

## **THE EFFECTS OF NATURE INSTITUTE COURSES: RESULTS OF A SURVEY**

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In March 2009, I sent a survey to everyone who had participated in one of The Nature Institute's weeklong summer courses between 2002 and 2008 and to the participants in the 2007-2008 ten-Saturday course. The aim of the survey was to find out both how the participants perceived the effect of their course experience(s) and how they viewed the work of The Nature Institute more generally. It has aided us in the ongoing assessment of our adult education programs.

In this report, I first list the questions asked and then provide an analysis of trends in relation to who responded to the survey. Then I present a summary of the answers to each question, provide examples, and discuss any apparent trends or themes in the types of responses to a given question. After the responses to all questions have been considered, I summarize the main themes that had been identified in the course of the analysis. Overall, the responses gave a positive and nuanced picture of the educational programs. Finally, I consider one primary challenge that was expressed by a number of participants in connection with the ongoing personal practice of the methodology they have learned.

### **Survey Questions**

The survey contained ten questions. Four of the questions were aimed at gathering basic background information:

- 1) What was your profession at the time you attended the course(s)?
- 2) What is your current profession?
- 3) How did you find out about the course(s) you attended?
- 4) What motivated you to take the course(s) you attended?

The other six questions focused on the effects of the course and the work of The Nature Institute:

- 5) Has your professional life been affected by what you learned and experienced? If so, in what ways?
- 6) Has your personal life been affected by what you learned and experienced? If so, in what ways?
- 7) Does the learning experience you had at The Nature Institute differ from other kinds of educational and learning experiences you have had? If so, how?

- 8) Has reading Nature Institute publications (*In Context*, *NetFuture*, website articles, and books by staff) influenced your thinking before you attended a course, or augmented your learning after course participation? Please explain.
- 9) What do you see as the significance of The Nature Institute's work within a larger societal context?
- 10) Is there anything else you would like to share?

### The Survey and Response Trends

The survey was sent to 117 individuals who had been participants in one of The Nature Institute's weeklong summer courses between 2002 and 2008 or in the 2007-2008 ten-Saturday course. Since 12 of the surveys were returned (bounced as emails or returned by the postal service), I assume that 105 people received the survey. Fifty-two people filled it out and sent it back; this is a response rate of 49.5%. The analysis in this section is guided by the question: Are there any general trends in connection with who responded to the survey?

Surveys mailed	117
Surveys received (by participants)	105
Survey responses	52
Response rate	49.5%

Of the 117 people who have participated in courses at The Nature Institute between 2002 and 2008, 26 have attended more than one course. I wondered whether these people were more likely to answer the survey than those who attended one course. The answer is yes (see Table 2). From the 52 survey responses, 17 (33%) were from people who attended more than one course, while 35 (67%) were from people who attended one course. In comparison, 25% of survey recipients attended more than one course, while 75% of the survey recipients attended one course. Put differently, 65% of the people who participated in more than one course and received the survey, responded to the survey, while 44% of those who participated in one course and received the survey responded. This difference in response rate suggests to me that the people who attended more than one course were more strongly affected by the courses and/or gained a stronger connection with The Nature Institute, and were therefore more likely to answer the survey.

	Attended one course	Attended more than one course
Received survey; number & % of total recipients	79 (75%)	26 (25%)
Responded to survey; number & % of total respondents	35 (67%)	17 (33%)
Received survey and responded, in %	44%	65%

When one reads through the survey responses, it is conspicuous that nearly half of the surveys contained brief, one- to two-sentence-long responses, while, in contrast, over one-third of the

surveys, which were easily identifiable, contained extensive, usually multi-sentence, paragraph-long responses (Table 3). The remaining responses were in between.

Response type	Number of responses and % of total responses	Attended one course: % of all responses to each category	Attended more than one course: % of all responses to each category
Comprehensive	19 (37%)	53%	47%
Brief	24 (46%)	88%	12%
In-between	9 (17%)	78%	22%

This does not by itself indicate, which one might at first be inclined to think, that an extensive answer necessarily means greater impact of the course(s) on the person and that he or she spent more time answering the questions. Surveys with brief responses express something essential, and it may be that someone who wrote a short and direct one-sentence answer put as much time and thought into that answer as someone who more quickly wrote a paragraph. That said, since the long answers contain more concrete detail they allow the reader to gain a more vivid and individualized understanding of the way a person sees the effects of the courses and the work of The Nature Institute more generally.

When one takes the 19 surveys with longer, more detailed responses, it turns out that nine were from people who had attended more than one course while 10 were from people who attended one course (Table 3). Quantitatively, this shows an “over-representation” of extensive responses from people who took more than one course, since 47% of extensive responses come from them while they made up only 33% of the survey responders. This is not surprising if one thinks that the people who took more than one course have had more extensive contact with The Nature Institute. However, when analyzing these data, I was actually surprised that over half of the comprehensive responses did come from people who had taken only one course.

Another question arose: Does the time that has passed since someone took a course affect whether the person responded to the survey or not? Among the people who attended one course and received the survey (n=79), more people who had attended a course recently responded to the survey than did people who attended a course five or seven years previous to receiving the survey (Table 4).

Year of course	2002	2003	2003	2004	2004	2005	2005	2006	2007	2008	2008	2007-2008*
		I	II	I	II	I	II			I	II	
Responses per course	7	3	8	3	6	4	8	8	9	14	4	9
Participants per course	19	12	13	15	9	9	13	11	18	20	9	15
% of participants who responded	37%	25%	62%	20%	67%	44%	62%	73%	50%	70%	44%	60%
Average response rate 2002 to 2004	42%	* Ten-Saturday course										
Average response rate 2005 to 2008	58%											

The highest response rates from single-course participants were from the 10-Saturday course in 2007-2008 (50%) and the public summer course in 2008 (47%), while for the courses from 2002 through 2004, never more than 23% responded. This trend, however, is not linear: Only 22% of the single-course participants in the 2008 summer science teachers course responded, while 43% responded from the introductory public summer course in 2005.

People from many different professions attend The Nature Institute courses (Tables 5 and 6). I asked whether the profession of the person was in any way correlated with who answered the survey. Individuals from all professional categories responded to the survey (Table 5) and, in most cases, the response and profession percentages were in the same range. For example, nearly half (47%) of all course participants have been educators and, similarly, 46% of the survey respondents were educators. One interesting fact is that nearly all (6 of 7) of the scientists and technology professionals who participated in a course also responded to the survey. In contrast, only one participant from the administrative and one from the “other” category responded to the survey.

Table 5. Survey responses and professions.				
Profession	All Participants		Survey Respondents*	
	Number	%	Number	%
Educator (K-College)	55	47%	24	46%
Agriculture/Land	13	11%	7	13%
Artist/Design	12	10%	4	8%
Student	10	9%	4	8%
Health Professional	9	8%	5	10%
Science/Technology	7	6%	6	12%
Administration	5	4%	1	2%
Other	6	5%	1	2%
<b>Total Number</b>	<b>117</b>	<b>100%</b>	<b>52</b>	<b>100%</b>
*The profession of the survey respondents indicated here was their profession at the time they took a course. Eight people changed professions since attending the course; only one of the people listed under “student” was still a college student.				

Table 6. Professions of participants in Nature Institute courses 2002 to 2008.  
 Eleven weeklong summer courses and one 10-month, one Saturday per month course.

