2.7   Bonus: Wisdom From a Senior Student

Here we include a few bonus words of advice from students who have 'been there, done that'. Much of this has been passed-on through the ages from previous iterations of this publication, but there are also some new nuggets of wisdom scattered throughout.

Managing Upwards

In starting your master's or PhD, you're going to develop a professional relationship with your supervisor, who will help you navigate your research and research project. The nature of the supervisor-student relationship depends heavily on the supervisor: how busy they are, how much experience they've had, how many other students they have, and many other factors. It's important to remember that as the student, it is also your responsibility to 'manage upwards'. Your thesis is the most important academic achievement you've ever taken part in, but you won't be the first or the last student that they have ever taught – your priorities won't always align. More than that, your supervisor won't always be totally on top of where you're at or when you're struggling. You should always be aware that during your degree, you should let your supervisor know when you feel you need help. Try to be on top of managing that relationship to best help your training and your professional development rather than necessarily relying on them to always take the reins.

Initiative and Breaking the 'Rules'

If you have a research idea that you really believe in, *work it through* – even if you have to do this outside your normal working hours. Your supervisor may not believe in the idea straight away, and tell you not to 'waste time' on it. Remember this is not personal: they are in charge of managing your research timeline and are trying to ensure you make the most of your candidature/degree.

   Working full-time on your project, by the end of your research degree you'll probably be more of an expert on this work than your supervisor, and you may well be the better judge of the value of your ideas. However, your supervisor is there to make sure your research timeline doesn't crash and burn, so might be more hesitant about new ideas that they are less-than familiar with.

   Your best bet to get them on-board is by testing your ideas (within reason) and coming up with a solid 'plan of action'. Through this kind of innovation, you take ownership of the project. If things do work out, you get a great sense of achievement and an original contribution to science – and if they don't, at least you'll know you tried!

Intellectual Property & Keeping Detailed Notes

One of the exciting aspects of research work is producing new ideas to solve long-standing problems. Intellectual property is the currency of science and should be valued accordingly – e.g. one measure of research performance is the number of published papers in refereed journals.

   Your ideas will probably contribute to other people's research as well as your own, and it is important to ensure you get adequate acknowledgment for your contributions.

Of course, this goes both ways and it is important to acknowledge the contributions of others in your research, too.

For research students, acknowledgement of contributions is particularly important, as your thesis will be assessed in terms of the 'original contribution you have made to your field'. If someone else has published without acknowledging you, this has an impact on the examination of your work (and on apportioning equity, should the research be commercialised).

Clear and detailed log book records are a very useful way to manage this. Record not only an experimental log, but also ideas, conversations, rough workings and so on. Important e-mails (e.g. outlining the scope of a collaboration) can also be referenced or included. Another benefit of keeping a logbook is that you'll have to produce a thesis at the end of your project. It really helps if you've written mini-reports along the way. Not only as a rough-note log book, but for each idea you work through produce a summary of your approach and findings, with the appropriate references flagged. This doesn't have to be anywhere near publishable standard but it does make things an awful lot easier when it comes to writing-up.

First-Year Floundering

Anecdotal evidence would suggest that many people flounder during their first year of research. This *should be* picked-up by your supervision committee, but often is dismissed until it becomes a bigger problem further down the track. How can this be avoided? Ill-defined goal setting is a supervisor *and* student problem. A project timeline needs to be well-established (e.g. read literature, organise apparatus, gather data, analyse, write up). When students and supervisors fail to do this, there can be a lack of direction and orientation. You should ask your advisor for a rough guide on how long you should spend on each part of a project from the get-go. Sure, this will be subject to change, but this will help you to check-in with yourself during your individual research journey.

Another hurdle could be that the experimental apparatus needed is unavailable, and therefore lead to spending a considerable amount of time building equipment. This sub-project can stretch on longer and longer . . . and the student acquires great lab skills, but does not do enough new science. One way to avoid this is with contingency plans (what if the equipment doesn't work?) and parallel processing other new science (e.g. theory work or simulations) whilst equipment being built.

