

A photograph of a vast Arctic sea filled with numerous icebergs of various shapes and sizes. The icebergs are a pale, milky blue color, contrasting with the dark, calm water. The sky is overcast with heavy, grey clouds, and the overall lighting is dim, suggesting a twilight or overcast day. The text is overlaid on the right side of the image.

*Arctic System
Science (ARCSS)
Synthesis Retreat
Big Sky MT
August, 2003*

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... and ways that might help guide the next five years of arctic research



Format of the retreat...

1. Roundtable introductions
2. Strawperson approaches
3. Breakout groups and plenary discussions to decide plan
4. Execution of plan...



More specific goals of the retreat...

- group decides details
- scholarly paper(s)?
- input for ARCSS Science planning process (knowledge gaps and what works in terms of synthesis)
- fond memories

So... just what is synthesis?



Synthesis:

The combination of separate elements of thought into a whole, as of simple into complex conceptions, species into genera, individual propositions into systems;

-- the opposite of **analysis**.

Source: Webster's Revised Unabridged Dictionary (1913)

synthesis *noun* (plural: **-ses**)

1 the process of combining objects or ideas into a complex whole

Compare: **analysis**

2 the combination or whole produced by such a process

...

(*Philosophy*)

b the final stage in the Hegelian **dialectic**, that resolves the **contradiction between thesis and antithesis**[ETYMOLOGY: 17th Century: via Latin from Greek *sunthesis*, from *suntithenai* to put together, from *syn-* + *tithenai* to place]

analysis *noun* (plural: **-ses**)

1 the division of a physical or abstract whole into its constituent parts to examine or determine their relationship or value

Compare: **synthesis** [1]

2 a statement of the results of this

...

7 (*Philosophy*) (in the writings of Kant) the separation of a concept from another that contains it

Compare: **synthesis** [6a]

The meaning of **synthesis**

The Concise Oxford Dictionary definition of '**synthesis**' is

"the process or result of building up separate elements, especially ideas, into a connected whole, especially into a theory or system"

The definition is straightforward but the interpretation of the process can vary considerably.

Source: <http://www.scenario-planning.com/define.htm>

The meaning of **synthesis**

continued...

One view is that is that the process can be understood by using a method of reasoning that Hegel called the **dialectic** : one phenomenon (a thesis) works against another (the antithesis) to produce something wholly new (the synthesis).

Alternatively, you can start the process by **believing that a level of synthesis exists already**. All you have to do is become more aware of the existing synthesis. This is described by, for example, the Theravadan Buddhist belief in the Doctrine of Conditioned Arising. The doctrine states that all mental, emotional and physical phenomenon[a] constituting individual existence are interdependent and mutually inclusive.

Source: <http://www.scenario-planning.com/define.htm>

Synthesis:

The scientific method, of which **synthesis** is part, increases understanding about Nature and does so through successive approximation. The purpose of **synthesis** is to reduce diverse parts of a project or experiment into a coherent simplified statement for *practical* application and to set the stage for the next hypothesis and experiment.

*Source: Patrick Webber, March 1997
ARCSS Workshop
(colors and italics, J. Overpeck)*

Synthesis:

continued...

Synthesis is *not* the listing of data or research achievements; it is the abstraction of the best understanding of the fundamental characteristics, dynamics and controlling principles of the system. It is the critical last step before the design of the next experiment.

*Source: Patrick Webber, March 1997
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(colors and italics, J. Overpeck)*

Synthesis:

“It is the abstraction of the best understanding - through the combining of ideas from disparate elements to gain new insight. It is that **NEW INSIGHT** - the “*AHA syndrome*” that is essential in my mind. That is **what makes the whole more than the sum of the parts.**

My idea is that **you only achieve that new insight by asking questions you cannot answer with the understanding you currently have.”**

Source: Neil Swanberg, July 2003
(colors and italics, J. Overpeck)

One last thought - the “value-added” of synthesis?

“The process of synthesis can be even more important than the result.

In many cases the process of participation and cross-discipline dialogue turns out to be even more valuable in the long term than the particular conclusions and findings about the system that we produce.

*Source: ARCSS HARC Workshop
Participants, May 2003*