EDUCATOR		AGRIC./PLANTS/LAND		ART/DESIGN	
Elem./Mid. Teacher	25	Gardener	4	Artist	8
High School Teacher	14	Farmer	2	Writer	1
Professor	7	Herbalist	1	Designer	2
Elem./Mid. Teacher, Retired	3	Gardener (retired)	1	Architect	1
Elem./Mid. Teacher, Home School	2	Horticulturalist/Artist	1		
Teachers' Aid	1	Land Conservation	1		
Kindergarten Teacher	2	Seed Grower	1		
Prison educator	1	Medicinal Plant Grower	1		
		Stonemason/Landscaper	1		
Subtotals	55		13		12
Percentage	47%		11%		10%
STUDENT		HEALTH PROFESSIONAL		SCIENCE/TECHNOLOGY	
College	7	Therapists (Speech, Phys.)	3	Software Engineer	2
Graduate school	2	M.D.	2	Research scientist	2
Apprentice	1	R.N.	2	Geologist	2
		Psychologist	1	Environmental regulator	1
		Social Worker	1		
Subtotals	10		9		7
Percentage	9%		8%		6%
ADMINISTRATION		OTHER			
Administrator (nonprofit)	2	Editor	1		
Admin. (business, retired)	1	Builder	1		
Development (nonprofit)	1	Homemaker	1		
Human Resources (business)	1	Lawyer	1		
		Unknown	2		
Subtotals	5		6		
Percentage	4%		5%		
				<b>Total Participants</b>	<b>117</b>

**Responses to the Survey Questions**

Each of the subsections below is dedicated to a particular survey question. Question 1 asked about the person's profession during the course and Question 2 about current profession. The analysis narratives begin with Question 3. Survey respondents are identified by a number (1 through 52). When I quote from a survey, the quotation is followed by a number in parenthesis; this number identifies both the question and the survey respondent. For example, the number 7.18 refers to Question 7 and respondent number 18.

***Question 3: How did you find out about the course(s) you attended?***

Twenty-one people (40%) stated that they had learned of a Nature Institute course through personal contact—"word of mouth," "friends," or having attended a talk or workshop I gave. Sixteen people (31%) indicated that the written word was their first introduction to a Nature Institute's course. They learned about a course through a flyer they found at their school or at a store, from the internet, or from reading a publication and then contacting us. Thirteen people (25%) said they are on The Nature Institute's mailing list and learned about the course through a flyer or mailing we sent out to them. Two people (4%) indicated that they didn't remember how they learned about the course.

I know with certainty that there had been personal contact with six of the thirteen individuals who indicated that they were on The Nature Institute's mailing list and heard about its courses through a mailing. They had participated in a talk or workshop before they signed up for the mailing list. So for a total of at least 27 people—over half of respondents—some form of personal contact preceded or provided the occasion for their learning about a course.

***Question 4: What motivated you to take the course(s) you attended?***

If there is one theme that stands out regarding what motivated people to participate in a course, it is the interest in learning a new or different way of looking at science and nature. Thirty-five responses (67%) refer in one way or another to this topic. Sixteen of these people refer specifically to their interest in learning more about and experiencing the practice of Goethe's approach to science and nature. "I'm interested in Goethean science and in contemporary philosophy and have been studying Henri Bortoft's work on these issues. I took the course to get more practical experience of studying nature in a more holistic way" (4.2). It is interesting that seven people use the term "perspective"—gaining a new, different or fresh perspective. One person describes, for example, how she had read The Nature Institute's newsletter *In Context* for many years, heard some talks and "I found the 'new' (to me) perspective of looking at science and the natural world fascinating and wanted to learn more about the perspective. I had studied botany and biology in college and found it lacking" (4.4).

With the question of a methodology or approach at the forefront of motivation, there were fewer people who focused on course content per se. Eight people mentioned being motivated by wanting to learn about plants, nature, or other topics of the course. Love or interest in nature was mentioned five times and a couple of people spoke of their desire to become better observers.

Beyond the desire or interest in learning about a new perspective and approach to science and nature, seventeen people expressed directly or indirectly a certain confidence that The Nature Institute was in fact a place where they could learn this approach. This came from familiarity with publications or

with Nature Institute staff through talks and workshops. “I deeply respect the Nature Institute’s mission, advocacy, publications and educational services” (4.21). Motivating factors were “the people (Craig and Henrike) teaching the course and the reputation of the Institute” (4.10).

There was an interest in learning from people and not only from publications. “I needed someone to walk me through and teach me how to see” (4.23). “I wanted to find out about the Goethean approach to nature from experts—by its nature this approach is difficult to learn about through books” (4.28). But it was not only the aspect of learning from us teachers as “experts”: “It is not possible to learn these principles in isolation or from a book, because the very nature of the work requires an interaction between people, and with the natural environment. I was seeking experienced people to guide me and peers to learn alongside in a “hands-on” setting” (4.32).

Fifteen people referred explicitly to their interest in applying what they learned in their profession. This was not only expressed by teachers, as I would have expected, but also by people whose work has little direct relation to science and nature study. A physical therapist wrote about his motivation being a “striving to learn how to better tend the people I care for. A quest to be ever more present in the presence of others” (4.31). Someone who works in human resources for a large company wrote that her motivation was “the possibility to learn and experience new ideas and concepts that can be transported to the not always friendly corporate environment to benefit the people working there” (4.16).

***Question 5: Has your professional life been affected by what you learned and experienced? If so, in what ways?***

Forty-three people (81% of respondents) answered “yes” by describing ways in which the course work had affected their professional lives. Six people indicated that their professional lives were somewhat affected, while three people responded “not that I am aware of” or “not yet,” and one answer was unclear.

The perceived effects on professional life clearly gravitate toward capacities: powers of observation were enhanced and a methodology—a way of considering things—was learned that had an effect on their day-to-day work. People describe less that they took away a particular content that they could directly apply, although this also happened for some teachers and also for gardeners.

It was striking how often people mentioned explicitly reference to an enhancement of observation abilities (23 people; 47% of the 49 “yes” or “somewhat affected” responses). “Yes, it has affected my teaching very much. I am more awake to all that surrounds us in the natural world, the plants, the birds, insects, the weather” (5.38, kindergarten teacher). “I am more aware that I need to more carefully observe the farm around me.... By learning to observe the plant, animal, and soil life on the farm we learn to value and care for it.” (5.5, farmer). “It contributed in the process of being more present at work, helping in the process of creating some pauses to breath, to ‘check in’ and be more conscious of the surroundings / environment” (5.16, human resources vice president at a large international company). “The observation (with inner picturing) is helpful in understanding patients and myself with them” (5.14, psychologist). “I think the ‘carry over’ to the work I do was in lessening the assumptions that are part of any given diagnoses and an increase in the actual observation of what is being presented” (5.31, physical therapist). “Yes, certainly. As a teacher of

science, the centrality of ‘observation’, namely direct sense experience in the classroom, was brought home to me with refreshing vigor” (5.40, high school science teacher). “Yes, my perception in diverse situations with people I see in my practice as a pediatrician increased a lot” (5.48, pediatrician).

These responses show how people became more attentive to their surroundings and gave more weight to the role of careful, open observation in their work. It is significant, I believe, that although the observation work at Nature Institute courses focuses mainly on nature and plants, the ability to observe that participants took away with them was not confined to this area of phenomena. Rather, the importance of sensory observation per se was brought home to them and the ability to observe what was in their particular surroundings and work environment was enhanced. In other words, there was a high level of transference of skills. As a result, the ability of people in therapeutic professions to perceive their clients and patients more openly and carefully was heightened, just as was the ability of farmers to observe plants, animals, and landscapes, and teachers to work with their students to observe natural and experimental phenomena.