Both these issues relate to a common problem: the conflicting goals of the student and of the research group. Students need to get a thesis, but research groups need to look at the bigger picture. Students need to remember to keep their goals paramount. Don't be afraid to ask "how will this help me get my degree?" or even "where will this go in my thesis?".

A separate kind of floundering relates to lack of required skills (e.g. programming, electronics, soldering, knowledge of software, even English language skills). This is something that should be assessed by the supervisor early-on, preferably in conjunction with a mentor who has more hands on experience (e.g. a later-year student or post doc who knows just what is practical).

A related problem is the transition from undergraduate to postgraduate. In undergrad, problems are well-defined and solvable, but postgrad research problems tend to

start out as ill-defined and with no "right" answers. In fact, the initial project you start may not even work – and it might take some time before this is discovered. Students are more likely to have difficulty with this than supervisors, and so at an early stage the supervisor needs to provide guidance about how long each part of the project should take and whether any difficulty is a hurdle or a dead-end.

For each of these issues, an important area of skill development is confidence. Develop the confidence to speak up, and even to disagree, with your supervisor about physics. Stand up for your own work in terms of ownership and value. Accept that it's impossible to know everything, and sometimes you will need to ask for help. You are, ultimately, the author of your thesis and the director for your research timeline – so make the most of it!

Random thoughts

- Get to know people all over the department. Don't be afraid to cross group boundaries – it's the only way to get the most out of your time here, and to enjoy yourself along the way.

- Wise postgrads will try to work reasonable hours. You'll find that some people will claim to be 'more dedicated' if they work for longer hours – this is not true! It is harmful to your mental and physical well-being, and it's unnecessary. Of course, one of the perks of the job is being able to set your own hours, but try to aim for a ~ 40 hour week.

- One of the weirdest things about the PhD is the way time works. You will often feel like the project will take the rest of your life. You'll also feel that you'll never have enough time to do it all the way it should be done. You'll frequently feel both at the same time. All you can do is set your goals and try to stick to your plans. You may not believe it, but it does all work out in the end.

- You're doing real research now, charting the unknown, and the sad fact is that it doesn't always work. This is not your fault. The real trick in research is being able to recognise when you've reached a true impasse. Even Einstein had his bad days!

- You're not in control of your data (if you are, you're cheating). Negative results might not be as flashy or publishable, but they're still good science and you shouldn't take them to be any kind of indictment on your research skill.

- The PhD is not your whole life – it's really important for your continuing sanity that you indulge in other personal and professional interests. You're allowed to take holidays and have some playtime. Lots of senior students spend a lot of time sitting around complaining about the fact that a PhD is something you can't 'leave behind at the office', but it's worth trying hard to do so!

- If you get cornered at a party or on public transport by someone you don't really want to talk to, just mention your PhD – it'll work like magic! Unless you're doing astro, in which case you'd better know your star-sign...

5

Student and Supervisor Perspectives

5.1 Thoughts of a Student

We thought that we would take this opportunity to share with you some of the thoughts that various senior students have worked out over the course of their PhDs. These are random bits of advice and encouragement which we hope will help to provide some perspective on the graduate experience, which can otherwise feel very scary and isolating. Remember that there are people around who've been where you are and are more than willing to help you along!

5.1.1 Notes From a Recent Graduate

One of our earlier Induction Days included a presentation by Mark von Bibra (a graduate of the school) outlining the sorts of tactics that helped him finish. Mark's talk was very well received, so we are including his notes as a guide to the sorts of things he said!

2020 edit: this account is useful, but slightly outdated so we'll insert a few comments to modernise it a little!
Mark von Bibra
PhD Induction Day, April 26th 2000

Introduction

- Personal journey.

- Learn as much about yourself as you will about your thesis topic.

- Most valuable lessons will be learned from your mistakes.

- You will learn many new skills (work skills/life skills) that most people don't develop.

- These are the lessons that I learned from my experience and from my colleagues.

Contents

Much of this stuff will be touched on in the staff/student discussion session this afternoon.

- Goal setting.

