts.

Do you think the effective realization of our future through design science is an important part of what Bucky meant when he wrote “the subjective and objective always and only coexist”?

Is Bucky’s design science a way to imagine, articulate, and actualize this interrelationship between science and the arts mediated through competent design?

Are design scientists the scientist-artists who engage the interfused subjective intellectual knowing and the objective designing/doing through inquiry, exploration, and action to effectively create our futures? Are they the ones who help devise new ways of thinking, knowing, and doing that provide new ways to experience and co-create and shape our complex, participatory, and ever-evolving Universe?

What is your perspective? How do you think about the subjective, the objective, design science, and their interrelationships?

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26 Responses to “The Objective, The Subjective, and The Nature of Design Science”

1. [Cherie Clark](#) on 15 March 2018 at 9:43 am

CJ Fearnley posts a blog about a quote from Bucky. (Objective)
Cherie Clark is excited to read it because in her experience, CJ is always brilliant (Subjective)



A related quote from Bucky, “Unity is plural, at minimum two.” is the essence of how Cherie approaches teaching Synergetics to people unfamiliar with even the word, most notably in her work in prisons. Teaching Synergetics to everyone is the core of what Bucky asked of us, so Cherie attempts to reduce the Principles to basic terms. Facts/Feelings about Facts. Objective Facts do not make so much a difference in the quality of one’s life so much as our response (subjective) to those facts. I cannot experience the objective without my own interpretation. Agree or disagree, I am always inserting my subjective experience into objective “reality”.

Thanks once again, CJ, for your brilliance. Always a treat. 🍌

[Reply](#)

- [CJ Fearnley](#) on 15 March 2018 at 10:01 pm



Cherie,

Of course, I agree with everything you say except I’d quibble that it is you

who are the brilliant one!

Because you mentioned the “Facts/Feelings” distinction and the ‘objective “reality”’ versus “subjective experience” distinction, I’m a bit worried that you and others may have in mind the commonplace interpretations of “objective” and “subjective”. I would define the commonplace sense of “objective” as being largely based on observation (fact/reality) and not too unduly influenced by emotion or prejudice. I’d define the commonplace sense of “subjective” as being largely based on emotion, feeling, intuition, or prejudice and not observation or reasoning.

My essay takes a significantly different approach to objectivity and subjectivity.

I claim that Bucky uses “objective” to mean voluntarily having a goal or purpose. And that Bucky uses “subjective” to mean being involuntarily subjugated as for instance with the “generalized principles” (which science-oriented people often call “the laws of nature”).

So we have two distinct meanings for “objective” and “subjective”. Let me consider each of your objective/subjective evaluations.

You write “CJ Fearnley posts a blog about a quote from Bucky. (Objective)”

It is an observation that we can both agree on, so it is objective in the commonplace sense. But it is also objective in Bucky’s sense (according to my interpretation): it was my goal or purpose (my objective) to write said blog, that’s objectivity! On the other hand, it is also subjective in the Bucky sense: the world including both of us is now subjugated to having the blog out there in Universe (like it or not!). It is also subjective in the commonplace sense: the only “real” evidence for the existence of the blog is the fleeting impressions on your visual cortex (or auditory cortex if you are using a text-to-speech or text-to-Braille application to “read” this) which quickly gets interpreted into a complex of feelings and emotions about writing, personhood, and the complex of sociological effects of communication in our society and between colleagues: that’s subjectivity!

You wrote: “Cherie Clark is excited to read it because in her experience, CJ is always brilliant (Subjective)”.

That is a subjective statement in the commonplace sense because it is your feeling and intuition that you are excited to read it and that I am brilliant. And it is also subjective in Bucky’s sense (according to my interpretation): your involuntary experience of excitement and your belief in my brilliance subjugate you to those realizations. But, it is also an objective statement in the commonplace sense because as a written statement it stands on its own as a direct observation that you made! And it is objective in Bucky’s sense (if my interpretation of Bucky is correct) because you purposefully wrote the statement to have an effect: it was an act of intentional literary design!

OK: is everyone starting to see Bucky’s point: the subjective and the

objective always and only coexist! But I'm having too much fun to stop now. Besides you made more objective/subjective observations and I want to make sure my point is clear.

