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EARTH-BONDING IN ENVIRONMENTAL EDUCATION:
A Unique Approach To Teacher Inservice Training

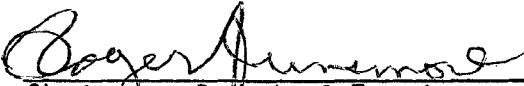
by
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Environmental Studies

Submitted as partial fulfillment
for the requirements for the degree of
Masters in Environmental Studies

UNIVERSITY OF MONTANA

1986

Approved by:


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INTRODUCTION

Many environmental education programs today skirt this central issue: our rapacious and environmentally destructive practices result from a deepening psychic gap with nature -- not from a lack of scientific knowledge about it. School programs which emphasize teaching "about" the environment, while holding nature at an objective arm's length from children, show little promise of reversing this damaging trend toward psychic separation. We have all seen examples of experts who have learned much about the natural world and who professionally participate in dismembering it. Becoming an expert on the environment does not, after all, ensure an individual's sense of identification, bonding, or belonging within it.

Then what constitutes an effective environmental education program? In Chapter I, I will explore briefly the theory of bonding with the environment and its relevance to education. My intention is merely to introduce readers to the concept for the purposes of further thought and discussion. In Chapter II, The Workshop, readers will see a practical application of the bonding approach to the inservice preparation of teachers for environmental education. I present, in a chronological and narrative style, the process and the problems encountered in bringing such a workshop into being. Key elements of the workshop and its development are highlighted. I hope that my description encourages teachers who wish to explore bonding in environmental education, and gives them some practical suggestions as to where to begin.

DEDICATION

To my father,
who first took me there.

I. Theory

In his book Magical Child, Joseph Clinton Pearce suggests that affective bonding with the earth is crucial to the healthy development of human intelligence. Pearce's work expands on Jean Piaget's observations and theories of how children learn, which we should first briefly recall.

Piaget proposed a series of stages -- an internal maturational sequence -- in the developing intelligence of children. It was his belief that a child's intellectual development mirrors his/her physical development in that both appear to be genetically programmed and internally driven. Significantly, Piaget asserted that children's mental development, like their motor skills and muscle development, requires young people's full interaction with appropriate physical environments.

It is the latter Piagetian premise -- that young intellects require dynamic interactions with selected physical environments -- which provides the cornerstone for Pearce's earth - bonding concept. Research field testing Piaget's premise is difficult but has been extensive, often yielding results that are sources of controversy (Sigel, 1968). However there are results which seem to confirm that children's tactile interactions with specific learning environments can at least enhance their intellectual development (Williams, 1969).

Pearce pursues this line of thinking by focusing on the nature of learning environments and children's interactions with them. He calls each new learning environment a "matrix" (Latin for womb), and suggests that there is a biologically programmed sequence of these

ever-broadening matrices. As children progress through the internal maturational sequence described by Piaget, they undergo a corresponding series of matrix shifts in Pearce's theory. Perhaps most important to our discussion, Pearce proposes that bonding is the biological process that carries the child securely from one matrix to the next. When a child is born, a matrix shift occurs from the womb to the mother matrix. This is facilitated by the infant's immediate psycho-physical bonding to its mother. From the safe base of mother, the child explores a broader natural environment in accordance with the biological plan. If, as intended, the child is able to play/explore adequately in a rich natural environment, a successful bonding with the earth will occur. The child can then cultivate a secure sense of place and belonging to his or her new earth matrix.

Following Pearce's scheme, aging brings us into matrices that are increasingly conceptualized. These do not, however, completely displace earlier "concrete" matrices. Rather they continue to interact with and build upon one another in healthy ways, enhancing our abilities for symbolic and creative thought.

As with Piaget, Pearce believes that success or failure in one stage directly affects the next, and produces a cumulative effect in overall maturation. Very relevant to our discussion of environmental education is both Piaget's and Pearce's assertion that "concrete" play/exploration within an appropriate environment is prerequisite to integrating fully new concepts and relationships. If the biological plan posited by Pearce is frustrated, if a child is deprived of extensive "concrete" play in a rich natural setting, could it cripple his or her ability to comprehend the relational subtleties of nature?

Will that child's own ability to self-define human relationships to the environment suffer?

Not so long ago, Chief Seattle of the Dwamish tribe gave us his understanding of humankind's relationship to the environment: "...all things share the same breath - the beast, the tree, the man...The air shares its spirit with all the life it supports. The earth does not belong to man; man belongs to the earth. This we know. All things are connected like the blood which unites one family. All things are connected." (McLuhan, 1971). If we find the poetry in his words refreshing, it is because we sense here a world beyond mere lifeless abstractions - a world where the vital marriage of the concrete and the conceptual realms remains intact. Seattle's conceptualization clearly reflects the way his people conducted their lives. It arose from his own lifelong immersion in the natural world, as well as from the instruction of his elders.

One hundred years later, we are reminded by pioneer ecologist Aldo Leopold how crucial our failure to understand fully and integrate this same concept has been to our current environmental crisis: "We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect...That land is a community is the basic concept of ecology..." (Leopold, 1980).