  - The THESIS is your goal!
  - How big? How detailed? How much time does it REALLY take?
  - Graduate reading room is full of examples.
  - Don't be intimidated by it all.
  - PhD is ONE step in your career – don't make it into a career (don't spend 6 years) *[actually, this is no longer possible with the hard 4 year cut-off]*.

- How NOT to write a thesis.

  - Do 80% of experiment A.
  - Decide to do the remaining 20% later on (when you plan to write it up).
  - Move on to experiment B.
  - Start writing thesis and realise that you don't have time to do the remaining 20% bits properly.
  - Get thesis examiners reports asking you to repeat experiments.
  - 20/80 rules.

- A better approach.

  - Before starting a piece of work, determine what result you wish to achieve.
  - Set result as goal - set a reasonable amount of time in which to achieve it.
  - Work on project UNTIL you achieve goal – OR you reach time limit.
  - Write up goals as you achieve them – maybe publish? Journal? Conference?
  - (Delaying this important step is procrastinating).

- Apply goal setting to every aspect of your work and your routine.

  - Set an achievable goal and a set time in which to do it.
  - Writing a scholarship application.
  - Preparing a lab area.
  - Writing a program.
  - Writing an email.

- Time management.

  - Procrastination.
  - You'll perfect this before you conquer it.

- HINT: Procrastination disguises itself as 'work'.
- Activity log helps you to analyse how you spend your time.
- Prioritised TO DO lists, are very simple and very effective.
- Weekly.
- Daily.
- Process orientation.
- Results orientation.

- Time management is about being efficient.

  - Big tasks/small results. INEFFICIENT.
  - Find the biggest results to be achieved with the least effort.
  - DO explore ways of improving efficiency.
  - mail filtering.
  - learning editor tricks and shortcuts.
  - learn to file!
  - *Productivity programs! See Section 2.3.3*

- Professional development.

  - Career aspirations. *What do you want to do? What do you enjoy most?*
  - Starting a career after your PhD is another goal to work towards.
  - Dedicate some time to defining your goals in this area.
  - Networking – very important work/life skill: Office mates, academics, people from other research groups (gasp!), people at conferences.
  - Collaborations (networking).
  - Most valuable part of my research.
  - Original ideas.
  - Learn other skills.
  - Technical problems already solved by others.
  - Presentation - do not shrink away from public speaking opportunities. *There are many opportunities to present talks to your peers and to undergraduates, take these up!*
  - Confidence.
  - Contacts.
  - Raises your profile ("Did you see the talk by that person from physics?").
  - *Make a Twitter account, connect with the experts in your fields, practice science communication.*
  - Go on committees.

– Attend talks, ask questions. *Many talks nowadays are hosted online, either live or recorded. These are great resources that you should check out.*

– Maintain non-academic interests.

– (My opinion) Weekends belong to YOU.

- Care and feeding of supervisors.

  – Strengths and weaknesses.

  – Find out what yours are (talk to other students compare and contrast).

  – Use their strengths.

  – Accept their weaknesses and supplement elsewhere.

    ∗ supervisory panel.

    ∗ more senior grad students.

    ∗ post-docs.

    ∗ Your external collaborators.

  – Complaining about your supervisor/project/yourself is counter-productive.

  – Realise that they do care about your success, but they won't manage it for you.

Summary

A personal journey and one of the most rewarding journeys you will make.

5.2   Thoughts of a Supervisor

This article was found in the desk draw of a long since completed PhD student. We have assumed that it was left as a gift to future generations of students. While aimed ostensibly at supervisors it makes many salient points of interest to students. We highly recommend reading it, so peruse at your leisure!

R.W. Connell - Vestes No. 2 1985 p 38

Supervising a research higher degree is the most advanced level of teaching in our education system. It is certainly one of the most complex and problematic – as shown by the very high drop out rate of students at this level. It is also one of the least discussed. It is important for the staff as well as the students involved to share ideas and experiences, and get some discussion of principles going.

This essay is an attempt to think systematically about the process and its problems, in the light of my own experience as supervisor and examiner, and colleague of others going through the process. It is focused on the pure-research PhD, though I think the principles apply (with differences of scale) to research master's and to the research component in coursework-plus-thesis graduate programs.

