THE STYLE AND PRESENTATION OF WRITTEN WORK
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WRITTEN WORK

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First printing: November 1988
Reprinted with amendments: September 1989, November 1990, October 1992
WORD FOR WINDOWS™ edition: October 1994
Revised edition October 1998

FOREWORD

When I first came to the University College of North Wales as an exile in the late 1890s, my fellow-students would no more have contemplated submitting a defective essay than they would have thought of attending a lecture without a gown. To write perfect English was a matter of the most fundamental academic competence, as well as a basic courtesy to our tutors.

Alas! Things are no longer as they were: leather jackets are not unknown in lecture theatres; the young have no respect for their elders; incorrect spelling abounds in the essay – and even in the prose of the impudent youngsters posing as reporters for *The Times*. Yet constantly we hear that the future is in the hands of the young; and, no matter how odious that contemplation may be, it is a possibility we must all face.

There are, however, signs of hope. We hear of a return to basic values, and in this admirable pamphlet Dr Colin Price makes his own contribution towards this healthful trend. I commend his little work to you, in the hope that you will study it earnestly, and endeavour to become as exemplary in the style and presentation of written work as was my own generation.

Professor Sir Ircon Pilec, DSc, FRS
Cobblers Court, Bangor
20th August 1988

ABSTRACT

Well-presented written work is crucial in communicating information and ideas effectively. Conciseness, a style consistent with purpose, and a logical, clear-cut structure are fundamental. Meaning is clarified by precision in details of grammar, word usage and punctuation, while neat arrangement of text, tables and figures creates a favourable impression. The appropriate presentation of a document depends on its objectives and readership, different styles being needed for general essays, specific reports and public information material. Stringent conventions cover the content and positioning of material such as abstracts and lists of references. For large documents in particular, forethought is needed in timetabling production and structuring material. All work should be checked before submission.

The abstract would normally be on a separate right-hand page. It is placed here to save paper.

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PREFACE

In the past individual members of staff have given hand-outs on their requirements for and expectations of written work, and students have sometimes been confused by apparently contradictory instructions. This document has drawn together and extended material from these individual hand-outs. It represents, in a very broad sense, a consensus on how work should be presented, although specific instructions, issued in connection with particular pieces of work, may override the general advice offered here.

There are many books about how to write correct and appropriate English: some reference texts are listed at the end of this document. The emphasis here is on the main features required of scientific writing, and on points where students – and particularly students from the School of Agricultural and Forest Sciences – have erred persistently in the past.

The intention is not to impose a straitjacket, confining your writing to a strictly uniform style, but to offer guidelines on how to produce effective writing which is appropriate for its purpose. These guidelines are drawn not only from a theoretical understanding of grammar, but also from the collective experience of the staff, both in their own writings, and in reading what students have written. Most of us have had our knuckles rapped by our own teachers and by editors of journals, and we try to learn from our mistakes.

Please read through the whole document when you have the opportunity, to get the feel of its scope. Note that the document is ***reflexive***, that is, turned back on itself: it aims to illustrate the rules as it describes them. Often, **bold, underlined text** is used to draw attention to the usage that is being described.

In addition, look through the document before producing any written work – specific information is given about different ***types*** of written submission. Not all the material is relevant to each piece of work; use the contents page to find what is specific to that type of work. Also refer to it for information on particular topics – the layout is logical, intended to make it easy to find what you want, and there is a helpful index.

The introduction considers the reasons for producing well-written and well-presented work, and distinguishes the types of written submission you may expect to encounter. Section 2 gives advice on expected size, style and structure of written pieces. Section 3 deals with the detail of grammar, word meaning, punctuation, spelling and use of numbers; it also makes suggestions about use of tables and graphic material in texts. Section 4 outlines requirements for particular types of submission – popular writing, essays, literature reviews, reports of experiments, dissertations, consultancy reports and plans, academic papers, and memoranda. Material which lies outside the main body of the text, such as contents lists and references, is discussed in Section 5. Section 6 describes production of documents, especially large ones.

When you get your work back, ***read the comments***. Where errors are identified in the text, make sure you know what was wrong, and how to correct it. Appendix IV shows some suggested identifying symbols for errors of a particular kind.

Although this compilation is a general SAFS document, I would like to add a view of my own. As I revise this document in 1998, I wonder if English usage is in serious danger from anarchy. Misusage is so pervasive that one can no longer derive any ***implicit*** rules for correct usage from the printed word, while ***explicit*** rules seem an endangered species in formal English education. Careless misusage is regrettable: wilful and unrepentant misusage is infuriating. A smug representative of the Association of University Teachers told me that it was ‘house style’ to use no initial capital for the months of the year in the *AUT Bulletin* – as though announcing officially that you were going to break the rules somehow made it all right. Of course, he doesn’t himself have the problem of finding and correcting tens of thousands of missing capitals each year, and explaining to students that some arrogant editorial operatives believe that they can make their own rules.

At the same time the task of correcting misuses is becoming overwhelmingly daunting. As this fact becomes plainer, yet as norms of correct usage become blurred, I suspect fewer teachers are troubling to correct anything that is technically wrong yet still comprehensible. The burden of correction thus falls on fewer and fewer people, who have a larger and larger job to do, in a system where they are increasingly regarded as eccentric bores by their students, and irritating pedants by their colleagues. The situation has the characteristics of a vicious downward spiral.

If misusage is no longer corrected on the basis that it breaks the rules, it may be that slippage will take place to the margin of comprehensibility. It will then be absolutely imperative to correct misusage, and to retrieve – at great cost – the heritage of useful rules that survive, tenuously, in common usage. I believe that it is ultimately easier to contain misusage now, with the expectation that writing ought to follow the rules and conventions, rather than to apply the criterion that misusage is acceptable if it remains comprehensible, and to wait for further deterioration.

Acknowledgements

Thanks are due to the following staff members who submitted material incorporated in this document: Ioan Ap Dewi, Martin Breese, Christine Cahalan, Pat Denne, Mike Hale, John Hall, Geoffrey Hunter, Graham Mayhead, Jeremy Williams, John Winterbourne and particularly John Hetherington. I accept full responsibility for any distortions and misspellings introduced to their material. I am also grateful to Roger Cooper, Pat Denne, Don Harding, John Healey, John Hetherington, Graham Mayhead and Fergus Sinclair for reading and commenting on earlier drafts, and to users of previous printings for finding errors and suggesting improvements.

1 INTRODUCTION

Communication is an important part of professional and academic expertise. Understanding ideas, accumulating fresh information, devising plans and making scientific discoveries are all of limited use unless the results can be passed on for others to assimilate, develop or implement. Hence the School emphasises education and training in communication: formal courses are given on some aspects of information transfer; comment may be expected on the effectiveness of submitted written work; students showing particular difficulties may be recommended to take extra courses.

It should be stressed at the outset that we recognise the special needs of some groups of students. For many students in the School, English is a second or third language. Others have inherent difficulty with spelling or handwriting. We wish to do all we can to help such groups, and their performance will be considered in the light of their particular difficulties.

We recognise also that many people, without specific problems and with conscientiously good intentions, nonetheless find it difficult to make their written English conform to all the rules and conventions. We want to help them too in their written presentations. Despite the stern tone of this document, its purpose is entirely constructive.

1.1 *Why conform to conventions of communication?*

It is sometimes suggested that language is dynamic, evolving to fit new circumstances or to express new subtleties of meaning: it is therefore not only unnecessary but also counter-productive to follow set rules. In recent years schools have tended to emphasise creative writing: this is desirable in itself, but it has led to relative neglect of technical matters such as spelling, punctuation and syntax. The consequent uncertainty about technicalities is reinforced by bad English in books, newspapers, television and radio, and even, regrettably, academic journals.

We welcome interesting writing and individual stylistic flair. However, such writing is perfectly possible without breaking the rules, and there are good reasons to write in a technically correct manner.

1 It is important in scientific subjects to encourage accurate and precise habits of thought. If looseness in structuring sentences and placing full stops passes without comment, it may foster a subconscious belief that such looseness is generally acceptable, for example, in designing scientific experiments or placing decimal points.

2 Despite moves to commercialise universities, they are still widely considered to be the repositories of standards and upholders of truth. Truth is expressed in words, and the means of storing and communicating truth are eroded by a norm that ‘it doesn’t really matter whether you use the right word, so long as everyone knows what it means’.

3 In fact, if you use the wrong word, spell it wrongly, or punctuate sentences incorrectly, readers may ***not*** know what you mean. The process of losing precision of meaning is a slow and insidious one, but the end of it is the failure of communication. Bad English may result in ambiguity – the words might mean two quite different things – or in obscurity – it is difficult to extract the true meaning from the words – or incomprehensibility – it is impossible to know what the words do mean. This is the most important reason for cultivating good English: without it, you lose the power to communicate; you waste your own time and that of readers. However arbitrary the rules and conventions may be, if they are abandoned language becomes anarchic and communication is ultimately threatened with disintegration.

   Language certainly does evolve to encompass new meanings, but remember that evolution is a harsh process in which most mutant forms are ruthlessly exterminated. To press the analogy further, constructive contribution to the evolution of language requires that the new usage is well-adapted: there should be good reason – such as a Greek or Latin

derivation – for using a word in a particular way. New usage should increase the colonising power of language by ensuring that it is specifically adapted for that use: using an existing word to mean something extra reduces its ability to bear precise meaning. When the meaning of an existing word is taken over by another word, the diversity of language is impoverished. This arena of new usage is one which only the brave, the experienced or the foolhardy enter.

4 By writing badly, you antagonise readers. During your courses here, the readers will normally be members of staff, marking your performance. Presentation, as well as content, is a characteristic of any document, so it is inevitable that you will lose marks by carelessness in use of English. Furthermore, if the marker is concentrating on trying to understand your meaning and on correcting your English, it will be difficult to give full attention to what you are actually saying, to question your logic or to point out errors of fact: valuable feedback is thus lost. You lose two ways by submitting badly-written work.

5 Employers, clients and other people whom you wish to impress will not be favourably influenced by bad writing: you may think they are fuddy-duddy old reactionaries, but you won't get the jobs. When you ***do*** get a job, you will continue to be more effective in communication if you have practised the necessary arts while in university. This is not just speculation: surveys have shown (e.g. Lamb (undated)) that there is widespread disquiet among employers about the linguistic competence of applicants, and that poor English on application forms decisively affects job prospects.

The arguments for taking care with writing thus cover a spectrum from immediate self-interest to the most abstract idealism.

But let it be repeated: we want to improve your writing, not to criticise it. If you have genuine problems with writing, for example dyslexia, please do let your tutor or supervisor know immediately – the university has a widely respected dyslexia unit. It is also possible to arrange extra tuition for those whose first language is not English.

1.2 *Types of written submission*

It is important first to identify ***what kind of document*** you are being asked to produce: what is its purpose, and what kind of readership is it intended for? Of course most of the written work produced in the college is actually for a staff member to read, and its purpose is associated with education, training and assessment. In some cases, however, you may be asked to imagine that you are producing a document as a part of a future job.

The types of document you may encounter during your course are:

1.2.1 *Articles and leaflets*

Articles for a non-technical audience, and leaflets for public information, require a different style from academic work. Some courses may receive special instruction on this subject.

1.2.2 *Essays*

These tend to be arguments or collections of information of a rather general nature. They will often be concerned with principles rather than specific examples, though examples should be used to illustrate a point.

1.2.3 *Reviews*

These are specialised essays which attempt to collate information on a topic from sources in the literature. Their chief function is to summarise the information and list the sources, though some comment by the author (particularly on consensus or inconsistencies in the literature) may be in order.

1.2.4 *Write-ups*

These are reports on laboratory experiments or field-work. The format is usually determined by the nature of the work undertaken. The emphasis is on describing specific methods used, and reporting and analysing results obtained.

1.2.5 *Dissertations*

Most taught courses now require a project dissertation to be written near the end of the course. For many of you, it will be the longest piece of written work you will ever attempt. It will normally contain elements of a theoretical review, and may additionally include an extended write-up of an experiment or survey. You will receive detailed guidance on what is required when the time comes.

1.2.6 *Consultancy/farm reports and plans*

During courses, these are normally responses to an imaginary consultancy brief. Like write-ups but unlike essays they concentrate on specific cases rather than general principles. The objective is to produce a policy or plan that could actually be implemented by a farm/forest/land manager.

1.2.7 *Academic papers*

Even if you don't go on to do further research, the results in your dissertation may be of sufficient interest to be written up for an academic or professional journal. Essentially academic papers are condensed dissertations. The techniques of writing them are specialised, and you may expect to write your first either jointly with, or with advice from a member of staff.

Detailed requirements for these types of work are given in section 4.

2 BROAD FEATURES OF ACADEMIC WRITING

2.1 *Size*

Unless you are turning out blockbuster novels paid by the page, there is no merit in writing at greater length than your material warrants. What you write in your working life will be read by busy managers and administrators, or by scientists who have many other papers to read. Their time is precious and should not be wasted; they will not think well of you for adding needlessly to their work; they will give less careful attention to verbose material. Conciseness is a very practical virtue.

This is reflected in the word limit set on many pieces of work. The limit gives you guidance on the amount of work expected, and allows markers to spend a reasonable amount of time on each submission. But it also encourages you to practise conciseness. Marks will be deducted for exceeding limits, or markers may simply ignore anything that exceeds the limit.

It is desirable to cultivate the habit of writing concisely 'at the first shot', but it is ***always*** possible to rewrite at lesser length what you have already written.

Conciseness can be achieved at every level: if the whole piece is structured logically it is less necessary to make cross-references or repeat information. Within sentences some words may be redundant, or length may be reduced by restructuring the sentence. Common causes of wordiness are:

2.1.1 *Circumlocution*

Examples of phrases which often add nothing to meaning are: 'in the case of'; 'from the point of view of'; 'in regard to'; 'in this direction'; 'with reference to'; 'due to the fact that'; 'in this respect'; 'in so far as ... is concerned'. Circumlocution wastes words:

> **In so far as** concise expression **is concerned it** is entirely the responsibility of the student.

The underlined words can be omitted without changing the meaning. Circumlocution also reduces precision when writers cannot trouble to think of the correct word. Prepositions, which define the relationship between two entities, are particularly prone to such abuse. For example:

> Timber production was better in 1988 **in regard to** the private sector.

This might mean

> Timber production ***by*** the private sector was better in 1988.

implying that the private sector itself produced more. Or it might mean

> Timber production was better ***for*** the private sector in 1988.

This might imply that world or Forestry Commission production was lower, leading to shortages and higher prices for the private sector.

Circumlocution usually arises from reluctance to spend time thinking about which words are necessary and appropriate. So beware when any of the phrases listed above slips from your pen: they are, in the vulgar expression, 'dead give-aways'.

2.1.2 *Long-winded forms*

There are some occasions **which** demand use of the construction 'there are... which...'. This example was not one of them – the underlined words can be omitted.

At least two more words **are** used **by** the passive voice than **by** the active voice. Or, to put it another way, the passive voice uses at least two more words (the underlined ones) than the active voice. (See, however, the use of the passive voice in section 3.3.)

2.1.3 *Repetition*

The previous paragraph says the same thing twice, with different word order. 'Or, to put it another way...' is another dead give-away. Don't repeat, unless what you are saying is so complex that a different form of words is needed to address different sections of your readership. (You may notice lecturers do repeat things in lectures: this may be because they are trying to give time for something to sink in; or they may just be getting past it....)

2.1.4 *Redundancy*

Some words, notoriously prepositions, are inserted in places where they have no function at all: 'to meet **up with**' is the classic example, but 'to head **up**' (meaning 'to head') is now equally common. Need and necessity are the same thing, but '...need not necessarily...' is becoming almost *de rigeur*. From time to time ask yourself whether any words in your favourite phrases can be omitted without loss of meaning.

2.1.5 *Tautology*

This involves statement of what is necessarily true. 'It is best that nitrogen should be applied at the optimal level' exemplifies this ('optimal' means best anyway, and the statement begs the question of how the optimal level is defined).

2.1.6 *Excess of examples*

The purpose of an example is to explain something general or abstract in specific or concrete terms, not to give an exhaustive list of everything contained in a class. You need only give one example of each class:

> Many conifers planted in Britain, for example Sitka spruce, come from the Pacific Coast region of North America.

2.1.7 *Excess of adjectives and adverbs*

> The climate of the North Wales mountains is very cold, very wet, very windy and very inhospitable.

What does each word here add to meaning? 'Cold', 'wet' and 'windy' refer to different aspects of climate, but 'inhospitable' is implied by the other words. 'Very cold, wet and windy' is quite adequate for scientific purposes: 'inhospitable' would do well in literary cases.

2.1.8 *In general...*

Although reduction of ***overall length*** is the first aim of conciseness, benefit is gained from conciseness within sections, paragraphs and sentences. Long sentences are not readily held in the mind all at once, and so are hard to understand: 20 words has been suggested as a normal upper limit; 40-worders usually provide tough opposition to comprehension, unless they are carefully structured, or – like this one – broken up by strong punctuation marks. Long paragraphs and sections are psychologically daunting to readers, who subconsciously are often looking for 'milestones' to give them a sense of progress.

2.2 *Style*

Style is hard to define helpfully (‘manner of writing’ according to Geddie (1959)), and even harder to teach. Some people have it: others don’t. Style is a matter of appropriateness, rather than correctness, so one cannot say ‘that is wrong style’. Nor can we tell you the secret of an excellent style. However, certain hints can be given, about style generally, and about ‘academic style’ in particular, and we can indicate what basics you need to master and what errors you must learn to avoid, before there is a prospect of your developing a good academic style.

Academic style tends to be impersonal (see section 3.3). Avoid expressions of opinion if possible. In particular, avoid dogmatic statements: controversial assertions should be supported by evidence from your own studies (before the statement), from a reputable published source (cited after the statement), or from a detailed argument (following the statement). This applies ***more***, not ***less***, when you write in a field where you are not an expert. (I make this comment with some bitterness, as an academic whose specialist field of economic and environmental evaluation is frequently invaded by experts from other spheres, with such groundless views as: ‘it is impossible to put a value on a beautiful landscape.’) If you do express an unsupported opinion, be honest about it, and do not allow any academic qualifications or titles you may possess to be used as a substitute for argument.

A racy, journalistic style is frowned on:

> Wonder fertiliser treatment produced monster fir-tree crop, says petite brunette researcher Jacqui Smith.

=

> Application of 500 kg/ha of NPK gave a 253% growth increase in checked Scots pine (*Pinus sylvestris* L.) (Smith, J., 1988).

So are colloquial words and expressions.

> Christmas trees are a nice little earner.

=

> Internal rates of return up to 40% may be obtained on Christmas trees.

Avoid vague, judgemental words like ‘reasonably’, ‘extremely’ and ‘acceptable’. If experimental results indicate a conclusion only weakly, however, or if only the majority of writers in the literature favour a viewpoint, it is safer to use hedging terms like ‘it may be the case...’ or ‘it could be tentatively concluded...’, rather than committing yourself. On the other hand, the phrase ‘may perhaps be suggestive of a possible relationship’ may perhaps be suggestive of possibly overdoing the hedging. In due course your degree of confidence in results can be expressed quantitatively on the basis of statistical analysis.

