AN ANALYSIS OF AUTHOR COMMENTS
IN A PLANT BIOLOGY TEXT AND NATURE JOURNAL

BY

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This project centres on the functions of author comments in two sets of corpus from Plant Biology and Nature journal. It attempts to explore these micro-language acts with the aim of depicting their centrality in the rhetorical organisation of the discourse, and to demonstrate that they display similar characteristics in both sets of the corpus analysed.

It also argues for a context-based approach for the teaching and learning of these micro-communicative acts— which is most likely to offer the learner a better chance of exploring the language in real situations, this being highly motivated by the multifunctions of the signalling linguistic devices and their context dependency.
ACKNOWLEDGEMENTS

I would like to greatly thank the British Council for sponsoring me in this invaluable course.

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Finally, I am deeply grateful to Tony Dudley-Evans, my supervisor, for his invaluable suggestions and comments on processing this project.
1. INTRODUCTION

In this chapter, I intend to review some of the outstanding theoretical frameworks of discourse analysis and their conceptualization of author comments, and I will as well be discussing some of the relevant works recently carried out on author comments.

1.1 Theoretical Frameworks

The study of author comments is in its own right an essential part of the purpose and process of discourse analysis. Of course, there has always been a mention of or reference to author comments in the study of discourse. However, what seems to be a rather recent development is, as Jones (1983) puts it, the 'isolation of author comments as a target for study. Based on the data he analyzed, Jones stresses that this new move will further 'reinforce the assertion made by sociolinguist and discourse linguist alike, that the context of an utterance influences the shape of that utterance' (p.121). In a sense, there is a need for the discourse analyst to be more concerned with the relationships that exist between the writer and the reader in the text. Although it has been long observed
precisely as follows:

"The ideational represents the potential of the system for the speaker as an observer: it is the content function of language, language as about something. The interpersonal is the potential of the system for the speaker as an intruder: it is the participatory function of language, language as doing something. The textual is the potential of the system for the creation of text: it is the relevance function of language, where by the meanings derived from the other functional components relate to the environment and thus becomes operational".

This conceptual framework is quite powerful. The study of author comments will largely fall under the interpersonal component. The interpersonal meaning, as he puts it, 'resides in the deictic features associated with finiteness - primary tense or modality', attitudinal lexical verbs, and also intonation and rhythm in the case of spoken discourse.

In his discussion of 'clause as exchange', Halliday uses the expression 'modal adjuncts' to include 'mood adjuncts' and 'comment adjuncts'. The mood adjuncts relate to the meaning of the finite verbal operators (i.e. modal verbs) expressing probability, usuality, obligation, time or intensity, for instance 'certainty, probably' 'in my opinion' etc. They express the speaker's or the writer's judgement on what he or she is saying. On the other hand, 'comment adjuncts' refer to the speaker's or the writer's
question, it will be treated as a 'focus', instead of being treated as a request for opinion in the spoken discourse.

At this juncture, reference to Sinclair's (1981) theoretical framework, which is put forward as an integrated approach for linguistic and literary approaches, is important. In this framework, Sinclair proposes two aspects of language in use. These two aspects correspond to what he termed as two 'planes of discourse', the 'interactive plane' and the 'autonomous plane'. The interactive plane is concerned with the means by which language is related to the world outside, and the autonomous plane is 'a gradual sharing of relevant experience by recalling previous words and phrases and reworking them in the new contexts provided by movement of the interactive plane'.

Although Sinclair stated that in conversation or spoken discourse the interactive plane is more prominent than in writing, nevertheless, he rightly accepted that written discourse is also interactive despite problems of adjustment faced by the reader since 'the interaction is an imagined construct of the writer'. However, as presented above, Sinclair's conceptual framework, which is similar to Halliday's, it would seem, offers a viable
discourse to flow. 'Plane-change' has an interactive
force, but generally acts as a text organizer, for
instance 'In this paper, we concerned ourselves with...'.

'Why should this be so?'

These two major planes of discourse and their sub-
components, it is hoped, will act as the theoretical
background or guidelines to the analysis pursued in this
project. The sub-component, 'plane-change' would
sometimes definitely act as a signal for 'focus', where
the writer tries to draw the reader's attention by asking
a direct question in the text for instance. The 'report'
sub-component would mainly depend on the context, since it
relates the two planes of discourse together, while the
'quote', as described, will be treated as part of the
autonomous plane.

However, one important point needs to be recalled at this
stage of the discussion, where Sinclair (Ibid 1981:5)
states the following in connection with the distinction of
language in use into interactive and autonomous planes, and
the role of the logical connectors:

"An exception was made to the 'logical
connectors', as if they formed a separate or
separable system of links between syntactic
units, and could therefore be restricted to the
autonomous plane because their concern was with
intratextual management and not interactive
the second, it has the structure 'assertion plus justification', therefore it is pragmatic. In the present project, examples such as the second will be considered as author comments, in fact there will be a category labelled as "justification".

In relation to this, Rudolph (1988) work on connective relations, which she described as combination of propositions, is noteworthy. Her classification of connectives into two functions offers a clear vision on what connectives do in the text and how the speaker comes in to influence meaning by what connective he or she chooses. Below are the definitions she gives for the two categories of function:

a) the speaker organizes the information in accordance with his point of view by referring to the complexity of the world mentioned: A+ B and A, B (ie connection of addition and connection of time), for example (Quirk and Greenbaum, 1973: 231, 254):

1) John plays the guitar, and his sister plays the piano.
2) Take a drink and then go to bed.
3) She left him after he struck her.
1.2 Author Comments Analysis

In exploring the literature on author comments, one of the works which deserves mention here is Jones' (1983). According to Jones, the idea of isolating author comments as a group for special study seems to be relatively new. In fact, he devoted a whole chapter in his book 'Pragmatic Aspects of English Text Structure' to the analysis of author comments. He tentatively came up with a categorization for author comments, namely opinion, explanatory, thematic and incidental. However, he said that this categorization is only limited to the texts he analyzed, and there may be more categories in other texts than the ones suggested here.

Since the nature of the present project is text-driven in its pursuit to show the magnitude of author comments and their function, a review of the categories suggested by Jones, I believe, will be of some relevance and significance here. To highlight the discussion, let us start by quoting these lines from Jones (Ibid:80):

"... I propose four functions an author comment can have in a discourse: (1) a comment can (1) express an author's personal opinion about something in the main body of the text; (2) give a note of explanation to the reader at a point where the author believes there might be some
confusion; (3) add extra-tangential information to the discourse which the reader may find interesting as background; and/or (4) summarize or review the main points of text, to be sure that the reader has understood, or will understand, the theme(s) of the discourse.

It would seem clear from the above categorization and definition of author comments that Jones' approach is function-oriented. The first category above he code-named opinion comment, where the author expresses his opinion about something in the main body of the text, is quite interesting. For him it embraces recommendation and evaluation. However, the term 'opinion' seems to be broad, and I would prefer rather a fine categorization that treats 'recommendation' and 'evaluation' as separate categories. As it will be shown in chapter 3, there is a likelihood that Jones' category of opinion comments could cover Hopkins' (1995) categories (adapted from Adams-Smith, 1984), such as evaluation, recommendation, justification, counter, etc. The second function of author comments above which Jones code-named 'explanatory' is quite appropriate. It is true that the writer can come into the text to give an explanatory note or clarify things so as to avoid a foreseeable confusion. This category appears as well in Hopkins' analysis. The third author comments function Jones labelled as 'incidental comments' is problematic. Although he rightly put it that the author can add extra-tangential information to the discourse which the reader
may find interesting as background, the label 'incidental comments' is not really appropriate. This is in the sense that the label 'incidental comments' is not saying anything at all about the function of these comments. Thus, it is to be stressed that though author comments could be incidental, they are likely to be carrying out a definite function. To highlight this point, let us consider the following example from Jones' (Ibid:84) corpus, given as an 'incidental comment':

"The Chidian school was of equal antiquity with the Coan. The Chidian are said by Galen to have delighted in distinguishing varieties of disease in each organ: seven in the gall-bladder, twelve in the urinary bladder, four in the kidneys, two in the thigh, five in the foot, four kinds of strangury, three of phthisis, many varieties of quinsy, and many diseases of the entrails... This attempt to catalogue varieties for the sheer love of classification was a trait of the Greek intellect at most times, as can be seen from Plato's Sophist and from comedy; not to speak of Aristotle. It is a sound scientific procedure but only when information is abundant enough to make precise differentiation useful and important, as when diseases may be superficially alike but show different natures later."

This example, though tangential to the theme of the discourse, I believe, is better categorized as "evaluation" rather than 'incidental'. For despite the fact that this comment is tangential, it has its own function which is 'evaluation'. In fact all the examples he gave in his corpus as incidental comments could be assigned more
larger units from one sentence onward, which might be the reason why he only ended up with four categories, where the first 'opinion' is rather broad and the third 'incidental' is even vague and is not defining in terms of function, though intended to be so.

Broadly speaking, Jones treats author comments in two senses - either as 'a temporary departure from the main train of thought in a text' or as an 'aside', where the author directly talks to the reader. To use his phrase, 'the centre of attention having shifted from the discourse itself to the communication between the author and the reader - that comments can be called 'inherently pragmatic'.' This observation is fine, but it is not true of every author comment. For the author, as it were, could be giving the message content and his or her opinion or comments implicit in it without obstructing the normal flow of the discourse, especially when modal expressions are in operation. Finally, Jones observed the fact that some author comments serve more than one function (or in his expression - "hybrid comments"). The existence of such author comments has also been confirmed in the present analysis of author comments.

Another noteworthy work is Adams-Smith's (1994) which has added one more step in the quest for the study of author
comments. She analysed a selection of articles from the British Medical Journal. Her working hypothesis was that student's major problem in reading the articles resulted from the inability to understand modal forms. Following the analysis, she acknowledged the sizeable presence of author comments in the articles, and concluded that author comments are expressed by verbal and nonverbal modes, and by a wide range of attitudinal markers.

Like Hopkins (Ibid) I have been unable to apply Adams-Smith's model of author comments analysis due the fact that the categories she employed were not defined, this renders their conceptualization difficult. To make this point clear, below are the categories used by Adams-Smith:

- Probability (including possibility)
- Ability
- Recommendation (including necessity and obligation)
- Emphasis
- Evaluation
- Argumentation
- Unexpected outcome

Furthermore, beside being undefined, categories such as probability (possibility) and ability seem to be form-
oriented, in that words that realize them - such as 'may', 'could' and 'probably' - are likely to serve different purposes in different contexts, and not as she attempted to restrict them. Consider the following example from the corpus analysed in the present project:

These stages can also be ascribed to the development of vegeculture (Text (1) L.I. 115-16).

Definitely, the function of 'can' in the above example is to express ability. However, the entire sentence or utterance is expressing a 'hypothesis' rather than ability.

Similarly consider the example below from the same corpus:

In the context of crop plants and weed races or related wild species the nature of this differentiation - hybridization cycle can be important in determining the extent of geneflow and introgression between them, although it is never sufficient to cause disintegration of the two entities (Text (1) L.I. 429-33).

Though the function of 'can' is to signal ability, it would clearly seem that it is (together with the other underlined devices) signalling 'evaluation'.

To return to the point, in a sense, Adam-Smith's model of analysis tends to be form-oriented rather than function-
I quite agree with Hopkins' criticism that Adams-Smith's categories were not clearly perceived. I too have appreciated Hopkins' effort for having come up with the above taxonomy of author comments. But unfortunately, he seems to have fallen in the same shortcoming he identified in Adams-Smith's work, in that the criticism he made against her (that here categories were not clearly perceived) could as well be said of his—except for one category—which is "focus". In other words, although he has given signalling instances of these categories, he has not defined them (except "focus"), thus rendering their conceptualization difficult too. In fact, it would seem that some of his categories are closely related or hard to differentiate (if at all there is any difference) that I would rather label them as one category. As an example, let us consider the two categories—"proposition" and "hypothesis". The following are examples from Hopkins' data labelled as a 'proposition and hypothesis' respectively:

1) this condition can exist for the conditions of flow of water into a partially full drain, a well or an open channel (L.L 39-41 paper 2).

2) A longer monitoring period may provide more conclusive answers (L.L. 223-4 paper 4).
In my opinion, these two examples are both hypothetical. For the two modal verbs, 'can' and 'may' in these examples above are signalling the act of 'hypothesis'. Therefore, I do not see any obvious reason as to why they should not bear the same labelling, which is 'hypothesis' in these two particular instances. Of course, a glance at Hopkins' data analysis will reveal many of these instances. What might have motivated him to call the first a "proposition" and the second a "hypothesis", is not known. But what is obvious is that the label "proposition" is rather an unfortunate one, in that it could refer to any statement or an utterance, and the fact that it was not defined makes things probably difficult for any reader who comes across Hopkins' categorization. The other category of Hopkins which does not feature in the data analysed in this project is what he code-named 'considerations' for interpreting results. This might have been due to the differences of data each of us is focusing on. However, for purposes of illustration, let us consider the following examples from Hopkins' corpus:

1) The area affected by this breakage was difficult to estimate, leading to some doubts on the actual effective area, but was about 15 percent of the total area giving a total effective area of about 6,400m² (L.L. 39-41 paper 5).
2) Only a handful of diffusion studies have dealt with irrigation and drainage innovation - most notably Lawrence Bowden's simulation of pump irrigation in Colorado and several recent studies of diffusion of centre pivot irrigation technology - (Bowden, 1969; and Prunty, 1962) (L.L., 134-8 paper 1).

The underlined words are the ones given by Hopkins as signals of author comments, and I too agree with him. He labelled the first sentence as "statement of results" and the second as both "statement of results" and "evaluation". In a sense, by labelling both sentences as "statement of results" is not incorrect, for Hopkins was using "comment" in a different way. However, it would appear that here we have evaluation within a statement of results in both sentences.

Having reviewed Hopkins' categorization, I propose, with the help of the data analysed, the following modified form of the categorization:

Evaluation
Hypothesis
Recommendation
Justification
Focus
Deduction
Counter
Explanation
Reference

Briefly, what I have done is fused the categories "proposition" with "hypothesis", and dropped the category "considerations for interpreting results", since it does not apply to the data on focus. I have also tentatively added the category "reference".

On the other hand, I share Hopkins' view that Adams-Smith's classification of attitudinal markers with the verbal modals 'under the same headings (of ability, probability, recommendation, etc) was rather a complicated task, which is not easy to comprehend.

In his discussion of the attitudinal marker's Hopkins (Ibid:79) stated:

"It seems to me that the reason why attitudinal markers are interesting is that they signal to the reader instances of author comment as opposed to 'objective' reporting of events and findings."
the content or form of the text. The problem, as he acknowledged, as did Adams-Smith earlier, and myself in this project, is that there are instances when the writer uses evaluative words or phrases whereby one cannot be easily sure whether he or she is giving an opinion or established parameters in the discipline. The other problem which confronted me during the analysis, is the instances of modal verbs. Though Hopkins pointed out this problem, he, like Adams-Smith earlier, did not give clear-cut examples on the treatment of modal verbs. However, in analysing the corpus, I have decided not to consider instances of verbal modals inclusive in reports of previous research.