You wrote "Objective Facts do not make so much a difference in the quality of one's life so much as our response (subjective) to those facts. I cannot experience the objective without my own interpretation. Agree or disagree, I am always inserting my subjective experience into objective "reality"."

In the commonplace sense objective Facts are effectively scientific observations and so they are objective. But in Bucky's sense, they are subjective because we the believers in said Facts must honor and uphold them, that is, we are subjugated to them as rulers over us. However, with a bit of honest reflection, we might realize that even the truest of true objective Facts is, as David Hume argues, nothing but a customary association which is filled with feeling and emotion and intuition about its asserted truthiness: it is therefore subjective in the commonplace sense. Now, can we also see Facts as objective in Bucky's sense? Yes: the purpose of any truth-honoring science-oriented person is to collect such Facts. Hence it is our purposeful goal and so it is objective in the Bucky sense!

Now to explore the subjective aspect of your quote: "our response (subjective)".

In the commonplace sense, "our response" suggests a feeling- or intuition-based response and so is subjective. In the Bucky sense such a response may, at first blush, be seen as voluntary and purposeful and so objective. But the semantics of "our response" is that we are subjects of, in this case, the objective Facts, so in the Bucky sense our response is inherently subjective too (but with less subjugation than in previous examples)! In the commonplace sense "our response" is something observable and so we can also see it as objective.

At least to my mind, my analysis shows that objectivity and subjectivity are not opposites and not mutually exclusive, instead, they "always and only coexist" as Bucky put it.

My essay limited the analysis to just my interpretation of what Bucky meant by "objectivity" and "subjectivity", but this analysis seems to also apply to the commonplace sense of the words as well.

Thank you, Cherie, for giving some great examples with which to clarify some of the subtleties of "objectivity" and "subjectivity" for which I did not have space to expand upon in the essay.

[Reply](#)

Thanks CJ!



I didn't see the word "paradox" in the discussion. Isn't the objective-subjective coexistence a paradox; also, the interesting flip-flop between Bucky's usage and the common usage? Both true while at the same time opposite.

[Reply](#)

- [cjf](#) on 17 March 2018 at 10:51 pm

Bob,

Certainly, I should have explored the paradox in always and only coexisting subjectivity and objectivity. But it would have taken a lot more words! I wanted to save some nuggets for future essays and/or for the comments 😊

If we insist that objective/subjective are mutually exclusive, then yes: it would be paradoxical for them to then be interfused.

My approach in the essay was to simply reject the orthodoxy that subjective and objective are mutually exclusive. The emperor has no clothes. Our thinking about subjective and objective has been wrong-headed and confused. I believe all that. But I am still a bit anxious that someone will point out how my thinking is what is fuzzy here. I'm committed to learning, so if I have to backpedal I will. But so far I still think it is the orthodox view that is mistaken.



Another approach which crossed my mind at several points over the last few years while this cosmic fish has been on the hook is to take the wonderful approach of William Byers in his interesting-to-me 2007 book "How Mathematicians Think: Using Ambiguity, Contradiction, and Paradox to Create Mathematics". Byers argues that throughout the history of mathematics it has been by mathematizing the paradoxical that our greatest mathematical achievements have been made. Take for instance the idea of zero: the nothingness that is! That's both a profound paradox and a key insight into almost all of the mathematics developed since it was identified and operationalized.

So I submit to you that if the paradox of always and only coexisting subjectivity and objectivity is anything like as fruitful as the idea of zero, then this is one paradox that we should lean into, embrace, and learn as much as possible from!

I have a glimmer of what you mean about "the interesting flip-flop between Bucky's usage and the common usage", but if you could detail it a bit more it might save me the embarrassment of misinterpreting your point.

[Reply](#)

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3. **Bob Sanderson** on 18 March 2018 at 6:10 am

Hi CJ

I use the term “flip-flop” to describe the apparent opposites of common usage: “subjective” being a matter of opinion, and “objective” having existence apart from opinion, and Bucky usage: subjective being inherent and inescapable and objective being a matter of choice.