I believe that the fruitfulness of the approach we take in our courses is related to what science educator Martin Wagenschein calls the “exemplary in teaching” (2009). We do not try to provide a general overview of phenomena or concepts, but rather delve in depth into a particular activity or phenomenon—the exemplar—through which knowledge is gained, and, importantly, capacities are formed. Capacities can only develop through real engagement and in as much as they develop they are connected with oneself—are internalized—and can therefore find expression in areas of experience different from the realm of specific phenomena through which they were learned in the first place. This is the basis for transference of learning from one area to another.

But it is not enough to simply observe, observe, and observe. We want to make the process of observation conscious and to reflect on the process of coming to know. In this way we strive to become conscious of a way of knowing and to practice phenomenological methodology. Therefore, in our courses, we put just as much emphasis on this methodological awareness as we do on the observing itself.

Does this aspect of the work find expression in the responses to this survey question? Twenty-eight of the 49 “yes” or “somewhat affected” responses (57%) referred to having learned a “method,” “approach,” “way of seeing” or “way of thinking” that some participants, in turn, have incorporated into their professional work. I bring here a number of longer quotations:

Yes. I now teach about delicate empiricism in many courses. It is a method which is useful in understanding democracy and in changing human relations to oppose racism and sexism. It carries much further than nature study into all aspects of how to conduct oneself. (5.5, philosophy professor)

Yes, as a gardener and landscaper the course has helped me to visualize and shape the man-made landscape in more harmonious ways, blending them into the natural environment. (5.30, gardener, stonemason, landscaper)

Yes. I came to understand more fully the current scientific paradigm we are in and how important it is for people to draw their own conclusions from scientific study rather than rely



solely on theories that we are taught. I have been much better able to impart to students a healthier perspective about science where what we experience now is equally important as studies that have come before. I encourage learning where students are participants drawing their own conclusions and are not relying solely on prior knowledge or expectations. (5.43, high school science teacher)

My experience at the Nature Institute was an invaluable step in moving me into a new way of thinking and working. It enhanced my capacity, as both an educator and an administrator of educational events, to design curriculum for others. (5.32, plant grower, educator, administrator)

[I have] more tools to use in the classroom and a clearer framework to implement phenomenology. (5.34, high school science teacher)

My professional life has been somewhat affected, in the sense that I now pay much more attention to context and try to think holistically about the tasks and issues I encounter in my work. This is an application of a mindset that I explored in the Nature Institute course, rather than application of particular knowledge I acquired in the course. (5.51, software developer)

These answers show that the methodology we work with in the courses and that we strive to consciously practice has been taken up by many participants and applied in their work (see also below). It is perhaps not surprising that this is most commonly the case with educators and farmers, gardeners and landscapers. For example, of the 27 educators who responded to this question, 20 (74%) indicated that their Nature Institute experience had an impact on their teaching. Of the other seven, four indicated that their understanding had changed but didn't mention actual application in their profession, while the comments of the remaining three participants did not speak directly to this issue (two responses) or stated that there had been no effect on their teaching (one response).

A number of people responded to this question with detailed descriptions and explanations of the effect of the course on their professional work. These answers, which I quote in full below, allow both fuller insight into the individual nature of the effects and point to the transformational nature of their course experiences.

My understanding of systems thinking, living systems theory, and complexity models of ecology are now grounded in an understanding that is not only intellectual, but also experiential. In the Nature Institute courses, I was able to experience, reflect, integrate, and express the complexity and beauty of the relationships of an ecosystem and the growth processes of a plant. This has been invaluable in my understanding of natural living systems and the qualities of adaptation and flexibility that they reflect. By understanding these qualities in nature, it helped me to tap into these qualities in myself. Developing these qualities in myself has allowed me to cope with new situations and challenges in creative ways. (5.2, student at the time of attending the course, presently sustainability educator and gardener)

Profoundly. I am aware of something that previously I never knew existed. I can't imagine teaching without knowing that there is another way to look at the world than the one that I

learned in college and in my previous profession. I work toward figuring out how to show my students these other more intuitive ways. This requires them (and me) to carefully, objectively observe without predrawn conclusions and then to thoughtfully find connections that can continue to grow and change. It requires them (and me) to clearly distinguish between what we know through our experience and what we surmise. (5.8, formally project manager in the computer industry, currently high school science teacher)

Resoundingly Yes. As an educator whose training and research is in the field of Molecular Biology, it caused me to rethink many of the assumptions I had made previously. It also caused me to think more seriously how I presented material and to provide students more insights into hidden assumptions that are made. It also made me more consciously go between the reductionist experimental view of the process of doing molecular research to reminding myself and my students that in our investigations we always need to keep in mind that we are asking a very small question in a very defined time frame. Truthfully, it is hard to completely know overall how this work has impacted my professional life, because it does not just change one piece, rather it changes your way of seeing and approaching and thinking about things--that it just becomes a way of thinking. Once you are conscious of taking as much as possible into account--it becomes a thinking habit--that really permeates how you approach everything. (5.29, college biology professor)

My professional life has been enriched in many ways by the teachers course at the Institute. With each lesson I focus on the phenomenon as it was grounded at the Institute and use it to evoke the path I plan to take with the students. My teaching has evolved a lot this year-- it seems more integrated and robust, and I find it easier to reach the students. It is still very much a work in progress though. (5.20, high school science teacher)

The course accelerated a personal transition I was going through anyway; and eventually I ended up changing careers. Specifically, I joined an alternative teaching certification program with Chicago Public Schools to teach math in a "high need school", which was directly related to Henrike's geometry course at the Institute. The course awakened in me an appreciation of the spiritual (broadly understood) significance of mathematics. In a more general way, the Goethean science courses provided me with some general understandings and skills that have helped me in my new career. These include the importance of careful observation and reflection to understand the professional situations in a deeper (without sounding too parrot-like) qualitative way. That sounds too mundane, too pragmatic. The things that I began to learn at the Nature Institute are ways of being and experiencing and knowing that naturally spill into my professional life. (5.7, formally software developer, now teacher)

What becomes clear in these detailed responses is the transformational nature of the experience. Clearly, what we are doing can be described as a form of transformative learning, as the term is used in adult education (Mezirow & Associates, 2000; O'Sullivan, 2001). Robert Kegan (2000) describes transformative learning as a "learning aimed at changes not only in what we know but how we know" (p.49). "We change the very form by which we make our meanings. We change our epistemologies" (p. 53). Inasmuch as this transformation occurs, knowledge takes on a new quality, as Kegan relates: "When a way of knowing moves from a place where we are 'had by it' (captive of it) to a place

where we ‘have it,’ and can be in relationship to it, the form of our knowing has become more complex and expansive” (pp. 53-54). The transformation that occurs through our courses includes a greater awareness or consciousness of the significance of a particular field of study (science or math, for example) and also the internalization of the phenomenological methodology.

As a number of these responses indicate, the transformation they have gone through is not limited to a cognitive shift—the “mere” application of a different method. Rather, it is a transformation that takes hold of the whole person. This is expressed by the molecular biologist when she writes, “it does not just change one piece, rather it changes your way of seeing and approaching and thinking about things--that it just becomes a way of thinking. Once you are conscious of taking as much as possible into account—it becomes a thinking habit--that really permeates how you approach everything.” Or when the software developer, who became a teacher, writes that “the things that I began to learn at the Nature Institute are ways of being and experiencing and knowing.”