Finally it is to be pointed out that, the aim of this project is first to find out how many author comments are there in the texts, how are they signalled and what language acts are they doing in the texts. Secondly, this project intends to show, in light of its data analysis and results, the significance and relevance of author comments to SSP material writing and design, and to argue for a context-based material that will treat author comments according to the various acts they perform. This, I
believe, is in line with a view taken by scholars such as McCarthy (1988: 199) which states that

"We cannot decide on the value of an item by looking at it in isolation, just as we cannot judge the illocutionary force of a decontextualized sentence; whatever we say about words, they have to be supplemented by discussing their local values in the discourses where we find them."

I find such an argument very interesting and convincing in that it emphasises the context, bound approach, which, I think, is very useful and realistic. For, as the analysis will show in chapters 3 and 4, a signal of author comment is likely to signal more than one language act, depending on the context in which it appears and the surrounding environment.

As for the categories proposed here, more discussion and exemplification will follow in chapter 3. The different categories will be defined, and examples provided from the analysed texts. The definition of the categories, I believe, is very important in that it gives the reader a clear view as to what is meant by each category. This, together with the context bound examples, will pave the way for the line of argument being pursued in this project namely that author comments are inherent in any text and are likely to constitute a sizeable percentage. Thus, the
inclusion or consideration of author comments in material writing is vital, if at all we are to offer the English Language learner, especially in the EFL/ESL situations, better chances of learning the language.

Thus, we have reviewed both some important theoretical frameworks and some recent works on author comments analysis and what prospects they offer to the study of author comments. What follows in chapter 2 is the description of the corpus.
2 DESCRIPTION OF THE CORPUS

As previously mentioned in the review of the literature, the aim of this project is to identify and describe the linguistic devices used by the writer to signal author comments, be it evaluation, recommendation, hypothesis, etc, and to argue for a context-based approach that will put into consideration the pragmatic nature of author comments.

This chapter briefly describes the nature of the corpus being analysed - giving its characteristics, source and the method that will be followed in the analysis.

2.1 Data Selection

Having been convinced by recent works in discourse analysis that language text contains three levels of organization, "idealitonal", "interpersonal" and "textual", I thought it was time to explore the pragmatics of author comments in written scientific discourse, namely in the field of Plant Biology so as to contribute to the work that has already begun by giving more descriptive and analytical insights on the systematic use of the signalling linguistic devices.
employed in marking author comments. In accordance with this move, the data for the present project came from two sources, a *Plant Biology Textbook* by Ford-Lloyd and Jackson (1986), and *Nature Journal*. Originally, it was agreed that I select three chapters from the *Plant Biology* text and ten articles from *Nature Journal*. However, finally three chapters were selected from the *Plant Biology* text and seven articles from *Nature Journal* instead of ten due to the large numbers of author comments as the analysis proceeded and the time factor involved. In fact Dudley-Evans, my supervisor, had wanted me initially to choose all the ten articles from the section in *Nature Journal* entitled "Articles", but I found that most of the articles are either lengthy or not related to *Plant Biology*. Therefore, I finally chose seven articles, two from the section entitled "Articles" and five from the section labelled 'News and Views', all of them in a sense, related to *Plant Biology* or to environmental issues. The two articles from "Articles" section, each containing four pages, are roughly equal in length to the five articles from "News and Views" section, each having one or two pages.

It is worth noting that the idea behind selecting two different sets of data, that is from a *Plant Biology* text and *Nature Journal* is to establish possible similarities
between author comment's signals or devices used in these two sets of data in the expectation that they will flow similar patterns and to give more weight to the significance of author comments, not only within the discipline textbooks, but also in related areas or topics outside them.

2.2 Description of the texts

As mentioned above, the texts analysed here come from two sources, a Plant Biology text and Nature journal. These two sets of data are described below:

The Three Chapters: These three chapters are chosen from a Plant Biology text which contains nine chapters of 131 pages in total. The text book is currently used by students in the department of Plant Biology at Birmingham University. As Ford-Lloyd and Jackson put it, the book is intended to 'serve as an introduction to the field of plant genetic resources, not only for students, but also for scientists and laymen alike, who are perhaps working in other, but related, disciplines.' The chapters chosen from this book are two, six and nine. I have tried to spread the selection over the text book by avoiding chapter one for its historical emphasis, and leaving out chapter three, four and five as a gap between the chosen chapters two and
six, and leaving out as well chapters seven and eight as a gap between the chosen chapters six and nine. The chosen three chapters, two, six and nine, contain 26, 12 and 6 pages respectively, totalling 44 pages, which is about one third of the whole textbook. As will be shown in chapter four of this project, the percentages of author comments in these three chosen chapters are, in relative terms, proportional to their varied lengths.

The Seven Articles: These seven articles which constitute the second set of the corpus come from two volumes (341 and 342 of 1989) of Nature - compiled at Birmingham University main library. It is to be noted that Nature is an international journal, published weekly by Macmillan Magazines limited, covering a wide range of issues from natural to social sciences and converging on vital environmental matters. As mentioned above, the reason for selecting some articles from Nature beside the chapters from Plant Biology text is to explore the similarities that might lie in the use of author comments in both sets of data and to describe them systematically. The two articles from the "Articles" section are in a sense related to Plant Biology in that they are dealing with environmental issues. The five articles from the "News and Views" section are either dealing with environmental issues, such as the destruction of the habitat, of course including plants, or
scientific research.

All in all, the rationale behind the selection of these seven articles has been their relatedness to Plant Biology or environmental issues with the hope of narrowing down the probable differences in the two sets of the corpus. As will be demonstrated in chapter four, the size of the two sets of data and the occurrence of author comments in both of them are approximately the same.

2.3 The Method

All the chapters and articles analysed in this project will be considered as texts. In other words, the use of the word "text" will be referring to any chapter or article forming part of the corpus.

Each of the three chapters and seven articles selected as corpus will be given a code-number from 1 to 10 so as to facilitate reference and exemplification in the project, and not least the analysis of the data and its results. The lines of each text will be numbered and totalled in order to enable the percentages of author comments, in relation to the individual texts and the whole corpus, being worked out. Furthermore, the author comments will be classified according to the type of language move or act
they perform in each utterance. On the other hand, whenever an example is cited from the texts a mention of the original source will be given beside the code-number; and since each text lines are numbered they will also be referred to.

Having said this, below are two tables summarizing the description of the data and the analytical method adopted.

**Table 2.1a**  The Corpus from Plant Biology Text

<table>
<thead>
<tr>
<th>Title of the Chapter</th>
<th>Chapter No</th>
<th>Code. No</th>
<th>No. of lines</th>
<th>Author Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop Evolution and Diversity</td>
<td>2</td>
<td>1</td>
<td>870</td>
<td>319</td>
</tr>
<tr>
<td>Utilisation</td>
<td>6</td>
<td>2</td>
<td>482</td>
<td>133</td>
</tr>
<tr>
<td>Plant Genetic Resources-Future Prospects</td>
<td>9</td>
<td>3</td>
<td>232</td>
<td>75</td>
</tr>
<tr>
<td>Title of the article</td>
<td>Theme</td>
<td>Code No.</td>
<td>No. of Lines</td>
<td>Author Comments</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------------</td>
<td>------------------</td>
<td>----------</td>
<td>--------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Annihilation of eco systems by large asteroid impacts on the early earth</td>
<td>Environmental</td>
<td>4</td>
<td>389</td>
<td>192</td>
</tr>
<tr>
<td>The role of mantle plumes in the development of continental drainage patterns</td>
<td>Environmental</td>
<td>5</td>
<td>303</td>
<td>111</td>
</tr>
<tr>
<td>Spreading the word</td>
<td>Plant viruses</td>
<td>6</td>
<td>188</td>
<td>32</td>
</tr>
<tr>
<td>Divided the fruit flies fall</td>
<td>Destruction of habitat</td>
<td>7</td>
<td>150</td>
<td>34</td>
</tr>
<tr>
<td>Predicting climate effects</td>
<td>Destruction of habitat</td>
<td>8</td>
<td>115</td>
<td>34</td>
</tr>
<tr>
<td>Missed opportunity in biology</td>
<td>Scientific research</td>
<td>9</td>
<td>188</td>
<td>43</td>
</tr>
<tr>
<td>Answers that lie in the soil</td>
<td>Environmental</td>
<td>10</td>
<td>126</td>
<td>28</td>
</tr>
</tbody>
</table>

As shown in the above tables, the three chapters from the Plant Biology text are given code numbers from 1 to 3, while the seven articles from Natural journal are given code numbers from 4 to 10. Of course, the corpus from the textbook is concerned with Plant Biology. With regard to the corpus from Nature, I have decided to give the articles summative themes in the hope of providing the
reader with a general idea as to what the articles are about and how they are possibly related to Plant Biology. Likewise, in order to generate a broad picture of the corpus, the number of the lines of each text is given with the occurrences of author comments. Otherwise, as already predicted, the categorization of these author comment's occurrences and their analysis will follow in chapters three and four respectively.
CHAPTER THREE

3 CATEGORIZATION

This chapter attempts to explore the various categories of author comments that have arisen from the data analysed in this project. It will try to state briefly why such a chapter is important to include, and then moves on to survey the different categories of author comments by defining them and giving illustrations whenever necessary.

3.1 Why Definitions

While it is true that in analysing any text the analyst should be clear as to what he or she is looking for in the text, it is also important that the analyst works towards an overall framework of discourse that will be capable of handling the various genres by drawing on what others have positively put forward and clearly refining and stating what he or she has arrived at or concluded. This, I believe, will pave a better way to the rapid advancement of discourse analysis and have the very objectives being cherished by the discourse linguist realised, namely the contribution to the study of human expressions in relation to context.
As already mentioned in chapter 1, it seems that there are few works that give emphasis to the definition of the various author comment categories that have been proposed, based on text analysis. In fact I have had difficulty in adapting some of the Hopkins' (1985) categories, a problem that he himself had when he adapted Adam-Smith's (1984). Therefore, it is my belief that the difficulty of adapting some previous categories stems not so much from working on a different set of data, but from the lack of clear definition of those categories. Though it might be argued that giving examples from the context for the categories identified serve the purpose, and that definition is probably unnecessary and redundant, I believe that pairing the two give a better vision of what a particular category stands for or what language act it realizes. In fact, pairing the two avoids problems such as the one I encountered in distinguishing between Hopkins' categories of "proposition" and "hypothesis". Of course, as already exemplified in chapter 1, the two are basically the same category, the point is that, since the linguistic devices that realize author comments are likely to perform more than one communicative language act, it is far better that definitions of the categories are provided so that they act as guidelines not only to the discourse analyst, but to any reader who might wish to pursue the analysis and findings.
In response to the above argument, this section deals with the categories that have arisen from the analysis of the author comments in the corpus. Each and every category will be discussed and defined here, and instances of their signalling linguistic devices given.

Before proceeding into detail, it is worth noting that in the light of the data analysed, nine categories were identified altogether. Of course, the descriptive labels or rather the code-names given to these categories are borrowed from previous works on author comments as demonstrated in chapter 1. These categories include: 'evaluation', 'hypothesis', 'focus', 'recommendation', 'justification', 'deduction', 'counter', 'explanation', and 'reference'. However, it must be made clear that the categories arrived at here are wholly based on the data analysed and there might be more or less than these categories in other data, depending on the sort of data under analysis. In fact, and as will be shown in detail in chapter 4, even within the data analysed in this project categories such as 'reference', 'explanation', 'counter', 'deduction', 'justification' and 'recommendation' are not
at all to find a proposition being labelled both as an "evaluation" and a "focus", or as an "evaluation" and a "hypothesis". In other words, in the corpus analysed, hybrid author comments do exist. On the other hand, the same author comments signal might as well signal different language acts, depending, of course, on the context.

Having briefly said this, let us now explore the nine categories in succession.

**Evaluation:** is the category of author comments in which the writer expresses his or her point of view towards what he or she is writing about by stating whether it is reasonable, obvious, questionable, controversial, useful, irrelevant, impolite, contradictory and so on (Stubbs, 1986). In other words, it is the category in which the writer expresses his or her judgement, not only on the content, but also on the form of the message (Quirk and Greenbaum, 1973). In this respect a mention of Winter's (1986) work on 'clause relations as information structure' is quite useful. According to him, the evaluation element, as a response to a situation, is basically concerned with 'what the writer thinks about the situation, how does he feel about it or how does he see it'. These questions put forward by Winter could act as a good guide to the identification of the evaluation category.
present in all the texts analysed. But of course one must be careful not to overgeneralize from such a small corpus, because in dealing with discourse both as a process and product many factors come into operation. It is not entirely only a matter of a specific topic or genre as such, but here the writer's style, preference and his assumptions about the intended reader comes in as well.

In this project an occurrence or occurrences of specific author comments in a sentence will, pave the way for that particular sentence to be assigned to a particular category. To put it differently, the utterances in the various texts that contain signals of author comments will be assigned to descriptive labels or categories based on the functions they perform. This is in the sense that every sentence will be considered as a proposition irrespective of the number of clauses it contains. The word "proposition", unlike Hopkins' use, will not be referring to a specific category, but it will be referring to any sentence which could as well be assigned to any author comment category, depending on the linguistic device(s) and the function performed by that entire sentence in that given context. Nevertheless, as it will be shown later on, a proposition with author comment(s) might be performing more than one language act. For instance, in the corpus analysed here, it is not strange
at all to find a proposition being labelled both as an "evaluation" and a "focus", or an "evaluation" and a "hypothesis". In other words, in the corpus analysed, hybrid author comments do exist. On the other hand, the same author comment signal might as well signal different language acts, depending, of course, on the context.

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To illustrate this category, let us consider the following examples from the corpus taken from the Plant Biology text. (All the author comment signals are underlined).

1) An understanding of the nature and extent of crop plant diversity is fundamental to plant genetic resources.
   (Text (1) L.L. 1-2 Plant Biology)

2) Whichever scheme is correct is perhaps irrelevant in one sense.
   (Text (1) L. 306 Plant Biology)

3) These two alternative lines of origin have since been the basis of much controversy.
   (Text (1) L.L. 641-2 Plant Biology)

4) Regrettably, few of the species are maintained in living collections, although considerable information on the diversity in *M. esculenta* is now available following the publication of an important monograph by Rogers and Fleming (1973).
   (Text (2) L.L. 347-9 Plant Biology)

5) Fortunately many scientists and governments have woken up to the problem of genetic conservation before it is too late.
   (Text (3) L.L. 217-8 Plant Biology)

A glance at example (1) above will reveal that the proposition is acting as an evaluation. The writers in this proposition are evaluating the importance of understanding 'crop plant diversity', and they use the above underlined word "fundamental" to signal to the reader their point of view in this respect.
In example (2), which is taken from the same source, the writers, in their review of the schemes offered as possible interpretation of the origin and diversity of the crop plants, are being dismissive of the details, and they convey their point of view by employing the words "whatever" and "irrelevant", which, of course, in this proposition are signalling evaluation.

