

The following text is taken from a bound monograph handed out to Field Naturalists and Ecological Planners upon entering their respective programs.

THE NATURALIST'S JOURNAL

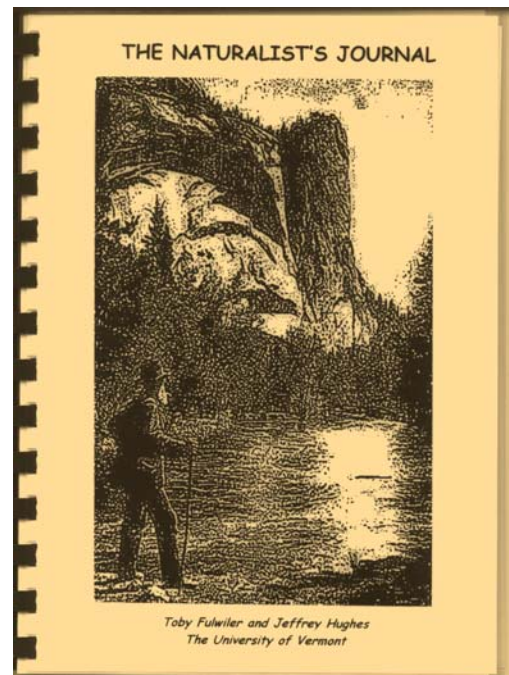
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A journal, of one kind or another, is standard issue equipment for the working naturalist. A good journal memorializes what you do, what you think, what you see, and what you need to do next. A good journal also catalogs techniques, methodologies, books, papers, and gizmos that you discover and wish not to forget. It becomes a personalized identification guide for all your interests, natural history and otherwise. Finally, a good journal helps you see the forest as well as the trees by connecting seemingly disconnected thoughts, musings, observations, and speculations. In short, it helps you think creatively, critically, and synthetically.

In simplest terms, a journal is simply a daily record of some portion of a person's life (in fact, the root "jour" is French for "day"). Journals are sometimes called diaries, daybooks, logs, or field notebooks. No matter what you call them, they are likely to include whatever thoughts, feelings, activities, or plans you deem worthy to record. This monograph describes three kinds of journals most commonly used by naturalists: 1) *personal journals* that record the pieces, processes, and patterns of one's life; 2) *dedicated journals* written to document particular projects or journeys, and 3) *field journals* that are the constant companions of working naturalists in the field, and often contains a mix or both personal and professional notes. In fact, many naturalists keep all three, and all three have certain characteristics in common

Sequence. No matter what the focus, journals capture thoughts sequentially, from one day to the next. Over time, the entries form a cumulative record of what you witnessed, experienced, and thought in the order these happenings, observations and ideas occurred. All journals are arranged, one way, or another, according to dates, sometimes within topical categories (field and dedicated journals), other times, with no separations at all (personal journals). Dating each entry provides a traceable record of when something was seen, thought, or read—chronological information that often proves crucial for later analysis and interpretation.

Audience. Journals are written to explore what's important to you, the writer/naturalist, at the time of writing and not to directly communicate information or ideas to someone else. The information and ideas written in a naturalist's journal is a seedbed for ideas that will go public only later, as reports, policies, presentations, conference papers, research projects,



grant proposals, or publications. In other words, while you write letters, reports, and proposals to external audiences, you write journal entries to yourself.

Language. Since your audience is yourself, the style in which you write in your journal is wide open. In writing to yourself, the only rule is that you be able, later, to read what you've written. The focus in any kind of notebook called a journal is on collecting data and exploring ideas rather than correct spelling, proper punctuation, complete sentences, or specific format.

OPTIONS FOR ORGANIZING A JOURNAL

Journal writing is important because, on the one hand, it focuses thinking at the time it is written while, on the other hand, it creates a record to be found and read at a later date. How you organize a journal, then, depends on your purpose in keeping it, your particular work methods, and how your memory works. Many practicing naturalists keep more than one journal as well as more than one kind of journal. The two common patterns described here are straight chronological (*personal* journals) and topical/chronological (*dedicated* and *field* journals).