The important question for environmental educators is how can we ensure that such essential concepts become truly integrated into our children's lives? Perhaps in early school years, learning "about"

nature should be kept secondary to immersed activity in it. Otherwise the concepts we teach will remain removed, shallow, non-contextual, and consequently non-integrated into children's future life activities. Perhaps abstract ecological concepts only have true relevance for us when we are successful biological beings in Pearce's sense. This means we must have undergone the "earth-bonding" experience, and that periodically we must rekindle this bond for our own continuing nourishment and sense of belonging.

Now let us look at the specific goals of environmental education as they appear in the literature. Thomas Tanner summarizes these for us in his article entitled "Significant Life Experiences" (Tanner, 1980): "All of these state ultimate goals of long-term environmental quality ... and place citizen participation at the top of their objectives." With this objective in mind, Tanner asks the appropriate question: what kinds of learning experiences produce an informed and active citizenry? His subsequent research examines biographical and autobiographical statements of prominent citizen conservationists and solicits direct responses from 45 leading environmental activists. In 44 of 45 responses, positive "youthful experience of the outdoors and relatively pristine environments emerges as the dominant influence" in these people's present environmental commitments. While this may not seem surprising, when we consider the largely indoors and conceptual public school approaches to environmental education, we have reason for concern.

What are the specific implications of Tanner's research for teachers? His respondents were primarily affected in their youth by the

positive experiences they had in natural areas. These were most often the result of frequent or daily visitations. The influence of both parents and teachers emerged second in significance. Teachers were remembered then primarily as individuals who were enthusiastic about nature, or were supportive of their students' interests, not as purveyors of specific school programs. Books emerged as a third influence, here being primarily interest and nature-oriented, rather than those filled with abstract concepts, problems and issues.

What Tanner identifies as the significant life experiences of his respondents -- their youthful establishment of loving ties with the earth -- seems to describe an "earth-bonding" process. The apparent key to this process is the children's exploratory immersion time in rich natural settings. The precise nature of the activities they were engaged in showed some variation (hunting, fishing, and birdwatching were the most prevalent).

In his concluding hypothesis, Tanner suggests: "Children must first learn to love the natural world before they can become profoundly concerned with maintaining its integrity." He recommends that school children be given substantially more frequent outdoors exploration time, and notes: "They would not always have to be given prescribed learning activities -- the subjects of this study certainly were not." (Tanner, 1980). Roger Hart, a researcher who has studied children's explorations of natural landscapes, likewise cautions us against over-programming children's exploration time: "Freedom from interruption and interference by adults is important; time to reflect on experience and develop a personal ordering of his world is essential to a child." (Hart, 1973).

Recall for yourself your "moments of consequence" in nature; remember your own inner stillness. Perhaps those moments of peace and strong feelings of belonging later led you to want to protect the natural world, and to initiate children into its wonders. Now recall when and how those moments occurred for you. Was it while reading about food chains in your seventh grade science class? Or during a guided naturalist's walk and talk? Or while engaged in a "predator-prey" teaching game outside? I believe that you will answer "no" for any of these types of experiences. I suggest that many of these traditional environmental education exercises are at the periphery, not the heart, of environmental education. They have value only when built upon a firm foundation of developing loving ties with nature. To have our children merely study, define, and label nature from a position of emotional detachment is to objectify our environment. It is this very process of objectification, or standing apart from nature, that permits us later to dissect and disintegrate natural systems, to subordinate and subdue them, and ultimately to waste them without true understanding or feeling.

The core of environmental education is to initiate children (or to support them) in their process of developing loving ties with the natural world. We cannot ensure this outcome or in fact "teach" it directly, but we can give the children situations where "significant life experiences" are likely to occur. As educators, we might think of introducing the environment as much like introducing our best friend. We do not usually do it by giving a ream of facts about our friend's height, weight, age, occupation, family members, and family dynamics.

Not if we want a true appreciation to develop. Rather we want our friend to be experienced first hand and under the best of circumstances. With this in mind we set the stage, carefully providing a structure for the encounter. It is then an act of wisdom and restraint to know when to step back, allowing the magic of interaction to occur.

As educators, we can also introduce children to individuals whose visible enthusiasm and love for nature can serve as contagious examples. We can in fact become good models ourselves of this enthusiasm. This brings me to the second part of my discussion: how can we apply practically the earth-bonding approach to our own inservice preparation as environmental educators?

II. THE WORKSHOP

Several years ago, I began to assist in some locally popular outdoor workshops for teachers at the National Bison Range in Montana. Here we teachers gave other teachers information on different environmental topics, demonstrating outdoor curricula techniques during the two-to four-hour sessions that jam-packed our workshop day. Invariably we had our good moments, made some nice (if fleeting) acquaintances, and ended our spring Saturday exhausted and ready for home. But the inherent incongruity of this rush through nature began to disturb me. Nature, after all, had never seemed to me a place for busyness and hurried schedules. My first and best childhood experiences of it were timeless...as the loon's song in my first summer mornings...I had seen the quieting experience of nature transform my entire family into gentler life ways, as we camped alone together for two weeks, on an island in the Quetico. The Saturday workshops we were giving at the Bison Range seemed to involve too little of this transformation, and too much "classroom" foisted into the lap of nature.