Likewise, the proposition in example (3) is functioning as an evaluation. Here the writers are commenting on 'two alternative lines' to the origin of 'barely' (put forward by another writer whom they quoted). They convey their point of view to the reader by the phrase "the basis of much controversy".

The proposition in example (4) is interesting in that it has two types of evaluative signals - one operating clause internally and the other clause externally. The author comment signal "Regrettably" which comes at the beginning of the proposition is clause-external. It is expressing the writer's attitude to the whole affair of how 'Crop Evolution and Diversity' has been conducted, in a sense, it is commenting rathermore on the form of the message than on the content or what Quirk and Greenbaum might term as "stylistic disjunct". The other author comment signals which function as clause-internal, namely "although
considerable" and "important", are commenting on the content of the message and revealing why the writers are regretful in conveying this message.

The word "fortunately" in example (5) is signalling the writer's positive evaluation of the work carried out recently by scientists and governments towards crop plants conservation. This proposition is actually offered as a broad evaluation of the activities in the field - following a proposition with a negative evaluation of the previous handling of the problem in the preceding sentence.

Having considered these examples from the Plant Biology text, let us further illustrate this category by exploring other examples from Nature journal, the second set of the corpus.

6) It is sometimes asserted... that these impacts would have prevented the continued existence of life before 3.9 Gyr, but little has been done until recently to quantify the untoward effects on life.
(Text (4) L.L. 2-5 Nature journal).

7) Because of its great extent in Africa and because of the spatial overlap of the Karoo province with the southern end of the East African rift system, it is not immediately clear which topographic features should be related to the proposed Karoo plumes.

8) But the same meetings have demonstrated that molecular biology has confused further some of the thornier problems of plant virus taxonomy.
9) The endless Frontier was one of the decisive influences in persuading the US congress that basic research should be supported generously, so is it not prudent to retell the tale lest the Congress should forget? (Text (9) L.L. 10-15. Nature journal).

10) For forest ecosystem, there is considerable disagreement over the proposition of fixed carbon that is allocated to subterranean organs. (Text (10) L.L. 46-9. Nature journal).

The writers in example (6), after having introduced the topic of the article, which is about an ecosystem, in the preceding proposition, come up with the second proposition as an evaluation of the work in this subject, using the phrase "but little has been done until recently", as a signal. In fact, such a presentation and signalling device is typical of what Swales (1981), in his analysis of article introductions, calls 'gap-indication', which is one of the signals of move 3 in which the writer evaluates previous research or move 2. Of course, the modal verb above "would" is not considered as an author signal since it is a part of previous research report. The sentence or proposition in example (6) is also typical of what Winter (1985) considers as a minimal text structure of a mere two clauses, one representing situation and the other representing evaluation element.
The author in example (7) (which is from an article about the "role of plume in continental drainage patterns), is evaluating the difficulty he faces in describing the "Karoo plume". The linguistic devices he used to signal this move structure or act in this proposition are those underlined above, namely "Because of its great extent", and "it is not immediately clear".

The co-authors in example (8) are also presenting the proposition here as an evaluation of the work on "the movement of viruses through plants". The evaluation is signalled by the linking word "But" and the phrases "has confused further" and "thornier problems". In a sense, it is a negative evaluation of the work in this area. The proposition here like in example (6) above acts as a signal of what Swales might similarly term as a 'gap-indication, where the writer, among other things, could put forward a negative evaluation of the previous research or move 2 so as to justify the present work. (Compare Winter's two English texts basic structures, 1986).

The author in example (9) is also putting forward the first clause of the proposition as an evaluation. This evaluative language act is marked by the phrases "one of the decisive influence" and "should be supported generously" as underlined above. On the other hand, the
second clause of the proposition or sentence is functioning as a "focus". We know that the author intended this second clause to be a "focus" in that it is expressed in a form of a direct question, where the writer usually intends to attract the reader's attention. To put it differently, the above proposition in example (9) is performing two communicative language acts, namely "evaluation" and "focus".

In example (10), the proposition is put forward by the writer as an evaluation of "forest ecosystem". He signals the evaluation by the phrase "considerable disagreement".

To sum up, as it appears above and will be further demonstrated in chapter 4, the category evaluation is mostly signalled by what have been termed by Quirk and Greenbaum (1973) as style and attitudinal disjuncts, among other devices, or what Halliday (1985) calls modal and comment adjuncts - such as "fortunately", "considerable", "fundamental", "irrelevant", "decisive" and "important" in the examples cited above. Finally evaluation is the largest category. It constitutes 40.4% of the author comments identified in the corpus.

Hypothesis: this category will be referring to any utterance in the text that is offered as a possible
interpretation of a phenomenon, or an explanation of likely facts. As Winter (1986) puts it, the hypothetical element can be signalled by means of the lexical items such as: 'assumption', 'belief', 'claim', 'expect', etc. To put it differently, the hypothesis here will be a tentative explanatory or an interpretative proposition of likely facts, be it in the past, present or future.

For the purposes of illustration, let us first consider the following examples from the Plant Biology text. (The devices signalling author comments are underlined).

1) What will remain a mystery, perhaps, is why agriculture began as we believe it did some 10,000 years ago in various parts of the world. (Text (1) L.L. 18-19. Plant Biology).

2) Seed agriculture appears to represent the indigenous mode of agriculture in the drier tropics and sub-tropics of both the Old and New worlds. (Text (1) L.L. 88-9. Plant Biology)

3) In centres of crop diversity, it is likely that such pathogens can be found, and this pathogen and pest variation must be taken into account when introducing seed from such regions. (Text (2) L.L. 466-8. Plant Biology)

4) Plant breeding is a capital intensive industry, and the production of a new variety may take up to 10 years or more. (Text (3) L.L. 72-3. Plant Biology)

The authors in example (1), having established how, where and when human first domesticated and cultivated plants in
the preceding proposition or sentence, are now presenting
the proposition here as their point of view with regard to
why agriculture began 10,000 years ago, which they think
is not likely to be established precisely. They signalled
their position by the lexical items: 'will', 'perhaps' and
'believe'. In a sense they are putting this proposition
forward as a possible interpretation of the state of
affairs that will prevail.

In example (2), the writers signalled their point of view
with regard to 'seed agriculture' in the tropics and sub-
tropics by employing the lexical item "appears" which
carries the connotation that the proposition is offered as
a possible description of 'seed agriculture' in those areas
rather than it being necessarily the exact case. In other
words, they are not committing themselves fully to the
proposition.

The proposition in example (3), which is on the discussion
of pathogen, is performing two language acts. In the first
clause of the sentence or proposition, the writers suggest
that pathogen could be found in 'centres of crop diversity,
this being signalled by the hypothetical phrases "it is
likely" and "can be found". In the second clause, the
writers are putting forward a recommendation in conjunction
with their hypothesis in clause one, this being signalled
by the modal verb "must".

In example (4), the proposition is functioning as a hypothesis too. The writers are estimating the period that might be required to set up a new variety of plant breeding. They employ the modal verb "may" to convey their tentative estimation in this context.

For further illustration, let us explore two of the examples below from the second set of the corpus (i.e. Nature journal articles).

5) Neither living cells nor complex organic molecules would have survived this blow. (Text (4) L.L. 22-3. Nature journal)

6) Beyond that point the continental margin may respond by fracture and undergo local surface uplift. (Text (5) L.L. 261-3. Nature journal)

7) Migration corridors, however, do not seem to compensate for this difference, a finding of particular relevance to the debate over whether such corridors are effective in maintaining populations in conservation areas. (Text (7) L.L. 102-7. Nature journal)

8) It may be that the tropical forests are sufficiently stable that they will grow back once human intervention ceases. (Text (8) L.L. 82-4. Nature journal)

The authors in example (5), which is taken from an article on the 'annihilation of ecosystems', are putting forward an interpretation of what might have happened if a 'Mars-sized
object fell on the early earth. In other words, the proposition here is a hypothesis about a phenomenon that is believed to have occurred in the past. The authors signalled their hypothetical expression to the reader by the modal verb "would".

Similarly in example (6) the author is imagining what will happen if the opposing forces on the continental margin intensify. Unlike the hypothesis in example (5) above, which is about a past phenomenon, this one is about a possible future phenomenon. It is signalled by the modal verb "may".

The proposition in example (7) is put forward by the writer as a tentative explanation of an existing phenomenon of 'fruitflies population' (in an article which is about destruction of habitat by man). The hypothesis here is signalled by the lexical verb "seem".

Likewise in example (8), the author is offering the proposition as an explanation of the state of affairs that might prevail in future, having given the account of how the deforestation of the tropical forests might upset global and local meteorological balances. The hypothesis here is signalled by the modal verbs "may" and "will".
In example (3), the authors are also stating why they think the development of various mechanisms in some outbreeding crops is important, this being mentioned in the preceding proposition. They signal the justification to the reader by the phrase "the importance of this lies in the fact that..."

The writer in example (4) is justifying why he thinks that diverting energy to roots has "implications for global carbon-budget studies." He signals the justifying proposition to the reader by the phrase "for clearly..."

To sum up, the justification category, which makes up 1.7% of the author comments identified in the corpus, expresses the reason why the writer takes a certain stand or move in the subject under discussion. As illustrated above, justification is signalled by linking words such as "because", "for" and "clearly", and lexical items such as "reason".

Deductions: here the author signals to the reader what is concluded as a definite fact from the preceding arguments or hypotheses.
To exemplify this category, let us explore the example below from the data.

1) Consequently the need for international finance is apparent, which comes mainly from so-called developed, industrialised nations of the 'North'.
   (Text (3) L.L. 8-10. Plant Biology).

2) These are therefore classified as one species, namely Hordeum vulgare (Bowden, 1959).

3) As a result the drainage system in the Kalahari basin, although still recognisable, has now adopted a more complex patterns as it adjusts to heterogeneous basement rocks.

4) Thus, the lunar crust is a reasonable starting point for our study.

5) By analogy, modern oil-field bacteria exist at the interface of oil and sulphate (or oxygen) rich water.

6) Both are zones of Karoo - age rifting,1,2 and hence analogous to the Namib in the Dacous province.

7) The Orange River rises only 150 km from the South-East Coast but flows into the Atlantic at Oranjemond, 1,400 km due West (fig.4) so it is evidently a classic case of drainage directed away from the new ocean.

In example (1), the writers, having reviewed problems that face 'plant genetic resources', are offering the proposition here as what they have arrived at as a
conclusion or deduction, namely 'the need for international finance'. They signal this to the reader by the lexical item "consequently".

The authors in example (2) are also putting forward the proposition as a deduction. They, having given a background to "barely", deduced the right classificatory label - "Hordeum Vulgare" - this being signalled by the linking word "therefore".

Similarly in example (3), the proposition is functioning as a deduction. After revealing the depth of the erosion at "Cape-Angola", the writer gives his deductive proposition on the drainage system in Kalahari basin. He employed the "phrase" "as a result" to signal this to the reader.

The authors in example (4), having accepted that the "crust" is the most studied object in the preceding proposition, are now deducing that it is 'a reasonable starting point for their study. They signal this to the reader by the linking word "thus".

The writers in example (5) are offering the proposition as a deduction, having considered various hypotheses in relation to early ecosystem on earth. They signal this to the reader by the prepositional phrase "by analogy".
Likewise in example (6), the writer in a discussion about the continental drainage pattern, is advancing the proposition here as a conclusion on the "Limpopo and the Zambezi rivers". He signals this deductive proposition by the linking word "hence".

Similarly in example (7), the author signals his deductive proposition on the "Orange River" by the linking word "so".

Briefly, the deduction category is a definite conclusion derived from an argument or hypotheses. This category constitutes 2.2% of the author comments located in the corpus. It is signalled by linking words such as "consequently", "therefore", "thus" and "hence", and phrases such as "as a result..." and "by analogy...".

Counter: this author comment functions as a contrary opinion or conclusion on hypotheses or arguments put forward by others.

Below are examples from the corpus to illustrate this category:

1) Conversely, it can be concluded that the number of huge objects that hit the earth was not large.  
(Text (4) L.L. 124-6. nature journal)
2) There are indications that agriculture had an independent origin in China (Ho, 1969) based on the cultivation of millets, but agriculture may have spread there from Thailand, as it probably did in Europe and parts of Africa from the Near East and S.W. Asia (Text (1) L.L. 242-3. Plant Biology).

3) It is convenient to these species as belonging to the genus Aegilops, although Feldman (1978) has assigned them to Triticum. (Text (1) L.L. 301-3. Plant Biology)

The authors in example (1) are advancing a different conclusion on objects that hit the earth, having dismissed other conclusions for the lack of evidence. They signalled this move by the lexical item "conversely".

Similarly, in example (2), the authors are putting forward a contrary hypothesis on the origin of agriculture to that which has been reported. They signal this by the linking word "but".

The writers in example (3) preferred one reference term of wheat to another used by others (i.e "Aegilops" to Triticum"), saying that the one they used is more convenient. They signal their preference by the items "convenient" and "although".

In summary, Counter functions as a contrary opinion or hypothesis to others. It constitutes 0.8% of the author
It is signalled by linking words such as "conversely", "but" and "although".

Explanation: this author comment functions as a clarificatory note for the reader where the writer thinks there might be some confusion or ambiguity.

Consider the examples below for illustrative purposes.

1) The polyploid condition means that they possess more than two sets of chromosomes, and that the genetic constitutions have a major element of redundancy in it.
   (Text (1) L.L. 446-7. Plant Biology)

2) Improvement in wheat, ... are being made by the international agriculture research centres which have a mandate for research on these crops (i.e. CIHOTT, IRRI and CIP)...
   (Text (3) L.L. 79-83. Plant Biology)

3) Surface uplift (the term is used to mean that the average elevation of the ground increases) on a regional scale is difficult to demonstrate.

The authors in example (1) are explaining the meaning of "Polyploid" in anticipation of any difficulty it might cause to the reader in understanding the text, having introduced the term in the preceding proposition. They signal this move by the phrase "...means that...".
Likewise, in example (2) the authors for the purpose of clarity, put the abbreviations of those research centres they referred to in brackets. Beside the brackets, they signalled this explanatory information by the abbreviation "i.e."

Similarly, in example (3) the writer included an explanatory note about the term "surface, up lift" in brackets so as to avoid any possible misinterpretation. He signal this to the reader by the phrase "mean that..."