Personal Journals.

Many naturalists keep personal as well as professional journals, because they find value in reflecting on their personal as well as professional lives. Personal journals are written with a simple chronological arrangement similar to daily diaries. If the notebook were merely a record of daily events that happen to the writer, we'd call it a diary; if the daily record also includes ideas, insights, speculations, and doubts, we'd call it a journal. In both notebooks, writers date each page as they go along, topics and events following willy nilly as they occur with little regard for thematic consistency. The advantage of straight chronology is that both ideas and events are integrated according to time; the disadvantage is that related ideas are not clustered together. Most personal journals are organized according to chronology, but topical journals, too are chronological within topic areas.

Naturalist Bernd Heinrich, a biology professor from the University of Vermont, has kept for many years a personal journal that meshes thoughts about both his personal and professional life. While Heinrich also keeps journals dedicate to specific research projects, his personal, strictly chronological journal is the one that is always with him and which he writes in most often. While much of the writing here is about private matters—family, vacations, exercise, emotions—many entries reveal the mind of a writer who is always, no matter what else he's doing, a naturalist:

***13 March.** I feel buoyant—exuberant. We have had warm days and cold nights. My ravens are laying eggs—I'm so excited—can't wait to open the aviary after the young hatch and let the whole family loose around the house. A new adventure. And I'm jogging again! And I can do 30+ pull-ups! But the running has been amazingly detrimental—had very sore legs after a six-miler.*

30 July *At camp—unusual huge piles of sawdust under a north ceiling log, just above shelf with beer bottle collection. The pile below that, on the floor, is even bigger. Now I finally know the culprits, after 3-4 years. I can hear little crinkly sounds inside the logs like the munching of rice crispies. A steady stream—in little bursts—of sawdust falls down from the back of the log, but the holes are out of sight. As I said, this falls about 18" onto a shelf. And here, on this shelf, a single carpenter ant was working. She was picking up pieces of sawdust, walking deliberately to the edge of the shelf, leaning out, and dropping her load. And so she carried sawdust, load after load, even as it was being replenished by those dropping it down on her from above. What teamwork! But why go to the trouble of dropping it off the shelf and onto the floor?*

30 September. *A good frost last night. The peak of the foliage is coming on with a great rush. And I harvested a lot of beautiful luscious raspberries yesterday, and there are still lots to come. A chance by-product of the raven research: raven dung. Three-four years ago I cleaned out the aviary and dumped all the smelly feces-impregnated leaves on the lawn. Result? Shoots of raspberries come up like crazy in the summer and bear fruit by fall. Normally they don't bear fruit till the next June. The fertilizer speeds things up. Meanwhile, all the others from the same rootstalk show not a single flower. These have many dozens of fruit on each stalk. So, now that the stalks are exhausted by reproduction, they die next summer and do not reproduce. Instead, a new shoot is therefore forced to come up. In effect, I've made an annual out of a biannual.*

Bernd Heinrich, author of some thirteen book and many periodical articles written to lay and professional audiences alike, uses his personal journal to record what happens and what he thinks about every day. It's a writing habit typical of prolific writers. He finds that capturing both private and scientific thoughts in his personal journal helps him keep track of the many dimensions of his life; without a doubt, it has proved an invaluable resource for finding and recording ideas that show up later in his research, teaching, and publishing. For example, the first entry above, simply illustrates the everyday writing common in a daily journal, Heinrich leaping from one subject (ravens hatching) to another (running). The second (ants) and third (raspberries) entries, however, identify the writer more strongly as a naturalist, curious about even the smallest episodes in the natural world, with especially keen powers of observation, reflection, and interpretation. No matter what your actual work or career path, daily writing in a personal journal provides you with a reflective record of your life to do with what you may.