On a related note, I had not looked up “paradox” before I sent off my email last night, but just now took a look, and I find, or I think I find, some degree of ambiguity in the definitions: there seems to be the suggestion that opposite meanings would resolve into a single truth if we dispersed the fog that makes them seem inconsistent- as opposed to the idea that the truth is that both propositions are true.



Not to wander off into religion, but someone once said “The first shall be last.” What nonsense!

In your third paragraph: aha! you use the word “orthodox” . Spinning further out of control, one might ponder that orthogonal means consisting of right angles, (as opposed to wrong angles?)

I am presently interested in the relationship between the cube and the tetrahedron. The cube is unstable but very useful; the tetra is stable but not very user-friendly. Oddly enough, the cube nests securely and stably in the tetra. Couldn’t this be seen as the underlying reality of almost all that is considered “architecture”? Artifacts that are made up of right angles which only exist- i.e. have structural continuity- because of the hidden triangulation?

[Reply](#)

4. **Martin Cohen** on 18 March 2018 at 5:46 pm



I am having trouble following what you are talking about, but I definitely do not see science as passive. You say that science requires design, which makes it anything but passive. Is there anything that follows from Fuller that would change the way things are done? Could you give an example?

[Reply](#)

- **cjf** on 19 March 2018 at 8:48 am

Martin, You are correct that the activity of science, in its full complexity, is not passive. It involves design and art, engineering and creativity.



In my essay, I wrote “In [161.00](#), Bucky writes “When science discovers order subjectively, it is pure science.””

I think, Bucky is distilling out the subjective aspect of science from the totality of science. He calls this subjective and passive aspect “pure science”. In my interpretation pure science is scientific knowledge abstracted from the messy world of hypothesis generation and verification. It may involve the philosopher-mathematician, deriving scientific

knowledge with pure reasoning (this is passive in the sense that it doesn't actively engage new experiments or applications; but it is not no effort). Pure science may also involve the way in which the knowledge of science is presented in school and to the general public: subjective in that science is the authority and as its subjects we passively and submissively learn it to become science literate.

The active and objective aspect of science is applying it or putting it to the test or critiquing its methods and assumptions. At least in my interpretation of Bucky's conceptioning.

You ask "Is there anything that follows from Fuller that would change the way things are done?". A philosophical answer is that if you change the ontology or metaphysics of your assumptions, then you can expect different implications and effects.

A cultural answer is that the [Synergetics Collaborative](#) has organized more than 15 events since 2003. Many of the presenters and participants are creating work based on Bucky's Synergetics, the book I cite in the first paragraph of the essay. Decades after Bucky's death in 1983, many people are still inspired to build on this work. That seems to me to be a good measure of the on-going strength of the tradition of inquiry and action inspired by Synergetics.

[Reply](#)

- [Martin Cohen](#) on 21 March 2018 at 8:38 am

The way discoveries in all fields, scientific or otherwise, is through induction, which may be regarded as subjective. The way that scientific truths are established is through experimental testing. This is deductive and objective. The results of experiments are published for review by other scientists to confirm the results. We can never know anything with certainty, but having experimental measurements match predicted values to several decimal places in numerous experiments, permits us to accept scientific hypotheses until something comes along which provides greater accuracy.



It has been argued that scientists do not spend all their time doing experiments. Neither do mathematicians spend all their time proving theorems, but experiments are to science what theorems are to mathematics. They embed the knowledge in their respective fields.']

[Reply](#)

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5. [Martin Cohen](#) on 18 March 2018 at 5:58 pm



Science tries to be objective. Scientific method results in publication of reproducible experiments. If the results cannot be duplicated, the results are nullified. That is about as objective as one can get. Art is by its very nature a

subjective expression of the artist. Scientific experiments may have aesthetically pleasing aspects, but would not ordinarily be displayed in a museum.

One thing I agree with. Science and engineering go hand in hand. Science opens up new engineering possibilities, which provide new tools for scientists.

[Reply](#)

6. **D. W. Jacobs** on 21 March 2018 at 8:17 pm

Subjective = Inside

Objective = Outside



They always and only co-exist.

More soon!

[Reply](#)

7. **D. W. Jacobs** on 21 March 2018 at 8:25 pm

Also... this is key to Bucky's thinking...