Humour in academic writing must be handled with great care, and with a good understanding of your audience. Jokes, the grand farce style and innuendo of the ‘*Carry On Communicating*’ type are not appropriate. Academic humour relies on delicate understatement, quirky juxtaposition of ideas and a play on words which may require knowledge of their Classical origins. If you do not feel comfortable with these subtleties it is safer to stick to straight writing. In reports for management superiors and clients be even more cautious in the use of humour. Promotion and further work may be lost by untimely wit.

Despite the injunctions above to ‘playing it straight’, you should try to interest the reader in what you have to say: this encourages attention and a favourable response. Interest is maintained by a good ***structure***, which leads the reader on towards an identifiable destination. It is aided by ***comprehensibility***, which maintains the momentum of reading, and ***conciseness***, which brings the reader to the conclusion with minimum delay. These qualities are discussed elsewhere.

Interest is also generated by variety. Varying the length of sentences is a useful device. A series of short, staccato sentences can become irritating. A series of very long, rambling sentences, in which large numbers of cautious hedging devices are inserted, and in which the

subsidiary clauses pile up one on top of another, not only becomes rather difficult to follow – low marks for comprehensibility – but also, in general, may perhaps have a possible tendency to send the reader, who may have had to put up with this sort of thing for many paragraphs, to sleep. A short sentence after a long one has immediate impact.

Academic writing tends to be – and often needs to be – exact and literal, but this can make it **as dull as ditchwater**. For readers who are **bored rigid** by it, some judicious figurative language in the form of metaphors ('bored rigid') and similes ('as dull as ditchwater') is **like rain in the desert** (another simile). But beware of:

- **flogging a common metaphor to death** (like that one);
- **broadcasting similes like corn-seed** through the text;
- **flitting** from one metaphor to another **like a half-baked butterfly** (this is the heinous crime of mixing metaphors).

Academics in **nit-picking** mode will drop **like a ton of bricks** on excessively **flowery** language: they are particularly keen on identifying mixed metaphors.

Attempt to use a variety of synonyms where they exist, and where scientific accuracy does not require one word and one only. 'Maybe', 'possibly' and 'perhaps' are everyday examples. 'Nevertheless', 'nonetheless', 'on the other hand' and 'by contrast' are substitutes for the overworked 'however'; 'thus', 'hence' and 'consequently' for 'therefore'. Use a thesaurus to suggest alternative words when one crops up over-frequently: this facility is now available on many word processors.

On the other hand, consistency of usage is important in conveying an impression of well-ordered work. Where more than one convention of spelling, punctuation or referencing may be used, choose one and stick to it.

Tense of verbs should be consistent and ***appropriate***. Thus details of experimental procedure should be treated in a tense according to whether it is a description of a generally-applied technique, or something which you ***have done***.

> In nursery experiments trees **are planted** in weed-free soil.

but

> In this experiment trees **were planted** into a weedy soil.

A comprehensible style is a function of conciseness (section 2.1), careful structure (section 2.3 and section 4), meticulous logic (section 2.4), and accuracy in use of language (sections 3.4 and 3.5). It is also aided by good sentence structure or syntax (section 3.1). In a broad sense, then, a large part of this document is about style.

2.3 *Structure*

Written communication is like a bridge between writer and reader: like a bridge, its performance and efficiency depend on its materials and structure. A good structure enables a powerful message to be conveyed with minimum use of words. In section 4 appropriate structures for popular pieces, essays, literature reviews, experimental write-ups, dissertations, professional reports, academic papers and memos are suggested. This sub-section presents general principles of structure.

The overall structure of a piece of written work has blocks or sections of more-or-less homogeneous material, arranged in order. Except for reference manuals or encyclopaedias, it also has a dynamic aspect: its subject matter will tend to ***develop*** in a certain direction. Often the first section describes the problem, the second section collates the facts, the third discusses deductions from and implications of the facts, and the last draws conclusions about relationships (in scientific writing) or about desirable courses of action (in management plans).

Between and within sections, it is good practice to work from the general to the specific; from the large-scale to the small; from the early to the recent. (Compare sections 2 and 3 in

this document.) It is helpful to adopt the real sequence of causality, e.g. to move from physical factors (geology to climate to soil) through biological factors (flora and fauna) to human factors (historical, demographic, socio-economic and political). If you do decide to work in the opposite direction, don't get faint-hearted and vacillate between specific and general.

In a well-written piece, the sections and sub-sections are evident by the cohesiveness of the material composing them. Nevertheless, it is often worthwhile to use sub-headings to divide the material. They help you to check that your organisation of material is clear-cut, give readers an impression of how the material is arranged, and break up text into more manageable chunks. Even if you don't put the sub-headings in, it is a good idea to have them in your mind.

Sections and sub-sections may be arranged in hierarchies by the style or numbering of their headings: size of type, capitals, bold type, italics, underlining and position on page may all be used. Different styles of numbering (I, II, III, IV...; 1, 2, 3, 4...; (i), (ii), (iii), (iv)) or lettering can also indicate level of importance. This document uses the heading styles recommended for British Ecological Society journals, together with a decimal system of numbered headings.

Numbers and letters may also be used for elements in a list. The following are good rules for clear listing.

1 Start each new element on a new line, with the number or letter against the left-hand margin, and the text indented on succeeding lines – this makes the list much easier to read.

2 Use a consistent hierarchy, such as:

   (a) unbracketed Arabic numerals for major elements;

   (b) small, bracketed letters for minor elements;

   (c) small, bracketed Roman numerals for very minor elements, but remembering that

      (i) you may have to set more tabs if you are using a word processor,
      (ii) if you have (iii) elements, the indentation must be at least six characters, and
      (iii) with complex hierarchies you need to keep a careful eye on punctuation at the end of elements.

3 Indent lower order elements more deeply.

4 Improve legibility by adding an extra line space or half line space between major elements in the list, especially in single-spaced documents.

It doesn't matter much what system you use in hierarchies, provided you stick to one system. More than three orders of importance in the hierarchy looks fussy and becomes confusing.

'Bullets' (filled circles or squares) are commonly used nowadays, and word processing packages usually have a facility to create a 'bulleted list' automatically. Good criteria for using bullets, rather than numbers or letters, in a list are:

- you want to make a strong visual impact, as with points on which action is required, or which ought to be remembered;
- the points come in no particular logical sequence and in no hierarchy;
- you do not need to refer back to individual points by a number or letter label.

2.3.8 Paragraphs should also be used as a structural element, to keep together all closely related points. Check that paragraphs do not contain a wide miscellany of information: this defeats the whole point of paragraphing, while a small number of large paragraphs makes difficult reading.

2.3.9.1 Where a report requires much cross-referencing, it is convenient to number paragraphs. Paragraphs give a more specific location than pages, they are more likely to contain the referenced material and that alone; and, very importantly, their numbering does not change as a result of reformating the text (e.g. from single to double spacing). The numbering may simply be a sequence of integers through the whole text: if so, do not assign integer numbers to the headings or sub-headings in the sequence. Alternatively, a decimal system may be adopted, in the format used for the

previous paragraph, this one and the next. The latter system should be integrated with the numbering system (if any) used for sub-headings. Thus the fourth section of the second chapter begins with paragraph 2.4.1, or with paragraph 2.4.0.1 if the sub-heading 2.4.1 is used later in the text. The decimal system has the advantage that if you insert or delete a paragraph, this only affects numbering within that sub-section.

2.3.9.2 Decimal numbering offers yet another means of structuring, since a series of related paragraphs can be 2.3.9.1, 2.3.9.2 and 2.3.9.3.

2.3.9.3 This sort of hierarchy, like that of sub-headings, can get out of hand (2.3.9.3.1.4...).

2.3.10 Paragraph numbering is unattractive and distracting in popular and 'literary' writing, including essays.

An extra line space or half line space between paragraphs makes the text look more attractive, especially if it is otherwise single-spaced.

It remains normal to indent the first line of a paragraph by a few spaces (use a <tab> on a word processor, ***not spaces*** which will lead to irregular alignments in fully justified text). This is unnecessary for the first paragraph following a sub-heading or for numbered paragraphs. Look in books (popular and academic), journals, magazines and newspapers to confirm that professionals still follow this convention. There is, however, a growing tendency not to indent, extra line spaces being used instead to separate paragraphs. This new convention fails to identify paragraphs

(a) which begin on a new page, or

(b) follow a list, table, plate or figure.

The tendency not to indent is observed almost as a convention in official letters. However, if people tell you that you must ***not*** indent in letters, ask them where the rule came from. The answer, if any, will probably be that it was from a bureaucrat, rather than from an expert in the English language.

Ignore people who tell you that a paragraph must contain more than one sentence.

Certain types of document have specifically-labelled pieces of material such as a summary or appendices wrapped round the main text. These pieces of ancillary material are discussed in section 5.

2.4 *Logic*

Logic, though not strictly part of style or presentation, is central to good academic and professional writing.

Statements are always facts, premises or deductions. A fact is something scientifically incontrovertible (so far), as that mean annual rainfall in Bangor is higher than that in London (you may need to quote evidence or a written source in scientific writing). A premise is an assertion that your readers can be expected to agree with ('an increase in profit is desirable, all else being equal'). A valid deduction follows inescapably and without exception from premises and facts. 'Therefore it is desirable to plant trees near Bangor rather than near London' has the form of a deduction, and may well be true, but it is not a ***valid*** deduction. Further facts ('tree growth and crop profitability increase with rainfall') and premises ('profit is the main reason for growing trees') are needed before the deduction can be supported.

' in front of a dubious deduction does not validate it: on the contrary, it will draw attention from critical readers. The same applies to 'hence...' and 'so...'.

'Surely...?' inserted at the beginning of a sentence is a rhetorical device usually intended to sway people emotionally. Be very wary of using the word in an academic argument.

Check whether conjunctions (connecting words) and adverbs are used logically as well as grammatically. Words such as '...and...', '...moreover...' **and** '... similarly,...' connect ideas which support each other: **but** words and phrases such as '...but...', '... however...',

‘...although...’, ‘...nonetheless...’, ‘...nevertheless...’, ‘...yet...’ and ‘... on the other hand...’ connect ideas which are in opposition.

Common logical errors are listed below. Some of them have Latin names, reflecting their recognition in Classical times.

1 *Non sequitur* (= it does not follow)

In a sense this covers all logical errors. Although the statement (usually) concerns the same subject matter as preceding statements, there is in fact no necessary connection. The deduction about tree-planting near Bangor given above is a *non sequitur*, as is ‘People are starving in the world; therefore we should subsidise British agriculture’ – a logical fallacy often thought, and not seldom spoken.

2 *Ignoratio elenchi* (= ignoring the point)

This entails proving what is not disputed, or disproving what no-one is asserting. It represents an attempt to draw attention away from the real subject of debate, by holding up an (irrelevant) conclusion as though it is an affirmation or refutation of what the argument is really about. Thus, in a discussion about turning off lights in lecture theatres to reduce carbon dioxide emissions, someone might (and someone did) argue that UWB wastes more money on phone calls than on lighting.

3 *Ad hominem* (or *ad feminam*) (= to the man (or to the woman))

This involves an attempt to discredit the person making an argument, rather than the argument he or she is making. For example, ‘pay no attention to the lecturer who argues about logical fallacies: he is bald and bearded.’ Clearly, that personal comment has no bearing on whether his arguments are valid. But even the more plausible ‘pay no attention to the lecturer who argues about logical fallacies: he has no qualifications in formal logic’ is a *non sequitur*: he might have learned formal logic from books, or in the University of Life, or by thinking about it. The ***validity of an argument***, as opposed to the ***value of an opinion*** does not depend on the abilities or character of the person proposing it.

4 *Post hoc, ergo propter hoc* (= after this, therefore because of this)

Because a change has happened after some other occurrence, it cannot be deduced that the occurrence was the cause of the change. The change might have happened anyway, as a result of some other unrecorded or unmentioned cause. Thus the appointment of a new Minister of Education is not reasonably attributed to the fact that Colin Price was granted a sabbatical term in 1994. The error is implicit in use of ‘consequently’
of this’) instead of ‘subsequently’

5 Inferring causation from correlation

Similarly, because measurable things seem to vary together, it cannot be deduced that any one thing causes change in the other. The increasing time I spend correcting students’ English shows a ***correlation*** with the number of errors students make, but I do not think it is the ***cause*** of those errors. Plausibly, the errors are the cause of the time I take. Alternatively, students may be growing more careless over time, while, independently, I am growing more conscientious.

6 Confusion of necessary and sufficient conditions

Availability of water is a ***necessary condition*** for a tree to grow, but not a ***sufficient condition***. Without water a tree won’t grow: it cannot be deduced that with water a tree ***will*** grow (salt water or water-logging may prevent its growth, and other conditions, like availability of warmth and carbon dioxide, are also necessary).

A variant (the fallacy of the distributed middle) is ‘All A (e.g. all lectures for Part One forestry courses) are B (e.g. are held in G23): therefore all B (e.g. all lectures held in G23) are A (e.g. are for Part One forestry courses).’ Surely no-one could make such an error? Just watch yourself!

7 Excluding the middle

Because a thing is not A (e.g. traditional agriculture), it does not follow that it is Z (e.g. traditional forestry): it could be any one of B–Y in the middle (e.g. agroforestry). A particularly silly example of excluding the middle was the debate held by the Institute of Chartered Foresters in 1993 on the subject '*Forestry: a Primary or a Service Industry?*'.

Similarly, quoting a single case in which a proposition is shown to be untrue, invalid or inappropriate does not prove the universal truth of the opposite proposition.

In adversarial debate, and often when academics engage in personal confrontation, polar positions are adopted deliberately, and the fallacy is drawn upon knowingly and wantonly. This is beneath contempt: shame your elders by refusing to engage in such puppet shows.

8 Circular argument

This begins by asserting the conclusion as a premise and arguing, often by devious steps, that the conclusion, often in a different guise, must therefore be true. This demonstrated conclusion is then held up as supporting the original premise.

> Wood, being wood, swells.

This quotation, taken from a student essay, is a masterpiece of compression, as well as of circularity. The assertion that wood swells is cleverly disguised by the insertion of 'being wood'; the further assertion, that wood is wood, is incontrovertible. It follows that wood swells, since wood ***is*** wood, and wood ***does*** swell. Not all circular arguments are quite so obvious.

It is an interesting but disconcerting exercise to assign statements made by politicians in debate to these headings.

3 DETAILED FEATURES OF ACADEMIC WRITING

3.1 *Syntax*

Sentences are the basic unit of grammar. At minimum they contain a subject and a main verb. **Sentences cohere**. That is to say, they hang together in a way that makes complete grammatical sense, even when they stand by themselves. Transitive verbs (like 'need') **need an object** (like 'an object'), and the sentence makes no sense without one. Any part of a sentence containing a subject, main verb (plus object where relevant) and any supporting phrases is a main clause. Any sentence may have subsidiary clauses, **which (like this clause) contain at least one other verb and which qualify or amplify part of the main clause**. Main clauses can be joined with words like 'and' and 'but', **and** they are then part of one sentence.

The way in which the parts of a sentence hang together is called its 'syntax'. If you find 'X' or 'SYNTAX!!!' scrawled by a marker in your margin, it means the sentence doesn't hang together; try reading it out aloud to your friends, and you will probably hear that something is wrong.

On the other hand it may be that the syntax is ***difficult***, rather than ***wrong***. Whether a reader is aware of it or not, the brain is continually formulating and modifying hypotheses about the syntax of sentences as the eye scans them. At the end of the sentence it may be that one and only one hypothesis is defensible: if so, the sentence is not only correct, but unambiguous. However, the test of ***good*** syntax is that this unambiguously correct hypothesis can be formulated quickly and easily. This is made possible by the customary pattern of words in the sentence-structure of a particular language.

The more clauses you pile together in a sentence, the greater the probability that the syntax will fall apart: the clauses obscure either errors in your syntax as ***you*** read it, or the underlying correct structure as ***others*** read it. Writing short sentences is the easy solution.

However, either necessity or a wish for variety may lead you to write longer sentences, in which clues to syntax become harder for readers to identify. The best clues usually come from subject, main verb and object (if any). Therefore a sentence **in which a long subsidiary clause intervenes between the subject and the main verb** will have, **especially if there is another long subsidiary clause between the verb and the object**, a difficult structure to follow. Also **if long subsidiary clauses are introduced at the beginning of a sentence and the subject and main verb are reached only at the end**, the structure will be difficult to follow. (The sentiments in both sentences can be put into a single restructured sentence: 'A sentence will have a difficult structure to follow if long subsidiary clauses either precede the main clause, or intervene between subject, main verb, and object.')

The part of speech (noun, pronoun, adjective, verb, adverb, preposition, conjunction, interjection) which each word represents also helps in interpreting syntax. Some words can be more than one part of speech. Such words sometimes produce baffling syntax. Consider the following:

> If only agroforestry research policy holds integration potential benefits back in the uplands....

The difficulty here is that 'only' may be an adjective or part of a compound conjunction 'if-only'; 'holds' may be a transitive verb (needing an object) or an intransitive one (meaning 'is maintained'); 'integration' and 'potential' may both be nouns or adjectives; 'benefits' may be a plural noun or a singular verb; 'back' may be a noun, adjective, verb (transitive or intransitive), adverb or a compound preposition 'back-in'. This makes the number of possible hypotheses about syntax overwhelming. There is only one defensible syntax, given that the sentence ends where it does (try putting a comma after 'holds' and reading 'benefits' as a verb). But the ending of the sentence is unknown when the eye begins to scan it. At least four additional syntaxes can be justified (with a comma after 'potential', or 'back', or 'benefits', or 'uplands') if the sentence is allowed to continue for a few more words.

The use of commas to elucidate syntax is discussed in section 3.5.1. An alternative is to choose fewer ambiguous words, or to use ‘the’ or ‘a’ to identify nouns, or to use ‘is’ or ‘will’ to identify verbs, or just to change the sentence order.

> The potential for integration back in the uplands will benefit, given only that agroforestry research policy is maintained.

The word ‘only‘, which created problems in the previous example, needs particularly careful placing in sentences, if its meaning is to be interpreted correctly. Consider the following.

> Only Fergus Sinclair marked ten essays.
>
> Fergus Sinclair only marked ten essays.
>
> Fergus Sinclair marked only ten essays.

The first suggests that his colleagues failed to achieve this (admirable) performance; the second, that he did nothing else; the third, that he should have marked more.

The problem of detecting poor syntax is that you, the author, need no clues: you already know what the sentence means. That is one reason why it is helpful to persuade other people to read what you have written, or to put the piece aside for a few hours before re-reading it.

3.2 *Grammar*

If ‘G’ or ‘GRAMMAR!!!’ is scrawled in the margin, it means that some specific rule of sentence construction has been infringed. Some common areas of difficulty are noted below.