5.2.1 The Nature Of The Task

There is a mystique about the PhD which can be damaging. Many students think it has to be a flawless piece of research, the definitive statement on its topic. On their side, many staff don't see supervision as teaching. The research degree gets caught up in the idea of 'research' itself, and the student is supposed to absorb the necessary know-how by a sort of intellectual osmosis between great minds.

On both counts there is need for some de-mythologising. The PhD is not meant to be flawless and definitive. It is research training. It is a 'master-piece' in the old guild sense of the carefully-done job which shows that an apprentice is now qualified to practice this trade. PhD theses always have limited scope, are never definitive, and always have errors and mis-judgments. If examiners did not recognise this, no thesis would ever be passed. The point is not to produce perfect research, but to produce research that is adequate, in quality and amount, to justify the award of a doctorate.

At the same time, the PhD is likely to be the most concentrated single piece of work in a lifetime. It represents a tremendous commitment of time, energy and emotion. For many students it is also the first experience of large-scale research. In both these ways the relationship with a supervisor is different from that between two academic colleagues working on related research projects. It has to be seen as a form of teaching. Like other forms, it raises questions about curriculum, method, teacher/student interaction, and educational environment.

One of my main arguments is that this is a genuinely complex teaching task. It requires a substantial commitment of time and energy. It involves grappling with a considerable range of problems, from technicalities of research design to the morale - and sometimes health - of the student. And it never stands still, as the character of the relationship changes markedly over the years of a candidature.

This complexity is not often enough acknowledged. Some university departments, for instance, happily accept the EFTS/Wsu dividend from higher degree enrolments, but do not schedule time for supervision when calculating individual staff members' teaching loads. In effect staff are expected to do it as a sideline in their own research time. This is one of the pressures behind the scrappy and casual supervision that many higher degree candidates complain of.

Higher degree students often feel isolated, sometimes extremely isolated. This is fed by another part of the mystique, which makes the PhD out to be a completely individual effort, a lonely testing time in which you stand or fall by your own merits and nothing else. I suspect this belief does a lot to rationalise thin supervision and a high drop-out rate.

Of course it is true that just one person is the candidate. But the situation is not as individualistic as it looks; nor is the supervision relationship simply a one-to-one affair. How much time a supervisor gives partly depends on what resources the department or school allocates to supervision. Other staff may be drawn in for technical advice, to take over supervision, in negotiations with Higher Degrees Committees, in the process of examination, and so on. Other graduate students can be a very important resource. A good network among students will provide a forum for discussing the project, personal support and encouragement, information about how to handle the University, and so on. Students should be encouraged to give this support as well as get it.

More generally, the individualism of academic language greatly underplays the extent

to which the production of knowledge is a social process. Universities aren't located somewhere out in deep space. The problems intellectuals work on grow out of the society they live in (including its encounters with the natural world). The resources they have for working on those problems are socially produced. And often the solutions are implicit in, or at least related to, the actions of people outside the academy who encounter the problems in a practical form. For student to withdraw totally from the 'outside world' under the pressures of the PhD – which are real enough – is dangerous. Part of the supervisor's job is to keep these larger connections in view, and help the student keep connected to the rest of the world.

5.2.2   Moments Of The Project

PhD projects take many different shapes, and one of the problems of being a supervisor is that each one has to be worked out separately. It seems as if one is always starting from scratch. And the students usually have little idea of what is in store for them.

There is a good reason for this. A creative research project (as opposed to a research exercise following well-established methods) involves a dialectic - an argument between the general conception and particular investigations, a back-and forth between data and theory, between formulation and critique. This dialectic has to follow its own logic. If we knew its course in advance, the research would be not worth doing. A good research project opens new questions up as much as it answers questions already posed.