"Unity is plural,
and at minimum,
two."



What's his other formulation?

Environment is everything, except you.
Universe is everything, including you.

[Reply](#)

8. **D. W. Jacobs** on 21 March 2018 at 8:49 pm

Subject and Object are borrowed from philosophy, filtered through psychoanalysis. Bucky seems closer to Jung than Freud. But I'll need more time to sort through my thoughts on self vs SELF, and the individual and UNIVERSE.



[Reply](#)

9. **[Patrick S. Doyle](#)** on 22 March 2018 at 12:43 am

"Inspiration exists, but it must find you working."
Pablo Picasso



For me, the objective is the work, the subjective is the inspiration.

[Reply](#)

10.D. W. Jacobs on 22 March 2018 at 5:43 am



My initial impression is that you are approaching this from the perspective and vocabulary of science, whereas Bucky approached it from the structural integrity of geometry, which is more of a blending of art and science. It's a subtle difference. Perhaps I'm wrong. I have to read all of this more carefully. Up to this point, I've been skimming, just to make sure I stick my foot in! M. Esther Harding, a Jungian, wrote a book... The I and the Not I. It might be relevant. As time goes on, I've come to believe that the false idea of "objective" news has ruined the country, because the bias is hidden, veiled or falsely denied. Without an admission of the inevitable biases at work, I'm not sure we can get to the truth. The idea of "objective news" is itself an essential tool of propaganda. From Fox to CNN, they all practice an "objectivity" that is essentially a lie.

[Reply](#)

11.D. W. Jacobs on 22 March 2018 at 5:53 am



I need to spend much more time on this, as you have, but here's one hit... Truth cannot be co-opted. You can own what you see, or walk away from it. In that sense, the Subjective is a relentless God. Purposes, however, are easily turned, twisted, and tweaked into a range of different directions. In that sense, perhaps I do agree with your definitions of Subjective and Objective. Or... perhaps I need to study this more carefully!

[Reply](#)

- [cjf](#) on 22 March 2018 at 8:11 am



Doug, I was thinking of purposes as crystalized commitments. But you are quite correct that purposes are often "easily turned, twisted, and tweaked". Thanks for pointing out an important aspect of objectivity (in the Bucky sense, if my interpretation of Bucky is apropos).

[Reply](#)

- D. W. Jacobs on 22 March 2018 at 12:25 pm



Yes. A crystalized commitment is based in the individual. I was thinking in terms of Bucky's warnings about "joining up" with others. Are we trying to make money, or make sense? Are we joining up in natural alliances, based in our own feelings, intuitions and truths? Or, are we thinking, believing and acting in line with what we've been taught to think, believe and do? Again, his last sail boat was named Intuition. Intuition helps us sail along the surface between the conscious Brain and subconscious (or all conscious?) Mind.

[Reply](#)

- Tim Wessels on 3 April 2018 at 2:07 pm

First, I appreciate the conversation CJ has started with his first blog in four years. I worked for Bucky in Philadelphia for seven years when Synergetics was published. It is a unique and deeply personal work that would not have been published without the guiding hand of E.J. Applewhite.



Water and sailing were significant influences on Bucky from a very early age. Intuition was his 40-ft. Martin sailboat. His last sailboat, Frangipani, was a J/22 or J/24 that Bucky could take out by himself or with another person onboard. The “Call Me Trimtab” inscription on his grave in the Mt. Auburn Cemetery in Cambridge sums up the importance of Bucky’s sailing” in the “one world ocean” on planet Earth.

That said, I would like to thank Mr. Jacobs for his play “R. Buckminster Fuller: The History (and Mystery) of the Universe.” I had the pleasure of seeing the late Thomas Derrah perform as Bucky in a 2011 performance at the ART in Cambridge.

[Reply](#)

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12.D. W. Jacobs on 22 March 2018 at 6:15 am

I’ve come to believe that Bucky was more of an artist-scientist than a scientist-artist. I believe “design science” did not accurately reflect his process. It was more art-science than design science. To use one of your formulations, but turning it inside out, you write...

“I interpret Bucky as advocating a design science that is an intentional, participatory, and competent initiative to induce change through design creation and invention informed, guided, and developed through a scientific approach to knowledge.”