3.2.1 *Countability, singularity and plurality*

The things of which nouns are the name may be countable or non-countable. For example, ‘numerals’ (e.g. 1, 2, 3...) are countable. By contrast ‘numeracy’ (the ability to use numbers correctly) is non-countable: like speed or temperature, you can have a greater ***intensity*** or ***amount*** of it, but not greater ***numbers*** of it. (Note that ‘uncountable’ means ‘countable in principle, but of such great number that counting is not practicable’ – something quite different from non-countable.) ‘Non-countable’ is not at all the same as ‘non-measurable’. The real variables of science (see section 3.10) are usually non-countable, but almost always measurable in principle.

Countable things are either singular (one only) or plural (more than one). Plural forms in English are normally formed by adding ‘–s’ or ‘–es’ to the singular form, or replacing ‘–y’ by ‘–ies’ (note that ‘–ey’ usually becomes ‘–eys as in ‘keys’). However, some words derived from Greek or Latin have different, less obvious, plurals. ‘Data’, ‘strata’, ‘bacteria’, ‘criteria’ and ‘phenomena’ are all plural forms (of ‘datum’, ‘stratum’, ‘bacterium’, ‘criterion’ and ‘phenomenon’ respectively). Do not write, for example, ‘one strata of rock...’ or ‘a criteria of financial success...’. Conversely, if a word is recognisably a Latin one, e.g. referendum, the plural is not necessarily formed by adding ‘s’. ‘Referenda’ is arguably the correct form, though many Latin-derived words, e.g. formulas, are so long established that they displace the original ‘formulae’. If in doubt, consult a dictionary.

A verb, like nouns and pronouns, **have** a singular and a plural form, which should agree. Did you notice that the subject of that last sentence (‘A verb’) was singular, while the main **The subject** of sentences **do** not become plural just because a plural phrase (‘of sentences’) intervenes between subject and verb. **The number** of people who notice errors like the underlined ones when reading their own writings **are** surprisingly small.

On the other hand, **a number of grammarians** **believe** that saying ‘a number of grammarians are...’ is equivalent to saying ‘several grammarians are...’. Also **the Royal Grammatical Society** **believe** that the name of a corporate body is shorthand for ‘the members of the corporate body’ – so a plural verb is appropriate. You should stick to one convention or the other in this case: do not write ‘The National Farmers’ Union **believe** that the Forestry Commission **is** now their ally.’

A consortium of other collective, singular nouns **are** now routinely used with plural verbs – as I did just then. **The range** of such nouns **includes** [that usage was correct] 'variety of...', 'range of...', 'group of...', 'spectrum of...', 'sequence of...'. Such is the power of persistent misuse that **a variety** of correct usages now actually **sounds** wrong. Whether logic or custom will prevail I know not: if it troubles you (it troubles me) you can avoid the problem by writing 'various correct usages now actually sound wrong'.

When one ***singular*** noun and another ***singular*** noun **are** joined by 'and' they become ***plural***.

Again, remember that Latin and Greek plurals may not end in 's'. Do not write '**Data is** collected by using questionnaires' or 'The **phenomena** of misuse of English **has become** very distressing to sensitive people.'

3.2.2 *Comparison of adjectives and adverbs*

In English (but not in all languages) adjectives formally have three degrees of comparison: 'a **tall** tree' [positive degree] is judged to be so without any comparison with other trees; 'a **taller** tree' [comparative degree] has greater height than ***one*** other tree or ***one other group*** of trees; 'the **tallest** tree' [superlative degree] has greater height than any other tree in the group considered. Don't refer the 'the tallest of two trees'.

The **clearest** rule for forming comparatives and superlatives is to add '–er' and '–est' endings to adjectives with one syllable. It is **more normal** (but seems a matter of custom) to prefix adjectives of two syllables by 'more' and 'most', while it is **most usual** to apply these prefixes to adjectives of three or more syllables.

Other languages (including Welsh) explicitly recognise a fourth degree of comparison – equality with other things – which is **as valid as** the three degrees already described, and **equally useful**. The two forms are: '(just) as [adjective] as...' (between the two elements compared); and 'equally [adjective]' or 'just as [adjective]' (after the second of the elements compared). Unfortunately the two forms are often, incorrectly, run together nowadays.

> This first example of comparison is **(just) as correct as** the second example, which follows.
>
> The first example above was correct: this second example is **equally correct**.
>
> The third example, given in this sentence, is incorrect: the fourth example which follows is **equally as incorrect**.
>
> The fourth example is **as equally incorrect as** the third example above.

A smaller comparative degree in a non-countable thing (see section 3.2.1) is indicated by the adjective 'less': thus lecturers may complain that **less literacy** is found among students these days [by implication, less than there was before]. The correct adjective for countable concepts is 'fewer': thus lecturers may complain that students read **fewer books** these days.

'Less' is also an adverb, which qualifies adjectives, as in 'less literate'. Using 'less' incorrectly, as an adjective qualifying a countable noun, causes ambiguities. What, for example, does 'less valid experiments' mean: 'a smaller number of equally valid experiments', or 'the same number of experiments of a lower level of validity'?

Adding to the confusion, 'lesser' is an adjective opposite in meaning to 'greater' (as well as a comparative adverb, as in 'one of the lesser-known errors of English usage...'). Thus the lesser spotted woodpecker is a smaller bird than the great (sic) spotted woodpecker. By contrast, a less spotted woodpecker could be a great spotted woodpecker with fewer spots.

I foresee **many corrections** and **much annoyance** arising in future from loss of understanding that 'much' applies only to non-countable things, 'many' being correct for countable things. It is, furthermore, my aim to ensure that the **fewest possible students** use 'least' for countable things, and that there is the **least possible abuse** of 'fewest' to refer to non-countable things.

Unhappily, ‘more‘ and ‘most’ are the correct words for both countable and non-countable things: to avoid ambiguity, use constructions such as ‘a greater number of valid experiments’ or ‘experiments of greater validity’.

Degrees of comparison may also be constructed with adverbs. **Most often**, this is done by adding ‘more’ and ‘most’, irrespective of the number of syllables.

3.2.3 *The case of pronouns*

Pronouns change form according to their case (grammatical status), e.g. I, me, my. This rule persists when the pronoun is combined with a noun. You should no more write ‘The soil pH was measured by Mr Kelso and I’ than ‘The soil pH was measured by I.’ Prefer ‘the experiment conducted by Dr Cahalan and myself’ to ‘Dr Cahalan’s and my experiment’. Eschew ‘Dr Cahalan and I’s experiment’.

3.2.4 *Participles*

Standing nakedly exposed at the beginning of this sentence, you will see a misrelated participle. The intended meaning is that the ***participle*** (‘standing’, in this case) is standing nakedly exposed: the grammatical meaning is that ***you*** are standing nakedly exposed.

Participles are literally ‘little parts’ of verbs, used as adjectives (‘standing’ in the paragraph above ***describes*** you, or the participle, according to interpretation). They may also be used as nouns (technically called gerunds), as in:

> the correcting of one’s colleagues’ English is not a habit they find endearing

Here, ‘correcting’ is a noun, and ‘endearing’ is an adjective. This flexibility between parts of speech needs care, to avoid unintended meaning. Distinguish between

> Why did the students object to the **lecturer** correcting [correcting = adjective] their English?
> Answer: because the lecturer was bald, bearded and boring.

and

> Why did the students object to the **lecturer’s** correcting [correcting = noun] their English?
> Answer: because the students didn’t like being corrected.

The second usage is hardly heard these days, yet <apostrophe>–s (see section 3.5.4) makes the crucial distinction between an objection to the lecturer and an objection to **their being** corrected.

3.2.5 *Infinitives of verbs*

Readers are also obliged **to frequently encounter** split infinitives: ‘to encounter’ is an infinitive, and it has traditionally been considered bad practice **to, as in this sentence, insert** material between the ‘to’ and the other part of the infinitive. Adverbs and adverbial phrases are the usual offenders. In many North American journals authors seem **to wilfully split** infinitives. Do not feel obliged to follow their practice, whatever trendy new dictionaries may say.

3.2.6 *Prepositions*

Prepositions are perhaps the most idiomatic part of speech. A particular noun, verb or adjective must be used with a particular preposition. In these pairings prepositions do not always translate consistently between languages, and so are very hard to master for those with English as a second or third language. Correct use of some prepositions also defeats many for whom English is the first language:

- ‘Compare to’ means ‘liken to’ – ‘shall I compare thee to a summer’s day?’ If you wish to make a comparison in which elements are different in quality or quantity, use ‘compare with’ – ‘compared with Manchester University, UWB is small.’
- ‘Different from’ is still the preferred usage. It may be pedantic, but many of us find that ‘different to/than/nor’ grates on the ear. It is also illogical: difference implies deviation away from, not towards.
- ‘Separate from’ is another correct adjective–preposition usage that has lost ground to the illogical ‘separate to’, even among people who would not dream of using that as a verb–preposition combination. (One would surely not separate the sheep to the goats?)

Redundant use of prepositions is mentioned in section 2.1.4. By contrast, required prepositions are often mislaid when normal word order is inverted, particularly in reference to location or time.

This is a suitable site for beech to grow [in]. What month does an oilseed rape crop ripen [by]?

Beech grows leaves, not sites; oilseed rape ripens its pods, not months. The problem arises when a particular verb may be either transitive (needing an object) or intransitive: in intransitive form, a following preposition tends to be swallowed, inadvertently converting the verb to transitive form, in which it is obliged to go looking for an object. Attempting to avoid the problem mentioned in the next paragraph may be the subconscious motivation for the error.

Since prepositions are literally ‘words placed before’, they should preferably not be used to end a sentence **with**. Do not, however, tie your syntax in knots by relocating a preposition **up with which** your sentence would otherwise end. Instead, rethink the construction and words **which terminate** your sentence.

3.2.7 *Articles and allied adjectives*

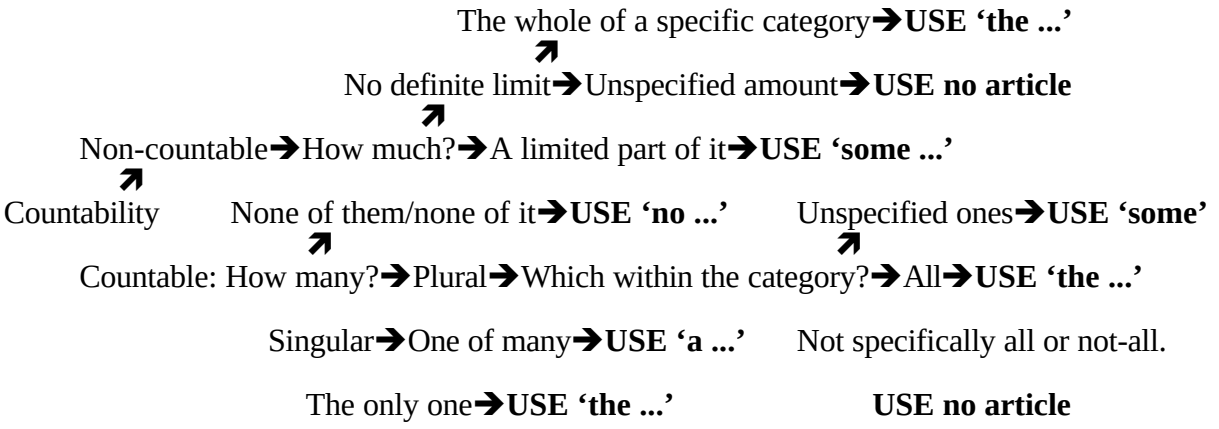
In most languages, the specificity, countability and plurality of a noun are reflected in definite and indefinite articles: words like ‘a, an, the, some’. Adjectives like ‘any’ and ‘no ...’ (meaning ‘not a ...’ or ‘not any ...’) act in the same role as articles. For native speakers of a language, proper use of these words comes from experience, and is rarely a problem. For those who have been formally taught the language, however, the rules are not always clear. Some guidance is offered below. (Examples in round brackets are given after each rule [with commentary in square brackets].) **[_]** means ‘no article at all’.

- No article at all is applied to **[_] plural, vaguely specified, countable things**. (**[_] Words** in this sentence are used to convey meaning. [It may or may not be all of the words].)
- No article at all is applied to vaguely specified non-countable things like **[_] ‘non-countability**’. (**[_] Grammar** [as a general concept] is not well taught in British schools.)
- The indefinite articles ‘a’ and ‘an’ are applied to **a singular, specific member** of a group of countable things. (**A word** in this sentence begins with the ninth letter of the alphabet. [It is the single word ‘in’.])
- The indefinite article ‘some’ is applied in order to mark out **some specific members** (but not all of them) from a group of countable things. (**Some words** in this sentence begin with the 23rd letter of the alphabet. [It is only two words out of 13: ‘words’ and ‘with’.])
- The indefinite article ‘some’ is applied in order to indicate **some amount** (but not the maximum amount) of a non-countable thing such as ‘amount’. (**Some grammar** [but not all, indeed, not much] is taught in British schools.)
- The definite article ‘the’ is applied to **the only thing** that exists in a group which could, in theory, contain more than one countable thing. (**The verb** in this sentence is ‘is’. [There could be several verbs in a sentence, but ‘is’ is actually the only one here.])

No countable thing' and '**no amount of non-countability**' together exclude everything in the Universe. (**No word** in this sentence begins with the letter 'Z'. [Even if you check each word individually, this will be found to be true.])

The diagram below summarises the advice.

Figure 3.1 Choosing the appropriate article



Most things which are non-countable when used in a general sense are countable when used in a specific sense. 'Agriculture', 'society' and 'timber', treated generally, are non-countable: 'agriculture is taught in SAFS; '"society" is a concept whose real existence was denied by Margaret Thatcher'; 'timber is extensively used in the construction industry'. These words, however, may also refer to a specific kind of agriculture, society or timber: 'an agriculture based on irrigation'; 'the society of late twentieth century Britain'; 'several timbers used for constructional purposes'. If there could be 'more than one' of these things, in the sense in which you are using them, treat them as countable, according to the rules above.

3.2.8 *Equivalent grammatical status*

Grammatical entities are of different status (words, phrases, clauses, sentences). Entities of the same status should be used in a series of equivalent positions (for example, as elements in a list). Lists of objectives seem particularly prone to lapsing into a grammatical shambles….

The objectives of submitting written work are:

(a) to give the student training in communication skills;
(b) making the student read about a subject;
(c) assessment of student performance;
(d) The marker can try to improve the student's English.

In the list above, items (a) and (b) are noun phrases (with two different kinds of verb); item (c) is a noun plus an adjectival phrase (without any verb); item (d) is a complete sentence.

Equivalent entities are needed **not only in lists** such as the one above, **but also in paired constructions** such as 'not only... but also...', 'either... or...', 'neither... nor...', and ' both... **both be justified** in terms of structural balance (as in the previous sentence), **and because of the difficulty** of unscrambling the syntax of sentence-like heaps of words like this one. Ensure **either that you** repeat words like 'that you' after both the elements in the paired construction **or that you** use words like 'that you' ***once only, before the first element*** of the paired construction. The 'once only' approach is best reserved **for** either **two short clauses**, or **one short clause placed first followed by a long clause which is reached quickly while you can still remember what came before the short clause**.

3.3 *Pronouns*

It is generally accepted that the pronouns 'I' and 'we' – which have subjective connotations – should be avoided in scientific writing, even when they are the most accurate way of describing reality. Thus 'the trees were planted out' is preferred to 'I planted out the trees.'

The view **held by the present author**, however, is not so rigid. Forestry, agriculture and allied subjects are not pure sciences, and sometimes in essays you will express an opinion. In these cases, naked subjectivity cannot be made truly respectable by cladding it in the modest garb of the passive voice or the circumlocutory third person singular. Do not write 'oak is found more attractive than spruce' or 'the present author finds oak more attractive than spruce' if you really mean 'I prefer oak to spruce.'

Forestry in particular is also a notoriously conservative profession, and the advance of women in it has been very slow. Nonetheless, English usage not only ***reflects*** but also ***affects*** the way we think about things and run society. Do not, therefore, assume that all your readers are males, or that all important people referred to in your writings are males. Some of your readers will, quite rightly, be affronted, and you will alienate part of your readership. This matters, even if you ***are*** an unrepentant male chauvinist boar.

Until a satisfactory genderless third person singular pronoun is found, this creates a problem. 'He or she' (or 'she or he') is cumbersome if used frequently; 's/he' looks inelegant. Alternating sexes, so that the first forester mentioned is 'she' and the second 'he' is a solution adopted by at least one recent textbook. A better solution is to use plural illustrative agents – foresters, farmers, scientists, house-spouses – and to refer to them as 'they'.

3.4 *Semantics*

The meaning of words has two foundations: derivation from another language or word, and customary usage. While fashion seems to demand that a few words should bear a distorted, highly specific or completely new meaning for short periods, words serve us best if they remain true to derivation and long tradition.

The English language is marvellously rich in sound and meaning, and students are encouraged to exploit this largesse – to ***enjoy*** the language. But do look up any word of whose meaning you are unsure, before committing yourself to paper. Check that words have the appropriate nuance: 'woodland', 'forest', 'spinney', 'copse', 'dingle' and 'hanger' are all nouns referring to land with trees on it, but each conveys a different shade of meaning.

3.4.1 *Common errors*

The sound of a word such as ‘sensuous’ may convey a part of its meaning, but sound alone can be misleading: I doubt if the sales promotion executive who gave the name ‘CHARADE’ to Daihatsu’s new model wanted customers to find that the word meant ‘a species of riddle’. Some words are commonly used with the wrong meaning, especially with the meaning of a similar-sounding word: malapropism is the technical term. Examples frequently encountered in the School are given below.

WRONG WORD MEANING	**RIGHT WORD MEANING**
Wind **mitigates** against lamb survival.	Wind **militates** against lamb survival.
Plants are **comprised** of cells.	Plants are **composed** of cells.
The **parameters** of oak timber are...	The **characteristics** of oak timber are...

‘Parameter’ once had the meaning ‘a system-defining constant’ in the physical sciences
Adding the meanings ‘variable’, ‘characteristics’, ‘boundary’ and ‘walls’ loses precision.

Wood can be **substituted by** plastics.	Wood can be **replaced by** plastics. OR Plastics can **be substituted for** wood.
Presence of nettles **infers** earlier human habitation.	Presence of nettles **implies** earlier human habitation. OR Earlier human habitation may **be inferred from** presence of nettles.

A person may infer a conclusion from premises or facts.
Premises or facts may imply a conclusion, which may then be inferred from them.
A person may imply something by mentioning such premises or facts.
But premises or facts cannot infer anything at all:
inference is a process of rational thought, to which inanimate abstractions cannot aspire.

the **affects** of drought on yield	the **effects** of drought on yield
Statistical analysis was **affected** by computer.	Statistical analysis was **effected** by computer.
Statistical analysis was **effected** by computer failure.	Statistical analysis was **affected** by computer failure.

an effect = a consequence
to affect = to influence
to effect = to accomplish
[I have a personal allergy to use of ‘X impacts on Y’, where formerly
the normal usage was ‘X affects Y’: please respect my sensitivity.]