Another disturbing realization: many of the teachers we were instructing seemed to be politely biding their time, too uncomfortable or fearful to sit down in the tall grass, and mentally one step elsewhere and ahead in their day. Of course this would be so; we were not giving them the time, support, structure, or encouragement to experience themselves in nature, to develop a comfortable sense of place here. Rather our focus was to quickly convey a particular body of information to them. Just what did we expect they would be doing when they got back to their classrooms and their children? A disturbing

image arose of them dutifully rushing their students through some activity we had taught them; their own fears, discomforts, and impatience for the outdoors remaining the predominant message of their teaching.

I soon discovered that all the environmental education inservices offered teachers in our area shared this same dubious format. I realized that if we were going to address children's real needs, we were going to have to start helping educators themselves to develop a comfortable sense of kinship with nature. The idea for a workshop that would encourage and support teachers to explore their own bonding process with a local environment began to emerge.

The first requirement for such an experience would be adequate immersion-time in a natural setting. One day obviously was not enough, but just how long would work? Three days? A week? Would I be able to entice the teachers who presumedly needed this the most, those with great fears and little outdoors experience, on such an extended outdoor excursion?

I began by talking with people involved in wilderness and education issues. My idea was enthusiastically received. At the same time I encountered the first seductive pressure to modify my goals: "Perhaps you should shorten the field time, include an indoor component with guest lecturers or slides." This, I was told, would be more palatable to teachers. Such pressure to revert to a more familiar workshop formula, to choose a format that was less open-ended, less intimate, and hence less risky, became pervasive. It seldom came openly as a head-on challenge to my goals or assumptions, rather it came wearing a smile,

perhaps offered with expressions of concern and steeped in an air of authority.

Other problems arose. I had to deal with outside accusations that our workshop participants would be getting three college credits for "just going on a camping trip." Closer to home, I began to question the practicality of my own goals. Would I be expecting too much from the teacher-participants in too short a time? Was the bonding experience, after all, limited to childhood and was it too late for adults? Was this all too "touchy feely" a process for adult educators to open up to? Suppose the workshop "backfired," inviting disapproval, even derision, from the participants themselves for my having taken a step outside the familiar teaching format? Fortunately, I was sharing my fears and my wavering moments with some clear-minded and supportive friends. They had seen the kernel of what was new and promising in this approach and were not about to let me water it down. The workshop would stay true to its initial conception.

My next task was to find a diverse facilitator team which could relate to teachers' needs, yet not be ruled by a classroom mindset outdoors. Extensive interviewing led to seven promising candidates. Eventually some of these would turn away, due to either scheduling conflicts or to personal doubts and fears surfacing as we got closer to the workshop dates. This was disappointing, but the final team of four proved to be a strong, committed, and capable group. There was Joanne Hall, a white woman raised on the Indian reservation just north of us. Joanne had spent childhood in her family's cabin and in the surrounding foothills of the Mission Mountains, still her favorite hiking grounds. When I interviewed her, she had been teaching for 27 years with this

ethic in mind: "Teach them how to get along with one another, and how to care for their mother earth." Next was Byron Weber, a marvelous and contagious naturalist and collector, journal keeper and observer, akin to that old crew of American turn-of-the-century naturalists. Byron came out of the Marines and Vietnam, expending several careers before becoming an eccentric and popular junior high science teacher. Both Byron and Joanne had accrued local reputations as skilled outdoors environmental educators. My third choice was Doug Coffman, a rather serious and idealistic young man like myself who could easily be teased into playfulness. Doug was a city boy who came to the wilderness late and with a passion, enrolling in every survival skills school he could locate. After acquiring a joint master's degree in anthropology and psychology, he had participated in several attempts at beginning outdoors schools in primitive survival skills, and now was teaching anthropology at a local college. Doug could make fire with a fire bow; brain-tan a buckskin hide; bake delicious ashcakes; and from experience, rank the palatability of maggots, ants, and grubs. Between us all, I felt, we had a wide enough range of backgrounds and skills to keep us interested in each other and to provide a stimulating environmental repertoire for the teachers we would soon lead outdoors.

The four of us began to get acquainted, meeting evenings together with a few other resource people, and sketching in the contours of our workshop. We needed first of all to select a quality environment. For us this meant an environment where we could expect to be alone, where human impacts were limited, and where the landscape itself was varied. We were fortunate enough to have a natural area nearby that was diverse (creek bottoms, coniferous forests, open meadows, and alpine terrain).

During the weekdays we could expect a measure of privacy here for our own personal explorations. To assure this, we later made special arrangements with the forest service to reserve a "low use" part of this area for our workshop.

Our recruitment goal was to reach a varied group of teachers with a range of outdoors skills and familiarities. We wanted to mix "beginners" who had little or no camping and hiking experience with more self-assured outdoors enthusiasts. We would look for and encourage the elements of patience, humility, and support that should develop in such a varied group. We also believe that the environmental bonding process we hoped to foster is not just for newcomers, but is an ongoing and vital reconnection point for all of us.

We next needed a workshop structure that would accommodate the needs of such a diverse group, supporting and challenging every individual including ourselves. We agreed that a gentle, five-day foot journey with packs through this varied landscape would suit our needs.

Our choice of a journey format would give our workshop an underlying "organic" theme. The changing landscape had a structure of its own to teach our feet and our senses...soft underfoot, traveling through a cool and shady dampness, rising slowly to sunny, rocky vistas, dry air, and forever new fragrances...these subliminal themes would underlie and enrich the mental ones -- the curricula -- we would later affix to our experience.