***Question 6: Has your personal life been affected by what you learned and experienced? If so, in what ways?***

All 52 respondents wrote about their personal life being affected by the course. Five of the participants answered Question 5 (about effects on professional life) and this question as one, so I include their answers in the evaluation of both questions. As one person put it: “we cannot separate the professional from the personal, the human being.” One additional person referred to Question 7 for his answer to this question; because this answer is clearly focused on the question 7, I do not consider it in the evaluation of question 6.

A common current that ran through many of the responses to this question can be summarized in the following way: Participants became (1) more attentive to things around them—especially, but not only in nature—and noticed more; (2) had greater enjoyment in their experience of nature; (3) feelings of reverence, awe, love, or respect for nature grew, which in turn, led them to (4) feeling a deeper, heartfelt connection with nature and a heightened ability to see connections within nature. 38 (73%) of the participants referred to one or more of these features in their responses.

A changed relation to perception and increased attentiveness was mentioned numerous times (in 25 responses). “[I am] more attentive to everyday experiences” (6.1). “I can stay more quiet with nature, more receptive” (6.48). “Yes, I am more able to appreciate and see the natural world that is all around me” (6.30). “Through the courses I’ve been given the power to look and pay attention to what’s going on around me.... Now, of course, this new found awareness can be a bit distracting. It’s not just about plant life, but animal life as well. A movement or a call of a bird will pull me away from a task. My field guides stay pretty much at hand. I’m much more attentive to things around me -- even people” (6.23). “I think that in general it caused me to stop and take notice of things that I would have walked by previously.... I think I have also become a better listener...” (6.29). “I had the profound experience that, even as a total novice in the life sciences, I could, through attentiveness to the natural world around me, come to know it better” (6.39).

So the ability to be receptive, which can also mean listening more carefully, and to take in what is to be experienced in one’s environment has been enhanced. While many of the participants spoke about

attentiveness to nature, the examples also show that people found their attentiveness heightened more generally, such as in situations with other people.

It was striking how the responses mentioned not only greater attentiveness but the way in which the relation to the world was more deeply felt:

A quality of depth has been added to my enjoyment of nature and gardening... a thirsting interest and curiosity about the world... (6.2)

Greater connection, reverence and curiosity about nature and the beings in it. (6.19)

To feel excited and interested in so many natural happenings.(6.1)

[The course] enables me to experience the world in -- how to say it -- a fuller, deeper, more heartfelt way. (6.7)

My love and respect for living systems (plants in particular) has deepened... (6.12)

I have a deeper awe and reverence for nature as a teacher of life, both emotionally, intellectually and spiritually. (6.35)

It has caused me ... to take joy in what nature had to tell me. (6.29)

Curiosity, interest, enjoyment, appreciation, excitement, renewal, reverence, awe, respect, love, warmth—these are the kinds of feelings that had been aroused in participants and continued to inform their experiences of the world around them. While the answers to Question 5 concerned with professional life focused more on the cognitive aspect of perception and the methodology of the Goethean approach, here the responses show the relation to the feeling sphere of the human being through which we form lasting and meaning-filled connections with the world. This feeling of connection and its significance was vividly described by one person who has participated in seven courses:

Discovering this way of looking at the world has been healing for me. Previously, something was missing for me, although I had no idea that was the case. Doing Goethean science exercises a different capacity and has a warm, heartfelt quality. This has allowed me to find inner warmth and spiritual possibility in other aspects of my life where previously there was emptiness in my cold, objective, analytical view of the world. (6.8)

Nine people indicated some kind of effect on their understanding of science and/or nature that had been awakened, stimulated, or deepened. For example, one person relates that he has a “better foundation for reading and understanding scientific material in the context of the whole of earth/cosmos” (6.3). Six of these nine responses did not refer to the more emotive and perception/attention-related features described above.

One person—who participated in one Nature Institute course (the very first one in 2002)—related the following:

The main effect on my personal life was to help me complete my transition from an essentially Western, Christian spiritual worldview to an Earth-centered spiritual worldview. I was not a practicing Christian when I attended the course, but I still held a set of paradigms that originated in Christian, and then quasi-Christian Unitarian, religious/spiritual practices and beliefs. I was definitely on the path to Earth-centered spirituality when I took the course. However, the focus on seeing the integrity and interconnectedness of organisms helped me to realize several essential insights into the nature of an Earth-centered worldview, and that made moving into it easier and more complete for me. (6.51)

Here we can see how the experience at The Nature Institute can fit into and help catalyze a process of transformation that is already happening in someone's life.

Several answers stand out by referring to types of effects other than those more commonly mentioned. Two responses refer to the fact that they made new friends at the course(s) they attended, while one person wrote that plants had become "intimate friends" for her. One response focuses on the importance of the kind of teaching he experienced at the course:

There is a quality in the people at the Nature Institute that serves as a touchstone for me. The course I participated in would not have had the effect on me that it did had it not been for the teachers that led it. Their dedication and patience, and their devotion to this work over untold years, resulted in an offering that was rich, thorough, complex and comprehensive. As I navigate my own course through this work, I hold as an ideal the thoughtfulness and clarity that they embody. (6.32)

***Question 7: Does the learning experience you had at The Nature Institute differ from other kinds of educational and learning experiences you have had? If so, how?***

Nearly all of the people said that the learning experience differed from that of their other educational experiences. Two people (7.34, 7.45) remarked that the experience differed little or only some from other learning experiences, while one person described only how it was the kind of learning she tried to foster in her own work (7.46). One person's response did not directly address the question (7.17). This leaves 48 responses (92%) that contained descriptions of the ways in which their Nature Institute learning experience differed from those of other education programs they had participated in. Nine of these 48 responses contained expressions such as "yes, absolutely," "very much so," or "differed greatly," thereby stressing the degree of difference between the way of learning at The Nature Institute and what the person had experienced elsewhere. In the following narrative I want to summarize the different facets of learning that the responses identified and discussed. In about two-thirds of the responses individuals addressed more than one of the features described below.

Thirty of the participants (58%) expressed how the observation-oriented, hands-on, experiential aspect of The Nature Institute courses was different from their more traditional educational experiences. The learning was about a "hands-on process of discovery"(7.8), "an indepth look at the world as we set aside the correct and incorrect" (7.11). For someone used to book and classroom education, "my learning in most disciplines has been facts out of the context of the whole -- rather sterile, actually little continuity or connectedness. My experience at the Nature Institute helps to give the facts a background, a place to live" (7.23).

The process of coming to know is important, not so much a pre-established end-product of knowing. “In many cases educational experiences are really about what other people know--and they are providing you with their perspective. The experiences at the Nature Institute were completely different. Craig and Henrike let the experience do the speaking--they designed the work we did in a way that allowed us to come to understanding at our own pace, rather than having a certain ‘pace’ they wanted to move at--or a certain amount of information they wanted to cover”(7.29). The teaching method was “not rigid and linear but open, flexible and inclusive” (7.25).

An important part of the learning process was how, through careful observation and “revealing relationships among things and processes we examined” (7.26), people were guided by the phenomena themselves. This was a group process that drew on the observations, feelings, and thoughts of the individuals involved. In this way the learning process was “open to diverse experiences from the group” (7.35). “The greater degree to which participants worked together and carried the responsibility of some of the education also differed from much of my educational experience to date” (7.32). People felt they were taken seriously as individuals—“I felt met as an individual and that my thoughts, struggles and questions mattered” (7.1). At the same time, as an individual, “I can listen carefully to what others discover and try on those thoughts” (7.8) and thereby profit from the group experience.