Willow has **alternative** leaves.	Willow has **alternate** leaves.
Economists consider **alternate** courses of action.	Economists consider **alternative** courses of action.

alternative = other than the present one, without implication of sequence
alternate = first one (side) then the other, in regular sequence

with regards to misuse of plurals...	**with regard to** misuse of plurals...

with regards to = with good wishes to
with regard to = as regards = with reference to

irregardless of readership, the right word must be used	**irrespective** of readership, the right word must be used OR **regardless** of readership, the right word must be used

irregardless (not a recognised word) = ***not*** regardless, ***not*** irrespective

Notes were sent to conference **attendees.**	Notes were sent to conference **attenders.**

...er = a person who does something
...ee = a person to whom something is done
e.g. an employer employs an employee
Note particularly that ‘vendee’ is technically something that is sold;
conventionally it means ‘a buyer’ (preferably, use that more direct word);
it is incorrectly used to mean ‘a seller’, the correct synonym here being ‘vendor’.

Spruces give profit, **whereby** oaks give amenity.	Spruces give profit, **whereas** oaks give amenity.

whereby = by means of which
whereas = while on the other hand

The trees blew over **due to** the waterlogged site. The trees blew over **as a result of** the waterlogged site.
OR The windblow was **due to the waterlogged site.**

'Due' is an adjective and must qualify a noun (as in 'due care'), not a verb.

The vet treated the horse; **consequently** it died. The vet treated the horse; **subsequently** it died.
Tree-felling posed a danger to the public; **subsequently** all paths were closed.
Tree-felling posed a danger to the public; **consequently** all paths were closed.

consequently = as a result of (and hence, potentially, may be a basis for law-suits)
subsequently = later in time (and hence cannot be applied to precautions taken beforehand)

Milk is obtained from cows and goats, **etc., etc.** Milk is obtained from cows, goats, **etc.**

etc. = *et cetera* = and the other things: 'etc., etc.' means literally 'and the other things, and the other things'. Since there are no other things than the other things already mentioned, this is quite superfluous. It reinforces the impression, often implicit in use of a single 'etc.', that you know there are other examples, but can't remember them!

the Professor of Forest Sciences **e.g.** Dr Godbold the Professor of Forest Sciences **i.e.** Dr Godbold
staple foods of the world, **i.e.** rice staple foods of the world, **e.g.** rice

e.g. = *exempli gratia* = for example
This term is illustrative: the entities which follow are just some among a number of entities in the category specified.
i.e. = *id est* = that is.
This term is exhaustive: the entities which follow are the only entities in the category specified.

Plants can recycle oxygen ***ad nauseam***. Plants can recycle oxygen ***ad infinitum***.
The lecturer talked about misuse of English ***ad infinitum***. The lecturer talked about misuse of English ***ad nauseam***.

ad nauseam = to sickness, until [someone or something was] sick of it
ad infinitum = to infinity, indefinitely

'Ahead of', which relates two ***objects in space***, was once clearly distinct from 'before', which relates ***events in time***. The subtle, but sometimes important, distinction in meaning is seen in 'Rain fell ahead of the warm front' (meaning geographically forward of the front at a particular time), as opposed to 'Rain fell before the warm front arrived' (meaning earlier in time than its arrival at a particular place). The new usage (originally a very specific one applied to anticipatory Stock Market price changes) is particularly ambiguous because 'ahead' is used to mean ***either*** preceding ***or*** following in time:

> Data on the previous week's weather were gathered ahead of the Sunday farming programme.
> The Sunday farming programme discussed the weather for the week ahead.

'Effective' means 'achieving its purpose well': 'efficient' means 'achieving its purpose to a high degree ***in relation to the resources used***'. Arguably British agriculture has been effective in increasing food production over the past 50 years: part of the present argument is that it has not been very efficient in so doing.

A serious misusage is of 'maximum' in place of 'optimum', and *vice versa*. 'Maximum' means 'the greatest possible': 'optimum' means 'the best possible', and generally refers to some independent variable which will result in a maximum value for another variable dependent upon it. For example, the maximum rate of feeding for a pig is the greatest amount it is possible to stuff through its alimentary canal in given time. It is hard to see what worthy purpose could be served by such a maximisation. The optimum rate of feeding depends on the objectives. From the farmer's viewpoint the objective is probably to maximise profit rather than physical rate of growth. From the pig's viewpoint the maximand would be the pig's welfare, in which comfort and long time lapse till slaughter weight was achieved would be arguments. Maximising achievement of a single objective is often an immoderate activity: optimising usually requires a balancing of objectives, and is often praiseworthy.

There is a pernicious present tendency to use verbs as nouns and *vice versa*, even when suitable words are already available:

> Correcting students' English demands a major **spend** of time.
> The trees **incremented** at 10 m^3 per year.

Much better are:

> Correcting students' English demands major **expenditure** of time.
> The trees **grew** at 10 m^3 per year.

Apart from the jarring sound and impoverishment of the language, interchanging the use of verbs and nouns may create difficulties in interpreting syntax (section 3.1).

3.4.2 *Abbreviations and phrases in other languages*

For use (and misuse) of *ad infinitum*, *ad nauseam*, C.V., *et al*., e.g., etc., i.e., *ibid*., *op.cit*., sic, see entries in the index. Some further common abbreviations and phrases, their meaning and correct use are given below.

Table 3.1 Common abbreviations and phrases

Term	Full form	Translation	Use
ad hoc		to this thing	indicating for this purpose alone, ***not*** 'ill-conceived' or 'ill-constructed'
a priori		from (the) preceding	generally, indicating a conclusion based on reasoning, rather than observation
cf.,cp.	*confer*	compare	pointing out similarity or contrast
de facto		in actual fact	indicating the accepted reality, as opposed to:–
de jure		by right	indicating the legal position, irrespective of reality
N.B.	*nota bene*	note well	drawing attention to an important point
per se		by itself	indicating independence of other information or qualification
prima facie		at first sight	suggesting that this is the immediate (but possibly not the correct) explanation
q.e.d., Q.E.D.	*quod erat demonstrandum*	which was to be shown	indicating that the required conclusion has been drawn
q.v.	*quod vide*	which see	referring the reader to another entry
vice versa		the other way round	referring to a reversed relationship, ***not*** to an opposite concept
vis-à-vis		face-to-face	indicating direct contact (on the matter of...)
viz.	*videlicet*	namely	making clear what is being referred to

For other abbreviations and phrases, consult a good dictionary.

Punctuation of abbreviations is treated in section 3.5.5.

3.5 *Punctuation*

The purpose of punctuation is to clarify the meaning of words, by breaking sequences of words into units, and by indicating the kind of sequence. Good punctuation makes a sentence easy to read aloud. However, in general, an elegant style, with good phrasing, and in which proper words are used, each in its proper place, needs less punctuation…. Sorry, let me start that again. Generally however, an elegantly phrased style with words properly placed needs less punctuation than a bad one; punctuation must not be expected to do the work that careful word choice and order might do better. If a sentence is groaning under the weight of punctuation marks, rewrite it or split it into several sentences. Be particularly wary about long sequences of commas (as above).

Spaces should be placed ***after*** punctuation marks, not ***before*** them. **(**Clearly, 'open bracket' and **'**open quotation mark' are exceptions.) Word processors often make line break0s(and, if you happen to be peculiarly unlucky in how the pagination works out, even page breaks

[top of next page]

)in silly places if you ignore this rule. Q.E.D. (q.v.)

3.5.1 *Commas*

Commas often correspond to a 'pause for breath'; it is useful to read your work aloud to check this. If taking a breath makes the sentence sound wrong, the comma probably shouldn't be there.

Whether a pause for breath is required is often a matter of judgement, but this is not to say that all use of commas is arbitrary. Insertion of commas may totally change the meaning of a sentence. Compare

> Farmers who invariably ignore the instructions on insecticide containers are a menace to conservation.

with

> Farmers, who invariably ignore the instructions on insecticide containers, are a menace to conservation.

Relative clauses ('who...' or 'which...') are always susceptible to this change of meaning. A convention **that is commonly applied in North America** is to use 'that' when the relative clause defines the relevant group of people or things: for example, 'a convention that is commonly applied in North America'. This usage, which is less observed in Europe, sounds unpleasantly ***im***personal in personal relative clauses such as '**farmers that** ignore instructions'. Relative clauses using ' , who...' or ' , which ...' ***describe*** what comes before, rather than ***defining*** the people or things that are relevant to what follows. The clause 'which is less observed in Europe' is a separate piece of information, describing the usage but not confining ***still*** sounds unpleasantly impersonal in personal relative clauses, even in continents other than Europe.

The meaning of 'however' is often altered by a following comma, and the commas in the subsequent sentence can throw the syntax in all directions (see section 3.1):

> However, illiterate scientists may argue that they are the best people to judge the value of other scientists' work.

> However illiterate, scientists may argue that they are the best people to judge the value of other scientists' work.
>
> However illiterate scientists may argue, that they are the best people to judge the value of other scientists' work [is beyond doubt].
>
> However illiterate scientists may argue – that they are the best people to judge the value of other scientists' work [– if they cannot communicate, then that judgement is useless to research councils].

Well, which does the author mean? The problem arises from the multiplicity of meanings of 'however': e.g. 'nonetheless', 'to whatever extent', 'in whatever fashion'. This word needs all the support it can get from accurate punctuation.

Commas may be used between the main clause of a sentence and subsidiary clauses, unless the latter are particularly short. A comma should be used to throw emphasis onto the first word of the following clause**, if** that is what you want. **At the end of a particularly long phrase occurring at the beginning of a sentence**, use of a 'pause-for-breath' comma can also be justified, despite being technically frowned on.

Commas are ***normal*** between main clauses joined by conjunctions such as 'and', 'but' and 'although'**, but** they are ***obligatory*** between items in lists (such as **'and', 'but' and 'although'**). It is usual not to place a comma between the last-but-one item in a list and the following 'and'. Nevertheless, it is permissible to do so if you want to make a particular point of distinguishing the last two items.

Use of commas for parentheses is covered in section 3.5.8.

Commas suffer from use as an all-purpose punctuation mark. They should not be used in the following ways:

(a) to end complete sentences (see section 3.1);
(b) at the beginning of a line;
(c) between the subject of the sentence and the main verb (or between the main verb and the object), except in pairs or in lists.

The next three examples are wrong.

(a) This example is wrong,
(b) Also this example, is wrong
(c) , and so is this one.
(d) This example is right, and so are (f) and (g).
(e) Moreover, this example is right. ('Moreover' is not the subject.)
(f) This example, the previous example and the next example are right. (There are three subjects joined in a comma'd list).
(g) This example, like the example above, is right. (A pair of commas marks a parenthesis – see section 3.5.8 – between subject and verb.)

Note particularly that 'however' at the beginning of a main clause should not be preceded by a comma**; however**, a preceding semicolon may be appropriate**. However**, a full stop is the safest punctuation mark to use before 'however'. The same applies to similar words, such as 'nevertheless', 'moreover', 'therefore' and 'furthermore'.

3.5.2 *Semicolons (;) and colons (:)*

These are tricky, and no clear-cut rules seem to exist, but correctly used they are valuable.

Short, snappy elements in lists should be separated by commas; use a colon to introduce a list of long, complex elements, which should then be separated by semicolons.

> The reasons for planting larch were**:** its early growth was rapid, suppressing weed growth**;** its timber was valued for fencing**;** its light-coloured foliage and deciduous habit contributed to amenity.

If the question (or exclamation) is not inherent in the words quoted, as with the ‘As has often been said...” example above, the final punctuation mark should be placed ***outside*** the ‘close quotation’ mark.

The use of quotation conventions is illustrated below by an extract from a hand-out on report writing by John Hetherington. On the left side of the page is a character-by-character reproduction of the extract: my quotation of this extract is on the right. According to this hand-out, quotations are:

__ when quotation marks enclose words as entities, coinages, etc. Two examples appear in this paragraph. This looks

better and is ***much*** more logical than taking the full stop or comma inside the quotation marks. It is also consistent with the convention given by MLA for all other punctuation marks in relation to 'close quotation **’ .** This convention is illustrated for '!' and '?' in the previous paragraph.

3.5.4 *Apostrophe*

This is used in two ways: to indicate omitted letters ***in the middle of words***, e.g. don't, it's (abbreviation of 'it is'); and to denote possession, together with an 's'. In the latter case the positions of apostrophe and 's' depend on whether the noun is singular – Colin Price's gripes – or plural – all the agriculture lecturers' gripes. Please note also:

> people's gripes; women's concerns; men's hang-ups; data's variability

['people', 'women', 'men' and 'data' are all plural forms to which 's is added];

> Mrs Coffee-Lady Jones's gripes; Terry Thomas's gripes

[the sometimes-suggested 'Terry Thomas' gripes' for names of two or more syllables seems inconsistent, and isn't the way you say it];

> quantitative analysis's results [better: results of quantitative analysis]

And, for those few of you who wish to allude to Classical writers, there appears to be an official exception to the rule:

> Sophocles' problems with apostrophes were diminished by the absence of apostrophes from Classical Greek.

Apostrophe is ***not*** used:

- in forming plurals you can't spell or use properly – lorries not lorry's, *coedwigwyr* not *coedwigwr*'s, Drs D.Jones and M.Jones, not the Dr Jones's;
- in referring to decades, e.g. the 1970s;
- in the possessive pronoun 'its', meaning 'belonging to it' (you wouldn't write hi's, would you?).

It is my impression that misuse of apostrophes is the most common fault in English punctuation. You can see several examples each day in captions on television (the only reason I watch it, of course).

3.5.5 *Full stop, period or point*

This is used at the end of sentences.

It also appears in abbreviations ***where letters have been omitted from the end of a word***, such as Prof. or fig. It is not required when the abbreviation ends with the same letter as the original word, so 'Dr Ioan ap Dewi' and 'St Deiniol's Cathedral' are correct, as is 'eds' for 'editors', even though 'editor' is correctly abbreviated to 'ed.'.

There is a modern trend towards dropping points in frequently used abbreviations, particularly when the abbreviation is habitually ***spoken*** as letters, for example GNP, MSc, UWB. These certainly look tidier without the points. Logically, this should apply to 'e.g.' and 'i.e.', but this usage is not established. Please do not use the half-baked forms 'eg.' or 'ie.'. The convention is also used for words spoken in their shortened form – for example, memo – and for acronyms – that is, words formed from the initial letters of others words, like UCAS. See section 3.10 for the convention on abbreviated units of measurement.

Sometimes sentences end with abbreviated words such as etc. There is no need for one full stop to indicate the abbreviation and another to end the sentence. Does it not seem strange, by contrast, that the convention is to use a full stop followed by an exclamation mark or question mark, if an exclamation or question ends with, for example, etc**. ?** Still, that is the rule. Note

also the use of two full stops when the abbreviated word is cut off from the end of the sentence by other punctuation marks (brackets, etc**.) .**

3.5.6 *Question and exclamation marks*

These are used (not unreasonably**!)** at the end of sentences which are questions or exclamations. They then take over the job of the full stop, except when the sentence ends with an abbreviation (see section 3.5.5). How strange it would look if you punctuated a sentence like thi**s ! .** Rules for positioning question and exclamation marks in relation to quotation marks are given in section 3.5.3, and you would also expect these rules to apply to brackets (wouldn't you **?) .**

Exclamation marks are used in commands

> Stop misusing punctuation marks!

or surprising statements

> Every student punctuated the essay correctly!

or emphatic utterances

> How delighted was I to see correct use of punctuation marks!

Note that the punctuation mark determines the meaning of the last sentence, that is, I was extraordinarily delighted to see it. By contrast,

> How delighted was I to see correct use of punctuation marks?

does not imply whether I was or was not delighted – it is a question, and it still needs an explicit answer, such as 'well, I would not have expected less.'

Emphatic use of exclamation marks is easily overdone! It can become jolly tedious! So be restrained!

Questions and exclamations may arise within sentences – can you see that examples appear in the first and last sentences of this section**? –** in which case question and exclamation marks are placed after the appropriate part of the sentence, not at the end of the sentence.

3.5.7 *Hyphens and dashes*

Hyphens (-) are used to ***join*** two separate concepts into a new compound one: thus 'clear-felling' has a more specific meaning than 'clear felling'. If in doubt about whether a hyphen is needed, at least be consistent: don't wander between 'clear felling', clear-felling' and **rapidly-proliferating** usage is of hyphens between adverbs and the adjectives which they qualify: these are, however, unnecessary, except in some **more-ambiguous** cases. Ambiguity arises when words like 'more', 'best', 'further', 'half', 'full' and 'fast' may be either adjectives or adverbs. Adjectives should then be separated from the following adjectives by commas, whereas adverbs should be hyphenated with the following adjective. The distinction is not trivial: eating a half, cooked chicken might not be prudent, but eating a half-cooked chicken could be fatal. Similarly, there is no need to hyphenate adjective–noun or noun–noun combinations like '[the] long term', 'land use' or 'decision making' when they are used as nouns. However, when these combinations are used adjectivally, as in 'long-term land-use decision-making procedures', readers will be glad of the help given by hyphens.

Hyphens may sometimes be used to break long words across lines, thus preventing the **optional/automatic typewriter/computer's right-margin-justification inserting/redistributing** conspicuous expanses of white space into the gaps between other words (as above). But if you do insert such breaks, choose sensible places to locate the **hyphenation** (definitely not there, for example). Try to keep together the sequences of letters that naturally belong in a group. Word processors usually have an operational variety of hyphens: 'soft' ones only print if the word is broken across lines; ordinary ones print whether the line is broken there or not; 'hard' ones will never be used as a line break – very useful for hyphens

used as minus signs! Some word processors have a capability to give you hyphenation automatically if white space begins to build up.

The key to the **hyphen–dash** distinction is that dashes are used to indicate ***separate*** though related concepts. **Cost–benefit** analysis is analysis of costs on the one hand and benefits on the other: **cost-benefit** analysis would be analysis of the meaningless (but often spoken of) compound concept of cost-benefits.

Dashes may also be used with a space on either side as a punctuation mark. Their use **–** a rather self-conscious one **–** in parentheses is discussed in section 3.5.8. They may be used to introduce a list **–**

- of short items preferably
- of long, rambling and further-punctuated items less prettily, especially those that have new clauses in them
- in conjunction with another punctuation mark dubiously, as in **:–**

  :– , occasionally as in
  ! – , or
  ? – , but not in
  , – , or
  ; – , or
  . – .

In the days of typewriters you only had one character to serve for hyphen and dash: nowadays word processors give you both (usually), so you need to be more careful.

3.5.8 *Parentheses*

A parenthesis is anything slipped into a unit of writing **– like these four words –** which serves to elaborate or exemplify something, and can be removed without damaging the sense. Parentheses are commonly enclosed in brackets **(like this)**, or**, if you like,** between commas, or **– provided you don't overdo it –** between dashes. Brackets must always be used in pairs: dashes and commas may be used singly if the parenthesis ends the sentence **– like this**. Don't use semicolons or colons for parenthesis.