So there can be no formula for PhD supervision, no fixed course of events. The 'curriculum' cannot be planned in the way it is for undergraduate courses. At the same time, there are 'moments' in the dialectic that are common to most research projects. And the higher degree framework imposes some tasks that always have to be done. It is often very useful to students to be told that such-and such a development can be expected. Accordingly, this section is a commentary on the 'moments' and tasks that will generally be encountered in supervising a doctoral candidate. They are not necessarily distinct stages, though some projects will sort themselves out neatly into stages.

5.2.3   Defining the Topic

Deciding what the research is to be about can take a surprising amount of time. Often it takes the first year of candidature; sometimes re-definition goes on right through the project. It can be very disconcerting for students who, after six months' reading in all directions, feel they have got nowhere and are wasting their time and the public's money. For them it is important for the supervisor to say that the process does take time, and it is better to get is right than to settle early on a false trail. Some other students arrive in the PhD with a cut-and-dried plan from the start. (The North American custom of requiring a detailed 'thesis proposal' encourages this.) It is quite likely to be a replay of their BA Honours thesis, on a larger scale. I always advise against that; and would try to hold back such students, asking them to read more widely and think about other problems.

The supervisor's job in this process is to be a sounding-board for ideas, and a fountain of suggestions for wider reading. It is more important to encourage 'diverse thinking' than to be critical. After a time it may be necessary to push the process towards closure,

to say that a choice has to be made. Many students, however, move on automatically.

5.2.4   Design

Some theses have a very formal method: others (e.g. archival research) mainly involve following one's nose; but all require decisions about what is to be done and how to set about it. I think it is always useful to formalize this by making a written plan of campaign and some estimates of time.

Having a plan written down gives some sense of achievement – progress registered – and helps student and supervisor check progress later on. Some students at this point start to write a chapter outline, i.e. a plan of the thesis. This is a mistake, liable to close off what may later prove the most fruitful lines of enquiry. What is needed is a plan of the research. For instance, what archives will be scanned, what debates in the literature will be dissected, what interviews will be done and how they will be analyzed between student and supervisor.

Estimating the time for each step is important for two reasons. First, to get the scale of the whole project right. A lot of students bite off too much, and if they are not firmly told it is too much will later find the project impossible to complete. Second, to create some markers along the way so that the job actually does get finished. If some part of the work is taking much longer than originally estimated, then something needs to be scaled down.

In the process of design, all of the supervisor's technical knowledge comes into play. Here criticism is important. The design of the student's research should be as good as the supervisor knows how to make it, within the limits of time and resources that the higher degree framework fixes. Simple things, like lending a book on technique, or finding a comparable study in your card files, can be very helpful to students planning their first large-scale project.

5.2.5   Gathering Material

In an empirical thesis this is likely to be the high point for the student, who has at last got out to the field, into the lab, onto the computer, into the archives. Less so for the supervisor, who is not likely to be enthralled by fifty hours of interviews on the same topic, or twenty slightly different experimental manipulations, or a hundred equally boring bureaucratic files. Nevertheless the supervisor should keep in touch, even if it is a matter of listening to tales of fieldwork heard twenty times before.

Merely looking at a sample of the raw material as it comes in - hearing a few tapes, looking at transcribed or original documents - gives a much better feel for the problems that are bound to come up in the following analysis. It might be important to catch mistakes in the way data are being recorded (do cards always have source details so they can be checked later? etc). It is always good for a field researcher to be able to talk over the trials and tribulations with someone who has a close understanding of what they're trying to do. And just occasionally there will be a fieldwork disaster - a key organisation that refuses access, a key piece of equipment that breaks down, or whatever - which can be shattering for the student and needs prompt action by the supervisor to keep the project afloat.

5.2.6 Writing Up

In my experience the analysis of the material, planning the actual thesis and writing of a first draft is usually the hardest part of a PhD, for both student and supervisor. Coming straight after the emotional high (in fieldwork studies), there is likely to be a trough anyway. Giving a clear account of a complex project and its results is a difficult task simply as a matter of writing technique; and for most higher degree students this is the first time they have tried to write anything on such a scale. It always takes longer than students expect, sometimes much longer. I generally warn people that in my own research the analysis and writing-up takes about three times as long as the fieldwork.