In short, and as demonstrated above in the explanatory comment, the writer explains to the reader what he assumes the reader might not understand. In the corpus analysed, this category constitutes 0.7% of the author comments identified. However, at this juncture it must be pointed out that, although information put in brackets is likely to come under explanatory comments, I have only considered those with lexical signals such as in examples 2 and 3-leaving out those bracketing without signals. Finally, explanatory comments are usually signalled by phrases such as "mean that" and "that is"

Reference: this author comment is concerned with the instance in which the author refers the reader to a certain
section in the text or to another source for further details or clarification.

To exemplify this category, consider the examples below:

1) From the practical point of view, the identification of the wild progenitors of crops is of great significance, ..., as will be shown in chapter 6. (Text (1) L.L. 8-11. Plant Biology)

2) As will be seen in a later section (p.12), the domestication of plants resulted in a number of fundamental changes in the plants themselves. (Text (1) L.L. 117-9. Plant Biology)

3) As a result, Vavilov recognized eight centres of Origin, shown in Fig 2.2, and an indication of their crop diversity is given in Table 2.1. (Text (1) L.L. 267-9. Plant Biology)

4) These techniques are referred to in more detail in the final chapter. (Text (2) L.151 Plant Biology)

As shown by the above examples, the function of the reference is to direct the reader’s attention to point(s) in the same section of the text or to another section with the aim of providing detailed or clarificatory information. This category constitutes 1.6% of the author comments located in the corpus. However, it should be mentioned that those reference instances without lexical item signals have not been considered in this project. The instances identified in the corpus are signalled by phrases such as "as will be shown in...", "as will be seen in...", "shown
hybrid author comments, where a proposition realizes more than one language act (Jones, 1983).

3) The signalling devices of the categories identified do not necessarily signal the same category. However certain signals tend to mark specific categories which suggests a possibility of patterns (see chapter 4 for details).

4) An author comment or language act is not necessarily signalled by one linguistic device in the proposition (or sentence). The various author comment signals tend to cluster to realize a particular language act, this being made conspicuous by the context.

5) The nine categories adapted or put forward here are not necessarily the only author comments available in every text. There might be more or less author comment categories in the text, as will be shown in chapter 4.

Next, in chapter 4, we discuss the results of the analysis carried out in this project and the direction into which they are pointing in the light of the two sets of data. In addition, the signalling devices will be further explored so as to establish any likely patterns and characteristics of the categories.
ANALYSIS OF THE DATA AND RESULTS

4. This chapter discusses the results of the analysis carried out in this project. It will first explore the corpus considered, giving a broad picture of the author comments identified in relation to the texts analysed. This broad picture will be followed by a detailed analysis of the two sets of data, focusing on the categories adopted so as to establish any similarities or differences that might suggest whether the two sets of the corpus share the same characteristics of author comment functions or not. To further consolidate this point, the linguistic signalling devices of the author comments will be reviewed with the aim of arriving at a possible pattern that cuts across the same category found in the various texts.

4.1 The Data Analysis

As mentioned previously, the data analysed in this project come from two sources, a Plant Biology text, and the journal Nature. The three chapters taken from the Plant Biology (code named Texts 1, 2, 3) contain 1584 lines with 527 occurrences of author comments, a ratio of 1 to every 3 lines. While the seven articles from the journal Nature
(code named texts 4, 5, 6, 7, 8, 9, 10) contain 140 lines with 447 occurrences of author comments, a ratio of 1 to every 2.6 lines. This general picture gives the corpus from Nature a lead in author comment occurrences. However, as shown in Table 4.1 below, with the exception of the two texts from the section entitled "Articles" in Nature journal (code named texts 4, 5), which have the ratios 1:2 and 1:2.7, the three texts from plant Biology are generally leading, each with the ratio 1:2.7, 1:3.6 and 1:3.1. The occurrences of author comments being slightly lower in the other 5 articles from the section entitled "News and Views" in Nature (codenamed Texts 6, 7, 8, 9, 10) each with the ratio 1:4.8, 1:4.4, 1:4.4, 1:4.3 and 1:4.8. Nevertheless, the fact that the three texts from Plant Biology (with 232-870 lines) and the two articles from "Article-section" in Nature (with 303-389 lines) have a higher ratio of author comment occurrences in the corpus analysed, will not come as a surprise given their larger sizes in comparison to the five articles from "News and Views section" in Nature, which relatively have smaller sizes (with 115 - 138 lines).
Table 4.1  Incidence and Ratio per Line of author comments in the two sets of corpus

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<th>Lines</th>
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<td>870</td>
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<tr>
<td>2</td>
<td>133</td>
<td>462</td>
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<td>3</td>
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<tr>
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<th>Comments</th>
<th>Lines</th>
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<td>1140</td>
<td>1:2.6</td>
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</table>

In brief, an average ratio of 1 to every 3 lines in the corpus from Plant Biology, and 1 to every 2.6 in the corpus from Nature is in no doubt indicative of the large numbers of author comments in these texts.

4.2 The Categories

To further illustrate the data under discussion, it is essential to explore the categories into which the author comments identified in the two sets of the corpus fall.

In the corpus from Plant Biology, evaluation as shown in Table 4.2 is the biggest category with 41.3% (177 instances) of the author comments. In fact in the three...
texts analysed here, it is the largest category in texts 1 and 2 - except in text 3 - where it comes next to hypothesis. Similarly in the corpus from Nature, evaluation, as presented in Table 4.2.1, is the largest category with 49.2% (129 instances) of author comments. This being made obvious by the fact that it has the highest occurrence of author comments in text 5, 6 and 9, and the same as hypothesis in text 7, while only in texts 8 and 10, it is surpassed by hypothesis. Thus, considering the two sets of the corpus together, evaluation constitutes the biggest category of the author comments with 40.4% (306 instances) as demonstrated in Table 4.2.2.

Hypothesis, as in Table 4.2, is the second biggest category of author comments identified in the corpus from Plant Biology text. It makes up 32.2% (138 instances) of the author comments. In the three texts analysed in this set of corpus, hypothesis has the second largest occurrence of author comments both in texts 1 and 2, and even the largest in text 3. Likewise in the second set of data which is from Nature, hypothesis is the second largest category of author comments as shown in Table 4.2.1. It constitutes 36.5% (120 instances) of the author comments. In the seven texts analysed in this set of corpus, hypothesis is the largest in texts 4, 8 and 10; the second largest in texts 5, 6 and 9; and has the same number of occurrences with
evaluation in text 7. On the other hand, if the two sets of
the corpus are put together, hypothesis constitutes the
second largest category with 34% (258 instances) of the
author comments as displayed in Table 4.2.2.

The third biggest category in the corpus from Plant Biology
is focus as shown in Table 4.2. It makes up 14% (60
instances) of the author comments identified in this set of
data. In the three texts analysed here, it is the third
largest category in texts 1 and 2; and the second largest
as evaluation in text 3. Similarly in the second set of
corpus, taken from Nature focus constitutes the third
biggest category with 14.9% (49 instances) of the author
comments as demonstrated in Table 4.2.1. In all the seven
texts analysed in this set of corpus, focus comes in the
third place. Taking the two sets of corpus together, focus constitutes the third largest category of author
comments with 14.4% (109 instances) as depicted in Table
4.2.2.

Recommendation, as shown in Table 4.2 on the set of corpus
from Plant Biology, is a relatively small category of
author comment. It only makes up 5.4% (23 instances) of
the author comments identified in this set of data. In the
three texts analysed here, there are few instances of
author comments in texts 1 and 3, except in text 2 where
it constitutes more than half of the instances of the whole category in this set of corpus. On the other hand, recommendation in the set from Nature journal, as shown in Table 4.2.1, is even smaller than in the first set of corpus. It constitutes only 2.7% (9 instances) of the author comments found in this second set of the corpus. In fact, it is only present in five of the seven texts analysed here. As shown in Table 4.2.2, putting the two sets of the corpus together, gives recommendation only 4.2% (32 instances) of the author comments identified.

Justification, as shown in Table 4.2 on the set of corpus from Plant Biology is also another relatively small category. It makes up 1.6% (7 instances) of the author comments. In fact, it is only present in one (text 1) of the three texts analysed here. Likewise in the second set of the corpus, which is from Nature justification is a very small category with 1.8% (6 instances) of author comments. It occurs only in three out of the seven texts analysed in this set of corpus. Thus, considering the two sets of the corpus together, gives justification only 1.7% (13 instances) of the author comments as shown in Table 4.2.2.

Deduction is also another small category of author comments. In the corpus from Plant Biology seen in Table 4.2, deduction, like justification, makes up only 1.6% (7
instances) of the author comments. Though present in all the three texts analysed in this set of corpus, it is only on a very small scale. In the second set of corpus, from Nature, deduction, as shown in Table 4.2.1, is slightly higher than in the first set of the corpus. It accounts for 3% (10 instances) of the author comments located in this set of data. However, like in the first set of corpus, it is only present, on a small scale, in three out of the seven texts analysed in this set of data. In the whole corpus analysed in this project, deduction makes up 2.2% (17 instances) of the author comments identified as displayed in Table 4.2.2.

Counter is one of the smallest categories in the corpus from Plant Biology. It makes up 0.5% (2 instances) of the author comments. As shown in Table 4.2, these two instances only come from text 1. The other two texts (2, 3) contain no counter. Likewise in the second set of data, though slightly higher, counter as shown in Table 4.2.1, is one of the smallest categories. It constitutes only 1.2% (4 instances) of the author comments identified. It is only present in three out of the seven texts analysed in this set of data. As displayed in Table 4.2.2, counter makes up only 0.8% (6 instances) of the author comments identified in the whole corpus.
Explanation is also one of the smallest categories of the author comments identified in the corpus from Plant Biology. It represents 0.7% (3 instances) of the author comments. Though present in the three texts analysed here, it is only on a small scale, an instance in each text as shown in Table 4.2. Like in the first set of data, explanation in the corpus from Nature as shown in Table 4.2.1, represents only 0.6% (2 instances) of the author comments. It is only found in two out of the seven texts analysed in this set of corpus. Putting the two sets of the corpus together, explanation as given in Table 4.2.2, only accounts for 0.7% (5 instances) of the whole author comments located.

Reference is also one of the small categories of author comments identified in the corpus from Plant Biology. It constitutes 2.8% (12 instances) of the author comments located in this set of corpus. However, though higher than the other small categories (except recommendation) as shown in Tables 4.2 and 4.2.2, reference is only present in the corpus from Plant Biology. In fact, it is only found in texts 1 and 2, which are among the four largest texts in the entire corpus. On the other hand, since reference is not present in the second set of corpus which is from Nature, it only makes up 1.6% (12 instances) of the author comments located in the whole data.
### Table 4.2. The Plant Biology Corpus: Author Comment Categories by Occurrence of Communication Acts and Percentage

<table>
<thead>
<tr>
<th>Categories</th>
<th>Text 1</th>
<th>Text 2</th>
<th>Text 3</th>
<th>Total</th>
<th>%</th>
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<td>138</td>
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### Table 4.2.1 The Nature Journal Corpus: Author Comment Categories by Occurrence of Communication Acts and Percentage

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<td>20</td>
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</table>

In brief, as the joint table for the two sets of the corpus shows above, evaluation (40.4%), hypothesis (34%) and focus (14.4) are the three largest categories of the author comments identified in the data as a whole. In fact these three author comment categories are present in all the ten texts analysed, this being shown in the tables above. It is also important to note that these three micro-language acts, especially evaluation and hypothesis, cut across the various parts of the discourses or texts analysed here, focus being sometimes present in specific parts of the texts or what Swales (1981) calls move 4. Regarding the other six categories, they have relatively small percentages, ranging from 4.2% to 0.7%, with categories such as recommendation tending to occur towards the end of
the texts, and reference and explanation restricted to the larger texts.

4.3 The Signalling devices

This section attempts to review the linguistic devices that mark the nine categories adopted in this project. However, as context-based examples or propositions have already been cited to illustrate the author comment categories in chapter 3, this section will only display the signalling devices so as to give a broader picture of the markers concerned and possible underlying pattern(s).

Below are the signalling devices of the categories in succession:

Evaluation Signals:

The Key issue...
The highly successful...
the most relevant, are believed to be
of the important...
of importance...
is difficult...
is the most obvious...
is perhaps the most important...
is of only regional importance...
is surprising...
is attracting increasing attention...
are considerable...
has an important...
better than...

Fortunately...
Broadly speaking...
Undoubtedly...
Regrettably, considerable... of an important

of probably only a few...

is simply... can... reasonably...
is clearly... implied...
is apparently highly... tolerant...
is also excellently preserved...
is strictly temporary...
if.. are sufficiently opaque...

may... be questionable...
at least, it may be necessary...
can be important... although never sufficient
that could act... is also difficult
especially... would have been much better
This complex and sophisticated... should have required.
should have been... as it has more surface area...

To a certain extent... enigma...
By contrast... is deeply...
by and large...

Whereas... is known with confidence... a source of controversy
However... far from certain
Despite... the controversy... still persists...
but little has been done...
But... has confused further...

that is neglected...
is not known with any certainty...
Seems to be... wearing thin...
little was appreciated...
special problems...
However there is still a problem

As the above examples taken from the various texts analyzed show, the author comment category, evaluation, is marked by various linguistic devices (see Appendix B). These signalling devices range from a single word to phrases. They are adjectives such as "important", "difficult".
adverbs such as "fortunately", "undoubtedly", modal verbs such as "may", "can", "should", "could": evaluative verbs such as "neglect", "improve"; and "nouns such as "importance", "problem"; prepositional phrases such as "to a certain extent", "by and large"; conjuncts such as "however", "despite", "but". However though evaluation is marked by various linguistic devices, it must be noted that these devices do not usually mark evaluation separately. They tend to cluster in order to realise this micro-text element, this being made conspicuous by the context-based signals given above.

Hypothesis Signals

What will remain a mystery, perhaps, is...
that may throw light...
can be estimated
ecological weeds must have been unpalatable...
If... the upper crust should have frozen...
would have survived...
might well have..
the sweet potato could have occurred...

tend to be...
commonly originate...
now implies
it appears that...
now it seems that...
if one postulates... then... probably...
if... one must conclude that...
the largest is expected to be...
is believed to have... would have...
presumed to be most important

is possible... may be needed...
is probable...
is also likely...
most likely...
as most likely...

perhaps... was
has perhaps...
is probably...
is apparently...
were probably...

the suggestion... must be
the implication... is that...
increasing evidence that...

In light of the analysis carried out in this project (see Appendix B) and as exemplified by the signals above, the
micro-text element, hypothesis, is mostly marked by modal verbs, some lexical verbs (i.e. 'reporting verbs'), and some adjectives, adverbs and their related nouns (i.e. 'nonverbal modality') - (Adams - Smith, 1984). Though I have tried to exemplify these signalling devices separately to some extent as illustrated above, it is also evident from the very illustration that these various linguistic devices tend to cluster together to realize the hypothetical elements of the texts.

Focus Signals

We are now aware that... must...
We suggest that it is better...
We are concerned here with...
We first discuss...
Our main concern is...
Let us now turn to the areas...
I interpret...
I assume that...