While the work was experiential, it was also “contemplative”(7.21) or “philosophical” (7.33), providing a “fascinating blend of ‘theory’... and experiential learning” (7.22). In this way a “balance of inner and outer” (7.40) was found. The learning “called upon more than the intellect and cultivated a kind of sensitive awareness” (7.22). It did not speak only to thinking, but to “thinking, feeling and doing” (7.16). As a result, it was “a learning experience that affects the whole being” (7.20).

The learning was integrated in that it addressed the different kinds of capacities of the individual human being and engaged both individual and group learning. Moreover, the learning brought “together disparate modes of exploration: color theory, projective geometry, etc.” (7.13) and the “different subjects felt very integrated even though they varied” (7.24). “The blending of art and science was so welcome” (7.47). By working with different subjects and modes of inquiry, different kinds of capacities were exercised, which enhanced the learning: “The integration of artistic expression and some analytical work such as projective geometry with the field work makes for a learning experience that is to me more balanced and more effective, as it makes use of visual, aural, and kinesthetic learning modes” (7.51).

It stood out that ten responses used the terms “deep”, “depth”, or “profound” to characterize the learning at The Nature Institute. One particularly striking remark: “I am currently a full-time student Columbia University, in the Private School Leadership program at Teachers College. It is astonishing how shallow this education is. Although there is plenty to read and write, rarely do any of my courses achieve any sort of meaningful depth. My one week at the Nature Institute had more depth than an entire year at Columbia” (7.39).

A few participants related that they had participated in other programs that emphasized experiential learning. Some mentioned similarities: “It differs from public educational institutions in the group context of learning, the philosophical discussions, and the hands on approach, but is similar to styles of learning that I experienced within the native/naturalist type schools” (7.49). Others highlighted the

differences to their other nontraditional learning experience. One individual (7.12) wrote that he led six to eight-week canoe trips in Maine and Quebec over a period of nearly ten years. “We worked as much on nurturing an ‘ecological’ perspective as we did on shepherding group dynamics --- it’s my belief that a sense of the meaning/identity of places with and without human footsteps was gained by all participants.” In contrasting this kind of work to that of The Nature Institute he continues:

The steps in direct perception and process interpolation that the NI uses in all of its work is, I believe, far more effective in awakening students to the wonders, formative forces and fragility of natural processes -- beginning with the careful direct observation of an organism, step-by-step, an image is constructed and used to repicture the organism within the “mind’s eye” - this process effectively creates a deeper understanding of the formative and life forces working within the organism. The difference between the two experiences is that moving through a natural place with care and appreciation does not necessarily move one toward a deeper understanding of nature’s metamorphic path.... Only by working with nature’s wholeness can we (as a species) begin the process of allowing nature to regain that wholeness. (7.12)

To conclude the discussion of the responses to this survey question, I want to quote in full length three responses. They are not representative examples of answers because they are more comprehensive than many of the answers. But they express in condensed form the richness and variety of perspectives that becomes apparent when one gains an overview of all 52 responses, which I tried to bring to expression in the above narrative. In this sense, they are exemplars:

It has differed greatly from my traditional schooling in high school and university, in that it does not only appeal to the intellectual-thinking way of knowing; rather, it values the other ways of learning such as sensing, intuiting, and feeling. It goes beyond the comprehension of the students as purely minds that need to be filled, to recognizing that participants also have a body, a soul, and a spirit, which can all contribute greatly to the learning process. This makes for wholistic learning - sustainable education - seeing the educational space created as a whole, seeing the participant in his/her entirety, and speaking to all these different levels of being in the world. (7.2)

Yes, it did. It was experiential, but at the same time philosophical. The group sharing was an integral part, on a deeper level than in field courses I have taken. Craig and Henrike worked with us in such a way that our diverse viewpoints, understandings and backgrounds felt woven together into an integrated whole which made my understanding of the nature we observed, and of life in general, that much richer and deeper. (7.33)

Yes, most definitely. The hands on experiments, observations in the forests, knowledge and techniques shared in lectures, and group conversations that helped integrate all of the experiences were living demonstrations of the Goethean approach to science. This way of learning was based on my direct observations and active participation. Instead of just studying about Goethe, his work, and his approach, I got to practice his approach through a variety of activities during the week at The Nature Institute. Most workshops and conferences I attend, I am listening to an expert or specialist who has done a lot of research and learning, and then sharing what he/she has integrated and highlighted as being significant. I take notes, contemplate them later, and depending on my will try to apply them or see if I observe similar aspects in my life. I don’t

necessarily have the opportunity to come back and converse with the specialist and the group to share and hear what the rest has experienced. It's not a living process as I experienced at The Nature Institute. (7.37)

***Question 8: Has reading Nature Institute publications (In Context, NetFuture, website articles, and books by staff) influenced your thinking before you attended a course, or augmented your learning after course participation? Please explain.***

I asked this question to ascertain in what ways there might be a connection or synergy between the publications The Nature Institute offers and course participation and learning. Since thirty-eight people (73%) responded that reading Nature Institute publications had some effect on their thinking or learning, this is clearly the case. Three additional people said they had read publications but made no further reference to the question asked. Eight people (15%) answered "no" to the question or did not respond, which I interpret as "no." The remaining three responses were ambiguous.

Twenty-one people indicated explicitly or implicitly that they had read publications before attending a course. (I assume that the number is larger, since in twelve additional responses indicating an effect of the publications, no reference to time was made.) In over half of these cases the responses describe how the publications played a role in their decision to take a course:

Before attending the courses I had read *In Context* and some of Craig and Steve's books and they very much got me interested in doing a course at the Nature Institute and set out different ways I could examine my thinking and expand it into a more fluid and connected thinking. (8.24)

I think reading Nature Institute publications prepared me for the type of learning that happens at the Nature Institute. (8.6)

Yes, I need the idea and the rationale before committing to the practice. (8.21)

Immensely, in fact, it was due to the newsletter, *In Context*, that I became interested in The Nature Institute, as well as Craig's book, *Genetic Manipulation*. I have continued to be thoroughly engaged in reading several books as I write this to you. (8.41)

As the last response indicates, after a course, study of publications continued. Twenty-five participants indicated they read publications after attending a course. Often the reading helped to reinforce or keep the learning process going that the course had stimulated:

Yes. Reading *In Context* led me to want to take a class. I was intrigued by the new to me way of looking at science. After the class *In Context* and *NetFuture* help me to continue to study and remind me to keep at it. They contain insightful articles that keep me thinking. (8.4)

I read issues of *In Context* before attending my 1<sup>st</sup> workshop - the quality of writing was excellent - since then I try to follow works published and recommended by the NI simply because topics are important, well presented and often lead to deeper understanding of the complexity within the living world. (8.12)



Absolutely. I return from these courses inspired by the interactions and spend several weeks immersed in the books I bring back. (8.26)

I have learned from these publications a great deal beforehand but it became more integrated into my work and my life [afterward]. (8.35)

Course attendance stimulated at least five people to begin reading publications, which enhanced their learning:

I hadn't read any of the publications beforehand. Afterwards, though, I have found all of the above titles to be a valuable resource both for my personal and professional life. The topics deal with current issues from many diverse fields, and, unlike other publications, there's a sense that what is being contributed is done so out of an in context approach. (8.1)

I didn't know about these publications before the course. As for after the course, they have augmented my learning by helping me to explore applications of Goethean science to different contexts: technology, plants, animals, community, etc... I have also found the website articles very useful in allowing me to continue to deepen my understanding of the Goethean science approach. It has been a great source of literature for continued education in the field. I have also used some of the shorter books, such as Craig's Giraffe and Elephant books, to introduce others to certain new ways of understanding the natural world. (8.2)