Parentheses – if you are not careful, or if you are too lazy (or ignorant), in the way you write – can pile up and – especially if you are writing (or even speaking) a complex, or very long, sentence – make it rather – and in some, or even many, instances extremely – difficult to figure out what you (or anyone else) may be trying to say.

Place the final punctuation mark outside the brackets if a parenthesis lies within a sentence (like this**) .** (If a sentence is itself a parenthesis, the final punctuation mark goes inside the brackets**.)**

3.5.9 *Capital letters*

As well as for beginning sentences, an initial capital letter is used for proper nouns, that is nouns that are the names ***given to*** or ***chosen for*** some specific individual person, place or thing, or to a collective set of individuals all bearing that personal name. Examples are: Professor Edwards-Jones, Gwydyr Forest, Goldie the Eagle, the Prices of Farrar Road. Traditionally, though not at all logically, Latin generic names, but not specific names, have a capital, e.g. *Homo sapiens*.

Capitals are not used for common nouns – nouns which refer to people or things in general – no matter how important you think them: professors, forestry, golden eagles, people who live in Farrar Road. Nor should they be used for trendy concepts like ***total economic value*** or ***sustainable development***, though they are often so misused in the literature. English names of plants and animals have a capital only when the name is itself a proper noun, as in Norway spruce. Do not follow the capitalising practice of many Forestry Commission publications (e.g.

Lodgepole pine, Red deer). This is wrong, as a previous publications officer has agreed. English Nature seem to have gone down the wrong track on this, requiring their **Bemused Scientists** to refer to Great Stag Beetles, etc. One sees the point, in so far as one might wish to be both descriptively and scientifically precise in referring to, for example, **brown Red Deer**. But if absolute unambiguity is required, one should prefer 'a brown-coloured red deer (*Cervus elaphus* L.)'.

As for scientific journals, they are all over the place, some advising one thing, some another. Editors seem to think they can, by ***Diktat***, replace the rules of the English language. If they want to use capital letters for common nouns, I suggest they apply for the editorship of journals published in German, for which this is the correct usage.

Above all, do not take your cue from titles and credits on television programmes or typography of promotional materials, which seem to have fallen under the control of graphic designers. For example, 'wales today' appears so on screen, and '**world*books***' is among those who apparently think their company name is not a proper one. Here 'visual impact' seems to have become the imperative, and 'doing it differently' takes precedence over 'doing it

3.5.10 *Omission marks (ellipsis)*

Words may be omitted from a sentence (usually the end of it) as a figure of speech: readers or listeners are then expected to speculate on how the sentence might end, and to fill the gap **with....** Words are often omitted from quotations when they are irrelevant to the purpose of the quotation (but this should never change the ***sense*** of what is quoted). Thus

> the (preferred) convention for representing omissions is to use three points (...) to indicate an omission, or four points (....) when the omission runs to the end of a sentence

might be quoted as

> the... convention to represent omissions is to use... four points (....) when the omission runs to the end of the sentence. (Price, 1992)

provided the rule for omissions in the middle of sentences had already been given, but not as

> the... convention for representing omissions is to use three points (...)... when the omission runs to the end of the sentence.

3.6 *Spelling*

Only a few English words can be spelled in more than one way; even then one spelling is usually 'more correct' than the others, and should be preferred. Some words (e.g. colour [color]) have different spellings in the UK and in North America: please use UK spelling while you are in the UK, unless you are just on a short visit from North America.

One important option is to use the endings –ize and –ization (preferred US spelling), or the endings –ise and –isation (preferred UK spelling). But do decide which you are going to use, and stick to that option. Note that some words, like 'advertise', have not been formed by adding an ending to another word, so should be spelled with an 's' whichever convention you

Spelling in English is unfortunately (though rather endearingly) idiosyncratic: a given sound may be spelled several ways, and a given sequence of letters may sound several ways. For those without a photographic memory, this is a real problem. Nonetheless, there are some infallible rules, and some which give a high statistical probability of correctness. If you lack the aforementioned photographic memory, Allan (1989) is a helpful guide: don't be put off by its being intended for use by children.

Keep a dictionary beside you whenever you are writing, and check any spelling of which you are unsure. If a word is marked by staff as mis-spelt, it is your responsibility to look up the correct spelling, and it is certainly worth writing it out 10 times correctly to fix it in your mind.

Below are listed words which are very frequently spelled incorrectly by students (not to mention staff!) of the School. Also note especi**ally** that adverbs formed from adjectives ending '–al' always end in '–ally', not '–aly'.

accommodate	environment	hypsometer	phosphorus	specimen
acquire	equilibrate	independent	pine marten	strategy
attach	exercise	innovation	procedure	supersede
benefit	feasible	integration	profit	susceptible
business	focused	maintenance	protein	tariff
commission	forwarder	mouldboard	pruning	tendency
definite	fulfil	occurring	receipts	vegetation
description	gauge	omission	revenue	vigorous
detrimental	height	operation	separate	yield
development	hydraulic	opportunity	Sitka	

The following spellings of words sounding the same or similar are often confused:

advice	=	that which it is suggested should be done [noun]
advise	=	suggest to, as being prudent [verb]
aerial	=	(pertaining to) something in the air
areal	=	pertaining to area
choose	=	select [present tense]
chose	=	selected [past tense]
complement	=	provide something missing from; something so provided; a full set
compliment	=	say nice things about; a nice thing said
dependant	=	a person who depends on another [noun]
dependent	=	depending on another [adjective]
discreet	=	quiet and careful about words and actions
discrete	=	characterised by being separate from other members of a group
foregone	=	of something which had previously been predicted or presaged
for**gone**	=	given up
lead	=	draw forward; a heavy, grey, metallic element
led	=	drew/drawn forward [past tense]
licence	=	a document giving permission [noun]
license	=	give formal permission to [verb]
loose	=	unrestrained
lose	=	mislay
meter	=	a measuring instrument
metre	=	a unit of length
ordinance	=	enactment, something which is to be carried out
ordnance	=	pertaining to artillery; most often referring to Ordnance Survey (maps)
ordonnance	=	general disposition of parts (of buildings, forest designs)
practice	=	the thing normally done; an act done to improve later performance [noun]
practise	=	do, undertake; do beforehand to improve performance [verb]
principal	=	most important, most important person
principle	=	fundamental law
program	=	list of instructions to a computer (NB computer ***programming***)
programme	=	sequence or collation of activities or projects
their	=	belonging to them
there	=	at that place
were	=	existed in the past
where	=	at which; at which place?

It is a good though not universal rule that nouns end in –ant, whilst adjectives end in –ent. When in doubt use the –se ending for verbs, the –ce ending for nouns.)

In plan documents, you will often refer to Welsh place names. These too should be spelled meticulously. Use the latest Ordnance Survey maps as a standard.

3.7 *Scientific names*

In scientific writing, names of plants and animals should be given in the scientific (Latin) form, since the vernacular (English or Welsh) name may not be known internationally. The scientific name must be put in italics (if you have that facility), or underlined. The first word **– the generic name –** but not the second word **– the specific name –** is given an initial capital. If this name is repeated within about a page of its first occurrence, and if no other genus is mentioned between first and subsequent occurrence, the generic name may be abbreviated to its initial letter. In academic papers, and preferably in dissertations also, the authority for the scientific name **(that is, the person who classified the organism and attributed the name)** should be given when the name is first mentioned, but not subsequently. This name may be given a standard abbreviation: Linnaeus**, the most important figure in the history of scientific naming,** is abbreviated to L. When a plant or animal has been reclassified, the original authority is placed in brackets before the new authority. Follow the nomenclature given by an appropriate flora or fauna.

There is dispute about punctuation between vernacular and scientific names when both are given: some bodies maintain that no punctuation is needed. Common English usage, however, separates nouns **– naming words –** from nouns in apposition to **(= placed side by side with)** them by some form of parenthesis (see section 3.5.8). The several underlined examples of such phrases in apposition in this and the previous paragraph demonstrate just how common this usage is, and makes one wonder on what grounds the usage should be different in naming of organisms.

The example below observes all the conventions.

> Scots pine (*Pinus sylvestris* L.) is now less widely planted than Sitka spruce (*Picea sitchensis* (Bong.) Carr.). Unfortunately, *P. sitchensis* has a smaller associated fauna than *Pinus sylvestris*.

3.8 *Italics*

Scientific names are italicised because they are written in Latin. Italics are also used for other words of foreign languages, unless they have been assimilated into English. It is sometimes difficult to decide what to do about words **en route** to assimilation. If you use a word in a ***rôle exotique*****,** italicise and retain its accents: if you use it in an **assimilated role**, use upright type and remove the accents.

It is also normal to italicise the names of books and journals (see section 5.5).

Before the advent of word processors, it was difficult to produce italic writing, and underlining was used as an indication to typesetters that words were to be set in italics. Underlining may still be used in place of italics, but do use italics as appropriate when you produce work on a word processor.

Use of *italics*, **bold type**, underlining or CAPITALS for emphasis should be done sparingly: overuse is unattractive and diminishes impact. It is preferable to use the same form of emphasis throughout. In this document, **bold plus underlining** is used for words within the text that exemplify a point made in the text; ***bold italics*** are (sparingly) used for emphasis; *ordinary italics* denote technical use for foreign words and book and journal titles.

3.9 *Numbers*

This document does not aim to give guidance on statistical analysis. Brief comment on presentation of numbers in written work is, however, relevant.

For integers (whole numbers, which apply to countable quantities) do not quote any decimal element at all. Thus an experiment might be performed on 40 sheep: it would not be performed on 40.000 sheep (which suggests that a sensible experiment ***could*** have been carried out on 40.374 sheep). For discrete variables (which can take only a limited set of values, and not any values in between) do not quote more decimal places than are required for complete accuracy. Thus the mean number of trees counted in 10 samples might be 13.8 (138 trees in all) whereas the mean in 100 samples would be 13.80 (1380 trees in all).

Real numbers (which can take any value over a range) should not be quoted to an implausible number of significant figures. Three significant figures is often good enough. In particular, do not quote figures beyond the precision or accuracy of the measuring instrument. ('Precision' refers to the human ability to make distinctions in reading the instrument: 'accuracy' refers to the instrument's ability to measure things as they really are.) This problem often arises when measured figures have been subjected to arithmetic, especially that involving π, raising numbers to powers, or metric conversion factors. Nobody would dream of giving the diameter of a tree as 25.1234 cm (our diameter tapes aren't marked in microns). Yet it is not unknown for the basal area of a tree of 25 cm diameter to be quoted as 490.8739 cm^2.

Do not write 'about 1905 mm of rainfall'. If precision matters, write '1905 mm of rainfall': if it doesn't, write 'about 2000 mm of rainfall'.

Where possible, choose units which give sensible orders of magnitude: cell dimensions quoted as 0.0004 m and world forest area as 4 000 000 000 ha are hard to grasp. Scientific formats like 4×10^{-5} m or 4×10^{9} ha are appropriate in scientific journals, but they lack immediate impact even there, and they should never be used in popular writing. Dimensions of 0.4 mm and 40 million km^2 are easier to handle. Using appropriate units is especially important in saving space in tables.

There is a kind of ruthless logic behind measures like $kg.m^{-3}$ (for density) and $m.sec^{-2}$ (for acceleration), but I don't find the idea of a metre raised to a negative power enlightening, nor that of dividing by a square second. Prefer kg/m^3 and m/sec/sec or metres per second per second when writing for ordinary mortals.

The most recent convention is to group digits in threes with spaces between groups as in the above paragraph, not separated by commas. No space is used in four-digit sequences, except for alignment in tables. Beware of word processors' breaking up of numbers like **4 000 000 000**. A 'hard' space character is often available to avoid this. Also dislocated minuses, (**–4000**, meaning 'minus 4000') can be prevented by using a hard hyphen or explicit minus sign.

In the text whole numbers up to nine (or if you prefer ninety-nine) should be spelled out. Use numerals for larger numbers, for decimals, for percentages, dates and page numbers, for numbers followed by a unit of measurement and for a series including numbers below and above 10. '0.4 cm of rainfall' does not look well at the beginning of a sentence. 'Rainfall of 0.4 cm' is much better. Therefore, write sentences so that they begin with a word, not a number, or spell the number out.

Ordinal numbers follow the same rules, e.g. third, 3rd March, 33rd.

Accepted abbreviations for scientific units like 'mm' and 'ha' need no full stop.

In scientific writing use the metric system for all measurements, or give a metric equivalent. If using currency units, give an equivalent in UK pounds, or a conversion factor if many sums are quoted.

3.10 *Maps, plates, figures and tables*

These items create an immediate impression of the care that has gone into your work. For works like dissertations which are read outside the School, the highest journal-quality standards of clarity, neatness and accuracy are required. Sketch maps and diagrams are acceptable in essays and write-ups, but a higher standard is expected in major reports and dissertations.

Figures and tables should have a specific purpose, and should not include data irrelevant to that purpose. Do not duplicate or triplicate material in text, figures and tables. Use a figure or a table to show a large amount of information, and comment on its important features in the text. ('Net discounted revenues for the two crops, as can be seen in figure 3.2, peak at about 36 and 48 years.' 'Table 3.3 (see p.36) shows that Sitka spruce inventories increased most rapidly.') Tables are best used to reveal small differences precisely, particularly for a discrete independent variable: figures give a better immediate impression of major trends for continuous variables.

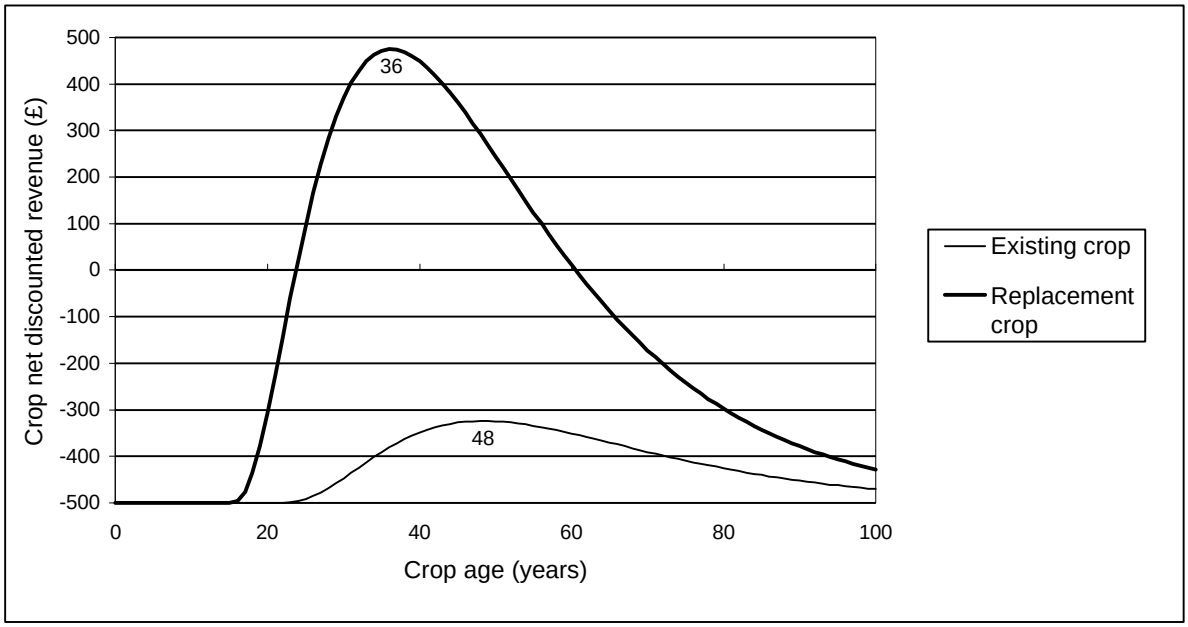
Small items may be included within a page of text, but larger ones should be on their own pages. These items are often produced separately and inserted at the last moment. Make sure you insert them in the right place, and the ***right way up***. Place them either close to their first occurrence in the text – ***particularly if they are needed for understanding of the text*** – or collect them together at the end of the text. When they are mentioned in the text, give a location ('page 68', or 'following page 67' if the page is unnumbered). If they are not cited in the text, they are superfluous to understanding the text, and should be left out or put in an appendix. All items should be numbered and captioned. The numbers may run in sequence throughout the work (plates I – XIV), or through each chapter (table 3.3, figure 3.2 in chapter 3). Prefer the latter system if you are using decimal numbering for sub-sections or paragraphs.

3.10.1 *Artwork*

Computer packages such as Excel, Quattro Pro and Corel Draw are capable of producing material comparable with that of professional draughtspeople. Output can be imported directly into word processing packages like WORD (but this will affect the size of fonts). Nowadays it is expected that you will use such aids, rather than submit hand-drawn material, for dissertations, major reports and preferably for essays too. Use consistent letter size and typeface in captions and labels of all artwork. Figure 3.2 uses WORD captions for consistency with other captions, and Excel's lettering (Arial Font) for the rest.

Academic journals have fully professional standards for artwork. Sometimes graph labels, and usually graph captions, are inserted by the journal's own staff.

Figure 3.2 Optimal rotation for two species



Both axes of graphs should be labelled and scaled, and the units specified. The dependent variable is normally on the vertical axis.

If you resize figures such as maps or micrographs, or move them from other applications, do not ***write*** the scale (e.g. 2 cm = 1 km; 500× magnification) as this will change. Instead draw a bar showing the length representing a kilometre, metre, mm or micron.

Do not overload figures with data: they are meant to clarify, not confuse. Use grid lines only in so far as they aid interpretation.

Maps and plans must be clear and tidy. Show the scale and compass points. Photocopies, especially of old maps, are often not good enough for dissertations, certainly not for journals. A hand-drawn copy of main features may be preferable, but many computer aids are available for better quality productions.

3.10.2 *Tables*

Tables should be arranged to be read and interpreted easily and, if possible, independently of reference to the text. They should make classifications evident, facilitate comparisons, reveal relationships and save space. Technical terminology for a table is as follows:

Table 3.2 Layout of a table [a]

		Primary boxhead [b]	
		Secondary boxhead I	Secondary boxhead II
Primary stub I	Secondary stub I	field	field
	Secondary stub II	field [c]	field
Primary stub II	Secondary stub I	field	field
	Secondary stub II	field	field

Notes:

[a] Place captions either consistently below or, preferably, consistently above tables and figures.
[b] Place markers for footnotes which refer to all fields here, e.g. those defining the units.
[c] Place markers for footnotes about individual fields at the end of the field, e.g. one noting that the figure is provisional.

When compiling tables with word processors, ensure that the table (including caption and notes) is not split across pages, by using either a 'hard' page break or a paragraph formatting instruction such as 'Keep with Next'.

Choose for the primary boxhead or stub either the factor with least variation, or the most important factor in the comparisons being drawn. Write the boxhead vertically or divide across rows if that is the only way to fit in the heading.