In the context of this book, we shall be less concerned.
In this text, it is our intention to...
In this paper, we concerned ourselves...
The preceding discussion has...
thus far I have tried to view...
Here we have been concerned with...
Here I have shown...
In this introduction... we have attempted to give the reader

What is the significance...?
Where would these plants...
Why should this be so?
How do the rainfall anomalies...
Do these...
Can two views...
Is there any...

It is known that...
It is true that...
It is apparent that...
It is probable that...
It is interesting that...
What is certain is that... impossible...
While it is clear that... it should be...
It is this... I shall test...

Focus, in the corpus analysed here and as shown by the above examples, is marked by five types of linguistic
signalling devices, namely (1) first person pronoun, where the writer refers to himself inclusive or exclusive of the reader, (2) reference to the work or subject under discussion, (3) summarizing or previewing what has been covered, (4) asking a direct question, (5) using extraposition sentences (cleft hand or pseudo-cleft sentences). However, although I tried to present these five types separately above, they tend to merge, among other things, to realize this communicative language act (see Appendix B).

**Recommendation Signals**

should be considered...
should be less than...
Future experiments... Should be complemented...
can undertake... in order to provide...
must be taken into account...
must be undertaken... to minimize the risk
clearly these risks must be taken into consideration...
In order... it may be necessary...
may be needed
may well be... it would be good if...

much more effort needs to be expanded...
Further research is needed in the future...
In order for progress to be made... research needs to be...

is particularly important
are an invaluable step
therefore of great importance
it is convenient...
it is important to...
Even if... it is necessary to...
If... then it is essential that...
As demonstrated by the examples above, recommendation is mostly marked by modal verbs, and lexical items such as the verb "need" and the adjectives "important", "essential", and "necessary" (see Appendix B).

Justification Signals

For this reason... cannot be emphasized too much
there is no reason to believe that...
But even this... for clearly there is a larger link...

Because of the widespread... there is considerable support...
This approach is better because the true scale...
The precise radiating... is not too important, because
Because of... is considerable... important
The probability that... because
is higher by an unknown amount because...

is unknown because no...

The importance of this lies in the fact that...

Indeed it could be argued that without this we would...

However... can still be seen... can be...

Justification, in the analysis here as illustrated above, is mostly marked, among other things, by linking words such as "for", "indeed", "because", "clearly"; lexical words such as "reason"; and phrases such as "the importance of this lies...".

Deduction Signals

Consequently there must have been...

consequently samples cannot be taken for testing...

consequently the need. is apparent...

These are therefore classified as one species...

Thus, the lunar crust is a reasonable starting point...

Thus, the analysis... is leading to discovery of...

Thus, must have originated...

hence analogous to the Narmada...

So it is evidently a classic case...

As a result... one of the main.

As a result the drainage system... a more complex...
By analogy, modern oil field bacteria exist...

The signalling items of the micro-function, deduction, as shown above, includes linking words such as "consequently", "therefore", "thus" "hence", "so"; and expressions such as "as a result" "by analogy".

Counter Signals

Conversely, it can be concluded that...
Conversely, a long continuity... would imply...
It is convenient to refer... although
But I speculate that...
But agriculture may have spread there from...
But it is hardly appropriate...

The micro-function, counter as exemplified above, is signalled by linking words such as "conversely", "but" and "although" - these being the only signals located in the texts analysed.

Explanation Signals

The polyploid condition means that...
The term is used to mean that...
This means that the genes...
On a global scale this means that...
Agriculture research centres... (i.e CIMMY T, IRRI and CIP)
The function, *explanation* is signalled by expressions such as "mean that" and "that is" or (i.e.). It is to be noted that those potential *explanation* acts put in brackets but contain no linguistic signals have not be considered in this project. This might be the reason why its presence is marginalized in the analysis. For a glance at the corpus in Appendix A will confirm the presence of information in brackets, especially in the articles.

**Reference Signals**

As we shall see in Chapter 6

as will be shown in Chapter 6

are referred to in more detail in the final chapter

As will be seen in a later section...

shown in Fig 2.2... is given in Table...

are listed in Table 2.4.

are summarized in Fig 2.5.

These context-based examples above, clearly show that the function, *reference* in the sense used in this project, is concerned with those expressions that refer the reader to either a point, section or chapter in the texts. In the data analysed, *reference* is only limited to texts 1 and 2 of the corpus from plant biology, which are relatively bigger in size.
The next chapter, conclusion, states the major points of the analysis carried out and their pedagogical implications.
CHAPTER 5

5 CONCLUSION

This chapter briefly states the findings of the micro-functions analysis carried out in this project, and discusses their pedagogical implications.

5.1 Summary of Results

Having explored the various author comment functions in the data analysed here, the following points are worth noting:

(1) In considering the occurrence of author comment signals in relation to the number of lines in the two sets of the corpus, the corpus from Plant Biology has a ratio of 1 to every 3 lines, while the corpus from Nature has a ratio of 1 to every 2.6 lines. This means that the two sets of the corpus have almost similar ratios of author comment signals per lines. On the other hand, it is to be concluded that these ratios of 1:3 and 1:2.6 from Plant Biology and Nature journal respectively, clearly show that the presence of author comments is quite sizeable in the texts analysed in this project.
(2) In working out the proportions of author comment categories adopted in the two sets of the corpus, it became clear that evaluation (40.4%), hypothesis (34%) and focus (14.4%) are the three biggest categories, accounting together for 88.8% of the author comments identified. These three categories (especially evaluation and hypothesis) tend to cut across the macro-parts of the discourse, while focus is mostly present in what Swales (1981) termed as move 4 (this being prominent in the articles). The other six author comment functions, namely recommendation, justification, deduction, counter, explanation and reference are of relatively smaller proportions ranging from 4.2% to 0.7%, accounting only for 10.2% of the author comments located. It is also worth noting that recommendation tends to occur towards the end of the texts. On the other hand, the occurrence of justification, deduction, counter, explanation and reference is limited to a small number of the texts analysed. In fact reference is only confined to two texts of the corpus from Plant Biology.

(3) On the signalling devices employed to mark these categories, it is to be observed that, although some of these signals, in isolation or cluster, tend to realize more than one author comment function, a possible signalling pattern is discernible, this being greatly
facilitated by the context, based interpretation of the signals. For instance, evaluation is mostly signalled by attitudinal markers: hypothesis - modal verbs; and focus-first person pronouns and extra position sentences, etc (see Appendix B).

(4) In the light of the analysis carried out here and their results, it is possible therefore to conclude that aspects of author comment in the two varieties of the scientific genre, represented by the corpus from the Plant Biology text and Nature journal articles, are essentially the same, this being consolidated by the similar number and functions of the author comments found in the two sets of the corpus and the close similarity of their signalling devices.

5.2 Pedagogical Implications

Having briefly stated the findings of author comments analysis carried out in this study, it might be useful to throw light on these micro-communicative acts and their pedagogical implications:

Firstly, as mentioned previously, the analysis has basically shown that:
(1) There are large numbers of author comments in the texts.
(2) An author comment function can be signalled by more than one linguistic device.
(3) An author comment can sometimes realise more than one language act, a phenomenon that is sometimes known as hybrid comments or double coding.

Secondly, the study has shown that author comments play a great role in the organisation of the texts. For, as Tadros (1985) puts it, 'there is evidence that the writer does not simply present facts and ideas to the reader, but is rather concerned that these should be understood and accepted'. This observation becomes clear if we look at the categories adopted in the analysis. Categories such as focus, explanation and reference, as presented in chapter 3, could be seen as an effort by the writer to ensure that clarity and understanding prevail, and confusion or ambiguity does not unnecessarily arise. On the other hand, categories such as evaluation, hypothesis, recommendation, justification, counter and deduction clearly convey the writer's persuasive powers. In other words, the writer's main duty is to manipulate these micro-language acts in such a way as to enhance understanding and acceptability of his or her message.
Therefore, the above argument points to the fact that for the learner of English to have a better chance of mastering the spoken and written discourse alike, he or she must be encouraged to explore these micro-language acts, or as Tadros (Ibid.54) states:

It is important to make students aware of signals of writer detachment from propositions so that they distinguish between what a writer thinks, believes or claims and what he says others think, believe or claim.

Indeed, as one went on to argue, failure to make this distinction leads to errors. Moreover, I would argue that this distinction should also apply to the various author comments. This is in the sense that a learner of English should be able to distinguish whether a particular signal of author comments in an utterance or a proposition is signalling, for instance, an evaluation, hypothesis or recommendation. He or she should also be able to deduce whether a proposition in a text is performing one act or more. To briefly illustrate this argument, let us consider the following examples from the corpus:

1. Whichever scheme is correct is perhaps irrelevant in one sense. (Text (1) L.306 Plant Biology).

2. What will remain a mystery, perhaps, is why agriculture began as we believe it did some 10,000 years ago in various parts of the world. (Text (1) L.1. 18-20 Plant
3. Viral taxonomy has always been a difficult area and is likely to remain so following new discoveries about the organisation of RNA genomes. (Text: (6) L.L. 147-50. Nature journal).

In order to understand fully the proposition in example (3) above, which is an evaluation, it is essential that the reader takes into consideration the signal "perhaps" beside the other signals underlined. Failure to do so will result in a wrong interpretation of this proposition. This is because although the writers in their 'review here of the schemes offered as possible interpretation of the origin and diversity of the crop plants' are being dismissive of the details, they are nevertheless non-committal to the total validity of their evaluation, this being signalled specifically by the nonverbal modality "perhaps". Similarly, the writers in example (2) are not entirely committed to the hypothesis they are putting forward on 'the origins of agriculture, this being signalled also by the nonverbal modality "perhaps". On the other hand, the proposition in example (3) is intended by the writers to function both as an 'evaluation' and a 'hypothesis'. The evaluation is signalled by the attitudinal marker "difficult" in the first clause, and the 'hypothesis' is signalled by the nonverbal modality "likely" in the second clause. Therefore, it is important that the reader
pays close attention to author comment signals not only at a propositional level, but also to the signals, within the clauses that made up the proposition.

This leads us to the conclusion that since a signal can signal more than one author comment, and an author comment can sometimes realise more than one language act, it is essential that a context-based approach is adopted in teaching or learning of these micro-communicative acts. To put it differently, the signalling linguistic items of author comments will be better presented in discourse contexts where they are performing the various communicative functions (McCarthy, 1988).

Finally, further research is needed to thoroughly study the various genres so as to explore the underlying language acts with the aim of working out more precise statements on the patterns of the signalling linguistic devices in relation to discourse contexts. This, it is hoped, will provide ESP course designers and material writers with an invaluable resource for shaping the courses and learning materials which will offer the learners more realistic learning situations, where the interactive aspects of language structures are effectively explored and utilized.
REFERENCES


Winter, K.G. (1986), Clause Relations as Information Structure: Two Basic Text Structures in English, in Discourse Analysis Monographs No.13 (ed Coulthard), Birmingham University: ELR.
Crop Evolution and Diversity

An understanding of the cause and extent of crop plant diversity is fundamental to the practice of crop plant improvement. Investigators of crop evolution have found that the major steps in this process can be divided into two main categories: mutations and introgression. The former includes those events by which new species are created, while the latter refers to the introduction of genes from one species into another. Both processes are important in the evolution of crop plants, and both can occur in a variety of ways.

In recent years, the study of crop evolution has become increasingly important as we seek to understand the genetic basis of crop improvement. This is particularly true in the case of crops that have been domesticated for thousands of years, such as wheat and rice. In these cases, the genetic diversity that exists within populations of these crops is often quite limited, and this limits the potential for genetic improvement.

However, the use of wild relatives can help to alleviate this problem. For example, by crossing domesticated wheat with its wild relatives, it is possible to introduce genes that can help to improve resistance to disease or drought. Similarly, the use of wild rice has been instrumental in the development of new strains of this crop that are better adapted to local conditions.

In summary, the study of crop evolution is essential to the future of agriculture. By understanding the genetic basis of crop diversity, we can develop more efficient and sustainable crop improvement strategies.
The evolutionary dynamics of plant domestication

Domestication of plants has been a significant process that has shaped human societies. Plants were domesticated for their various uses, such as food, fiber, and medicine. The process of domestication involves the selection of plants with desired traits, such as larger size, better taste, or higher yield. Over time, these traits are passed on to subsequent generations through breeding, resulting in the development of new varieties of plants.

The process of domestication has occurred in a number of plant species. Early evidence of domestication dates back to at least 10,000 years ago, with the domestication of wheat, barley, and domesticated plants. The domestication process was influenced by factors such as climate, soil, and available resources. Domestication led to the development of agriculture, which in turn had a significant impact on human societies.

The domestication of plants has had a profound impact on human societies, shaping the way we live and interact with the natural world. The process of domestication continues to this day, with ongoing efforts to develop new plant varieties that meet the needs of modern societies.
The Dr. Coop Elza of this document on the left side of the page. The text is not clearly visible due to the image quality.
Wildfires are a factor in natural vegetation in many areas. Although they do occur in some places, in the form of plant fire damage, it is more concentrated in certain areas. However, it is also important to note that the effects of wildfire can vary depending on the conditions at the time of the fire. In addition, wildfires can also have a significant impact on the natural vegetation and may lead to changes in the landscape.

The graphic variability of crop plants

The pattern of growth directly affects crop plant yields. The interaction of five basic factors: water, nutrient availability, and temperature, is critical in determining crop yields. In addition, the use of appropriate crop varieties and proper management practices can significantly improve crop yields. The selection of the right crop variety and the appropriate management practices can help to ensure a successful crop season.
of organisms at different latitudes, but in the tropics temperate, contrasts high and low latitudes, especially if they are alpine and deciduous. The tropics, however, have a different climate and vegetation, and the distribution of organisms is different in different latitudes, especially if they are alpine and deciduous. The tropics, however, have a different climate and vegetation, and the distribution of organisms is different in different latitudes, especially if they are alpine and deciduous.
Table 24. The major food groups.

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<thead>
<tr>
<th>Food Group</th>
<th>Examples</th>
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</thead>
<tbody>
<tr>
<td>Grains</td>
<td>Rice, bread, pasta</td>
</tr>
<tr>
<td>Fruits</td>
<td>Apples, bananas</td>
</tr>
<tr>
<td>Vegetables</td>
<td>Spinach, carrots</td>
</tr>
<tr>
<td>Meats</td>
<td>Chicken, beef</td>
</tr>
<tr>
<td>Dairy</td>
<td>Milk, cheese</td>
</tr>
<tr>
<td>Oils</td>
<td>Olive oil</td>
</tr>
</tbody>
</table>

Table 25. The major food groups.

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grains</td>
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</tr>
<tr>
<td>Oils</td>
<td>Olive oil</td>
</tr>
</tbody>
</table>

The table shows the major food groups and their examples. The groups include grains, fruits, vegetables, meats, dairy, and oils. Each group provides essential nutrients for a balanced diet.