Dedicated Journals

A dedicated journal focuses on a single professional research project or trip, recording all matters of data collection, methodology, interpretation as well as insights, doubts, and brief notations about other dimensions of a writer's life. Following are selected entries from the journal kept by Vermont Botanist David Barrington on a two-week trip to Oaxaca, Mexico. His journal consisted of a single bound notebook, 7" X 10," with lined pages that contained all records of this journey, including travel notes, discoveries, hunches, personal anecdotes, and professional doubts. The latter part of this notebook included pasted-in samples of ferns collected on the trip.

Barrington formally began the journal while flying from Vermont to Mexico, labeling his first page, *Table of Contents (TOC)* and calling his first entry *Prologue: Goals*, where he outlined for himself the projects he hoped to accomplish on the trip. We include selected entries below to illustrate the writer-based nature of such project journals.

Here's what I can do down there:

- 1. collect *fournieri* so that I can run it*
- 2. fix *fournieri* in the field; also fix others as possible*
- 3. collect more *turrialbae* alive*
- 4. look for 4X in Mexico, where I expect it originated*
- 5. there remains the question of how divergent CR & ME populations of *turrialbae* are.*

Barrington filled out the rest of the *TOC* only after completing the trip, this final organizational effort making the journal easy to use at a later date, when the specifics of his trip were otherwise forgotten. Following the *Prologue*, the *TOC* of the finished journal reads, in part, like this:

<i>Prologue: Goals</i>	<i>7</i>
<i>Dec. 30 - to Veracruz</i>	<i>13</i>
<i>Dec. 31 - Veracruz to Ixtlan de Juarez</i>	<i>15</i>
<i>Jan. 1 - Pelon</i>	<i>19</i>
<i>Jan. 2 - Pelon</i>	<i>23</i>
<i>Jan. 3 - Ixtlan to Oaxaca, San Vincente</i>	<i>29</i>
<i>Jan. 4 - San Gabriel trip</i>	<i>31</i>
<i>Etc.</i>	

While not every naturalist will paginate and make a table of contents for a project journal, doing so proves especially valuable when the journal is used later as a research source. Since Barrington has many similar project journals, he finds the small extra work of putting in page numbers and making a table of contents worth the effort.

The early entries describe both where he is located as well as personal doubts about the trip:

Dec. 31. So here we sit by the wood stove in Saul's bedroom which is also a sitting room. Three small logs chuckle with a single flame. Anomalous in this dusty neglected house is a wind-up wall clock in immaculate condition, which chimes at each quarter hour. But we have a big pot of chicken, rice, and vegetables & soon we shall be enjoying it.

So how do I best further my science down here? I confess to being depressed—there are too many plants to collect—it's impossible to get a good sample of any use to science & isozymes are old hat. But the hell with that, I have my own little projects to keep my mind active & my techniques are adequate if not current...

Jan 1. I already have a long list of things I've done wrong in preparing for this trip. At the top is bringing no locality data for alfarii, except Purpus Hacienda & completely forgetting about smithii which could easily be the same as Costa Rican diploid.

Later on in the same entry, Barrington describes a collection site as follows:

At the end of the day, on the return, we stop here & collect living rhizomes, 20 of them for isozymes. Only two of these come from above the road; the remaining come from down below in among the tangle and rocks of a wet little cleft in the mountainside where the stream cuts down through the earth. . . it's fair to say this species is common on the highest part of the road—km 125 to km 135...Chris discovers he's locked the keys in the car. I break my knife getting the door open. Back at Rancho Texas we find Boone again. Black beans for supper.