For educators, the publications have been helpful in class preparation and some of the teachers/professors give their students Nature Institute publications to read:

Craig's book on the forgotten factor of context is an important work for me. I have used it in several courses I have taught. (8.5)

I have definitely used several publications in my teaching to help formulate how to bring subject matter in a way that creates an environment where students discover relationships and connections. I also look for resources and ideas in this material. (8.8)

I would say both. I try to read all the articles, and have assigned some of these in classes I have taught. I would say that perhaps more than augmenting the learning, they have reinforced a particular way of learning or engaging with things that are encountered. (8.29)

Yes. I read Craig's books before the course, and used some of his books and other books he recommended in my preparation, and sometimes for student reading in the classes I teach. (8.33)

I conclude this section with some especially strong statements:

NI publications are invaluable in providing a holistic perspective to nature study by drawing attention to the life or "liveliness" of the living world and placing it always in context. Craig's monographs are so thoroughly grounded in careful observation. I'm reading the work

on genetic engineering and feel it offers a unique critique of this crucial issue from a truly holistic, contextual perspective. (8.22)

Yes, reading these publications feels like my “in” for understanding current issues ranging from organism study, to genetic questions. I feel I can rely on these materials to educate myself and understand ideas beyond what I would otherwise encounter. They also feel spiritually enriching. (8.49)

The publications have definitely influenced my thinking significantly. In Context, NetFuture, and Steve Talbott’s book *The Future Does Not Compute* have had significant influence on my knowledge, understanding, and in a major respect, my life and the life of my family. Based on that book, I became a subscriber to *NetFuture*. Because of what I learned about cognition and Waldorf Education in *The Future Does Not Compute* and *NetFuture*, we sought out and enrolled our daughter in [name of school]. One of the factors that led us to choose where we relocated to was the access to a Waldorf school. Her four years there were transformative for all of us. From that introduction, I expanded my study of biodynamics and anthroposophy, and for a while, pursued teacher training in Waldorf education, as a possible career change. (8.51)

I read a few articles and books by Craig Holdrege before I took the course and it opened my mind to a different way of thinking that allowed for more possibility. It encouraged my own tendencies to see plants as they relate to the communities of which they are a part, to see plant anatomy as more than a study of parts, but an interaction of parts to whole. Exploring this kind of examination became a theme for me in later teaching and will continue to shape my teaching and learning in all the sciences. (8.43)

After the courses I did read (and continue to when I can) many of the Institute publications, including *In Context*, *Net Future*, and Craig and Steve’s other articles and books. I think it is hard for me to really say where exactly the courses ended and the impact of the readings began -- it’s a continuum for me. After The Nature Institute, I returned to university to finish my undergrad degree. The degree program was mostly self-directed, and I continued to study themes I was introduced to at The Nature Institute, including Goethean science and Owen Barfield (mainly a connection with the *NetFuture* publication). The Nature Institute publications were important (and influential) sources of ideas and perspectives. (8.7)

Clearly, there is a synergy between our publications and course work. The publications support and further the learning in the courses, just as the courses can awaken interest in the publications and also enhance their value for a person as a means to deepen or continue the process that began for them in a course.

**9) What do you see as the significance of The Nature Institute’s work within a larger societal context?**

One can see from the responses to this question that, as one person stated, The Nature Institute “draws people who want to make a difference and influence others” (9.23). The responses are strong and often impassioned in describing both what people see as the challenges humanity faces and how they characterize the role that the work of The Nature Institute plays.

The most prevalent theme that runs through the responses is the contribution The Nature Institute is making to changing the way we think about and perceive the world by developing a different kind of science. Forty-five (87%) of the responses speak to some aspect of this topic. “What the Nature Institute offers is a way of evolving our thinking and perception--a new way of participating in nature and society ‘grown’ out of old ways” (9.32). It helps people “gain new and coherent (meaning--heart-mind convergence) pictures of Nature” (9.36). It does this through a variety of practices: “encouraging people to encounter nature, to experience its life and real needs, to find ways to let it speak, to experience how it can inform our understanding of ourselves as well (plant as teacher of living thinking)” (9.46).

The approach can help us “move from understanding things as entities in and of themselves to understanding how to understand the connectedness of everything. It is also important to understand how our own context influences how we observe and learn about things” (9.29). “The idea of context might be given lip service in the wider world but The Nature Institute takes it very seriously and it never feels that scientific information coming from the Institute is fixed or ‘this is what so and so means;’ ...instead the Institute provides more of a sense that, ‘this is the rich picture we can get of such and such a phenomenon, and look how it is only the beginning, how much more complex it can be.’ Complexity in this sense being the feeling that we can reach ever deeper into a subject or issue or question, and the result will be understanding and personal extension....that’s it!” (9.49). “The more the world at large hears of delicate empiricism and practices it as a methodology and as a way of life, the greater becomes the challenge to a business as usual mentality with its short sighted ignorance of the context in which it exists” (9.5).

The Nature Institute “stands apart as a haven where the study of phenomenological science unfolds in its true form” (9.43). It is “a source for the practice of Goethe’s approach to natural science, so that this necessary approach is not lost, and so that it can continue to evolve” (9.51). “There are precious few places, especially in the U.S., where the tradition of delicate empiricism is practiced and kept alive. That makes The Nature Institute a real treasure” (9.5). “I see it as being on the forefront of bridging and being a reputable voice to enliven the thinking of people in mainstream science, and the masses. In order to help humanity grow from materialistic thinking and approaches in how we live, to holistic, living thinking where spirit, consciousness and matter are balanced in our practices, we need a leadership like those being inspired through the work of The Nature Institute. I am not aware of other organizations in the scientific community with such a clear and specific focus with this approach” (9.37). “It provides a unique holistic perspective of many issues that are otherwise separate and fragmented in society and in academia” (9.35).

Thirteen respondents (25%) write explicitly of the significance of The Nature Institute’s work in relation to environmental and sustainability issues. “I think qualitative science is critical to the survival of the planet as we know it, and to the survival of our species. The Nature Institute is playing an important role in promoting qualitative science and equipping people with the tools and desire to

practice qualitative science”( 9.7). What this means concretely was described eloquently by one person:

In a larger societal context, I think that the question of how we as humans can learn to develop a way of thinking that is more whole, that is more flexible and adaptable, and that more closely resembles living processes, is a question that holds so much potential in transforming our society towards a more sustainably functioning. I think the ability to learn from nature and then to take what we learn as an inspiration to shape our worlds, is a very empowering and promising approach to creating communities that cooperate and value diversity the way nature does. (9.2)

This relation between our ways of thinking and experiencing the world and how we treat the world was emphasized in various ways: “The NI teaches about the fundamental relationship of the human to the natural world, a relationship which is disintegrating in modern society. Being with nature in a holistic, contented and observational way is vital if humans are to see the reality of the world as it is and act on what must be done to preserve our heritage which has been inherited from the eons” (9.13).