Our vote for an immersed experience outdoors meant a willingness to relinquish some control to the environment. Natural events (rain, wind, sunshine, coldness, animal encounters, etc.) would require our responsiveness, becoming part of the fabric of our learning experience.

We felt we would benefit by engaging in this dynamic, in which nature interspersed its own, unexpected lessons with our prescribed ones. If an important message of environmental education is that we are not the controllers of the environment, but willing participants in it, why not select a teaching model that is consistent with this message?

Our next important structural concern was to maintain a low (1:3) ratio of facilitators to teachers. This ratio had many advantages. Teachers would benefit from the personal level of encouragement and support they received. The ratio would engender a highly flexible and stimulating learning environment, where teachers could pursue any of a number of topics with individual facilitators and gain immediate feedback.

Because of the uniquely intimate and challenging character of this workshop, I knew that it would require a close team of facilitators with a shared vision. This would not come strictly through talking. I engaged the services of a university professor, and mentor of mine, in preparing a pre-workshop team retreat. The Saturday morning we met, my friend Roger Dunsmore took us into the quietness of his home for some moments. He then escorted us to a creek in the cottonwoods, where stones were baking in the fire under the careful eye of a young Indian man. The Lakota took care to lead us slowly through the sweatlodge, his people's entryway into the wilderness. It was now our entryway too. After the ceremony we followed the creek to a place deeper in the forest. At our first night's campfire we made plans to arise early for a full day of silence, fasting, and solitude. Instead we found ourselves sitting and talking over tea in the morning for more than an hour. When a black bear female and her cub came down close to drink,

there by the creek's opposite shore, it was our signal to leave and to find our places alone in the forest.

By late afternoon all of us had returned. At the fire, we shared our final meal, and Doug began his own story for this place and day. Twelve years ago he had come to the West to try and practice survival skills. With a wool blanket, a knife, and his fears, he had picked a creek to follow into the wilderness. Fear drove him back out again. Since that time, his search had been for a way to embody and teach the knowledge he had acquired and the connections he felt with primitive survival ways. Today it came to him, in the ceremony he performed on the banks of this creek, the same one he had fled twelve years previously. His sincerity and his willing disclosure led us all to share secret ceremonies we had made with nature and had quieted away for ourselves. By the fire's end, the five of us had generated a nearly complete itinerary for our upcoming workshop.

The next day saw our re-emergence from the retreat. We rejoined the Lakota man, and he helped us to explore our experiences of solitude in the darkness of the sweatlodge. One of us had found a way to mourn a recent family death. Another had found "first fire," a new way to teach, completing his twelve year search (a discovery that was to play a key role in the upcoming workshop). Our experiences alone and together had woven this diverse group of five individuals into a tight working team.

We first met "our" teachers a week before the workshop began. We were happy to find that we had attracted a group of individuals with a range of outdoors experience levels. Our group included a petite young woman who had never spent a night in the woods and was terrified of

spiders, some casual day hikers, an experienced backpacker, and a life-long hunter. Our brochure described the workshop as "paced to the needs of the participants," noting that one of our facilitators was in the "over 50 years club." It specifically invited both absolute beginners and experienced campers. The advertised goals of our "educational backpack" were to give teachers "a personal experience base outdoors" and to develop both their conceptual skills and confidence in leading outdoor or environmental education programs. We chose to avoid the use of the term "bonding" until we first met with the teachers for this orientation day.

During the four hour pretrip orientation session we examined and fitted participants' backpacks and footgear (begged, borrowed, purchased or rented by them), assisted them in their own menu planning for the five days, and clarified the pre- and post-trip graduate credit requirements. The first requirement was a written critique of a pretrip reading, "The heart of the hunter," an essay by Roger Dunsmore, enticing them to explore deeper levels of human participation in the landscape. We had mailed this to teachers earlier, along with their letters of acceptance, equipment and clothing lists, and suggestions for pretrip physical conditioning. The second requirement was an "approved" personal project to be developed during or after the workshop. For example, one teacher chose a photographic essay of the journey and the local flora species he had learned, another made a fire bow from native materials and later introduced this as a project for his high school shop students, others submitted journals or poetry written from the experience. We required the keeping of a personal and/or observational

journal, though individual choice determined which participants shared their entries with the group. In addition, teachers were told to bring along a literary (or artwork) selection through which they had gained an understanding of nature. They would share these at one of our crucial evening campfire talks during the workshop. Finally, we had a reading list from which teachers would pick and review a single work in a post-workshop assignment. The list included literary and philosophical treatises on nature as well as pragmatic teaching approaches.

We discovered that "The heart of the hunter" became a touchstone for some teachers of their workshop experience. Most had read it before the trip, and those who waited to critique it until afterwards indicated that they had come back to the work again with "new eyes." This pre- and post-workshop reflection on the same piece seemed valuable enough to make an intentional feature in our next workshop.

The last thing we did with teachers on this day was to hand them a written pre-workshop test. This was to gain a sense of their present outdoors experience levels, to get a perspective on their outdoors related fears and discomforts, and to determine how often they had brought school children outside for environmental education purposes the previous teaching year. An independent evaluator would use this information as baseline data to compare with post-workshop results. After the workshop, an immediate test would tell us of any changes in teachers' outdoor fear and discomfort levels. One teaching year later our evaluator would conduct an unannounced followup survey. Here we would learn of any longer term effects the workshop had for teachers, keying in on changes in their teaching approaches, and hoping to see more frequent outdoor visits conducted for their students.