Where tables are to be compared, ensure that the same layout is used for each. In particular, place a given factor either always in columns or always in rows consistently. Arrange the table so that fields are totalled down the column rather than across the row. It is also easier for the eye to run down a column than across a row, so if possible present the figures to be compared in one column. For example, if the table is to show the increase in standing volume between successive inventories then the format should be:

Table 3.3 Volume in cubic metres in successive inventories for the four main species

	Species			
Inventory year	Sitka spruce	Norway spruce	Douglas fir	Western red cedar
1950	10 000	2 000	6 000	8 000
1960	12 000	2 500	7 000	9 000
1970	15 000	3 000	7 500	11 500

If to show variation in volume with species then:

Table 3.4: Volume in 000s of cubic metres for the four main species in successive inventories.

		Inventory year		
Species		1950	1960	1970
Spruces	Sitka	10.0	12.0	15.0
	Norway	2.0	2.5	3.0
Douglas fir		6.0	7.0	7.5
Western red cedar		8.0	9.0	11.5

Note that the table caption avoids the need to have either footnotes or a boxhead cluttered with the units used. For large numbers, it is convenient to scale up units, as in table 3.4.

Columns and rows should be well enough separated that lines in the body of the table are not needed. If you do use lines, especially with hierarchies of thickness, do so in a logical and consistent way. Table 3.2 on the one hand and tables 3.3 and 3.4 on the other show two possible layouts.

Align all numbers on the decimal point: word processors often have a facility (decimal tab) to do this automatically. (Unfortunately WORD treats the spaces between groups of three digits as a decimal point: reverting to commas gets round this problem.) Do not include columns of data that can be calculated easily from data in other columns. Minimise use of superscripts to indicate footnotes to tables, and if you do use them ensure that they do not run into other fields.

4 REQUIREMENTS FOR PARTICULAR KINDS OF WRITING

Some examples of different written styles appear in section 4.9. In the following sections general requirements are outlined.

4.1 *Leaflets and popular articles*

Writing for the general public has less rigorous formal requirements than academic style. However, the needs for conciseness, clarity and interest are even more acute. Popular writing is an important way of presenting your organisation favourably to the public, and it deserves much care.

When writing leaflets for visitors – to a nature trail, say, or for a factory open day – remember that the visitor is not a technical expert and probably has no wish to become one. Words which may be everyday to you, like ‘transhumance’, ‘brashing’ or ‘arabinogalactan’ mean nothing to most people. Piles of technical terms confuse them and make them feel inferior. They may be prepared to learn one or two new words if you define them carefully, but don’t overload them.

Don’t assume that people know much about your specialism: they may not even know the difference between a conifer and a hardwood. If you draw their attention to something, make sure that they will know it when they see it. ‘Goldeneye may be seen nesting in trees near here’ is not very helpful, if visitors have no means of telling what a goldeneye is like, or whether it might kill them if it falls on them.

Try to draw out some human interest from your material. Local sayings and customs help to relieve the tedium of unmitigated scientific instruction.

Illustrations are very important, both to identify unknown objects and to break up the text. Try to scatter illustrations uniformly through a leaflet.

Devising a good trail or layout for an interpretation centre is another skill, but it may help when doing it to bear in mind the descriptive leaflet you hope to produce. Both the visited location and the leaflet will be more interesting if they have an identifiable ***theme*** (rather than a miscellany of facts in the general subject area) and a ***story*** (which develops from point to point through the experience).

Popular articles may have a political purpose (to enlist public sympathy for your organisation’s viewpoint). Contentious statements are more admissible, particularly because the public will become bored with a meticulous attempt to cover all possible cases and exceptions. But make sure that you can back up the statements with facts and sound arguments. There will be plenty of folk ‘from the other side’ waiting to pounce on loose arguments and disputable facts.

4.2 *Essays*

Essays are set to improve and assess your ability to collect, select, arrange and communicate facts and ideas. In exam conditions they also test ability to remember them! These skills are important for those whose working lives will include a large portion of organisational and communication activity. For the majority of students, essays for examinations and assignments are the most important means of assessment, so it is worth taking trouble to improve your technique. ***Note that a huge number of marks is lost each year because essays do not answer or even address the question set***. The advice below may help.

4.2.1 *Identifying the problem*

It seems to me that there are three types of essay:

I memory or search tests;

II compilations which involve selection and synthesis of information;

III arguments which have to be thought out from scratch.

From I to III, importance shifts from materials (emphasis on correct facts) to structure (emphasis on construction of argument). Different members of staff tend to set different types of essay, which should give you the opportunity to develop a range of skills.

Type I requires the ability to identify the 'key phrase' in the question, to locate the appropriate material, and to set it down ***in your own words*** – extensive quotation of learned authorities does you very little good, and simply copying out a long passage of a book is quite likely to get you no marks at all. Such questions are best kept for exams, where memorisers will do well. In continual assessments you can only expect to do well in questions like this if you give the answer elegantly in your own words – which may limit the aspirations of some of you.

Type II requires a command of the information and an orderly mind to organise it (probably in the form of the divergent hierarchy described in section 4.2.3). This is probably the commonest type of exam question.

Type III requires innovative thinking skills. In continual assessments you can think at leisure, but in exams you have to be able to do it quickly. Some thinking-out questions require a close argument ('Present the case either for or against the use of discounting in forestry in a named country.') Others allow you to be less definite ('Speculate on possible developments in crop harvesting technology.') A good answer to this type of question will probably get more marks than any other. Some members of staff who hope to encourage ***creative thought*** tend to set questions of this type.

4.2.2 *Approaching the problem*

It is first helpful to decide which type of essay is indicated by each question, and assess how it matches your own strengths. In exams it is a common tactic to try to guess who has set each question, and choose the questions accordingly. This ***may*** pay dividends, although you may guess incorrectly, or misperceive an identified individual's likes and dislikes. (If an exam question has clearly been answered as though for someone else, we generally give it to that person, rather than the setter, to mark.) However, the main advantage in 'setter-spotting' remains that a particular setter may set questions which match your own strengths – and weaknesses. That being so, the best tactic is to answer the questions in areas where you feel most competent.

In an exam the next thing to do is to decide whether you have an adequate knowledge of the facts required to answer each question. Argumentative questions may not need ***many*** supporting facts, but they need ***some***. In continual assessments the important question is, can you get at the necessary facts in the time available (if the submission time is 9 a.m. tomorrow, is the library about to close?)

The third step is to analyse the question. What is it getting at? Can it be interpreted in more than one way? Can it be broken down into components? Is it straightforward, with a clear right (and clear wrong) answer? or is it contentious, suggesting that any one of several views might be argued, robustly? (Questions which open with a quotation are often of the contentious type.) What kind of result does it expect: a detailed and accurate description of a narrow topic? a comprehensive overview of the important factors in a broad topic? a balanced assessment of two sides of an argument? an account of differences and similarities between groups of ideas or things (compare and contrast questions)? a definite conclusion favouring one idea, process or thing over others? Once you have decided that, remember what you are trying to do, and don't be diverted from your purpose by details.

Fourthly, you need to marshal the facts into some sort of order. Sometimes you have too many facts, and you need to decide which to throw out. In argumentative (type 3) essays the facts need to be at hand (on headed sheets of paper, if you don't have them in your head), ready to be drawn into the argument where appropriate to the argument's structure. For type II essays the facts themselves will tend to determine the structure. ***Do*** take the trouble to arrange them in some pattern. Ask, what different aspects of the topic need to be covered? What kind of sequence can be given to the material? is there some obvious historical development? can the relevant factors be arranged on a spectrum through physical to biotic to human? what are the generalities (which come first) and what the specifics (which come after)?

4.2.3 *Addressing the problem*

When you sit down to write, remember that a good essay is distinguished not by the number of facts it contains – nor even the number of ***relevant*** facts it contains – but by its logical development of an argument or structuring of an array of information. An essay is not a repository for your accumulated knowledge of a subject, but a response to a particular question.

Very generally, an essay will be in three parts: introduction, discussion, conclusion. Usually the discussion will be much longer than the other parts. If you are using sub-headings, 'Introduction' and 'Conclusion' are often appropriate, but several sub-headings within the discussion may be needed. The sub-heading 'Discussion' is not very enlightening.

The introductory passage is normally devoted to an expansion of the question. It may include brief comment on factual circumstances mentioned in the question, a breakdown into elements of the question itself and possibly an outline of your intended method of answering it.

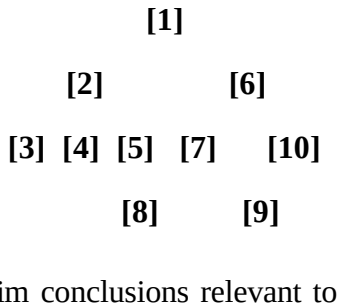
The central part of the essay is a discussion, and will include most of those facts which you decide are relevant. Two kinds of structure are possible: linear, or hierarchical – though they may occasionally be combined by those of prodigious skill.

A linear structure suits answers to those type I questions which follow a process through time or across space ('Describe the sequence of operations during a complete silvopastoral cycle'; 'What layout would you expect to find in a modern paper production line?'). If you have the facts at your disposal, they clearly determine the appropriate flow of the essay. Chapter 5 of this document follows an obvious preordained order of this nature.

A linear structure is also appropriate for a contentious answer intended to display originality and clarity of thought (type 3 questions). Each paragraph is a step in developing the argument and is a logical consequence of what has been proposed or demonstrated in the paragraph before. Facts are introduced as they bear on the discussion, and counter-arguments are generally dismissed where they relate to supporting arguments: it is, however, possible to develop first the case for, then the case against a proposition, in two separate sequences, followed by a concluding section that weighs the merits of each.

A hierarchical structure is apt when many lines of thought are pursued, or much information imparted, and is especially suitable if you have a comprehensive grasp of the relevant facts (in response to a type II question). The chief function of the hierarchy is to present information in a clearly structured format. Usually, a divergent hierarchy is needed. First the major classes are introduced – say the economic and the environmental arguments for a course of action. When any general points have been made, further subdivisions can be revealed, successively down to the level of individual points or facts. It is generally more satisfactory to work through all the sub-classes within each class before saying anything about other classes (except that they exist). The order of treating a hierarchy can be represented diagrammatically thus:

Figure 4.1 The sequence of treatment of hierarchical material



Interim conclusions relevant to higher orders may be stated before the next major division is treated (e.g. for [2] between [5] and [6]). A given paragraph should normally contain all the information relevant to a particular number in the hierarchy.

A convergent hierarchy, in which the lower classes are successively joined together, is much more difficult to handle. It requires a clear knowledge of how the argument is to develop if the essay is not to appear as a random collection of facts. Expertly done, it is probably the most interesting form of essay, since the relationship of all the facts only unfolds gradually towards the climax of the argument.

In a linear discussion, the essay's conclusion may well sum up the main steps in the sequence of logic. It will reintroduce the elements of the question, and show how the last step in the sequence answers them. To conclude a divergent hierarchical argument, the most salient facts from the bottom of the hierarchy may be summarised, and their relation to the question receives comment. The convergent hierarchy may need no conclusion beyond the last part of the discussion. That may in itself answer the question ('I rest my case, M'lud'!), or only need brief comment. ***It is vital to avoid conclusions that fail to answer the question, or that give the impression that you have run out of facts***.

It is helpful to write out a 'map' of the structure on one page (you may submit a neat copy if you wish), with stages in development assigned a letter, or a number, or both if you want to group ideas (B1, B2). Then list the important facts or arguments elsewhere, and give them a letter according to where they fit into the development. Alternatively, scatter the elements about a page, and draw arrows linking the sequence of thought. Avoid dragging in facts simply because you have written them down: if the fact does not affect the argument it is better left out.

Appendix III suggests some essay titles which might be discussed in an Essays Workshop.

4.3 *Literature reviews*

You may be required to write an essay examining the literature on a particular topic as a free-standing assessment exercise; you will certainly be required to include a literature review section in your dissertation; and, when you hit the Big Wide World, you may be commissioned to produce a professional subject report which is partly or wholly a literature review.

A literature review may simply be a factual report on what has already been written on a topic. In this case your job is to summarise and collate the ***information*** on the subject. To do so requires a degree of generic skill in information processing (how to extract the main points; how to structure a related set of information), and a sufficient knowledge of a broad subject area to understand the essential meaning of what has been written.

On the other hand you may be required to supply an ***evaluation*** of what has been written. In this case you may have to weigh the merits of apparently contradictory results or statements, give reasons why some of these deserve more attention than others, and possibly offer a personal view about where the truth, on balance, appears to lie. Clearly to do this well needs a deeper knowledge of the subject, probably with some first-hand experience in this field.

The first thing to establish is which of these two kinds of review is required: you should neither exceed your brief by venturing opinions when summary and collation alone are

required, nor confine yourself to factual report, when guidance about the reliability and value of other people's work is sought.

There are three general ways to structure a review. In the first, the literature is dealt with author-by-author (at worst in alphabetical order, better in historical succession), and paper-by-paper (possibly in date order). If comment is offered, it would be in a concluding section. The result (much abbreviated and generalised) would be something like this.

> Jones (1987) investigated the phenomenon in laboratory conditions and found major differences (by a factor of two) between growth rates under high and low carbon dioxide concentrations. However, in field conditions these results were not reproduced (Jones, 1991), despite very accurate measurement. Jones (1993) has recently repudiated suggestions that her laboratory results are unreliable.
>
> MacGregor (1985) had earlier experimented in field conditions with a wider range of species, and obtained results similar to Jones's field results. More recently, MacGregor (1992) has suggested that laboratory results may be unreliable, owing to the artificiality of light wave-bands.
>
> Smith's work (Smith, 1979) pioneered laboratory techniques in....

Such an approach is likely to be safe and comprehensive, but uninspiring and dull. It is most likely to be appropriate for factual reports of literature, where superiors just want to know what has happened so far, and possibly to make up their own minds.

The second approach, appropriate to an evaluation of the literature, goes through the subject area sub-topic by sub-topic, preferably in a logical divergent hierarchy (see section 4.2.3). The material is arranged in such a way as to highlight possible conflicts, ambiguities and consensuses in the literature; these are commented on, with perhaps a suggested resolution. The result might be like this.

> Following the pioneering work on laboratory techniques by Smith (1979), Jones (1987) investigated the phenomenon in laboratory conditions. She found major differences (by a factor of two) between growth rates under high and low carbon dioxide concentrations. MacGregor (1992) has suggested that these laboratory results may be unreliable, owing to the artificiality of light wave-bands. It seems, however, that MacGregor is unaware of recent developments in simulating natural wave-banding, so his conclusions may be viewed with scepticism. Jones (1993) is also critical of MacGregor's conclusions, but fails to produce supporting evidence.
>
> On the other hand, MacGregor (1985) and Jones (1991) both found no significant effect of carbon dioxide concentration on growth in the field. MacGregor used a range of species, while Jones employed very accurate measurement, and their findings might be provisionally accepted.

The third approach is a hybrid, more interesting than the first, but less prone to charges of author bias than the second. The material is introduced sub-topic by sub-topic, and by author under the sub-headings.

> <u>Field experiments</u>
>
> MacGregor (1985) and Jones (1991) have both conducted extensive field trials, concluding that carbon dioxide levels did not affect growth significantly. MacGregor used a range of species, while Jones's work involved more accurate measurement. [Any other work under this sub-heading.]
>
> <u>Laboratory experiments</u>
>
> Techniques here were pioneered by Smith (1979). Jones (1987) applied these techniques and found that high carbon dioxide levels increased growth by a factor of two. She has repudiated criticism of the reliability of these experiments (Jones, 1993). MacGregor (1992) has suggested that laboratory results may be unreliable, owing to the artificiality of light wave-bands.

In terms of organising your work, clearly the first phase is to read the literature. You may be given a list of items to read (especially at first). As you become more expert, you will be expected to put the list together yourself. There are various ways of doing this, listed in increasing order of sophistication and effort you need to apply.

1 Look up the reference list in a recent book on the subject.

2 Ask experts in the field (verbally, by phone, by letter) for what they regard as the key items. ***This is not recommended: you will probably annoy the hard-pressed people who do respond; the hard-pressed people who don't respond will probably annoy you.*** At least show that you are making an effort by compiling your own list and asking for additions. But don't use this technique at all outside the School, at least until you reach dissertation stage.

3 Interrogate data-bases such as *CAB for CD-ROM* or *CD-TREE*, with appropriate variations and combinations of keywords. These are both available on-line.

4 Start from a key paper, and compile both its references, and the papers which have later cited it. References can be taken from the hard copy: later citations require the power of BIDS, or the old *Science Citation Index*. You will find that this technique produces an ever-growing list.

You can read all through the items you find, noting the main points as you come to them. (Do this on record cards for easy rearrangement, or on your own data-base if you are good at that kind of thing.) It is more efficient, however, to read the abstract (often available on data-bases), to find whether the item is really relevant, and to get an assessment of main points.

Probably you will discover that there is a relatively small number of key items (which are referred to by many other authors, or which seem to make most of the relevant points). Read these end to end (unless they contain irrelevant experimental detail or excessive mathematics). As well as information, they may well supply you with appropriate sub-topic headings. Highlighter pens, or asterisks in the margin, may be helpful, ***but only on your own copies of material***.

Don't wait until the last moment to structure and write your review. You'll never include all the relevant literature anyway: so decide ***when*** you are going to draw a line under your data-gathering efforts, and do it, ***then***. A good review of an incomplete sets of items is better than an incomprehensible review of everything. Decide which approach to structuring you will adopt, then draw up a structure using the techniques suggested in section 4.2.

Then write it. See section 5.5 for instructions on how to cite and list the references.

Examples of reviews recommended by members of SAFS staff appear in Loveless and Hamrick (1984), Peters (1970), Price (1994), Rowell (1983), Ruane (1988) and Savill (1983).

4.4 *Experimental write-ups*

The report should be clearly structured into sections. The usual structure is:

Summary/Abstract	If it is required, place it here. See section 5.1.
Introduction	Briefly outline the subject matter and the objectives of the exercise (see section 4.10): what is the topic and why is it being investigated?
Materials and methods	In laboratory experiments what apparatus and chemicals/biological materials did you use? In field experiments, where is the study area and what is it like? What was the experimental design? (this may require a preliminary explanation of data analysis methods). What treatments were adopted? how many replications? what did you do to evoke a response from your materials? What did you measure? with what? how often or at what spatial intervals?
Results	Present your data in a structured form - usually in tables. If there are masses of data, junk any that are not relevant (but ***not*** any that you cannot explain or which undermine your prejudices); all that are not needed for immediate understanding may be placed in an appendix. Summarise data graphically or using summary statistics such as mean, mode, standard deviation or standard error. Analyse the data in a logical sequence, noting significant differences or trends.

Discussion	Consider the implications of the analysed data, in relation to your objectives.
Conclusion	Make a concise statement of your main conclusions, again in relation to objectives.
Acknowledgements	See section 5.4.
References	See section 5.5.
Appendices	See section 5.6.

4.5 *Dissertations*

Dissertations may be extended literature reviews, essays or case studies. Take great care with the structure of such dissertations, as the way you present information is your chief academic contribution.