Often the people who wrote about environment and sustainability also stressed the importance of The Nature Institute’s work for nature and science education:

One of the things that I find most significant about what the Nature Institute does is the class they offer to science teachers. I think that if children could learn about science through the Goethean methodology it would be a much more meaningful experience. If students are engaged with the natural world I would hope they would then value it and themselves. If students can grasp the difficult concept that everything is related to everything else maybe they will make better decisions than the past generations. (9.4)

Education these days teaches children very little of how to observe, listen and exist in the environment given to us, specifically basic survival skills. I hope for the ‘trends’ of societal living to move back to the earth, to promote healing, instead of degradation, and I think the work of The Nature Institute serves an integral role in the sustainability movement. (9.9)

The Nature Institute provides a place of collegial, collaborative learning: Although ‘learning from experience’ and ‘professional learning communities’ are trendy catch-phrases here at Teachers College, I have found them to be poorly understood and rarely practiced. What The Nature Institute provides, an opportunity to rigorously learn from an experience of nature in collaboration with others is, I believe, one of a kind. (9.39)

It offers a place for lovers and teachers of science to meet and be inspired in an environment that encourages creativity, clarity of observation, and openness to possibilities. By allowing space and time for people to relate to the natural world in a reverent and intelligent way, new possibilities open up for others. (9.43)

Two people emphasized that this kind of collaborative learning is central to the new kind of science and that it “had the effect of integrating us with our fellow human beings rather than separating us

into each of our individual viewpoints and logical thinking” (9.33). We realize that “it is only through the collective looking and sharing that we can truly understand,” an insight that can help us gain the “type of humility needed to keep our knowledge in perspective” (9.29). “It is invaluable to have an institute focused on gaining insight into the living world and share ideas that feel alive and deepen our understanding. That the NI also teaches others how to develop these insights makes its work that much more invaluable and important” (9.22). In this way “course participants spread what they have learned by sharing their knowledge and experience of the course with others” (9.14).

One last topic that was mentioned by eight people was the importance of The Nature Institute’s work related to genetics and genetic engineering. Since this is a topic that is either not dealt with at all or only tangentially in our courses, the knowledge of this aspect of our work came through publications, website or talks. As one person described its significance: “Your work critiquing genetic engineering is valuable because it gets some of the unforeseen consequences of g.e. [genetic engineering] out into the press so the public can make a more informed opinion” (9.27).

### *10) Is there anything else you would like to share?*

Thirty-seven people (71%) responded to this question. Twenty of the responses, which were usually not more than one sentence long, directly expressed thanks or gratitude for the work we do and/or for the opportunity to participate in a course. “I am grateful for the respect shown to us in the class and the fact that deep knowledge was shared so simply” (10.35). “I am grateful for the work you do—both the scientific investigation and the teaching” (10.22). “I thank you for making these experiences possible and hope to work with you in the future again” (10.31).

Others spoke of the value they see in the work and its importance and quality. “I value very highly the great variety of workshops and classes that the Nature institute offers on a regular basis. It is a great institute!” (10.30). “I would just like to say that the information you impart and the ideas you inspire are crucial to the health of the earth” (10.10). “I think that you (all) bring great skills and balance to the Institute--- with respect to subject matter, culture, experience, and pedagogy. You make it a very special place! Thanks!” (10.20). Or simply, “The work you do is very important: keep it up!” (10.28).

There were hopes expressed for the effect that the work of The Nature Institute can have. “I would really like to see Nature Institue affecting teacher training” (10.36). “I found a very contemporary way of doing science and I hope this new methodological approach, based in JW Goethe teachings, will contribute a lot to academic research” (10.48).

Five of the responses referred to ways in which people believe or hope The Nature Institute could develop further. On the one hand the desire was expressed that the Institute’s work reach more people:

I would like to see The Nature Institute’s work institutionalized so that more people may have a taste of what it can offer. Although being on the margins may have its advantages as marginal space is often very creative space, I would see it as positive if more people could have access to this liminal space of creativity. May our society move towards the margins in

search of transformation - away from a single solution at the centre and towards the diversity of possibilities held at the edges. (10.2)

I keep wondering how the Nature Institute could bring the information, teachings, and imagery forth in new, and wider reaching ways. Could there be an easy reading book / pamphlet written as a guide for organic farm alliances, green and growing initiatives, college students, environmental groups? (10.47)

On the other hand, the need for advanced studies was expressed:

I look forward to a future where the NI can continue to expand/deepen its program, offering more opportunities for advanced inquiry (10.12).

I would really like to see the opportunity for longer in-depth classes to supplement shorter and monthly courses. (10.24)

The remaining responses expressed something of the quality of the experience at a course and its subsequent effects. These responses augment what these individuals described in their answers to questions 5, 6, and 7.

I value the time I spent at The Nature Institute and feel that I have learned a lot there. I feel that the effect has been somewhat oblique rather than direct, in that coming to the courses and preparing presentations for them helped me do work that I wanted to do. The courses provided an impetus rather than teaching me something that I then used.... I have thought of my time there as a commitment to something larger rather than a means of learning something in particular.... I think that if I hadn't felt that I was going for an experience rather than for particular kinds of knowledge, I might have gotten impatient with some aspects (a la [name removed]), but in general once I was there I felt open to whatever way the conversation went. (10.44)

Spending the week in the gorgeously green and rural surroundings of Ghent, and meeting people from all over the country, and parts of the world added to the richness of this experience for me. It was a retreat for rejuvenation, and research for study all wrapped neatly in one. It met my needs for learning, discovery, fun, adventure, meeting new people from different walks of life, beauty, respect for the earth and all beings connected with the earth, and for hope. (10.37)

I experienced a true feeling of home when I took the course at The Nature Institute. The balance between teaching and discussion, observation and understanding, was an inspiring mix. I learned a great deal from Craig and Henrike as well as from my fellow classmates. By providing opportunities for us to experience phenomena first hand, we were able to make our learning more tangible, to retain memories that stimulate and heighten all of the senses. Our learning was not just on an intellectual level, but on a visceral level. Thank you!! (10.43)

My favorite response to this question: "I truly dislike questionnaires" (10.42).

## Summing Up

Most people come to a Nature Institute course in search of a different way of looking at and understanding science and nature. Their interest has been aroused through previous experiences with Nature Institute staff (talks, workshops, or courses), publications by Nature Institute staff, word-of-mouth, or simply picking up a brochure or searching on the internet. Several themes stand out in the survey responses:

- 1) Frequently the participants' capacity to observe nature and other phenomena in life has been enhanced and they feel a greater desire to observe. People feel more attentive and receptive.
- 2) Many experience nature with more reverence, awe and joy. Something has been enlivened in their relation to the perceptual world.
- 3) They feel a deeper, heartfelt connection with nature and a heightened ability to see connections within nature.
- 4) They encountered a different way of thinking about things, a different methodology or approach to understanding nature. This was described in various ways as "holistic," or "Goethean," and "contextual." It included increased awareness of the assumptions that inform our thinking, in particular in science. Many have been able to apply this new way of knowing in their own professional and personal lives.
- 5) The way of knowing was experienced as integrative. It integrated the different modalities of observation, affective responses, careful analysis, and contemplative reflection. It also integrated different kinds of topics. In this way it provided for learning that spoke to the whole human being and was experienced as being deep or profound.
- 6) The learning was observation-oriented, hands-on, and experiential.
- 7) Although the content of the courses was specific (geometry, plant and nature studies, etc.) the focus on process and method allowed participants to apply what they learned in different professions and in manifold situations in everyday life.
- 8) The courses wove together teacher-guided exploration, group learning and individual learning. Since the learning was experiential, everyone could be involved. As a college professor expressed it at the end of one course: "this was the most democratic learning environment I've ever been part of."
- 9) The learning in the courses was often augmented and supported by learning through Nature Institute publications.
- 10) Course participants see what they have learned and experienced at The Nature Institute, and the work of The Nature Institute more broadly, as a contribution to changing our culture—changing the way we think about and perceive the world through the work to develop a science that is holistic, integrated, contextual, both in content and method.