It was satisfying for me finally to be dealing with such concrete details as food, boots, and packs with actual people. My idea had now become an adventure in which I could partake.

We began our workshop one week later in the parking lot of K-Mart, on a dry August Monday morning. Wives and husbands and kids gave parting kisses there as the city awoke, and we eleven boarded a public bus. Strong smells of fresh road tar and asphyxiating diesel, full seats crammed with packs, a winding route through the crowded suburbs leading us to the limits of the city...there was a method in this unlikely beginning. We facilitators had decided to initiate our journey in the heart of civilization and work our way through to its margins. Getting off the bus, walking in the sunlight and the fresh air...lush green surrounding the fashionable homes on the edges of the forest...we walked finally by the dam site and through the old horse pastures that marked the edges of the wilderness. A local power company representative met us here. He spoke pleasantly of the city's history and use of the forest's water flow. We walked on. A seasoned ranger and story-teller met us at the forest trailhead. He walked with us, charmed us with his tales of early settlers, ate lunch with us, and led us off the trail in the bush for awhile. He left us with a thought that would re-emerge for some of us days later: "It is a different thing entirely to be in the wilderness and to be of the wilderness." I had arranged for both of these interpretive guides to meet us and to leave us early in our journey. They gave us just a taste of what life might have meant here to our grandparents. They also provided a transition for teachers from the comfortable lecture format to the more direct learning experiences to come.

The trees grew darker and wilder around us and the wind drew rain to skin. We reached our camp and set up tents, Doug demonstrated latrine building techniques and etiquette, and we settled in around our first campfire. The talk that night was of the new physics, and of how it provided a conceptual model for the unity of all things. Bonding with nature was perhaps one deep acknowledgement of this unity. Byron and I told Einsteinian riddles until all heads nodded and finally slept.

Rain the next morning and a change of plans. We had intended to hike up to the alpine meadows and make camp. The thought of wet, cold clothes and damp sleeping bags after a hard day's hike caused us to sit tight. After consulting everyone, we decided to keep this camp tonight and take a day hike up Strawberry ridge in our rain ponchos.

The valley we were in had been farmed once, but early frosts had made that life marginal. Now forests were retaking pastures, and everywhere were signs of past and impending future. As we hiked up the slope, I talked of these changes in terms of trees who were pioneers species and trees who were shade-lovers. Byron pointed out bird life; Joanne, the flowers and herbs. I began to feel that competitive tug of wanting to be the one doing most of the telling. It was an uncomfortable feeling for me, and it produced a disturbing thought: was this workshop to become merely an experience of "tellers" and "listeners?" I didn't want that. I didn't want our group split apart like a classroom between the "haves" and "have nots" of knowledge.

I thought again about my desire to be the teller and enchanter, to have attentive listeners and to create a sense of wonder. It is a

natural desire -- I believe everyone has it. Why not let everyone indulge it a bit? I suggested a plan to the group. We could divide up into teams of two, each team picking a small part of the slope to focus in on, and then we would develop stories from the details we found. The clues were all here: a cleared area in the forest, old charred stumps, the spent lead of bullets in Rainier cans, elk droppings near the closely cropped Ceanothus bush, ditches dug and edged with ferns, and sparkling droplets in a pine tree top. The plan was accepted and implemented. After many minutes of study the teams reassembled. One by one they led us to their study sites and "explained" the evidence they had found. Each had taken a careful look around them, selected the factors they thought were significant, and woven a coherent vision. Some pretty tall tales were told (no taller than some authoritative talks I have attended). We laughed together and found some beauty here in the rain.

On the ridge top we split and regrouped and split, following our own deer paths through the raspberry brambles, huddling under a spruce tree when the rains thickened. Byron and friends discovered an occupied woodpecker tree. We all joined and rested on an open slope when the sun reappeared. "What did you all do to prepare yourselves for this workshop?" We answered that question with the same love and care with which it was asked. More questions came, and more disclosures. We talked of bonding and what it meant for each of us. We shared stories of the personal ceremonies we each had come to perform alone in nature. We sat together under the welcome sun in silence and in peace. Most of the group chose to return off trail and bushwack back to camp. The down

slope was steep and slippery, our pant legs soaked from the dripping foliage, but there were few complaints. We stopped once, watching a doe with fawn in the sunlight green. A teacher scrawled quietly in her journal, "Today we have become a family."

That evening's campfire was devoted to talk of fears and joys each of us associate with nature. We shared our literature selections, and some shared their first journal entries. The wind played with our communal raintarp overhead. Two teachers revealed they had brought tents without rainflies (next time at orientation we would have to check tents as well as boots and packs!). We could double up, but still we lacked dry tent space for two. Doug and I decided to sleep around the fire under the tarp and give his tent to others. With the last of us nodding off, Doug wrapped in his wool blanket and I in my warm down bag, the wind came up and the rain down-poured such as August never sees in Montana. Like a sailor at sea, I grabbed the post that held the tarp that was pouring rivers of rain around me, and held tight. As the puddles became ponds, snide remarks and laughter floated freely in the dark around our camp. Hadn't our gear list cautioned novice teachers against wettable down bags? Doug was wrapped up and giggling fairly comfortably in his relatively warm wool blanket. I spent the night maneuvering tennis shoes under my down bag - an attempt to engineer dry contact points with the earth. It was a cold and silly night for me, my laughter releasing the tensions of being a group leader. In the morning, I found a bone-dry patch of ground (big enough for one sleeping bag) beneath a conifer "witch's broom" just a few yards away.