The following entry reveals Barrington's consistent documentation of identity markers: day, time, highway numbers, car travel in kilometers, elevation in meters, and landscape type:

Jan. 4 We rise at six, an hour before dawn & head for Sola de Vega & the Pacific slope. Chris at the wheel. Gas full, station open by 6:30 a.m. Here with a transect of Rt. 131 the road runs through agricultural country & towns at 1400-1500 m. to San Martin Lachila at km 47. Here we begin to climb [first numbers are altitudes followed by times of day]:

1410 8:10 San Martin Lachila: heavily disturbed patch of long needle pine—oak soon after

1430 7:16 Bald Cypress, river crossing of yesterday
1770 7:25 Forest is similar, mostly dry w/ legumes, oak, and lazy
If. pine—again in bloom
1840 crest—pine, juniper, one of the common oaks is the colorful leafed
one.

It is difficult for a non-specialist to understand much of Barrington's technical language about observing and collecting ferns; however, the role of the journal in documenting and communicating scientific discovery is unmistakable. For example, the following paragraph is from an article published in a Botany journal ten years after the initial research trip:

Polystichum fournieri is a rare species known only from Oaxaca to Chiapas, Mexico, where it is found between 2300 and 2700 m. It grows in the deep shade of streambeds and on dripping rock faces in forests of mixed oak, pine, and fir. ("Polystichum lilianae ... and its relationship to *P. fournieri* and *P. turrialbae*." *Brittonia* 55 (4), 2003, 320)

Keeping a journal dedicated to one specific research project—whether thesis, dissertation, proposal, or publication—keeps all investigative thoughts and data together in a single place. And, in time, when you've collected more than one such research journal, if each is dated, labeled, or otherwise indexed (alphabetically by subject) each will remain a potentially useful resource at a later date. The structure of Barrington's two-week project journal was simply chronological, similar to that of a personal journal; other project journals might be divided into topical sections similar to that we'll describe next, the field journal.

Field Journals

The field journal might be called the workhorse writing notebook of many professional naturalists. Whether a very general personal journal or the very specific dedicated journal, this journal is commonly divided into separate topical sections to allow the writer to record related entries in the same place so that ideas build upon each other and are easy to find and reread at later dates. The following suggestions describe a practical way of organizing one's field notebook, into four distinct sections:

- **To-Do Lists:** Lists of things you need or mean to do to be crossed off when completed
- **Daily Log:** Records of daily events and ideas, similar to the random mix of a personal journal
- **Natural History Notes:** Observations, records, notes, sketches, of natural phenomenon witnessed in the field
- **Useful Resources:** Lists of books, articles, documents, films, people, agencies to be remembered for future reference

Field journals can be divided into sections to facilitate both thinking and remembering. Try dividing your notebook into sections such as those above. Plan to record entries chronologically within appropriate sections. Number the odd-numbered

pages of your journal in the upper right corner for easy reference and future indexing. Leave the first page blank in case you wish to add a table of contents when the notebook is finished. To expedite locating each section quickly, you might add tabs to each section or color the edge of the top or side pages in different colors with magic markers. Suggestions for writing in each section follow.

To Do Lists. Whatever you're doing or not doing, there always are things you need to remember -- equipment to bring, people to call, things to take care of. Unless your life is overrun with meetings every day (in which case you might need to invest in a daily planner), use this first section of your field journal to remind yourself of what you need to do/take care of/not forget. Following is a selection from graduate student Kristen Puryear's "To Do" list:

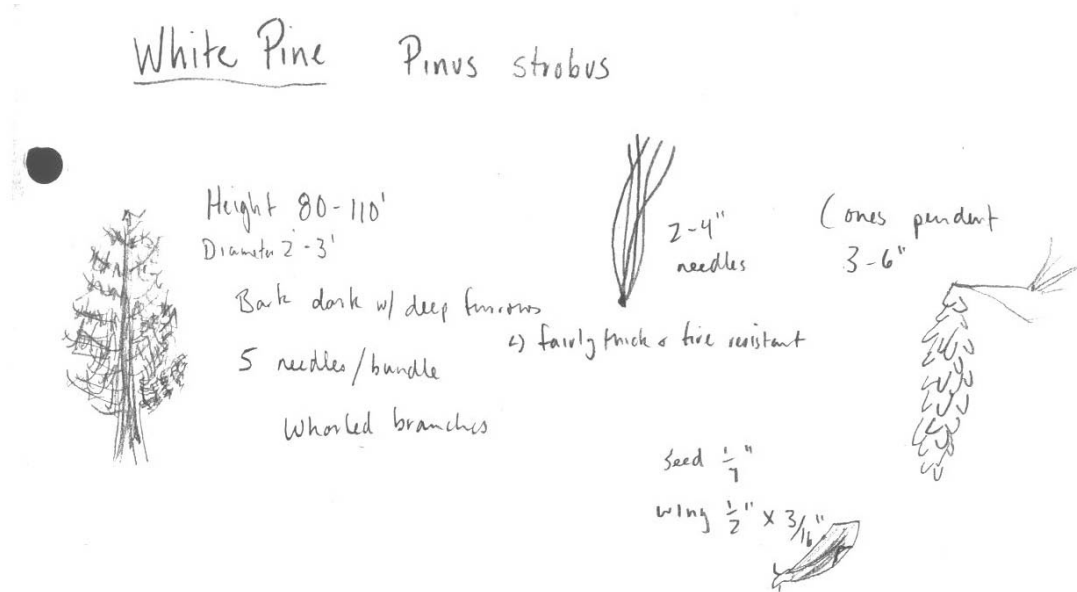
- add graphs to final paper*
- design overview of road study*
- make strap to carry clipboard and notebook*
- take photos of road site and farmer fields*
- bring along Peterson's Guide to identify nesting birds.*
- find deadline for fellowship application*
- get haircut*

Daily Log. Develop the habit of recording each day's thoughts and events, even if such recording may not seem important when you're doing it. Record date, time, weather and whatever what activities you've done, how long they took, where you went, and what you accomplished. Something as simple as recording the amount of time spent on activities helps you plan future endeavors more realistically. If you need to draw a map or record directions to get someplace, do this in your daily log section (likewise for compass bearings so that you don't get lost!). Consider making a ritual of daily log writing, say twenty minutes each morning with a cup of coffee or tea, or each evening before bed. While it's hard to write every single day, if you get in the habit, you'll write most days. Graduate student Kendra Schmiedeskamp's records the following in her daily log:

2/3 In A Walk in the Woods, Bill Bryson describes how farmers were driven out of the Delaware River Valley to make way for dam and a forty-mile lake that was never constructed). Later, this vacant wooded corridor was made part of the Appalachian Trail. How dull, he says, no human activity to break the wooded monotony (p.199). I agree. I most enjoy a landscape that includes the interaction of human beings and along with field, forests, and rivers —we are, after all, part of nature, not a species to be separated from it as in a zoo.

Natural History Notes. Use this section to record site observations, critter behaviors, and anything else about the natural world that interests you. Write down tricks you learn to identify things so that you don't forget them. Think of this section as your own personalized field guide. Over time, your natural history notes will generate an authoritative resource book that is uniquely suited to your interests and needs. It will be of

greater value to you than any store-bought book you could buy. Be sure to sketch what you see and wish to remember, for visual images help you match and remember what you saw, rapidly, as and in ways words cannot do—as seen in the identifying sketches of white pine profile, needle cluster, cone, and seed, made by Matt Kolan in his field journal. The attention needed to sketch also forces you to notice details easy to miss with simply verbal notes. If you feel self-conscious about your drawing, remember, your journal is private, and nobody else need see your sketches.



Natural history notes may also resemble daily log notes, as does the following entry from Matt's journal:


1/20 (Saturday) 20 degrees, 7 a.m.

Backyard full of fresh snow—two inches over maybe a 12" base. And it's still snowing. I find fresh fisher tracks (26" bound) near the pines out back, but no scat. Fox tracks from yesterday barely visible. Many deer tracks along regular route that cuts through the yard (walking, 23" stride), with fresh scat No dog or coyote tracks—a relief.