Rice is one of the most widely cultivated crops. It is the staple food of the population of many countries, including China, India, and Japan. Its cultivation dates back to prehistoric times and has been a major factor in the development of human civilization.

The nutritional value of rice is high, providing a good source of carbohydrates, proteins, and fibers. It is also a good source of minerals such as iron and zinc, which are essential for maintaining good health.

In conclusion, rice is a vital crop that plays a crucial role in the economies of many countries, providing food security and nutrition for millions of people worldwide.
The diploids have been selected as the A genome, the monoploids as the B genome, and the haplotypes as the AB genotype. Subsequently, the chromosomes of the A and B genomes are known to be in balance with the T. brachypus species, and the diploids of the AB genotype and the haplotypes of the AB genotype are shown in Fig. 2.3.

The monoploids are also shown in Fig. 2.3, where they are shown as a single chromosome. The diploids are shown as two chromosomes, one from the A genome and one from the B genome. The haplotypes are shown as a combination of both chromosomes. The figure shows the arrangement and orientation of the chromosomes in the monoploids and diploids.

In summary, this study examines the genetic relationships between the A and B genomes of cereal crops and demonstrates how these relationships can be used to understand the genetic diversity and evolution within these crops. The findings have implications for breeding programs aimed at improving crop resistance to disease and climate change.
Diverse recent discoveries, the continua" over the science of man's life. For instance, the latest research has led to a deeper knowledge of evolution in the Americas, upon which the development of several important cultures, particularly the Andean civilization, depended.

Rippon (1990: 105-100)...

The recent discovery of the Americas has been a turning point in the evolution of man's life. The Andean civilization, upon which the development of several important cultures, particularly the Andean civilization, depended.

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The recent discovery of the Americas has been a turning point in the evolution of man's life. The Andean civilization, upon which the development of several important cultures, particularly the Andean civilization, depended.
34 Crop Evolution and Dispersal

Toward the end of the year of 1912, Dr. F. G. G. P. B. J. E. M. was growing a crop of maize in the field in front of the laboratory. The corn was healthy and vigorous, with a high yield of grain. Dr. B. J. E. M. noted that the grains were significantly larger than those of the local wild-type maize. He speculated that the increased size might be due to genetic factors, possibly resulting from a hybridization event.

3.5 The genetic basis of this increase in size was later elucidated by Dr. J. E. M. B. G. F., who performed a series of crosses and back-crosses with the local wild-type maize. The results showed that the increase in grain size was due to the inheritance of a single dominant gene from the hybrid strain.

8.05 A classic example of the hybridization theory was reported by Dr. G. H. M. J. E. in 1915. He conducted experiments with a hybrid strain of maize, which was found to exhibit increased vigor and yield compared to the local wild-type maize.

8.10 However, Dr. G. H. M. J. E. also observed that the hybrid strain tended to lose its vigor and yield over several generations, indicating a possible marker trait that could be used for early detection of the true hybrid strain.

8.15 The hybridization theory of crop evolution was further supported by Dr. J. E. M. B. G. F.'s experiments, which showed that the hybrid strain could be successfully propagated through self-fertilization, maintaining its improved characteristics.

Table 3.1: Selected Hybrid Maize Strains

<table>
<thead>
<tr>
<th>Variety</th>
<th>Hybridization Type</th>
<th>Yield Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hybrid A</td>
<td>Single gene</td>
<td>25%</td>
</tr>
<tr>
<td>Hybrid B</td>
<td>Double gene</td>
<td>30%</td>
</tr>
<tr>
<td>Hybrid C</td>
<td>Triple gene</td>
<td>35%</td>
</tr>
</tbody>
</table>

8.20 It is interesting to note that the hybridization events observed by Dr. B. J. E. M. were not purely genetic but also involved environmental factors. Dr. M. B. J. E. suggested that the hybrid strain's improved characteristics could be further enhanced by selecting for specific environmental conditions during its cultivation.

Conclusion

The hybridization theory has been a cornerstone in understanding the evolution and improvement of crops. It has enabled farmers to develop strains with increased yield and vigor, contributing significantly to global food security.
Plant Genetic Resources Exploration

Early days — the botanical collectors

The earliest records show that collecting expeditions date back to 1699 when a French botanist, Jean-Baptiste Tavernier, sent an expedition to India in search of tea, whose fragrance was known to the ancient Chinese. He observed the botany and biology of various plants during the 17th century, and during the 18th century, the collections made by the French botanists, such as the work of Joseph Banks (1743-1820), President of the Royal Society, and the Swedish botanist Carl von Linné (1707-1778), a pioneer in the study of plant taxonomy. These collections were sent to various parts of the world in search of exotic species. The first large-scale botanical expeditions in the 19th century were launched in search of plants for medicinal, agricultural, and horticultural purposes.

In these early days, plant collecting was a dangerous occupation, with the collectors often facing environmental challenges, including the absence of modern transportation and communication methods. The early collectors faced many challenges, including the lack of knowledge about the plants' habitats and the diseases they might carry. Despite these challenges, the early collectors laid the foundation for the modern study of plant genetic resources, which continues to this day.
subsequent stages, southern and northern key species. As a result, the number of species has increased significantly. In addition, the Gentianaceae family has also expanded, with a number of species being reported in the latest literature.

5. Development of Two-Phase Cultures

The development of two-phase cultures is an important aspect of plant tissue culture technology. This method involves two distinct phases: the proliferation phase and the differentiation phase. The proliferation phase is crucial for the rapid multiplication of plant cells, while the differentiation phase is responsible for the formation of new tissues and organs. The use of two-phase cultures allows for the efficient production of large quantities of plant material, which is essential for various applications such as biofuel production and genetic modification.

6. Genetic Transformation

Genetic transformation is a powerful tool in plant tissue culture technology. It involves the transfer of foreign genes into the genome of plant cells, which can then be expressed in the transgenic plants. This technology has revolutionized the field of plant breeding and genetics, enabling the development of new crops with improved traits such as increased productivity, disease resistance, and tolerance to environmental stresses.

7. Conclusions

The advancements in plant tissue culture technology have opened up new avenues for research and application. These include the development of new crop varieties, the production of herbal drugs and essential oils, and the use of plant cells in biotechnology. However, there are still many challenges that need to be addressed, such as improving the efficiency of tissue culture and ensuring the safety of transgenic plants. Despite these challenges, the future of plant tissue culture technology looks promising, with continued research and development likely to lead to even more innovative applications in agriculture and biotechnology.
38. Discussion

6.5 Section: Antipyrine species may also be bred using the Maxeler Series.

Lamprologus live in fresh and saltwater environments and do not store energy in the liver as do those in the same family. Antipyrine species are known to be able to survive in brackish water environments.

7.2 The purpose of the present study is to examine the taxonomic relationships among the species of Antipyrine. Although the study was conducted using a large number of specimens, the results presented here are a preliminary report.

7.4 In the course of our studies, we have found that the species of Antipyrine can be divided into two groups, Group A and Group B. Group A consists of species that are found in the western Pacific, while Group B consists of species found in the eastern Pacific.

8.5 The results of our study suggest that the taxonomy of Antipyrine species is complex and that further studies are required to fully understand their relationships.

Table 3.1: Taxonomic analysis of Antipyrine species

<table>
<thead>
<tr>
<th>Species</th>
<th>Habitat</th>
<th>Distribution</th>
</tr>
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<tbody>
<tr>
<td>A. pacificus</td>
<td>Freshwater</td>
<td>Pacific Ocean</td>
</tr>
<tr>
<td>A. tropicalis</td>
<td>Saltwater</td>
<td>Atlantic Ocean</td>
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References:


In their communication with plant and animal biologists, the application of the technique to the genetic analysis of species in the genus *Lycium* has been highly controversial. The authors of *Phenolipid* and *Viva* (1971) have strongly criticized the selection of full-progeny populations of plants grown in field conditions, as well as for the identification of wild populations."
The emergence of genetic resistance generally does not involve large numbers of seed and, consequently, may take place over many years. In the case of resistance to plant diseases, the resistance may be hereditary, but it is often a result of a mutation or a new genetic combination. The understanding of the genetic basis of resistance is crucial for the development of effective control measures. Genetic resistance can be used to develop crop varieties that are resistant to specific diseases. 

In many cases, the development of genetic resistance involves the identification and selection of resistant parent materials. The selection process involves the evaluation of the resistance of different cultivars or varieties to specific diseases. This is often done in a controlled environment, where the disease is introduced under controlled conditions. The selected resistant lines are then propagated and evaluated for their resistance in the field. This process is repeated until a resistant variety is developed.
The Future

It is necessary that we concentrate on the development of the human potential in order to achieve the long-term goals of human development. The development of human potential requires a coordinated effort among all levels of government, international organizations, and private sectors. It also requires a strong foundation in science, technology, and education. The development of human potential is a complex and multifaceted process that involves many different factors. The development of human potential is not only important for the economic growth of a country, but it is also essential for the quality of life of its citizens. It is important to focus on the development of human potential because it is the key to achieving sustainable development and creating a better future for all people.
characteristics of the system which are aimed at today include by Paneth and his co-workers [9], in the breeding of legume crops. A large number of different species of wild varieties. These varieties are also used in improving the intensification of breeding efforts and are great threats of genetic information by Hoagland, which has been of the utmost importance to intensification and breeding techniques. Differentiation of the selection process and hybrid seeds further plant breeding. In the breeding effort to improve the selection process, an attempt has been made to develop new plant materials with better performance, which are also common in the process of developing new plant materials with better performance. In order to achieve this, it is necessary to have a comprehensive understanding of the basic principles of cultivar development, and the utilization of genetic resources by understanding the process and genetic factors. In recent years, the role of the hybrid system is seen by geneticists as a means of improving plants by introducing new genes and traits from other species. This approach is used in a variety of crops, and particularly in the case of legume crops, which have the potential to introduce new traits and characters in the crop. The hybrid system is seen as a means of improving plants by introducing new genes and traits from other species. This approach is used in a variety of crops, and particularly in the case of legume crops, which have the potential to introduce new traits and characters in the crop. However, the utilization of genetic resources by understanding the process and genetic factors is also seen as a means of improving plants by introducing new genes and traits from other species. This approach is used in a variety of crops, and particularly in the case of legume crops, which have the potential to introduce new traits and characters in the crop.
Annihilation of ecosystems by large asteroid impacts on the early Earth

H. Stuart, J. Zahnle, J. E. Krissin & R. M. Morowitz

Scientific American, September 1978

Abstract: The collision of a large asteroid with the Earth is hypothesized to have been responsible for the annihilation of ecosystems on the early Earth. This hypothesis is based on the assumption that the early Earth was not a self-sustaining system and that the impact of a large asteroid would have produced a global climate change that would have resulted in the destruction of all life on Earth. The hypothesis is supported by the observation that the early Earth was not a stable system and that the impact of a large asteroid would have produced a global climate change that would have resulted in the destruction of all life on Earth.

Key points:
- The early Earth was not a self-sustaining system.
- The impact of a large asteroid would have produced a global climate change.
- The impact of a large asteroid would have resulted in the destruction of all life on Earth.

The hypothesis is supported by the observation that the early Earth was not a stable system and that the impact of a large asteroid would have produced a global climate change that would have resulted in the destruction of all life on Earth. The hypothesis is supported by the observation that the early Earth was not a stable system and that the impact of a large asteroid would have produced a global climate change that would have resulted in the destruction of all life on Earth.

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Intermediate states in the movement of transfer RNA in the ribosome

Danaeh Moadz & Harry F. Noller
Thomson Learning, University of California at Santa Cruz, Santa Cruz California 95064·LA

Direct chemical 'footprinting' shows that translational initiation of tRNAs occurs in two discrete sites. During the first stage, which occurs spontaneously after the addition of the mature mRNA, the acceptor end of tRNA moves relative to the large ribosomal subunit. During the second stage, which is promoted by an movement factor (EF-G), the acceptor end of tRNA, along with the messenger RNA, moves relative to the small ribosomal subunit.
The role of mantle plumes in the development of continental drainage patterns

G. Cox

The neotectonic framework suggests that the origin of the Neotropical drainage system can be traced back to the time of the opening of the South Atlantic. The Neotropical drainage system is considered to be a result of the collision of the South American and North American plates. The Neotropical drainage system is characterized by a series of large rivers, including the Amazon, Orinoco, and Paraná-Paraguay rivers. These rivers drain a large area of South America and are a testament to the long history of tectonic activity in the region. The Neotropical drainage system is also influenced by the Andean orogeny, which occurred during the Miocene and Pliocene periods. This orogeny resulted in the formation of the Andes mountain range and led to the uplift and erosion of the Andean region, which in turn affected the drainage patterns of the Neotropical region. The Neotropical drainage system is also influenced by the volcanic activity of the Andes, which has had a significant impact on the development of the region's geomorphology and hydrology. The Neotropical drainage system is a testament to the complex and dynamic processes that have shaped the landscape of South America. The Neotropical drainage system is also a key indicator of the ongoing tectonic activity in the region, which continues to shape the landscape and influence the development of the region's biodiversity. The Neotropical drainage system is a key component of the global hydrological cycle and plays a significant role in the regulation of the Earth's climate. The Neotropical drainage system is also a key component of the region's cultural heritage and is an important source of water for the region's human populations.


difficulty of drainage patterns

- The"Saw-Grass" pattern, one of the most common, occurs where the water table is near the surface and the soil is relatively free of trash. Drainage channels follow the natural contours of the land, and the flow of water is slow and steady. This type of drainage is common in low, flat areas such as marshes and swamps.

- The "Ring-Grass" pattern, another common type, occurs where the water table is deeper and the soil is more compact. Drainage channels are circular or oval in shape and the flow of water is rapid and irregular. This type of drainage is common in areas with a more pronounced water table, such as the edges of lakes and rivers.

- The "Finger-Grass" pattern, occurs where the water table is even deeper and the soil is very compact. Drainage channels are narrow and irregular, and the flow of water is very slow. This type of drainage is common in areas with a very persistent water table, such as the bottoms of valleys and along the sides of hills.

- The "Spruce-Grass" pattern, occurs where the water table is shallow and the soil is very compact. Drainage channels are narrow and irregular, and the flow of water is very rapid. This type of drainage is common in areas with a very shallow water table, such as the tops of hills and along the edges of streams.

- The "Peat-Grass" pattern, occurs where the water table is very shallow or absent, and the soil is very compact. Drainage channels are narrow and irregular, and the flow of water is very rapid. This type of drainage is common in areas with a very shallow water table, such as the tops of hills and along the edges of streams.

- The "Clay-Grass" pattern, occurs where the water table is shallow and the soil is very compact. Drainage channels are narrow and irregular, and the flow of water is very rapid. This type of drainage is common in areas with a very shallow water table, such as the tops of hills and along the edges of streams.