Morning consultation time. We had clothes that could stand to dry,

one soaked sleeping bag and some that were damp, and a tent or two that leaked in the rain. Overhead the narrow valley sky changed quickly from sun to clouds and back again. This was no one's good gamble for a move into the alpine...Still we facilitators saw the need for a change on this third day of the workshop. Some teachers expressed the desire to see the subalpine lakes, though few seemed inclined to carry packs up there and risk setting up a camp in the rain. Our solution was to keep camp here, Byron and Doug leading those who wished on a long day's hike into the alpine and back. Surprisingly, all seven teachers chose to join them. The one who was an experienced backpacker carried his pack, taking on for himself a personal challenge by staying alone in the high country. Joanne volunteered to hike back to the trailhead and seek dry bags and an extra tent. I stayed in camp and restrung our faltering raintarp, collected wood, and hung clothes to dry.

Joanne was back by late afternoon and we were brewing tea when nine smiling and proud hikers returned. We heard enthusiastic tales of the hike and the bird life they had seen. Byron had a gift for getting teachers excited about observing, and leading them to answer their own questions. After an eclectic meal of ashcakes, boiled goatsbeard lichen, homemade pizza and pudding, Doug led the campfire talk by introducing tomorrow's activities. It would be a day to spend alone and in silence in places of our own choosing. Fasting was encouraged. We would return in late afternoon for Doug's "first fire" ceremony and our evening meal. Byron then told his tale of Jupiter, vying with the Sun as giant of the solar system. In the clear cold night sky, many left the fire with him to watch the planets and the stars before bed.

I left a quiet camp in the morning to find my own place far up on the shoulder of a ridge. Old, bear-clawed larch trees up there...a scat with ants in it and another, larger one, with bone and hair. The red-tailed hawk called out my arrival. From my knees I saw the aphid sucking the dewy underside of the antennaria leaf. Where I chose to sit, a squirrel had been working to amass fir cones for the winter. He and the resident ants convinced me finally to find a cool creekside down below to spend the rest of my hours. My time alone meant more self-acceptance, and a relaxing of expectations both upon myself and others. I returned across the meadow after dipping in the creek, walking peacefully into camp. Some sat in the sunshine, writing quietly in their journals or sketching in the meadows, others sipped tea by the fire. Doug approached me, "We should be starting the ceremony soon, it will take about two hours." The seed of his mystery had been sown and I was intrigued.

We were all gathered and following Doug down to the creek. There was a circle of flat stones there, a seat for each of us. Next to Doug were a number of organic objects; charcoal, cattail fluff, water and wood, a feather, grass, deer jerky, and stone. He held four of these before him: "These are all that we have ever needed for life..." clean water to drink from the creek, a feather representing pure air to breath, the deer jerky for our food, wood and stone for our shelter. At some point in our human story, a fifth powerful element had appeared: "Charcoal from the first fire humans ever made, a fire that has burned continuously to this day. Fire has furthered the gift of life for us, it has allowed humans to extend their range from the

tropics into the great temperate regions of the earth. If we have gained a certain mastery over fire -- it burns for us now when we flick on a light switch or raise a thermostat -- we have also lost a certain reverence for it. Without either wisdom or reverence, we have come full circle today to where the nuclear fire threatens our existence."

We sat together with Doug in silence, asking that once again we might find that reverence and use fire in wisdom. The sun was lower now over the trees by the creek, and the air was cold. I and others had not dressed warmly enough for this; we fidgeted uncomfortably as Doug hunched over in his fire-making. He had explained carefully the technology of the fire-bow: a few degrees drop in temperature, a slight rise in humidity by the creek, these things could make it harder for the ember to come, harder for the cattail down to receive spark. A whisp of smoke...Doug's pace quickened. A billow of white...he had us there. He stopped abruptly -- raised a cupped secret to his lips -- breathing life in a burst of flames. I forgot being cold; I had never seen fire before. We passed ash from the little fire among us. Quietly our party rose and walked back together to camp.

How had people received this event? Doug had taken a risk here, offering us something more than a demonstration of technology. He had invited us in to a powerful personal experience, and asked that we feel a living connection with our own ancestry. Certainly we gave him respect in our collective silence. I heard little said of the event that evening. Perhaps it was still being received, in eleven different ways.

This was our last night together. We pulled out all the stops for

our final dinner: deer sausage pizza, walnut raisin ashcakes, a vegetable noodle dish, a rice dish, an apple crisp, and Byron's two kinds of pudding for desert. When our stomachs were full and happy, we began to speak of our hours in solitude. One had written a story she shared with us; a bear's eye view of the strange human proceedings (ours) on the valley floor. Another had seen that bear, or at least its cousin, as she sat anxiously near its path. With a stick she had made the noise that scared it into the brush. She only half regretted this now, wondering how it might have been to sit and watch a bear in silence. And then Rebecca, the petite woman who was terrified of spiders and had never camped before, told us her story. Today she had let a spider crawl on her body. All were proud of her; all found in her simple joy and accomplishment a measure of their own. Our stories went around the fire. In the morning we would have our final circle in the meadow. Awards sketched by the teachers would be given to each facilitator; their journal readings would reveal the depth of their feelings for us and this experience. Our hike out would be too quick. Like many others, I would find the bus ride back to K-Mart too disturbing a transition back. Something we must attend to in future workshops. Still, this was our last evening's fire. It would burn until all our stories were told, until we bade each other good-night.