It is easy to get bogged down in the details, and some PhD theses (my own included) suffer because the candidate tried to put everything in. On the other hand the supervisor has to make sure significant detail doesn't get left out as a result of over-formalization. It is often helpful to lend students books which are good examples of scientific writing, clear English prose, vivid accounts of fieldwork, etc, even on topics quite remote from their thesis.

There is often tremendous anxiety about writing. Many students feel themselves on trial as soon as they put pen to paper (or finger to word-processor), and think that anything they show the supervisor must be polished to a high gloss. Here the supervisor has to take the initiative, and make it clear that the roughest of rough working, the most meagre of fragments, is welcome in order to give feedback and keep the production line moving. It may be useful to start the process of writing very early in the candidature, even before data collection. I have known students whose projects worked like this from the start, and worked very well. As one remarked, in response to the first draft of this paper: I now think of thesis writing as a constant dialectic of thinking/writing/thinking/writing rather than a long period of thinking followed by a period of writing.

5.2.7 From Draft To Final Submission

The first draft completed, everyone heaves a great sigh of relief; but there is still work to be done. At this point the supervisor has to start looking at it from the examiner's angle, checking that the design is clearly explained, the data fully displayed, the implications fully stated, and so on. There may be a lot of cutting-and-polishing to be done to convert a rambling first draft into a clear statement to the outside world. There may even be some further sections to be written, though the supervisor should sternly resist the panic desire to collect more data that seizes some students after a full first draft is written. Finally there are technicalities to be checked: accurate and complete referencing, careful proofing of the typescript (texts laden with typists' misspellings and misprints are highly annoying to examiners), and meeting the formal specifications laid down in the university's PhD regulations. The candidate has to do this work, but the supervisor needs to say what has to be done and watch it with a beady eye.

5.2.8 Examiners

The supervisor is normally responsible for proposing the list of examiners. This is best done in consultation with the student and other staff of the department, so there is a general feeling that a good panel has been chosen. Some students get very twitchy about

this, hearing horror stories of hostile examiners rejecting perfectly good theses. Yet it is a mistake to pick examiners for their supposed sympathy to the students point of view: it is bad for the degree's reputation, and anyway does not guarantee the result. I would certainly never pick as an examiner someone who is known to be hostile to the student's methods or perspectives. That exception generally leaves a fair field to choose from. The criteria I generally propose are that the examiners (a) should be people known in the field, so the examination will carry weight; (b) should be people whose criticism of the thesis should be valuable to the student, worth learning from; and (c) should be people whose knowledge of the work might be useful later to the student or the department (e.g. in getting the study known in the academic world, having a referee or a contact overseas, etc).

When the reports come in there may be more to do. If the examiners are unanimous and favourable, everything is sweet; but often they are not. If the thesis is acceptable with minor revisions – 'to the satisfaction of the Head of the School' is Macquarie's phrase – my advice is not to quibble, and have them done quickly. If there is total contradiction between the examiners, the university is in a difficult position and it may be necessary to appoint a new examiner; the supervisor will have to suggest who.

If more than one examiner is talking about a major rewrite, and there is a fair measure of agreement between their criticisms, the higher degrees committee will certainly insist on a rewrite. The supervisor's shortest path to getting the thesis accepted is likely to be to agree with the requirement and get a clear specification of what the rewrite is to consist of. Since different examiners will always emphasise different points, the student may well be confused about what line to follow, as well as upset by what seems a rejection of the work. It is the supervisor's business to get what is being required clear, and on paper too. From then on the main task may be to keep the revision focused on these points, so that the student is not undertaking a whole new thesis, and the job is done in the shortest time.

5.2.9   Dissemination

I count this as part of the job though it is not formally anything to do with the degree. If the thesis is a worthwhile 'contribution to knowledge', as most PhD regulations specify, then the contribution ought to be published. The supervisor is in the best position to give advice on how to do this. In some cases the thesis can be converted into a book; and if so, some advice may be wanted on what publisher to approach, and how to set about the conversion, most theses being unpublishable as they stand. In other cases the work, or parts of it, can be converted into papers; the supervisor can help with advice on what conferences to present them at, what journals to submit them to. If the new graduate is unemployed, the supervisor might reasonably steal a bit of the university's resources and get a paper or two typed and copied. (It is, after all, to the university's advantage to have its graduates' work known.)