An especially useful way to record field observations is in a **double-entry** format that allows you to separate initial observations or questions from later interpretations or answers. To allow

for double entries in this section, divide your page with a vertical line down the middle. On the left side of the page, record initial field observations, data, sketches, or questions. On the right side, directly across, add later reflections, interpretations, hunches, or

answers. To the right is a double-entry sample from Toby's forestry journal about what do with slash left over from thinning trees in a sugar-bush/wildlife habitat. A good way to incorporate "double-entry techniques" into an otherwise single-entry journal is to add the extra right margin to any page where you ask a question, pose a problem, or intend, later, to amplify, explain, or add reference notes. If you plan to add a lot of information later, leave a full blank page (or back of a page) adjacent to the entry that needs further completion.

<p>11/10 TUES 38°</p> <p>Spent the morning cutting poplars + red maples out of the sugarbush. Took logs near trails for firewood.</p> <p>A question about slash — is it better to leave it where it falls? Or should I make brush piles to increase wildlife habitat? Deer will profit either way, but brush piles might be esp. good for smaller game?</p> <p>slash pile</p> 	<p>12/8</p> <p>Snowed enough to ski the trails today. I checked slash piles + found many animal tracks — not my deer but rabbits + mice + maybe squirrels as well. Think it's a good idea to make frequent brush piles to provide such cover as well as deer browse.</p>
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Useful Resources. Save the last few pages of your journal to record titles and other pertinent information on books, articles, people (telephone numbers, email addresses), movies (whatever) that you wish to remember. You never know when you'll unexpectedly stumble across a gem of a resource, so be sure, always, to have your field journal with you! You're then assured of having a standardized place to record your gem discoveries so that you can find them later when you want them. The resources listed in the back of Toby's journal include these:

- *Reading the Forested Landscape*, Tom Wessels
- *Round River: From the Journal of Aldo Leopold*, ed. Luna Leopold
- *The Leopold Outlook* (newsletter for spring/summer, 2004) Aldo Leopold Foundation--includes dates of Shack seminars and tours
- *American Nature Writing, 2003*, ed. R. Dawkins
- *The Sierra Club Nature Writing Handbook*
- *Writing Naturally*, David Peterson (2001)
- Hub Vogelmann, founder of UVM Field Naturalist program, now retired—Jericho, VT

TEN SUGGESTIONS FOR JOURNAL KEEPING

In the event don't keep a journal now or haven't kept one before, the following guidelines will help you get started.

1. Purchase a small bound notebook with approximately 100 pages and hard covers that fits easily in a backpack or large pocket--the hard covers make writing in the field a lot easier. (Or if you prefer use any notebook you are comfortable with.)
2. Inside the front cover write: name, date, local address, e-mail address, telephone number. (If you lose it, you hope it will be returned.)
3. Add page numbers, but leave the first page blank for a future table of contents. (A table of contents is optional, of course, but if the journal is important, it will help.)
4. Consider adding dividers, either color or tab, to help organize your thoughts. (How you divide and label is up to you; we've suggested a pattern that works for many naturalists, however you may have other preferences.)
5. Keep a journal with you at all times, in field and out. (The more journal writing becomes a regular habit, the more useful your journal will be.)
6. Start and date each entry on a fresh page. (This recommendation suggests that blank pages ask to be filled, encouraging you to write more per sitting which encourages more thought captured.)
7. Write in your natural voice. (Of course you can write in any voice you choose, but remember a journal is written for you to read and casual language is most easily at your disposal.)
8. Make journal writing a habit. (Try every morning with a cup of coffee or each evening before bed—but don't worry when you miss a day or two—we all do that.)
9. Experiment with writing at different times of day. (If a habitual writing time doesn't come easy, locate the nooks and crannies in your day where writing might be easy; notice how your language and thought change early-morning to mid-afternoon to late at night.)
10. When one section runs out of blank pages, retire that journal and start another one. (In time, you'll learn which sections need more paper, which less, and there'll be less waste.)