APPENDIX A
SUMMARY OF FORMAL WORKSHOP EVALUATIONS

Introduction

Three written questionnaires were presented to workshop participants during the course of this evaluation. An immediate pretest was presented to them at the pre-trip orientation session five days before the workshop, an immediate post-test was presented them on the final day of the workshop, and a previously unannounced follow-up survey was mailed them ten months after the workshop. Participants mailed their questionnaires to an independently contracted evaluator for compilation. To insure candid responses, each workshop participant was guaranteed anonymity by a double blind coding system. Neither the workshop facilitators nor the independent evaluator correlated the names of participants with individual questionnaires, and the workshop facilitators saw only the evaluators' final compilation of the results for the entire group.

Our sample size (seven participants) was too small to give a statistical significance to our numerical results. However, in several categories the figures show clear (often unanimous) trends to the participants responses, which are then substantiated in their written commentaries.

Immediate Pretest and Post-test

The immediate pretest and post-test each consisted of short answer Likert scale responses and short essays. The results which follow are a compilation of responses from all seven participants.

Likert scale responses were used to establish participants' fear and discomfort levels associated with hypothetical outdoors' situations before and after the workshop, for example:

	Strongly Agree					Strongly disagree				
"I am fearful, or have a phobia of snakes"	1	2	3	4	5	1	2	3	4	5
"I find sleeping on the ground unpleasant"	1	2	3	4	5	1	2	3	4	5

General trends: The completed group averages indicate an immediate overall decrease in teachers' outdoor's associated fear and discomfort levels after the workshop. We consider this an important step in preparing teachers to explore the outdoors comfortably with their children for environmental education purposes.

Interesting specific responses: In looking at group response averages to six fear-related items (1. insects, 2. spiders, 3. snakes, 4. being alone in the forest, 5. bears or other animals, and 6. being alone in the woods at night), for all except two items there was a decrease in participants' fear levels. Item 4 (being alone in the forest), showed no change, and item 6 (being alone in the woods at night), showed an increase in fear levels. Perhaps relevant here was the group-orientation of our experience. Both these items involve being alone in the forest, for which the workshop provided only limited opportunities. We are planning to expand the solitary time for participants in future workshops, perhaps encouraging them to spend a night camping alone.

Of nine discomfort factors tested, group averages showed a decrease for eight items and no change for one (being wet). It is noteworthy that despite three days of "unseasonable" rain and considerable wet clothing,

workshop participants seemed to learn to take the wetness in stride.

Essay question responses. One essay question in the pretest asked teachers to describe the frequency and extent of their outdoors' activities with children in the teaching year prior to the workshop. This was used as baseline data to compare with the follow-up survey results gathered one teaching year after the workshop.

Essay questions in the immediate post-test asked participants 1.) which aspects of the workshop were most beneficial/most detrimental for them and why; 2.) did the workshop make them feel more comfortable/less comfortable out-of-doors, and if so, in what ways; 3.) did they feel the workshop experience would affect their teaching, and if so, in what ways; and 4.) for comments on the workshop's strengths or weaknesses, with suggestions for improving it.

General trends: The essays indicate that the workshop was seen as a beneficial experience by all the teachers participating, with comments ranging from extreme to moderate levels of enthusiasm. The positive features which were most often singled out were 1.) the diversity and quality of the facilitators (e.g., "The chosen facilitators were probably the key to the success of this workshop...all used varied approaches that complemented each other."); 2.) the experience of feeling bonded with nature, (e.g., "I learned to listen, observe and think like nature--if I am a part of nature, there's less to fear."), 3.) the self-discovery approach (e.g., "...example given by facilitators will help teaching by letting students explore at their own pace, and realize that arriving at the 'correct' answer is not the most important thing"), and 4.) specific curricula ideas (e.g., "teaching strategies

such as journal keeping, animal observations, writing ideas, story telling and art activities").

Detrimental aspects of the workshop noted were few. They were restricted to weather related discomforts and to suggestions for minor structural changes (e.g., "Campers would have arisen earlier if the fireside discussions had not lasted so long. Early morning hours are precious.").

All of the teachers indicated that the workshop would positively affect their teaching; most referred to their own new enthusiasm as key (e.g., "...my excitement about the outdoors generated by this experience will be transmitted to the students.").

Interesting specific responses: One respondent indicated a way in which the workshop made him/her less comfortable outdoors: "...because of blind ignorance, I came with no fear of bears, but when I left, they were my biggest fear, because after seeing so much bear scat, I knew they were a reality and they were around."

The rainy weather became an important aspect of the workshop for several of the participants, being cited with equal frequency as a detriment, and as a positive aspect of the learning experience. Again, we facilitators stress that for us the life breath of environmental education lies in a teacher's willingness to relinquish some controls to nature over the learning experience. The rain for us became a challenge and a welcome occurrence.