More often they are big experimental or survey write-ups with a literature review between the 'introduction' and 'materials and methods' sections. The literature review will deal with both the theory of the subject, and the results obtained by previous experimental workers. There may also be a section where you develop the theory further, and explain what you are going to do to test it. In the discussion section it ought to become clear what contribution you have made to knowledge, and you should give much time and thought to it.

For higher degrees many experiments may be involved. Some may give results which in the end are irrelevant: don't waste space describing these, though it may be worth mentioning that they were performed as part of the investigation. If experiments test different hypotheses, the materials and methods/results/discussion sequence may be repeated several times, with a concluding chapter drawing together the main points from your discussions.

See section 4.10 for information on titles and objectives of dissertations.

4.6 *Reports*

Plans and reports are practically orientated. The structure is likely to be:

Introduction	Locate and briefly describe the area covered by the plan. Define the objectives of the plan.
Description	This should follow the logical sequences suggested in section 2.3. Information may be gathered directly (usually only a brief outline of the method is needed), or be derived from secondary sources. Detailed data should be placed in appendices; the text should contain the key information; anything which contributes nothing to the remainder of the report should be junked, irrespective of how long it took to collect.
Alternatives	The report is normally expected to recommend some course of action: this recommendation only has meaning if it is known what other courses of action have been considered. Always outline them explicitly. Sometimes this section is placed before the description.
Evaluation	On the basis of the data presented, the capability of each alternative to meet the objectives is assessed. Evaluation may be intuitive or descriptive, or some formal quantitative technique may be invoked. The reader should be able to follow your evaluation, but no description of the theory of standard techniques is needed.
Recommendation	The preferred course of action is presented, and a detailed programme for its implementation may follow.
Review process	It may be helpful to indicate possible response to changing circumstances.

4.7 *Academic papers*

An academic paper should report a new conclusion, or a new application of an old idea. Management reports and evaluations, and experimental findings that replicate known results, are not of interest. If you think you have something worth turning into a paper, discuss it with a staff member before investing effort in planning: the work may already have been done elsewhere, or the topic may be unsuitable. Staff members may also suggest an appropriate journal, so you can study its style. Explicit *Instructions to Authors* are often printed (e.g. inside the back cover of the journal) especially in the last issue of each volume.

Journals are pressed for space, so brevity is at a premium. Reducing a dissertation to a paper means omitting most of the material, as well as condensing the material that is included. At the same time you must be even more rigorous in supporting your conclusions. The lions and jackals of the academic world are waiting to tear you to shreds if your conclusions undermine their own, and you may bear the scars of premature or incautious publication long after the event. But cheer up: the academic reviewers will probably reject or refer back the paper without its getting into print! They may be doing you a kindness.

Immaculate presentation is a worthwhile investment. Don't argue that it isn't worth bothering to make it look good unless it is accepted. Editors and reviewers will be quickly turned against your paper if it looks slapdash.

It is more than usually important to persuade someone else to read what you have written before submission. Some journals require you to list people who have read the paper prior to submission.

4.8 *Memoranda, technical notes and subject reviews*

Part of your professional job may be to produce potted information for colleagues or practitioners with less time or specialist knowledge than you have yourself. You should plan even a brief memo according to the rules in section 6.2, though with experience this becomes a mental, not a written process.

Memos in particular must be brief: a side of A4 is a good target size. Senior managers may be pressed for time and unfamiliar with technical jargon: all they need is an answer to the question posed. The recommendations are therefore more important than the argument or supporting evidence. An example and critique of a memorandum are given in appendix I.

Technical notes tend to be passed ***down*** a hierarchy rather than up, but they too must be brief and give a clear indication of the practical implications, rather than the theoretical basis, of a topic.

Subject reviews should be comprehensive – though still concise. They may be needed for someone totally uninitiated, such as a new minister, or for someone thoroughly familiar with the general background to a subject. Scientists will be irritated by long explanations of what is familiar to them. You must establish precisely who is going to read the review, and what their competence is.

Quite possibly no recommendation is required, your job being to provide background information. Make sure the information is grouped logically, so that readers can find their way easily to any sub-topic. Paragraph or section numbering is very helpful in this kind of document, for indexing and cross-referencing. Always provide an 'executive summary' at the beginning, giving the main points for action and referring to the paragraph or section numbers where a fuller version of information and arguments may be found.

Detailed advice on reviewing literature is given in section 4.3.

4.9 *Contrasting examples of style*

The following all convey similar information, for different purposes and readerships. Firstly, the summary of an experimental report:

> Twelve winter wheat varieties were sown at 150 kg/ha on 19 September and 11 October 1988. The varieties were arranged in four randomised blocks for each sowing date. The mean response to early sowing was 1.05 t/ha with all varieties giving a higher yield following early sowing. Brock, Slejpner and Galahad were the highest-yielding varieties at both sowing dates, while Corinthian and Rendezvous gave lowest yields.

The second example is from an academic paper which collates such results. This might be the introduction to some further experimental work, or could be a free-standing literature review:

> Wheatman and Flour (1985) and Breadmaker *et al*. (1987) have reported optimal sowing dates for winter wheat ranging from 20 September to 10 October. However, Contrary (1989) noted that many producers are unable to achieve dates within the optimal range, since they have large areas to sow. The sowing rates achieved in experimental work and under commercial conditions have been reviewed by Tiller (1988). It has been suggested (Playit and Safe, 1989) that early sowing, before 20 September, entails less loss of yield than sowing after 10 October.

A general Technical Advisory Note follows:

> The optimum time of drilling for wheat is near the last week in September or first in October. The problems resulting from starting too early are generally seen as less serious than the risk of ending too late, and this has encouraged early drilling. On heavy soils some early sowing is essential if drilling is to be completed before weather and soil conditions deteriorate. Contact your local ADAS office for more information.

A farming press article is more informal, and notes management as well as technical factors:

> Winter wheat growers should get their crops in early. This was the conclusion drawn after three years of experiments at sites throughout the country. Optimum sowing dates ranging from mid-September to mid-October were found, but many farmers had to sow their crops at other times because current work rates are too slow to allow large acreages to be sown in this period.

Next, a farmers' newsletter refers to local conditions:

> Local experiments have shown that the best time to drill winter wheat in Grainshire is during the last week in September or the first week in October. Often it is difficult to achieve this ideal, especially if you have large acreages to drill. Since drilling late can lead to lower yields it is better to start early. However, local evidence suggests that drilling before 15 September is not worthwhile.

Finally, a farm trail leaflet addresses the public on the matter:

> If you pass through these fields in early autumn you are likely to find the farmer sowing winter wheat. [Sketch of tractor with seed drill.] Scientists at the nearby Ivory Towers Research Station (you can see the building ahead) have found that best yields are achieved by sowing in the last week of September and the first week of October. Hence the traditional jingle:
>
> Sow before St Matthew's day
> And money you will throw away.
>
> The restricted sowing period creates a problem for farmers with large areas of winter wheat, and they work long hours to get the job done. A local story has it that many years ago a farmer sowing wheat on a moonlit night was confronted by a frog, who promised to sow the whole area that night if only it was allowed to sleep in the farmer's bed afterwards. The farmer agreed, and to his amazement in the morning the frog had become a beautiful girl of noble bearing, who had been placed under a spell by a wicked wood-witch. They married, and moved to the girl's ancestral home at Talltale Hall in the next parish. The present owner of the hall still prides himself in finishing his sowing first of all the neighbourhood!
>
> Later in the year, the green blades of the wheat plant, called ***tillers***...

4.10 *Defining objectives of written work*

When defining the objectives of single experiments it is important to be clear and specific. Groups of experiments require broader objectives, but clarity is still important. Consider the following:

> To compare the growth, crop yield and fruit quality of thirteen new pear seedlings with two standard varieties.

The features that make this a good example are:

- type of crop/animal is stated;
- variety/breed is included;
- an indication of treatments is given;
- the records to be collected are mentioned.

The following bad examples lack several, or all, of the above:

> To assess the causes of death in young lambs.
> To investigate the recovery of the tick population after a period of regular control measures.
> To improve the yield of second crops of winter wheat when grown on peat soil.
> To assess the effect of various factors on the severity of take-all in the winter wheat crop.

(There is often a converse tendency to be too detailed in titles of dissertations, which thereby almost become a parallel statement of objectives:

> An Investigation into the Origins, Causes and Socioeconomic Consequences of the Migration Drift from Rural to Urban Areas in Karnataka State, India, with Special Reference to Ground Surveys of the Impact of Forest Employment on the Evolution of Village Settlement Pattern in the Western Ghats.

All dissertations report investigations, so the first three words are redundant. They also have a pathological tendency to 'have special reference to' something. The remainder can be reduced to:

> Forest Employment, Migration and Settlement in the Western Ghats.

This is more eye-catching, and easier to print on the thesis spine! Detail, if needed, can be given in a sub-title.)

In dissertations, it is quite likely that there will be a broad objective, within which several narrower experimental objectives will be subsumed. Mention all of these in your introduction. For case study and social survey dissertations, it is important to distinguish the objectives of ***your study*** from the objectives of ***what you are studying***. An extension programme might have the objective of persuading farmers to plant more woodlots: the objective of your research might be to determine how effective the extension programme had been.

5 ANCILLARY MATERIAL

Major pieces of writing will include material which stands before the main text, or after it, or both. It needs the same care as the text, and is governed by several additional conventions. Don't leave its preparation until the last moment: it really does take a lot of time.

5.1 *Abstract or summary*

An abstract is not a list of contents in free prose: it is a self-contained piece of writing which says, with great terseness, the same thing as the text. It is often treated as a separate piece of work, and may very well be published separately in abstracts of dissertations, or in an abstracting journal, or in a data-base. The abstract will almost certainly be read by more people than the full text (and those who read the full text may do so because the abstract catches their attention), so it is worth taking great care with it.

Written matter of the following kind is often submitted and published as an abstract, but it isn't one.

> A problem with the growth of second-rotation Sitka spruce in a forest area in Britain is identified. The conditions under which the problem occurs are described. Experiments to find the cause of the problem were set up, with two factors combined in various combinations. The results which were recorded are analysed, and their statistical significance is evaluated. It is concluded that the causes are primarily biological and edaphic. Some action should be taken to improve the situation.

This is almost totally useless as a source of information. What actually happened was this.

> Extensive failure of second-rotation Sitka spruce in Kielder Forest is found in waterlogged areas. Different deer protection regimes and seedling planting positions were combined experimentally. Mortality ranged from 95% (no protection and planting in ditches) to 10% (fencing and elevated planting position). Differences were significant at the 99% level. Elevated planting position seemed to have the greatest effect, and should become part of establishment practice.

With no greater length, this is much more informative. Journals do require abstracts to be as terse as this. For a dissertation about 300 words may be permitted.

5.2 *Contents lists*

These are only required in longer reports. They may seem an unnecessary chore, but they serve as a guide and give at a glance an idea of the scope of the work. 'Contents' should list parts, chapters, appendices and other ancillary material, but not necessarily every section and sub-section within chapters. Accurate lists of tables, figures, plates and maps should follow: they are vital if you refer to one item from several parts of the text without giving a page number.

You cannot assign page numbers in the lists until the final copy has been produced, but it is advisable to make a fair copy of headings/titles beforehand. This can be upgraded very easily if a word processor is used. WORD has a facility to create contents lists automatically, but you need to spend some time learning about it first, so don't leave it to the last minute.

Contents lists are best placed immediately before the preface. If there are many appendices, you might list them separately at the beginning of the appendix section.

If abbreviations and symbols not in common use appear throughout the text it is very useful to place a list of them before the main text.

5.3 Forewords, prefaces and introductions

There is much confusion over the distinction between these terms, which is as much a matter of common practice as of ordinance. It is normal for the foreword (note the spelling) to be written by an eminent person (usually the Duke of Edinburgh) to commend a book. It is not appropriate for the sort of writing you will do. A preface is written by the author, to explain how a book came to be written, what its purpose is, who should read it and how it should be used. Both foreword and preface stand outside the main composition, and this is optionally reflected by numbering their pages in small Roman numerals with other end-papers.

By contrast, the introduction is part of the main text; it forms chapter 1 or the first section, and always falls into the main sequence of page numbering. It introduces the ***topic*** rather than the ***book***.

5.4 *Acknowledgements*

You should acknowledge any help received in compiling written work: those who helped with experimental work and whose results you share; those who advised you on statistical analysis; those who guided you (especially your supervisor), supplied ideas and commented on earlier drafts; those who helped with production (typists, photographers, draughtspeople, and computer managers who rescued your files); those who made your life congenial/bearable while the work was being done; those who provided financial support. All this is common courtesy. It is also mandatory in submitting dissertations to acknowledge any academic help received.

In a book or dissertation, acknowledgements come before contents lists or between contents lists and introduction, if there is no preface. If there is a preface, acknowledgements often form the last section of it.

In short papers, acknowledgements normally appear between main text and references.

5.5 *References*

If you use an idea, opinion or piece of information from a publication or another worker, acknowledge it by placing a marker in the text immediately after it. List all such sources under the heading ‘References’ or ‘Literature cited’ at the end of the text. Many systems are in use for the layout of references, and there is no widely agreed way of punctuating references; adopt one system consistently. The system described here is widely used in the scientific literature (go to the library and check that this is so).

5.5.1 *The text marker*

After the publication is referred to, place in the text a marker consisting of author and year of publication, in brackets. For example: ‘It has been shown (Hall, 1986) that...’. If there is no date, refer to as ‘undated’ or ‘s.d.’ (= *sine datum* = without date); if unpublished, as ‘unpubl.’; if accepted for publication, but full publication details are unknown, as ‘in press’; if it is a personal communication from another worker as ‘[date] pers.comm.’.

If the author’s name is part of the syntax of the sentence, only the date is put in brackets. For example: ‘Hall (in press) has shown that…’. If you use inset quotations, **Anon (1985)** argues that

> it is often neater to incorporate the reference into the sentence before the extract.

However

> where the reference does follow the extract, it should be in parentheses, following the final full stop of the extract, but without a full stop of its own**. (Anon, 1985)**

Thirdly, 'where a shorter quotation is run on in the text, the reference in parentheses is best typed before the [final] full stop...' **(Anon, 1985).**

Unless two authors with the same surname are quoted, do not include the author's initials, and never include the author's title. If you quote several publications by an author in one year, distinguish them by letters. Thus:

> Behaviour of enraged elephants in pole-stage plantations has been characterised as unhelpful (Hall, J.B., 1986a, 1986b). However, this view has been challenged (Hall, L., 1986; Hall, M., 1986).

Cite two authors as (Hall and Healey, 1988); cite more than two authors as (Hall *et al*., 1986). '*Et al*.' = '*et alii*' = 'and other persons'. Some journals use a different convention on how many authors should be named in the text, and on how many should reappear at every subsequent mention in the text. You just have to check for that.

If the author is not named (for example, in a newspaper article), give the reference as (Anon., 1987). However, an organisation's publications for which no personal author is given are usually quoted as, for example, (Building Research Establishment, 1989).

If you quote what Reviewer (1976) alleges that Originator (1963) wrote, the reference is to (Originator, 1963, quoted in Reviewer, 1976). The full reference list need only include Reviewer's paper. Alternatively, you may give a text reference to (Originator, 1963), then give the bibliographic details for Originator in the full reference list, followed by 'Cited by Reviewer (1976) [full reference].' It is safer and more satisfactory to check and quote Originator's publication directly, but it may not always be readily available.

If you quote several sources in one place, do it consistently either in alphabetical order of author, or preferably in order of date, separating the authors with a semicolon **(Anon, 1985; Denne, 1994)**.

Some publications still use '*ibid*.' = '*ibidem*' = 'in the same place', rather than repeating the reference, if it recurs without any other reference's being given in the meantime. This is tiresome, as it means scanning back through the text. Using (Denne, *op.cit*. = *opere citato* = in the work [by Denne most recently] cited) is pointless in the referencing system used here – just repeating the date takes less space and gives fuller information. You may meet this weird usage in publications using other referencing systems, but don't fall into the trap of thinking it is somehow more sophisticated or helpful: it isn't.

5.5.2 *Electronic material (World-wide Web)*

Nowadays a vast amount of material, not published in conventional format, is available through the Internet. It is also sometimes easier to access material that is conventionally published, in electronic form. However, because Internet material does not have to go through a reviewing process, it still has less *a priori* weight than printed material which normally has been so reviewed.

No well recognised conventions on referencing such material have emerged, but the two principles are the same as for other formats: report the author(s) and title of the material; give the 'publication' details in a form that makes it easy for another reader to find it. Page numbers should usually be omitted, as they depend on the output medium used. The date given should be that when the material was placed on the Internet, not when you found it there. A suggested format is given in section 5.5.3.

5.5.3 *The list of references*

At the end of the text, list references ***firstly*** in alphabetical order of first-named authors' surnames; ***secondly*** in alphabetical order of first-named authors' initials; ***thirdly*** in order of second-named authors' surnames (if any – and so on through later-named authors); ***fourthly*** in chronological order of date; ***finally*** in order of the reference letter, which itself should follow the same sequence as alphabetical order of titles. Use authors' surname and initials only, ***not*** their personal names or titles (exception: Porchester, Lord). Thus we would have:

Hale, M.D. (1988)
Hall, J. (1988)
Hall, J.B. (1986a)
Hall, J.B. (1986b)
Hall, J.B. (1988)
Hall, J.B. (in press)
Hall, J.B., Alcock, M.B. and Thomas, T.H. (1988)
Hall, J.B. and Hall, M. (1986)
Hall, J.B. and Thomas, T.H. (1987)
Hall, M. and Hall, J.B. (1985)
Healey, J.R. (1986)

The full reference should correspond unambiguously with the text marker, and enable readers to trace the original source easily. It should include the names of ***all*** authors. Conventions for layout, typography and punctuation vary between publishers and journals (consult the appropriate journal when writing a paper for it). The following show layouts for respectively a personal communication, material found on a Web site, a contribution to an edited volume, a journal article, a book, a newspaper article and an unpublished report. Extra half line spaces between items, or indented continuation lines, or both, help in finding author names quickly.

Denne, M.P. (1994). Personal communication. School of Agricultural and Forest Sciences, University of Wales, Bangor, Gwynedd LL57 2UW.

De Sarkar, D. (1998). UNDP Report: Row over Consumption. http://independent-bangladesh.com/news/sep/20/200998ed.htm.

Harding, D.M. (1978). The hidden input: water and forestry. In R.B. Tranter, (ed.), *The Future of Upland Britain*. Reading: Centre for Agricultural Strategy, pp.91-9.

Mayhead, G.J. (1973). The effect of altitude above sea-level on the yield class of Sitka spruce. *Scottish Forestry*, **27**, 231-7.

Price, C. (1989). *The Theory and Application of Forest Economics*. Oxford: Blackwell.

Stokes, P. (1990). Gale-hit trees ravaged by hot summer. *The Daily Telegraph*, October 15, p.4.