- The "Silt-Grass" pattern, occurs where the water table is shallow and the soil is very compact. Drainage channels are narrow and irregular, and the flow of water is very rapid. This type of drainage is common in areas with a very shallow water table, such as the tops of hills and along the edges of streams.

- The "Sand-Grass" pattern, occurs where the water table is shallow and the soil is very compact. Drainage channels are narrow and irregular, and the flow of water is very rapid. This type of drainage is common in areas with a very shallow water table, such as the tops of hills and along the edges of streams.

- The "Loam-Grass" pattern, occurs where the water table is shallow and the soil is very compact. Drainage channels are narrow and irregular, and the flow of water is very rapid. This type of drainage is common in areas with a very shallow water table, such as the tops of hills and along the edges of streams.

- The "Clay-Grass" pattern, occurs where the water table is shallow and the soil is very compact. Drainage channels are narrow and irregular, and the flow of water is very rapid. This type of drainage is common in areas with a very shallow water table, such as the tops of hills and along the edges of streams.

- The "Silt-Grass" pattern, occurs where the water table is shallow and the soil is very compact. Drainage channels are narrow and irregular, and the flow of water is very rapid. This type of drainage is common in areas with a very shallow water table, such as the tops of hills and along the edges of streams.

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Spreading the word

Cara Beall-Barnes and Penny Nix

As the first of a series of 'Scoping the Literature' features, we highlight some recent publications in the field of RNA biology.


There are recommendations for the modi- 
fication of the irrigation system, in 
particular the installation of a 2.5 hp 
water pump and the use of a 1.5 hp 
water pump for the irrigation of the 
vegetable garden. The recommendation 
for the installation of a 2.5 hp water 
pump is based on the need to increase 
the efficiency and flow rate of the 
irrigation system. The 1.5 hp water 
pump is recommended for the irrigation 
of the vegetable garden due to the 
limited area and the smaller water 
requirements.

There are also recommendations for the 
maintenance of the irrigation system. 
It is suggested to clean the irrigation 
valves and pipes regularly to ensure 
their proper functioning. The 
maintenance of the irrigation system 
is crucial to ensure its efficiency and 
longevity.

The recommendations for the 
maintenance of the irrigation system 
include:

1. Regular cleaning of irrigation 
valves and pipes to maintain 
their functionality.
2. Inspecting the irrigation 
system for any leaks or 
malfunctions.
3. Ensuring the proper 
fitting of the irrigation 
valves and pipes.
4. Testing the system 
regularly to ensure its 
capacity and efficiency.

There are also recommendations for 
the proper use of the irrigation 
system. It is suggested to use the 
system during the early morning 
hours when the water demand is 
lower. This will help conserve water 
and reduce the risk of water 
loss.

There are recommendations for the 
proper use of the irrigation system. 
It is suggested to:

1. Use the system during the 
evaporative demand.
2. Use the system during the 
peak hours.
3. Use the system during the 
non-peak hours.
4. Use the system during the 
early morning hours.

There are recommendations for the 
proper use of the irrigation system. 
It is suggested to:

1. Use the system during the 
peak hours.
2. Use the system during the 
non-peak hours.
3. Use the system during the 
early morning hours.
4. Use the system during the 
evaporative demand.

There are recommendations for the 
proper use of the irrigation system. 
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non-peak hours.
4. Use the system during the 
early morning hours.
Mixing of basal magma

Emmy M. Klein

This process of mixing melt and crystalline fragments toward producing lower-density basaltic magma is important in understanding the generation of oceanic plate boundary magmas. The mixing process occurs in a magma chamber, where the melt is brought to the surface by convection. The resulting magma is then erupted at mid-ocean ridges, where it mixes with fresh mantle material to form new oceanic crust.

Rainbows reveal good vibrations

Robert A. Bindschadler

Rainbows are formed when light is split into its component colors and then recombined, creating a visual display of color. In this case, the rainbows are formed in the atmosphere, where light is scattered by water droplets or ice crystals. The colors of the rainbow are determined by the wavelength of the light, with red light being at the outer edge and violet light at the inner edge. This phenomenon is important in understanding atmospheric processes and the interactions between light and matter.
TEXT (4)

NEW AND VIEWS

Missed opportunity in biology

The US National Academy of Sciences recently released a report on the US government's role in supporting scientific research. The report, "The Future of Scientific Research: The Case for Federal Support," highlights the importance of federal funding for scientific research and the need for continued investment in this area. The report argues that federal funding is crucial for supporting basic research, which is the foundation of scientific progress and innovation. Without adequate funding, the United States risks falling behind in the global race to advance scientific knowledge.

The report also emphasizes the need for a multidisciplinary approach to scientific research, recognizing the importance of collaboration between different fields. It calls for greater investment in STEM education and training to ensure a strong pipeline of scientists and researchers.

The US government has historically provided significant funding for scientific research. However, funding levels have declined in recent years, and the report calls for a recommitment to supporting scientific research at all levels, from basic to applied.

The report is a timely reminder of the importance of federal funding in advancing scientific knowledge and innovation. It underscores the need for continued investment in scientific research and highlights the potential benefits of such investment for the economy and society as a whole.

The report is available for download on the National Academy of Sciences website.
Answers that lie in the soil

For most farmers, not much more than the tips of the roots are visible above the surface of the soil. But it is possible to get a better picture of what lies beneath the surface, and this can be very useful in deciding what crops to plant and how to manage them.

Soil fertility is determined by a variety of factors, including the type of soil, the climate, and the crops that are grown. To improve soil fertility, farmers can use a variety of techniques, including crop rotation, cover cropping, and the use of organic amendments such as compost and manure.

Crop rotation is the practice of growing different crops in a field in a particular order, with each crop being grown for a specified number of years. This helps to reduce the build up of pests and diseases, and also helps to improve the fertility of the soil.

Cover cropping is the practice of growing crops specifically to improve the soil, rather than for a harvest. These crops are typically grown between the main crops, and help to improve soil structure, increase soil organic matter, and reduce soil erosion.

Organic amendments, such as compost and manure, are also widely used to improve soil fertility. These amendments provide a range of benefits, including the addition of organic matter, which helps to improve soil structure and water holding capacity, and the release of nutrients, which can be used by plants.

By improving soil fertility, farmers can grow healthier crops, which can lead to increased yields and improved profitability.
APPENDIX B

THE SIGNALLING SERVICES IN THE CORPUS

TEXT (1)

**Signal**

**Fundamental**

Indeed it could be argued that, we would, satisfactorily

important, shrouded in mystery

of great significance, valuable

as will be shown

In order to understand, is relevant, our major

fair

will, perhaps, we believe,

surely, is correct

undoubtedly, suggested, only sufficient

**here... or there they**

Whatever..., major

probably, slow, the dramatic

It is these, more likely to have

It is convenient to use, we shall return

**We... less concerned**

can

in fact we are, we cannot

Let us now

it seems clear that
Interestingly, most important

What we see

obviously, cannot, can be

If we, is common

Where would

tend to be

did, or did

Even, limited settlement

hypothesis suggests that

most likely

must have

will

appears

more typical

would

would be

would be, seem

can

As will be seen

fundamental changes

What is clear is that

actively, would be at a considerable disadvantage

undoubtedly, deleterious, although it is clear that, will

consequently, must have ... considerable

only, could
must have, would have
would enable
must, may... be
of the important
can be, can
dramatically, one of the most important
In order for, it is advantageous
or importance
commonly originate, often
Good examples
often fully fertile, not extensive, disruptive
music, efficient;
may
Whatever, may considerably
For this reason, cannot, too much
extremely fortunate that... can, with fair degree of certainty
extremely untidy
But what...
is surprising
is considerable
but... may, probably
impressive, far less certain
well, to the greatest extent
rapidly
consequently, is poor, often only, suggest, may not actually
significant
undoubtedly
shown in, given in
It is probable that
profound
notable gaps
can be easily
consequently
It is now known that, important
such that, could not be
A comprehensive
shown in
whichever... is perhaps irrelevant
What is important is that, must
What is... certain is that
We are now aware that, must
it is... known that
most likely
the importance, predictive, if, then... is likely to be
tend to
their relative importance can be
is a spontaneous
there... no reason to believe that
can, is hard to
However, very important
good, probably originated

should be considered

is greater, but... high level

the importance of this lies in the fact that, or what might be

there is no reason to believe that

why

Perhaps one explanation can be

is considerable evidence to indicate

may, so that

will now be considered

successful, will

will be

often selectively disadvantageous, albeit is an important way

What is the significance can be

must, only a very small of probably only a few it is important, can be

may not be so important, will be

Indeed we are now aware that, may

has perhaps, best

But what
is simply, can, reasonably a sharply modified

can be important, although — never sufficient rarely creates, differ markedly
one... likely to be major
must have, reasonably
can occur
means that, major
tends, can
effective, may not

are important

important, of increased value

It is convenient at this point, most important

most widely cultivated

the classical

listed in

However, a simplification as we now understand it

considerable, specific

must have been

must have originated, a large

excellent example

It is clear that

It is convenient, although

It is clear that, will be

by and large
Whereas... is known with confidence, a source of controversy
reasonable
However, far from certain
shown in
The importance, of the greatest evolutionary importance
provokes... with greater
the important, important

Although, perhaps, has attracted more controversy
is most impressive
On these
While there is little agreement
that, less certain
However, can still be seen
can be
Careful, suggests, complex

would suggest
Considerably, although... no evidence
to suggest
Despite, the controversy, still persist
What is certain is that, important
is perhaps the most important
although obviously closely related, sterile
Can be
remarkably
achieved little more, considerable extent
is much harder
better than, little, even though it is
 Known that
is an important
well
major
preeminent
probably represents
therefore
positive
possibly can be
such controversy
could have, but in fact fueled further
debate
simplest view, say
is likely to be correct, recent evidence
suggests
as most likely
the most important
But what
is apparently
bitter-tasting, frost tolerant, must be
is probably
the relatively small number, does suggest
that
was probably
Summarized in
it is now clear that
As a result, major, as well shall see, one of the main, important
is an important, high
achieved importance
is extremely varied, appears to be
can be
comprehensive, the closest relative
it is apparent that
would be increased
appear to be, would
it is clear that, are actually favoured
Because of, it considerable, important
are still the subject of controversy, uncertain
undoubtedly
needs to be
does provide an interesting
is still not certain
What is certain is that, impossible
could have
To a certain extent, enigma
would produce, suggests
We cannot... with certainty, is a likely
are the main, the important
shown in
It is interesting that
can almost invariably be
A common, is clear
are apparent
of great importance
are considerable
well known
is not known with any certainty
While it is possible, detailed... may not be
The cleanest and most complete
ancient, is most impressive
most important, importance
can be
is larger than
the possibility that
is considerable
the pre-eminent, maybe due
may be a result of
The preceding discussion has
can still be
dynamic
the importance, can easily
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<thead>
<tr>
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<th>Note</th>
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<tr>
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<tr>
<td>should be</td>
<td>1</td>
<td>Recommendation</td>
</tr>
<tr>
<td>it is important, cannot</td>
<td>2</td>
<td>Hypothesis</td>
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<tr>
<td>can</td>
<td>9</td>
<td>Hypothesis</td>
</tr>
<tr>
<td>generally much easier</td>
<td>11</td>
<td>Evaluation</td>
</tr>
<tr>
<td>can only, inevitably</td>
<td>16</td>
<td>Hypothesis</td>
</tr>
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<td>considerably more effort</td>
<td></td>
<td></td>
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<tr>
<td>increasingly</td>
<td>18</td>
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<td>will be</td>
<td>24</td>
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<td>In order... efficiently, it is convenient</td>
<td>25/6</td>
<td>Recommendation</td>
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<td>can</td>
<td>28</td>
<td>Hypothesis</td>
</tr>
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<td>can, in order</td>
<td>31</td>
<td>Recommendation</td>
</tr>
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<td>generally</td>
<td>32</td>
<td>Evaluation</td>
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<td>useful</td>
<td>39</td>
<td>Evaluation</td>
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<tr>
<td>can be... relatively easily, difficulties</td>
<td>41/3</td>
<td>Evaluation</td>
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<td>may be</td>
<td>45</td>
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<td>In this text it is not our intention to...</td>
<td>46</td>
<td>Focus</td>
</tr>
<tr>
<td>... we have</td>
<td>52</td>
<td>Focus</td>
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<tr>
<td>can</td>
<td>54</td>
<td>Hypothesis</td>
</tr>
<tr>
<td>is possible, may be needed</td>
<td>61</td>
<td>Hypothesis +</td>
</tr>
<tr>
<td>(Recommendation)</td>
<td></td>
<td>Evaluation</td>
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<td>it is... very difficult</td>
<td>63</td>
<td>Evaluation</td>
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<td>as a buffer, enormous</td>
<td>70</td>
<td>Focus</td>
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<td>we can be certain that, will be</td>
<td>73/5</td>
<td>Evaluation</td>
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<tr>
<td>most excessive</td>
<td>82</td>
<td></td>
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<tr>
<td>More generally</td>
<td>84</td>
<td>Evaluation</td>
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No better
excessively successful
could be easily
laborious and costly, greatly
certainly, only, marginal
limited
dramatically demonstrates the dangers.
Fortunately
can
say
certainly, will... the best results
The highly successful
cutstanding, quickly
era often good
maybe, cannot, may be
coften complex, delicate
referred to
say
may easily be
could
it seems that, truly
this means that
may be
cutstanding, highly tolerant
is apparently highly... tolerant
can... be
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<td>it is suggested that... may, may</td>
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<td>proving to be useful</td>
<td>Evaluation</td>
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<td>one of the best</td>
<td>Evaluation</td>
</tr>
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<td>why should this be so?</td>
<td>Focus</td>
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<tr>
<td>undoubtedly</td>
<td>Evaluation</td>
</tr>
<tr>
<td>difficult, considerable success</td>
<td>Evaluation</td>
</tr>
<tr>
<td>well defined</td>
<td>Evaluation</td>
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<td>it appears that</td>
<td>Hypothesis</td>
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<td>considerable promise</td>
<td>Evaluation</td>
</tr>
<tr>
<td>is an important</td>
<td>Evaluation</td>
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<td>invaluable resource</td>
<td>Evaluation</td>
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<td>can be</td>
<td>Hypothesis</td>
</tr>
<tr>
<td>are shown</td>
<td>Reference</td>
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<tr>
<td>one important success</td>
<td>Evaluation</td>
</tr>
<tr>
<td>successfully</td>
<td>Evaluation</td>
</tr>
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<td>Perhaps... was important</td>
<td>Hypothesis</td>
</tr>
<tr>
<td>was important</td>
<td>Evaluation</td>
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<td>major</td>
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</tr>
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<td>successful, contrasts</td>
<td>Hypothesis</td>
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<td>undoubtedly</td>
<td>Evaluation</td>
</tr>
<tr>
<td>Fortunately</td>
<td>Evaluation</td>
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<td>has an important</td>
<td>Evaluation</td>
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<td>Important</td>
<td>Evaluation</td>
</tr>
<tr>
<td>a major</td>
<td>Evaluation</td>
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</tbody>
</table>
an important
however, relatively few
fairly, even when... it is possible
appear to be
of international importance
Nevertheless, need access to, undoubtedly
Regrettably, considerable, of an important
largely
can be
undoubtedly, much less than
need to be effectively
may well be
therefore of great importance
may not be
incapable
is particularly valid, successful
it is apparent that
it is clear that, common practice
can, easily
important
is one of the most important
is particularly important
extensive, could
fortunately
important
In order, it may be necessary, can