Ten Month Follow-up Survey

Our follow-up survey consisted of short answer Likert scale responses and short essay questions, and was mailed to participants at

the end of the school year following the workshop. We successfully retrieved six out of seven possible responses to include in the compiled results which follow.

Likert scale responses were used to determine if after ten months participants considered the workshop 1.) among their significant life experiences, 2.) transformative in their personal relationships with nature, and 3.) transformative in their teaching approaches. Responses of "1" represent the strongest possible perceived levels of workshop influence and significance; responses of "6" indicate the weakest perceived levels; for example:

a) At present, I consider my involvement in the summer workshop to be among my significant life experiences.

Strongly Agree 1 2 3 4 5 6 Strongly Disagree

Comments:

b) I recall a special moment(s) or event(s) during this workshop which is still important to me now.

Strongly Agree 1 2 3 4 5 6 Strongly Disagree

Comments:

General trends: Group averages from the four questionnaires received range from medium to very high levels of perceived impact in all categories:

	<u>Group averages</u>
1) a. Among my significant life experiences?	1.7
b. Special moment(s) that remain important to me now?	1.3

2. Transformative in my personal relationship
with nature? 2.0
3. Transformative in my teaching approaches? 2.2

Overall, former participants rank the internal impact the workshop and its associated special moments has for them as still very high (questions #1, a. and b.) and the workshop's manifest impact in their personal and professional lives as somewhat lower (questions #2, 3). This not too surprising trend is further elucidated and confirmed in participants' essay question responses.

Interesting specific responses:

One teachers' single low response (5) to the influence the workshop had on his/her personal relationship with nature seems puzzling. Below the numerical response was written: "Share it (nature) more with others, not...hoarding it as my own personal treasure." It is possible that his/her numerical selection was a mistake, or that this person felt little change in relating to nature but notable growth in sharing this relationship with others (confirmed in his/her other responses).

Another teacher (the experienced backpacker) chose "3" for this question and wrote: "My personal relationship with nature wasn't really changed that much...What I value most about the experience was the social interaction with people that valued nature."

The remaining four participants all chose the highest level (1) in evaluating the impact the workshop had in changing their personal relationships with nature.

Frequency of outdoor visits with students: We attempted to make a quantitative comparison between the number of outdoor experiences teachers conducted a) the school year prior to the workshop (data from

pretest), and b) the school year following the workshop.

General trends: Disappointingly, our results were incomplete and therefore not conclusive. In two instances either the "before" or "after" numerical figures were left blank making a comparison impossible. In a third case, the respondent was a retired administrator for whom the question no longer applied. In a fourth instance, the respondent reported a substantial decrease in outdoor class experiences as a result of a move and a change from full time to substitute teaching status following the workshop.

Of the three respondents who gave us complete data, the two full time teachers did show an increase in their outdoors and natural site activities. We had considered our impact in influencing teachers to take students outdoors more frequently as a primary goal of the workshop.

Essay question responses were intended to confirm and elucidate the numerical results of the Likert scale responses.

General trends/interesting specific responses: Four of the six respondents indicated specifically that the group experiences and comradeship provided some of the special moments still important to them. This was confirmed independently of the evaluation through the post-workshop correspondences initiated by participants and a Christmas season reunion organized by them. Interestingly, one respondent listed "coping with the rain," among his/her moments of special significance. Others listed "seeing a bear," "viewing Venus," and "the fire making ceremony" among their moments of special importance. In counting the workshop among his/her significant life experiences, one wrote "When I get tense, I flash back."

Five respondents made comments relating to changes the workshop encouraged in their personal relationships with nature. Two referred to sharing these relationships with others; one, to lessening his/her fear of spiders; a fourth wrote: "I can walk at night without artificial light...I remove insects without killing them"; and the last wrote: "provided the synthesis for a chapter in a book."*

Three respondents who are currently teaching gave specific examples of the workshop's influence on their teaching approaches. One conducted "an all day environmental field trip...I concentrated on feelings, and not just information." A second (the substitute teacher) listed three outdoor excursions, utilizing journal keeping and "create a story" approaches learned during the workshop. The third, who responded "rarely" to the frequency of outdoors school experiences, wrote: "I wish to make others (administrators, staff) realize the 'rarely' answer... is sad...Would like to develop the schools' attitude of letting us 'out.' They are reluctant." This same teacher suggested "a yearly get-together with those involved (workshop) would be nice - to trade - exchange - show and/or tell how the workshop has affected our work and daily lives."

*The latter respondent has since disclosed that her book on innovative teaching approaches has been accepted by a major publisher, and confirmed the thematic contribution of the workshop to her work.

CONCLUSION

Our pretest, post-test, and ten-month followup surveys suggest that this workshop approach was largely successful in its goal of engendering "significant life experiences" for teachers in the out-of-doors. Such experiences were self-described by them as involving strong feelings of bonding with nature, and a close sense of comradeship developed with fellow participants. Indications are that these experiences are of lasting quality, with some longer term effects in teachers' personal lives and professional teaching approaches already evident. Their responses suggest that a support network and some follow-up work with teachers during school year could significantly increase the impact this workshop has had in affecting environmental education programs for children.

APPENDIX B

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