I would shift the last sentence to read... “to induce change through design creation and invention informed, guided, and developed through an “artistic” approach to knowledge.



The scientists never wanted to own Bucky. The artists did! In some ways, he had very low taste in “art”... but he was an artist, longing to be a song and dance man, even if he couldn’t actually sing or dance. John Cage was his friend, but his tastes gravitated to tin-pan alley, British music hall, Ray Bolger, jazz, popular music and musical comedy.

I always believe sailing and navigation offered better tools for understanding his methods than science. A sailor navigates through a constantly changing environment. Scientists like standardized testing. There are practices, but no real standards when you are faced with the vagaries of natural forces. Bucky knew that. The Lab is not Life. When life threw a curve ball, Bucky got curious. Scientists, and many artists, more and more, when faced with the unexpected, they worry

about funding.

Thoughts?

[Reply](#)

- [cjf](#) on 22 March 2018 at 11:51 am

Doug, I agree with you that in many ways Bucky was more artist than scientist. He received more accolades from the art world. I agree that few in the world of science “wanted to own Bucky” with the significant exception of the work of Harold Kroto, James R. Heath, Sean O’Brien, Robert Curl, and Richard Smalley on [buckminsterfullerene](#).

However, if I recall correctly, Bucky would say that he was a “hard-nosed engineer” and in *Synergetics* he is fluent in a lot of science and frequently adopts its perspective (iconoclastic and occasionally irreverent though his science may sometimes be).

In particular, my essay highlights these two passages from *Synergetics*: [161.00](#): “When science discovers order subjectively, it is pure science. When the order discovered by science is objectively employed, it is called applied science.” And [326.03](#): “All the synergetic metaphysical consists of two phases (1) subjective information acquisition by pure science exploration, and (2) objectively employed information by applied science invention.”



In my reading of Bucky I see him directly attributing the subjective and the objective to “pure science” and “applied science” respectively.

Then my essay goes beyond Bucky by suggesting that “pure science” abstracts to knowing and “applied science” abstracts to doing and the arts in general.

Then I bring Bucky back in with his idea of Design Science which in my interpretation justifies my abstractions of knowing as science and doing as art.

I think my interpretation is an honest reading of Bucky. Is it a good reading? Does it have deficiencies? Your familiarity with his work may identify some caveats or adjustments.

[Reply](#)

- **D. W. Jacobs** on 22 March 2018 at 1:00 pm



Your clarification reminds me that Bucky saw individuals as local information gatherers, and that fits in easily with your description of pure science. In applied science (design science), one can design an artifact that moves easily out into the “objective” world, like a meme. Change the environment, not man. His most baffling, therefore, most fruitful warnings, come from his ideas about

precession. If our purpose is to solve one problem, we might be blind to the five problems created by our single purposed solution. It's important to see how often he, as a systems thinker, uses the word "comprehensive" coupled with design science. He could zero into the parts and then zoom out to Whole. In our current dilemma, his most fruitful idea might be his concept of waste and garbage as misplaced resources. He understood that money driven industry is something that cranks out mountains and oceans of misplaced resources, thereby endangering both mountains and oceans. I'm not sure how that trend can be reversed. When money gathers in huge concentrations, it becomes like a black hole in space. It's quite different from Thornton Wilder's character, Dolly Levi, when she says, "Money, pardon the expression, is like manure. It's not worth a thing unless it's spread around, encouraging young things to grow."

[Reply](#)

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13.**Marek Oktaba** on 29 March 2018 at 9:42 am

English "objective" means both free of distortion and focused on achieving the goal. I do not have it in my native Polish language. Scientists love "objectivity" for it is impartial, dispassionate and disinterested. But they forgot, that Galileo once decided to exclude from the sphere of science asking questions about the purposeful cause. He did so to improve the reliability of scientific claims, disgusted by some Aristotle's obvious errors. Today science is still post-Galilean and post-Cartesian; for its convenience, it excludes certain matters beyond the area of its interest and introduces clearly divisions. Bucky protested very much against this and that is why he found himself outside of the strict Academia environment. Martin Cohen may be very pleased with how well the scientific community works; unfortunately, this community bypasses certain topics. Where the goal is treated negligibly, it is difficult to find a place for Design Science.