329 Evaluation
330/1 Evaluation
335 Evaluation + Hypothesis
337 Hypothesis
343 Evaluation
344/5 Recommendation
347 Evaluation
350 Evaluation
357 Hypothesis
361 Evaluation
368 Hypothesis
371 Recommendation
372 Hypothesis
375 Evaluation
376 Evaluation
383 Focus
385 Focus
387 Hypothesis
389 Evaluation
395 Evaluation
396 Recommendation
398 Hypothesis
413 Evaluation
422 Evaluation
427/8 Recommendation
and invaluable step
rarely
possible risks
may appear, may be
More importantly, serious, should
clearly... must be, may, will be
an important
to a certain extent
special problems
but in general
may, may
must be, equally important
it is likely that... can be, must be
generally, consequently... cannot
It may be necessary
must be
Perhaps, is fully appreciated
the safest
we are...
<table>
<thead>
<tr>
<th>Line</th>
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<tbody>
<tr>
<td>1</td>
<td>While it is clear that, pivotal will be, only</td>
</tr>
<tr>
<td>5/6</td>
<td>it will not be possible, certainly</td>
</tr>
<tr>
<td>6</td>
<td>consequently the need ... is apparent</td>
</tr>
<tr>
<td>38/9</td>
<td>may not be, great deal</td>
</tr>
<tr>
<td>66</td>
<td>is essential</td>
</tr>
<tr>
<td>47</td>
<td>unfortunately, cannot</td>
</tr>
<tr>
<td>54/5</td>
<td>while it is clear that, it should be stressed that</td>
</tr>
<tr>
<td>66/7</td>
<td>we believe that, should</td>
</tr>
<tr>
<td>67/8</td>
<td>It is also clear that</td>
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<tr>
<td>69/70</td>
<td>need, must</td>
</tr>
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<td>71</td>
<td>it is not realistic to expect</td>
</tr>
<tr>
<td>73</td>
<td>May</td>
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<td>75/7</td>
<td>while it is clear that, perhaps</td>
</tr>
<tr>
<td>82</td>
<td>is</td>
</tr>
<tr>
<td>83</td>
<td>cannot</td>
</tr>
<tr>
<td>90</td>
<td>if, then it is essential that</td>
</tr>
<tr>
<td>91</td>
<td>unfortunately</td>
</tr>
<tr>
<td>97</td>
<td>We suggest that it is better</td>
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<tr>
<td>106/7</td>
<td>cannot be, can be, unless we</td>
</tr>
<tr>
<td>108</td>
<td>Surely our, will judge us</td>
</tr>
<tr>
<td>110/11</td>
<td>It is a certainty that if, then... is unlikely</td>
</tr>
<tr>
<td>113</td>
<td>Cannot be guaranteed</td>
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<thead>
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<td>Hypothesis</td>
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<tr>
<td>Deduction</td>
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<td>Hypothesis + Evaluation</td>
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<tr>
<td>Evaluation</td>
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<td>Explanation</td>
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<td>Hypothesis + Focus</td>
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<td>Focus</td>
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<tr>
<td>Hypothesis</td>
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Assuming that, can be, likely
will
undoubtedly
will, will
will inevitably
importantly, will
the more exciting
can be

can
will be
fascinating
can be
can be, can be
it is also possible that, can be
will certainly, it is also possible that, may
may
say
Whether or not, will, subject for debate
Nevertheless, will, important, we
It will
In order, needs to be
limited success
Generally, it is worth looking more specifically
improved dramatically
may be

115/8
123
124
127/9
130
131
133
137
139
141
152
154
155-7
157/8
158/69
161
174
178
179/80
183
184
189
192/3
195
202

Hypothesis
Hypothesis
Evaluation
Hypothesis
Hypothesis
Hypothesis
Evaluation
Hypothesis
Hypothesis
Evaluation
Hypothesis
Hypothesis
Hypothesis
Hypothesis
Hypothesis
Focus
Hypothesis
Recommendation
Evaluation
Focus
Evaluation
Recommendation
Despite, may offer
...is needed
we have attempted
little was appreciated
Fortunately
great deal, precious
What we do not want to see
must be
we are optimistic
Our main concern is
undoubtedly, will be,
it is our hope that, can be

Evaluation
Recommendation
Focus
Evaluation
Evaluation
Focus
Focus
Evaluation
Focus
Focus
Hypothesis -
(Focus)
Text (4)

Signal

but little has been done
In this paper, we concern ourselves, when did...
that is, we assume that..., would have
is better because... is very poorly constrained, whereas... are broadly constrained

relate only to
we argue that, can be
more strongly then
maybe able
we first discuss
is believes to have, would have
would have survived
It is the..., that is relevant
By contrast, is well preserved and well studied

That is, a reasonable starting point
we represent, would add
So long as, can be neglected
are believed to be typical
It is generally agreed that
It is controversial
is not well constrained
believed to be deeply buried
if this implies, being our preferred estimate

Line 5 10/12 13 15/8 19 21 23 25 27 30/1 33 33/4 35/6 37 38/40 41/3 47 49 50 57 57 63/5

Act Evaluation Focus Focus Justification
Focus Evaluation Hypothesis Focus Hypothesis Hypothesis
Hypothesis Focus Evaluation Deduction Focus Hypothesis Hypothesis Focus
Evaluation Hypothesis
is also constrained

if, should have

was largely solid, is believed to be

is so mildly, a useful, large

were sufficiently rare

seen to have been rare

In particular, should have

excavated, but no...have ever

been found despite careful search

Similarly, is quite are

should be less than

is relevant

the youngest and best preserved

If we assume that, is deeply,

being our profound estimate

assuming

should have been, as it has

more surface area and larger gravity

is also likely

we assume below

The probability that, because

if...is the largest,

are expected to have

are difficult to constrain

could be

There is no convincing evidence

and no obvious mechanism

Conversely, it can be concluded that,

was not large
we can visualise
The largest is expected to be
it can be shown that
the most relevant,
are believed to be
If this... applies, need not
have exceeded
assuming
is higher, an unknown,
because
we are concerned here with
is the most obvious
have no obvious
is of only regional importance
would be
are insensitive
roughly
would evaporate
we estimate that
thus, is quickly
is not too important, because roughly,
roughly
is strongly
All... is somewhat transparent, are not
effectively shielded, yet is sufficiently
opaque..., is quickly
roughly
would not form
can radiate
this is precisely

219 Hypothesis

can only reduce

224 Hypothesis

can cool

229 Hypothesis

would sit

232 Hypothesis

would consist of

233 Hypothesis

is negligible compared with

238 Evaluation

can be estimated

243 Hypothesis

249/50 Evaluation

if... are sufficiently opaque, is unimportant

will leave

252 Hypothesis

may not be

254 Hypothesis

But it is clear that extremely adverse, are expected, modestly larger than

256/8 Focus +

(Hypothesis)

By contrast, adverse, evaporates only

259/61 Evaluation

would be

252 Hypothesis

might, if they were lucky, be

263/4 Hypothesis

would, however, be

265 Hypothesis

would suffice

271/2 Evaluation

is plausible

272 Hypothesis

Using the inference that inferred, is expected

273/6 Hypothesis

as massive as, is also statistically expected

278/9 Hypothesis

may have occurred

281 Hypothesis

is probably, however, whatever, would suffice

283/4 Hypothesis

is thus statistically likely

286/7 Hypothesis

It is likely that

293 Focus

is unknown because no

295 Justification
is unambiguously

This complex and sophisticated, should have required a substantial
indicate that, implying that
Even if, it is necessary to
the key issue
there is sufficient light
would destroy
especially, would have been much better
However there is still a problem
ultimately
would die out
would survive
that could act, is also difficult
are easily... in a well
were probably
would depend
If significant sulphate... existed, was basically similar to
could then exist
would be, is less mobile than, and
would accumulate
are not easily exhausted, only a small mass
might escape
zoon adaptable, might exist
By analogy
Although... could persist, would need to
suggests the existence
here we have been concerned with
hence, what one believes is
Did, could utilize
Is it easier for
Rather than, we examine
the broader implication
If one postulates, then... probably occurred
is less clear if one postulates
is also less probably, as no evidence
may be as great as, if... was similar
or if, happened
However, should statistically increase
thus, would have had to be increasingly
sophisticated to survive
As this is counter to the usual course,
would be, with considerable uncertainty
Conversely, would imply
Signal

It is this... I shall test
postulates that
may produce
if... are favorable, may widen, new... will be
is strictly temporary
can be, I have present... evidence
strong support
is an old one
the fundamental
If..., a typical... ought, roughly
should be, should lead
I believe, a remarkable general, postulated will be discussed
is the youngest
now believed to be
I interpret
I assume that if
are interpreted as
a relatively small
is similar
unlike, however
only small areas, but... so extensive
I interpret
unlike... does not seem to have been

Line | Act
---|---
4/5 | Focus
5 | Hypothesis
10 | Hypothesis
14/15 | Hypothesis
16 | Evaluation
21/22 | Hypothesis + (Focus)
25 | Evaluation
27 | Evaluation
30/2 | Hypothesis
33/6 | Recommendation
41/3 | Focus
48 | Hypothesis
49 | Evaluation
54/5 | Hypothesis
62 | Focus
64 | Focus
70 | Hypothesis
75 | Evaluation
80 | Evaluation
82 | Evaluation
86/7 | Evaluation
91 | Focus
94 | Evaluation
is more difficult
is huge
clearly
in the present work
Because of its great extent, because of, it is not immediately clear, should be
broadly
hence analogous
has resulted in considerable
are well preserved
is still obvious
the simple
only, but, so it is evidently a classic case
is also excellently preserved
it is not obvious, however, realistic
although, are obviously difficult
the extremely, indicate, by implication
Thus, must have originated, probably
a considerable
but is closely, especially
is clearly, implied
thus, presumably, lending weight to speculation
the dynamic effects
may have, the postulated
but it is difficult to test
however, it is important to
As a result, although, a more complex main, of a known, the known, as far as possible, here I have seen, are less obviously preserved, however may enable more extensive
Signal

is attracting increasing attention 1
was evident 3
But... has confused further 7/9
increasing evidence that, is facilitated, the most studied 16/18
in still unknown 30/1
Broadly speaking 42
a specific interaction 44
abnormally large molecules, can pass 49/50
So far, although there will be complication 51/3

Of course, are much larger, so simple gating cannot be 83/4
Although there is much less information, is one important experiment 85/7
Thus, efficient assembly is not necessary, 97/98

curiously, necessary 115
at least, it may be necessary 129/31
Thus 137
the complex, suggest that this will be an effective and durable trait 141/3

will be 144
has always been a difficult area... and is likely to remain so 147/6

blurred 151
that may throw light 157

a true satellite... that is not obviously 172

Hypothesis
Evaluation
Evaluation
Evaluation
Hypothesis
Evaluation
Evaluation
Hypothesis
Hypothesis
Focus + (Hypothesis)
Evaluation
Evaluation
Evaluation
Deduction
Hypothesis
Hypothesis
Evaluation

It appears that clearly, good progress has been made, one looks forward to equally good progress.
Signal

- can be complex
- very difficult, almost exclusively
- serious implications
- more accurately, assumed, cannot be
- presumed to be most important
- generally more realistic, more suited
- can
- Although, were expected
- interestingly
- better... than, better than,
- some what unsurprisingly
- seem
- can only
- should be, more complex, realistic

Our
- are inexpensive
- adequate, high... significance
- Of course, can, may,
- more easily, most significant
- can
- But, more importantly, may provide
- an insight of profound, rapidly, may indeed
- be
Text (8)
Signal

might be, a matter of wide public concern
most strikingly,
a subject of speculation
such
such clearer
it is only with detailed,
    we can, may, extensive
    can, will be
the new study seems
the suggestion, must be'
Now
might
will...
It will be important, will
It may be, sufficiently, will
significantly
it is worth noting that, probably
it is easy, would be
complex
will
it is questionable that, will

Line  

1/5  
11  
15/16  
18  
21  
24/30  
52/4  
63  
67/9  
69  
74  
75  
78/90  
82/89  
92  
94/8  
100/2  
108  
110  
113/14

Act  
Hypothesis  
Evaluation  
Evaluation  
Evaluation  
Evaluation  
Hypothesis  
Focus  
Hypothesis  
Focus  
Hypothesis  
Focus  
Hypothesis  
Evaluation  
Hypothesis  
Focus
Signal
why
simply
one of the decisive, should be,
so is it not, should
seems to be, is wearing then
fair enough
indeed well suited
will, serious, will be
of course
It is true that
it is true that, will, say
Evidently a better understanding,
will throw light, possibly
will yet
Far from suggesting that, at pains
basic puzzles
must be, can be
might well have
It is too easily... that, awkward
now it seems that
will no doubt, maybe, will be
Is there any
irritating sin of commission
one must suppose that, disconcerting
insubstantial
largely inoffensive, disappointing

Line
1
9
11/5
16/7
40
41
44/5
51
53
57/8
62/8
66
70/2
77
84
86
88/90
99/100
101/6
106
110
114
143

Art
Focus
Evaluation
Evaluation + (Focus)
Evaluation
Evaluation
Hypothesis
Focus
Focus
Hypothesis
Focus
Hypothesis
Evaluation
Evaluation
Recommendation
Hypothesis
Focus
Hypothesis
Focus
Hypothesis
Hypothesis
Focus
Evaluation
Hypothesis
Evaluation
Signal  
may be  
it is hardly appropriate  
But... are firms, account adequately  
now implies that, could be a serious under-estimate  
It would be wrong to suggest that  
neglected, simply  
considerable disagreement  
may... be questionable  
ultimately, our knowledge, will depend  
that is neglected  
this means that, substantially  
implies that  
If... one must conclude that  
But even, has implications, for clearly, only if  
See, much more effort needs  
Equally important, will  
Perhaps, actually  
line   Act  
1    Hypothesis  
3    Counter  
16/18 Evaluation  
34/26 Hypothesis  
27 Hypothesis  
37 Evaluation  
46 Evaluation  
54 Evaluation  
69/70 Focus  
91 Evaluation  
96/7 Explanation  
102 Hypothesis  
106 Hypothesis  
109/14 Justification  
115/18 Recommendation  
120/1 Hypothesis  
124/5 Hypothesis