**FUNDAMENTALS OF FIELD NOTES**

Field notes are written records of field work *made at the time the work is done*. Obviously, this means while you are in the field, not when you get back to camp or your office. Notes made after a field exercise, of just-remembered details or hypotheses you forgot to record on site, may be useful but they are not field notes. Notes other than field notes should be clearly labeled as such.

Field notes must be as complete, neat and accurate as possible, for the most careful and reliable field work will be of little or no value if the record of that work is unreliable or illegible. Making truly valuable, understandable field notes may be the most difficult thing that you will have to do while working in the field. It will require all of the alertness, care, accuracy, neatness, intelligence and geological knowledge you can muster.

Field notes should be records of the best possible pertinent field data available. Thus, the value of field reconnaissance should never be underestimated. To paraphrase the distinguished Tom Freeman (University of Missouri), before taking pencil and notebook in hand and digging into note-taking, invest some time in investigating your study area. All of us have had the experience of spending valuable time measuring and recording data at a particular location only to later find a much better outcrop (more complete, easier to measure, better fossils, etc...) just around the corner. Don’t let this happen to you!

**Methods of Keeping Notes**

Methods of note taking are different for different kinds of work. Surveyors, for example, use proscribed formats for recording different kinds of data such as level lines vs. transit work. Geological field notes cover a wide range of needs and data, thus though they adhere to a basic format their content varies widely.

**General Suggestions for geological field notes**

1. Use a good quality notebook that will withstand hard usage - rain, hail, snow, being dropped overboard, etc... It can be bound or loose leaf, but should have a hard cover. ‘Waterproof’ pages may prove useful (especially if your field area is in Oregon or Alaska), but water resistant paper tends to be grainy and it can be challenging to record some data (e.g. detailed drawings) on such a medium.

2. Use a hard, sharp pencil - H, 2H or 3H. **DO NOT USE A PENCIL THAT IS SOFT ENOUGH TO BLUR.** Ink is OK, but be sure to use waterproof ink (even if your paper is not waterproof). Use colored pencils to enhance and clarify sketches and stratigraphic columns (if approp.).

3. Notes should read from left to right and from top to bottom (with the exception of stratigraphic columns, which should always begin at the bottom of the page).

4. Trust nothing to memory. Write everything down. When in doubt as to whether or not an item will be needed, put it in. Better too much than too little. It is probably impossible to record too much information in the field.

5. Constantly ask yourself what will be needed in your notes when you use them in the office. To answer this question you must know the purpose of your work. If you are in the field...
preparing a geologic map, and a final map and report must be prepared from the notes, you
must know what the map is to be used for, what units should be mapped and what features are
to be emphasized on the map. If you are studying fossil distribution, you must be able to
identify samples and record their locations in your field book and on your map. And so on.

6. **Keep facts separate from interpretations.** Facts are incontrovertible - many geologists are now
serving fries because they were unable to distinguish their facts from their interpretations.
Interpretations should be clearly labeled and be in the form of multiple working hypotheses.
Facts must be accurate.

7. If a page of notes becomes illegible, make a copy of it while the data are fresh in your mind, but
mark it “COPY” and preserve the original page (and pray).

8. Make each page of notes as complete as possible without undue crowding. Use both sides of each
page.

9. It is usually desirable to record all numerical calculations made during field work in your field
notebook. Your calculations should be neat and systematic and should not obscure other
portions of your field notes. Calculations should not be scribbled in the margins. All data
associated with the calculations should be recoverable.

10. The names of the persons in the geological party, the equipment used, the weather and any other
special conditions should be recorded in your notes. These data are sometimes of great
importance, particularly if the notes must be presented as evidence in court.

11. For extensive surveys or field projects, the notes should be preceded by a title page, and if there
are many pages, there should be an index. Space for a ‘Table of Contents’ is typically
provided in the front of a fieldbook.

12. No B.S. in your field notebook. Falling into that category would be: graffiti of any kind, records
of your daydreams, sketches of your boyfriend, the phone number of the girl you met in the
local bar, etc... Excluded from the B.S. category is anything relating to the geology of the
field area or your perception thereof, including casual sketches of outcrops, your campsite,
etc... , temperature readings, weather observations, flora and fauna, etc...

13. **Each page** of your notebook should contain the following:
   a. Your name and your field partner’s(s(‘) name(s)
   b. Date
   c. Descriptive title of the project
   d. Page number
   e. Identification of the aerial photo or map you are working on
      
      Air photo identification number: i.e., USDA, 7-18-93, #183-20
      Base map identification: i.e., USGS Chounet Ranch Quadrangle, 7.5
The Three Parts of Field Notes

Field notes can be divided into three major conceptual parts:

1. **Numerical values**: Records of all measurements (angles, distances, strikes/dips, etc... made in the field.

2. **Sketches**: Sketches of outcrops, contact relationships, locations, topographic features not clearly shown on map, structural features, fossils, etc...

3. **Explanatory notes**: All descriptions of rocks, contacts and fossils, geographic references, captions for photographs, etc... and all interpretive prose.

**Numerical values**

1. Write carefully. Words can be guessed at, numbers can’t.
2. Make numbers large. (See above)
3. Never write one number on top of another. Draw a line through, or cross the incorrect one out and write a new number next to it.
4. Do not try to change one number into another.
5. Avoid erasing numbers. Draw a line through the incorrect value and write the correct value either above, below or adjacent to it. Sometimes you have to erase, and when this is the case do so completely.
6. Measurements on sketches should clearly indicate distances or dimensions or directions. If the space on the sketch is too small for numbers, a measurement may be placed to one side, and an arrow drawn to indicate where the measurement should go.
7. When recording measurements in the field (i.e. strike and dip) it is easy to misread geographic coordinates (e.g. make SW into NW). To avoid this:
   a. Always check that the attitude or measurement is consistent with what is observed on the ground.
   b. If the note keeper is receiving oral instructions or descriptions from another geologist, the note keeper should repeat back what she/he has written loudly enough to be clearly heard.