5.2.10   The 'Supervising' Relationship

The commonest complaint of PhD students is that they never get to talk to their supervisors. The commonest complaint of supervisors is that their PhD students never

come to talk to them. I think it is up to the supervisor to bridge the gap. It is not good enough to say "Come in and see me any time you need to". A lot of students won't. They know the supervisor is a busy person (we usually are, and show it) and the current difficulty seems relatively trivial. Or there seems to be nothing new to report. Or there is too much to report, and it's bad all errors, doubts and back-tracking. Or the student is embarrassed to show half-baked plans or rough-draft writing. Or the student is having an existential crisis and so hasn't done any work.

To all these problems there is one answer: the supervisor ought to know what's going on, and often can help. The only way to make sure it happens is to schedule regular meetings. My department allocates an hour of face-to-face teaching per full-time research student per fortnight, as part of our workloads equation. I write those hours into my teaching timetable during term, and ask student to come at a regular time. The point is to reverse the pattern where student consult the supervisor if they feel up to it; and instead hold a supervisory session unless there is a clear reason not to.

There are rhythms in a PhD, as in all research. Sometimes a student may need more time than usual – a crisis in the field, a rush to meet a deadline. There will be times when less will do – if writing-up is going well it may be better to wait till a chapter is finished. The important thing is never to let matters drift, to lose contact without reason for it.

Much of the time the content of the sessions is straightforwardly defined - it's a matter of discussing current developments in the work. Sometimes the student comes in and says there is no progress to discuss. This may be so; it may also be a pointer to problems that still need to be articulated. I would also argue that at no stage should discussions be all narrowly focused. There is a place for freewheeling, brainstorming, and conversation about intellectual things in general.

The supervisor needs to know some basic facts about the student's personal life. Not in order to start amateur therapy sessions, but to know what to do if there is a crisis, or a need to apply for a suspension of candidature, a scholarship renewal or an extension of time. The supervisor should know where to refer the student in several contingencies; medical problems (e.g. the university's student health service); emotional crisis (e.g. a university counselling service); financial trouble (e.g. a student loan scheme). Academic troubles are the supervisor's very own.

At each supervision session I make brief notes – sometimes only a few lines, sometimes a couple of paragraphs – on what topics we have discussed, what problems have come up, and what decisions have been jointly made. I note in detail such things as time estimates and chapter outlines; also illnesses or other events with a bearing on rate of progress. I keep this diary of the supervision in a separate file for each student. (It is entirely distinct from the university's official file.) Such a diary is useful in a number of ways. Most obviously it is a reminder of where things are up to and what remains to be done. If I have to hand over the supervision to another member of staff, they also have a summary of how the work has evolved. If I have to support an application for an extension of time, suspension of candidature, or whatever, the reasons and dates are usually there in the notes.

Most students have very limited knowledge of how the university's machinery works. The supervisor may be able to short-circuit problems that would take the student a lot of time and trouble: finding research money, getting access to equipment and transport,

getting a subsidy to go to a conference, finding space to work in and furniture to put in it, and so forth.

It is also the supervisor's business to keep an eye on formal 'progress': how the work is going in relation to minimum and maximum times of completion; whether the student should be registered full-time or part-time; whether there should be a suspension of candidature for a period; whether an extension of time will be needed, and if so for how long. It is worth getting to know the formal regulations governing higher degree work; and also getting to know those people in the university administration who handle higher degree matters.

In higher degrees, as in other forms of teaching, the personal relationship between teacher and student is important. There is inevitably an emotional dimension to this. Over the years of a PhD the two people become involved with each other, for better or worse. The supervisor can make a powerful contribution to the success of the project if this emotional relationship can be made constructive and supportive. Students will, of course, draw support from other people – spouses and lovers, parents and children, etc; but there are some things the supervisor is best placed to do.