## The Challenge of Practice

The preceding review of the survey responses shows quite vividly, I believe, the strong effect of Nature Institute courses on participants. Here I would like to reflect on some comments describing how the kinds of changes a person hopes for have not really occurred. A scientist and environmental regulator writes, “In my professional life I still tend to stay with the outside plant/landscape observations, not taking the further steps; I guess I need the warmth, support, relaxation, distance of The Nature Institute course setting to ‘pass through the membrane’ to a deeper insight that I can have confidence in” (40; in response to Question 5). She adds in her response to question 6: “I still have the longing to experience what I did in the classes and not have to wonder how it is that for my own work I tend to ‘stay on the outside’.” Similarly, a biology professor writes in reference to the style of teaching at The Nature Institute courses, “I wish I could emulate this in my own teaching--have not made it to this stage yet” (29). These comments point to experiences gained at The Nature Institute that were profound enough to work on in the person’s consciousness as a kind of ideal and also to a contrast or tension between that ideal and what she is actually able to realize in her professional life.

To explore this issue further I had a conversation with a community college biology professor (26) who has participated in three summer courses. We spoke right after the third course had ended (July 2009). I will call her Amy. Amy spoke about how she has been able to apply in her classes some of the observational exercises and thinking exercises she learned at The Nature Institute. For example, in one course we looked at a simple machine and then compared it with a plant. She did something similar in one of her classes.

Such concrete examples, or perhaps better said, concrete case studies, provide a kind of “tool kit of techniques” that can stimulate Goethean thinking, helping her see how she could carry out research and teach in different ways. For example, she was especially inspired by a course exploration of the holistic character of lion and zebra. “The lion and zebra comparison was amazing—the activity of looking at all those patterns in the two animals and how they were expressed in the whole animal. How the parts were an expression of the behavior, the activity of the animal. It helped clarify for me the wholeness bringing forth the parts in a very integrated way.” This activity suggested to her how she could develop the same kind of approach in teaching about birds, which were her research focus in graduate school. She realized that the approach she learned through the zebra and lion example (and other examples at Nature Institute courses), as well as through the work of Goethean biologist Mark Riegner on bird plumage patterns (2008), provides methods that are just waiting for her to explore in her own field of research and in her teaching.

The significance of such concrete case studies is that they can live on as exemplars, as ideals in one’s mind, and can therefore provide inner orientation for new ways of looking and working. When I had just begun teaching high school science I visited an experienced teacher and told him of my struggles to imagine how I was going to teach a geology course in a way that would be interesting to the students. I was all excited about geology, but I had the feeling I would not be in a position to kindle that kind of excitement in the students. So he told me in an hour-long conversation about how he taught. What did he describe? The examples he used. He described vividly what the geologists did, saw and discovered, and then he told me how he developed geological concepts based on the presentations of the work of those particular scientists. At the end of the hour I knew how to teach that geology course. I did in fact use a number of his examples, but I also understood what was key—



embedding geology in the human adventure of doing science and letting the students experience riddles that generate questions so that in the classroom or in the field they are engaged in a process of discovery. Over the years I found many of my own examples that became exemplars in the geology course. (For some examples in geology and other subjects, portrayed in relation to developing different modes of thinking, see Holdrege, 2001/2002.)

In our conversation, Amy described a kind of frustration and impatience that she has not been able to transform her teaching more:

My goal in coming to these courses, and I hope to keep coming, is to find a way to live these ways of thinking myself and then be able to go out and share them—I feel it is a gift you are giving to all of us and I would like to give this experience to others. I see such potential in this way of being in the world and seeing the world. It’s my third time here and, although it feels like I integrate more each time, the length of time between my exposures and, paradoxically, the limited preparation time needed to incorporate these methods into my own teaching, leaves me frustrated. I’m impatient rather than discouraged.

At the courses she is supported by “the group energy, your guidance, the whole process as we experience it. There are revelatory experiences that change the way we think and approach things.” Especially right after a course she feels enlivened, she reads a lot (Goethean texts) and sees patterns more vividly. But “when I get back into my routine in the mainstream school environment it is really hard to get those ways of thinking back.” Amy remarks that “I am not at the stage where I automatically can step into this mode of thinking all the time.” She tends to continue to teach in the ways she taught before. She feels she does not have enough time—life gets too full—to work through a topic so that she could teach it in a new way. And, of course, she has a curriculum to follow and institutional learning expectations and college structures that can hamper exploring new territory in teaching.

So there is the hurdle of finding the time and inner space in order to re-enter a mode of exploration to develop one’s own new approaches. This is not easy for anyone today, since we tend to be overloaded with the day-to-day tasks in which we are already embedded. Then, even if we do find time, we are confronted with the barriers of our own thought habits. Trying to move out of them on one’s own is no simple matter even if one is supported by vivid memories and written material. There is an additional hurdle for scientists and science teachers who work within conventional educational and institutional settings; by their very nature conventional structures make the further exploration and development of what has begun at The Nature Institute difficult. When I went into teaching, I was already familiar with the Goethean approach and I chose to teach at a Waldorf school. There I was completely free to develop my science teaching in those directions. That is much more difficult within a traditional setting and especially within science. From this perspective it is perhaps understandable that people from other professions may find it easier to apply what they have learned and internalized than someone who works in the sciences.

It would be an altogether different matter if people returned to work environments that would support what has begun or been deepened through a Nature Institute course. It is a fact that Amy has no colleague back home with whom she can share her newly found interest. Since we are dealing with the development of new capacities, ongoing practice alone allows something new to develop and take

root in life. That process is facilitated and especially nurtured when people can share their experiences, difficulties and revelations. In other words, the more a community of like-striving people arises, the more the individual finds support for his or her own work and at the same time fructifies the work of others.

This is a great need. Nature Institute courses can fulfill a part of that need, and we will continue to offer new courses and workshops. Amy returns to courses because that is a way of continuing to work with others. I offered to speak with her further about her idea of bird research and, if she were to write something up, to read through it and discuss the work further. Some aspects of isolation can be bridged over 4,000 miles distance. As more people get to know this kind of approach, local and regional groups could begin to form. This already happened in Vermont where a small group of former course participants met periodically to work together.

In our professional development course for science teachers, which started in 2008, one of our aims is to help facilitate the growth of a community of science teachers who are interested in developing phenomenological science and experience-based learning in their teaching. In the first year, nine teachers participated in the course; in the second year 20 teachers participated, including eight people returning from the first year. These teachers, who teach at schools around the country (and last year one teacher came from Belgium), get to know each other and, although they may return to a school in which they work mostly on their own, they have become part of a developing community. I know personally how much it has meant to me over the past decades to simply know that I am not alone doing what I'm doing, but that I have—even if only few—colleagues around the country and the globe who are striving in the same direction.

In addition to the need to facilitate “a growing community of researchers,” as it was spoken of already at the end of our first summer course, there is the question of how to help people actually continue individual practice, even in the most modest terms, when they leave an institute course. In our 10-Saturday course, which met monthly, we suggested that participants do observational exercises and then, during the session a month later, we could discuss any questions or comments people had. In this way the individual practice was reinforced on a monthly basis for those who took it up. This is impossible in a weeklong intensive. In those courses, participants get a kind of total immersion—which one Saturday a month does not allow—but there is no regular reinforcement for those who take up a practice. Clearly, it is up to the individual whether and in what way he or she takes up a new practice. No educational program can do that for them. But since practice is key to developing the capacities that are so direly needed to transform culture, we need to explicitly address this question and in future intensives inquire into what kind of support processes we might be able to set up to help people continue and deepen their own individual practice.

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