**Sketches**

1. Put a scale on the sketch. Try to make your sketches to scale. If a sketch is not to scale, it should be labeled as such.
2. Make sketches as large, open and clear as possible. Don’t crowd notes.
3. If necessary, use a straightedge for linear features.
4. Try to measure angles/azimuths accurately, and then plot them accurately (in the case of strike/dip, fold axes, etc...)
5. Occasionally you may have to exaggerate details (gasp!) at the cost of scale. This is acceptable as long as the exaggeration/loss of true scale is clearly labeled. Alternatively, you may wish to prepare a second large scale drawing of the ‘detail area’ next to the true scale original.
6. Determine what you plan to show at what scale before you begin sketching.
7. If necessary, use several sketches to show large portions of the study area.
8. How to decide when to make a sketch: if geologic relationships cannot be easily described, or if the description in words of a feature would take more time and notebook space than would be required for a sketch, then DO IT. ‘A picture is worth a thousand words’ was never truer than in geological field work. Sketches generally capture geometry and field relationships better than either written descriptions or even high resolution photographs. Moreover, sketching forces you to get to know an outcrop in detail and confront confounding relationships up front. MOREOVER, sketches can also serve as qualitative base maps for recording locations of field measurements, rock samples, fossils, etc..

Explanatory Notes

1. Explanatory notes are taken to clarify what is not evident from numbers and sketches.
2. Print. Do not use ordinary handwriting. Be neat and clear! Your writing must be legible.
3. Notes on sketches should be places in vacant spaces where they do not interfere with other aspects of the sketch or diagram.
4. When writing field notes assume that they will be read by someone not familiar with your study or the field area. Be clear and concise. Put yourself in the place of another geologist who will use the field data.
5. Record your thoughts, ideas, hypotheses, contradictory ideas, plans, etc... in your field notes. At least once a day take the time to summarize your ideas on the geology of the area and the data that you have collected in the field. Reflect on the successes and failures of each day’s work. Writing down your thoughts will help you to clarify them.

Final Thoughts on Field Notes

Field notes serve a variety of purposes ranging from class exercise to legal document to record of complex geology in a research area. At the very least they provide a well-documented memory of a pleasant day spent with friends in the field; at most they become pieces of evidence that can be held up to public and/or professional scrutiny. Therefore, never let anything appear in your field notes that could be misunderstood or misinterpreted. In order to serve you well legally and scientifically, your notes must be as complete and clear and to the point as possible. Thorough field notes can be used to guide the course of a research plan, and the evolution of hypotheses. Field notes are not just records of observations, but a method of guiding future observations and for generating original ideas. They are an important tool for developing all of your other field skills.
The following two pages show examples of field notes taken by Dr. Gerald E. Weber. The first page is from EART 188A/B (summer field geology), the following pages from geological consulting investigations. Please note that they are well documented, legible and record essential information (both graphically and in writing).

Gerald E. Weber  
UCSC Field Camp  
Bachan Ridge  
'south side north side of 'ossil Valley  
USDA-USDA  
8.5-9  
183-184

%t-6b (cont.) The outcrop lies north of the 
Qga glacial outwash channel. There are no 
outcrops between %t-6a ml %t-6b (north of 
the drainage. All Qge and tephra.

\[ \text{Diagram of sketch - looking east} \]

Contacts - Qga/Qbt and Qib/Qga poorly continued.

%t-6b Qbt densely wooded, glacial orientation N-S 6\(^{\circ}\) W

No vertical fault scarp in Qbt. Some fault

found subdues scarp in Qga - up slope on

"Bachan Ridge"

%t-6c At crest of Tahoec mooring (Qga) Scarp in

till forms 20\(^{\circ}\) slope at max

\[ \text{USDA 7-10-83} \]

183-34

%t-7b Qbt. View the pu. man w. bounding high 
degree of v.p.c. quartz plus crystallization.

%t-7c Qbt. pu. v.p.c. may lie in a small fault

slice.
The main fault break appears to be the eastern fault.

It just passes through sandstone bedrock on the SW of Q4 + Q6 in the NE.

Bedrock unexposed in gully NE of fault zone.

Ground surface

Sheer valley

Morrison Reservoir

View from NW to SE

Rock in the fault zone, between the faults, is sandstone bedrock, predominantly sandstone.

The presence of the sheer valley, parallel to the fault, makes it impossible to determine bedrock offset.

Questions:

1. Could the Q6/Q7 be buttressed against the fault?
2. Or is the Q6/Q7 really offset?

Close inspection reveals that the Q6/Q7 has been incorporated into the fault zone, and is part of the fault gouge.

Small shear present in the Q6 and Q7.

The presence of a shear fabric in the Q6/Q7 clearly indicates movement along the fault.

View from NW to SE

Bending of "shear fabric" probably the result of creep.

Disrupted zone (gouge?)

The probable following sequence of events:

1. Deposition of Q4/Q6 deposit either against fault plane or above the fault.
2. Fault movement juxtaposes Q4/Q6 against bedrock.
3. Calcite zone in Q4/Q6 suggests period of soil formation.
4. Ground surface near (?) present location. Calcite has developed along shears in Q4/Q6.
5. Q6 channel cuts into Q4/Q6 deposit. Exposes fault plane.
6. Development of soil on Q4 cut and recent Q6 deposit above the top of the fault.