There will be times when the student feels intellectually lost, e.g. when having trouble crystallizing the topic. The supervisor is best able to help find a focus. There will be times when the student feels the whole thing is a waste of time, the design is bad, the problem frivolous or hopelessly ambitious. The supervisor is best placed to show what the value of the research really is. There will be times when the student feels the task has become endless, especially when writing up; that to do it properly will take the rest of a lifetime, that the flaws are huge, and years more are needed to repair them. The supervisor can put the PhD in perspective, show how to put limits on the job: leaf back to the time estimates, and chart a clear way to the end.

Often the best support is simply to lend an ear. And often the best advice is to say No, the student isn't going mad; most people have this kind of problem during a PhD, and some have survived it.

5.2.11   Criticism and Intellectual Growth

At the core of the project is an intellectual relationship between student and supervisor. If this relationship works well, the result is not just that the student learns particular ideas or techniques from the supervisor. (Indeed that need not happen at all – I can think of several theses where I contributed little technically.) There can be a shared intellectual development in which both parties gain some new perspectives and the result of their joint labour is some public gain in knowledge.

To say 'shared' is not to imply that the two parties make the same kind of contribution. The framework of a higher degree generally prevents that. Nor is it to imply that the intellectual collaboration is easy. It has its problems, many of which come to a head in the issue of criticism.

The supervisor has to be at different times both a supporter and a critic of the student's work, and sometimes the two together. A balance is not easy to strike; and at times like the writing of the first draft it can be acutely difficult. Sharp criticism can be very discouraging at a stage when many students feel more or less suicidal anyway. Yet to hold back any valid criticism is to do less than justice to the student, and may

damage the chances of the thesis getting through.

What is most to be avoided is destructive criticism, such as an attack on the student's framework of thought, and an attempt to substitute the supervisor's point of view. Helping the student critically develop the framework will mean a better relationship in the short term, and in the long term its weaknesses should show up of their own accord.

Criticism is also more likely to be well received (and constructively used) if it is clearly made in the context of respect and interest. For instance it is only fair to read drafts reasonably promptly. Few things are more discouraging for a student than waiting for weeks or months wondering when a supervisor will get around to their latest piece of writing. In commenting on drafts and plans, it is also worth saying explicitly what is good about them as well as what is wrong. Giving the student a sense of the achievement accumulating in the drafts is well worth the extra expense of ink.

5.2.12   References and Sponsorship

A supervisor almost automatically becomes the candidate's referee for jobs, fellowships, and so forth, during the candidature and for some time after. If the supervisor is not named as a referee, selection committees will wonder why. The basis of a confidential reference will, of course, be one's opinion of the research and the writing (backed, if possible, by the sense of the examiners' reports). But as the post applied for will rarely be in exactly the field of the thesis, it also matters to be able to say something about other topics - another reason for not confining supervision sessions to technical matters. The academic world would be hideous if every academic sponsored in-house students like feudal retainers, to the exclusion of all others. A student should still be able to expect a supervisor to offer support, within reason, for several years.

5.2.13   Final Thoughts

All this sounds like a lot of trouble, and sometimes it is. As I said earlier, PhDs are very different, and so are supervisors. Some go smoothly and easily, some are difficult, some break down altogether.

There are limits to what a supervisor can do, and therefore limits to the responsibility one should feel for the outcome. Ultimately it is the student's responsibility, and at a certain point the supervisor has to let go - hard as that may be. The student has to do the work, and take a reasonable initiative in planning the project and seeing it through. The supervisor can never substitute for the student (though careful supervision may save the student a lot of time and energy).

Supervisors also have rights, and competing obligations: other students, their own research, undergraduate courses, administration, and even a few shreds of life outside the department. These determine how quickly one can read drafts, and how much time one can give to devising bibliographies or reading new literature to keep up with the student. Supervisors have to draw lines to protect them selves as well as to give the student space to work independently.

Within those limits, the job can be very demanding and very rewarding. I have had some disasters, but I have also learnt an immense amount from the graduate students I

have worked with. And there are few moments in teaching like the time maybe four or six years after the project began, when a doctorate is finally through.