Thomas, T.H. and Willis, R.W. (unpubl.). *Cost-Benefit Analysis of Alternative Farm Forestry Systems: Farm Survey Methods*. School of Agricultural and Forest Sciences, University of Wales, Bangor.

Notes:

1 Italics and some capital letters are used for the title of the journal or book. If in doubt, use italics for the title which seems most likely to be helpful in locating the item in a library.

2 There are standard abbreviations for journal titles, but it is safer to give the full title.

3 Volume number often appears in bold type, or underlined, followed by page numbers, which are contracted as much as possible (231-7 means 231-237). [Exception: 10-19, 213-17.] There is usually no need to write 'vol.27, pp.231-7'. The part number within a volume is sometimes given in brackets after the volume number, as in **31** (3), 23-9: this is only

necessary if the page numbering starts at page 1 in each part, or if the journal for which you are writing uses this as standard.

4 Place of publication or publisher or both should be included for books.

5 Contributions to edited volumes are given page numbers preceded by 'pp.'

6 The newspaper reference is an example of (Denne, quoted in Stokes, 1990).

7 Important UK Government documents are often referred to as command papers. The command paper number should be given, along with HMSO as the publisher. For example:

H.M. Forestry Commissioners (1943). *Post-War Forest Policy*, Cmnd 6447. London: HMSO.

When Acts of Parliament are referred to, it is usual simply to give their whole title, including date, in the text. For example:

The National Parks and Access to Countryside Act 1949.

If you include them in lists of references, give the full title of the act, and again quote HMSO as the publisher.

8 Personal communications are not usually listed, but it may be valuable to do so, and to give an address for those who wish to check your source. However, you should first check with the source that it is acceptable to give the address, and that what you have said is a reasonable representation of what was communicated.

Check that everything cited is included in the list of references. Check that each item in the list of references is actually cited. This is most easily done by going carefully through the text and ticking each item in the reference list as you find it. Any unticked items can be checked again using the search function of the word processor – if you are working on one.

'Literature consulted but not cited' – from which you may have derived a general feel for the subject – is sometimes listed as such after the references in the same format. The term implies a comprehensive list of all literature on a subject, and is unlikely to be an appropriate heading.

5.6 *Appendices*

Appendices are normally placed after the references, but it is sensible to place them before the references if the appendices themselves cite references.

Appendices should contain material which is relevant to the topic of the document, but which

(a) is so voluminous that it would obstruct reading the text;
(b) provides detailed examples of a general principle or process discussed in the text;
(c) has been taken from other people's work;
(d) covers related material which is not needed to follow the text to a conclusion.

It is tempting to shovel everything collected but not needed in the text into appendices, which thus become a sort of verbal cold store. Resist the temptation to do this. Ask whether any reader might want the information to support reading of the document. If so, arrange it carefully. If not, junk it. Appendices need not lead in any sequence from one to the next, but the content of each appendix should be cohesive. The text should refer the reader to ***each appendix*** at the points where the appendix is most helpful. If there is no such reference, the appendix is probably best left out.

Appendices may be numbered either in a series of Roman numerals (say I-VIII), or according to the chapter to which they are relevant (e.g. appendix 5.1, appendix 5.2).

5.7 *Glossary and Index*

Any glossary is usually placed at the end of the text, where it is easy to find. Work in the School will not require you to compile an index, but for completeness it can be mentioned that this would be the very last item in the document. WORD can compile one of these too.

6 PREPARING THE DOCUMENT

When you are faced by a large piece of work, it is easy to become daunted by the immensity of the task. Don't sit there looking at it: start!

6.1 *Timetabling*

Remember Murphy's law: 'It's harder than it looks; it'll take longer than you think; it'll cost more than you budgeted for; if anything can go wrong, it will.' (Many researchers regard this law as irresponsibly optimistic.)

For major pieces of work, draw up a timetable, working backwards from submission date (check that it isn't a weekend or public holiday). Allow at least 10 days for hard binding, and three days for comb binding. It may take two or three days to print out the final version of a large document on a slow printer (the system usually crashes six pages from the end). A typist may type it in a week; you will take longer; but whatever system you use it will take another week to check and correct the errors of detail. Two weeks may be taken in preparing graphic material and collating references, even for a small dissertation. Adding this all up, you will see that it is prudent to aim to have the final draft of a big document completed six weeks before the deadline.

Allow time for three drafts. The first puts all your material down on paper in what looks like the best order. The second allows you to revise the structure, now you have had the chance to read the whole through. The third corrects detailed errors. Some documents go through more drafts than that (my book on discounting went through ten). Conclusion: you need to start the first draft earlier than you expected.

6.2 *Structural planning*

Then start planning the structure; this becomes more important, the larger the document. If possible look at similar reports, to give a feel of what is required. Draw up an outline, which should look like a table of contents, before you start writing anything else. One or other of the forms in section 4 should provide a useful template, but circumstances will require modification. Don't forget to list the ancillary material before or after the main text. As the deadline for submission approaches you will be glad to have a list on which you can tick items off as they are completed.

For a large document the suggested sections may become chapters, and within these you should insert the sub-headings you expect to use. Forcing yourself to put down these sub-headings will make the logical structure clearer to you, and you may identify missing information at an early stage. The more time that is spent on detailed planning, the less time will be needed for writing and rewriting. Furthermore, development of a coherent outline enables the document to be written section by section as material becomes available, regardless of the final order. This means you needn't be held up in writing because the material for one early section is unavailable, or because you haven't made up your mind completely about how to tackle it.

Begin to jot down ideas and sentences. Don't assume you will remember them when you reach the stage of an orderly write-up: you won't. A detailed plan enables you to see where each piece fits into the whole.

Decide what system of headings and sub-headings, or numbering of sections and paragraphs you are going to adopt now, and apply it consistently.

Then get writing. Don't wait until you feel you have mastered the field of knowledge (you never will) or until the perfect form of words to express your thoughts has arrived (***that*** never will). Once you have something written down, in a well-defined structure, you will find it much

easier to refine your thoughts and expression. Remember to give each piece you write a section marker, and keep hard copies of your material together in a file.

Word processors are very useful for structural planning, because they allow you to make a rough structure, into which ideas and word-forms can be filled and modified as inspiration comes to you. Make a sub-directory/file folder for large documents, and put all relevant files into that, especially if you have lots of other files. It is helpful to give the files names that result in their appearing in correct sequence within the sub-directory.

6.3 *Presentation of the final version*

6.3.1 *Handwriting*

We don't expect everybody to produce copperplate handwriting, but we do expect any handwritten submissions to be easily legible, even when produced under examination conditions. 'Easily legible' does not mean that it is just possible to translate it into normal English characters: it means each individual word is clearly and immediately recognisable.

If you know your writing is bad, or if there are comments on it when your work is returned, treat it as a real problem. You may be able to improve matters by slowing your writing speed right down, and making very deliberate attempts to form characters clearly. If your writing is incorrigibly sprawling, consider writing on alternate lines of paper. Try making a 'fair copy' of a rough draft – this may seem like a waste of time, but it also provides an opportunity to check what you have written.

Using a word processor provides a straightforward solution to bad handwriting in continual assessments. Remember, however, that you cannot take these machines into examinations, so you should try to maintain neat handwriting anyway.

If you hand your work to other people for typing, remember they have to read it before they can type it. Furthermore, because they will be less familiar than lecturers are with the technical terminology of your subject, they are less likely to guess the meaning of an illegible collection of letters. Keyboards have no facility for making a letter halfway between an 'e' and an 'l', and if that is the squiggle you have made the typist will have to plump for one or the other. If your handwriting is less than perfect, it is worth writing out technical terms, words in foreign languages (including Latin) and place-names in BLOCK CAPITALS in the margin. It will save a lot of time in correcting drafts.

6.3.2 *Typed format and word processors*

Nowadays dissertations must be submitted as typescript. Typed essays are also well received, and may become mandatory now that nearly everyone has experience of word processors. SAFS's own computing facility offers WORD, the central computing laboratory WORD PERFECT. But take note:

- the facilities becomes very congested, especially near major submission dates, so don't assume you'll have a clear run at the printer;
- disk corruption is not unknown and catastrophes seem to increase in frequency as deadlines approach, so keep an updated copy of your work on another disk
- computer problems are not considered a valid reason for late submission.

Double-spacing is often stipulated for typed material, but no-one is likely to object to 1½spacing. This document is single-spaced to save paper, but don't submit plans, dissertations or articles in single-spaced format.

Word processors make it dangerously easy to update drafts. Consider producing drafts in 1½ or even single-spacing for your own consumption – provided there is room for amendments – and printing one draft on the back of another. This gives significant savings of print-out paper. Do not reprint drafts every time you make a small amendment. Put a date on the front

of each draft – or even better in the document header or footer. That way you can be sure you are always correcting the most recent version.

If you print something for other people to read on an old dot-matrix printer, ensure that the ribbon gives an easily visible print density: lecturers already suffer terrible eye-strain from excessive dedication to reading. Produce your final copy with a laser or ink-jet printer.

Footnotes are untidy, distracting and very rarely necessary. They used to cause a lot of trouble in typing fair copy, though word processors now handle them automatically. If you give material which includes footnotes to a typist, be sure to make your intentions clear[1] [Footnote 1: e.g. place the footnote in square brackets immediately after the marker in the text]. Never use footnotes in headings or abstracts.

6.3.3 *A plea*

Whatever medium you adopt for writing, ***leave margins large enough for comments***.

6.4 *Checking and editing*

NO MATTER WHAT THE CIRCUMSTANCES, EVEN IN EXAMS, ALWAYS ALLOW TIME TO CHECK WHAT YOU HAVE WRITTEN. Check the logic and clarity of the structure; check the grammar, spelling and punctuation. Look for ways of shortening what you have written: the chances are that you will gain clarity, not lose it, by doing so. Check also on the meaning. Often you will find that what was perfectly clear when you wrote it down last night is perfectly obscure in the cold light of morning. Particularly with dissertations, ask other students if they can understand what you have written. If you have used any, check that tables, figures, maps, plates and references are correctly cited and placed.

It cannot be said too often that proof-reading and checking is the responsibility of the student: check a dissertation ***before*** presenting it to your supervisor for comment. But it is a common-place experience, that it is difficult to detect the last few errors in what you have written yourself. It is worth making an arrangement with someone else to exchange and check dissertations.

If you handwrite for someone else to type, do not assume that the typist will correct your spelling. Supervisors will be prepared to note errors, if you have made the effort to weed errors out yourself; but do not expect them to rewrite everything correctly.

For dissertations and papers, this process will normally result in substantial rewriting of the piece. Having it on a word processor from the beginning is then an immense boon. To avoid waste, particularly in a bound volume, a small amount of Tippex is acceptable in the final document. The copy, cut and paste facilities of word processors avoid the need to create a maze by putting in asterisks which refer the reader to the bottom of the page, or to another page, for insertions.

POSTSCRIPT

Whatever the aim, no-one's written work is perfect: staff members make mistakes in written material too, and past experience leads me to predict confidently that this revised document is no exception. If you find an error, do point it out. Most of us will have the grace to smile and thank you for your trouble. If someone has crossed out something you have written that is in fact correct, try to catch the perpetrator on a good day – wait for him or her to smile at you first!

[1] e.g. place the footnote in square brackets immediately after the marker in the text

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APPENDIX I: EXAMPLE OF A SHORT MEMO

(example and comments supplied by J.C. Hetherington)

TO: Head – Air Photo Section FROM: J. BLOGGS

RE: Crown diameter–stem diameter relationships in Sitka spruce

As requested in your memorandum of 13th October 1987 (ref. no. 123789) I have investigated the relationships between crown and stem diameter in stands of pure Sitka spruce. Regression equations have been developed so that d.b.h. can be predicted from crown diameter as seen on aerial photographs. I have checked the results in the field and found them to be accurate to 5%.

Preliminary studies showed that the relationship varied with site index. I selected the same number of samples from each site index to accommodate this variation. Free crown diameter was measured along the contour to the nearest 0.5 m with an optical device, and d.b.h. to the nearest cm with a tape.

Free crown diameter (i.e. that part of the crown free from overlap with adjacent crowns) varied with stand density for a given d.b.h.; thus it was necessary to include a measure of stand density in the analysis.

The data were analysed using multiple regression techniques. The relationship was linear and of the following form:

$Y = a + b_1X_1 + b_2X_2$

where Y = d.b.h. in cm,
X_1 = free crown diameter in metres,
X_2 = stand density index (S.D.I.)

The best stand density measure proved to be an index based on the product of free crown diameter and number of stems per ha as follows:

S.D. VALUE	INDEX NO.
2000	0
2001–4000	1
4001–6000	2

The equation produced is as follows:

$$\text{d.b.h.} = 2.61 + 25.6\ X_1 + 7.2\ X_2$$

This equation accounted for 85% of variation in d.b.h. and is highly significant. The equation was checked using aerial photographs and ground samples, and on the average actual d.b.h. was within 5% of the estimated value.

I conclude that this approach is applicable to inventory on a limited scale and recommend that it be used when appropriate.

You can see that the subject is covered by the title. The first paragraph is an introduction and summary. The next three paragraphs are concerned with procedures/methods. Then come the results, followed by a final sentence of conclusions and a recommendation. The brief report contains all the basic elements. Nonetheless, some comments are in order. One must question whether the section concerned with the basic form of the regression is relevant. This is not of much interest, especially as the form is repeated in the actual equation given later. What on earth is the value of the recommendation 'that it be used when appropriate'? The head of the air photo section really needs ***telling*** exactly when its use is appropriate.

APPENDIX II: WRITING A JOB APPLICATION

Although rather out of place in this document, this subject is worth considering because more jobs are lost by poor applications than by any other cause.

1 *The application letter*

The application should consist of two parts: the covering letter applying for the job, and the *curriculum vitae* (C.V.). The letter should be carefully worded. It should say that you wish to apply for the position advertised, and when and where you saw it advertised. It should blow your own trumpet a little, but not to the extent of bragging, and refer the reader to the attached *curriculum vitae* for details. For example:

Hoppus End
Greenhectares Lane
Metricaster
Metricshire MT25 4MM

The Personnel Officer
Next Steps Forest Agency
75 Commission Close
Edinburgh EH12 7AT

23rd April 1998

Dear Sir,

I wish to apply for the position of [forest herpetologist] as advertised in [*Ecology*] on [1st April 1998].

It appears I am well suited by training and experience for this position, as you will see on reading my *curriculum vitae* (attached). If my application interests you I will be pleased to attend an interview at any time.

Yours faithfully,

J.C. Hetherington

2 *The curriculum vitae*

If at all possible this should be typed. Relevant information may include:

Full name
Date of birth
Marital status (though whether this is appropriate information to seek is contentious)
Schooling (not elementary); further education: place, dates, qualifications
Any other relevant courses attended
Past positions held (in chronological order); other relevant experience
Particular interests
Published papers if any
Referees

There may be a printed application form for candidates to complete. The form then replaces the *curriculum vitae* and the letter should be amended accordingly. The form should be in typescript if at all possible.

APPENDIX III: A SELECTION OF ESSAYS

The titles below embrace a range of types of essay, to which different approaches might be attempted. Identify which type each is, what it is getting at, and how the question ought to be answered. Try to draw up a structure for an answer, for those questions whose subject matter you have covered so far.

1 Discuss the problems of plantation establishment.

2 Which criterion of investment appraisal would you recommend for use in forestry, and why?

3 Describe how you would set about determining the value of a felled tree.

4 Is beauty in the eye of the beholder?

5 How do the seven principles of landscape design apply to forestry?

6 'Agroforestry is a compromise technology which combines the high costs of agriculture with the long-delayed revenues of forestry.' Discuss.

7 Write an essay on thinning.

8 'The animal welfare lobby will soon make it impossible to maintain an upland livestock

9 What are the relevant economic factors in deciding whether it is worth purchasing an area of land for afforestation?

10 'Resources that are commonly owned will commonly be mismanaged.' Do you agree?

11 What steps are required in implementing a breeding programme for a named animal?

12 Speculate on the effect of removal of discounting from British forestry.

13 What do you consider to be the most important aspect of tropical forestry?

14 Should forests be located for optimal land use or optimal wood use?

15 Do western agronomists have anything to learn from traditional tropical farming systems?

16 Assess the importance of forest plantations for carbon dioxide absorption.

17 What are the three main methods of timber extraction? What factors determine which should be used in a given forest?

18 What is meant by the term 'economies and diseconomies of scale'? Illustrate your answer with forestry examples.

19 'At the age of 80, the Forestry Commission is well past retirement.' Comment.

20 Discuss the use of herbicides in forestry.

21 Describe the use of herbicides in forestry.

22 'Forest wildlife is just another name for pests of trees.' Is it?

23 Write an essay on the price-size relationship.

24 'The British dream of rural life harks back to a golden age that never was.' Write in defence, either of this claim, or of the golden age.

25 Whither forestry in the twenty-first century?

APPENDIX IV: SUGGESTED ERROR SYMBOLS

All markers have their own way of making comments. I sometimes use

AAARGH!!!

to suggest I am having trouble with logic or comprehensibility. (It also helps to relieve my feelings.)

To save time writing out 'SPELLING!' etc., I suggest the following symbols. I persistently, though not very successfully, encourage my colleagues to adopt them.

MARK	MEANING	SEE SECTION
A	Assertion: you have not substantiated this statement.	2.2
C	Capital letter(s): use them for the letter(s) indicated	3.5.9
D	Delete: the indicated material is superfluous or wrong	
E	Expression: this sentence is clumsy or hard to follow though technically correct.	3.1
F	Factually incorrect.	
G	Grammar: word(s) indicated do not obey the rules.	3.2
J	Journalistic or colloquial language.	2.2
L	Logic: the deduction is invalid, or the sequence of ideas does not follow.	2.4
L1-L8	indicate particular logical errors as noted in section 2.4.	
M	Mathematical error: check your method and working.	
N	Numbers: an inappropriate convention has been used.	3.10
NAS	Not a sentence: check what happened to subject, main verb and (possibly) the object of this sentence. Check also for conjunctions (linking words) like 'while', 'whereas', 'although' and 'since', which link two clauses into one sentence, and therefore do not introduce a new sentence.	3.1
NC	No capital(s) for the letters indicated.	3.5.9
O	Omission: something appears to be missing (may be indicated by $\wedge$ in the text)	
P	Punctuation: the mark is not the correct one, or is used incorrectly.	3.5
R	Repetition: this seems to be saying something which has already been said.	2.1
S	Spelling: incorrect for word indicated. Please look it up in a dictionary and find the correct spelling.	3.6
T	Tautology: 'logical overkill' – this adds nothing.	2.1
W	Wrong word (or word used with wrong meaning).	3.4
X	Syntax: the sentence does not hang together properly.	3.1

Markers are busy people, and may not have time to explain the error in detail. It is your responsibility to decide what is wrong. This document should help in many cases. If you cannot work it out, ask the marker to explain, or refer to the compiler of this document (= me).

INDEX

Entries given as a word or phrase followed by ... refer to usage of that precise word or phrase. Entries without ... describe the topic referred to.

F

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