One of the examples of how Fuller's intuitions are still ahead of scientific research today is the topic of syntropy. Science is still blind to this phenomenon, although it is of key importance for Design Science and for our lives. "Wherever entropy is gaining over syntropy, death prevails; wherever syntropy is gaining over entropy, life prevails" (Synergetics 1052.55). Due to its post-Cartesian tendency to cut off issues in which one hundred percent certainty can not be obtained, science today, in 2018, still cannot develop what Bucky wrote 40 years ago.

Cherie directed the discussion to consider the advantages and disadvantages of emotion, feeling, intuition, and prejudice. This has turned our attention away from Christopher's remarkable remarks about the huge role played by subjectivity – as Bucky understood it. "We don't usually think of knowledge as subjective, but that is exactly what truths do: they make us subjects of the agreed wisdom. That is, truths imperially obligate us." Sphere of objectivity, bastion of contemporary science, seems to be like secondary – here is the place for applied science. In this optics everything is somehow connected and mutually needs each other. This also applies to arts. If I, as an architect, were to express what Design Science I would wish, it would be close to that described by CJ "a way to imagine, articulate, and actualize this interrelationship between science and the arts mediated through



competent design.”

[Reply](#)

14. **Josh Pang** on 26 April 2018 at 5:39 pm

Hi CJ,

Just got the notice of feedback requested on Facebook in a roundabout way.
My quick-take:

Unofficially, I think you may be right.

[http://www.rwgrayprojects.com/SynergeticsDictionary/SDCards.php?](http://www.rwgrayprojects.com/SynergeticsDictionary/SDCards.php?cn=12128&tp=1)

[cn=12128&tp=1](http://www.rwgrayprojects.com/SynergeticsDictionary/SDCards.php?cn=12128&tp=1)



[http://www.rwgrayprojects.com/SynergeticsDictionary/SDCards.php?](http://www.rwgrayprojects.com/SynergeticsDictionary/SDCards.php?cn=17146&tp=1)

[cn=17146&tp=1](http://www.rwgrayprojects.com/SynergeticsDictionary/SDCards.php?cn=17146&tp=1)

I’m not really interested in going further than this right now, but the Synergetics Dictionary on S vs O seems to corroborate to a degree, and there are links for other definitions which may further support your claim.

Josh

[Reply](#)

15. **Bob Sanderson** on 14 June 2018 at 5:50 am

Continuing to swim out of my depth: compression and tension. Do they always equally co-exist? We speak of “tension members” and “compression members” but doesn’t this distinction describe what appears to be the case, and what is functionally the case, but not what is actually the case?



Could one ever really get into that piece of rope or cement block and find one function to the exclusion of the other?

[Reply](#)

16. **cjf** on 9 September 2018 at 12:01 pm

I was fascinated to come across a passage on pages 295-6 in Hannah Arendt’s influential work “The Human Condition” that also mentions the Michelson-Moreley experiment (she cites Whitehead’s “Science and the Modern World”) as evidence that science requires technology in its experimenting. She explains: “[T]he element of making and fabricating present in the experiment itself [...] produces its own phenomena of observation and therefore depends from the very outset upon man’s productive capacities.”



She sees this ability to make science from technology as a necessity: “for the “theoretical” reason that certainty in knowledge could not be gained otherwise: “Give me matter and I will build a world from it, that is, give me matter and I will show you how a world developed from it.” These words of Kant show in a nutshell the modern blending of making and knowing, whereby it is as though a few

centuries of knowing in the mode of making were needed as the apprenticeship to prepare modern man for making what he wanted to know.”

Arendt finds Immanuel Kant (1724-1804) recognizing that the modern approach to science involves “the blending of making and knowing”. The passage seems to me to imply that knowing is subservient to making.

But I do not find Arendt pointing out that “homo faber [...] man as a builder and fabricator” requires know-how to do the making. How can you make something without some idea about what might work? I find the two processes of knowing and making must always and only coexist. Maybe Arendt thought that was too obvious to mention? Or perhaps I missed the passage where she says it?

[Reply](#)